

ENGINEERING SUBMITTAL

I-85 1.0 MGD WATER RECLAMATION FACILITY
JEFFERSON, GA

SECTION 465361 – VERTICAL LOOP REACTOR AERATION SYSTEM

(4) 30HP Disc Aerator Assemblies Installation in (1) New VLR Tank

Project No.: 2033/001848.P.01 (453130-01)

Revision No.: B

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REVISION HISTORY

Revision	Description	Author(s)	Date
A	Initial draft.	RRK	8/17/2022
B	Updated as per Customer Comments. (For Record)	RRK	12/1/2022



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SECTION 1 DOCUMENTATION

CLARIFICATIONS AND EXCEPTIONS

The item(s) listed below are presented to clarify, justify, or bring project specification exceptions to your attention. A copy of this listing should be returned with the submittal marked or stamped accordingly, by the approving authority.

1. General Note

All storage, installation, operation, maintenance, spares, parts list, material, and weight information will be submitted at a later date, prior to equipment delivery.

2. Critical Note to the Installing Contractor on the VLR Drive

Evoqua asks that the included "IMPORTANT INSTALLATION NOTE" located in this submittal at the end of the reducer information section be *signed and returned* by the installing contractor prior to installation to prevent common, easy-to-make errors in drive installation which have led to significant drive damage on past projects. This note will be included in the O&M for reference, as well.

3. Contract Drawing Number 6-M-3 OF 37

In the Contract Drawing Number 6-M-3 of 37 the Max. Water Level is stated as 809.75 however as per the process requirement with the 21.5" submergence (Max. Condition) of the Disc the Max. Water Level is updated to 809.97. Please refer the Section Views in the GA drawing.

4. Contract Drawing Number 6-M-2 OF 37

As per the Wilo recommendation Location of the Mixer in the Anaerobic Tank 1 & 2 is changed from the Location shown in the Contract Drawing Number 6-M-2 OF 37 . Please refer the GA drawing No.: 453130-102 & 453130-110.

Location of the ORP Probe is changed from Anaerobic Tank 2# to VLR Tank 2#. Please refer the GA drawing No.: 453130-102.

END OF CLARIFICATIONS AND EXCEPTIONS



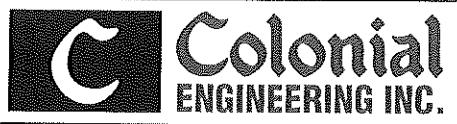
TITLE
Responses to Shop Drawing
Review Comments

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Customer Contract / Project Number	-
Evoqua Project Number	2033/001848.P.01 (453130-01)
Contract Description	Vertical Loop Reactors (VLR) - Evoqua Mechanical

Submittal No.	-	Response No.	01	Date:	12/1/2022
Submittal Description	Engineering Submittal for (4) 30HP Disc Aerator Assemblies Installation in (1) New VLR Tank				

Comment No.	Comment	Response
1	See Revised Basin Layout Dimensions	Updated the Dimension of the Basin as per the Markup.
2	Move Effluent channel on inner wall	Noted and Updated.
3	Define extents of recycle pump piping.	As per the email dated Nov 3, 2022 from Civil Engg. Consultant Incorporation, the recycle pump was removed from Our Scope. GA drawing No. : 453130-109 related to recycle pump was removed from this submittal. Also updated the dimension of the Turing Vane in repective GA drawings after removing the Cutout provided for lifting the Recycle Pump.
4	Aerator Motors (30 HP):- a. Provide a thermostat for motor protection. b. Provide internal space heaters c. Motor will be operated off a VFD, speed will change.	Noted and Updated the Drive GA drawing with these Motor Accessories.
5	Mixer Motor:- a. To assist in VFD selection, please confirm the mixer amp at 480V is 11 amps. That's bit high for a 4.4HP motor at 400 RPM.	We confirm that the Full Load Amps is 6.7 A and Starting Current is 33A for the Mixer.
6	Moisture / Temperature Relays a. To confirm compatibility, provide exact model number and dada sheets for recommended moisture/temperature relays for Mixer#1, Mixer #2 and the Recycle Pump. The MCC manufactrued will purchase the relays and install integral to the MCC bucket. We are currently specificity the following relay which may not be compatible (from drawing 20-E-2)	Noted and enclosed the data sheet in this submittal under the Section 1 Documentation.



Mr. Pamperin,

The Orbal Discs are made in the United States in Portage Michigan at Colonial Engineering. Evoqua owns the molds and Colonial Engineering, Inc. is the Manufacturer. Colonial stores the molds for Evoqua for the following PN's.

PN	Description
W2T407002	54" Orbal Disc with 6" hub
W2T309871	54" Orbal Disc with 12" hub
W2T407585	Gripping block for the 12" hub
W3T363428	66" OX Disc with 6" hub
W3T363429	66" OX Disc with 14" hub
W3T363430	Gripping block for the 14" hub

Patrick Beebe

Patrick A. Beebe 09/12/16

President/CEO
Colonial Engineering, Inc.

wilo® Pump Monitor Relay



UL FILE #E101681

**MADE IN
THE U.S.A.**

OPERATION

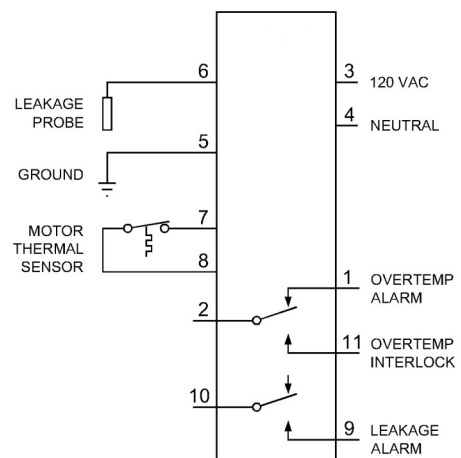
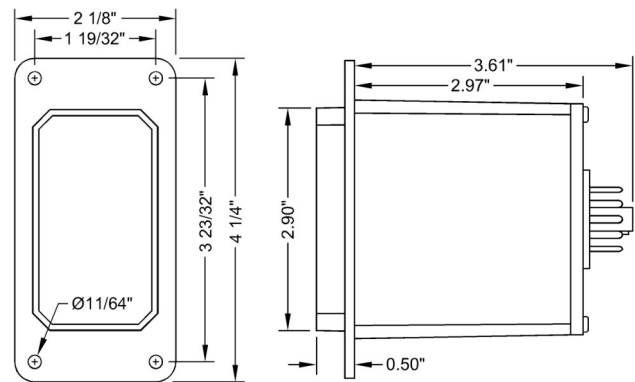
The WILO PMR1 provides Motor Over Temperature and Seal Leakage alarms for WILO Submersible Pumps.

Motor Over Temperature Alarm - The unit applies a low voltage DC signal to the Motor Thermal Sensor to check its status. If the unit detects that the Motor Thermal Sensor contacts are closed (normal condition), the Overtemp indication remains off, and the Overtemp Relay is energized closing the contacts between terminals 2 and 11.

If the Motor Thermal Sensor contacts open (Over Temperature condition), the Overtemp Indication is turned on and the Overtemp Alarm Relay is de-energized opening the contacts between terminals 2 and 11 and closing the contacts between terminals 2 and 1.

When the High Motor Temperature condition has cleared, the unit will reset based on the position of Alarm Reset Mode Select Switch (Auto or Manual). When in the Auto position, the Overtemp Alarm resets automatically. If the switch is in the Manual position, the Overtemp Reset Push-button must be pushed for approximately 1.5 seconds to clear the alarm.

Seal Leakage Alarm - The unit detects moisture inside a pump motor by using a low voltage AC signal to measure the resistance between the Leakage Probe and the grounded motor housing. A Seal Leakage condition is considered present when the amount of moisture in the motor causes the resistance between terminal 6 and 5 to drop below the 4.7K Ohm trip point. When this occurs the unit turns on the Leakage Indication and energizes the Leakage Alarm Relay closing the contacts between terminals 9 and 10.



SPECIFICATIONS

Input Power:	120 VAC ±10%, 7.0 VA max
Output Rating:	8A Resistive @ 120VAC
Operating Temp:	-20°C to +65 °C
Storage Temp:	-45°C to +85 °C
Temp Sensor Voltage:	6.6 VDC ±10%
Leak Sensor Voltage:	4.7 VAC ±10%
Enclosure:	White Lexan
Base:	Phenolic

ORDERING INFORMATION

Part Number: 2763882



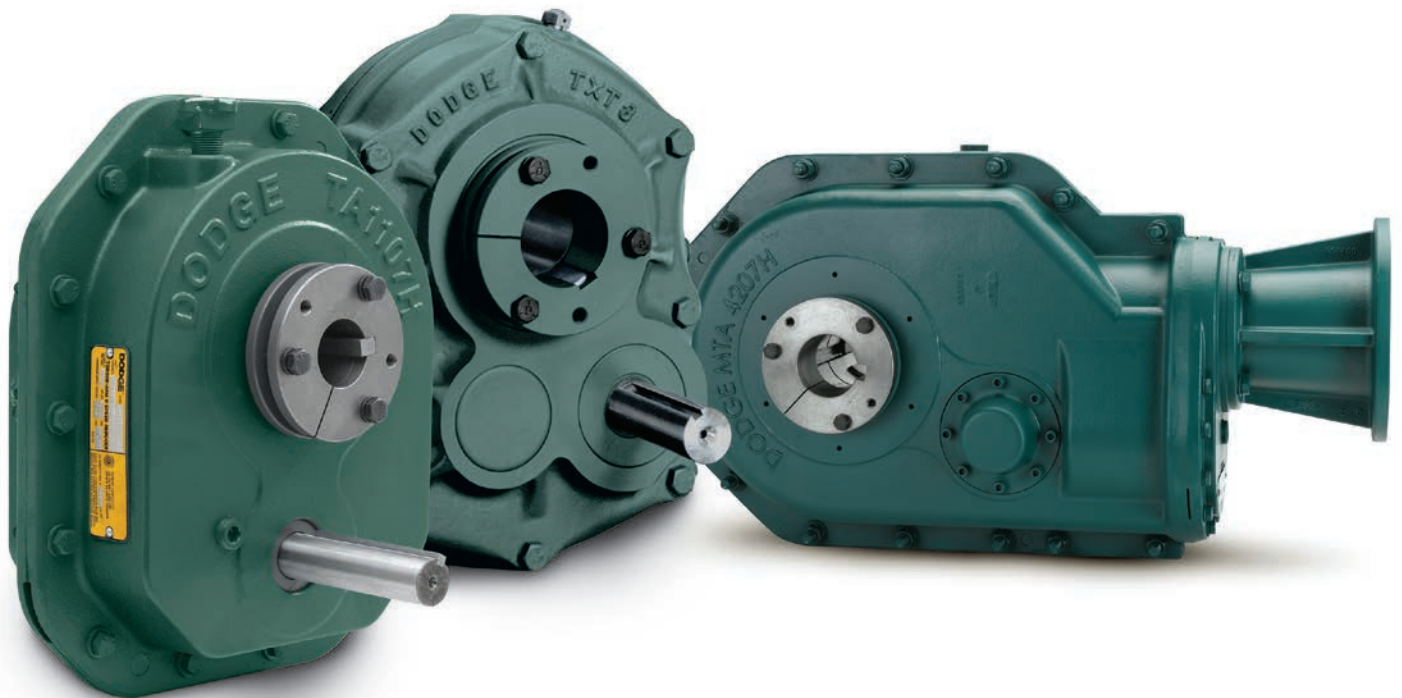
SECTION 2 PRODUCT DATA

MECHANICAL POWER TRANSMISSION

Torque Arm Family catalog:

Motorized Torque-Arm II, Torque-Arm II,
and TXT/SCXT/HXT product lines

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Reference guide

Dodge® Torque-Arm and MTA II Gearing



Motorized Torque-Arm II shaft mount reducers - Page G1-1

- 7 new reducer sizes with modular accessories
- All reducers can be shaft mounted, screw conveyor, vertical, and flange mounted
- Up through 100 Hp with torque ratings through 130,000 lb-in
- 12 ratios and multiple motor speeds provide a wide range of output speeds
- Available as a C-face reducer assembly or a C-face gear-motor assembly
- Bushing bores through 4-7/16"
- Meets or exceeds AGMA standards, minimum class 1 bearing L-10 life of 5,000 hours - 25,000 average life
- Harsh duty, metal shielded sealing system with excluder lip
- New 36-month/18-month warranty protection
- ATEX Certified Category 2 and M2 equipment
- All MTA II reducers are factory ready to accept Smart Sensors for condition monitoring



Torque-Arm II shaft mount reducers - Page G2-1

- 12 new reducer sizes with modular accessories
- All reducers can be shaft mounted, screw conveyor, vertical, and flange mounted
- Up through 400 Hp with torque ratings through 500,000 lb-in
- Standard 5, 9, 15, 25, 40:1 gear ratios equal nearly 300:1 speed reduction with V-belt drives
- Twin tapered bushing bores: 1" through 7"
- Meets or exceeds AGMA standards, including minimum class 1 bearing L-10 life of 5,000 hours - 25,000 average life
- Harsh duty, metal shielded sealing system with excluder lip
- Smooth, rugged Class 30 cast-iron housings with pry slots
- All TA II reducers are factory ready to accept Smart Sensors for condition monitoring
- New 36-month/18-month warranty protection
- ATEX Certified Category 2 and M2 equipment



TXT Torque-Arm shaft mount reducers - Page G3-1

- 12 new reducer sizes with modular accessories
- All reducers can be shaft mounted, screw conveyor, vertical, and flange mounted
- Up through 700 Hp with torque ratings through 1,000,000 lb-in
- Standard 5, 9, 15, 25:1 gear ratios equal nearly 210:1 speed reduction with V-belt drives
- Twin tapered bushing bores: 1" through 10"
- Meets or exceeds AGMA standards, minimum class 1 bearing L-10 life of 5,000 hours - 25,000 average life
- Standard ratios: 5, 9, 15, and 25:1
- Optional flange mount and vertical shaft application
- Available with hydraulic motor input
- All TXT reducers are factory ready to accept Smart Sensors for condition monitoring



SCXT Screw conveyor shaft mount reducers - Page G3-81

- Industry standard, high quality, drive mounting
- Adapter conforms to any CEMA trough ends
- Rugged, high-thrust roller bearings
- Conforms to CEMA standards
- CEMA high-strength shafts, 2- and 3-bolt, 1-1/2" to 3-7/16"
- Fractional to 75 Hp
- Standard ratios: 5, 9, 15, and 25:1
- Available with hydraulic motor input
- Vertical and incline mounting capability
- All SCXT reducers are factory ready to accept Smart Sensors for condition monitoring

Dodge® Motorized Torque-Arm II

Features and benefits

Since 1949, Dodge® Torque-Arm products have proven dependability with more than 2 million units in service throughout the world. Dodge Torque-Arm speed reducers are the standard of the industry. Extending the product offering to include, Dodge Motorized Torque-Arm II, we now offer a heavy-duty, compact, right angle gearbox that is available from stock and decreases maintenance and reduces the overall total cost of ownership.



Dodge Motorized Torque-Arm II shaft mount reducers deliver longer life in demanding applications. Designed with a patented harsh duty sealing system, twin tapered bushings, and the highest torque rating per case size, Motorized Torque-Arm II reducers provide maximum reliability with less maintenance to increase operating time and lower your total cost of ownership.



Backstop

The backstop design features a unique sprag profile for extended life and designed for use with lubricants containing EP additives.

Sealing system

In addition, the Motorized Torque-Arm II line has a patented, premium sealing system that uses a Harsh Duty oil seal protected by a metal excluder seal with rubbing lip. This harsh duty sealing system makes this reducer series a perfect fit for today's harsh duty industries such as aggregates, mining, cement, asphalt, mixing & milling and ethanol.

Twin tapered bushings

The patented twin tapered bushing system – in standard length, short shaft, and metric versions – offers all the features of our standard twin tapered Torque-Arm bushing design which are unique to Dodge.

Accessories

Dodge® Motorized Torque-Arm II
MTA uses standard TA II accessories



Standard twin tapered bushing system

Is an easy on, easy off, no-wobble bushing system featuring a fully split, ductile iron 8° taper and reliable twin support. Available in inch and metric bores. Increased bore capability in many sizes.



Short-shaft twin-tapered bushing kits

Eliminate the need for full-length shafts. Constructed with ductile iron, it has all the Features of our standard bushing system. Available in both inch and metric bores. The patented insertable tapered wedge enables the optional extended tapered bushing kit to be applied for shorter shaft lengths, allowing the replacement of straight bore reducers.



MTA II bushing covers

Provide protection from the spinning bushing bolts and offer an added layer of contamination protection. The MTA II is drilled and tapped for the heavy duty ABS covers.

ABS



Backstop

This new-design backstop option helps prevent reverse rotation in high stop-start loads, and results in less wear and longer life. Its centrifugal sprag design operates with standard and EP lubricants and requires no external lubrication. NOTE: MTA II reducers require a larger backstop than equivalent TA II. See MTA II section for ALL MTA II accessories.



TA rod kit

Ruggedly constructed, the rod kit includes standard brackets and offers universal mounting options.



Screw conveyor adapter

The CEMA bolt-on screw conveyor adapter features double-lip seals on both surfaces. The adapter center is open for contaminate drop out for optimized sealing. An optional adjustable packing kit bolts to the standard adapter and provides a proven sealing option for hostile environments. Packing can be retightened.



Driveshafts

The screw conveyor driveshafts are made from high alloy steel and engineered To CEMA dimensions. They are three-bolt drilled and their tapered fit ensures simple installation. The rugged locking plate (patent pending) also provides a mechanical shaft removal feature. #316 Stainless Steel drive shafts also available.

Torque-Arm family breather technology

1.

Standard Breather is a filter breather

- Cotton filter media
- Screen to support filter
- Chamber to allow oil to collect and return to reducer
- Non captured filter (should not clog and block air exit)

1.



Harsh Duty Breathers are available

2.

Hydra-Lock desiccant breather

- Built in standpipe
- 3 micron filter media top and bottom
- Desiccant material changes color from blue (good) to pink (replace)
- Check valve system, so breather is only open to atmosphere under pressure or vacuum. Closed when not running.

2.



3.

Fully enclosed canister breather

- Allows no outside air
- Excellent protections for extreme wet environments

3.



4.

Optional Position D breather kit

- Use when reducer is mounted in position D (G1-65)
- Includes: Enclosed Breather, sight glass, all necessary piping to allow for fitment to all sizes of MTA

4.



MTA2 through MTA8 Nomenclature and descriptions

(TSC – accommodates NEMA TS short shaft frame, 2 pole, 280 frame and above)

MTA C-Face reducer nomenclature

M6H67T28C Torque-Arm reducer only

M - Motorized Torque-Arm II

6 - Case size, **H** - Heavy duty,

67 - Nominal ratio, **T** - Tapered bore

28 - 280 - Motor frame, **C** - NEMA - C-Face



Part number	Part number	Part number	Part number	Part number	Part number	Part number
M2H15T18C	M3H14T21C	M4H14T21C	M5H14T25C	M6H14T28C	M7H14T25C	M8H14T36C
M2H15T21C	M3H14T25C	M4H14T25C	M5H14T28C	M6H14T32C	M7H14T32C	M8H14T405C
M2H15T25C	M3H14T28TSC	M4H14T28C	M5H14T32C	M6H14T36C	M7H14T36C	M8H17T36C
M2H18T14C	M3H17T21C	M4H18T18C	M5H14T36C	M6H19T28C	M7H14T405C	M8H17T405C
M2H18T18C	M3H17T25C	M4H18T21C	M5H18T21C	M6H19T32C	M7H19T25C	M8H23T32C
M2H18T21C	M3H17T28TSC	M4H18T25C	M5H18T25C	M6H19T32TSC	M7H19T32C	M8H23T36C
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M2H21T18C	M3H21T25C	M4H18T32TSC	M5H18T32TSC	M6H22T25C	M7H22T32C	M8H27T32C
M2H21T21C	M3H21T28TSC	M4H22T18C	M5H18T36C	M6H22T28C	M7H22T36C	M8H27T36C
M2H21T25C	M3H25T18C	M4H22T21C	M5H18T36TSC	M6H22T32C	M7H22T405C	M8H27T405C
M2H25T14C	M3H25T21C	M4H22T25C	M5H21T18C	M6H22T32TSC	M7H26T25C	M8H31T32C
M2H25T18C	M3H25T25C	M4H22T28C	M5H21T25C	M6H22T36C	M7H26T28C	M8H31T36C
M2H25T21C	M3H25T28TSC	M4H22T28TSC	M5H21T28C	M6H22T36TSC	M7H26T32C	M8H31T405C
M2H25T25C	M3H29T18C	M4H22T32TSC	M5H21T32C	M6H24T25C	M7H26T36C	M8H31T405TSC
M2H30T14C	M3H29T21C	M4H26T18C	M5H21T32TSC	M6H24T28C	M7H26T36TSC	M8H34T32C
M2H30T18C	M3H29T25C	M4H26T21C	M5H21T36TSC	M6H24T32C	M7H26T405TSC	M8H34T36C
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M2H30T25C	M3H32T18C	M4H26T28C	M5H25T28C	M6H24T36C	M7H29T32C	M8H34T405TSC
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M2H32T18C	M3H32T25C	M4H26T32TSC	M5H25T32C	M6H29T25C	M7H29T36C	M8H40T36C
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M2H32T25C	M3H35T18C	M4H30T21C	M5H25T36TSC	M6H29T28TSC	M7H29T405TSC	M8H40T405TSC
M2H36T14C	M3H35T21C	M4H30T25C	M5H29T18C	M6H29T32C	M7H33T28C	M8H46T28C
M2H36T18C	M3H35T25C	M4H30T28TSC	M5H29T21C	M6H29T32TSC	M7H33T32C	M8H46T32C
M2H36T21C	M3H38T14C	M4H30T32TSC	M5H29T25C	M6H29T36TSC	M7H33T36C	M8H46T36C
M2H36T25C	M3H38T18C	M4H34T18C	M5H29T28C	M6H34T25C	M7H33T36TSC	M8H46T36TSC
M2H39T14C	M3H38T21C	M4H34T21C	M5H29T28TSC	M6H34T28C	M7H33T405TSC	M8H46T405TSC
M2H39T18C	M3H38T25C	M4H34T25C	M5H29T32C	M6H34T32C	M7H38T21C	M8H51T32C
M2H39T21C	M3H44T18C	M4H34T28TSC	M5H29T32TSC	M6H34T32TSC	M7H38T25C	M8H51T36C
M2H44T14C	M3H44T21C	M4H34T32TSC	M5H29T36TSC	M6H34T36TSC	M7H38T28C	M8H51T36TSC
M2H44T18C	M3H44T25C	M4H41T18C	M5H34T18C	M6H39T21C	M7H38T32C	M8H51T405TSC
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M2H47T18C	M3H47T25C	M4H41T28C	M5H34T28C	M6H39T32C	M7H38T36TSC	M8H53T36C
M2H47T21C	M3H51T18C	M4H41T28TSC	M5H34T28TSC	M6H39T32TSC	M7H38T405TSC	M8H53T36TSC
M2H51T14C	M3H51T21C	M4H44T18C	M5H34T32TSC	M6H39T36TSC	M7H44T21C	M8H53T405C
M2H51T18C	M3H51T25C	M4H44T21C	M5H34T36TSC	M6H45T21C	M7H44T25C	M8H53T405TSC
M2H51T21C	M3H58T18C	M4H44T25C	M5H40T18C	M6H45T25C	M7H44T28C	M8H60T32C
M2H58T14C	M3H58T21C	M4H44T28TSC	M5H40T21C	M6H45T28C	M7H44T32C	M8H60T36C
M2H58T18C	M3H65T18C	M4H49T18C	M5H40T25C	M6H45T32TSC	M7H44T36C	M8H60T36TSC
M2H58T21C	M3H65T21C	M4H49T21C	M5H40T28C	M6H45T36TSC	M7H44T36TSC	M8H60T405TSC
M2H66T14C	M3H70T18C	M4H49T25C	M5H40T28TSC	M6H50T21C	M7H44T405TSC	M8H69T28C
M2H66T18C	M3H70T21C	M4H49T28TSC	M5H40T32TSC	M6H50T25C	M7H51T25C	M8H69T32C
M2H66T21C	M3H76T18C	M4H52T18C	M5H43T18C	M6H50T28C	M7H51T28C	M8H69T32TSC
M2H71T14C	M3H76T21C	M4H52T21C	M5H43T21C	M6H50T32TSC	M7H51T32C	M8H69T36TSC
M2H71T18C	-	M4H52T25C	M5H43T25C	M6H50T36TSC	M7H51T32TSC	M8H69T405TSC
M2H71T21C	-	M4H52T28TSC	M5H43T28C	M6H52T21C	M7H51T36TSC	M8H79T25C
M2H71T56C	-	M4H61T18C	M5H43T28TSC	M6H52T25C	M7H58T21C	M8H79T28C
M2H77T14C	-	M4H61T21C	M5H43T32TSC	M6H52T28C	M7H58T25C	M8H79T32C

Note: Use EZ-Selection Charts and verify **required** base C-Face motor speed before ordering

MTA2 through MTA8 Nomenclature and descriptions

(TSC – accommodates NEMA TS short shaft frame, 2 pole, 280 frame and above)

MTA C-Face reducer nomenclature

M6H67T28C Torque-Arm reducer only

M - Motorized Torque-Arm II

6 - Case size, **H** - Heavy duty,

67 - Nominal ratio, **T** - Tapered bore

28 - 280 - Motor frame, **C** - NEMA - C-Face



Part number	Part number	Part number	Part number	Part number	Part number	Part number
M2H77T18C	-	M4H61T25C	M5H48T21C	M6H52T28TSC	M7H58T28C	M8H79T32TSC
M2H77T21C	-	M4H66T18C	M5H48T25C	M6H52T32TSC	M7H58T32C	M8H79T36TSC
-	-	M4H66T21C	M5H48T28C	M6H52T36TSC	M7H58T32TSC	-
-	-	M4H66T25C	M5H48T28TSC	M6H59T21C	M7H58T36TSC	-
-	-	M4H74T18C	M5H48T32TSC	M6H59T25C	M7H67T25C	-
-	-	M4H74T21C	M5H51T18C	M6H59T28C	M7H67T28C	-
-	-	M4H74T25C	M5H51T21C	M6H59T32TSC	M7H67T32C	-
-	-	-	M5H51T25C	M6H67T21C	M7H67T32TSC	-
-	-	-	M5H51T28C	M6H67T25C	M7H67T36TSC	-
-	-	-	M5H51T28TSC	M6H67T28C	M7H76T21C	-
-	-	-	M5H51T32TSC	M6H67T28TSC	M7H76T25C	-
-	-	-	M5H60T21C	M6H67T32TSC	M7H76T28C	-
-	-	-	M5H60T25C	M6H79T21C	M7H76T32TSC	-
-	-	-	M5H60T28TSC	M6H79T25C	-	-
-	-	-	M5H60T32TSC	M6H79T28TSC	-	-
-	-	-	M5H65T18C	M6H79T32TSC	-	-
-	-	-	M5H65T21C	-	-	-
-	-	-	M5H65T25C	-	-	-
-	-	-	M5H65T28TSC	-	-	-
-	-	-	M5H72T18C	-	-	-
-	-	-	M5H72T21C	-	-	-
-	-	-	M5H72T25C	-	-	-
-	-	-	M5H72T28C	-	-	-
-	-	-	M5H72T28TSC	-	-	-

Note: Use EZ-Selection Charts and verify **required** base C-Face motor speed before ordering

MTA Engineering information

MTA6 Horsepower and torque ratings

-MTA6307

Ratio	Mtr speed	NEMA 210TC		NEMA 250TC		NEMA 280TC / 280TSC	
		1750	3450	1750	3450	1750	3450
78.53	Output RPM	22	44	22	44	-	44
	Class I catalog Hp	23.6	44.7	23.6	44.7	-	44.7
	Class I torque in-lbs	61675	58420	61675	58420	-	58420
	Part number	M6H79T21C	M6H79T21C	M6H79T25C	M6H79T25C	-	M6H79T28TSC
66.92	Output RPM	26	52	26	52	26	52
	Class I catalog Hp	27.5	52.1	27.5	52.1	27.5	52.1
	Class I torque in-lbs	60887	57598	60887	57598	60887	57598
	Part number	M6H67T21C	M6H67T21C	M6H67T25C	M6H67T25C	M6H67T28C	M6H67T28TSC
59.05	Output RPM	30	58	30	58	30	58
	Class I catalog Hp	31.5	57.5	31.5	57.5	31.5	57.5
	Class I torque in-lbs	60309	57038	60309	57038	60309	57038
	Part number	M6H59T21C	M6H59T21C	M6H59T25C	M6H59T25C	M6H59T28C	M6H59T28TSC
52.35	Output RPM	33	66	33	66	33	66
	Class I catalog Hp	34.3	64.7	34.3	64.7	34.3	64.7
	Class I torque in-lbs	59800	56359	59800	56359	59800	56359
	Part number	M6H52T21C	M6H52T21C	M6H52T25C	M6H52T25C	M6H52T28C	M6H52T28TSC
50.26	Output RPM	35	69	35	69	35	69
	Class I catalog Hp	36.2	67.3	36.2	67.3	36.2	67.3
	Class I torque in-lbs	59500	56100	59500	56100	59500	56100
	Part number	M6H50T21C	M6H50T21C	M6H50T25C	M6H50T25C	M6H50T28C	M6H50T28TSC
44.61	Output RPM	39	77	39	77	39	77
	Class I catalog Hp	39.8	74.4	39.8	74.4	39.8	74.4
	Class I torque in-lbs	59050	55500	59050	55500	59050	55500
	Part number	M6H45T21C	M6H45T21C	M6H45T25C	M6H45T25C	M6H45T28C	M6H45T28TSC
39.37	Output RPM	44	88	44	88	44	88
	Class I catalog Hp	44.7	83.0	44.7	83.0	44.7	83.0
	Class I torque in-lbs	58420	54219	58420	54219	58420	54219
	Part number	M6H39T21C	M6H39T21C	M6H39T25C	M6H39T25C	M6H39T28C	M6H39T28TSC
33.51	Output RPM	52	103	52	103	52	103
	Class I catalog Hp	52.1	94.2	52.1	94.2	52.1	94.2
	Class I torque in-lbs	57598	52600	57598	52600	57598	52600
	Part number	M6H34T21C	M6H34T21C	M6H34T25C	M6H34T25C	M6H34T28C	M6H34T28TSC
29.03	Output RPM	60	119	60	119	60	119
	Class I catalog Hp	59.4	106.0	59.4	106.0	59.4	106.0
	Class I torque in-lbs	56877	51200	56877	51200	56877	51200
	Part number	M6H29T21C	M6H29T21C	M6H29T25C	M6H29T25C	M6H29T28C	M6H29T28TSC
24.43	Output RPM	72	141	72	141	72	141
	Class I catalog Hp	69.8	119.8	69.8	119.8	69.8	119.8
	Class I torque in-lbs	55995	48900	55995	48900	55995	48900
	Part number	M6H24T21C	M6H24T21C	M6H24T25C	M6H24T25C	M6H24T28C	M6H24T28TSC
22.04	Output RPM	79	157	79	157	79	157
	Class I catalog Hp	76.0	129.0	76.0	129.0	76.0	129.0
	Class I torque in-lbs	55400	47290	55400	47290	55400	47290
	Part number	M6H22T21C	M6H22T21C	M6H22T25C	M6H22T25C	M6H22T28C	M6H22T28TSC
18.95	Output RPM	92	-	92	-	92	-
	Class I catalog Hp	86.0	-	86.0	-	86.0	-
	Class I torque in-lbs	53743	-	53743	-	53743	-
	Part number	M6H19T21C	-	M6H19T25C	-	M6H19T28C	-
14.24	Output RPM	123	-	123	-	123	-
	Class I catalog Hp	86	-	86	-	86	-
	Class I torque in-lbs	40141	-	40141	-	40141	-
	Part number	M6H14T21C	-	M6H14T25C	-	M6H14T28C	-

This page lists all 'possible' part numbers. Part numbers with service factor higher than 2.0 may not be loaded in the system. Call Dodge for price availability. For reducer dimensions and accessories, see pages G1-42 through G1-67.

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MTA EZ Selection tables

Class 1, 1.0 service factor

MTA6307H Class 1

Output RPM	Ratio	Class 1 motor Hp	Motor speed	Part number	C-Face Gearmotor Part number	Service factor
22	78.53	20	1750	M6H79T25C	M6H79T25C2018	1.18
26	66.92	25	1750	M6H67T28C	M6H67T28C2518	1.10
30	59.05	30	1750	M6H59T28C	M6H59T28C3018	1.05
33	52.35	30	1750	M6H52T28C	M6H52T28C3018	1.14
35	50.26	30	1750	M6H50T28C	M6H50T28C3018	1.21
39	44.61	30	1750	M6H45T28C	M6H45T28C3018	1.33
44	78.53	40	3450	M6H79T32TSC	M6H79T32TSC4036	1.12
44	39.37	40	1750	M6H39T32C	M6H39T32C4018	1.12
52	66.92	50	3450	M6H67T32TSC	M6H67T32TSC5036	1.04
52	33.51	50	1750	M6H34T32C	M6H34T32C5018	1.04
58	59.05	50	3450	M6H59T32TSC	M6H59T32TSC5036	1.15
60	29.03	50	1750	M6H29T32C	M6H29T32C5018	1.19
66	52.35	60	3450	M6H52T36TSC	M6H52T36TSC6036	1.08
69	50.26	60	3450	M6H50T36TSC	M6H50T36TSC6036	1.12
72	24.43	60	1750	M6H24T36C	M6H24T36C6018	1.16
77	44.61	60	3450	M6H45T36TSC	M6H45T36TSC6036	1.24
79	22.04	60	1750	M6H22T36C	M6H22T36C6018	1.27
88	39.37	75*	3450	M6H39T36TSC	M6H39T36TSC7536	1.11
92	18.95	75*	1750	M6H19T36C	M6H19T36C7518	1.15
103	33.51	75*	3450	M6H34T36TSC	M6H34T36TSC7536	1.26
119	29.03	75*	3450	M6H29T36TSC	M6H29T36TSC7536	1.41
123	14.24	75*	1750	M6H14T36C	M6H14T36C7518	1.15
141	24.43	75*	3450	M6H24T36TSC	M6H24T36TSC7536	1.60
157	22.04	75*	3450	M6H22T36TSC	M6H22T36TSC7536	1.72

* Consult Dodge Engineering for thermal considerations of application

Class 2, 1.4 service factor

MTA6307H Class 2

Output RPM	Ratio	Class 2 motor Hp	Motor speed	Part number	Std C-Face Gearmotor Part number	Severe duty C-Face Gearmotor Part number	Service factor
22	78.53	15	1750	M6H79T25C	M6H79T25C1518	M6H79T25C1518CP	1.57
26	66.92	15	1750	M6H67T25C	M6H67T25C1518	M6H67T25C1518CP	1.84
30	59.05	20	1750	M6H59T25C	M6H59T25C2018	M6H59T25C2018CP	1.57
33	52.35	20	1750	M6H52T25C	M6H52T25C2018	M6H52T25C2018CP	1.72
35	50.26	25	1750	M6H50T28C	M6H50T28C2518	M6H50T28C2518CP	1.45
39	44.61	25	1750	M6H45T28C	M6H45T28C2518	M6H45T28C2518CP	1.59
44	78.53	30	3450	M6H79T28TSC	M6H79T28TSC3036	M6H79T28TSC3036CP	1.49
44	39.37	30	1750	M6H39T28C	M6H39T28C3018	M6H39T28C3018CP	1.49
52	66.92	30	3450	M6H67T28TSC	M6H67T28TSC3036	M6H67T28TSC3036CP	1.74
52	33.51	30	1750	M6H34T28C	M6H34T28C3018	M6H34T28C3018CP	1.74
58	59.05	40	3450	M6H59T32TSC	M6H59T32TSC4036	M6H59T32TSC4036CP	1.44
60	29.03	40	1750	M6H29T32C	M6H29T32C4018	M6H29T32C4018CP	1.48
66	52.35	40	3450	M6H52T32TSC	M6H52T32TSC4036	M6H52T32TSC4036CP	1.62
69	50.26	40	3450	M6H50T32TSC	M6H50T32TSC4036	M6H50T32TSC4036CP	1.68
72	24.43	50	1750	M6H24T32C	M6H24T32C5018	M6H24T32C5018CP	1.40
77	44.61	50	3450	M6H45T32TSC	M6H45T32TSC5036	M6H45T32TSC5036CP	1.49
79	22.04	50	1750	M6H22T32C	M6H22T32C5018	M6H22T32C5018CP	1.52
88	39.37	50	3450	M6H39T32TSC	M6H39T32TSC5036	M6H39T32TSC5036CP	1.66
92	18.95	60	1750	M6H19T36C	M6H19T36C6018	M6H19T36C6018CP	1.43
103	33.51	60	3450	M6H34T36TSC	M6H34T36TSC6036	M6H34T36TSC6036CP	1.57
119	29.03	60	3450	M6H29T36TSC	M6H29T36TSC6036	M6H29T36TSC6036CP	1.75
123	14.24	60	1750	M6H14T36C	M6H14T36C6018	M6H14T36C6018CP	1.43
141	24.43	75*	3450	M6H24T36TSC	M6H24T36TSC7536	M6H24T36TSC7536CP	1.60
157	22.04	75*	3450	M6H22T36TSC	M6H22T36TSC7536	M6H22T36TSC7536CP	1.72

*+ Severe duty gearmotor packages are designed for class 2 service and come with a CECP severe duty motor attached
For reducer dimensions and accessories, see pages G1-42 through G1-67.

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Torque-Arm II

Torque-Arm

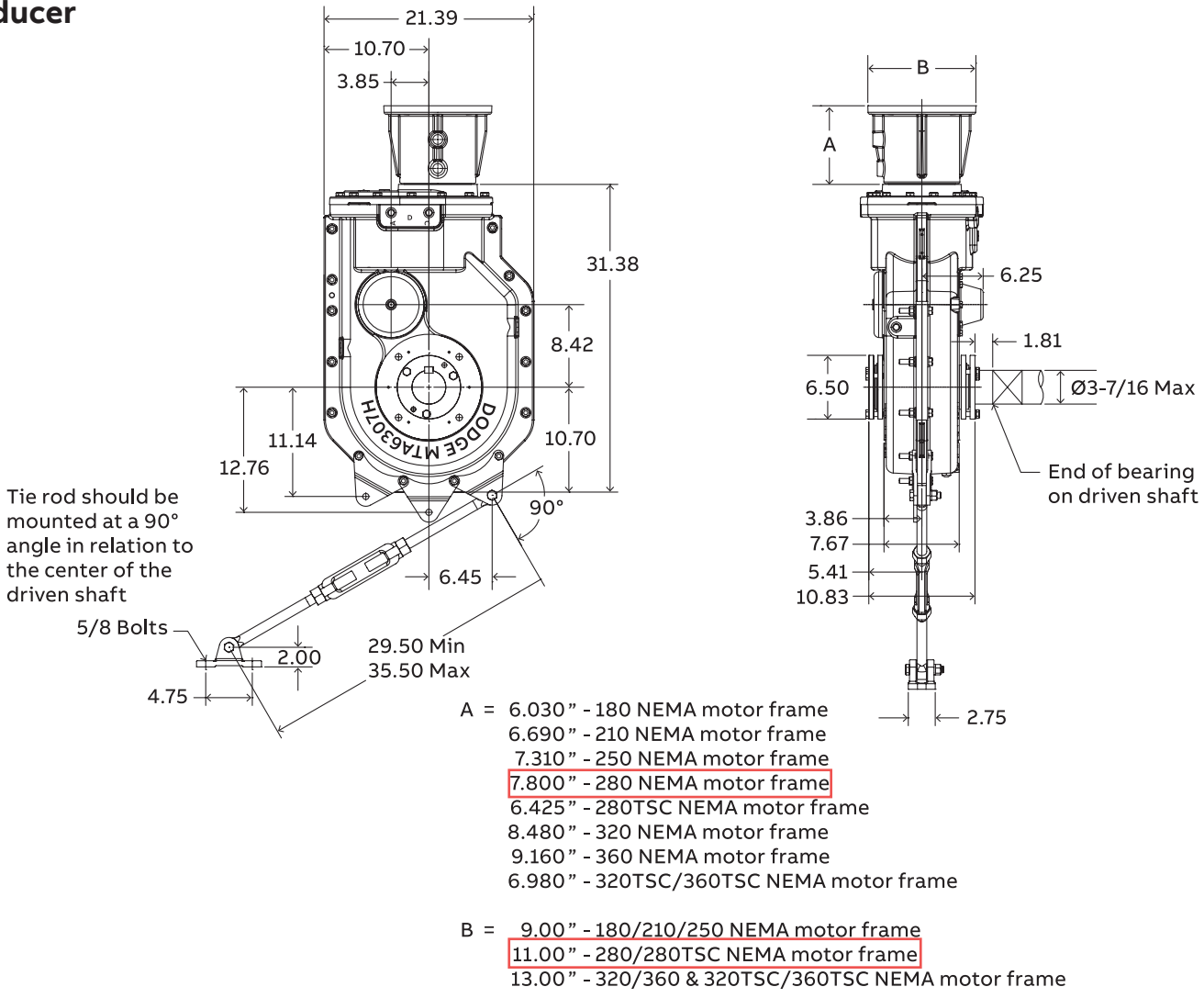
Engineering

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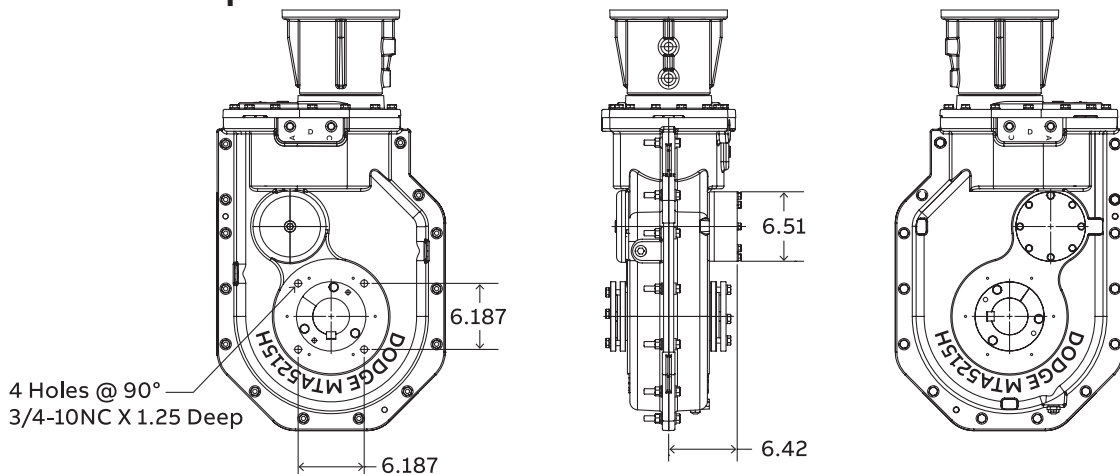
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MTA6307 Shaft mounted reducer

Reducer



Reducer with backstop



MTA6307 Shaft mounted accessories

MTA6307 C-Face reducer weights with adapter (lbs)

		Adapter size						
Reducer	180	210	250	280	280TSC	320	360	320TSC & 360TSC
Weight (lbs)	475	480	485	505	505	525	545	525

MTA6307H Accessories

Description	Part number	Weight lbs.
TA6307RA Rod assembly	906109	19.9
TA7315BS Backstop assembly use for MTA6307	907102	20.0
V-ring seal kit	906249	0.3
TA4-TA9 Hydra-Lock dessicant breather kit	964364	0.8
MTA2-8 Vertical Position D breather kit	472300	3.0
ABB ability sensor	750000	0.5

Safety bushing covers

Reducer size	ABS polymer buhsing cover part numbers			
	Closed	Weight lbs.	Split	Weight lbs.
MTA5215H & MTA6307H	905142	1.0	905143	1.5

MTA is drilled and tapped to accept the ABS bushing cover bolts.
Bushing covers fit both the outboard and inboard side of the MTA reducer.

TA6307H Tapered bushing kits (5) (6)

Bushing size standard shaft bushing kit	Part number (7)	Weight lbs.	Shaft keyseat required (9) (10)
TA6307TB x 3-7/16 ▲	906020	16.7	7/8 x 7/16 x 10.82
TA6307TB x 3-3/16	906021	17.7	3/4 x 3/8 x 10.82
TA6307TB x 3	906022	19.1	3/4 x 3/8 x 10.82
TA6307TB x 2-15/16 φ	906023	19.6	3/4 x 3/8 x 10.82
TA6307TB x 2-7/8 φ	906024	20.1	3/4 x 3/8 x 10.82
TA6307TB x 2-11/16 φ	906025	20.9	5/8 x 5/16 x 10.82
TA6307TB x 2-1/2 φ	906026	22.1	5/8 x 5/16 x 10.82
TA6307TB x 2-7/16 φ	906027	22.3	5/8 x 5/16 x 10.82
TA6307TB x 2-3/8 φ	906028	22.7	5/8 x 5/16 x 10.82
TA6307TB x 2-1/4 φ	906029	23.1	1/2 x 1/4 x 10.82
TA6307TB x 2-3/16 φ	906030	23.3	1/2 x 1/4 x 10.82

TA6307H Tapered short shaft bushing kits (5) (6)

Bushing size short shaft bushing kit (8)	Part number	Weight lbs.	Shaft keyseat required (9)(10)
TA6307TBS x 3-7/16	906031	16.5	7/8 x 7/16 x 6.72
TA6307TBS x 3-3/16	906032	19.0	3/4 x 3/8 x 6.72
TA6307TBS x 3	906033	20.9	3/4 x 3/8 x 6.72
TA6307TBS x 2-15/16	906034	21.6	3/4 x 3/8 x 6.72
TA6307TBS x 2-7/8	906035	22.3	3/4 x 3/8 x 6.72
TA6307TBS x 2-11/16	906036	23.7	5/8 x 5/16 x 6.72
TA6307TBS x 2-1/2	906037	25.3	5/8 x 5/16 x 6.72
TA6307TBS x 2-7/16	906038	25.8	5/8 x 5/16 x 6.72
TA6307TBS x 2-3/8	906039	26.3	5/8 x 5/16 x 6.72
TA6307TBS x 2-1/4	906040	26.7	1/2 x 1/4 x 6.72
TA6307TBS x 2-3/16	906041	27.5	1/2 x 1/4 x 6.72

- ▲ AGMA maximum bore size
- φ Check driven shaft strength against torque requirements and assembly weight
- (5) Bushing kit required to mount TA II reducer to driven shaft
- (6) Bushing kit is not required to mount TA II reducer on screw conveyor drive shaft in a screw conveyor application
- (7) Standard shaft bushing kit includes two standard bushings with back-up plates and snap rings; hardware, and key
- (8) Short shaft bushing kit includes one standard bushing, one long bushing with insertable wedge; two back-up plates with snap rings; hardware and key. This is an optional bushing for after market, short shaft mounting.
- (9) Minimum keyseat and shaft length required to mount reducer with bushing kit
- (10) Always check the driven shaft and key for strength

Motorized Torque-Arm II

Reliability packages for harsh duty environments

Dodge Motorized Torque-Arm II is designed for use in harsh duty environments. It is the go to gearbox for users demanding maximum bearing life and uptime from their equipment. When severe applications arise, Dodge answers with the new reliability kits for MTA II.

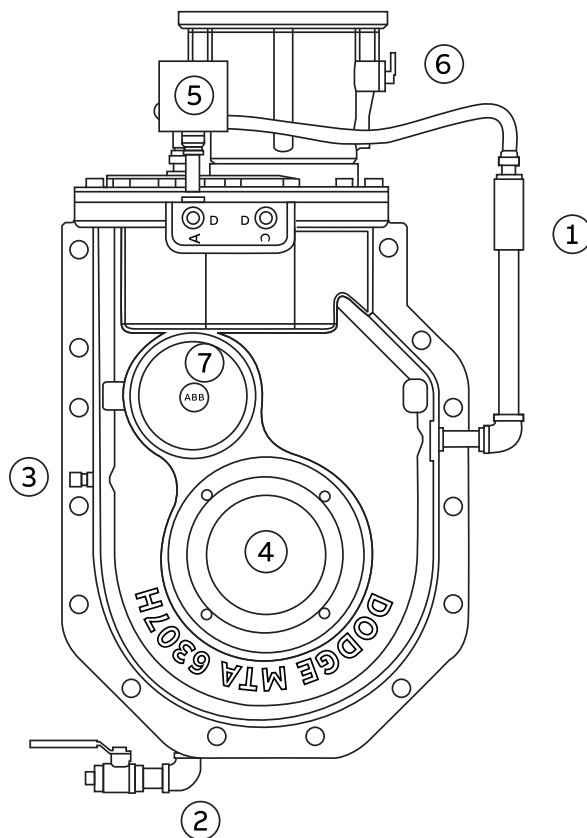
Reliability kit level 1 is used where users demand maximum uptime from critical equipment.

The level 1 kit includes:

1. Large vented oil sight tube with closed loop piping.
2. Quick drain valve.
3. Quick oil sampling port.
4. ABS bushing covers, closed cover and a split cover for the backside.
5. Position D breather kit with sight gauge and enclosed.
6. Severe duty adapter plug

Reliability kit level 2 is used when condition monitoring is critical to the uptime reliability of the plant and adds:

7. ABB ability sensor.



Motorized Torque-Arm II

Reliability packages for harsh duty environments

Part number	Description
M2RELIAKITLVL01	MTA2115 reliability kit level 1
M3RELIAKITLVL01	MTA3203 reliability kit level 1
M4RELIAKITLVL01	MTA4207 reliability kit level 1
M5RELIAKITLVL01	MTA5215 reliability kit level 1
M6RELIAKITLVL01	MTA6307 reliability kit level 1
M7RELIAKITLVL01	MTA7315 reliability kit level 1
M8RELIAKITLVL01	MTA8407 reliability kit level 1

Reliability kit level 1 is used where users demand maximum uptime from critical equipment. The level 1 kit includes creates a closed loop system that eliminates the introduction of any outside air or contaminants. It also allows the end user to check the oil level from a distance. Add to that, the complete protection from spinning bushing bolts, and you have a winner for longevity and safety.

Part number	Description
M2RELIAKITLVL02	MTA2115 reliability kit level 2
M3RELIAKITLVL02	MTA3203 reliability kit level 2
M4RELIAKITLVL02	MTA4207 reliability kit level 2
M5RELIAKITLVL02	MTA5215 reliability kit level 2
M6RELIAKITLVL02	MTA6307 reliability kit level 2
M7RELIAKITLVL02	MTA7315 reliability kit level 2
M8RELIAKITLVL02	MTA8407 reliability kit level 2

Reliability kit level 2 is used when condition monitoring is critical to the uptime reliability of the plant and adds the ABB ability sensor. This allows trend monitoring of critical data from the reducer. And can be read from cell phone or computer. Can be integrated into plant wide preventative maintenance programs.

Aftermarket replacement parts

Motorized Torque-Arm II seal kits (5)

Reducer size	Part number	Weight lbs.
MTA2115H	M2SEALKIT	0.60
MTA3203H	M3SEALKIT	0.8
MTA4207H	M4SEALKIT	1.00
MTA5215H	M5SEALKIT	1.2
MTA6307H	M6SEALKIT	1.50
MTA7315H	M7SEALKIT	1.65
MTA8407H	M8SEALKIT	1.75

(5) Kit includes 2 output seals, 1 input seal, 2 output excluder seals

Motorized Torque-Arm II backstop cover and gasket (6)

Reducer size	Part number	Weight lbs.
MTA2115H	M2BSCVRKIT	0.40
MTA3203H	M3BSCVRKIT	0.45
MTA4207H	M4BSCVRKIT	0.50
MTA5215H	M5BSCVRKIT	0.60
MTA6307H	M6BSCVRKIT	0.70
MTA7315H	M7BSCVRKIT	0.80
MTA8407H	M8DSCVRKIT	0.85

(6) Kit includes backstop cover and cork gasket

Motorized Torque-Arm II coupling replacement parts (7) full coupling part numbers for motor frames listed below

Reducer Size	180C	210C	250C	280C	280TSC	-
MTA2115H	M2-18CPLKIT	M2-21CPLKIT	M2-25CPLKIT	-	-	-
MTA3203H	M3-18CPLKIT	M3-21CPLKIT	M3-25CPLKIT	-	M3-28CPLKITTSC	-
MTA4207H	M4-18CPLKIT	M4-21CPLKIT	M4-25CPLKIT	M4-28CPLKIT	M4-28CPLKITTSC	-
MTA5215H	M5-18CPLKIT	M5-21CPLKIT	M5-25CPLKIT	M5-28CPLKIT	M5-28CPLKITTSC	-
MTA6307H	-	M6-21CPLKIT	M6-25CPLKIT	M6-28CPLKIT	M6-28CPLKITTSC	-
MTA7315H	-	M7-21CPLKIT	M7-25CPLKIT	M7-28CPLKIT	M7-28CPLKITTSC	-
MTA8407H	-	M8-21CPLKIT	M8-25CPLKIT	M8-28CPLKIT	M8-28CPLKITTSC	-
	320C	320TSC	360C	360TSC	405C	405TSC
MTA2115H	-	-	-	-	-	-
MTA3203H	-	-	-	-	-	-
MTA4207H	-	M4-32CPLKITTSC	-	-	-	-
MTA5215H	M5-32CPLKIT	M5-32CPLKITTSC	M5-36CPLKIT	M5-36CPLKITTSC	-	-
MTA6307H	M6-32CPLKIT	M6-32CPLKITTSC	M6-36CPLKIT	M6-36CPLKITTSC	-	-
MTA7315H	M7-32CPLKIT	M7-32CPLKITTSC	M7-36CPLKIT	M7-36CPLKITTSC	M7-40CPLKIT	M7-40CPLKITTSC
MTA8407H	M8-32CPLKIT	M8-32CPLKITTSC	M8-36CPLKIT	M8-36CPLKITTSC	M8-40CPLKIT	M8-40CPLKITTSC

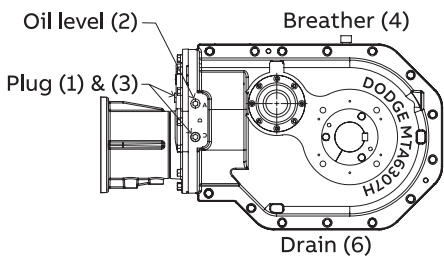
(7) Kit includes two coupling halves and element

Coupling (element only) part numbers for motor frames

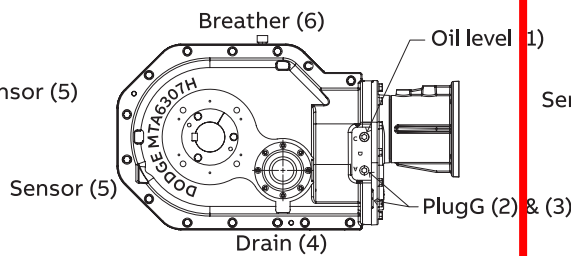
Reducer Size	180C	210C	250C	280C	280TSC	-
MTA2115H	334291	334291	334291	-	-	-
MTA3203H	334291	334291	334291	-	334291	-
MTA4207H	454424	454424	454424	454424	454424	-
MTA5215H	454424	454424	454424	454424	454424	-
MTA6307H	-	454424	454424	454424	454424	-
MTA7315H	-	454424	454424	454424	454424	-
MTA8407H	-	454424	454424	454424	454424	-
	320C	320TSC	360C	360TSC	405C	405TSC
MTA2115H	-	-	-	-	-	-
MTA3203H	-	-	-	-	-	-
MTA4207H	454434	454434	-	-	-	-
MTA5215H	454434	454434	454434	454434	-	-
MTA6307H	454434	454434	454434	454434	-	-
MTA7315H	454434	454434	454434	454434	454434	454434
MTA8407H	454434	454434	454434	454434	454434	454434

Mounting positions

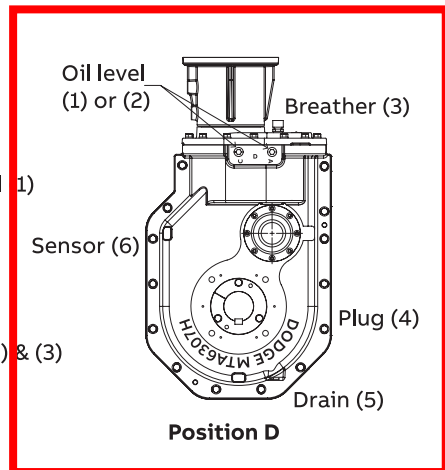
Horizontal mounting



Position A

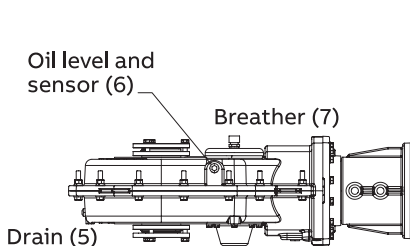


Position C

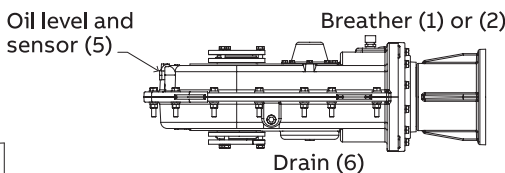


Position D

Vertical mounting

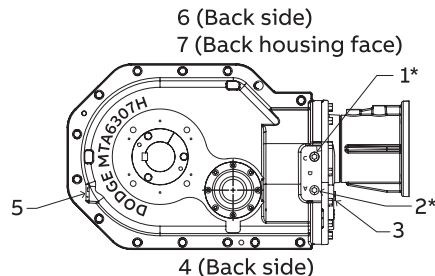


Position E



Position F

Typical oil hole locations



* Plugs (1) and (2) are located on both sides of the reducer. Fill oil to plug with cast lettering that matches the mounting position.

Vent and plug locations

Mounting position	Vent and plug locations for all speeds						
	1	2	3	4	5	6	7
Position A	Plug	Oil level	Plug	Breather	Sensor	Drain	Plug
Position C	Oil level	Plug	Plug	Drain	Sensor	Breather	Plug
Position D	Oil level*	Oil level*	Breather	Plug	Drain	Sensor	Plug
Position E	Plug	Plug	Plug	Plug	Drain	Oil level & sensor	Breather
Position F	Breather*	Breather*	Plug	Plug	Oil level & sensor	Drain	Plug

*Either Plug (1) or plug (2) may be used

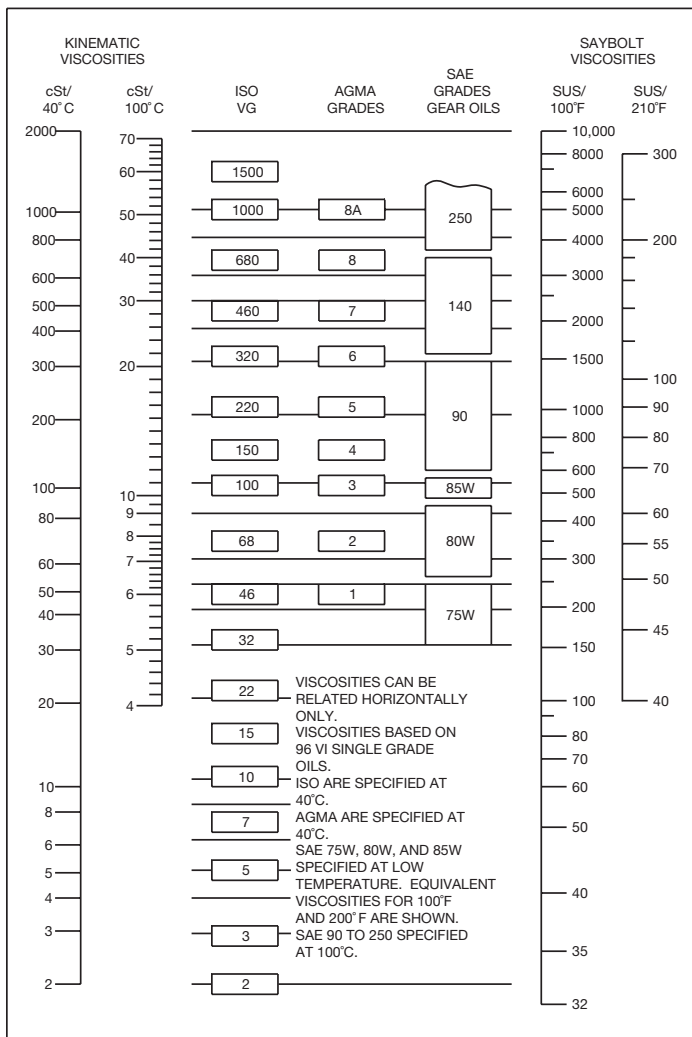
Approximate oil volumes

Case size	Oil volume in quarts ■ ● □						Oil volume in liters ■ ● □					
	Horizontal			Vertical			Horizontal			Vertical		
	A	B	C	D⊕	E (up)	F (down)	A	B	C	D⊕	E (up)	F (down)
MTA2115H	4-1/4	□	3-5/8	7	5-3/8	5-5/8	3-3/4	□	3-1/2	6-5/8	5	5-3/8
MTA3203H	6-3/8	□	4-3/8	9-3/4	7-3/8	7-5/8	6	□	4-1/8	9-1/4	7	7-1/8
MTA4207H	8-1/4	□	6-3/4	13-1/8	9-1/4	9-5/8	7-7/8	□	6-3/8	12-3/8	8-7/8	9-1/8
MTA5215H	14	□	10-1/8	21	16	16-7/8	13-1/4	□	9-5/8	20	15-1/8	16
MTA6307H	18-3/8	□	15-3/8	30-1/8	23-1/2	24-7/8	17-3/8	□	14-1/2	28-1/2	22-1/4	23-1/2
MTA7315H	25	□	19-5/8	38-1/4	23-1/4	26-1/2	23-5/8	□	18-1/2	36-1/2	22	25-1/8
MTA8407H	29-1/8	□	22-5/8	52	31-3/4	31-3/4	27-5/8	□	21-3/8	49-1/4	30	30

- Oil quantity is approximate. Service with lubricant until oil runs out of oil level hole as indicated per drawings in figure 1.
 - Below 15 RPM output speed, oil level must be adjusted to reach the highest oil level plug. If reducer position is to vary from those shown in Figure 1, either more or less oil may be required. Consult Dodge.
 - Position B not shown or recommended, check with factory
 - ⊕ For Position D - It is recommended to use "Position D breather kit" part number - 472300.
- All Dodge MTA II gearboxes are equipped with ABB Ability sensor plugs from the factory

MTA II Engineering information

Oil viscosity equivalence chart



Recommended lubricants for Motorized Torque Arm II and Torque Arm II reducers *

Standard oils		EP oils	
Exxon			
150		150	150
220	Teresstic	220	Spartan EP
320		320	320
Chevron			
150		150	150
220	Machine	220	Gear Compound EP
320		320	320
Unical			
150		150	141
220	Turbine Oil	220	Extra Duty HL
320		320	Gear Lube
320			300
Kluber Synthetic			
150		150N	-
220	GEM4	220N	-
320		320N	-
Kluber			
150		150N	-
220	GEM1	220N	-
320		320N	-
Mobil Synthetic			
150		150	150
220	SHC	220	SHC XMP
320		320	320
Mobil			
150		Extra Heavy	150
220	Mobil DTE	BB	MobilGear 600 XP
320		AA	320
Texaco			
150		150	150
220	Regal Oil R&O	220	Meropa
320		320	320
Shell Synthetic			
150		150	-
220	Morlina S4 B	220	-
320		320	-
Shell			
150		150	150
220	Morlina S2 B	220	Omala S2 G
320	Morlina S3 B	320	320

* Partial list. Consult Dodge or a lubricant manufacturer for further options, and check lubricant manufacturer's website for new revisions in oil nomenclature

Table 1 – Oil recommendations

Output RPM	Motorized Torque-Arm II reducer size						
	2115H	3203H	4207H	5215H	6307H	7315H	8407H
151 – 200	320	220	220	220	220	220	220
126 – 150	320	220	220	220	220	220	220
101 – 125	320	320	220	220	220	220	220
81 – 100	320	320	320	220	220	220	220
41 – 80	320	320	320	220	220	220	220
11 – 40	320	320	320	320	320	320	320
1 – 10	320	320	320	320	320	320	320

Table 2 – Oil recommendations

Output RPM	Motorized Torque-Arm II reducer size						
	2115H	3203H	4207H	5215H	6307H	7315H	8407H
151 – 200	220	150	150	150	150	150	150
126 – 150w	220	150	150	150	150	150	150
101 – 125	220	220	150	150	150	150	150
81 – 100	220	220	220	150	150	150	150
41 – 80	220	220	220	150	150	150	150
11 – 40	220	220	220	220	220	220	220
1 – 10	220	220	220	220	220	220	220

- (1) Assumes auxiliary cooling where recommended in the catalog.
- (2) Pour point of lubricant selected should be at least 10°F lower than expected minimum ambient starting temperature.
- (3) Extreme pressure (EP) lubricates are not necessary for average operating conditions. When properly selected for specific applications, Torque-Arm II backstops are suitable for use with EP lubricants.
- (4) Special lubricants may be required for food and drug industry applications where contact with the product being manufactured may occur. Consult a lubrication manufacturer's representative for his recommendations.
- (5) For reducers operating in ambient temperatures between -22°F (-30°C) and 20°F (-6.6°C) use a synthetic hydrocarbon lubricant, 100 ISO grade or AGMA 3 grade (for example, Mobil SHC627). Above 125°F (51°C), consult Dodge Gear Application Engineering (864) 297-4800
- (6) Mobil SHC630 Series oil is recommended for high ambient temperatures.



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Mechanical Power Transmission Support
Ph: 1.864.297.4800

new.abb.com/mechanical-power-transmission

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MECHANICAL POWER TRANSMISSION

ABB Ability™ Smart Sensor

For mechanical products

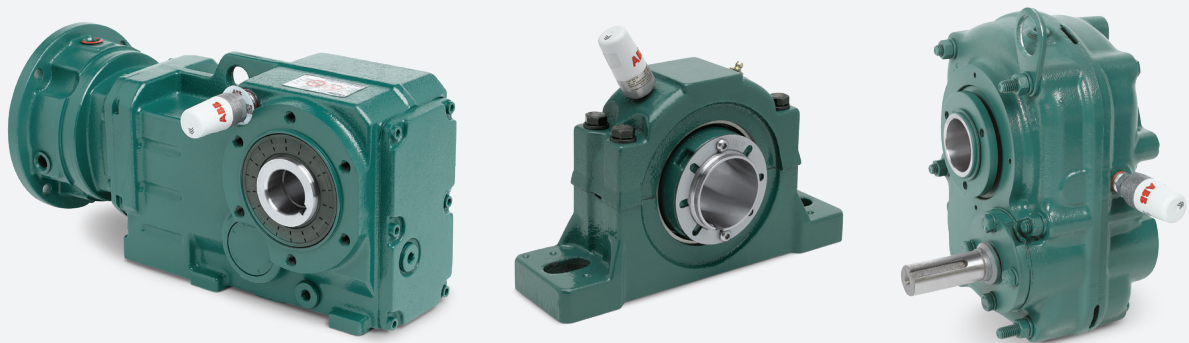


ABB Ability Smart Sensor for mechanical products

Changes in temperature and vibration can indicate potential problems in mounted bearings and gear reducers. Yet understanding the health of these mechanical products is often overlooked, leaving problems unnoticed until failure occurs. ABB now makes it easier and safer to know how your products feel.

ABB Ability connects you to the power of the Industrial Internet of Things (IIoT). ABB offers a unique digital advantage by combining connectivity and data analytics with our expertise to make your operations efficient, predictable and safe.

The ABB Ability Smart Sensor for mechanical products is an easy-to-use, wireless sensor which monitors the health of ABB Dodge mechanical products, allowing users to reduce downtime, improve reliability, and operate safely.

- Increased safety ●—●
- Increased productivity ●—●
- Reduced maintenance ●—●
- Eliminated unplanned stops ●—●
- Easy to use ●—●



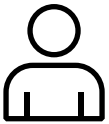
<https://new.abb.com/mechanical-power-transmission/smart-sensor-for-mechanical-products>

Do your mechanical products talk to you?

This is why they should



Traditional way



Routine maintenance introduces safety hazards as employees are working around rotating equipment or trying to reach mechanical products that are difficult or dangerous to access.

Not knowing the health of your mechanical products leaves you at risk for untimely equipment failure, which can lead to process interruption, unplanned downtime, and lost revenue.

Maintenance is a routine schedule based on a combination of experience, training and "this is how we always do it".

The user has little visibility of when component failure may occur.

With ABB Ability Smart Sensor



Increased safety

The ability to monitor mechanical products remotely allows maintenance and other relevant personnel to safely get a health check of the products without touching equipment.

Increased productivity

Trending data helps to develop patterns for monitoring performance and ability to predict replacement.

Reduced maintenance

Maintenance can now be planned according to actual needs rather than based on generic schedules.

Eliminate unplanned downtime

Warnings on decreasing health status allow you to plan maintenance before there is a problem and the system is down.

Easy to use

Wireless

Sensor is battery operated, no wiring, special tools or special software required.



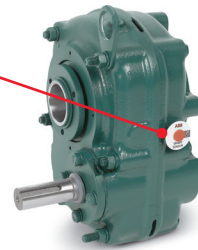
Easy installation

ABB mechanical products come sensor ready with drilled, threaded, and plugged installation holes. The sensor is installed by removing the plug and threading the sensor into the provided receptacle.



Retrofitting – no problem

Adapters designed to accept smart sensor are available for easy installation in the field. The gearing adapters replace one of several oil fill plugs with a blind plug. The sensor adapter for bearings replaces the standard grease fitting in the housing, allows for easy installation of the sensor, and provides a grease port for continued hand lubrication of the bearing.

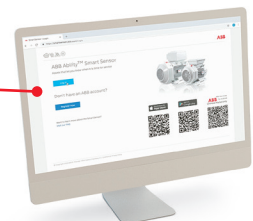


Easy activation

The sensor is activated by pressing the LED activation switch.



Complimentary access to ABB Ability for data trending



Easy to use

No matter where you are

Machinery is working even when you are not. Advanced condition monitoring is now hand held through the Smart Sensor Platform app. Designed with ease in mind, the app allows you to get up to date information on all mechanical products at any time, no matter where you are. Simply download ABB Ability Smart Sensor App for any iOS or Android based device.

Intuitive interface

The simple, graphical interface is easy to use and understand.

Traffic light system

Health is displayed with a traffic light icon to quickly show users the state of that product.

Push notifications

When conditions change, you want to be the first to know. ABB Ability allows you to get notifications based on your preferences.

Constant communication

When events happen, everyone in the organization can know. This also allows records of who closes the events and what comments are made.

Event log

All maintenance performed on mechanical products can be scheduled and recorded in the app, providing an easy to access record of service.

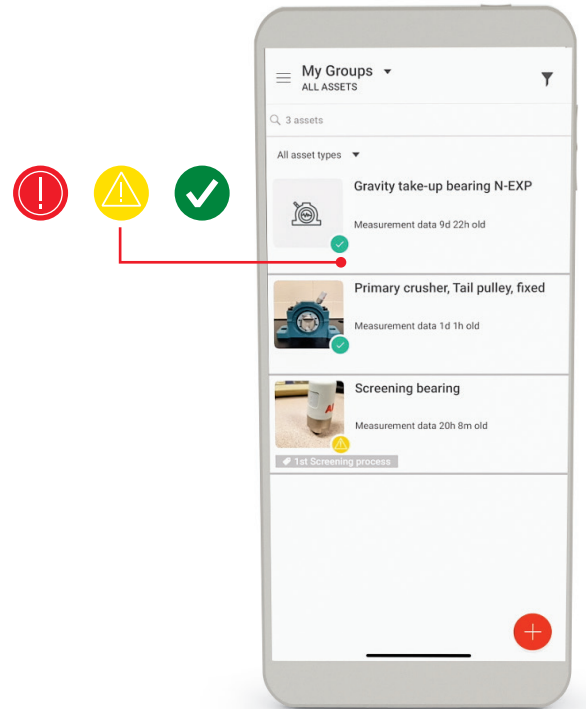
Asset identification

Each product is registered through a part number, which provides a reference when it comes time to replace.

Access in remote locations

When mechanical products are located in difficult to reach locations or out of mobile device range, sensor data can be automatically sent via Bluetooth Low Energy to the ABB Ability platform using a Gateway.

Twenty Smart Sensors can be connected to one Gateway.



Safe to use

Cyber security

ABB understands the importance of protecting your data, and we take this responsibility seriously. The ABB Ability Smart Sensor for mechanical products adheres to strict security measures to ensure that the health of your mechanical products are all you need to worry about.

Data ownership

- You own all of your data.
- Your data cannot be accessed by anyone outside your company unless you have authorized them in the portal.

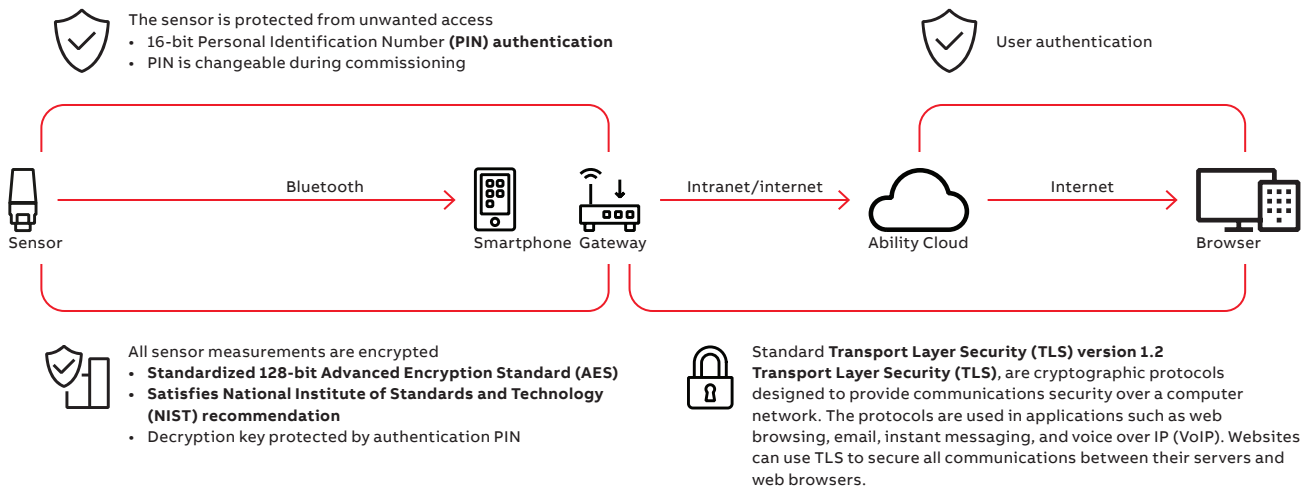
The sensor is protected from unwanted access

- 16-bit Personal Identification Number (PIN) authentication
- PIN is changeable during commissioning as well as during normal sensor usage (Default PIN is 0000)
- PIN throttling prevents brute-force attacks

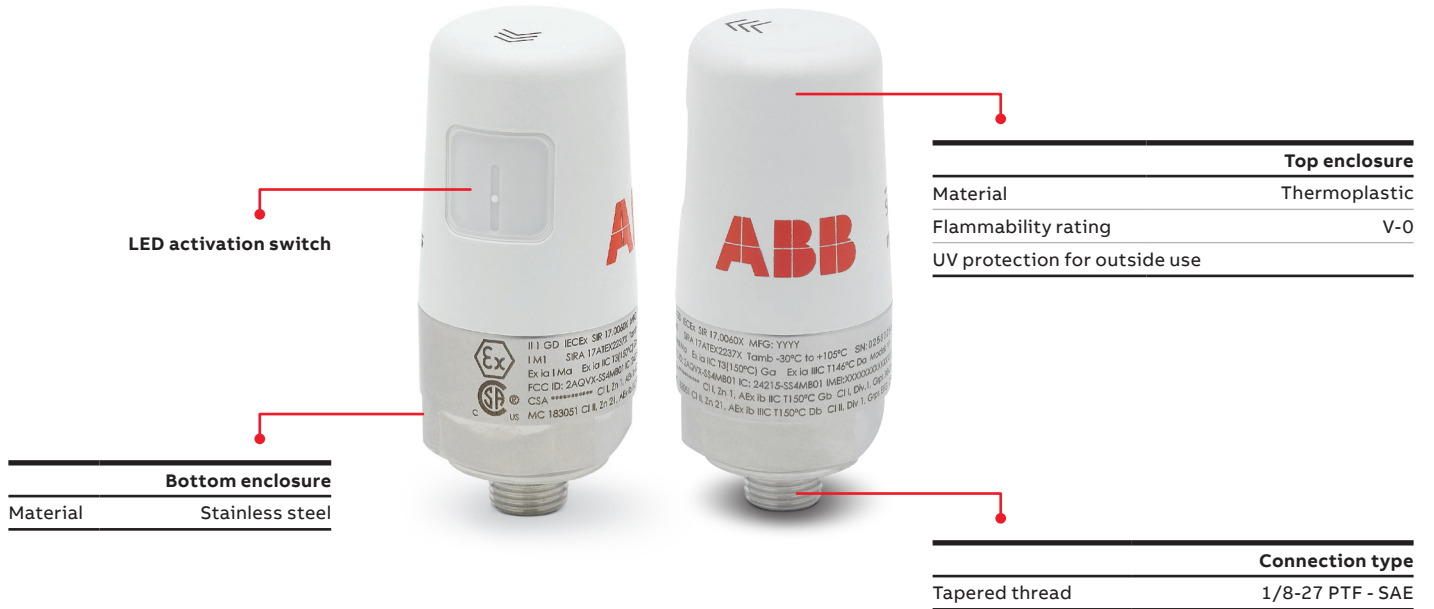
All sensor measurements are encrypted

- By recommendation of National Institute of Standards and Technology (NIST)
- Decryption key is protected by authentication PIN

Secure communication system overview



Safe to use Certificates

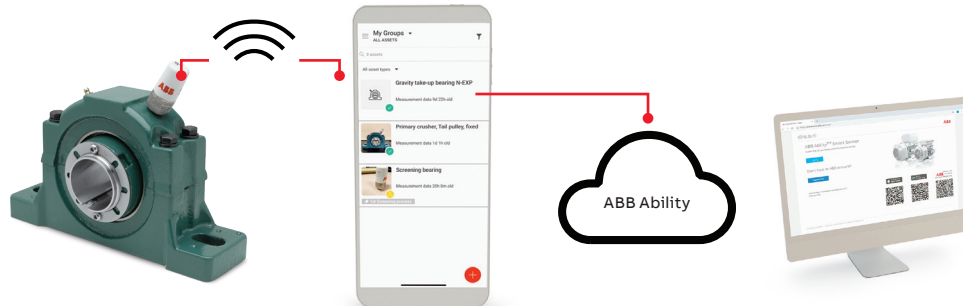


	II 1 GD IECEx SIR 17.0060X MFG: YYYY IP 66 IM1 SIRA 17ATEX2237X Tamb -30°C to +105°C SN: NNNNNNNN Ex Ia I Ma Ex Ia IIC 150°C (T3) Ga Ex Ia IIIC T146°C Da Model: V1 FCC ID: 2AQVX-SS4MB01 IC:24215-SS4MB01 IFT:RCPABV118-2199 CSA 19CA70215658 CI I, Zn 0, AEx Ia IIC 150°C Ga CI I, Div.1, Grps ABCD MC 274769 CI II, Zn 20, AEx Ia IIIC T146°C Da CI II, Div 1, Grps EFG CI III, Div 1			ABB Motors and Mechanical Inc. 5711 R.S. Boreham Jr. Street Fort Smith, AR 72901, USA	 0518
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Third-party hazardous location certified (intrinsically safe)

When it comes to applications in hazardous environments, there's no reason for customers to assume any risk by using a product which is self certified. That's why the ABB Ability Smart Sensor for mechanical products is third party ATEX certified for worry-free use in hazardous environments. All required product markings and documentation are included with each sensor at no additional charge. When it comes to hazardous environments, you can trust ABB Ability Smart Sensor for mechanical products.

ABB Ability portal



The Smart Sensor for mechanical products includes complimentary access to the ABB Ability digital platform. This portal allows you to monitor function and analyze data trends, leading to better uptime and ensuring that critical operations run smoothly and consistently.

The sensor uses Bluetooth Low Energy to wirelessly communicate information about the mechanical products operational health via your smartphone or bluetooth-gateway to a secure server. Data from the sensor can be displayed graphically on a smart phone, tablet or the ABB Ability web portal.

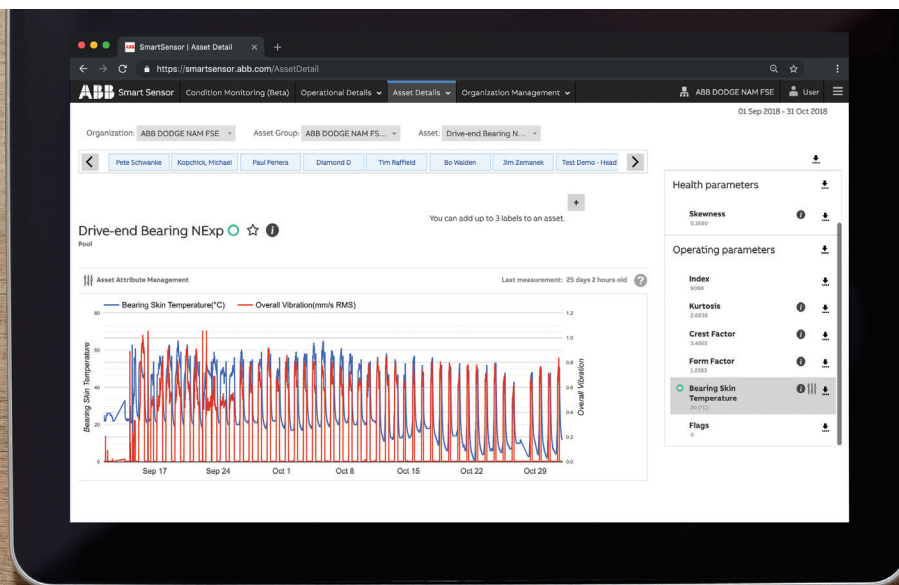
Trending data

Allows users the ability to zoom in and pin point certain events. Users can customize preferences and plot data relevant to them. This data is available to download to Microsoft Excel.

Advanced algorithms are loaded into ABB Ability to help direct proper maintenance and decrease unexpected down time.

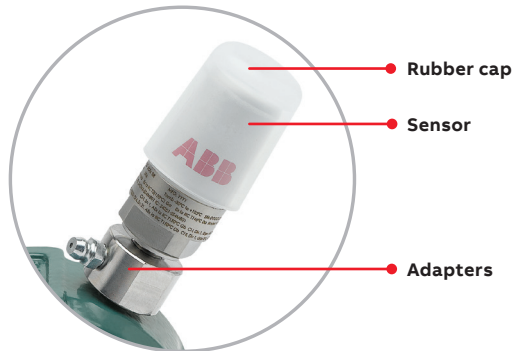


<https://smartsensor.abb.com/Login>

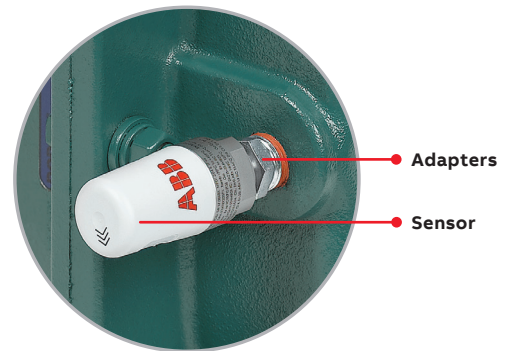


Part number information

Bearing



Gearing



Part number	Description
750000	Smart Sensor for mounted bearings
Smart Sensor adapters for mounted bearings	
749904	1/8" - 27 pipe thread adapter
749905	1/4" - 28 straight thread adapter
749915	M6X0.75 adapter
137994	1/8"-27 dual for auto lube adapter
Smart Sensor adapters for gearboxes	
966905	3/8" NPT to 1/8" NPSM sensor hardware kit
966906	1/2" NPT to 1/8" NPSM sensor hardware kit
966907	3/4" NPT to 1/8" NPSM sensor hardware kit
Bluetooth Gateway	
749908	Bluetooth Gateway

Adapter retrofit charts

An adapter is available for retrofitting existing Dodge mechanical products with an ABB Ability Smart Sensor.

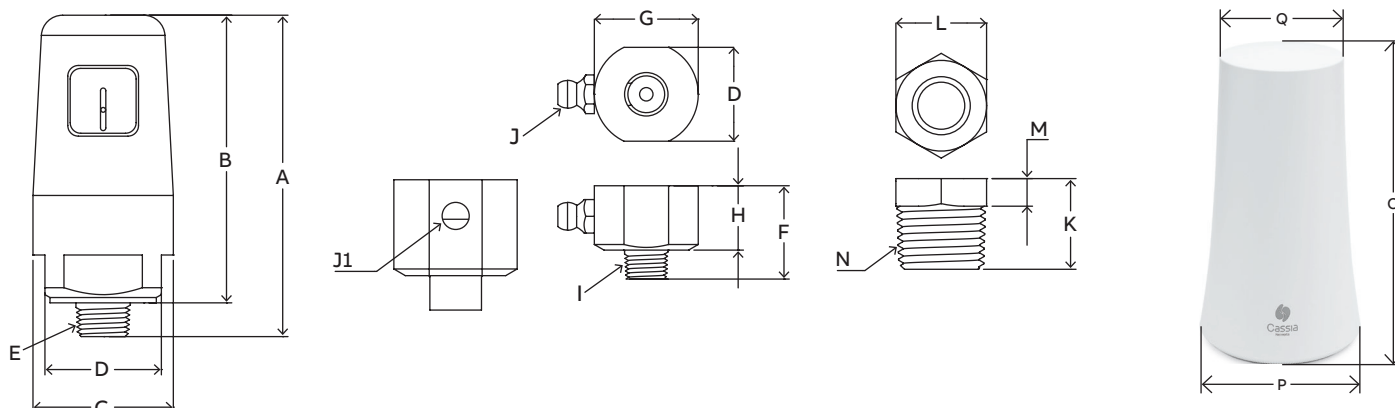
Mounted bearing product	Product description	Sensor adapter compatible	Sensor adapter size		Housing style
			1/8" - 27 adapter PN 749904	1/4" - 28 adapter PN 749905	
Ball bearings	Washdown ball bearings	Yes	No	Yes	Pillow blocks only
Ball bearings	Standard cast iron ball bearings	Yes	204 series and larger	Yes, for 203 series only	Pillow blocks only
Spherical roller bearings	All spherical roller bearing products	Yes	Yes	No	Pillow blocks only
Tapered roller bearings	Type E	Yes	Yes	No	Pillow blocks only
Tapered roller bearings	Split cap tapered products-Type EXL, Double Interlock®, TAF, Type K, Type C, Special Duty	No			N/A
Plain bearings	Sleevoil® and journal bearings	No			N/A



Adapter Description and part number	Quantis RHB, ILH and MSM	TXT	TAII	MTA	Maxum XTR	MagnaGear
3/8 NPT to 1/8" P/N: 966905	Sizes 38-128	Sizes 1-4	Sizes 0-3	Sizes 2-3	-	-
1/2 NPT to 1/8" P/N: 966906	-	Sizes 5 & 6	-	-	All sizes	-
3/4 NPT to 1/8" P/N: 966907	Sizes 148-168	Sizes 7-12	Sizes 4-12	Sizes 4-8	-	Sizes 100-920

Smart Sensor

Dimensions & installation



Note: Drawings are not to scale.

Smart Sensor dimensions

Part number	Description	Dimensions				
		A	B	C	D	E
750000	Smart Sensor for mounted bearings	2.38 (60.5)	2.13 (54.14)	1.04 (26.4)	7/8 (22)	1/8"-27 PTF-SAE

Smart Sensor adapters for mounted bearings dimensions

Part number	Description	Dimensions				
		F	G	H	I	J, J1
749904	1/8" - 27 pipe thread adapter				1/8" - 27 PTF-SAE	
749905	1/4" - 28 straight thread adapter	0.88 (22)	0.97 (24.61)	0.61 (15.37)	1/4" - 28 UNF-SAE	1/4" - 28 HYD GR FTG
749915	M6X0.75 adapter				M6X0.75 taper thread	
137994	1/8" - 27 dual for auto lube adapter	1.19 (30.16)		0.92 (23.3)	1/8" - 27 PTF-SAE	1/8" - 27 NPT hole

Smart Sensor adapters for gearboxes dimensions

Part number	Description	Dimensions			
		K	L	M	N
966905	3/8 NPT to 1/8 NPSM sensor hardware kit	0.69 (17.53)	11/16 (17.19)	0.21 (5.33)	3/8" - 18 NPT
966906	1/2 NPT to 1/8 NPSM sensor hardware kit	0.81 (20.57)	7/8 (22.23)	0.25 (6.35)	1/2" - 14 NPT
966907	3/4 NPT to 1/8 NPSM sensor hardware kit	0.93 (23.62)	1-1/16 (26.99)	0.30 (7.62)	3/4" - 14 NPT

Bluetooth Gateway dimensions

Part number	Description	Dimensions		
		O	P	Q
749908	Bluetooth Gateway	10.20 (259)	5.63 (143)	4.05 (103)

Installation information*

Description	Torque (lb.-in.)
Smart Sensor/ sensor adapter	7 to 12

*Using torque wrench

Note: Installation and maintenance instructions for Dodge products available at new.abb.com

Technical data

Certification(s)	
	II 1 GD
	I M1
	Ex ia I Ma
EX (hazardous areas)	Ex ia IIC 150°C (T3) Ga
	Ex ia IIIC T146°C Da
	CI I, Zn 0, AEx ia IIC T150°C Ga
	CI I, Div.1, Grps ABCD
	CI II, Zn 20, AEx ia IIIC T146°C Da
	CI II, Div 1, Grps EFG
	CI III, Div 1
IP (Ingress Protection) class	IP 66
Temperature	
Measurement range	-22°F... +185°F (-30°C ... +85°C)
Resolution	1°C
Accuracy	±2°C
Vibration	
Amplitude range	+/- 2g
Frequency range	1 Hz – 1.6 kHz
Detection type	RMS
Wireless communication	
Network standard	Bluetooth Low Energy
Radio standard	IEEE 802.15.1C
Frequency	2402-2480 MHz
Range (nominal)	Up to 70 ft (20 m) via mobile device
Environmental	
Storage temperature	+14°F ... +86°F (-10°C ... +30°C)
Operating temperature	-22°F... +185°F (-30°C ... +85°C)
Power	
Battery type	3.6V LiSOCl ₂ cells
	Lithium thionyl chloride cell battery is not replaceable
	-22°F...+122°F (-30°C ... +50°C)
Estimated battery life*	2+ years with measurement taken once per hour and data collected once per day by mobile device.
	+123°F...+185°F (+51°C ... +85°C)
	1+ year with measurement taken once per hour and data collected once per day by mobile device.
Physical	
Weight	60 grams
Case material	Stainless steel/thermoplastic/silicone
Dimension	60.5mm x 26.4mm
Mounting	Male 1/8" - 27 PTF SAE

Helpful websites



Smart Sensor app:

One stop shop for sensor commissioning and condition monitoring for users on the go – app provides easy 'at-a-glance' overview of asset conditioning.



Apple store
<https://apps.apple.com/us/app/smart-sensor-platform/id1222531884>



Google Play store
<https://play.google.com/store/apps/details?id=com.abb.ability.smartsensor>

Condition monitoring portal:

One stop shop for condition monitoring, user and asset group setup, and organizational management. Users can view temperature and vibration trends for any given asset within their organization.



<https://smartsensor.abb.com/Login?returnUrl=https://smartsensor.abb.com/AssetDetail/Index?id=13503>

Powertrain portal:

Allows users to overlay KPI's from multiple assets at once, provides easy comparison of data from different assets beyond basic functionality of condition monitoring portal.



<https://powertrain.abb.com/Login>

Additional information

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5711 R.S. Boreham, Jr. Street
Fort Smith, AR 72901
Ph: 1.479.646.4711

Mechanical Power Transmission Support
Ph: 1.864.297.4800

new.abb.com/mechanical-power-transmission

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Specifications subject to change without notice.

Orbal drives supplied with Dodge MTA gearboxes include twin tapered bushing to ensure that the reducer output hub will not seize the shaft. Proper twin tapered bushings and key installation ensures integrity of the seal and gearbox bearings. Figure A illustrates a typical gearbox installation with the key installed onto the Orbal shaft.



Figure A: Typical Gearbox Installation with Keyed Shaft

Keys provided with the gearbox can be rectangular in shape and require attention to orientation when installing. The keys are provided with the standard widths per ASNI B17.1, while the height is slightly under or oversized. For example, given a 4-7/16" shaft, the key is 1.000" wide x 0.955" tall. Install the key such that the full 1.000" width seats properly into the keyway. The installing party must ensure that the key is installed to the full width of the keyway. **Failure to install the key correctly will void the equipment warranty by Evoqua.**

The keys are provided by Dodge with both a bushing kit number and stamped indication of correct orientation as shown below in **Figure B** below. The key should be installed with the key seat facing up, and the key installed with the marked side also facing upwards.



Figure B: Dodge Key Marking

Follow gearbox manufacturer’s recommended torqueing sequence for bushing installation. Common torqueing procedures must be followed, including the use of calibrated torque wrenches. **Under no circumstances should an impact wrench be used to install the tapered bushings.**

If the key and bushings are installed incorrectly, it will prevent the reducer from mounting concentrically with the shaft, causing the reducer to wobble on the driven shaft, causing distortion and damage to the output bearings. If the bushing is installed with a key incorrectly, the bushing faces may become distorted as shown in **Figure C** below.



Figure C: Bushing Distortion due to Improper Key Installation.

During installation, any questions regarding installation of the reducer on the Orbal shaft should be directed to Evoqua’s project manager or field service staff during an installation inspection.

Please return this document to Evoqua confirming correct installation of the keyway and torque sequence of the tapered bushings.

Project Location

Contractor Representative

Date:

BALDOR® • RELIANCE 

Product Information Packet

10-0000-0620

30HP,1770RPM,3PH,60HZ,286TC,1060M,TEFC,W

Part Detail							
Revision:	G	Status:	PRD/A	Change #:		Proprietary:	No
Type:	AC	Elec. Spec:	10WGZ506	CD Diagram:	CD0005	Mfg Plant:	
Mech. Spec:		Layout:	10LYH462	Poles:	04	Created Date:	03-05-2019
Base:		Eff. Date:	08-17-2021	Leads:	9#10		

Specs			
Enclosure:	TEFC	Enclosure Modification:	Severe Duty Features
Frame:	286TC	Feedback Device:	NO FEEDBACK
Frame Material:	Iron	Heater Indicator:	No Heater
Motor Letter Type:	Three Phase	Insulation Class:	F
Output @ Frequency:	30.000 HP @ 60 HZ	Inverter Code:	Inverter Duty
Synchronous Speed @ Frequency:	1800 RPM @ 60 HZ	IP Rating:	IP55
Voltage @ Frequency:	230.0 V @ 60 HZ	KVA Code:	G
	460.0 V @ 60 HZ	Lifting Lugs:	Standard Lifting Lugs
XP Class and Group:	None	Locked Bearing Indicator:	Locked Bearing
XP Division:	Not Applicable	Motor Lead Termination:	Flying Leads
Agency Approvals:	CSA EEV	Motor Type:	1060M
	UR	Mounting Arrangement:	W6
Auxillary Box:	No Auxillary Box	Power Factor:	84
Auxillary Box Lead Termination:	None	Product Family:	Super-E Chemical Processing
Base Indicator:	No Mounting	Pulley Face Code:	C-Face
Bearing Grease Type:	Polyrex EM (-20F +300F)	Rodent Screen:	None
Blower:	None	Shaft Ground Indicator:	No Shaft Grounding
Constant Torque Speed Range:	1.0	Shaft Rotation:	Reversible

Current @ Voltage:	78.000 A @ 208.0 V	Speed Code:	Single Speed
	72.000 A @ 230.0 V	Motor Standards:	NEMA
	36.000 A @ 460.0 V	Starting Method:	Direct on line
Design Code:	B	Thermal Device - Bearing:	None
Drip Cover:	Drip Cover	Thermal Device - Winding:	None
Duty Rating:	CONT	Vibration Sensor Indicator:	No Vibration Sensor
Electrically Isolated Bearing:	Not Electrically Isolated	Winding Thermal 1:	None
		Winding Thermal 2:	None

Nameplate NP3634													
CAT.NO.				P/N				ENCLOSURE	TEFC				
SPEC.	10-0000-0620		CC	010A		FRAME	286TC		S/N				
HP	30			CLASS	F		HZ	60		DES	B		
RPM	1770			RPM MAX	2700		PH	3		KVA-CODE	G		
VOLT	230/460			MOTOR WEIGHT	460								
AMP	72/36			SER.F.	1.15		PF	84		ODE BRG	6311	DE BRG	6311
RATING	40C AMB-CONT			NEMA-NOM-EFF	93.6		GREASE	POLYREX EM					
										INV.TYPE	PWM		
										C HP FR	60	C HP TO	90
CT HZ FROM	1.0		CT HZ TO	60									
HTR-VOLTS			HTR-AMPS			HTR-WATTS			VT HZ FROM	0		VT HZ TO	60

Parts List		
Part Number	Description	Quantity
SA366835	SA 10-0000-0620	1.000 EA
RA356282	RA 10-0000-0620	1.000 EA
LB1115N	LABEL,LIFTING DEVICE (ON ROLLS)	1.000 EA
LC0005E01	SPL CONN.DIA./WARN.LABEL(LC0005/LB1119)	1.000 EA
LB1417	LABEL CARTON 6X4 PERFORATED BLANK ROLLS	1.000 EA
NP3634	SS SUPER-E INV UL CSA-EEV PREM CC (300 S	1.000 EA
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	4.000 EA
MN416A01	TAG-INSTAL-MAINT no wire (2200bx) 4/22	1.000 EA
10FH1007A68P	FAN COVER, MACH W/EPOXY PRIMER	1.000 EA
HW1001A31	LOCKWASHER 5/16, ZINC PLT.591 OD, .319 I	3.000 EA
10XN3118K24	5/16-18 X 1.50" HEX HD, GRADE 5	3.000 EA
09FN3001D02	EXTERNAL FAN, PLASTIC (COMES W/SCREW FRO	1.000 EA
HW2500A25	WOODRUFF KEY USA #1008 #BLOW CARBON STEE	1.000 EA
MJ1000A02	GREASE, POLYREX EM EXXON	0.130 LB
10EP1110A40LP5	FREP, MACH W/PRIMER & MG1025L14	1.000 EA
10XN3816K28	3/8-16 X 1.75 HEX HD CAP SCREW, GRADE 5	4.000 EA
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 EA
HW4600B40	V-RING SLINGER 2.000 X 2.680 X .28 VITON	1.000 EA
HW5100A13	W4627-047 WVY WSHER	1.000 EA
HW4500A20	1/8NPT SL PIPE PLUG	1.000 EA
HA4054	SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 EA
HA4017A02	.125X2.50 GREASER EXTENS.F/S	1.000 EA
HA4017A11	1/8 X 2.75 GREASE EXT (F/S)	1.000 EA
HW4019A01	PIPE COUPLING 1/8 NPT,STEEL,ZINC COATING	1.000 EA

Parts List (continued)		
Part Number	Description	Quantity
10XN3118K40	5/16-18 X 2.50" HEX HD, GRADE 5	4.000 EA
HA4051A00	PLASTIC CAP FOR GREASE FITTING	1.000 EA
HW4500A21	1618BALEMITE FITTING 825 UNIVERSAL	1.000 EA
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
10EP1305A117P	PU ENDPLATE, MACH W/EPOXY	1.000 EA
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 EA
10XN3816K28	3/8-16 X 1.75 HEX HD CAP SCREW, GRADE 5	4.000 EA
HW4600B40	V-RING SLINGER 2.000 X 2.680 X .28 VITON	1.000 EA
10XN3118K40	5/16-18 X 2.50" HEX HD, GRADE 5	4.000 EA
HA4051A00	PLASTIC CAP FOR GREASE FITTING	1.000 EA
HW4500A03	GREASE FITTING, .125 NPT 1610(ALEMITE) 8	1.000 EA
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
HW4500A20	1/8NPT SL PIPE PLUG	1.000 EA
10CB1000A352P	CONDUIT BOX, MACH W/EPOXY PRIMER	1.000 EA
09GS1010	GASKET, DWG, LEADWIRE SEPERATOR	1.000 EA
10XN3118K16	5/16-18 X 1" GRADE #5, STL, ZINC PLATE	4.000 EA
HW1001A31	LOCKWASHER 5/16, ZINC PLT.591 OD, .319 I	4.000 EA
WD1000B25	GND LUG, BURNDY L125HP OR T&B L125HP-BB	1.000 EA
19XW3118G08	.31-18X.50,HEX WSHR HD,TAPTITE 2,GREEN	1.000 EA
10CB1503A01P	CONDUIT BOX LIPPED LID, MACH W/EPXY PRMR	1.000 EA
14GS1003	GASKET CONDUIT BOX LID, NEOP	1.000 EA
10XN2520K16	1/4-20 X 1" HX HD SCRW GRADE 5, ZINC P	4.000 EA
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	4.000 EA
12FH1500A01P	MACH DRIP COVER 310-312 MTRS	1.000 EA

Product Information Packet: 10-0000-0620 - 30HP,1770RPM,3PH,60HZ,286TC,1060M,TEFC,W

10XN3816K36	3/8-16 X 2.25 HEX HD CAP SCREW, GRADE 5	4.000 EA
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 EA
MG1025N19	WILKOFASST, 778.50, RELIANCE BLUE-GREEN 8	0.125 GA
MJ5001A27	32220KN GRAY SEALER *MIN BUY 4 QTS=1GAL	0.031 QT
MJ5001A14	DYNAPRO SEALANT, CP MTR VC#2508050 (603	0.033 EA
PK6014	STEEL STRAP FOR 309-312 BASELESS MOTORS	4.000 EA
12PA1000	PACKAGING GROUP PRINT PK1024A07	1.000 EA
10XN3816K10	BOLT, 3/8-16 X 5/8 HHCS YZ	4.000 EA
HW2501H28	KEY, 1/2 SQ X 3.250	1.000 EA

AC Induction Motor Performance Data

Record # 59573

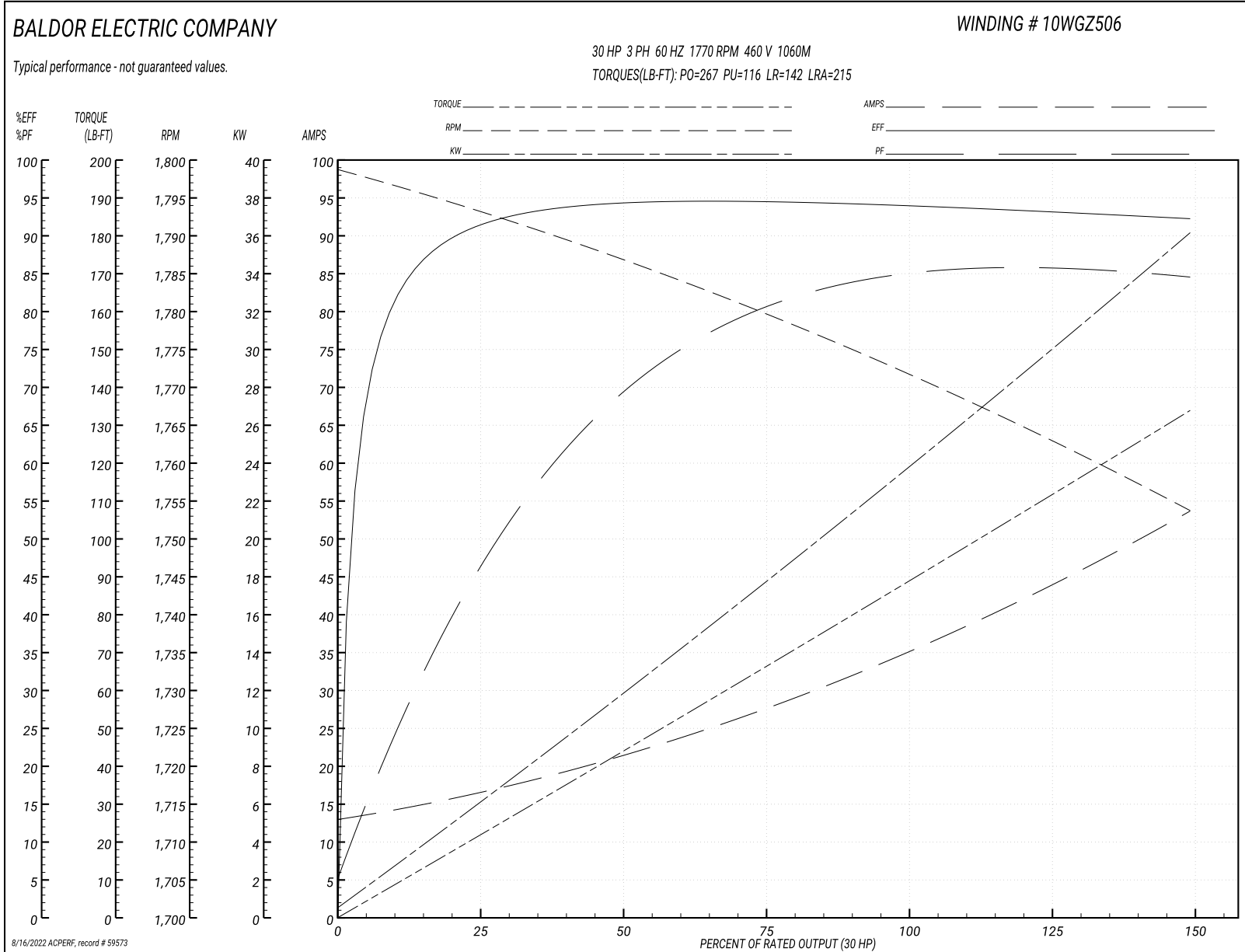
Typical performance - not guaranteed values

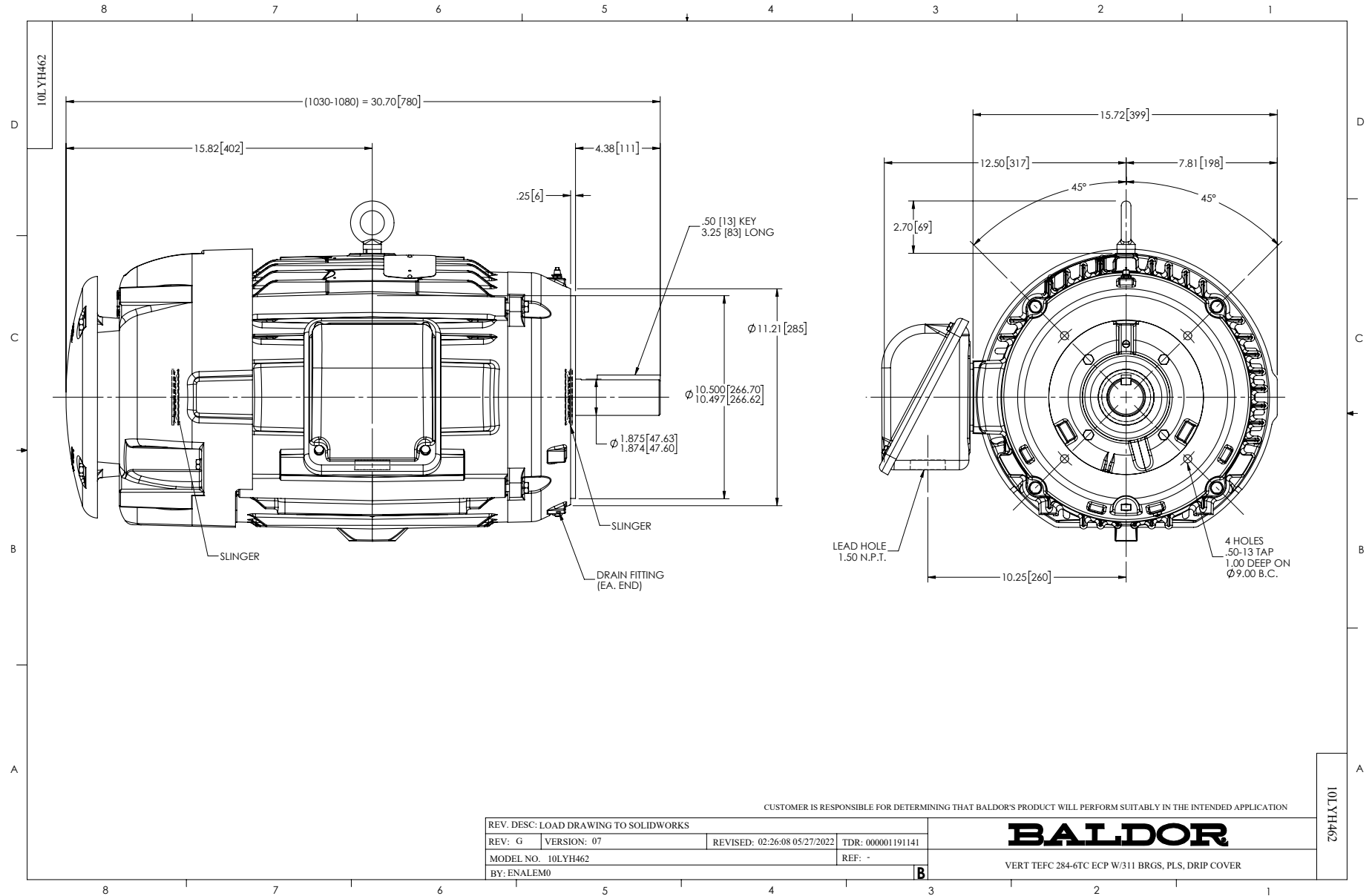
Winding: 10WGZ506-R004		Type: 1060M	Enclosure: TEFC	
Nameplate Data			460 V, 60 Hz: Single Voltage Motor	
Rated Output (HP)	30	Full Load Torque	88.64 LB-FT	
Volts	230/460	Start Configuration	direct on line	
Full Load Amps	72/36	Breakdown Torque	267 LB-FT	
R.P.M.	1770	Pull-up Torque	116 LB-FT	
Hz	60 Phase	Locked-rotor Torque	142 LB-FT	
NEMA Design Code	B KVA Code	Starting Current	215 A	
Service Factor (S.F.)	1.15	No-load Current	13.5 A	
NEMA Nom. Eff.	93.6 Power Factor	Line-line Res. @ 25°C	0.234 Ω	
Rating - Duty	40C AMB-CONT	Temp. Rise @ Rated Load	62°C	
S.F. Amps		Temp. Rise @ S.F. Load	76°C	
		Locked-rotor Power Factor	29.7	
		Rotor inertia	4.77 LB-FT ²	

Load Characteristics 460 V, 60 Hz, 30 HP

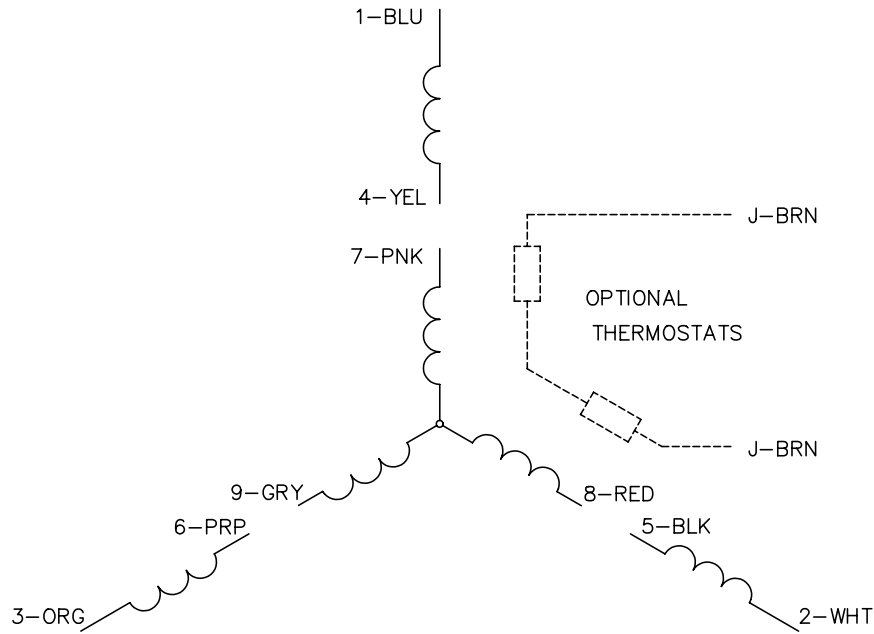
% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	48	71	80	84	85	85	83
Efficiency	91	94	94.3	94	93.7	92	93.4
Speed	1793	1787	1779	1772	1764	1753	1769
Line amperes	15.8	21.1	27.8	35.6	44	53.5	41.5

Performance Graph at 460V, 60Hz, 30.0HP Typical performance - Not guaranteed values

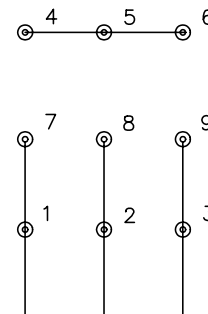




CD0005

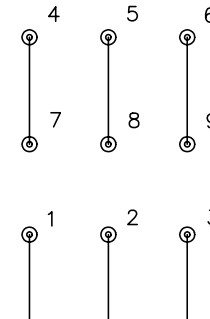


LOW VOLTAGE
(2Y)



LINE

HIGH VOLTAGE
(1Y)



LINE

NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

REV. DESC: REVISE TO SHOW OPTIONAL COLORS			
REV. LTR: E	BY: JLP	REVISED: 01/19/99 10:15	TDR: 0171435
900000		FILE: AAA00005140	MDL: -
		MTL: -	

BALDOR ELECTRIC Co.

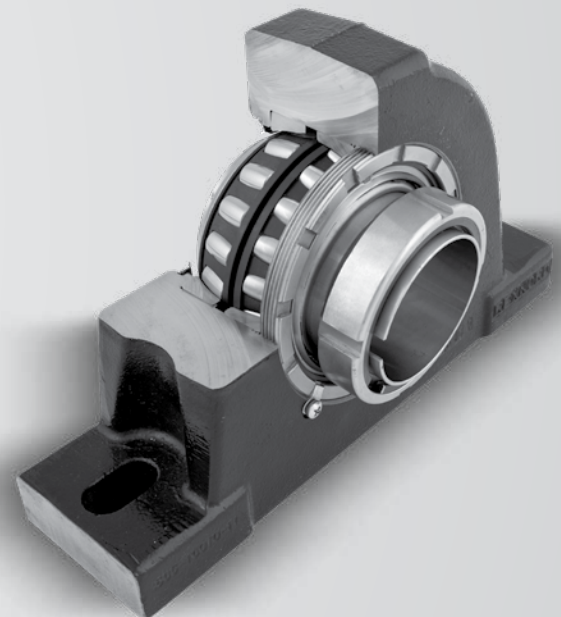
3PH, DV, 9 LEADS

CD0005

Marketing maintained PDF of MN416:

<http://www.baldor.com/support/Literature/Load.ashx/MN416?ManNumber=MN416>

Large-Bore SHURLOK Adapter Mounted Roller Bearing



We don't simply understand bearings.
We understand your business.



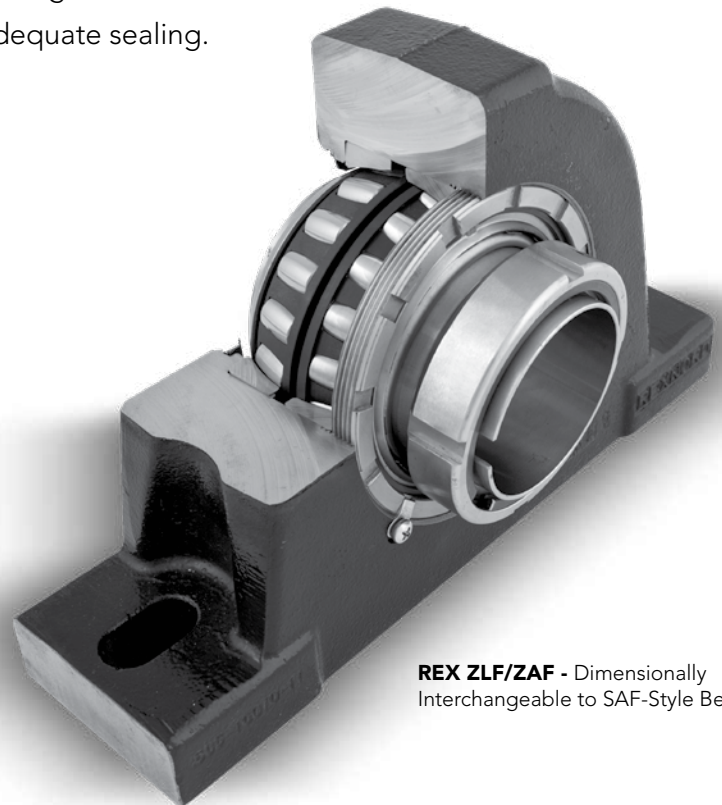


Large-Bore SHURLOK Adapter Mounted Roller Bearings

Available up to 6-15/16"

When equipment goes down you lose money — plain and simple. The Rex® SHURLOK™ adapter mounted roller bearing was designed to maximize uptime and minimize changeover time so you can keep your equipment — and your profits — going strong.

SHURLOK attacks the two primary causes of bearing failure: improper mounting to the shaft and contamination due to inadequate sealing.



REX ZLF/ZAF - Dimensionally Interchangeable to SAF-Style Bearing.

Large-Bore SHURLOK Adapter Mounted Roller Bearings

Maximize Uptime

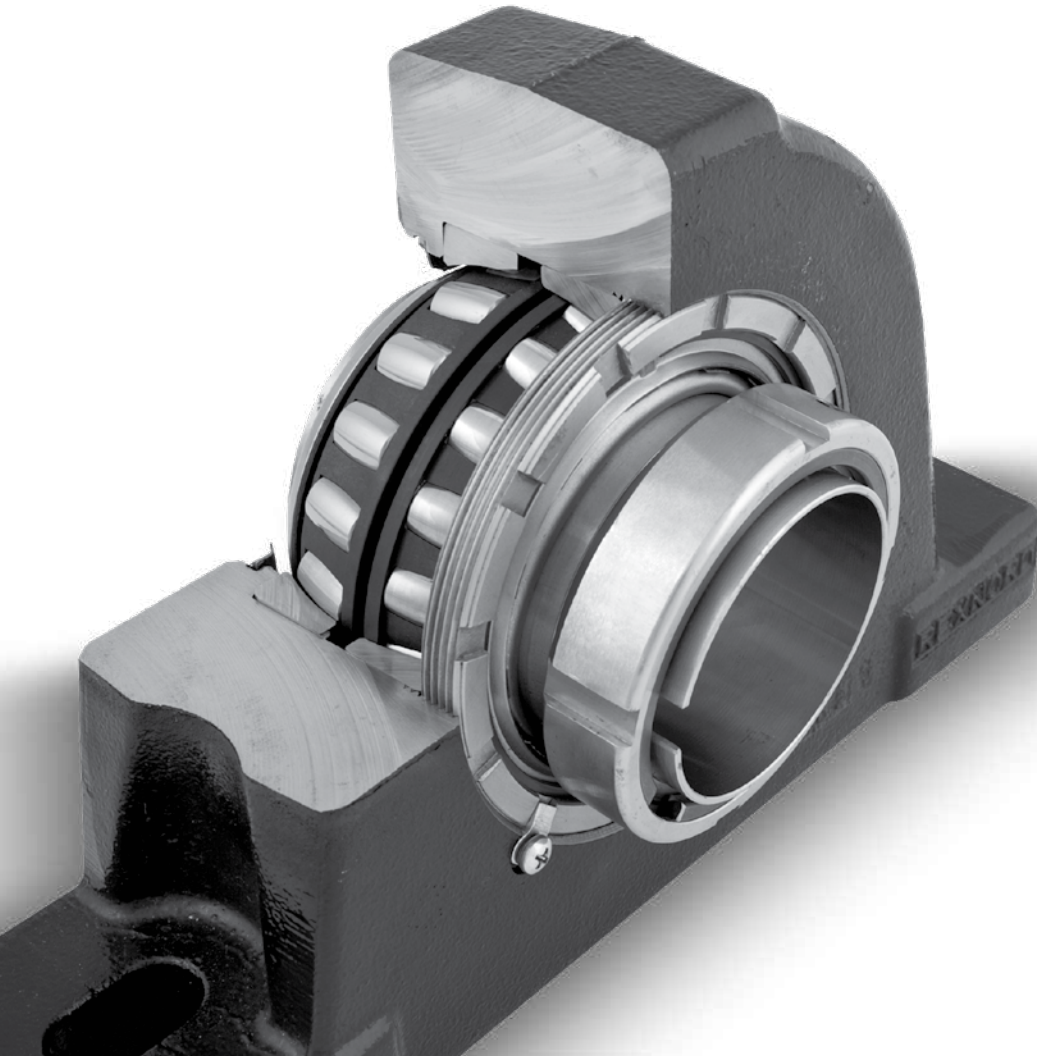
- Sealing solutions to fit any application — even underwater!
- Performance surfaces ground and super-finished
- Industry-best 4° of total misalignment

Minimize Changeover Downtime

- SHURLOK comes fully lubed with factory-set clearance
- Install four times faster than SAF-style adapter mounted bearings
- Integrated bearing puller makes removal a snap — removal guaranteed

Take The Mystery Out of Adapter Mounting

- No more feeler gauges — no more guesswork!





Industries Served

Aggregates
Air Handling
Construction Machinery
Food & Beverage
Forest Products
Material Handling
Mining
Pumps & Compressors
Heavy Duty Truck
Steel

General Bearing Information

Races

- 8620 case-carburized premium bearing steel.
- Precision ground and super-finished.

Housings

- Solid-housed from 1-15/16" to 6-15/16"
- Split-housed from 5-7/16" through 6-15/16"

Seals

- Z high speed high temp labyrinth seal, K light contact lip seal, M spring-loaded heavy contact lip seal, and auxiliary end caps with five-point protection plan; offering maximum protection.

Mounting Type

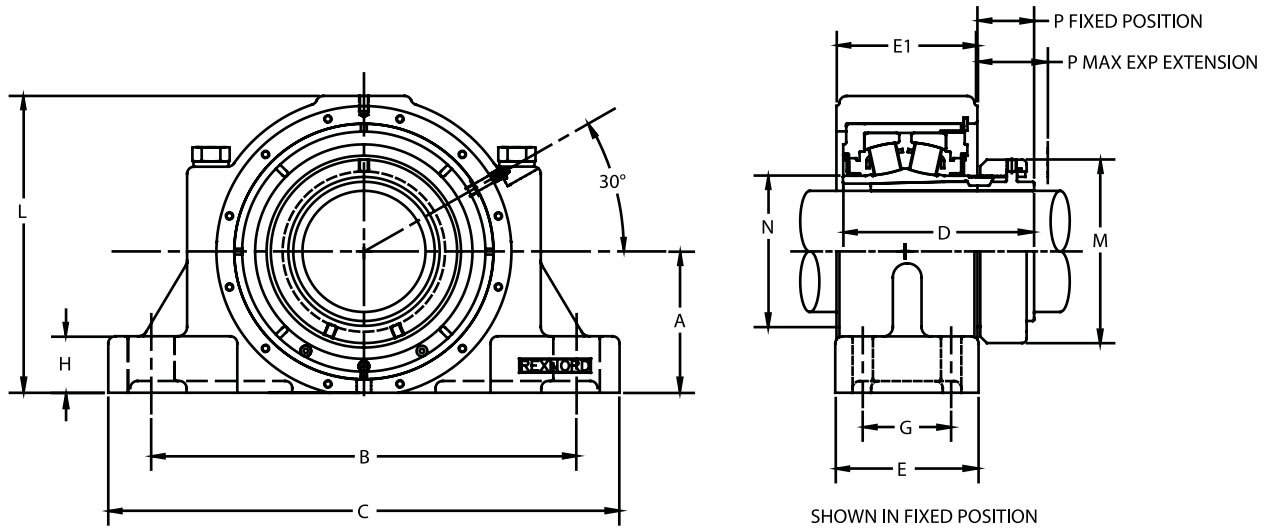
Adapter mount.

Shaft Sizes

1-15/16" to 6-15/16"



Rex 6000 SHURLOK ZLF Split-Housed Pillow Block



Bearing Dimensions

Size Code	Shaft Diameter	Fixed Expansion		A Base to Centerline Height	B Min Distance Between Bolt Holes	B Max Distance Between Bolt Holes	G Bolt Hole Spacing (Width)	C	D	E	E1	F Bolts	H	L	M	N	P Fixed Position	P Max Expansion Position	Approx Weight
		Part Number	Part Number																
4 BOLT SPLIT PILLOW BLOCK																			
14	5 7/16	ZLF6507F	ZLFS6507F	6 11/16	17 3/8	19 1/4	3 3/4	22	8 49/64	6 1/4	6 3/4	1	2 5/8	13 11/16	8 1/64	6 1/2	2 11/32	3 3/64	248.00
15	5 15/16	ZLF6515F	ZLFS6515F	7 1/16	19 3/8	21 5/8	4 1/4	24 3/4	9 19/64	6 3/4	7	1	2 3/4	14 9/16	8 21/32	7 13/64	2 47/64	3 7/16	295.00
16	6 7/16	ZLF6607F	ZLFS6607F	7 1/2	20 7/8	23 5/8	4 5/8	26 3/4	10	7 1/2	7 3/8	1	3	15 3/4	9 3/4	8 3/64	2 31/32	3 43/64	355.00
16	6 15/16	ZLF6615F	ZLFS6615F	7 7/8	21 5/8	24 3/8	4 1/2	28	10	7 1/2	7 3/8	1 1/4	3 1/8	16 1/8	9 3/4	8 3/64	2 31/32	3 43/64	376.00

Please call 1-866-REXNORD for availability
 Lubrication fitting tap size 1/4" PT
 Base to Centerline ±.005"
 Bore Size = nominal shaft size +.001"/-.000"
 Seals - To specify M seal, replace "Z" in the part number with "M" Seals
 Auxiliary end caps available except as noted
 Expansion 3/4"

Selection Guide, see Rex Spherical Roller Bearings Selection Guide section within the Link-Belt®, MB®, and Rex® Bearings Catalog.

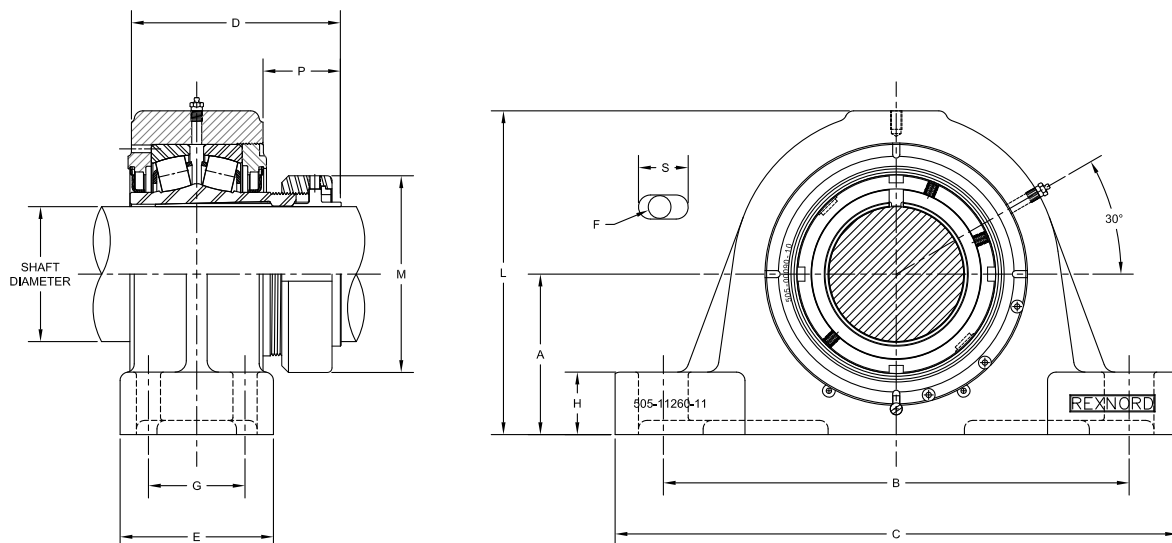
Load Ratings & Speed Limits, see Rex Spherical Roller Bearings Load Ratings & Speed Limits section.

Note: Dimensions subject to change. Certified dimensions of ordered material furnished on request.



Rex 6000 SHURLOK ZAF Solid-Housed Pillow Block

Available up to 6-15/16"



Bearing Dimensions

Size Code	Shaft Diameter	Part Number	Expansion			Fixed			Approx Weight (lbs)	A Base to Centerline Height	B Min Distance Between Bolt Holes	B Max Distance Between Bolt Holes	G Bolt Hole Spacing (Width)	C*	D	E	F Bolts	H	M	S
			L	P	Approx Weight (lbs)	Part Number	L	P												
2 BOLT PILLOW BLOCK																				
6	1 15/16	ZAFS6115	5 5/16	1 1/8	20.00	ZAF6115	5 5/16	1 1/8	16.50	2 3/4	7 3/8	7 7/8	9.625	3 41/64	2 3/4	5/8	1	2 55/64	15/16	
7	2 3/16	ZAFS6203	5 31/32	1 5/32	25.50	ZAF6203	5 31/32	1 5/32	21.00	3	8 1/8	9 1/2	11.000	3 49/64	3 1/8	5/8	1	3 15/64	1 3/8	
8	2 7/16	ZAFS6207	6 25/32	1 27/64	32.50	ZAF6207	6 25/32	1 27/64	32.50	3 1/4	8 5/8	9 5/8	11.125	4 5/32	3 1/8	5/8	1 1/4	3 19/32	1 3/16	
9	2 11/16	ZAFS6211	7 1/2	1 25/64	45.50	ZAF6211	7 1/2	1 25/64	45.50	3 1/2	9 7/8	11	12.594	4 17/32	3 1/2	3/4	1	4 3/32	1 3/8	
	2 15/16	ZAFS6215	7 3/4	1 25/64	45.00	ZAF6215	7 3/4	1 25/64	45.00	3 3/4	9 7/8	11	12.594	4 17/32	3 1/2	3/4	1 1/4	4 3/32	1 3/8	
10	3 3/16	ZAFS6303	8 1/4	1 19/32	59.00	ZAF6303	8 1/4	1 19/32	52.00	4	10 3/8	11 5/8	13.750	5 9/64	3 7/8	7/8	1 5/8	4 61/64	1 7/16	
	3 7/16	ZAFS6307	9 9/32	1 19/32	76.50	ZAF6307	9 9/32	1 19/32	76.50	4 1/2	11 5/8	13 1/8	15.375	5 9/64	4 11/32	7/8	1 21/32	4 61/64	1 11/16	
4 BOLT PILLOW BLOCK																				
8	2 7/16	ZAFS6207F	6 25/32	1 27/64	31.00	ZAF6207F	6 25/32	1 27/64	31.00	3 1/4	8 5/8	9 5/8	1 7/8	11.125	4 5/32	3 1/8	1/2	1 1/4	3 19/32	1 1/16
9	2 11/16	ZAFS6211F	7 1/2	1 25/64	45.00	ZAF6211F	7 1/2	1 25/64	45.00	3 1/2	9 7/8	11	2 1/8	12.594	4 17/32	3 1/2	5/8	1	4 3/32	1 1/4
	2 15/16	ZAFS6215F	7 3/4	1 25/64	44.50	ZAF6215F	7 3/4	1 25/64	44.50	3 3/4	9 7/8	11	2 1/8	12.594	4 17/32	3 1/2	5/8	1 1/4	4 3/32	1 1/4
10	3 3/16	ZAFS6303F	8 1/4	1 19/32	59.00	ZAF6303F	8 1/4	1 19/32	52.00	4	10 3/8	11 5/8	2 1/8	13.750	5 9/64	3 7/8	5/8	1 5/8	4 61/64	1 5/16
	3 7/16	ZAFS6307F	9 9/32	1 19/32	75.00	ZAF6307F	9 9/32	1 19/32	75.00	4 1/2	11 5/8	13 1/8	2 3/8	15.375	5 9/64	4 11/32	3/4	1 21/32	4 61/64	1 9/16
11	3 15/16	ZAFS6315F	10 5/16	1 47/64	103.00	ZAF6315F	10 5/16	1 47/64	103.00	4 15/16	12 19/32	14 1/2	2 3/4	16.500	5 31/32	4 3/4	3/4	1 25/32	5 43/64	1 53/64
12	4 7/16	ZAFS6407YF	11 7/8	1 7/8	144.00	ZAF6407YF	11 7/8	1 7/8	144.00	6	14 1/2	16	3 1/4	18.375	6 1/4	5 1/8	7/8	2 1/16	6 1/16	1 3/4
13	4 15/16	ZAFS6415F	12 9/16	2 1/4	208.00	ZAF6415F	12 9/16	2 1/4	208.00	6	15 5/8	17 3/8	3 3/8	19.703	7 15/16	5 7/8	1	2 1/16	6 61/64	1 15/16
14	5 7/16	ZAFS6507F	13 11/16	2 15/16	248.00	ZAF6507F	13 7/16	3 3/64	248.00	6 11/16	17 3/8	19 1/4	3 3/4	22.000	8 49/64	6 1/4	1	2 5/8	8 1/64	2
15	5 15/16	ZAFS6515F	14 9/16	3 23/64	295.00	ZAF6515F	14 1/4	3 7/16	295.00	7 1/16	19 3/8	21 5/8	4 1/4	24.750	9 19/64	6 3/4	1	2 3/4	8 21/32	2 3/16
16	6 7/16	ZAFS6607F	15 3/4	3 37/64	355.00	ZAF6607F	15 5/16	3 43/64	355.00	7 1/2	7 1/2	20 7/8	4 5/8	26.750	10	7 1/8	1	3	9 3/4	2 7/16
	6 15/16	ZAFS6615F	16 1/8	3 37/64	376.00	ZAF6615F	15 11/16	3 43/64	376.00	7 7/8	7 7/8	21 5/8	4 1/2	28.000	10	7 1/2	1 1/4	3 1/8	9 3/4	2 11/16

Please call 1-866-REXNORD for availability
 Lubrication fitting tap size: Size code 6-11, 1/8" PT; Size code 12-16 1/4" PT
 Base to Centerline ±.005"
 Bore Size = nominal shaft size +.001"/-.000"
 Expansion: Size code 6-8 3/8", Size code 9-11 1/2", Size code 12-16 3/4"
 Seals - To specify K or M seal, replace "Z" in the part number with "K" or "M"
 "K" Seals only available in size codes 6-11
 Auxiliary end caps available all sizes
 * "C" Dimension tolerance ±.0075" size codes 6-13, ±.015" size codes 14-16

Selection Guide, see Rex Spherical Roller Bearings Selection Guide section within the Link-Belt®, MB®, and Rex® Bearings Catalog.
 Load Ratings & Speed Limits, see Rex Spherical Roller Bearings Load Ratings & Speed Limits section.
 Note: Dimensions subject to change. Certified dimensions of ordered material furnished on request.

Nomenclature

Symbol	Description	A	Z	A - 2	207	F
A	Two open auxiliary end caps					
AB	One open auxiliary end cap on locknut side, one closed on housing side					
B	Two auxiliary end caps (open on housing side, closed on threaded cover side)					
BA	One open auxiliary end cap on housing side, one closed on locknut side					
X	Designates "SPECIAL UNITS", contact Rexnord Industries					
Z	Clearance seal					
K	Light contact seal					
M	Heavy contact seal					
G	Triple Lip Seal					
A	Pillow block, fixed					
AS	Pillow block, floating					
AF	Pillow block, fixed SAF interchange					
AFS	Pillow block, floating SAF interchange					
LF	Split pillow block, fixed SAF interchange					
LFS	Split pillow block, floating SAF interchange					
P	Pillow block, fixed					
PS	Pillow block, floating					
EP	Pillow block, fixed Type E interchange					
EPS	Pillow block, floating Type E interchange					
B	Flanged block, fixed 4-bolt					
BS	Flanged block, floating 4-bolt					
EF	Flanged block, fixed 4-bolt Type E interchange					
F	Flanged block, fixed 4 or 6-bolt					
FS	Flanged block, floating 4 or 6-bolt					
BR	Flanged cartridge block, fixed 4-bolt round					
CS	Cartridge block, steel housing					
MC	Cartridge block, cast iron housing					
N	Take-up block for protected screw frame					
T	Take-up block for center pull frame					
AT	Center pull take-up assembly					
NT	Protected screw take-up assembly					
HT	Center pull take-up assembly					
FT	Elevator boot end take-up assembly					
GT	Elevator head end take-up assembly					
ST	Center pull spring loaded take-up assembly					
11	Size code – only for take-up blocks and assemblies					
2	2000 Series, single set collar					
3	3000 Series, eccentric locking collar					
5	5000 Series, double set collar					
6	6000 Series, SHURLOK tapered adapter sleeve					
9	9000 Series, tapered adapter sleeve					
207	2 7/16" – last two digits in 16 th of an inch					
100MM	100 millimeters					
24	Inches of take-up adjustment – only for take-up assemblies					
A	One open auxiliary end cap (threaded cover side)					
B	One closed auxiliary end cap (threaded cover side)					
C	Closed end cap housing side					
CB	Closed end cap collar side					
F	4-bolt housing (pillow blocks only)					
G	Face locked threaded cover					
H	Reverse assembly					
PL	Precision bore diameter and bore roundness					
R	Tight fit of outer races in housing (high vibration, shock loading)					
S	Machined pilot on face of flanged units					
V	Viton seal material (when M seal suffix is used)					
Y	Redesigned shaft size – not interchangeable					
04	C5 internal clearance (high temperature)					
05	C4 internal clearance (high speed)					
06	C0 internal clearance					
07	C2 internal clearance					
40	Preservative only, no lubrication in unit					
42	Grease designation for Chevron SRI #2					
43	Grease designation for Mobilith SHC460					
63	Grease designation for Mobilith SHC100					
66	Housing drilled both sides for aux caps					
72	Steel housing					
78	Steel retainers					
82	Inner race with Rexlon lined bore - Teflon™ material					

Rexnord SHURLOK Bearings:

MAF6307F (3-15/16" Fixed)
MAFS6307F (3-7/16" Exp)

▼ Teflon™ is a trademark of The Chemours Company FC, LLC used under license by Toray Fluorofibers (America), Inc.



866-REXNORD/866-739-6673 (Within the U.S.)
414-643-2366 (Outside the U.S.)
www.rexnord.com

Why Choose Rexnord?

When it comes to providing highly engineered products that improve productivity and efficiency for industrial applications worldwide, Rexnord is the most reliable in the industry. Commitment to customer satisfaction and superior value extend across every business function.

Delivering Lowest Total Cost of Ownership

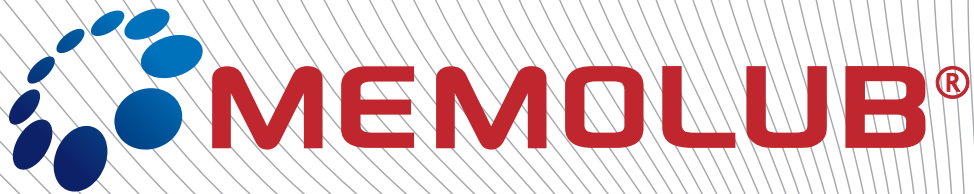
The highest quality products are designed to help prevent equipment downtime and increase productivity and dependable operation.

Valuable Expertise

An extensive product offering is accompanied by global sales specialists, customer service and maintenance support teams, available anytime.

Solutions to Enhance Ease of Doing Business

Commitment to operational excellence ensures the right products at the right place at the right time.



HIGH PERFORMANCE LUBRICATION SYSTEM



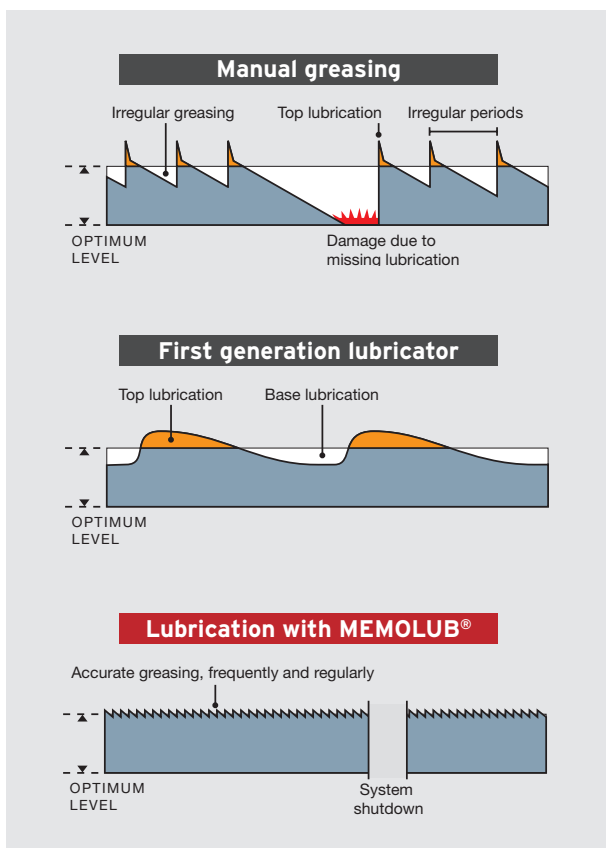
- Single or multiple points
- Easy to use and reusable
- Remote installation
- Patented control system
- For all types of industries
- Guaranteed return on investment

The standard in industrial lubrication systems

► High-quality lubrication solutions

MEMOLUB® offers a range of class leading single & multi-point lubrication systems, recognised as the benchmark and undisputed reference point for electro-mechanical lubricators. The exceptional features and high quality manufacture of MEMOLUB® offers outstanding protection for lubricated equipment across a wide range of industrial applications.

EFFECTIVE, EASY TO USE, AND ACCURATE



The right Lubricant, the right Quantity, at the right Frequency and on the right Place.

ECONOMICAL

- Long-term protection of equipment.
- Increased mechanical reliability.
- Cartridge change in less than 60 seconds!
- Accurate lubrication.
- Reduced maintenance costs.
- Increased profitability.
- The right lubricant volume per point.

RELIABLE

- Industry proven: 30 years' worldwide distribution.
- Exceptional setting features.
- Patented pump design.

SAFE

- Remote installation for difficult or dangerous access points.
- Reduced downtime for lubrication.
- Easy to use.
- Instant verification offered by transparent housing and check function.

ECOLOGICAL

- Reusable.
- Wide range of affordable replacement cartridges and battery power packs.
- Unlimited refills.
- Reduced environmental impact.
- Reduced lubricant consumption and improved protection of production equipment.

Examples of applications



BEARINGS



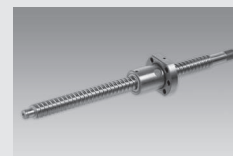
CHAINS



LINEAR GUIDANCE



GEARS



BALL SCREW

The dosing pump and the Memo

➤ A powerful and efficient pump

- Dosing pump with adjustable output.
- Lubricant ejection pressure: 10 and 25 bar.
- High-performance pump able to pump lubricants at extreme temperatures and with high viscosity.

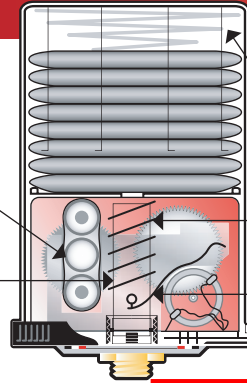
4.5 V Batteries
(Optional external 24 V power supply)

Dosing piston
Opens the check valve.
Standard quantity
0.6 cm³

Compression spring

Ejection spring:
10 or 25 bar

Lever



10 bar & **25 bar**

➤ The Memo: Smart Setting

- The patented Memo system adjusts the lubricant output frequency.
- The output frequency can be adapted on demand.
- The settings are independent from the body and the cartridge.



- Only one screwable part specifies the lubrication program

Memo 10 bar



- Programming the MEMO with the combination of 3 coloured rings: black, white and red

Memo 25 bar

➤ The technology: the accumulator effect

MEMOLUB® not only protects the moving parts of your machine, it protects your lubricant.

Excessive pressure applied to the lubricating grease causes oil separation. Back pressure generated by a lubrication system depends on a number of factors. The tubing diameter, the type of lubricant and the ambient temperature, are all major contributors but the most significant element is the speed/pressure ratio at which the lubricant is expelled.

MEMOLUB®'s unique method of operation eliminates this problem. Thanks to its patented design MEMOLUB® allows the lubricant to travel to the lubricating point without the need for excessive pressure.

The lubricant remains in its premium condition offering substantially improved lubrication of your valuable asset.





MEMOLUB® 25 bar

Single or multiple points, reusable and remote lubrication system

HPS

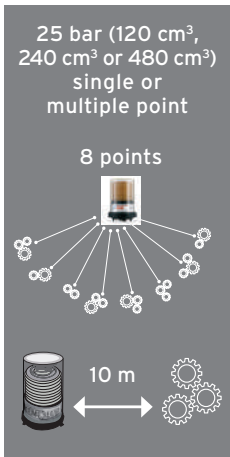
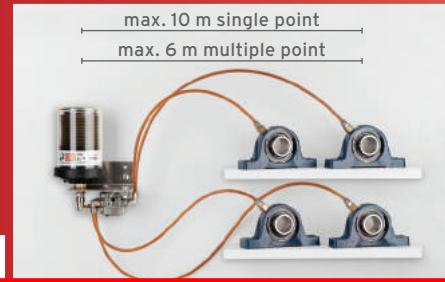
4.5 V BATTERIES

HPS EPS

24 V EXTERNAL POWER SUPPLY

HPS PLCD

24 V POWER SUPPLY PLC DRIVEN



> HPS

Universal model with battery power supply, allowing it to be used in all types of environments and applications. This model provides regular, accurate and reliable lubrication.

> EPS

Ideal for lubrication on installations functioning on an irregular basis. The frequencies of the MEMO are stored but can be adapted at any time.

> PLCd

Unlimited settings with possible machinery feedback. The perfect solution for OEMs.

Technical specifications

	HPS	EPS 24V	PLCd
Cartridge volume	120 cm ³ , 240 cm ³ or 480 cm ³		
Output settings	7 main settings and several additional settings		Unlimited settings by PLC
Maximum stroke pressure	25 bar / 350 psi		
Batteries / Power supply	Alkaline batt. 4.5 V DC (AA-LR6)	External 24 V DC	External 24 V DC
Remote installation	Up to 10 metres / single point – Ø 8 mm external tubing		
Lubricants	Oil and Grease (up to NLGI #2 with an oil base between 100 and 460 cSt)*		
Operating temperature	-15°C to 50°C**		
Connections	1/4 BSP		
Distributor units	Progressive distributor from 1 to 8 outputs		

* For any other viscosity level please contact your distributor. ** Batteries + lubricant adapted for low temperatures.

MEMO adjustments

	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Daily ejection	24	12	4	2	1.5	1	0.5
Daily output in cm ³	14.4	7.2	2.4	1.2	0.9	0.6	0.3
Months to empty 120 cm ³	0.25	0.5	1.5	3	4	6	12
Months to empty 240 cm ³	0.5	1	3	6	8	12	24*
Months to empty 480 cm ³	1	2	6	12	16	24*	-

* Only with MEMOLUB® EPS.

Recommended Initial Settings

Accessories

SPLITTER MEMO HPS



HPS Kit for 2 points

DISTRIBUTOR KIT HPS



HPS Kit for 3 to 8 points

EXTENSION KIT



Single point fixture kit

BRUSHES AND KIT



Brushes to lubricate chains

CRANE RAIL



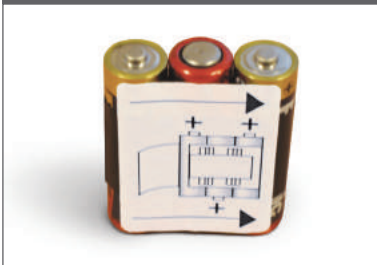
Rail lubrication

SPRAY NOZZLE



Liquid grease sprays

BATTERIES



Batteries for EM, ECO, ONE, HPS

PROXIMITY SWITCH



Lubrication switch

PROTECTION COVER



In difficult environments, water, salt

MEMO KIT



Frequency adjustment kit

SPARE PARTS

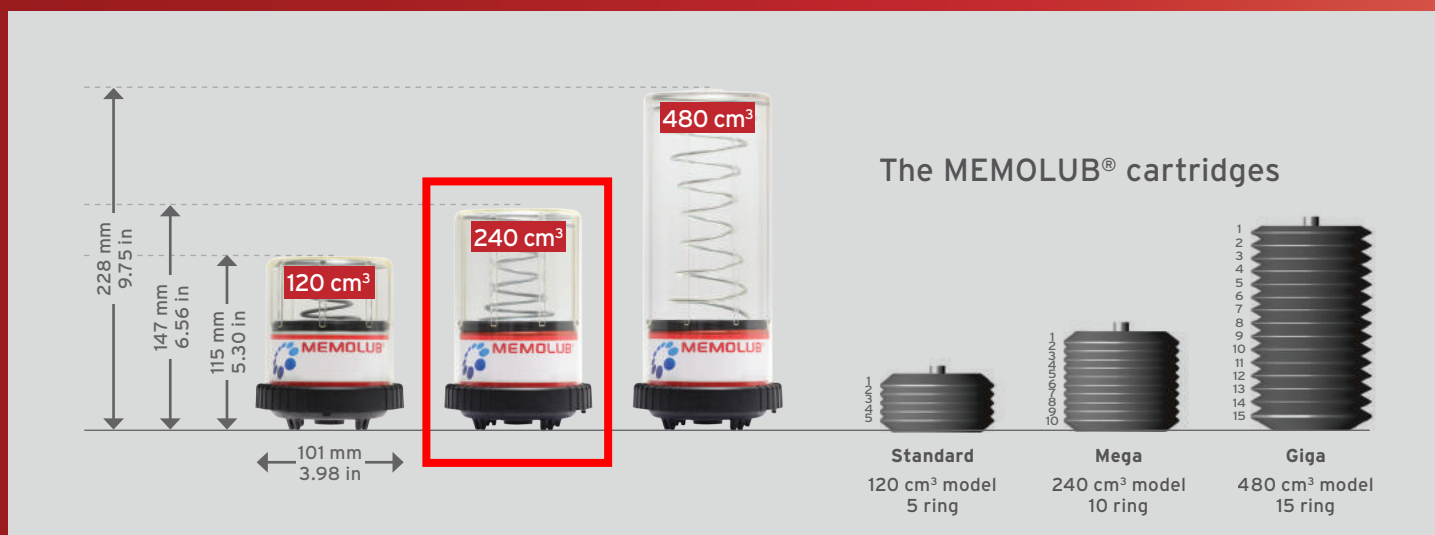


See our online catalogue

ADAPTATORS



Adaptors



Electrical characteristics

	EM	ECO	ONE	HPS	EPS 24 V	PLCd
Power supply	Int.	Int.	Int.	Int.	Ext.	Ext.
Output voltage	4.5 V DC	4.5 V DC	4.5 V DC	4.5 V DC	24 V DC	24 V DC
Output current	-	-	-	-	< 0.5 A	< 0.5 A
Short circuit protection	ok	ok	ok	ok	ok	ok
Stroke duration	8 sec	8 sec	8 sec	8 sec	4 sec	4 sec
Min. time between strokes	2 days	12 hours	2 hours	1 hour	1 hour	10 minutes
Max. cable length	NA	NA	NA	NA	10 m	10 m
Power cable	NA	NA	NA	NA	2 x 0.5 mm ²	2 x 0.5 mm ²

MEMOLUB® greases

Name	Class NLGI	Base oil	Soap	Temperature range (°C)	Viscosity at 40 °C	Speed (high, medium, low)	Bearings	Slide bearing	Open gear, rack and pinion	Ball screw	Linear guidance	Shaft sealing
MEMOMULTI 2 (standard) Multipurpose grease Excellent resistance to water	2	Mineral	Calcium sulfonates	-20°C to 150°C	460	Low to High	✓	✓	-	✓	✓	✓
MEMOFOOD H1 certified Multipurpose grease Excellent resistance to water	2	White	Aluminium complex	-20°C to 120°C peak at 140°C	140	Low to High	✓	✓	-	✓	✓	✓

Remote installation or with distributor block 2 to 8 outlets

Lengths of tubing with Multi2 grease grade N.L.G.I. 2, tubing Ø int. 6 mm et fittings M8 minimum:

Type of installation	Distance*
Single-point	10 meters
Splitter (2 outlets)**	6 meters
Distributor block (4 - 8 outlets)**	6 meters

* Laboratory test under the following conditions:
 - With multifunctional grease grade NLGI2
 - With pipes of dimensions 6/8 mm in Rilsan
 - At an ambient temperature between 10°C and 20°C

** Splitter and Distributor block: Models distributed by MEMOLUB®

NB : For any installation that differs significantly from the above conditions, please refer to your MEMOLUB® distributor.

YOUR DEALER

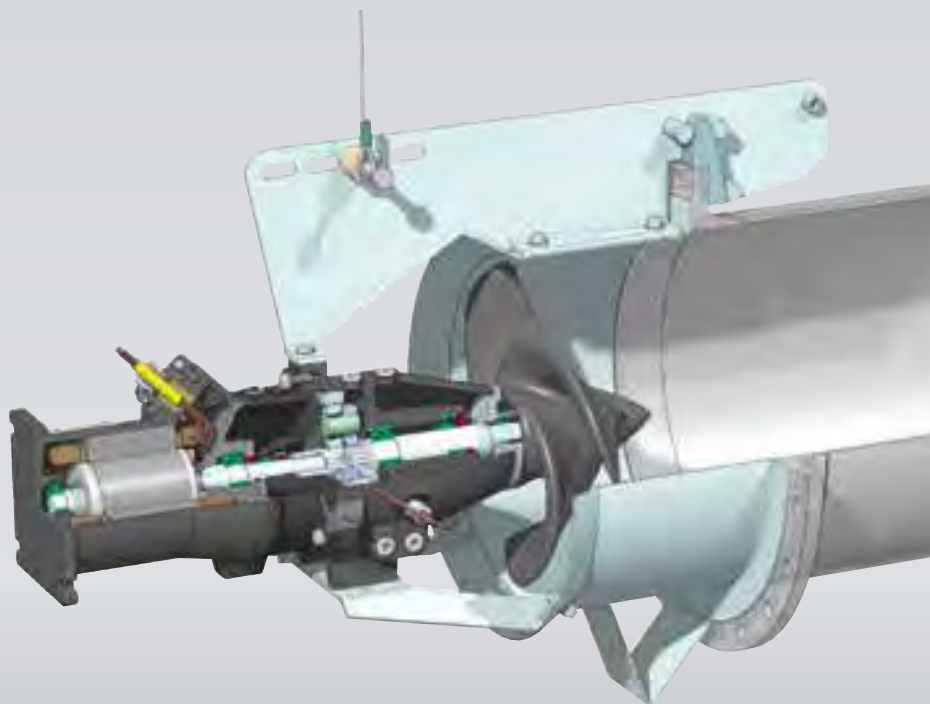


Equipment for sewage treatment.

Recirculation Pumps

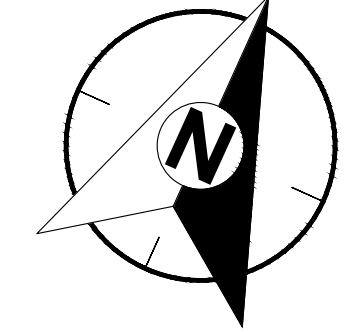
Jefferson GA Preliminary

04.14.2022



Project Information / Assumptions

- Recirculation Pump
 - Qty: one (1)
 - Max: 2800-gpm @ 1.5-2-ft
 - Min: not provided
- Wall height relevant to RZP mast > 20-ft.

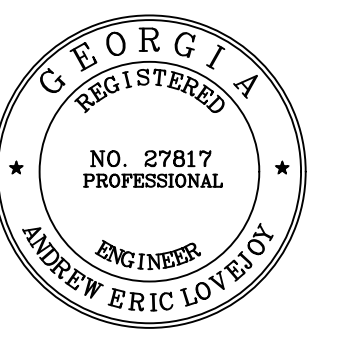


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 Civil & Environmental Engineering
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CITY OF JEFFERSON

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REVISIONS

No	Date	Description
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7		
8		

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Drawn By : JWN

Checked By : CKB

Scale : SEE DETAIL

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PROJECT NAME

JEFFERSON I-85 WATER
 RECLAMATION FACILITY

PROJECT INCEPTION DATE

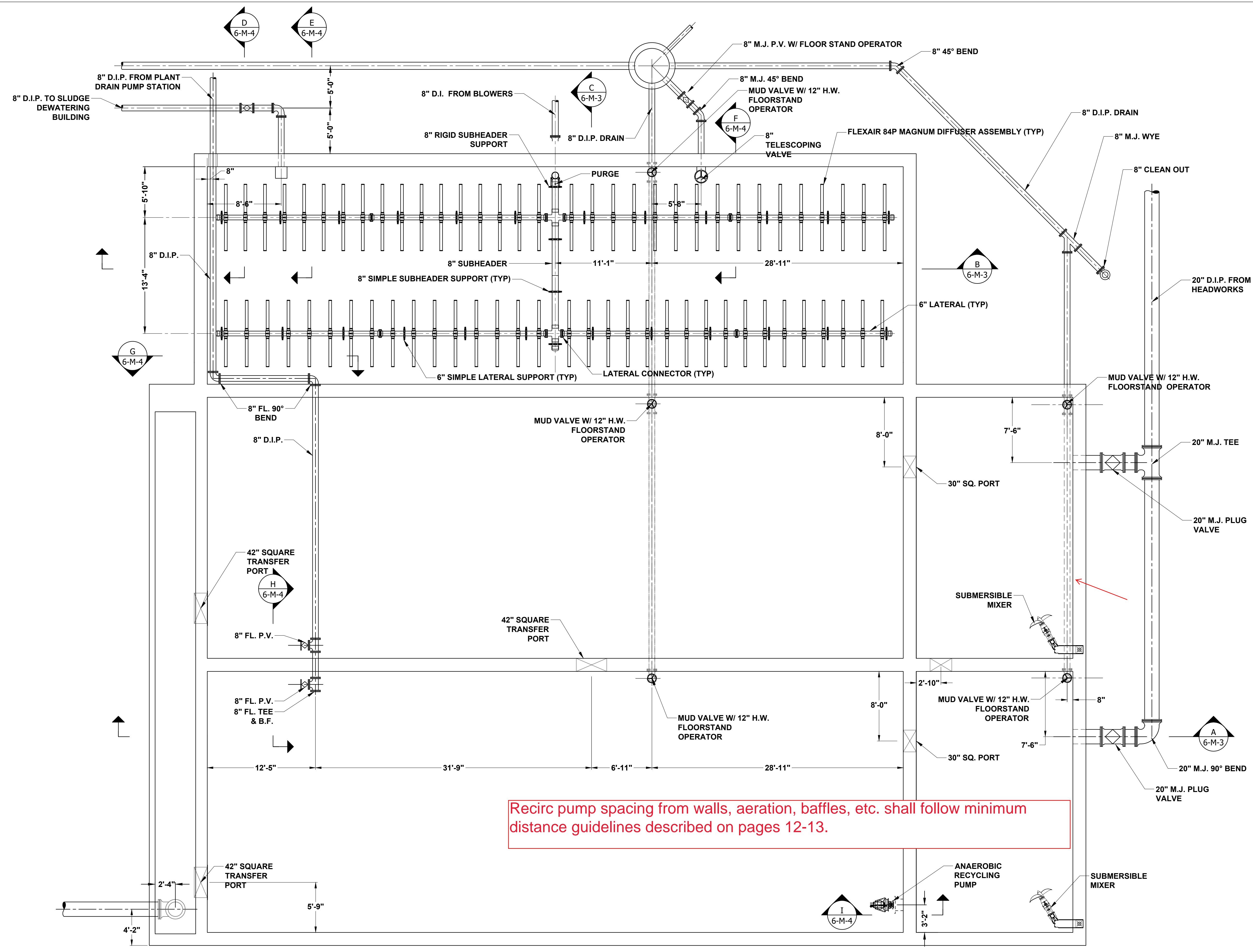
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SHEET TITLE

AERATION BASIN
 MECHANICAL BOTTOM PLAN

DRAWING NUMBER

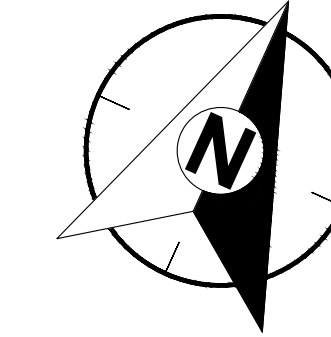
6-M-1
 OF
 37



Recirc pump spacing from walls, aeration, baffles, etc. shall follow minimum distance guidelines described on pages 12-13.

1 AERATION BASIN PLAN
 Scale: 3/16"= 1'-0"

21095 - JEFFERSON I-85 WATER RECLAMATION FACILITY - JESSE NELSON - 3/23/2022 2:12 PM



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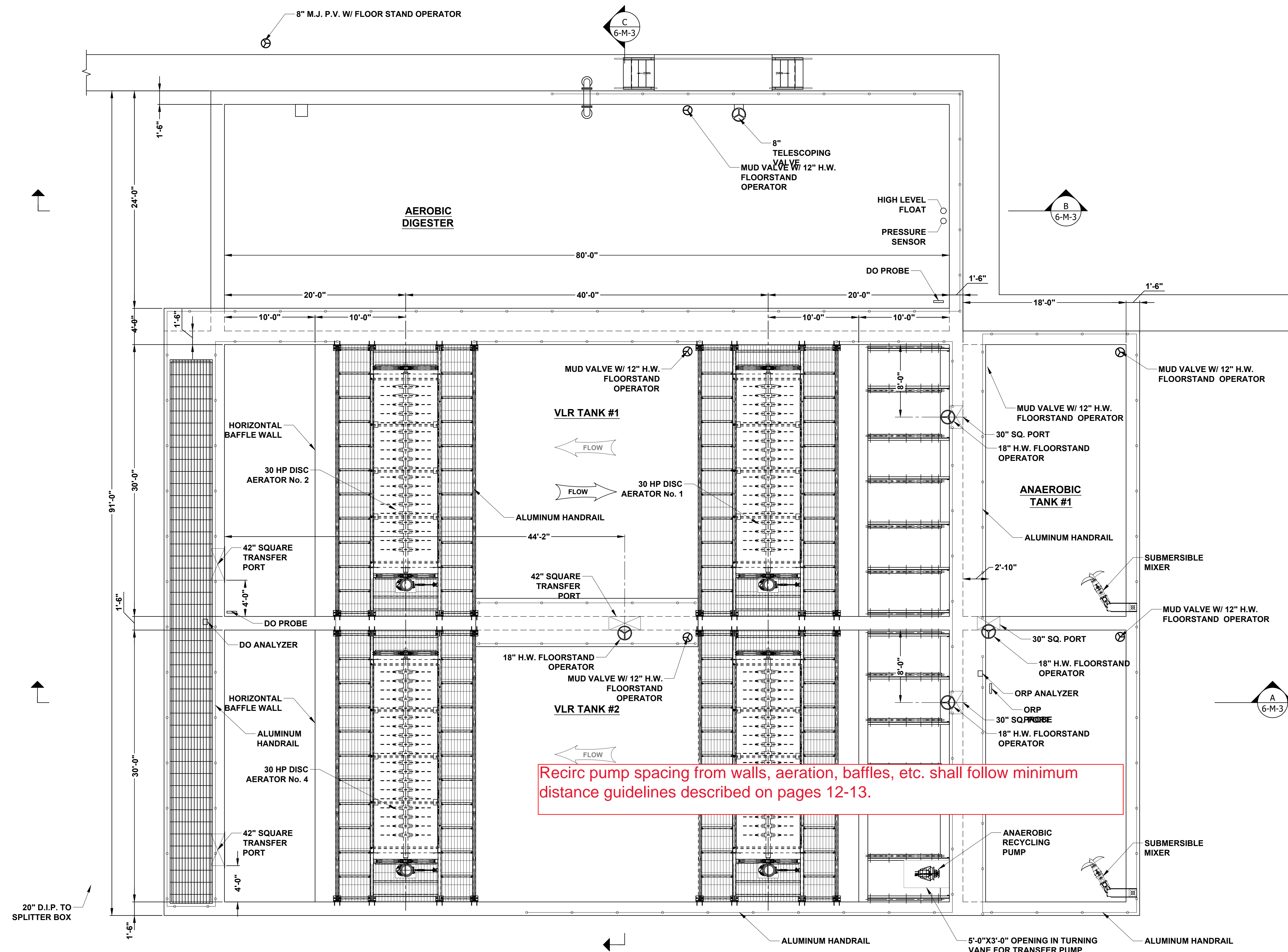
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SHEET TITLE

AERATION BASIN
 MECHANICAL TOP PLAN

DRAWING NUMBER

6-M-2
 OF
 37



Recirc pump spacing from walls, aeration, baffles, etc. shall follow minimum distance guidelines described on pages 12-13.

1 AERATION BASIN PLAN
 Scale: 3/16" = 1'-0"

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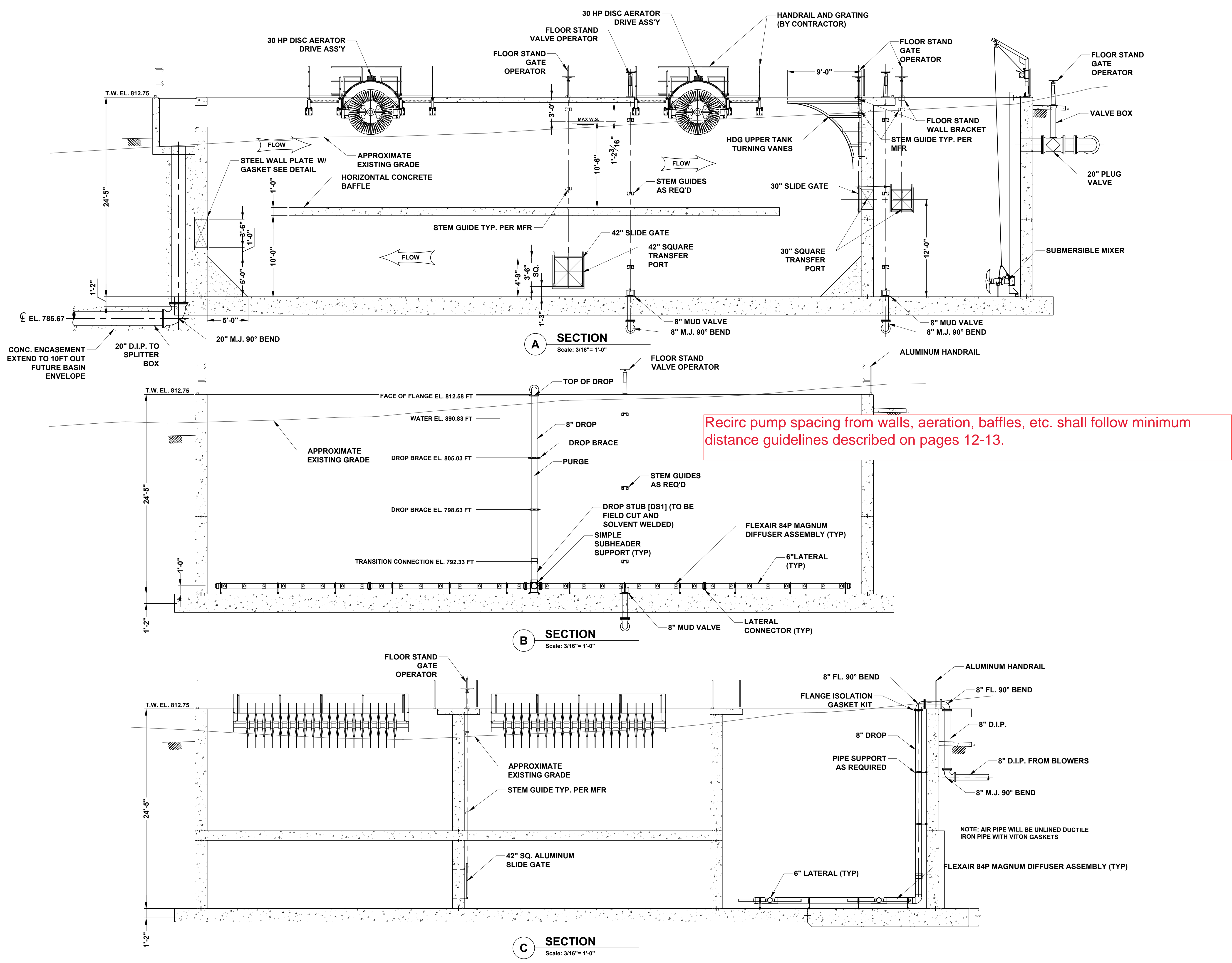
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SHEET TITLE

**AERATION BASIN
 MECHANICAL SECTIONS 1**

DRAWING NUMBER

**6-M-3
 OF
 37**



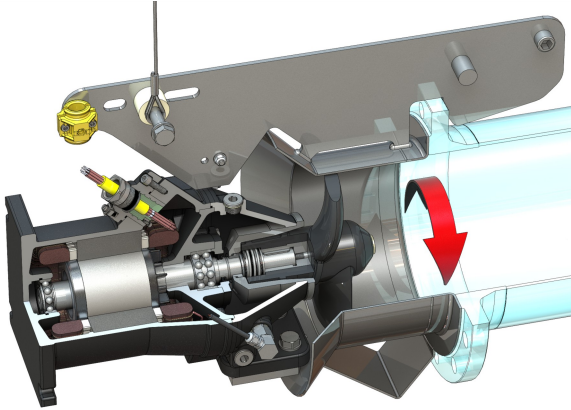
21095 - JEFFERSON I-85 WATER RECLAMATION FACILITY - JESSE NELSON - 3/23/2022 2:12 PM

Recirculation Pump
RZP25-2.174-4/16 S17
AVRZ60 mast/rail
E/EH 250kg hoist with floor base

Data sheet

Wilo-EMU RZP 25-2.174-4/16 S17

Design / Direction of rotation



Technical data	
Unit	
Weight of unit <i>m</i>	196.2 lbs
Protection class	IP 68
Explosion protection	FM, CSA
Ex classification FM	CLASS I, DIV. 1, GROUPS C, D; CLASS II, DIV. 1, GROUPS E, F, G; CLASS III
Propeller	
Propeller model	3-blade propeller with self-cleaning hub; backward-curved as a result clogging- and entwining-free
Nominal propeller diameter	9.8 in
Propeller speed <i>n</i>	1680 rpm
Transmission ratio	1
Fill quantities and types	
Filling sealing chamber	White oil
Fill level sealing chamber V	0.3 gal (US)

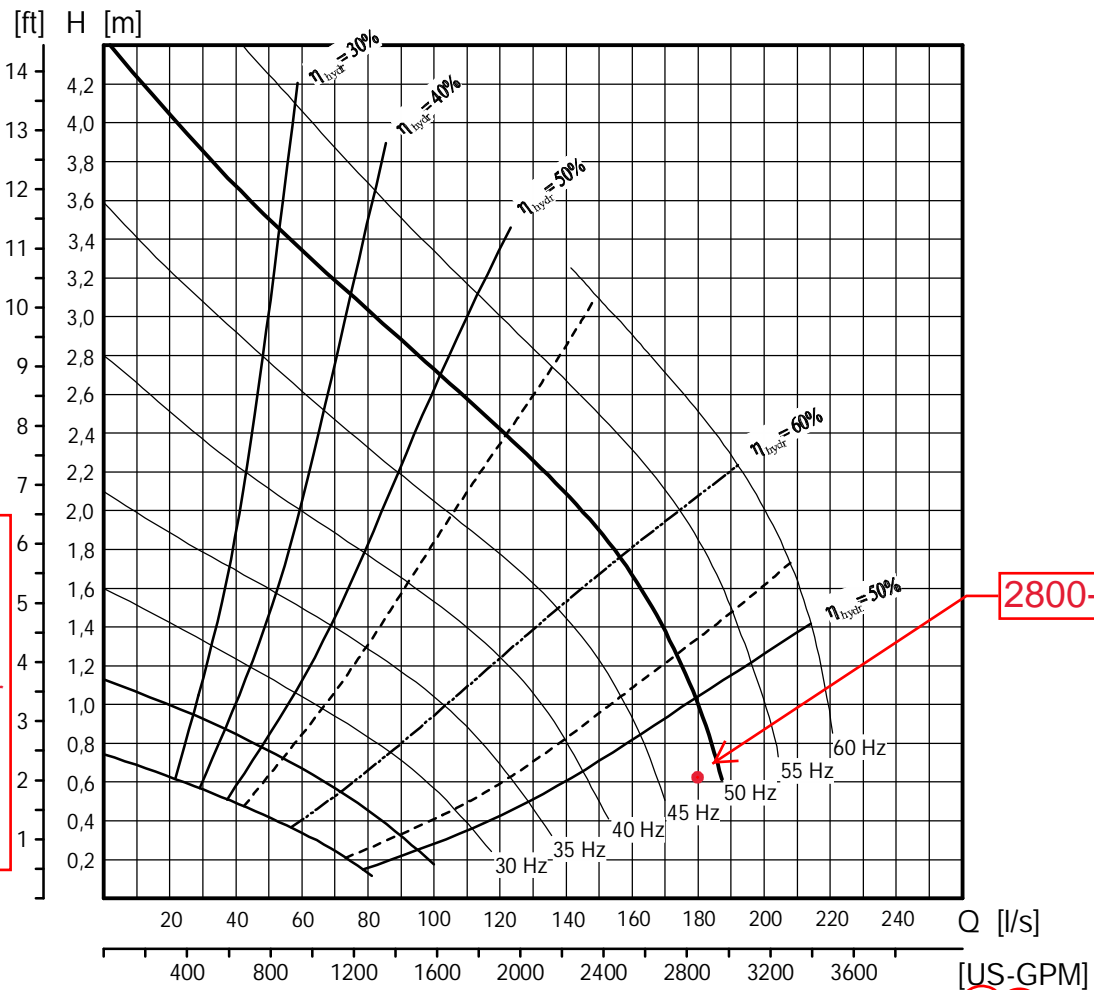
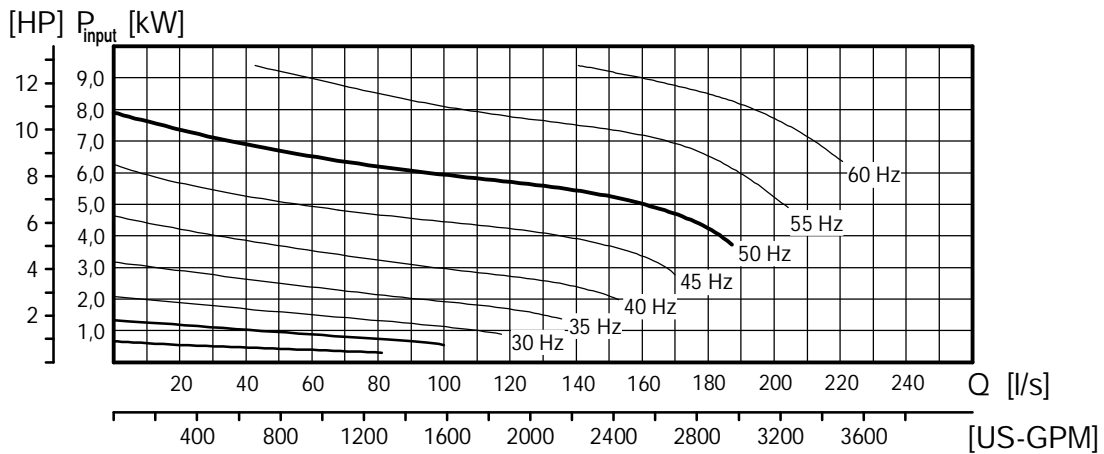
Motor data	
Type of motor	T 17-4/16R (Ex)
Motor type	Submersible motor according to DIN/VDE 0530 (IEC 34)
Power connection	3~460 V, 60 Hz
Full load amps I_N	13.6 A
Starting current - direct I_A	65 A
Starting current - star-delta I_A	22 A
Maximum power consumption P_1	12.6 hp
Rated motor power P_2	10.1 hp
Rated speed <i>n</i>	1680 rpm
Efficiency η_M	80.0 %
Power factor $\cos \varphi$	0.87
Fluid temperature <i>T</i>	37 ... 104 °F
Max. submersion	66 ft
Insulation class	H
Max. switching frequency <i>t</i>	15 /h
min. switching break <i>t</i>	3 min
Starting torque <i>M</i>	98 Nm
Moment of inertia	0.0134 kg/m ²
Motor bearings	1 grooved ball bearing, 1 two-row inclined ball bearing
Materials	
Motor housing	ASTM A48 Class 35/40B
Motor shaft	1.4021
Static seal	FPM
Mechanical seal	SiC/SiC
Sealing on motor side	FPM
Propeller	1.4571
Propeller hub	1.4571
Flow housing	1.4571

Curves for recirculation pump REZIJET RZP 25-2.174-4/16 S17



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 www.wilo.com E-Mail: info@wilo.com

Motor type:	T17-4/16R (Ex)			
Motor data:	Rated output [kW]	7,5		
	Power input [kW]	9,4		
	Rated speed [rpm]	1680	Number of poles	4
	Rated current [A]	13,6	Frequency [Hz]	60
	Maximum starts [/h]	15	Rated voltage [V]	460
Propeller type:	welded steel 17°	Number of blades	3	
	Diameter [mm]	246	Free ball passage [mm]	65



Recommend increasing TDH to move operating points more onto the curves.

Below 30-hz, the motor magnetic field becomes unstable, which leads to unpredictable pump performance.

2800-gpm @ 2-ft

Technical modifications reserved

Date: 18.09.13 MaK

Toleranz $\pm 10\%$

K10165us.prt

Type: **RZP 25-2**

Scale: **1:25**

Technical changes reserved!

Nr./No.: **Plh131**

Date: 16.06.15 ToR

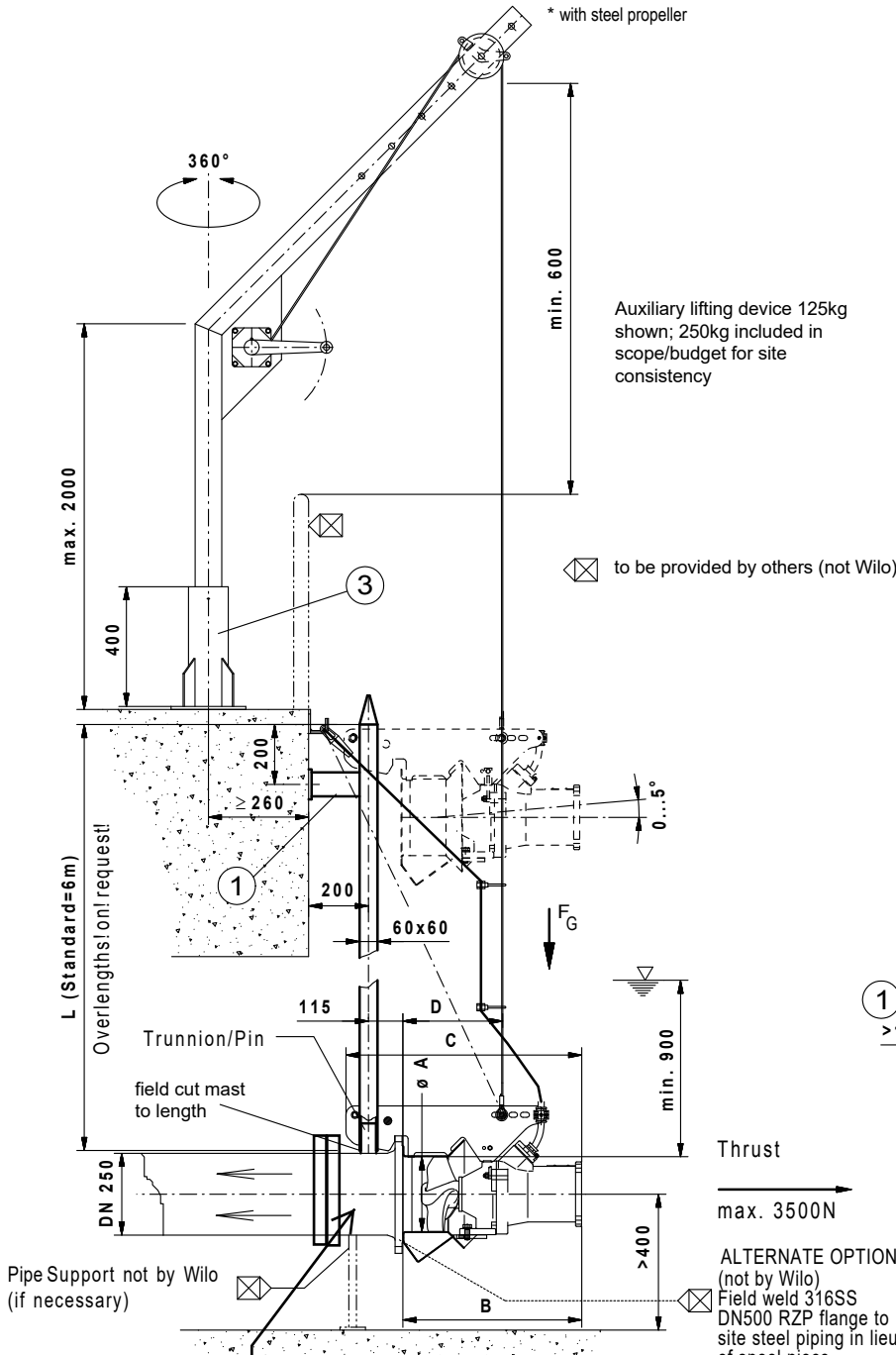
Typ	ØA	B	C	D / D*	F _G / F _G *
RZP 25-2.../8	250	560	750	305/310	66/71 kg
RZP 25-2.../12	250	595	785	325/335	74/78 kg
RZP 25-2.../16	250	635	825	370/365	85/90 kg
RZP 25-2.../24	250	715	905	410/400	101/104 kg

All connections doweled by means of composite anchor HVA!

	M16	M12
Perforation	Ø18x125	Ø14x110
Tightening torque	80 Nm	40 Nm

Concrete / fissure free ≥ C25

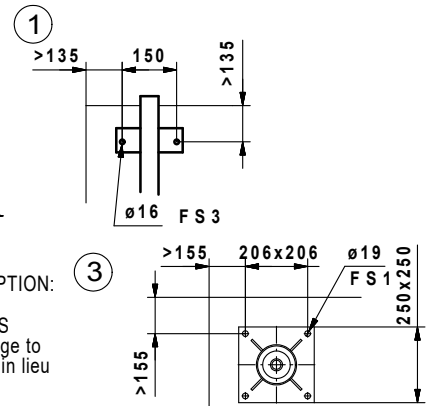
JEFFERSON



Auxiliary lifting device 125kg shown; 250kg included in scope/budget for site consistency

⊠ to be provided by others (not Wilo)

Fixing elements:



Thrust
max. 3500N

ALTERNATE OPTION:
(not by Wilo)
Field weld 316SS
DN500 RZP flange to
site steel piping in lieu
of spool piece

Spool piece with 316SS RZP flange x ANSI flange in lieu of field welding 316SS RZP flange

Range of delivery: Lowering device including fixing elements. Pump with 12-m electrical cable (overlengths on request). Necessary modifications of the structure (for example plug-in railings, covers, bridges, platforms) as well as the power supply will have to be provided by the user. The user is responsible for due operation and compliance with all accident prevention and safety regulations and rules of hygiene. Free access as well as safe operation and installation will have to be made possible.

X Guide pipe extension for lowering devices

Our lowering devices can only be manufactured up to a length of 6 m. If longer lowering devices are required, a guide pipe extension must be mounted at the site. The guide pipe extension is available in the same materials as the lowering devices.

Product description

The guide pipe extension is available for the lowering devices of the type AVU 60 to 120, AVMS and AVMSH and may be used only for these devices.

Proper use

For other lowering devices, please consult the manufacturer!

- 1 A 45° bevel must be ground at the upper end of the original guide pipe.
- 2 A 45° bevel must also be ground on the end of the guide pipe extension (not on the connecting lugs).
- 3 Place both guide pipes on a suitable support for welding.
- 4 Insert the guide pipe extension into the original guide pipe. Align the guide pipe extension so that it forms a straight line with the original guide pipe. Make certain that the gap width is 2 mm!
- 5 Drill 2 auxiliary holes on each side so that the connecting lugs can also be welded on.
- 6 The connecting lugs of the guide pipe extension are to be welded on using a root run in the weld seam. In addition, the auxiliary holes on the original guide pipe are to be welded up. Make certain that the base metal of the connecting lugs is also fused on. Level off the raised top layer at the surrounding weld seam and the raised edge at the auxiliary holes. The WILO EMU machine must not get caught on the weld seam when it is lifted and lowered.

Installation

Beware of injury

Welding work must be carried out by a qualified welder! This work must be certified according to the following standards:

Welding test: EN 287 - 1 111 T BW W11 t3,0 D 114

Quality standard: EN 25817 Evaluation Group C

Proper protective clothing/equipment must be worn!



- 7 In the stainless steel version, the weld seam must be steeped in mordant and polished. In the galvanized version, lasting corrosion protection must be provided by using a suitable coating.

Guide pipe extension for lowering devices

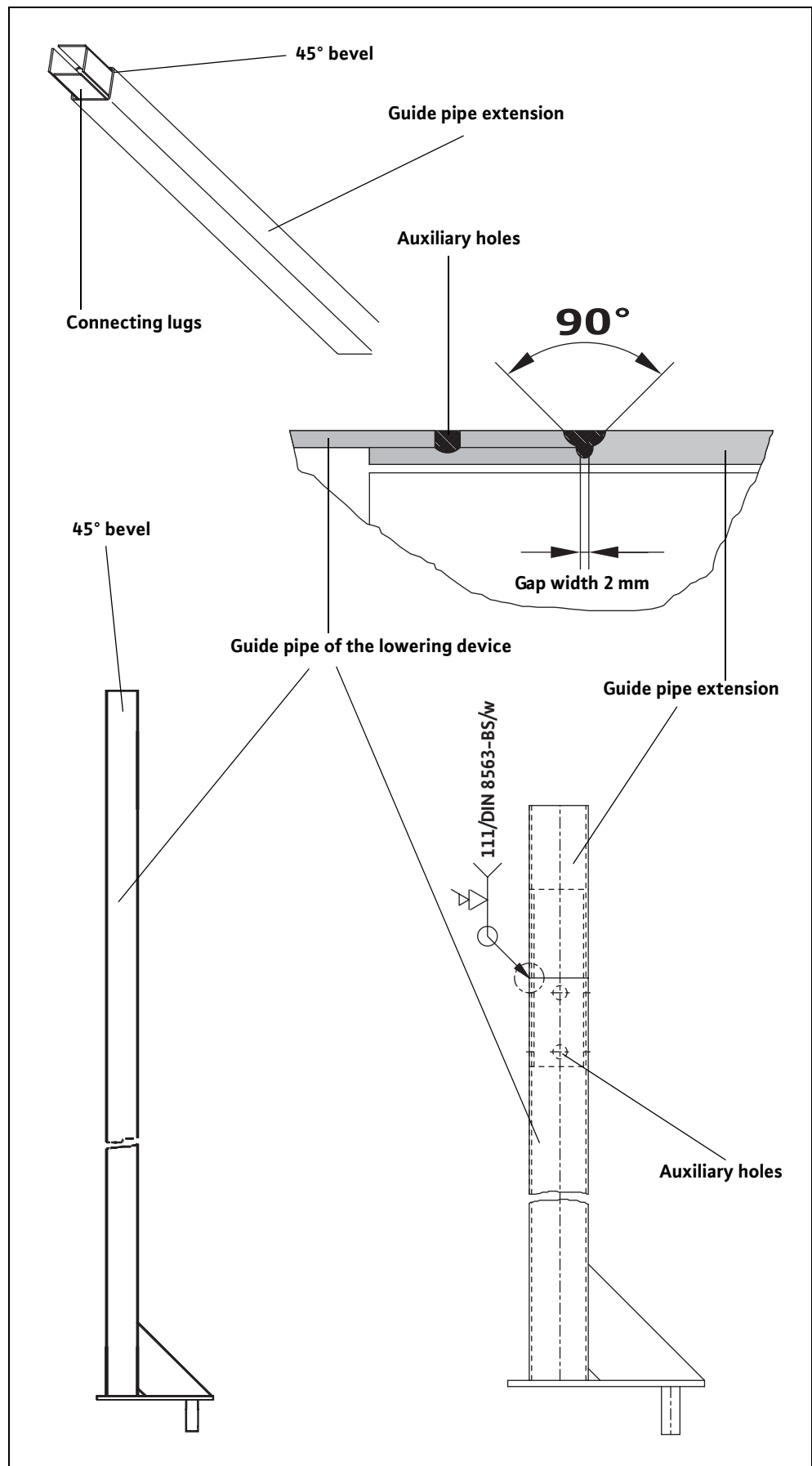
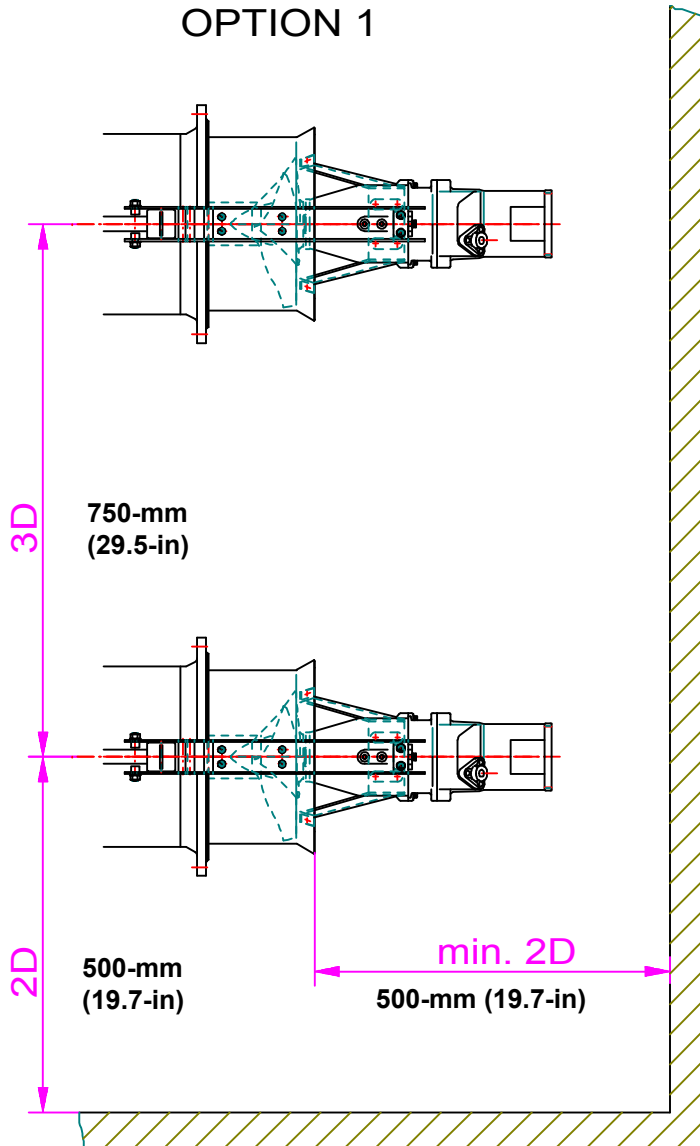


Fig. X-1: Installation

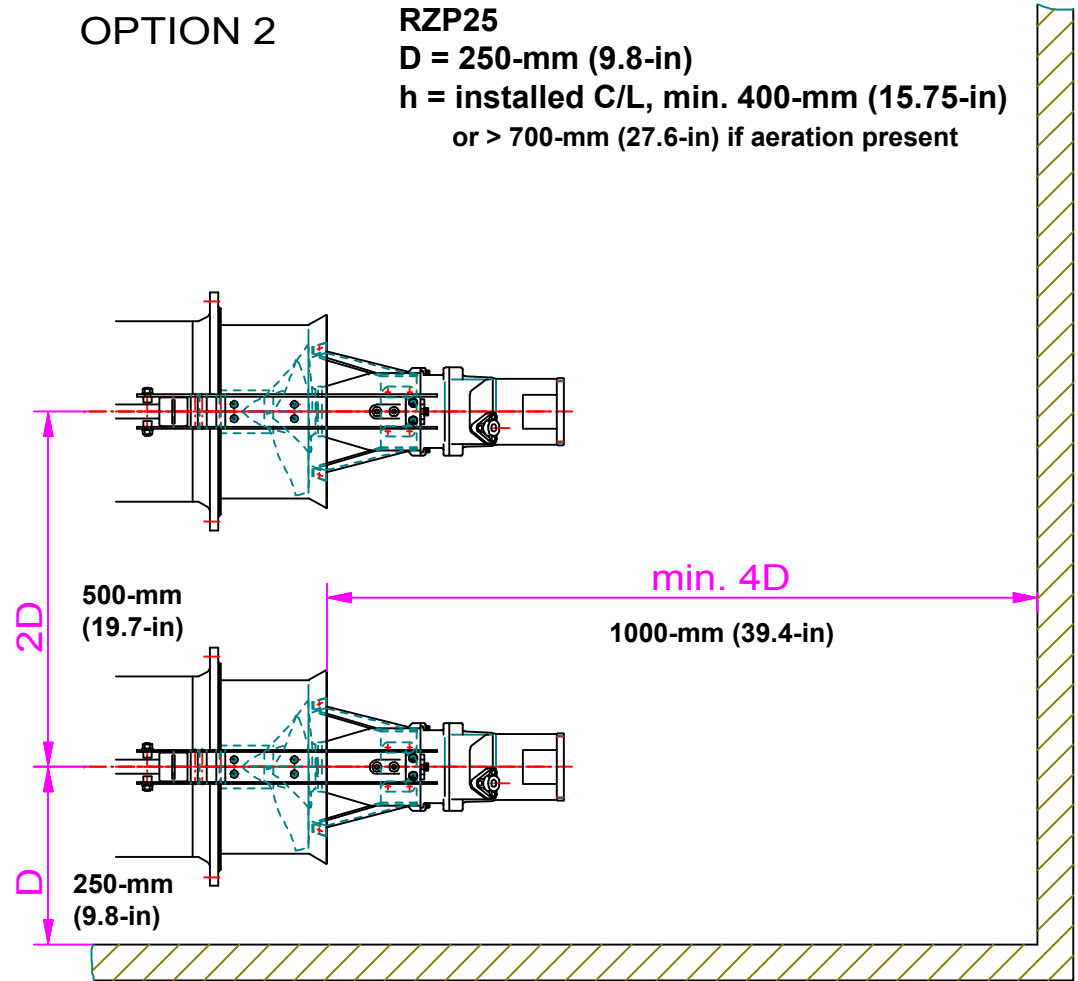
PLAN VIEW

(for distance from walls)

OPTION 1



OPTION 2



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Mindestabstände - RZP
Minimum distances - RZP

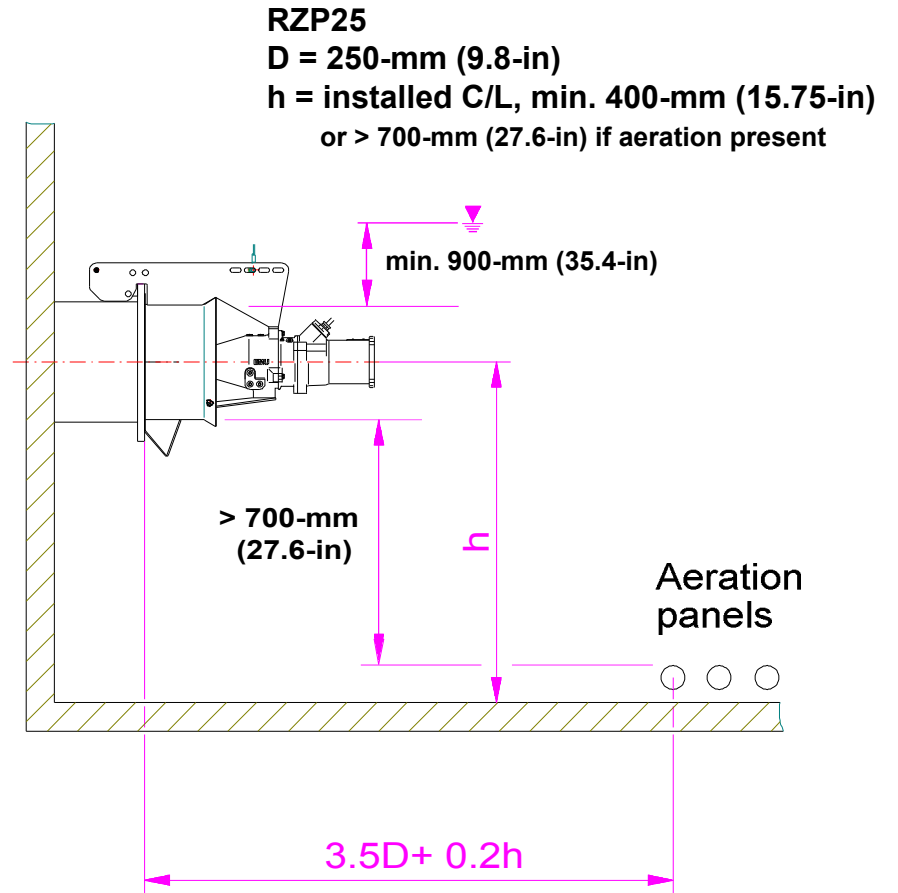
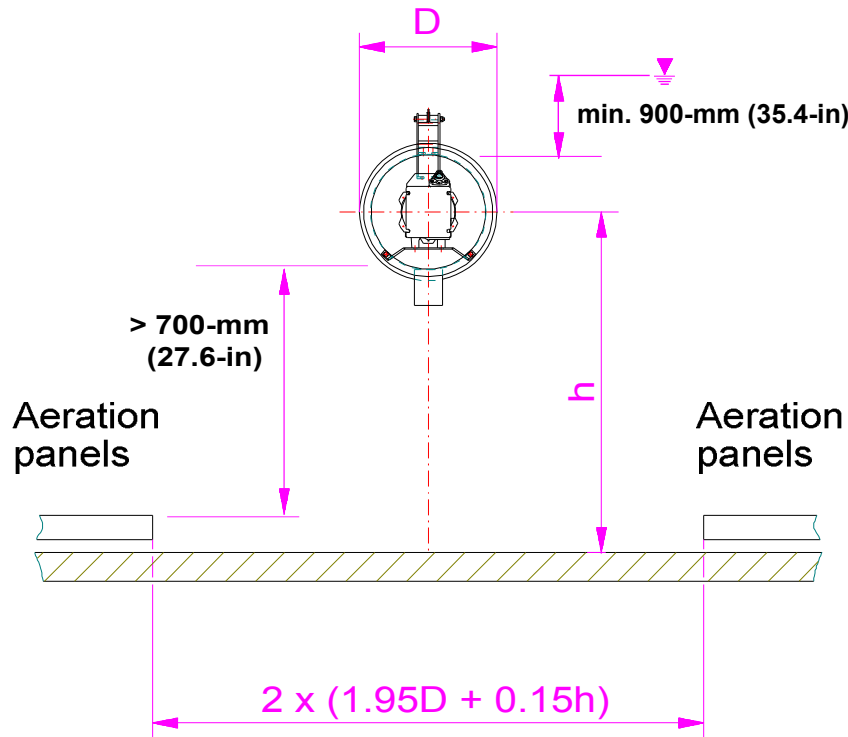
Gez. 3.7.07 Wi

Gepr. *

Blatt 1

*

ELEVATION VIEW
 (for distance from floor)
 (for distance from aeration)



RZP25
D = 250-mm (9.8-in)
h = installed C/L, min. 400-mm (15.75-in)
or > 700-mm (27.6-in) if aeration present



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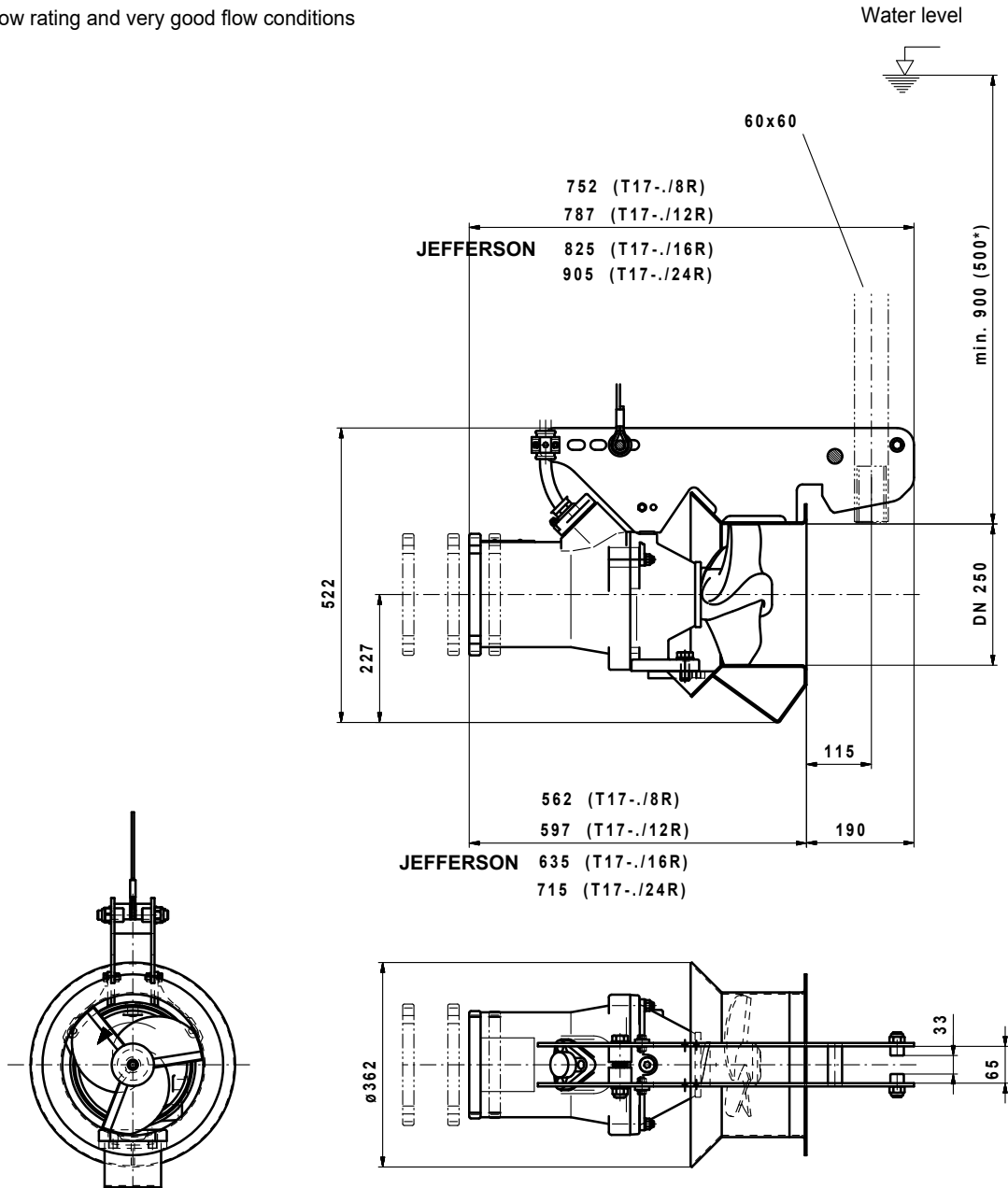
Distance to aeration panels
 RZP-pumps

Gez.	13.10.08	Wi
Gepr.	*	
	Blatt	1
	*	

Dimensions of Recirculation pump RZP 25-2

wilo

*) at low rating and very good flow conditions



Scale: 1:12.5 Technical changes reserved

Date: 17.06.15 ToR

Mb030.prt

Type: **E/EH**

Scale: **1:25 (1:10)**

Technical changes reserved !

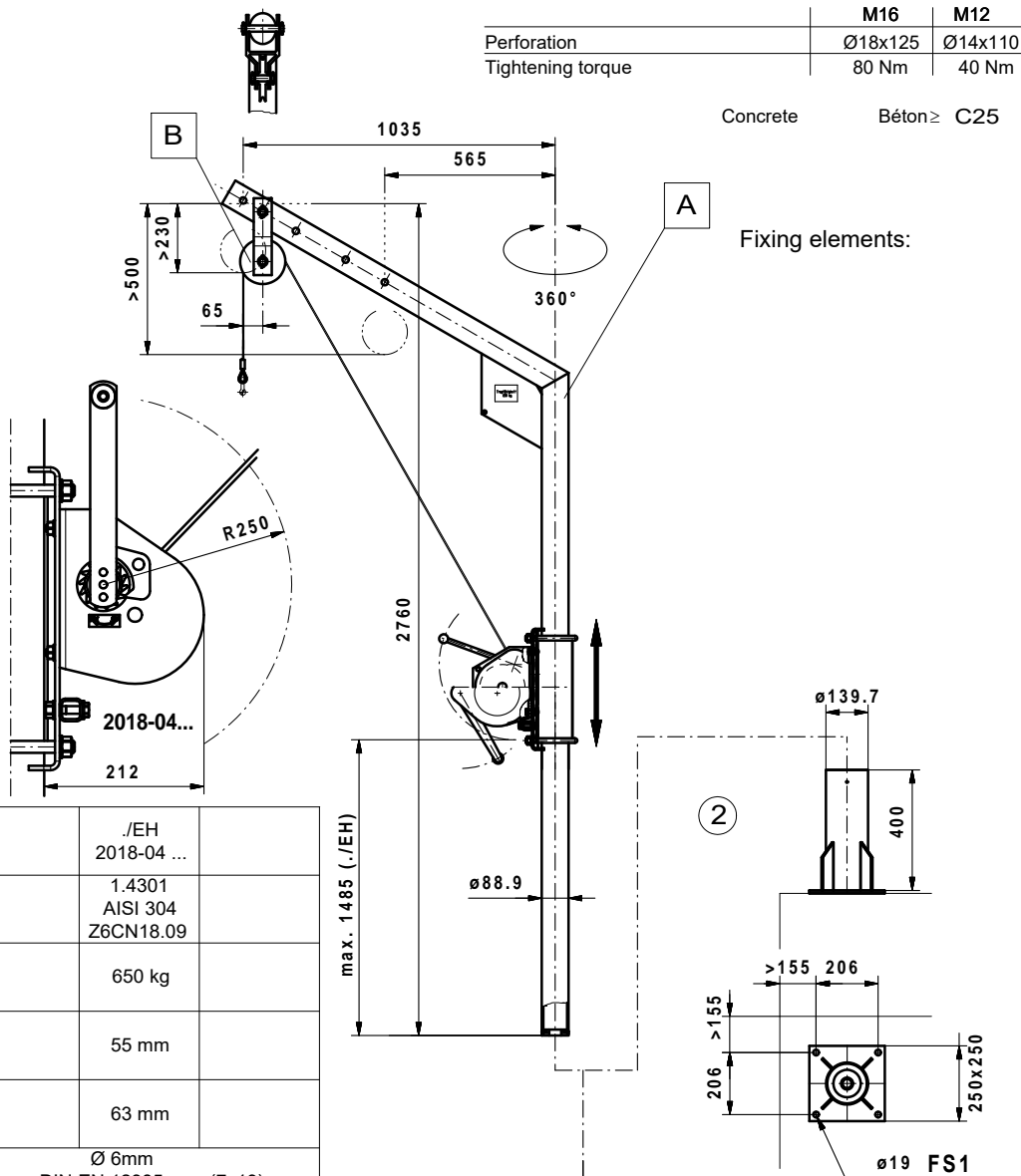
Nr./No.: **PIh037**

Date: 2018-02-19 Rie

All connections doweled by means of composite anchor HVA

	M16	M12
Perforation	Ø18x125	Ø14x110
Tightening torque	80 Nm	40 Nm

Concrete Béton ≥ C25



../EH

Hand winch	../EH 2018-04 ...
Material	1.4301 AISI 304 Z6CN18.09
Tensile load 1st cable layer	650 kg
Medium lifting per handle rotation	55 mm
Drum diameter	63 mm
Stainless cable	Ø 6mm DIN EN 12385 (7x19) max. 1570 N/mm ²
Cable capacity max.	20 m
Necessary force to move handle	12 daN
Weight	9 kg

Variations

../E/.

304SS	38 kg
Weight parts A+B	

* Rapid power transmission

Range of delivery: Auxiliary lifting device including fixing elements with 12-m 316SS lifting cable (over-lengths on request).

Necessary modifications of the structure (for example plug-in railings, covers, bridges, platforms) as well as the power supply will have to be provided by the user. The user is responsible for due operation and compliance with all accident prevention and safety regulations and rules of hygiene. Free access as well as safe operation and installation will have to be made possible.

Use of the auxiliary lifting device according to DGV D8 only together with WILO-lowering devices!

Wilo Ceram C0
(Coating on housing)

wilo[®]

The one-of-a-kind
Ceram coating from Wilo.



CERAM
protected

Ceram coating from Wilo.

Effective protection from abrasion and corrosion.



Wilo Ceram is only available for Wilo pumps and units. This special version in the form of a unique 2-component coating offers the best possible protection against aggressive media compared with

other coatings. Thanks to its increased resistance to abrasion and corrosion, it effectively prevents wear and chemical corrosion and always ensures optimal functionality and performance.

Thanks to Wilo Ceram, maintenance-related downtimes are greatly reduced and the service life of pumps and units is considerably increased. Far-sighted? We call it Pumpen Intelligenz.

Ceram coating from Wilo.

Technical data.

Description

Sprayable, solvent-free, 2-component polymer coating material with portions of aluminum oxide: for corrosion protection of our products even when under great mechanical stress.

Composition

Solvent-free epoxy polymer with solvent-free polyamine hardener and various extenders.

Properties

- Tough and hard, durable coating with high mechanical and chemical resistance, as well as good wear resistance
- Excellent wet adhesion as single- or multi-layered coating on steel surfaces
- Replaces tar-containing coatings
- Cost-savings thanks to the long service life, low maintenance and easy reparability.
- Tested by the "Bundesanstalt für Wasserbau" (German Federal Institute for Hydraulic Engineering) (BAW).
- Solvent-free.
- High gloss finish after hardening
- Later coating and repair possible

Technical data Ceram C0

Designation	Standard	Value	Unit
Density (mixture)	ASTM D 792	1.4	g/cm ³
Solid content (volume)		97	%
Solid content (weight)		98	%
Adhesive strength, steel	ISO 4624	15	N/mm ²
Impact strength	DIN EN ISO 6272	9	J
Temperature resistance			
Dry, continually		60	°C
Dry, for short periods		120	°C
Moist/liquid	depends on fluid, on request		

Technical data Ceram C0

Designation	Temperature range	Resistance
Sewage, alkaline (PH 11)	+20 °C/+40 °C	1/1
Sewage, weakly acidic (PH 6)	+20 °C/+40 °C	1/1
Sewage, strongly acidic (PH 1)	+20 °C/+40 °C	2/3
Ammonium hydroxide (5 %)	+40 °C	3
Decanol (fatty alcohol)	+20 °C/+50 °C	1/1
Ethanol (40 %)	+20 °C	1
Ethanol (96 %)	+20 °C	3
Ethylene glycol	+20 °C	1
Heating oil, diesel	+20 °C	1
Compressor oil	+20 °C	1
Methyl ethyl ketone (MEK)	+20 °C	3
Caustic soda (5 %)	+20 °C/+50 °C	1/2
Sodium chloride solution (10 %)	+20 °C	1
Hydrochloric acid (5/10/20 %)	+20 °C	2/2/3
Sulphuric acid (10/20 %)	+20 °C	2/3
Nitric acid (5 %)	+20 °C	3
Toluene	+20 °C	2
Cooling and industrial water	+50 °C	1
Xylene	+20 °C	1

Key: 1 = resistant, 2 = resistant for 40 days, 3 = spill resistant (immediate cleaning recommended)
Total layer thickness: at least 400 µm

Technical data for C1, C2, C3 on request

Ceram coating from Wilo. Long-lasting protection.



Wilo Ceram offers all-round protection for all unit components, whether they are inside or on the surface. Depending on the field of application, different Wilo Ceram coatings are offered, which are applied using various methods. For use in special fluids, the individual Ceram versions can also be combined with each other.

Ceram C0 is used both for the outer coating as well as for the interior coating. This is applied using the airless method in one layer with a thickness of 0.4 mm.



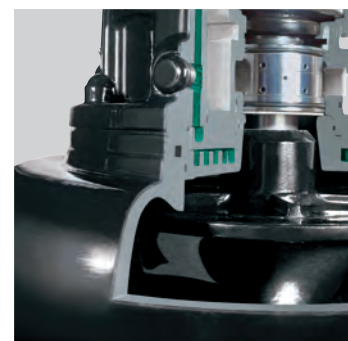
Outer and interior coating

- To protect against heavy corrosion
- Increased efficiency thanks to lower friction losses



Impeller and suction port coating

- A perfect combination, e.g. C2 + C1 against strong abrasive corrosion in the case of moderately stressed pump components
- Can also be used in seawater and brackish water, as well as in industrial sewage areas

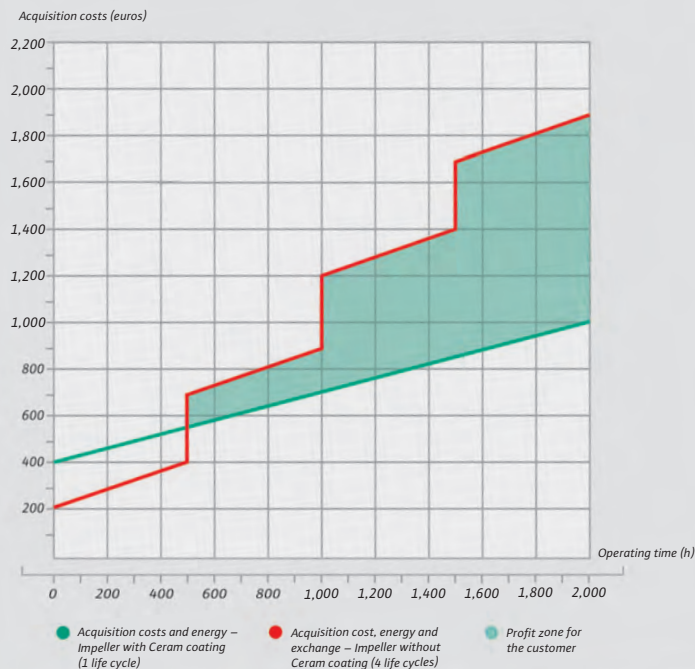
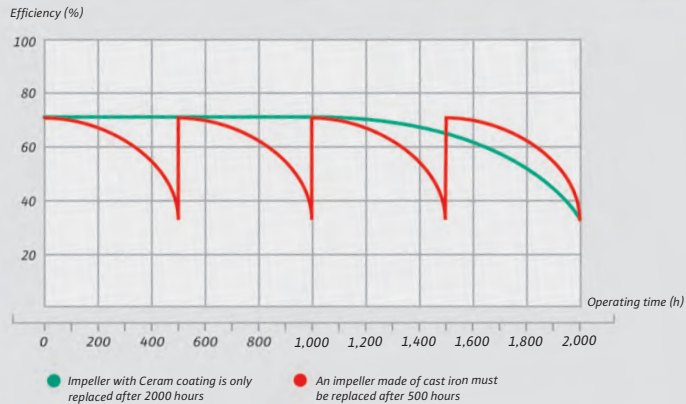


Pump housing, inside

- A perfect combination, e.g. C3 + C1 as a cost-effective alternative compared to special materials
- Later coating/repairs possible

Ceram coating from Wilo. Highest efficiency thanks to optimised durability.

Long-term process safety



Sewage and sewage treatment plant pumps are constantly being exposed to aggressive fluids. Corrosion and abrasion, as well as UV light, heat, cold, salt, condensate and the alkalinity influence the surfaces and material structures of the units, sometimes with considerable impairment to the performance. This significantly reduces the hydraulic efficiency of a pump (see graph). This not only results in a higher energy consumption, but also leads to a greatly reduced service life due to the displacement of the load locus for the motor and hydraulics.

A specific application case uses just the example of an impeller coated with Ceram – to illustrate the performance and the associated potential for savings. In a kaolin plant, the fluid is so abrasive due to the large amount of very small-grain sand that a cast-iron impeller, which normally has an operating time of about 100,000 h with no problems, already had to be replaced after 500 hours of operation.

In a test period of 15 months, a total of four cast iron impellers were therefore replaced. This resulted in the following:

- Acquisition costs
- Loss in efficiency due to the corroded material
- This resulted in increasing energy costs
- Downtimes due to removal and installation

Under the same conditions in exactly the same time period, an impeller coated with Ceram was used. This impeller only had to be replaced after about 2000 hours of operation. The coating could withstand the high mechanical load for four times as long.

If one takes the overall costs over the entire service life of the pump into account, the investment costs for a unit coated with Ceram are less than 11 % and thus negligible. In addition, there is a high savings potential due to fewer repairs being required, resulting in fewer system downtimes. Therefore, a Ceram coating already pays for itself within the first 500 hours of operation, i.e. within the first year.



Germany – Salzgitter



Germany – Heidenau



Turkey – Tuzla



China – Yanquiu

Ceram coating from Wilo. Used world-wide.

Whether in the municipal water and sewage management, in the offshore area or industry: Everywhere where pumps and systems are exposed to aggressive fluids, Wilo Ceram offers long-lasting protection. Companies all over the world trust the one-of-a-kind

coating from Wilo. For a good reason: Wilo Ceram increases the service life of all mechanical components, lowers the energy costs noticeably, thanks to the higher efficiencies, and is therefore very convincing with their minimum life cycle cost.



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March 2009

D Ceram C0 data sheet

WILO products are used for many different pumped liquids and installation sites. We want our coatings to offer an even higher degree of protection against wear and corrosion. For this purpose, we mainly use our Ceram coatings. However, only an intact coating provides the best possible protection.

Therefore check the coating after all installation and maintenance work, and repair any minor damage immediately. In the event of major damage, please consult the manufacturer.

Ceram C0 is a sprayable, solvent-free, two-component ceramic-based coating material which protects our products from corrosion under particularly harsh mechanical conditions.

Solvent-free epoxy polymer with solvent-free polyamine hardener and various extenders.

- A tough, hard and long-lasting coating with high mechanical and chemical resistance and excellent resistance to abrasion.
- Excellent wet adhesion and compatibility with corrosion protection as a single-layer coating on steel surfaces.
- Very good adhesion to steel surfaces.
- Replaces coatings containing tar.
- Cost-effective thanks to its durability, low maintenance and easiness to repair.
- Tested by the Federal Waterways Engineering and Research Institute (BAW).
- Solvent-free.
- High-gloss coating when hardened.

General information

Description

Composition

Properties

Technical data

Density (mixture)	ASTM D 792	1.4	g/cm ³
Adhesion / steel	ISO 4624	15	N/mm ²
Impact resistance / hardness	DIN EN ISO 6272	9	J
Temperature resistance: dry, long-term		60	°C
Temperature resistance: dry, short-term		120	°C
Temperature resistance: wet / fluid	Depends on pumped fluid	Information on request	°C
Solid content (mixture)	Volume	97	%
	Weight	98	%

Table D-1: Technical data

Resistance

Pumped fluid	Temperature	Resistance rating
Waste water, alkaline (pH 11)	+20°C	1
Waste water, alkaline (pH 11)	+40°C	1
Waste water, slightly acidic (pH 6)	+20°C	1
Waste water, slightly acidic (pH 6)	+40°C	1
Waste water, very acidic (pH 1)	+20°C	2
Waste water, very acidic (pH 1)	+40°C	3
Ammonium hydroxide (5%)	+40°C	3
Decanol (fatty alcohol)	+20°C	1
Decanol (fatty alcohol)	+50°C	1
Ethanol (40%)	+20°C	1
Ethanol (96%)	+20°C	3
Ethylene glycol	+20°C	1
Heating oil / diesel	+20°C	1
Compressor oil	+20°C	1
Methyl ethyl ketone (MEK)	+20°C	3
Sodium hydroxide solution (5%)	+20°C	1
Sodium hydroxide solution (5%)	+50°C	2
Sodium chloride solution (10%)	+20°C	1
Hydrochloric acid (5%)	+20°C	2
Hydrochloric acid (10%)	+20°C	2
Hydrochloric acid (20%)	+20°C	3
Sulfuric acid (10%)	+20°C	2
Sulfuric acid (20%)	+20°C	3
Nitric acid (5%)	+20°C	3
Toluene	+20°C	2
Water (cooling/industrial water)	+50°C	1
Xylene	+20°C	1

Table D-2: Resistance

Total layer thickness: at least 400µm

Key: 1 = resistant; 2 = resistant for 40 days; 3 = resistant against overflow, immediate cleaning recommended

In order to achieve the best results with this product, proper preparation of the surface is of critical importance. The exact requirements change depending on the application, expected period of service and original surface condition.

Surface preparation

Make sure it is clean, dry and free of grease. The best results are attained by removing rust by blasting in accordance with DIN EN ISO 12944-4, standard cleanliness grade Sa 2.5 - 3. The roughness should be at least 50µm deep. A test certificate for the blasting equipment must be available.

Steel

Please ask for our advice on preparing other surfaces.

The material is supplied in the agreed mixing ratio. Mix all the hardener component into the basic component, preferably using a mechanical mixer, also mixing around the walls and bottom of the container. Only mix as much material as can be applied during the pot life.

Material preparation

The mixing ratio is 4:1 by weight.

Application instructions

The surface and air temperatures must be at least +10°C, and the relative air humidity at most 80%. The temperature of the surface to be coated must be at least 3°C above the dew point. Low temperatures slow down hardening and make application more difficult. For the coating to harden completely, the surface temperature must be above the minimum hardening temperature. High air humidity or temperatures below the dew point can cause condensation to form on the substrate or the coating surface. This can cause problems of adhesion to the surface and between layers. These object conditions must be maintained during the application and hardening period. If the temperature or humidity approach the threshold values, we recommend the use of heating or drying equipment. Ceram C0 can be applied on small surfaces by roller or brush.

Object requirements

Temperature	16 °C	20 °C	25 °C	32 °C
Pot life (minutes)	30	20	15	10

Table D-3: Pot life

Pot life

This table shows the practical hardening time from the start of mixing.

Ceram C0 is applied in layers of 400µm to around 1000µm, depending on the media and intended duration of protection.

Theoretical yield: 1.8m²/kg at 400µm or 0.9m²/kg at 800µm.

Theoretical consumption: 0.60kg/m² at 400µm or 1.15kg/m² at 800µm.

In practice, consumption depends on the surface properties and the application method.

Use the following formula to determine how much is needed to cover a given surface:

Density x area (m²) x average thickness (mm) = consumption (kg)

Coating layers and material requirements

Another layer of Ceram C0 can be applied after around 16 hours up to 24 hours at +20°C. The surfaces must be clean, dry and free of oil or grease. If this interval is exceeded, the coating must be blasted. In hot sunshine, the repeat coating interval is much shorter. Take suitable measures to prevent this.

Repeat coating intervals / subsequent coating

Temperature	15 °C	25 °C	30 °C
Hand dry	8 hours	4.5 hours	4 hours

Table D-4: Hardening time

Hardening time

Ceram C0 data sheet

Light load	1 day	13 hours	10 hours
Full load	6 days	3 days	2 days
Chemically resistant	10 days	6 days	4 days

Table D-4: Hardening time

Material needed

- Cleaning agent for cleaning the surface
- Abrasive paper for roughening the surface (select the roughness according to the surface)
- Paintbrush for applying the coating (select the size according to the extent of the damage)
- 2 component coating (Ceram C0 + hardener)
- Vessel for mixing the two components

Working steps

- 1 Lift the WILO machine from the basin, place it on a secure surface and clean it.
- 2 Thoroughly clean the damaged area with suitable cleaning agent.
- 3 Roughen the surface around the damaged area.
- 4 Mix the 2 component coating (Ceram C0 + hardener) in a 4 to 1 ratio in a suitable vessel.
- 5 Wait 10 to 15 minutes.
- 6 Apply the finished Ceram C0 coating to the damaged area with a suitable paintbrush. Make sure the coating is of at least the minimum thickness: 400µm

If you are using a combination of different Ceram types (e.g. C2+C1), please consult the manufacturer.

- 7 After repairing the damage, let the Ceram C0 completely dry. See "Hardening time".

Cleaning tools

Use a commercial solvent (acetone, alcohol or methyl ethyl ketone) to clean your tools immediately after use. Once the material has dried, it can only be removed by abrasion.

Storage

Store at temperatures between 10°C and 32°C, slight deviations during transport are acceptable. The containers can be stored unopened for 12 months.

Safety precautions

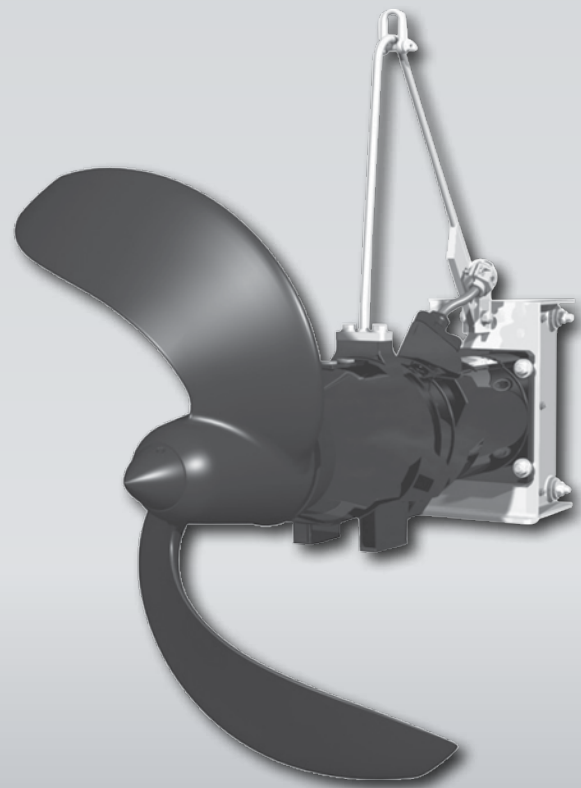
Before using any products, read the material DIN safety data sheet (MSDS) or the safety regulations regarding them. Observe all applicable safety regulations when working in enclosed rooms.

Equipment for sewage treatment.

Submersible Mixers

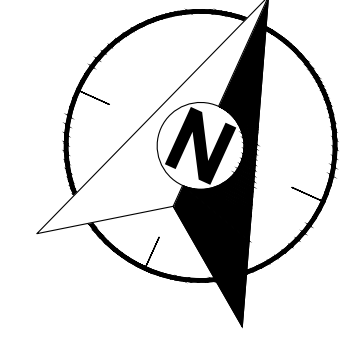
Jefferson GA Anaerobic Preliminary

04.14.2022



Project Information / Assumptions

- Anaerobic basin
- Qty: two (2)
- Dims: 30-ft x 18-ft x 24.5-ft x 21.5-ft SWD
- TSS: 0.5% (assumed)
- No aeration

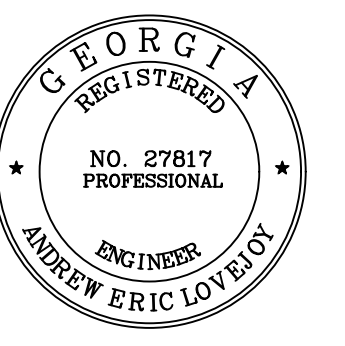


CEC
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 Marietta, GA 30068
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 www.cecincga.com

CLIENT

CITY OF JEFFERSON

APPROVAL STAMP



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REVISIONS

No	Date	Description
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Designed By : CKB

Drawn By : JWN

Checked By : CKB

Scale : SEE DETAIL

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PROJECT NAME

JEFFERSON I-85 WATER
 RECLAMATION FACILITY

PROJECT INCEPTION DATE

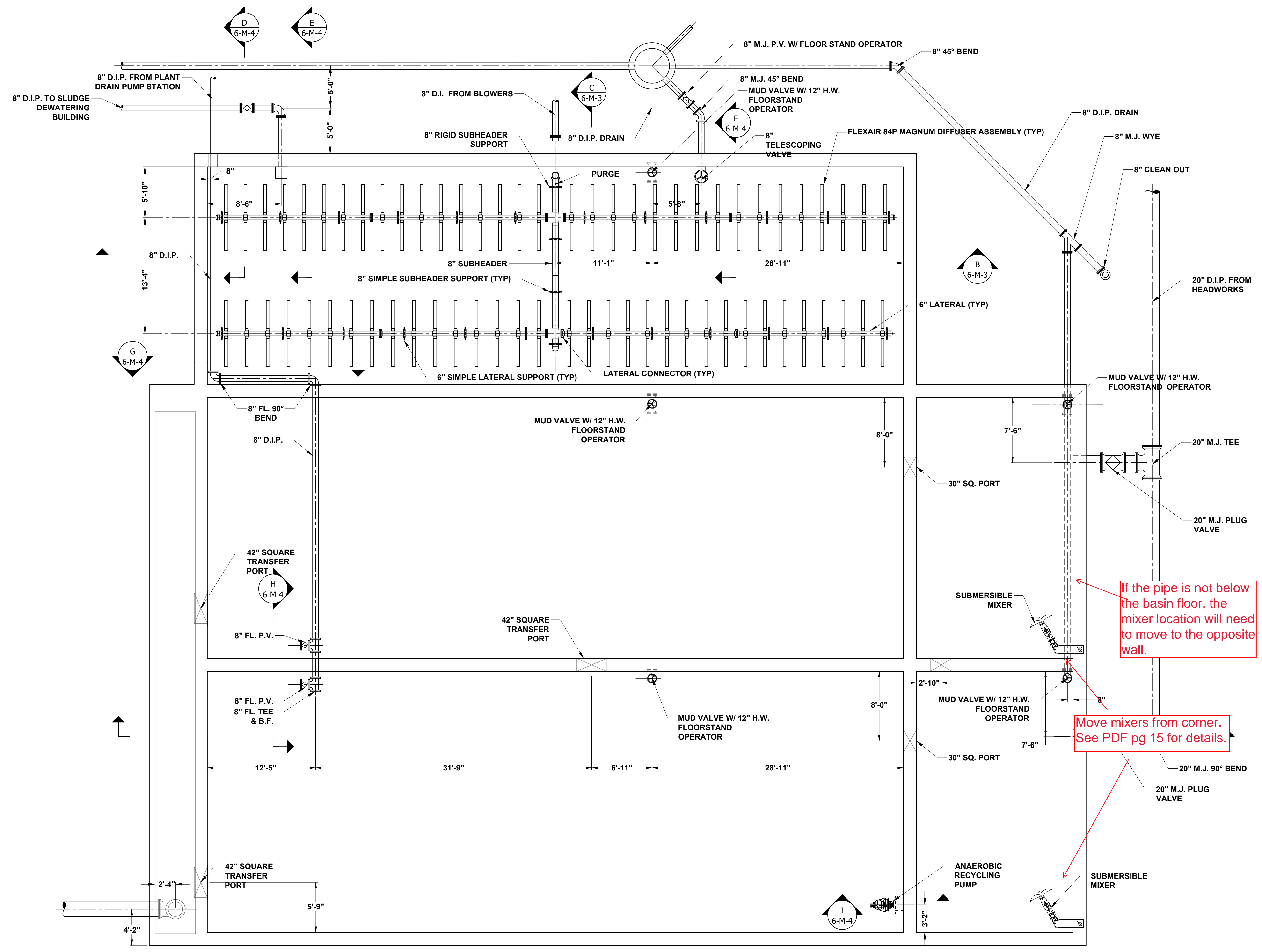
10/05/2021

SHEET TITLE

AERATION BASIN
 MECHANICAL BOTTOM PLAN

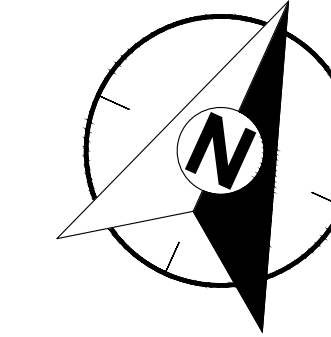
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6-M-1
 OF
 37



1 AERATION BASIN PLAN
 Scale: 3/16"= 1'-0"

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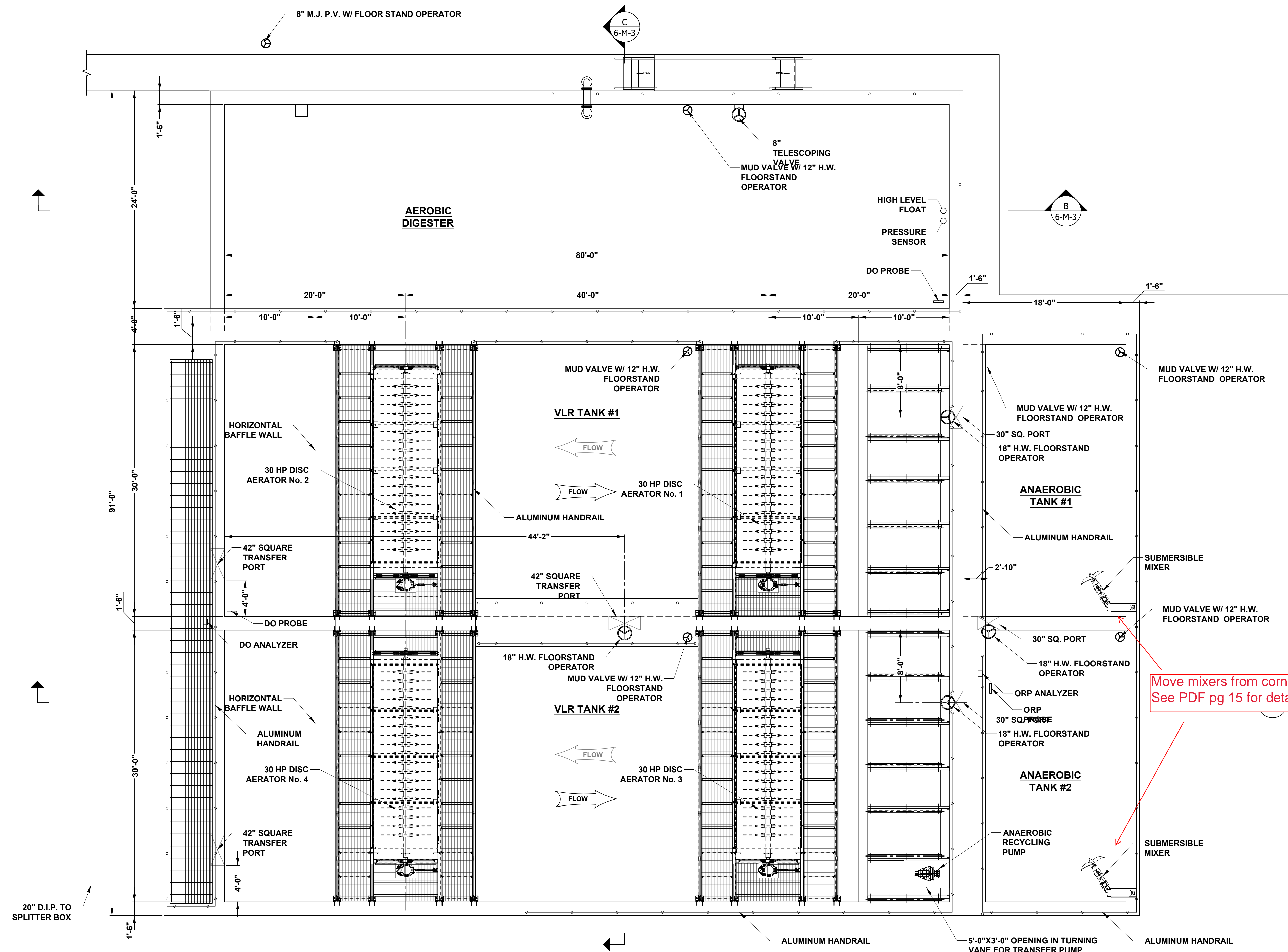
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AERATION BASIN
 MECHANICAL TOP PLAN

DRAWING NUMBER

6-M-2
 OF
 37



1 AERATION BASIN PLAN
 Scale: 3/16"= 1'-0"

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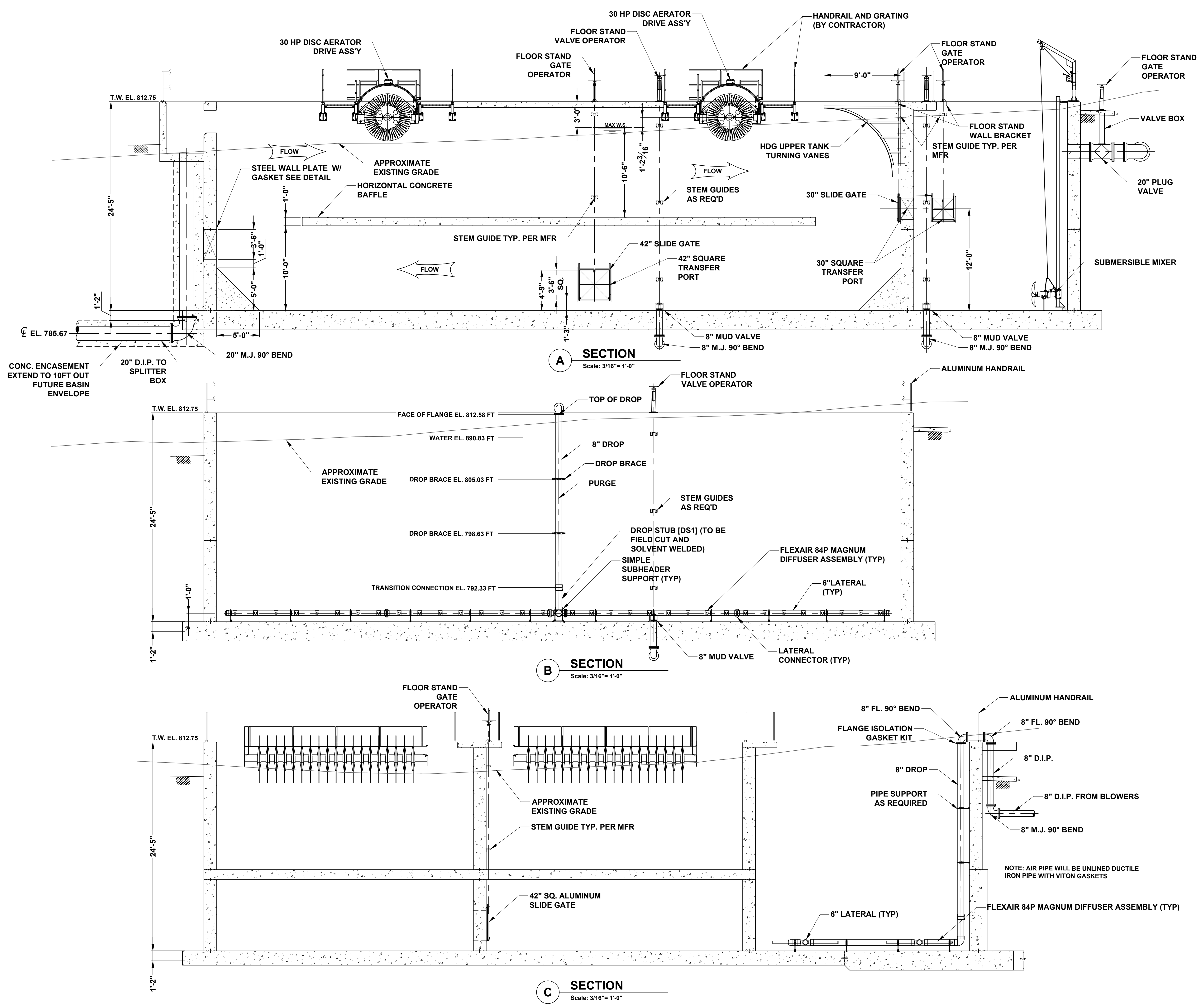
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SHEET TITLE

**AERATION BASIN
 MECHANICAL SECTIONS 1**

DRAWING NUMBER

**6-M-3
 OF
 37**

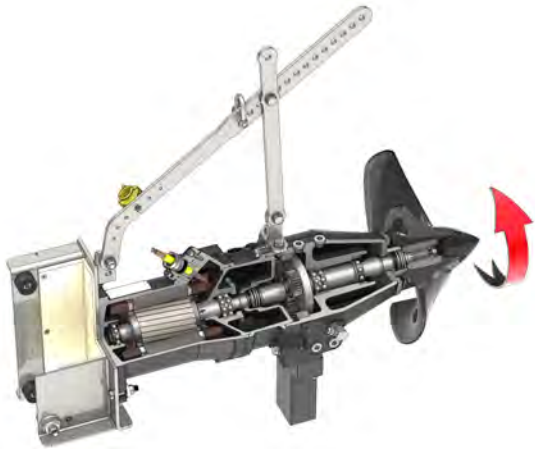


Anaerobic Basin
TR50-2.40-4/8V
AVU100 mast/rail
E/EH 250kg hoist with floor base

Data sheet

Wilo-EMU TR 50-2.40-4/8V

Design / Direction of rotation



Technical data	
Unit	
Power Consumed $P_{1,1}$	4.6 hp 3.4 kW
Max. thrust F	196 lb _f
Weight of unit m	224.9 lbs
Max. weight* m	308.6 lbs
Protection class	IP 68
Explosion protection	FM, CSA
Ex classification FM	CLASS I, DIV. 1, GROUPS C, D; CLASS II, DIV. 1, GROUPS E, F, G; CLASS III

* = maximum weight including accessories

Propeller	
Propeller model	3-blade propeller with self-cleaning hub; backward-curved as a result clogging- and entwining-free
Nominal propeller diameter	19.7 in
Propeller speed n	400 rpm
Transmission ratio	4.25

Fill quantities and types	
Filling prechamber	CLP transmission oil, ISO VG 220
Filling volume prechamber V	0.3 gal (US)
Filling gear chamber	CLP transmission oil, ISO VG 220
Fill quantity gear chamber V	0.1 gal (US)
Filling sealing chamber	White oil
Fill level sealing chamber V	0.3 gal (US)

Motor data	
Type of motor	T 17-4/8V (Ex)
Motor type	Submersible motor according to DIN/VDE 0530 (IEC 34)
Power connection	3~460 V, 60 Hz
Full load amps I_N	6.7 A
Starting current - direct I_A	33 A
Starting current - star-delta I_A	11 A
Maximum power consumption P_1	6.2 hp
Rated motor power P_2	4.4 hp
Rated speed n	1680 rpm
Motor Efficiency Level	-
Efficiency η_M	72.0 %
Power factor $\cos \varphi$	0.86
Fluid temperature T	37 ... 104 °F
Max. submersion	66 ft
Insulation class	H
Max. switching frequency t	15 /h
min. switching break t	3 min
Starting torque M	42 Nm
Moment of inertia	0.0073 kg/m ²
Motor bearings	1 grooved ball bearing, 1 two-row inclined ball bearing

Materials	
Motor housing	ASTM A48 Class 35/40B
Motor shaft	1.4021
Gear housing	ASTM A48 Class 35/40B
Planetary gear	1.7131
Hollow gear	1.5216
Sun gear	1.7131
Output shaft	1.4462
Static seal	FPM
Mechanical seal	SiC/SiC
Seal, gear chamber/prechamber	FPM
Seal, gear/sealing chamber	SiC/SiC
Sealing on motor side	FPM
Propeller	PUR

Gear	
Gear construction type	m 2.0 as per DIN 780/P10 (ISO 54); Sun and planetary gears case hardened and sanded, internal gear butt-jointed
Gear bearings	Three needle roller bearing (planetary), one two-row inclined ball bearing and one grooved ball bearing (output shaft)
Service life L_{h10}	> 100000 operating hours, ISO 281

Type: **Uniprop**
TR 50-2 ... TR 90-2

Scale: **1:25**

Technical changes reserved !

Nr./No.: **Plh044**

Date: 20.10.16 VM

PRE-ANX	Typ	Ø A	B**/B*	C	D**/D*	F _G **/F _G *
	TR 50-2.../8	500	1000/985	900	305/330	140/150 kg
	TR 50-2.../12		1035/1020		340/370	145/155 kg
	TR 50-2.../16		1075/1055		375/405	160/170 kg
	TR 50-2.../22		1150/-		375/-	170/- kg
	TR 50-2.../24		-/1135		-/485	170/180 kg
	TR 60-2.../8	600	995/1005	900	305/330	140/150 kg
	TR 60-2.../12		1030/1040		340/370	145/155 kg
	TR 60-2.../16		1070/1080		375/405	160/170 kg
	TR 60-2.../22		1150/-		375/-	170/- kg
	TR 60-2.../24 ¹		1150/1160		455/485	170/180 kg
	TR 75-2.../16	750	1145/-	1100	375/-	175/- kg
	TR 75-2.../24 ¹		1225/-		455/-	185/- kg
	TR 90-2.../8	900	1075/-	800	300/-	150/- kg
	TR 90-2.../12		1110/-		335/-	155/- kg
	TR 90-2.../16		1150/-		375/-	170/- kg

* with steel propeller

** with PUR propeller

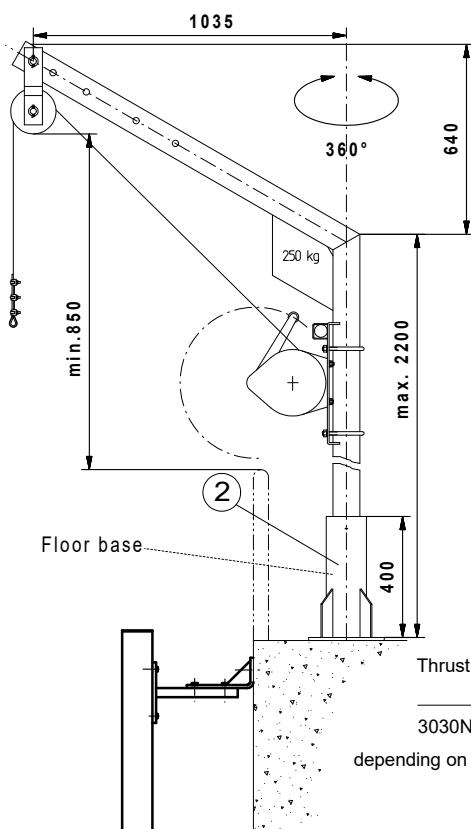
¹) only after consultation with Engineering

All connections doweled by means of composite anchor HVA

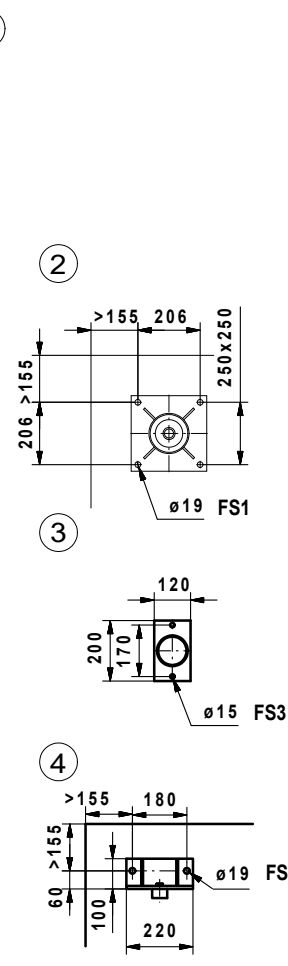
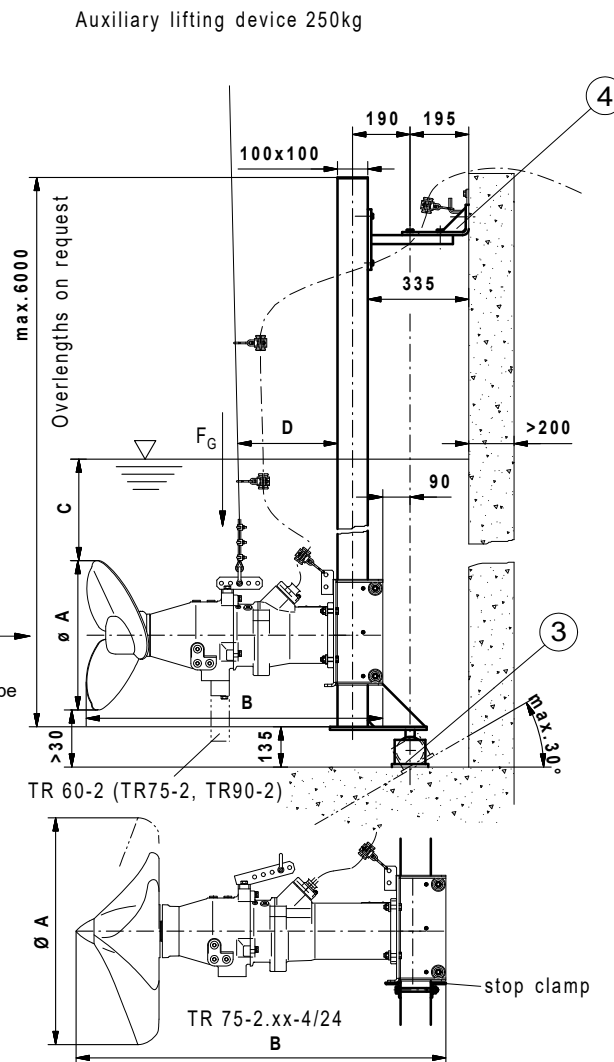
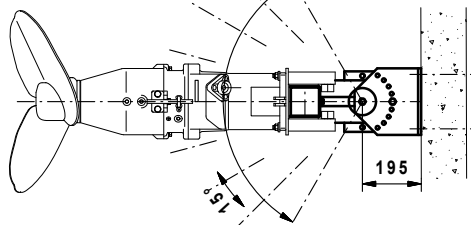
	M16	M12
Perforation	Ø18x125	Ø14x110
Tightening torque	80 Nm	40 Nm

Concrete / fissure free ≥ C25

Fixing elements:



Working range +60°/-60°



Range of delivery: Lowering device including fixing elements. Mixer with 12-m electrical cable (overlengths on request). Necessary modifications of the structure (for example plug-in railings, covers, bridges, platforms) as well as the power supply will have to be provided by the user. The user is responsible for due operation and compliance with all accident prevention and safety regulations and rules of hygiene. Free access as well as safe operation and installation will have to be made possible.

Type: **E/EH**

Scale: **1:25 (1:10)**

Technical changes reserved !

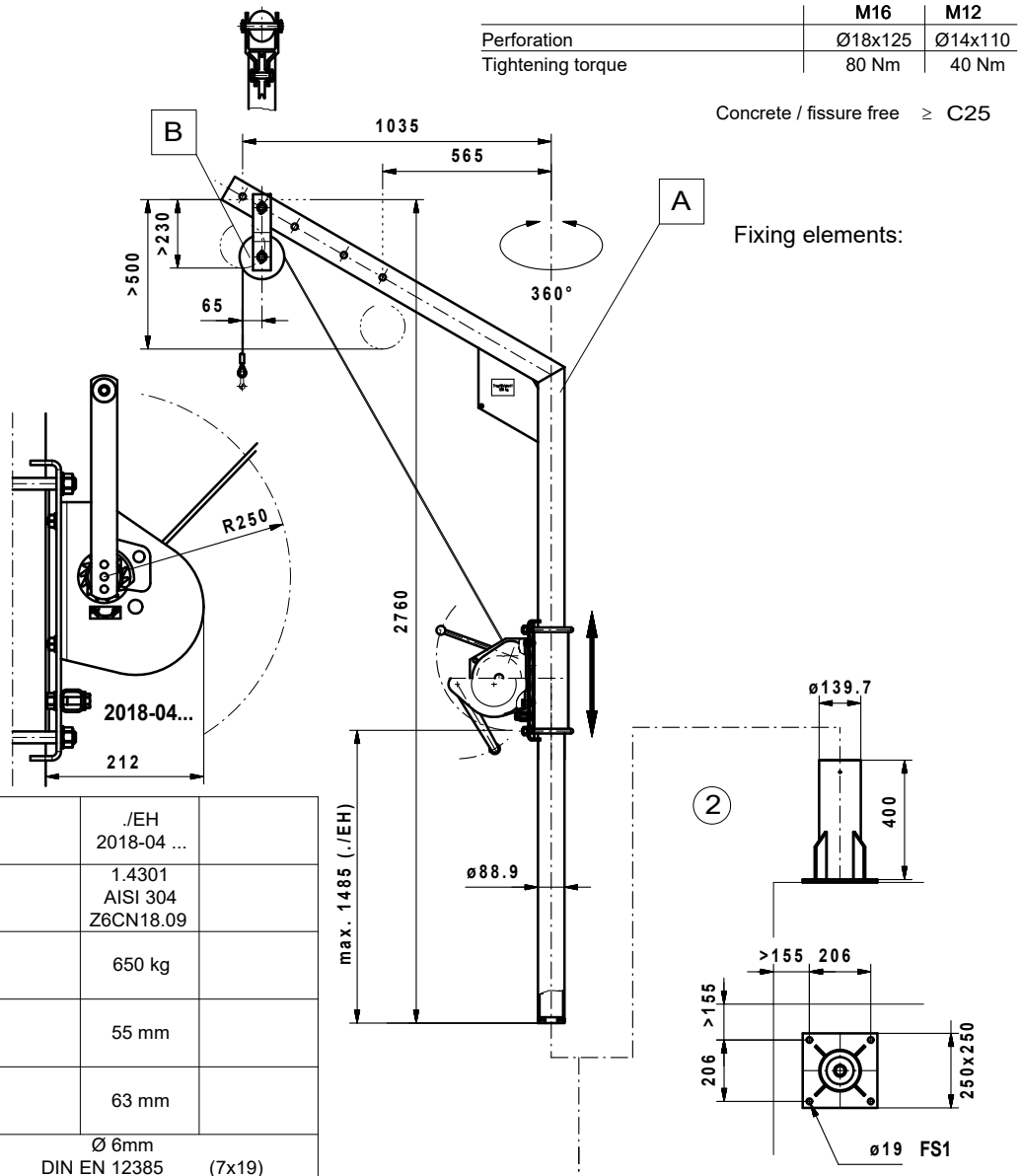
Nr./No.: **PIh037**

Date: 2018-02-19 Rie

All connections doweled by means of composite anchor HVA

	M16	M12
Perforation	Ø18x125	Ø14x110
Tightening torque	80 Nm	40 Nm

Concrete / fissure free ≥ C25



Fixing elements:

../EH

Hand winch	../EH 2018-04 ...
Material	1.4301 AISI 304 Z6CN18.09
Tensile load 1st cable layer	650 kg
Medium lifting per handle rotation	55 mm
Drum diameter	63 mm
Stainless cable	Ø 6mm DIN EN 12385 (7x19) max. 1570 N/mm ²
Cable capacity max.	20 m
Necessary force to move handle	12 daN
Weight	9 kg

Variations	../E/.		
		304SS	38 kg
			Weight parts A+B

* Rapid power transmission

Range of delivery: Auxiliary lifting device including fixing elements with 12-m 316SS lifting cable (over-lengths on request).

Necessary modifications of the structure (for example plug-in railings, covers, bridges, platforms) as well as the power supply will have to be provided by the user. The user is responsible for due operation and compliance with all accident prevention and safety regulations and rules of hygiene. Free access as well as safe operation and installation will have to be made possible.

Use of the auxiliary lifting device according to DGV D8 only together with WILO-lowering devices!

X Guide pipe extension for lowering devices

Our lowering devices can only be manufactured up to a length of 6 m. If longer lowering devices are required, a guide pipe extension must be mounted at the site. The guide pipe extension is available in the same materials as the lowering devices.

Product description

The guide pipe extension is available for the lowering devices of the type AVU 60 to 120, AVMS and AVMSH and may be used only for these devices.

Proper use

For other lowering devices, please consult the manufacturer!

- 1 A 45° bevel must be ground at the upper end of the original guide pipe.
- 2 A 45° bevel must also be ground on the end of the guide pipe extension (not on the connecting lugs).
- 3 Place both guide pipes on a suitable support for welding.
- 4 Insert the guide pipe extension into the original guide pipe. Align the guide pipe extension so that it forms a straight line with the original guide pipe. Make certain that the gap width is 2 mm!
- 5 Drill 2 auxiliary holes on each side so that the connecting lugs can also be welded on.
- 6 The connecting lugs of the guide pipe extension are to be welded on using a root run in the weld seam. In addition, the auxiliary holes on the original guide pipe are to be welded up. Make certain that the base metal of the connecting lugs is also fused on. Level off the raised top layer at the surrounding weld seam and the raised edge at the auxiliary holes. The WILO EMU machine must not get caught on the weld seam when it is lifted and lowered.

Installation

Beware of injury

Welding work must be carried out by a qualified welder! This work must be certified according to the following standards:

Welding test: EN 287 - 1 111 T BW W11 t3,0 D 114

Quality standard: EN 25817 Evaluation Group C

Proper protective clothing/equipment must be worn!



- 7 In the stainless steel version, the weld seam must be steeped in mordant and polished. In the galvanized version, lasting corrosion protection must be provided by using a suitable coating.

Guide pipe extension for lowering devices

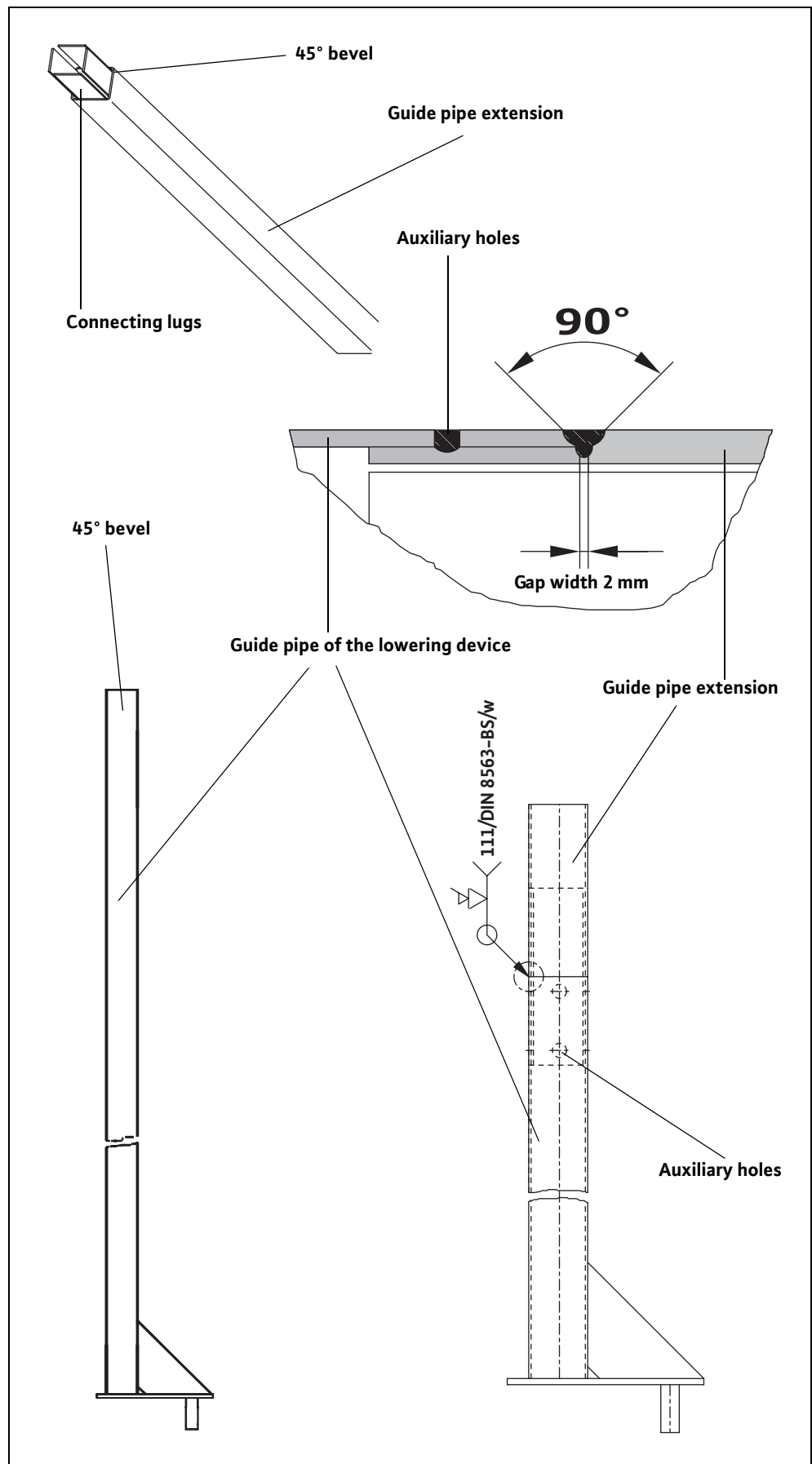


Fig. X-1: Installation

WILO SE, Werk Hof
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 Postfach 3309 - D-95030 Hof/Saale
 T: +49 9281 974-540 F: +49 9281 974-133
 ctwwt@wilo.com www.wilo.com

ID 22-WKE-US-AAB-1-0001
 Project country United States (USA)
 Project name Jefferson GA
 Position 1 Anaerobic tank
 Date 2022-04-13
 Enquiry

Data for selection

Mixed liquid

Kind	Activated sludge	
Density	62.43	lb/ft ³
pH value	7	
Temperature	68	°F
Dry solids content	0.5	%
Flow behaviour	Newton flow	
Kind of thickening	None	
Additional thickener	No	

Solids

Origin	Not determined
Kind	Not determined
Solid size	Not determined

Mixing task

Operating mode	Continuous
Mixing task	Suspend

Tank

Material	Concrete	
Outlet	On bottom, laterally at the tank edge	
Tank shape	Rectangular tank	
Tank volume	86850	US gal
Vertical / inclined walls	Tank with vertical walls	
Length on upper edge	30	ft
Width on upper edge	18	ft
Tank height	24.5	ft
Maximum filling level	21.5	ft
Minimum filling level	21.5	ft
Relevant filling level	21.5	ft

Preparation

Preparation	None
-------------	------



WILO SE, Werk Hof
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Mixer data sheet

Page 2 / 3

ID	22-WKE-US-AAB-1-0001
Project country	United States (USA)
Project name	Jefferson GA
Position	1 Anaerobic tank
Date	2022-04-13
Enquiry	

Aeration

Kind

Without

Tank particularities

Default

Remarks regarding the selection process

The mixing result depends on the functional quality of the plant equipment in the mechanical treatment stage (preliminary treatment). Mineral fractions (grit and sand) must be always excluded from the process and cannot be kept in suspension. It is absolutely required to check the values mentioned above with the actual values on site.

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 ctwwt@wilo.com www.wilo.com

ID	22-WKE-US-AAB-1-0001
Project country	United States (USA)
Project name	Jefferson GA
Position	1 Anaerobic tank
Date	2022-04-13
Enquiry	

Selection of submersible mixers

Proposal

Type	TR 50-2.40-4/8V	
Quantity	1	
Frequency	60	Hz
Rated power	4.43	hp
Propeller speed	400	rpm
Power factor (ISO 21630)	256	N/kW
Propeller diameter	1.64	ft
Maximum power input	6.17	hp
Power input in duty point	*1 4.56	hp
System-dependent power input	*2 4.56	hp
Power density	*3 10.3	W/m ³
System-dependent power density	*4 10.3	W/m ³
Distance to water surface	2.95	ft

*1 Measurement at static thrust acc. to ISO 21630 (inflow velocity ~0, Open Sea conditions).

*2 The power consumption of the mixer will be reduced in proportion to the flow velocity which is generated in the tank.

*3 According to ISO 21630.

*4 According to site conditions.

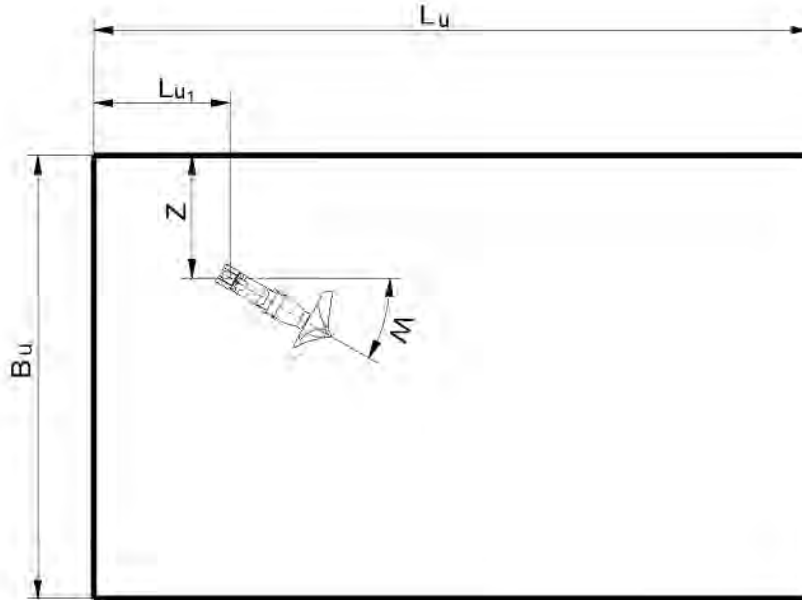
Important note

Installation of the mixer(s) according to installation sketch. Before installing the mixers, the up-to-date tank plans must be submitted without previous request to WILO SE, Hof for revision.

To guarantee a continuous operation, the minimum water cover above the propeller specified by WILO must be ensured. Please check if our basic data are identical to your application and, if necessary, inform us in writing about modifications/objections. The aforementioned mixer(s) selection data are integral part of our warranty, whereas our warranty comes only into effect, when the submersible mixers are installed according to our recommendation. Because the overall function depends considerably on the correct positioning of the submersible mixers, we will not accept any warranty claims which result from positioning which we did not approve explicitly. Also zones of weak flow due to the tank geometry are not part of our warranty. The values of maximum power input, power input in the duty point and energy density are valid for clean water. Furthermore the use of our submersible mixers in patented procedures or under trade mark rights of third parties is excluded from our liability.

WILO SE, Werk Hof
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 ctwwt@wilo.com www.wilo.com

ID 22-WKE-US-AAB-1-0001
 Project country United States (USA)
 Project name Jefferson GA
 Position 1 Anaerobic tank
 Date 2022-04-13
 Mixer TR 50-2.40-4/8V
 Enquiry



Installation recommendation regarding to miscellaneous minimum distances

n *	1	
Bu	18	ft
Z	1.312	ft
NI *	1	

Lu	30	ft
Lu1	7.5	ft
W	30	°

* n = no. of mixer per tank, NI = no. of installation positions per tank

Minimal distances (type based) ¹

Mixer type: TR 50-2.40-4/8V

Prior to the aeration field**	6.562	ft
After aeration**	6.562	ft
Between two mixers standing side by side**	6.562	ft
Between the lowering device and the tank wall**,****	1.312	ft
To suction side tank wall in rectangular tanks**	4.921	ft
To discharge side tank wall in rectangular tanks**	13.12	ft
To tank floor	0.3281	ft
To water surface	2.953	ft
Minimal volume	21130	US gal
Minimal profile area	16.14	ft ²

** Distances apply to the middle of the leading pipes

*** Above aerator - operating area

**** Depending on the profile of the leading pipe, setting angle and type of the lowering device

ID	22-WKE-US-AAB-1-0001
Project country	United States (USA)
Project name	Jefferson GA
Position	1 Anaerobic tank
Date	2022-04-13
Mixer	TR 50-2.40-4/8V
Enquiry	

Hints

¹ A prerequisite for the correct positioning of the submersible mixers is a well-founded mixer selection based on all selection relevant criteria, such as mixed liquid, tank geometry, etc.

The distances listed in the above mentioned table can therefore only be considered as reference values. This table is valid up to an average, calculated flow velocity of max. 0.3m/s.

If higher flow speeds are selected, it is essential to consult WILO SE Hof.

The enclosed installation proposal is a schematic drawing and not according to scale. It serves as orientation guide. In case of order, the feasibility of this installation has to be matched with the tank drawing and the actual conditions. If there is an inflow and/or outflow in the immediate vicinity of the mixer, the mixer position must be checked based on updated tank plans to avoid bad influences on the mixer and short-circuit flows.

Wilo Ceram C0
(Coating on housing)

wilo®

The one-of-a-kind
Ceram coating from Wilo.



CERAM
protected

Ceram coating from Wilo.

Effective protection from abrasion and corrosion.



Wilo Ceram is only available for Wilo pumps and units. This special version in the form of a unique 2-component coating offers the best possible protection against aggressive media compared with

other coatings. Thanks to its increased resistance to abrasion and corrosion, it effectively prevents wear and chemical corrosion and always ensures optimal functionality and performance.

Thanks to Wilo Ceram, maintenance-related downtimes are greatly reduced and the service life of pumps and units is considerably increased. Far-sighted? We call it Pumpen Intelligenz.

Ceram coating from Wilo.

Technical data.

Description

Sprayable, solvent-free, 2-component polymer coating material with portions of aluminum oxide: for corrosion protection of our products even when under great mechanical stress.

Composition

Solvent-free epoxy polymer with solvent-free polyamine hardener and various extenders.

Properties

- Tough and hard, durable coating with high mechanical and chemical resistance, as well as good wear resistance
- Excellent wet adhesion as single- or multi-layered coating on steel surfaces
- Replaces tar-containing coatings
- Cost-savings thanks to the long service life, low maintenance and easy reparability.
- Tested by the "Bundesanstalt für Wasserbau" (German Federal Institute for Hydraulic Engineering) (BAW).
- Solvent-free.
- High gloss finish after hardening
- Later coating and repair possible

Technical data Ceram C0

Designation	Standard	Value	Unit
Density (mixture)	ASTM D 792	1.4	g/cm ³
Solid content (volume)		97	%
Solid content (weight)		98	%
Adhesive strength, steel	ISO 4624	15	N/mm ²
Impact strength	DIN EN ISO 6272	9	J
Temperature resistance			
Dry, continually		60	°C
Dry, for short periods		120	°C
Moist/liquid	depends on fluid, on request		

Technical data Ceram C0

Designation	Temperature range	Resistance
Sewage, alkaline (PH 11)	+20 °C/+40 °C	1/1
Sewage, weakly acidic (PH 6)	+20 °C/+40 °C	1/1
Sewage, strongly acidic (PH 1)	+20 °C/+40 °C	2/3
Ammonium hydroxide (5 %)	+40 °C	3
Decanol (fatty alcohol)	+20 °C/+50 °C	1/1
Ethanol (40 %)	+20 °C	1
Ethanol (96 %)	+20 °C	3
Ethylene glycol	+20 °C	1
Heating oil, diesel	+20 °C	1
Compressor oil	+20 °C	1
Methyl ethyl ketone (MEK)	+20 °C	3
Caustic soda (5 %)	+20 °C/+50 °C	1/2
Sodium chloride solution (10 %)	+20 °C	1
Hydrochloric acid (5/10/20 %)	+20 °C	2/2/3
Sulphuric acid (10/20 %)	+20 °C	2/3
Nitric acid (5 %)	+20 °C	3
Toluene	+20 °C	2
Cooling and industrial water	+50 °C	1
Xylene	+20 °C	1

Key: 1 = resistant, 2 = resistant for 40 days, 3 = spill resistant (immediate cleaning recommended)
Total layer thickness: at least 400 µm

Technical data for C1, C2, C3 on request

Ceram coating from Wilo. Long-lasting protection.



Wilo Ceram offers all-round protection for all unit components, whether they are inside or on the surface. Depending on the field of application, different Wilo Ceram coatings are offered, which are applied using various methods. For use in special fluids, the individual Ceram versions can also be combined with each other.

Ceram C0 is used both for the outer coating as well as for the interior coating. This is applied using the airless method in one layer with a thickness of 0.4 mm.



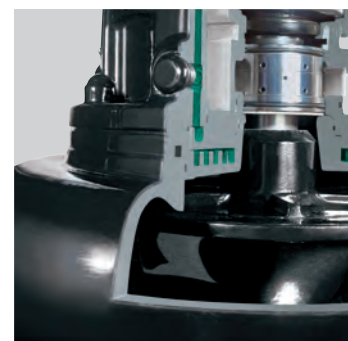
Outer and interior coating

- To protect against heavy corrosion
- Increased efficiency thanks to lower friction losses



Impeller and suction port coating

- A perfect combination, e.g. C2 + C1 against strong abrasive corrosion in the case of moderately stressed pump components
- Can also be used in seawater and brackish water, as well as in industrial sewage areas

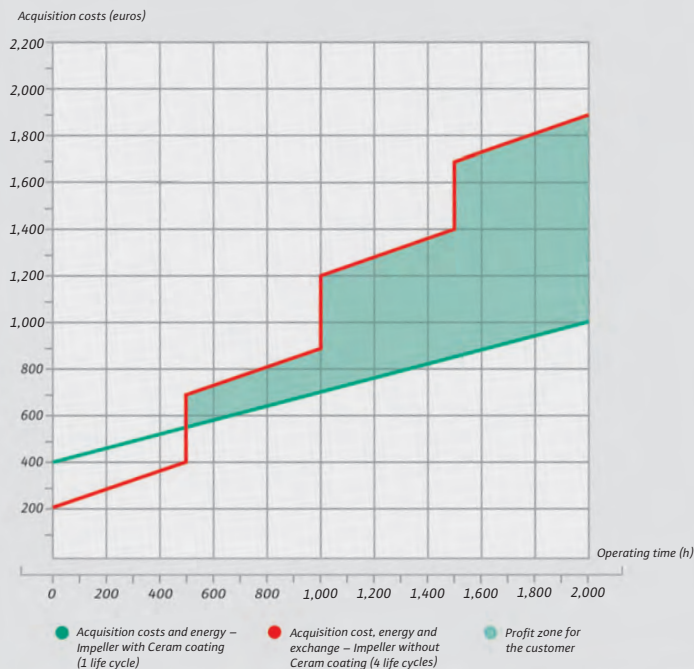
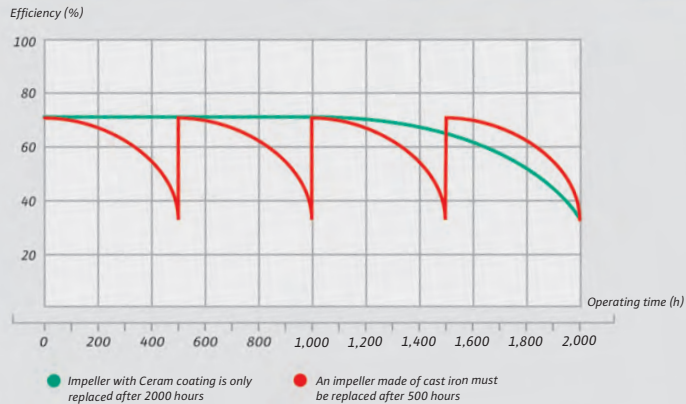


Pump housing, inside

- A perfect combination, e.g. C3 + C1 as a cost-effective alternative compared to special materials
- Later coating/repairs possible

Ceram coating from Wilo. Highest efficiency thanks to optimised durability.

Long-term process safety



Sewage and sewage treatment plant pumps are constantly being exposed to aggressive fluids. Corrosion and abrasion, as well as UV light, heat, cold, salt, condensate and the alkalinity influence the surfaces and material structures of the units, sometimes with considerable impairment to the performance. This significantly reduces the hydraulic efficiency of a pump (see graph). This not only results in a higher energy consumption, but also leads to a greatly reduced service life due to the displacement of the load locus for the motor and hydraulics.

A specific application case uses just the example of an impeller coated with Ceram – to illustrate the performance and the associated potential for savings. In a kaolin plant, the fluid is so abrasive due to the large amount of very small-grain sand that a cast-iron impeller, which normally has an operating time of about 100,000 h with no problems, already had to be replaced after 500 hours of operation.

In a test period of 15 months, a total of four cast iron impellers were therefore replaced. This resulted in the following:

- Acquisition costs
- Loss in efficiency due to the corroded material
- This resulted in increasing energy costs
- Downtimes due to removal and installation

Under the same conditions in exactly the same time period, an impeller coated with Ceram was used. This impeller only had to be replaced after about 2000 hours of operation. The coating could withstand the high mechanical load for four times as long.

If one takes the overall costs over the entire service life of the pump into account, the investment costs for a unit coated with Ceram are less than 11 % and thus negligible. In addition, there is a high savings potential due to fewer repairs being required, resulting in fewer system downtimes. Therefore, a Ceram coating already pays for itself within the first 500 hours of operation, i.e. within the first year.



Germany – Salzgitter



Germany – Heidenau



Turkey – Tuzla



China – Yanquiu

Ceram coating from Wilo. Used world-wide.

Whether in the municipal water and sewage management, in the offshore area or industry: Everywhere where pumps and systems are exposed to aggressive fluids, Wilo Ceram offers long-lasting protection. Companies all over the world trust the one-of-a-kind

coating from Wilo. For a good reason: Wilo Ceram increases the service life of all mechanical components, lowers the energy costs noticeably, thanks to the higher efficiencies, and is therefore very convincing with their minimum life cycle cost.



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March 2009

D Ceram C0 data sheet

WILO products are used for many different pumped liquids and installation sites. We want our coatings to offer an even higher degree of protection against wear and corrosion. For this purpose, we mainly use our Ceram coatings. However, only an intact coating provides the best possible protection.

General information

Therefore check the coating after all installation and maintenance work, and repair any minor damage immediately. In the event of major damage, please consult the manufacturer.

Ceram C0 is a sprayable, solvent-free, two-component ceramic-based coating material which protects our products from corrosion under particularly harsh mechanical conditions.

Description

Solvent-free epoxy polymer with solvent-free polyamine hardener and various extenders.

Composition

- A tough, hard and long-lasting coating with high mechanical and chemical resistance and excellent resistance to abrasion.
- Excellent wet adhesion and compatibility with corrosion protection as a single-layer coating on steel surfaces.
- Very good adhesion to steel surfaces.
- Replaces coatings containing tar.
- Cost-effective thanks to its durability, low maintenance and easiness to repair.
- Tested by the Federal Waterways Engineering and Research Institute (BAW).
- Solvent-free.
- High-gloss coating when hardened.

Properties

Technical data

Density (mixture)	ASTM D 792	1.4	g/cm ³
Adhesion / steel	ISO 4624	15	N/mm ²
Impact resistance / hardness	DIN EN ISO 6272	9	J
Temperature resistance: dry, long-term		60	°C
Temperature resistance: dry, short-term		120	°C
Temperature resistance: wet / fluid	Depends on pumped fluid	Information on request	°C
Solid content (mixture)	Volume	97	%
	Weight	98	%

Table D-1: Technical data

Resistance

Pumped fluid	Temperature	Resistance rating
Waste water, alkaline (pH 11)	+20°C	1
Waste water, alkaline (pH 11)	+40°C	1
Waste water, slightly acidic (pH 6)	+20°C	1
Waste water, slightly acidic (pH 6)	+40°C	1
Waste water, very acidic (pH 1)	+20°C	2
Waste water, very acidic (pH 1)	+40°C	3
Ammonium hydroxide (5%)	+40°C	3
Decanol (fatty alcohol)	+20°C	1
Decanol (fatty alcohol)	+50°C	1
Ethanol (40%)	+20°C	1
Ethanol (96%)	+20°C	3
Ethylene glycol	+20°C	1
Heating oil / diesel	+20°C	1
Compressor oil	+20°C	1
Methyl ethyl ketone (MEK)	+20°C	3
Sodium hydroxide solution (5%)	+20°C	1
Sodium hydroxide solution (5%)	+50°C	2
Sodium chloride solution (10%)	+20°C	1
Hydrochloric acid (5%)	+20°C	2
Hydrochloric acid (10%)	+20°C	2
Hydrochloric acid (20%)	+20°C	3
Sulfuric acid (10%)	+20°C	2
Sulfuric acid (20%)	+20°C	3
Nitric acid (5%)	+20°C	3
Toluene	+20°C	2
Water (cooling/industrial water)	+50°C	1
Xylene	+20°C	1

Table D-2: Resistance

Total layer thickness: at least 400µm

Key: 1 = resistant; 2 = resistant for 40 days; 3 = resistant against overflow, immediate cleaning recommended

In order to achieve the best results with this product, proper preparation of the surface is of critical importance. The exact requirements change depending on the application, expected period of service and original surface condition.

Surface preparation

Make sure it is clean, dry and free of grease. The best results are attained by removing rust by blasting in accordance with DIN EN ISO 12944-4, standard cleanliness grade Sa 2.5 - 3. The roughness should be at least 50µm deep. A test certificate for the blasting equipment must be available.

Steel

Please ask for our advice on preparing other surfaces.

The material is supplied in the agreed mixing ratio. Mix all the hardener component into the basic component, preferably using a mechanical mixer, also mixing around the walls and bottom of the container. Only mix as much material as can be applied during the pot life.

Material preparation

The mixing ratio is 4:1 by weight.

Application instructions

The surface and air temperatures must be at least +10°C, and the relative air humidity at most 80%. The temperature of the surface to be coated must be at least 3°C above the dew point. Low temperatures slow down hardening and make application more difficult. For the coating to harden completely, the surface temperature must be above the minimum hardening temperature. High air humidity or temperatures below the dew point can cause condensation to form on the substrate or the coating surface. This can cause problems of adhesion to the surface and between layers. These object conditions must be maintained during the application and hardening period. If the temperature or humidity approach the threshold values, we recommend the use of heating or drying equipment. Ceram C0 can be applied on small surfaces by roller or brush.

Object requirements

Temperature	16°C	20°C	25°C	32°C
Pot life (minutes)	30	20	15	10

Table D-3: Pot life

Pot life

This table shows the practical hardening time from the start of mixing.

Ceram C0 is applied in layers of 400µm to around 1000µm, depending on the media and intended duration of protection.

Theoretical yield: 1.8m²/kg at 400µm or 0.9m²/kg at 800µm.

Theoretical consumption: 0.60kg/m² at 400µm or 1.15kg/m² at 800µm.

In practice, consumption depends on the surface properties and the application method.

Use the following formula to determine how much is needed to cover a given surface:

$$\text{Density x area (m}^2\text{) x average thickness (mm) = consumption (kg)}$$

Another layer of Ceram C0 can be applied after around 16 hours up to 24 hours at +20°C. The surfaces must be clean, dry and free of oil or grease. If this interval is exceeded, the coating must be blasted. In hot sunshine, the repeat coating interval is much shorter. Take suitable measures to prevent this.

Coating layers and material requirements

Repeat coating intervals / subsequent coating

Temperature	15°C	25°C	30°C
Hand dry	8 hours	4.5 hours	4 hours

Table D-4: Hardening time

Hardening time

Ceram C0 data sheet

Light load	1 day	13 hours	10 hours
Full load	6 days	3 days	2 days
Chemically resistant	10 days	6 days	4 days

Table D-4: Hardening time

Material needed

- Cleaning agent for cleaning the surface
- Abrasive paper for roughening the surface (select the roughness according to the surface)
- Paintbrush for applying the coating (select the size according to the extent of the damage)
- 2 component coating (Ceram C0 + hardener)
- Vessel for mixing the two components

Working steps

- 1 Lift the WILO machine from the basin, place it on a secure surface and clean it.
- 2 Thoroughly clean the damaged area with suitable cleaning agent.
- 3 Roughen the surface around the damaged area.
- 4 Mix the 2 component coating (Ceram C0 + hardener) in a 4 to 1 ratio in a suitable vessel.
- 5 Wait 10 to 15 minutes.
- 6 Apply the finished Ceram C0 coating to the damaged area with a suitable paintbrush. Make sure the coating is of at least the minimum thickness: 400µm

If you are using a combination of different Ceram types (e.g. C2+C1), please consult the manufacturer.

- 7 After repairing the damage, let the Ceram C0 completely dry. See "Hardening time".

Cleaning tools

Use a commercial solvent (acetone, alcohol or methyl ethyl ketone) to clean your tools immediately after use. Once the material has dried, it can only be removed by abrasion.

Storage

Store at temperatures between 10°C and 32°C, slight deviations during transport are acceptable. The containers can be stored unopened for 12 months.

Safety precautions

Before using any products, read the material DIN safety data sheet (MSDS) or the safety regulations regarding them. Observe all applicable safety regulations when working in enclosed rooms.



Protective & Marine Coatings

DURA-PLATE® 235 MULTI-PURPOSE EPOXY

PART A
PART B

B67-235
B67V235

SERIES COLORS
HARDENER

Revised 6/11

PRODUCT INFORMATION

4.67

PRODUCT DESCRIPTION

Dura-Plate 235 Multi-Purpose Epoxy is a modified epoxy phenalkamine, formulated specifically for immersion and atmospheric service in marine and industrial environments. Dura-Plate 235 provides exceptional performance in corrosive environment, and can be applied at temperatures as low as 0°F (-18°C).

- Self-priming
- Low temperature application, 0°F (-18°C)
- Surface tolerant - damp surfaces
- Provides salt water and fresh water immersion resistance
- Approved as a primer per MIL-PRF-23236, Type V, Class 7, Grade C
- Outstanding application properties

PRODUCT CHARACTERISTICS

Finish:	Semi-Gloss
Color:	Wide range of colors available
Volume Solids:	68% ± 2%, mixed
Weight Solids:	79% ± 2%, mixed
VOC (EPA Method 24):	Unreduced: <280 g/L; 2.33 lb/gal Reduced 10%: <327 g/L; 2.72 lb/gal
Mix Ratio:	4:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	6.0 (150)	12.0 (300)
Dry mils (microns)	4.0* (100)	8.0* (200)
~Coverage sq ft/gal (m ² /L)	136 (3.3)	272 (6.6)
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil / 25 microns dft	1088 (26.6)	

*See Performance Tips section

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 6.0 mils wet (150 microns):

	@ 0°F/-18°C	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 120°F/49°C
To touch:	18 hours	3.5 hours	2 hours	20 minutes
To handle:	36 hours	12 hours	3.5 hours	40 minutes
To recoat:				
minimum:	36 hours	12 hours	3.5 hours	40 minutes
maximum:	6 months	6 months	6 months	6 months
Cure to service:	30 days	14 days	7 days	3 days

*If maximum recoat time is exceeded, abrade surface before recoating.
Drying time is temperature, humidity, and film thickness dependent.*

Pot Life:	16 hours	8 hours	4 hours	1 hour
Sweat-in-time:	1 hour	30 minutes	15 minutes	5 minutes

Shelf Life:	Part A: 36 months, unopened Part B: 24 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C).
Flash Point:	116°F (47°C) PMCC, mixed
Reducer/Clean Up:	Reducer R7K104

RECOMMENDED USES

For use over prepared steel and masonry surfaces.

- Salt water and fresh water immersion resistance
- Ballast tanks, offshore and marine structures
- Bilges and wet void areas
- Above- and below- water hull areas
- Decks and superstructures
- Water and waste water tanks
- Acceptable for use with cathodic protection systems.
- Dura-Plate 235 Black meets or exceeds the performance criteria of C-200; SSPC Paint 16; and Mil-P-23236B(SH) Type I or IV Class 2
- Suitable for use in USDA inspected facilities
- Conforms to MPI # 101

PERFORMANCE CHARACTERISTICS

Substrate*: Steel

Surface Preparation*: SSPC-SP10/NACE 2

System Tested*:

2 cts. Dura-Plate 235 @ 5.0 mils (125 microns) dft/ct
*unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060 CS17 wheel, 1000 cycles, 1 kg load	65 mg loss
Adhesion	ASTM D4541	850 psi
Direct Impact Resistance	ASTM D2794	10 in lb
Dry Heat Resistance	ASTM D2485	250°F (121°C)
Moisture Condensation Resistance	ASTM D4585, 100°F (38°C), 2000 hours	Rating 10 per ASTM D610 for rusting; Rating 10 per ASTM D714 for blistering
Pencil Hardness	ASTM D3363	H

IMMERSION (Ambient temperature)

- Salt Water.....Recommended
- Fresh Water.....Recommended
- Ballast Tank MixRecommended

Epoxy coatings may darken or yellow following application and curing.



Protective & Marine Coatings

DURA-PLATE® 235 MULTI-PURPOSE EPOXY

PART A **B67-235** **SERIES COLORS**
PART B **B67V235** **HARDENER**

PRODUCT INFORMATION

4.67

RECOMMENDED SYSTEMS		
	Dry Film Thickness / ct.	
	Mils	(Microns)
Steel, immersion or atmospheric service:		
2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, immersion service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. Dura-Plate UHS	10.0-12.0	(250-300)
Steel, immersion service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. TarGuard Coal Tar Epoxy	8.0-16.0	(200-400)
Steel, immersion service:		
2 cts. Dura-Plate 235	4.0-8.0	(100-200)
2 cts. SeaGuard Anti-Foulant (refer to respective data pages for coverage)		
Steel, atmospheric service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. Macropoxy 646	5.0-10.0	(125-250)
Steel, atmospheric service:		
1 ct. Zinc-Clad II Plus	3.0-5.0	(75-125)
1-2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, atmospheric service:		
1 ct. Zinc-Clad IV	3.0-5.0	(75-125)
1-2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, atmospheric service:		
1 ct. Corothane I GalvaPac Zinc Primer	3.0-4.0	(75-100)
1-2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, atmospheric service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. Acrolon 218 HS	3.0-6.0	(75-150)
or Hi-Solids Polyurethane	3.0-5.0	(75-125)
Concrete/Masonry, immersion service:		
1 ct. Kem Cati-Coat HS Epoxy Filler/Sealer as required to fill voids and provide a continuous substrate	10.0-20.0	(250-500)
2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Galvanized, atmospheric service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)

Steel-Seam FT910 - as required for filling pits, and transitioning sharp edges, weld seams, etc...

The systems listed above are representative of the product's use, other systems may be appropriate.

DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel:

Atmospheric: SSPC-SP2 or SSPC-SP12/NACE 5, WJ-4
Immersion: SSPC-SP10, 2 mil (50 micron) profile or SSPC-SP-12/NACE 5, WJ-2

Concrete & Masonry:

Atmospheric: SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3

Immersion: SSPC-SP13/NACE 6-4.3.1 or 4.3.2, or ICRI No. 310.2, CSP1-3

Galvanized, atmospheric: SSPC-SP1

Surface Preparation Standards

Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal	Sa 3	Sa 3	SP 5	1
Near White Metal	Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast	Sa 2	Sa 2	SP 6	3
Brush-Off Blast	Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	C St 2	C St 2	SP 2	-
Pitted & Rusty	D St 2	D St 2	SP 2	-
Rusted	C St 3	C St 3	SP 3	-
Pitted & Rusty	D St 3	D St 3	SP 3	-

TINTING

Tint Part A with Maxitones only. Mill White tints at 150%. Ultradeep Base tints at 100%. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

APPLICATION CONDITIONS

Temperature: 0°F (-18°C) minimum, 120°F (49°C) maximum (air and surface)

At least 5°F (2.8°C) above dew point

Material should be at least 40°F (4.5°C) for optimal performance.

Relative humidity: 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:

Part A: 1 gallon (3.78L) and 4 gallons (15.1L) in a 5 gallon (18.9L) container

Part B: 1 quart (0.94L) and 1 gallon (3.78L)

Weight: 11.3 ± 0.2 lb/gal ; 1.35 Kg/L, mixed may vary with color

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.



Protective & Marine Coatings

DURA-PLATE® 235 MULTI-PURPOSE EPOXY

PART A **B67-235** **SERIES COLORS**
PART B **B67V235** **HARDENER**

Revised 6/11

APPLICATION BULLETIN

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SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel, Immersion Service:

Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Near White Metal Blast Cleaning per SSPC-SP10/NACE 2 or SSPC-SP12/NACE 5. For SSPC-SP10/NACE 2, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). For SSPC-SP12/NACE No. 5, all surfaces to be coated shall be cleaned in accordance with WJ-2. Pre-existing profile should be approximately 2 mils (50 microns). Light rust bloom is allowed. Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned.

Iron & Steel, Atmospheric Service:

Minimum surface preparation is Hand Tool Clean per SSPC-SP2 or SSPC-SP12/NACE 5. For surfaces prepared by SSPC-SP2, first remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6/NACE 3, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). For surfaces prepared by SSPC-SP12/NACE No. 5, all surfaces shall be cleaned in accordance with WJ-4. Pre-existing profile should be approximately 2 mils (50 microns). Prime any bare steel the same day as it is cleaned.

Galvanized Steel

Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1 (recommended solvent is VM&P Naphtha). When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Concrete and Masonry

For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F (24°C). Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910.

Concrete, Immersion Service:

For surface preparation, refer to SSPC-SP13/NACE 6, Section 4.3.1 or 1.3.2 or ICRI No. 310.2, CSP 1-3.

Follow the standard methods listed below when applicable:

ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
SSPC-SP 13/Nace 6 Surface Preparation of Concrete.
ICRI No. 310.2 Concrete Surface Preparation.

Surface Preparation Standards

Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal	Sa 3	Sa 3	SP 5	1
Near White Metal	Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast	Sa 2	Sa 2	SP 6	3
Brush-Off Blast	Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	C St 2	C St 2	SP 2	-
Pitted & Rusted	D St 2	D St 2	SP 2	-
Rusted	C St 3	C St 3	SP 3	-
Power Tool Cleaning	Pitted & Rusted D St 3	D St 3	SP 3	-

APPLICATION CONDITIONS

Temperature: 0°F (-18°C) minimum, 120°F (49°C) maximum (air and surface)
At least 5°F (2.8°C) above dew point

Material should be at least 40°F (4.5°C) for optimal performance.

Relative humidity: 85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer/Clean UpReducer R7K104

Airless Spray

Unit.....30:1 Pump
Pressure.....2400 - 2800 psi
Hose.....1/4" - 3/8" ID
Tip0.015" - .019"
Filter60 mesh
Reduction.....As needed, up to 10% by volume

Conventional Spray

GunDeVilbiss MBC-510
Fluid TipE
Air Nozzle.....704
Atomization Pressure.....60-65 psi
Fluid Pressure.....5-15 psi
Reduction.....As needed, up to 10% by volume

Brush

Brush.....Natural Bristle
Reduction.....Not recommended

Roller

Cover3/8" woven with solvent resistant core
Reduction.....Not recommended

If specific application equipment is not listed above, equivalent equipment may be substituted.



Protective & Marine Coatings

DURA-PLATE® 235 MULTI-PURPOSE EPOXY

PART A B67-235
PART B B67V235

SERIES COLORS
HARDENER

APPLICATION BULLETIN

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APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly using low speed power agitation. Make certain no pigment remains on the bottom of the can. Then combine 4 parts by volume of Part A with 1 part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated prior to application. Re-stir before using.

If reducer solvent is used, add only after both components have been thoroughly mixed, after sweat-in.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	6.0 (150)	12.0 (300)
Dry mils (microns)	4.0* (100)	8.0* (200)
~Coverage sq ft/gal (m ² /L)	136 (3.3)	272 (6.6)
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil / 25 microns dft	1088 (26.6)	

*See Performance Tips section

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 6.0 mils wet (150 microns):

	@ 0°F/-18°C	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 120°F/49°C
To touch:	18 hours	3.5 hours	2 hours	20 minutes
To handle:	36 hours	12 hours	3.5 hours	40 minutes
To recoat:				
minimum:	36 hours	12 hours	3.5 hours	40 minutes
maximum:	6 months	6 months	6 months	6 months
Cure to service:	30 days	14 days	7 days	3 days

If maximum recoat time is exceeded, abrade surface before recoating.
Drying time is temperature, humidity, and film thickness dependent.

Pot Life: 16 hours 8 hours 4 hours 1 hour
Sweat-in-time: 1 hour 30 minutes 15 minutes 5 minutes

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer R7K104. Clean tools immediately after use with Reducer R7K104. Follow manufacturer's safety recommendations when using any solvent.

DISCLAIMER

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PERFORMANCE TIPS

Stripe coat crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Insufficient ventilation, incomplete mixing, miscatalyzation, and external heaters may cause premature yellowing.

Excessive film build, poor ventilation, and cool temperatures may cause solvent entrapment and premature coating failure.

For Immersion Service: (if required) Holiday test in accordance with ASTM D5162 for steel, or ASTM D4787 for concrete.

Do not mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer R7K104.

Please contact your Sherwin-Williams Representative for recommendations for immersion service of tinted material.

When coating over aluminum and galvanizing, recommended dft is 2-4 mils (50-100 microns).

Refer to Product Information sheet for additional performance characteristics and properties.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

WARRANTY

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AT-XP® High-Strength Acrylic Adhesive

Formulated for high-strength anchorage of threaded rod and rebar into cracked and uncracked concrete and masonry under a wide range of conditions, AT-XP adhesive dispenses easily in cold or warm environments and in below-freezing temperatures with no need to warm the cartridge. When mixed properly, this low-odor formula is a dark teal color for easy post-installation identification.

Features

- Passed the demanding ICC-ES AC308 adverse-condition tests pertaining to reduced and elevated temperatures and long-term sustained loads
- Tested per ACI 355.4 and AC308
- Code listed under the IBC/IRC for cracked and uncracked concrete per IAPMO UES ER-263 and City of L.A. RR25960
- Code listed under the IBC/IRC for masonry per IAPMO UES ER-281 and City of L.A. RR25966
- AT-XP is code listed for installation with the Speed Clean™ DXS system without any further cleaning (AT-XP: IAPMO-UES ER-263)
- 10:1 two-component high-strength, acrylic-based anchoring adhesive
- Suitable for use under static and seismic loading conditions in cracked and uncracked concrete as well as masonry
- Easy hole-cleaning procedure — no power-brushing required
- Suitable for use in dry or water-saturated concrete
- For best results, store between 14°F (–10°C) and 80°F (27°C)
- Cures in substrate temperatures as low as 14°F (–10°C) in 24 hours or less
- Available in 9.4 oz., 12.5 oz. and 30 oz. cartridges for application versatility
- Volatile Organic Compound (VOC) — 30 g/L
- Manufactured in the USA using global materials

Applications

- Threaded rod anchoring and rebar doweling into concrete and masonry
- Suitable for horizontal, vertical and overhead applications

Codes

IAPMO UES ER-263 (concrete); IAPMO UES ER-281 (masonry); City of L.A. RR25960 (concrete), RR25966 (masonry); FL-16230.1; NSF/ANSI Standard 61 (43.2 in.³/1,000 gal.); AASHTO M-235 and ASTM C881 (Type I and IV, Grade 3, Class C — except AT-XP is a non-epoxy formulated for fast cure time)

Chemical Resistance

See pp. 252–253

Installation and Application Instructions

(See also pp. 100–105)

- Surfaces to receive adhesive must be clean.
- Base material temperature must be 14°F or above at the time of installation. For best results, material should be 14°F (–10°C) to 80°F (27°C) at time of application.
- To warm cold material, store cartridges in a warm, uniformly heated area or storage container. Do not immerse cartridges in water or use microwave to facilitate warming.
- Mixed material in nozzle can harden in 3–4 minutes at temperatures of 70°F (21°C) and above.



AT-XP Adhesive

Suggested Specifications

See strongtie.com for more information.

AT-XP® High-Strength Acrylic Adhesive

AT-XP Adhesive Cartridge System

Model No.	Capacity ounces (cubic in.)	Cartridge Type	Carton Qty.	Dispensing Tool	Mixing Nozzle
AT-XP10 ⁵	9.4 (16.9)	Coaxial	6	CDT10S	AMN19Q
AT-XP13 ⁴	12.5 (22.5)	Side-by-side	10	ADT813S	
AT-XP30 ⁴	30 (54)	Side-by-side	5	ADT30S ADTA30P or ADTA30CKT	

1. Cartridge estimation guidelines are available at strongtie.com/apps.
2. Detailed information on dispensing tools, mixing nozzles and other adhesive accessories is available at strongtie.com.
3. Use only Simpson Strong-Tie® mixing nozzles in accordance with Simpson Strong-Tie instructions. Modification or improper use of mixing nozzle may impair AT-XP adhesive performance.
4. One AMN19Q mixing nozzle and one nozzle extension are supplied with each cartridge.
5. Two AMN19Q mixing nozzles and two nozzle extensions are supplied with each cartridge.

Cure Schedule

Base Material Temperature		Gel Time (minutes)	Cure Time (hrs.)
°F	°C		
14	-10	30	24
32	0	15	8
50	10	7	3
68	20	4	1
86	30	1½	30 min.
100	38	1	20 min.

For water-saturated concrete, the cure times must be doubled.

Test Criteria

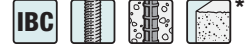
Anchors installed with AT-XP adhesive have been tested in accordance with ICC-ES *Acceptance Criteria for Post-Installed Adhesive Anchors in Masonry Elements (AC58)* and *Adhesive Anchors in Concrete Elements (AC308)*.

Property	Test Method	Result*
Consistency	ASTM C881	Passed, non-sag
Heat deflection	ASTM D648	253°F (123°C)
Bond strength (moist cure, 60°F)	ASTM C882	3,227 psi (2 days) 3,560 psi (14 days)
Water absorption	ASTM D570	0.10% (24 hours)
Compressive yield strength (cured 60°F)	ASTM D695	18,860 psi
Compressive modulus (cured 60°F)	ASTM D695	718,250 psi
Gel time	ASTM C881	5 minutes
Shrinkage coefficient	ASTM D2566	0.002 in./in.

*Material and curing conditions: 73 ± 2°F, unless otherwise noted.

AT-XP® Design Information — Concrete

AT-XP Installation Information and Additional Data
for Threaded Rod and Rebar in Normal-Weight Concrete¹



Adhesive Anchors

Characteristic	Symbol	Units	Nominal Anchor Diameter d_a (in.) / Rebar Size							
			3/8 / #3	1/2 / #4	5/8 / #5	3/4 / #6	7/8 / #7	1 / #8	1 1/4 / #10	
Installation Information										
Drill Bit Diameter for Threaded Rod	d_{hole}	in.	7/16	9/16	1 1/16	1 3/16	1	1 1/8	1 3/8	
Drill Bit Diameter for Rebar	d_{hole}	in.	1/2	5/8	3/4	7/8	1	1 1/8	1 3/8	
Maximum Tightening Torque	T_{inst}	ft.-lb.	10	20	30	45	60	80	125	
Permitted Embedment Depth Range ²	Minimum	h_{ef}	in.	2 3/8	2 3/4	3 1/8	3 1/2	3 3/4	4	5
	Maximum	h_{ef}	in.	7 1/2	10	12 1/2	15	17 1/2	20	25
Minimum Concrete Thickness	h_{min}	in.	$h_{ef} + 5d_{hole}$							
Critical Edge Distance ²	c_{ac}	in.	See footnote 2							
Minimum Edge Distance	c_{min}	in.	1 3/4						2 3/4	
Minimum Anchor Spacing	s_{min}	in.	3						6	

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.

2. $c_{ac} = h_{ef} (\tau_{k,uncr} / 1,160)^{0.4} \times [3.1 - 0.7(h/h_{ef})]$, where:

$$[h/h_{ef}] \leq 2.4$$

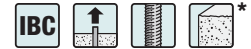
$\tau_{k,uncr}$ = the characteristic bond strength in uncracked concrete, given in the tables that follow $\leq k_{uncr} ((h_{ef} \times f'_c)^{0.5} / (\pi \times d_a))$

h = the member thickness (inches)

h_{ef} = the embedment depth (inches)

* See p. 13 for an explanation of the load table icons.

AT-XP® Design Information — Concrete



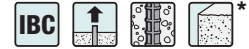
AT-XP Tension Strength Design Data for Threaded Rod in Normal-Weight Concrete¹

Characteristic		Symbol	Units	Nominal Anchor Diameter d_a (in.)							
				3/8	1/2	5/8	3/4	7/8	1	1 1/4	
Steel Strength in Tension											
Threaded Rod	Minimum Tensile Stress Area	A_{se}	in. ²	0.078	0.142	0.226	0.334	0.462	0.606	0.969	
	Tension Resistance of Steel — ASTM F1554, Grade 36	N_{sa}	lb.	4,525	8,235	13,110	19,370	26,795	35,150	56,200	
	Tension Resistance of Steel — ASTM A193, Grade B7			9,750	17,750	28,250	41,750	57,750	75,750	121,125	
	Tension Resistance of Steel — Type 410 Stainless (ASTM A193, Grade B6)			8,580	15,620	24,860	36,740	50,820	66,660	106,590	
	Tension Resistance of Steel — Type 304 and 316 Stainless (ASTM A193, Grade B8 and B8M)			4,445	8,095	12,880	19,040	26,335	34,540	55,235	
Strength Reduction Factor — Steel Failure	ϕ	—	0.75 ⁶								
Concrete Breakout Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)											
Effectiveness Factor — Uncracked Concrete		k_{uncr}	—	24							
Effectiveness Factor — Cracked Concrete		k_{cr}	—	17							
Strength Reduction Factor — Breakout Failure		ϕ	—	0.65 ⁸							
Bond Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)											
Uncracked Concrete ^{2,3,4}	Characteristic Bond Strength	$\tau_{k,uncr}$	psi	1,390	1,590	1,715	1,770	1,750	1,655	1,250	
	Permitted Embedment Depth Range	Minimum	h_{ef}	in.	2 3/8	2 3/4	3 1/8	3 1/2	3 3/4	4	5
		Maximum			7 1/2	10	12 1/2	15	17 1/2	20	25
Cracked Concrete ^{2,3,4}	Characteristic Bond Strength ^{9,10,11}	$\tau_{k,cr}$	psi	1,085	1,035	980	950	815	800	700	
	Permitted Embedment Depth Range	Minimum	h_{ef}	in.	3	3	3 1/8	3 1/2	3 3/4	4	5
		Maximum			7 1/2	10	12 1/2	15	17 1/2	20	25
Bond Strength in Tension — Bond Strength Reduction Factors for Continuous Special Inspection											
Strength Reduction Factor — Dry Concrete		ϕ_{dry}	—	0.65 ⁷					0.55 ⁷		
Strength Reduction Factor — Water-Saturated Concrete		ϕ_{sat}	—	0.45 ⁷							
Additional Factor for Water-Saturated Concrete		K_{sat}	—	0.54 ⁵			0.77 ⁵		0.96 ⁵		
Bond Strength in Tension — Bond Strength Reduction Factors for Periodic Special Inspection											
Strength Reduction Factor — Dry Concrete		ϕ_{dry}	—	0.55 ⁷					0.45 ⁷		
Strength Reduction Factor — Water-Saturated Concrete		ϕ_{sat}	—	0.45 ⁷							
Additional Factor for Water-Saturated Concrete		K_{sat}	—	0.46 ⁵			0.65 ⁵		0.81 ⁵		

- The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
- Temperature Range: Maximum short-term temperature of 180°F. Maximum long-term temperature of 110°F.
- Short-term concrete temperatures are those that occur over short intervals (diurnal cycling).
- Long-term concrete temperatures are constant temperatures over a significant time period.
- In water-saturated concrete, multiply $\tau_{k,uncr}$ and $\tau_{k,cr}$ by K_{sat} .
- The value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition B are met. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition A are met, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ . If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values for 1/2", 5/8", 3/4" and 1" anchors must be multiplied by $\alpha_{N,seis} = 0.85$.
- For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values for 1 1/4" anchors must be multiplied by $\alpha_{N,seis} = 0.75$.
- For anchors installed in regions assigned to Seismic Design Category C, D, E or F, the bond strength values for 7/8" anchors must be multiplied by $\alpha_{N,seis} = 0.59$.

* See p. 13 for an explanation of the load table icons.

AT-XP® Design Information — Concrete



AT-XP Tension Strength Design Data for Rebar in Normal-Weight Concrete¹

Adhesive Anchors

Characteristic		Symbol	Units	Rebar Size							
				#3	#4	#5	#6	#7	#8	#10	
Steel Strength in Tension											
Rebar	Minimum Tensile Stress Area	A_{se}	in. ²	0.11	0.2	0.31	0.44	0.6	0.79	1.27	
	Tension Resistance of Steel — Rebar (ASTM A615 Grade 60)	N_{sa}	lb.	9,900	18,000	27,900	39,600	54,000	71,100	114,300	
	Tension Resistance of Steel — Rebar (ASTM A706 Grade 60)			8,800	16,000	24,800	35,200	48,000	63,200	101,600	
	Strength Reduction Factor — Steel Failure	ϕ	—	0.75 ⁶							
Concrete Breakout Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)											
Effectiveness Factor — Uncracked Concrete		k_{uncr}	—	24							
Effectiveness Factor — Cracked Concrete		k_{cr}	—	17							
Strength Reduction Factor — Breakout Failure		ϕ	—	0.65 ⁸							
Bond Strength in Tension (2,500 psi ≤ f'_c ≤ 8,000 psi)											
Uncracked Concrete ^{2,3,4}	Characteristic Bond Strength		$\tau_{k,uncr}$	psi	1,010	990	970	955	935	915	875
	Permitted Embedment Depth Range	Minimum	h_{ef}	in.	2 ³ / ₈	2 ³ / ₄	3 ¹ / ₈	3 ¹ / ₂	3 ³ / ₄	4	5
		Maximum			7 ¹ / ₂	10	12 ¹ / ₂	15	17 ¹ / ₂	20	25
Cracked Concrete ^{2,3,4}	Characteristic Bond Strength		$\tau_{k,cr}$	psi	340	770	780	790	795	795	820
	Permitted Embedment Depth Range	Minimum	h_{ef}	in.	3	3	3 ¹ / ₈	3 ¹ / ₂	3 ³ / ₄	4	5
		Maximum			7 ¹ / ₂	10	12 ¹ / ₂	15	17 ¹ / ₂	20	25
Bond Strength in Tension — Bond Strength Reduction Factors for Continuous Special Inspection											
Strength Reduction Factor — Dry Concrete		ϕ_{dry}	—	0.65 ⁷					0.55 ⁷		
Strength Reduction Factor — Water-Saturated Concrete		ϕ_{sat}	—	0.45 ⁷							
Additional Factor for Water-Saturated Concrete		K_{sat}	—	0.54 ⁵			0.77 ⁵		0.96 ⁵		
Bond Strength in Tension — Bond Strength Reduction Factors for Periodic Special Inspection											
Strength Reduction Factor — Dry Concrete		ϕ_{dry}	—	0.55 ⁷					0.45 ⁷		
Strength Reduction Factor — Water-Saturated Concrete		ϕ_{sat}	—	0.45 ⁷							
Additional Factor for Water-Saturated Concrete		K_{sat}	—	0.46 ⁵			0.65 ⁵		0.81 ⁵		

- The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
- Temperature Range: Maximum short-term temperature of 180°F. Maximum long-term temperature of 110°F.
- Short-term concrete temperatures are those that occur over short intervals (diurnal cycling).
- Long-term concrete temperatures are constant temperatures over a significant time period.
- In water-saturated concrete, multiply $\tau_{k,uncr}$ and $\tau_{k,cr}$ by K_{sat} .
- The value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .

- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition B are met. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition B are met. If the load combinations of ACI 318 Section 9.2 are used and the requirements of ACI 318-11 D.4.3 (c) for Condition A are met, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ . If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .

* See p. 13 for an explanation of the load table icons.

AT-XP® Design Information — Concrete



AT-XP Shear Strength Design Data for Threaded Rod in Normal-Weight Concrete¹

Characteristic		Symbol	Units	Nominal Anchor Diameter (in.)						
				3/8	1/2	5/8	3/4	7/8	1	1 1/4
Steel Strength in Shear										
Threaded Rod	Minimum Shear Stress Area	A_{se}	in. ²	0.078	0.142	0.226	0.334	0.462	0.606	0.969
	Shear Resistance of Steel — ASTM F1554, Grade 36	V_{sa}	lb.	2,260	4,940	7,865	11,625	16,080	21,090	33,720
	Shear Resistance of Steel — ASTM A193, Grade B7			4,875	10,650	16,950	25,050	34,650	45,450	72,675
	Shear Resistance of Steel — Type 410 Stainless (ASTM A193, Grade B6)			4,290	9,370	14,910	22,040	30,490	40,000	63,955
	Shear Resistance of Steel — Type 304 and 316 Stainless (ASTM A193, Grade B8 and B8M)			2,225	4,855	7,730	11,425	15,800	20,725	33,140
	Reduction for Seismic Shear — ASTM F1554, Grade 36	$\alpha_{V,seis}$ ⁵	—	0.85						
	Reduction for Seismic Shear — ASTM A193, Grade B7			0.85						
	Reduction for Seismic Shear — Type 410 Stainless (ASTM A193, Grade B6)	$\alpha_{V,seis}$ ⁵	—	0.85	0.75				0.85	
	Reduction for Seismic Shear — Type 304 and 316 Stainless (ASTM A193, Grade B8 and B8M)			0.85	0.75				0.85	
	Strength Reduction Factor — Steel Failure	ϕ	—	0.65 ²						
Concrete Breakout Strength in Shear										
Diameter of Anchor	d_a	in.	0.375	0.5	0.625	0.75	0.875	1	1.25	
Load-Bearing Length of Anchor in Shear	ℓ_e	in.	h_{ef}							
Strength Reduction Factor — Breakout Failure	ϕ	—	0.70 ³							
Concrete Pryout Strength in Shear										
Coefficient for Pryout Strength	k_{cp}	—	1.0 for $h_{ef} < 2.50"$; 2.0 for $h_{ef} \geq 2.50"$							
Strength Reduction Factor — Pryout Failure	ϕ	—	0.70 ⁴							

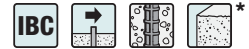
- The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
- The value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition B are met. If the load combinations of ACI 318 Section 9.2 are used and the requirements of ACI 318-11 D.4.3 (c) for Condition A are met, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ . If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition B are met. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The values of V_{sa} are applicable for both cracked concrete and uncracked concrete. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, V_{sa} must be multiplied by $\alpha_{V,seis}$ for the corresponding anchor steel type.

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Adhesive Anchors

* See p. 13 for an explanation of the load table icons.

AT-XP® Design Information — Concrete



AT-XP Shear Strength Design Data for Rebar in Normal-Weight Concrete¹

Adhesive Anchors

Characteristic		Symbol	Units	Rebar Size						
				#3	#4	#5	#6	#7	#8	#10
Steel Strength in Shear										
Rebar	Minimum Shear Stress Area	A_{se}	in. ²	0.11	0.2	0.31	0.44	0.6	0.79	1.27
	Shear Resistance of Steel — Rebar (ASTM A615 Grade 60)	V_{sa}	lb.	4,950	10,800	16,740	23,760	32,400	42,660	68,580
	Shear Resistance of Steel — Rebar (ASTM A706 Grade 60)			4,400	9,600	14,880	21,120	28,800	37,920	60,960
	Reduction for Seismic Shear — Rebar (ASTM A615 Grade 60)	$\alpha_{V,seis}$ ⁵	—	0.56				0.80		
	Reduction for Seismic Shear — Rebar (ASTM A706 Grade 60)			0.56				0.80		
	Strength Reduction Factor — Steel Failure	ϕ	—	0.65 ²						
Concrete Breakout Strength in Shear										
Diameter of Anchor	d_a	in.	0.375	0.5	0.625	0.75	0.875	1	1.25	
Load-Bearing Length of Anchor in Shear	ℓ_e	in.	h_{ef}							
Strength Reduction Factor — Breakout Failure	ϕ	—	0.70 ³							
Concrete Pryout Strength in Shear										
Coefficient for Pryout Strength	k_{cp}	—	1.0 for $h_{ef} < 2.50"$; 2.0 for $h_{ef} \geq 2.50"$							
Strength Reduction Factor — Pryout Failure	ϕ	—	0.70 ⁴							

- The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 and ACI 318-11.
- The value of ϕ applies when the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition B are met. If the load combinations of ACI 318 Section 9.2 are used and the requirements of ACI 318-11 D.4.3 (c) for Condition A are met, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ . If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The value of ϕ applies when both the load combinations of ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3 or ACI 318-11 D.4.3 (c) for Condition B are met. If the load combinations of ACI 318 Appendix C are used, refer to ACI 318-11 D.4.4 to determine the appropriate value of ϕ .
- The values of V_{sa} are applicable for both cracked concrete and uncracked concrete. For anchors installed in regions assigned to Seismic Design Category C, D, E or F, V_{sa} must be multiplied by $\alpha_{V,seis}$ for the corresponding anchor steel type.

For additional load tables, visit strongtie.com/atxp.



Anchor Designer™ Software for ACI 318, ETAG and CSA

Simpson Strong-Tie® Anchor Designer software accurately analyzes existing design or suggests anchor solutions based on user-defined design elements in cracked and uncracked concrete conditions.

* See p. 13 for an explanation of the load table icons.

Adhesive Anchoring Installation Instructions

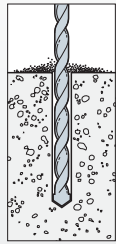


NOTE: Always check expiration date on product label. Do not use expired product.

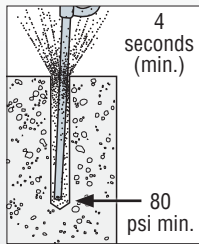


WARNING: When drilling and cleaning hole, use eye and lung protection. When installing adhesive, use eye and skin protection.

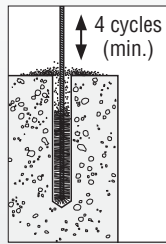
1A Hole Preparation — Horizontal, Vertical and Overhead Applications (SET-XP®, AT-XP®, ET-HP®, AT and SET)



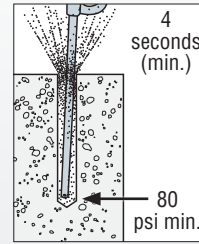
1. Drill.
Drill hole to specified diameter and depth.



2. Blow.
Remove dust from hole with oil-free compressed air for a minimum of four seconds. Compressed air nozzle must reach the bottom of the hole.



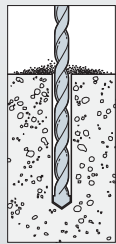
3. Brush.
Clean with a nylon brush for a minimum of four cycles. Brush should provide resistance to insertion. If no resistance is felt, the brush is worn and must be replaced.



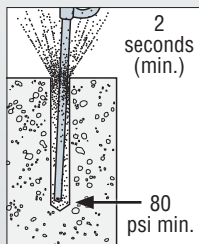
4. Blow.
Remove dust from hole with oil-free compressed air for a minimum of four seconds. Compressed air nozzle must reach the bottom of the hole.

Visit strongtie.com for proper brush part number.

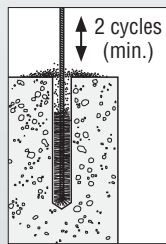
Hole Preparation — Horizontal, Vertical and Overhead Applications (SET-3G™)



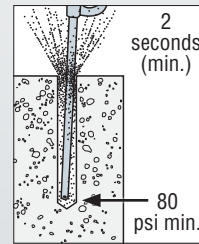
1. Drill.
Drill hole to specified diameter and depth.



2. Blow.
Remove dust from hole with oil-free compressed air for a minimum of two seconds. Compressed air nozzle must reach the bottom of the hole.



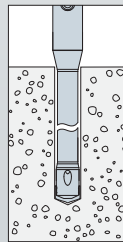
3. Brush.
Clean with a steel wire brush for a minimum of two cycles. Brush should provide resistance to insertion. If no resistance is felt, the brush is worn and must be replaced.



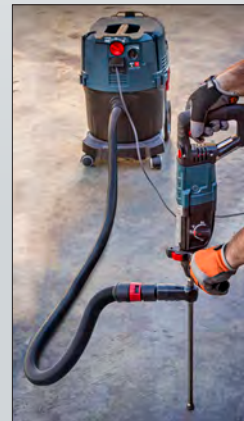
4. Blow.
Remove dust from hole with oil-free compressed air for a minimum of two seconds. Compressed air nozzle must reach the bottom of the hole.

Visit strongtie.com for proper brush part number.

1B Hole Preparation Vacuum Dust Extraction System with Bosch® / Simpson Strong-Tie® DXS Hollow Carbide Drill Bit — Horizontal, Vertical and Overhead Applications



1. Drill.
Drill hole to specified diameter and depth using a Bosch / Simpson Strong-Tie DXS hollow carbide drill bit and vacuum dust extraction system.



Bosch / Simpson Strong-Tie DXS drill bit used with the vacuum dust extraction system.

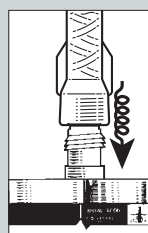
2 Cartridge Preparation

1. Check.

Check expiration date on product label. **Do not use expired product.** Product is usable until end of printed expiration month.

2. Open.

Open cartridge per package instructions.



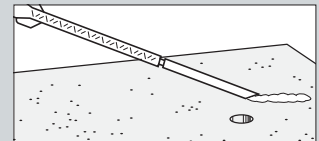
3. Attach.

Attach proper Simpson Strong-Tie® nozzle and extension to cartridge. Do not modify nozzle.



4. Insert.

Insert cartridge into dispensing tool.



5. Dispense.

Dispense adhesive to the side until properly mixed (uniform color).

Refer to strongtie.com for proper mixing nozzle and dispensing tool part number.

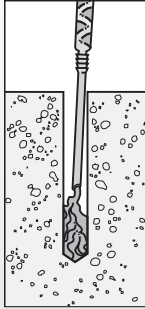
Adhesive Anchoring Installation Instructions

FOR SOLID BASE MATERIALS

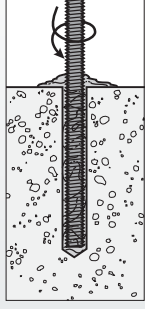
3A Filling the Hole — Vertical Anchorage

Prepare the hole per "Hole Preparation" instructions on product label.

Dry and Damp Holes:

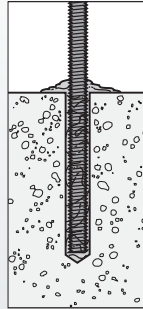


1. Fill.
Fill hole ½ to ¾ full, starting from bottom of hole to prevent air pockets. Withdraw nozzle as hole fills up.



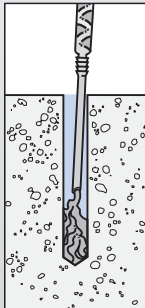
2. Insert.
Insert clean, oil-free anchor, turning slowly until the anchor contacts the bottom of the hole.

Threaded rod or rebar

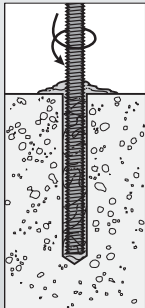


3. Do not disturb.
Do not disturb anchor until fully cured. (See cure schedule for specific adhesive.)

Water-Filled Holes:

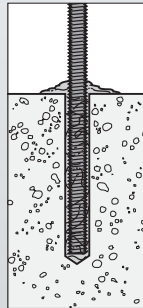


1. Fill.
Fill hole completely full, starting from bottom of hole to prevent water pockets. Withdraw nozzle as hole fills up.



2. Insert.
Insert clean, oil-free anchor, turning slowly until the anchor contacts the bottom of the hole.

Threaded rod or rebar



3. Do not disturb.
Do not disturb anchor until fully cured. (See cure schedule.)

Note: Nozzle extensions may be needed for deep holes.

Installation instructions continued on p. 102. →



SECTION 3 DRAWINGS

VERTICAL LOOP REACTOR SPECIFICATIONS

AERATION EQUIPMENT:

THE COMPLETE VLR AERATION EQUIPMENT SHALL CONSIST OF:
FOUR (4) COMPLETE ROTARY DISC AERATOR ASSEMBLIES
FOR TWO (2) NEW BASINS, AS SHOWN ON THE PLANS

THE ROTARY DISC AERATORS WILL BE DESIGNED FOR OPERATION AT A CONTROLLED RANGE IN THE LIQUID LEVEL WITH DISC IMMERSION OF 19.5" - 21.5" INCHES, THE OXYGEN TRANSFER RATE AND POWER REQUIREMENTS CAN BE VARIED WITH THE FLOW AND TREATMENT REQUIREMENTS.

AERATION REQUIREMENTS:

THE ROTARY AERATOR ASSEMBLIES TO BE FURNISHED AND INSTALLED IN THE VERTICAL LOOP REACTOR TANKS WILL DELIVER THE FOLLOWING REQUIRED QUANTITY OF OXYGEN AS DESCRIBED BELOW. THE OXYGEN VALUES ARE MEASURED AT STANDARD OPERATING REQUIREMENTS OF 20°C AND 760 mm Hg

OXYGEN DELIVERED AT MAX. DISC SUBMERSION OF 21.5" (LBS. O2/HR.)

# OF AERATORS	HP	RPM	VLR BASIN
4	30	52	78.00 O2/HR. (19 DISCS PER AERATOR)

AERATION DISCS:

A MINIMUM OF (76) DISCS WILL BE PROVIDED. THE DISCS WILL BE 5'-6" (66") DIAMETER, FABRICATED FOR A 1/2" THICK MOLDED PLASTIC COMPOUND RESISTANT TO ANY CORROSIVE ACTION OF THE MIXED LIQUOR BEING AERATED. A MULTIPLICITY OF OPENINGS WILL BE PROVIDED IN THE DISC TO CAUSE ENTRAINED AIR TO BE DISPENSED IN THE MIXED LIQUOR.

THE AERATION DISCS WILL BE FIRMLY ATTACHED TO THE SHAFTING BY MEANS OF A SHAFT LOCKING COLLAR. THIS SHAFT LOCKING COLLAR WILL BE AN INTEGRAL PART OF THE AERATION DISCS. TO ENABLE THE INDIVIDUAL DISCS TO BE ATTACHED, ADJUSTED, OR REMOVED FROM THE SHAFTING WITHOUT DISASSEMBLING THE SHAFTING, DISCS WILL BE SPLIT INTO HALF SECTIONS, HELD IN POSITION BY STAINLESS STEEL BOLTS AT THE SHAFT AND PERIPHERY. BOLTS WILL HAVE TWO (2) OVERSIZED WASHERS EACH.

AFTER TRIAL OPERATIONS, THE CONTRACTOR WILL ADJUST DISC DISTRIBUTION AS REQUIRED TO MEET THE SPECIFICATIONS AND THE TREATMENT PROCESS AS DETERMINED BY EVOQUA WT AND THE ENGINEER.

SHAFTING:

ROTOR SHAFTING WILL BE 6" OUTSIDE DIAMETER SOLID, SAE 1045 T&P MACHINE STEEL SHAFTING. SHAFT ENDS WILL BE TURNED DOWN AS SHOWN AND WILL BE CONCENTRIC "WITHIN 0.008" TOTAL INDICATOR READING.

THE SHAFTING WILL BE CAPABLE OF WITHSTANDING ALL DEAD, LIVE, AND RADIAL LOADS IMPOSED ON IT WITH A MAXIMUM ALLOWABLE DEFLECTION OF 0.15 INCHES PER 10 FT. OF SHAFT LENGTH.

EACH SHAFT SECTION WILL BE SUPPORTED BY SELF-ALIGNING, PRESSURE GREASE LUBRICATED, ROLLER BEARING PILLOW BLOCKS SET ON THE AERATOR SUPPORT FRAME.

BEARINGS:

EACH PILLOW BLOCK WILL HAVE DOUBLE ROW SPHERICAL ROLLER BEARINGS AND TAPERED ADAPTER SLEEVE MOUNTINGS. THE ADAPTER SLEEVE LOCK NUTS WILL BE EQUIPPED WITH SENSORS TO PROVIDE A VISUAL INDICATION WHEN THE BEARING HAS BEEN PROPERLY TIGHTENED TO THE SHAFT. BONDED ELASTOMERIC, SINGLE-LIP, SPRING LOADED CONTACT SEALS WILL BE PROVIDED TO INSURE POSITIVE SEALING AGAINST CONTAMINANTS. THE SEALS ARE DESIGNED FOR OPERATION IN A MOISTURE LADEN ENVIRONMENT AND WILL SEAL EFFECTIVELY, EVEN WITH UP TO +/- 1 DEGREE OF MISALIGNMENT. MINIMUM B-10 BEARING LIFE WILL BE 200,000 HOURS.

UPPER TURNING VANE ASSEMBLIES:

TURNING VANE ASSEMBLIES WILL BE AN INTEGRAL PART FOR DIRECTING THE FLOW OF THE VLR. TURNING VANE PLATES WILL BE 3/16" THK.

WEATHER PROTECTION:

WEATHER HOODS WITH SUPPORT STRUCTURES WILL BE PROVIDED TO PREVENT THE AERATION DISCS FROM ICING IN COLD WEATHER. THE HOODS WILL BE CONSTRUCTED OF 3/16" THICK FIBERGLASS WITH DIMENSIONS SUFFICIENT TO ASSURE CLEARANCE BETWEEN THE ROTATING AERATION DISC AND SHAFTING. THE HOODS WILL BE SUPPORTED BY THE AERATOR SUPPORT FRAME. HOLD DOWN LATCHES WILL BE PROVIDED TO PREVENT UPLIFT DUE TO WIND.

HOODS WILL BE HINGED AND OF SUFFICIENTLY LIGHT WEIGHT SUCH THAT INDIVIDUAL HOOD SECTIONS CAN BE RAISED MANUALLY. SUPPORT BARS WILL BE PROVIDED WITH SELF-LOCKING PINS AT EACH END, TO PROP THE HOOD IN A RAISED POSITION AND PREVENT UPLIFT DUE TO WIND. ALL ASSEMBLY HARDWARE SHALL BE STAINLESS STEEL.

RETAINER PLATES WILL BE AN INTEGRAL PART OF THE WEATHER HOODS AND WILL BE PROVIDED WITH 1/4" NEOPRENE SEALS TO PREVENT LIQUID FROM MOVING ALONG THE SHAFT TO THE BEARINGS.

EQUIPMENT FASTENERS: (VLR)

ALL EQUIPMENT FASTENERS WILL BE 304 STAINLESS STEEL.

EQUIPMENT ANCHORS: (VLR)

ALL EQUIPMENT ANCHORS WILL BE ADHESIVE TYPE 304 STAINLESS STEEL. COMPLETE WITH 304 STAINLESS STEEL HARDWARE. ANCHORS WILL BE OF AMPLE SIZE AND STRENGTH FOR THE PURPOSE INTENDED. ALL ANCHORS WILL BE SET BY THE GENERAL CONTRACTOR IN ACCORDANCE WITH THE MANUFACTURER'S STANDARD.

SURFACE PREPARATIONS:

1. IN ADDITION TO WELDS INDICATED ON DETAIL DRAWINGS, ALL JOINTS WILL BE SEALED WATER-TIGHT WITH 1/8" MINIMUM CONTINUOUS WELD.
2. ROUND SHARP CORNERS OF CUT OR SHEARED EDGES WITH ONE PASS OF A POWER GRINDER.
3. ALL SHARP WELDS AND BURRS WILL BE GROUND, FLUX AND SPATTER REMOVED.

PAINT NOTE:

1. BEARINGS TO REMAIN MANUFACTURERS' STANDARD.
2. DISCS TO REMAIN UNPAINTED.
3. GALVANIZED, STAINLESS STEEL AND ALL NON-FERROUS MATERIALS TO REMAIN UNPAINTED.
4. DRIVE WILL BE FURNISHED WITH MANUFACTURERS' STANDARD PAINT.
5. TOUCH-UP AND ALL ADDITIONAL COATS OF PAINT TO BE BY CONTRACTOR.
6. WEATHER HOOD SUPPORT CHANNELS WILL BE HOT DIP GALVANIZED. (ASTM A123)

SHAFTING PAINT NOTES:

1. 6" SHAFT TO BE BLAST CLEANED PER SSPC-SP10-63.
2. FOLLOWED BY ONE (2) SHOP COATS OF: SHERWIN-WILLIAMS DURA-PLATE 235 B67A235 HAZE GRAY TOTAL DFT (8.0-12.0 MILS DRY FILM THICKNESS)
3. ALL EXPOSED MACHINED SURFACES ON 6" SHAFT TO RECEIVE ONE (1) COAT OF: RUST VETO 344, 3.0 TO 4.5 MILS DRY FILM THICKNESS. SURFACES ARE NOT BE PREPARED BY BLAST CLEANING.

CUSTOMER NOTE:

EVOQUA WT WILL NOT FURNISH ANY ELECTRICAL CONTROLS, WIRING OF MOTORS OR CONTROLS, FLOOR PLATE, PIPING, VALVES, GROUT, LUBE LINES, BAFFLES, SPLASH PLATES, WEIRS, FIELD PAINT OR PAINTING OTHER THAN SPECIFIED IN THE CONTRACT.

EVOQUA WT IS NOT RESPONSIBLE FOR CONCRETE DESIGN BY OTHERS WHO WILL ALSO SIZE WALLS AND FOOTINGS TO SUIT LOCAL GROUND CONDITIONS. FOR DIMENSIONS NOT SHOWN, REFER TO ENGINEER'S DRAWINGS.

SUPERVISION OF ERECTION AND/OR INSPECTION SERVICE OF OUR FACTORY REPRESENTATIVE WILL BE FURNISHED IN ACCORDANCE WITH THE TERMS OF OUR CONTRACT WITH THE CUSTOMER.

CORRECTIONS OF MINOR MISFITS AND A REASONABLE AMOUNT OF CUTTING AND REAMING ARE CONSIDERED A PART OF ERECTION. ANY ERROR WHICH PREVENTS ASSEMBLY BY MODERATE USE OF DRIFT PINS, CUTTING AND WELDING, IS TO BE REPORTED AND APPROVAL OF CORRECTION OR CHANGE IS TO BE RECEIVED IN WRITING BEFORE PROCEEDING. FAILURE TO COMPLY WILL RELIEVE EVOQUA WT OF ALL OPERATIONAL AND MONETARY RESPONSIBILITY.

DO NOT INSTALL DISCS OR WEATHERHOODS UNTIL A EVOQUA WT FIELD SERVICE REPRESENTATIVE HAS INSPECTED AND APPROVED THE INSTALLATION.

ALL GROUT TO BE NON-SHRINK. USE A POUR TYPE GROUT WHERE SPECIFIED IN THE ASSEMBLY.

EVOQUA WT MATERIAL DESCRIPTIONS

CAST IRON

GENERAL PURPOSE HIGH STRENGTH GRAY IRON. CONFORMS TO ASTM A48, CLASS 40B. OPTIONAL TEST PER ASTM A-438. TENSILE STRENGTH (MINIMUM 1.2 IN. OR 30.5 MM DIA. TEST BAR BI= 40,000 PSI 9276 MPa). MAXIMUM HARDNESS TO BE 269 BHN.

STEEL

MILD CARBON H.R. STEEL PLATE, STRUCTURAL QUALITY. STANDARD AISI TOLERANCES. CHEMICAL ANALYSIS = CARBON .15%- .25%, MANGANESE .30%- .60%, PHOSPHORUS .04% MAXIMUM, SULPHUR .05% MAXIMUM.

STRUCTURAL STEEL

ALL ROLLED STRUCTURAL STEEL SHAPES WILL CONFORM TO ASTM A36. EXCEPT FOR WIDE FLANGE BEAMS WHICH WILL CONFORM TO ASTM A992.

BRONZE

HIGH LEADED TIN BRONZE SAND OR CONTINUOUS CAST CONFORMS TO ASTM B144 NO. 3B, 81%-85% COPPER, 6.25%-7.5% LEAD, 2%-4% ZINC. TENSILE STRENGTH 30,000 PSI MINIMUM SAE-660.

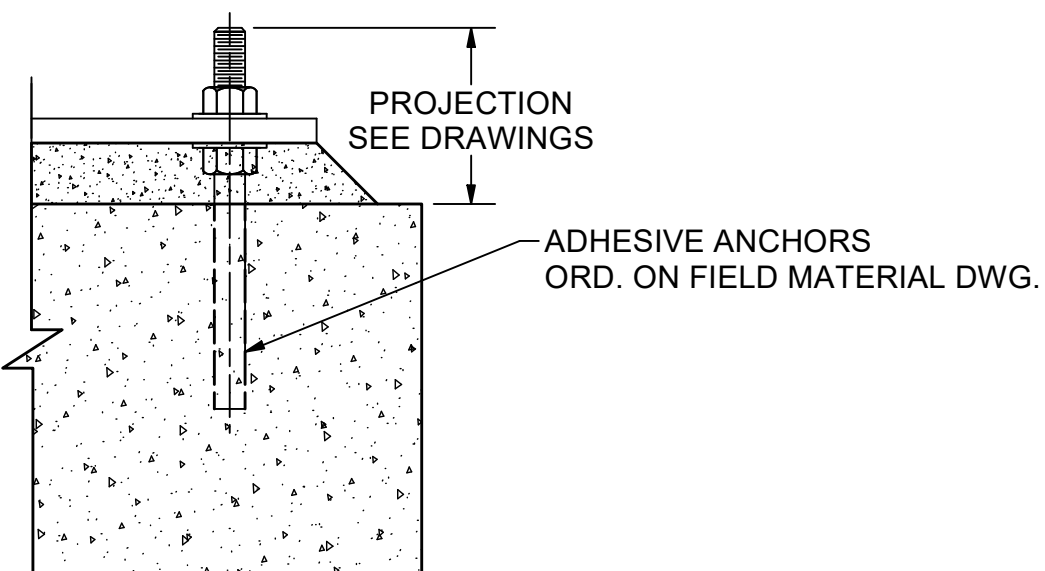
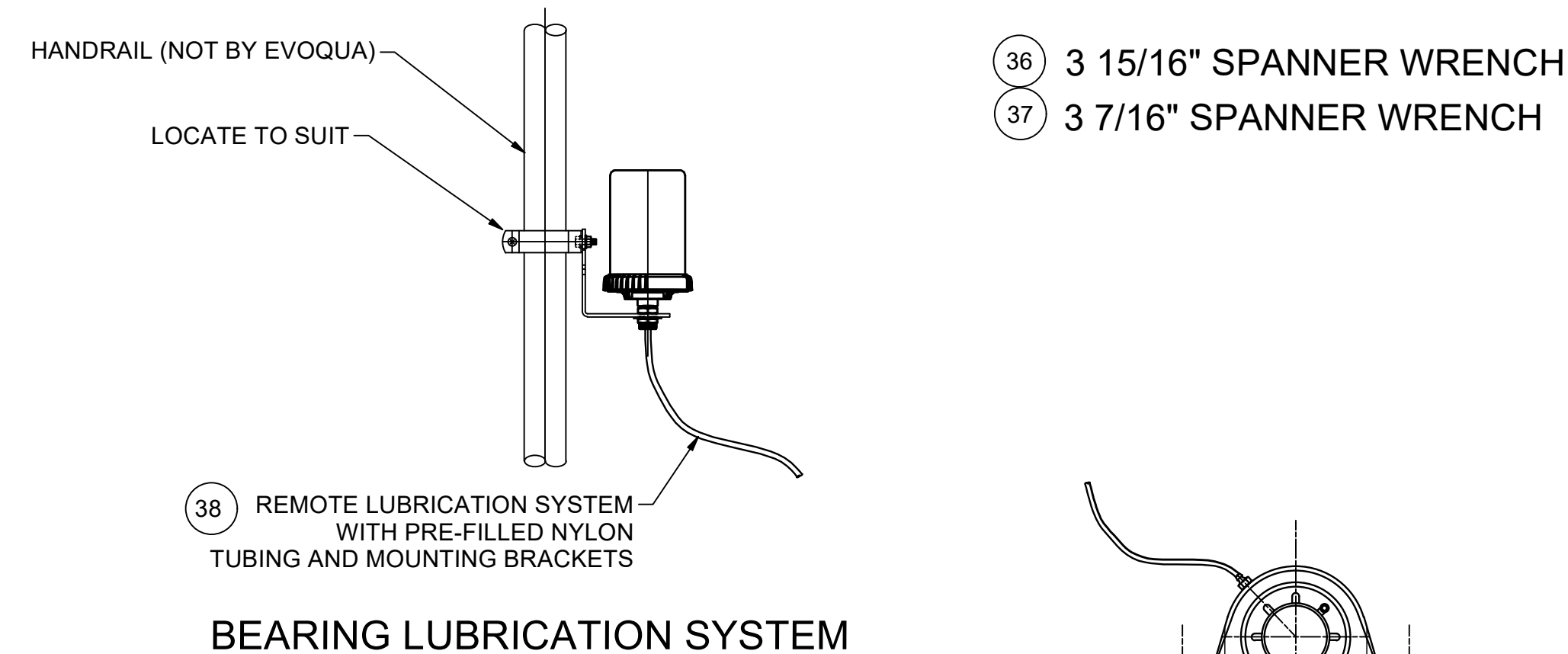
SMARTBNR LITE PROCESS CONTROL SYSTEM : FURNISHED BY EVOQUA WT.

INSTRUMENTS:

- ONE(1) DO PROBE
- ONE(1) ORP PROBE
- ONE(1) ANALYZER

TWO (2) WILCO SUBMERSIBLE MIXERS FOR ANAEROBIC TANK (FURNISHED BY EVOQUA WT): REFER GENERAL ARRANGEMENT DRAWING 453130-110

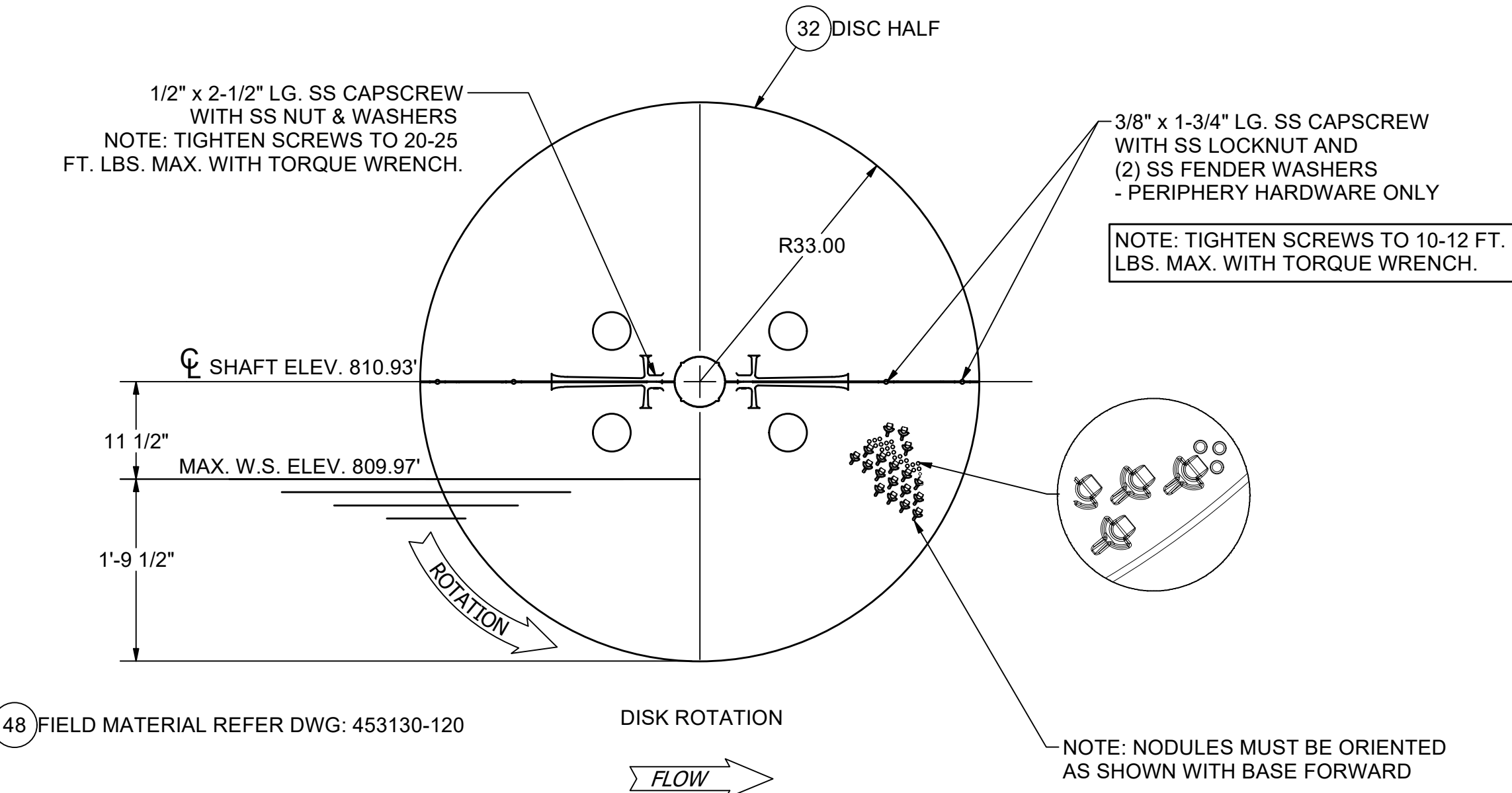
HANDRAIL & GRATING (NOT FURNISHED BY EVOQUA WT)



ANCHOR BOLTS & SHIMMING

COAT STAINLESS STEEL FASTENER THREADS WITH ANTI-SEIZE COMPOUND SUCH AS FEL PRO. C5A LOCKTITE OR EQUAL (NOT BY EVOQUA WT)

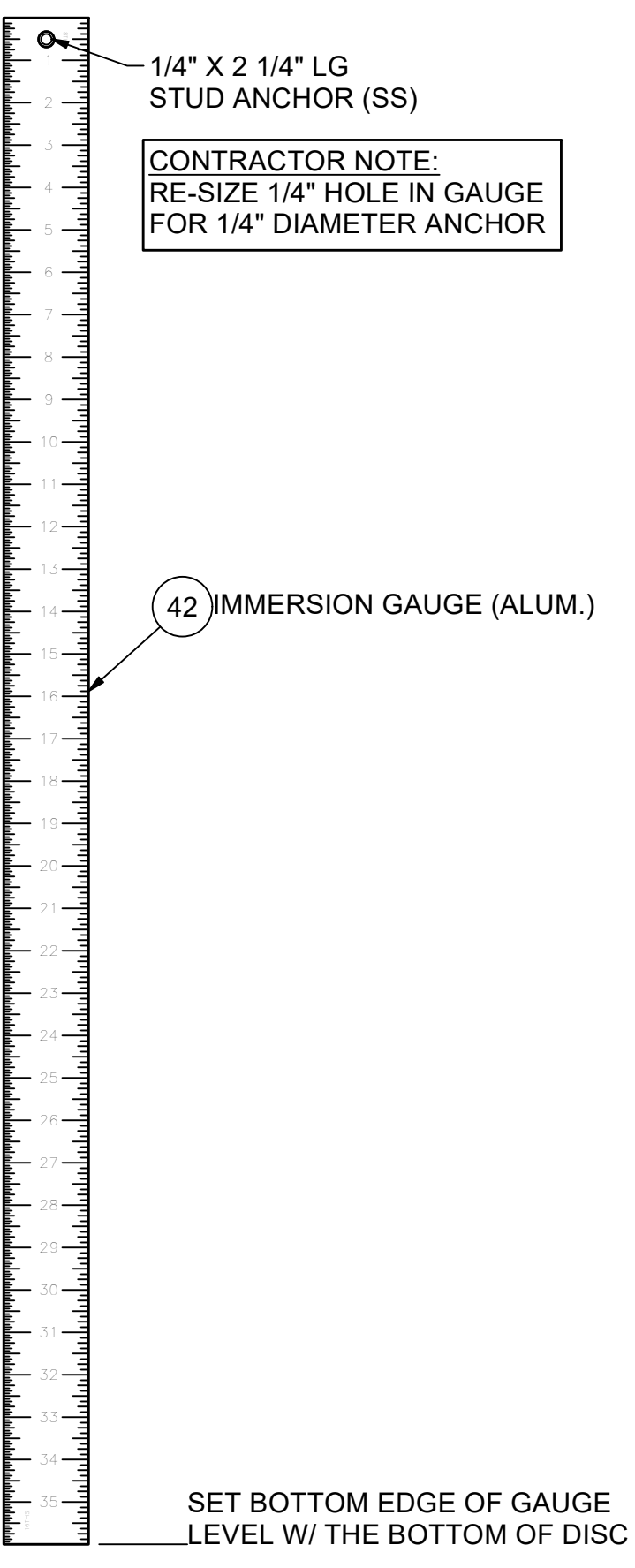
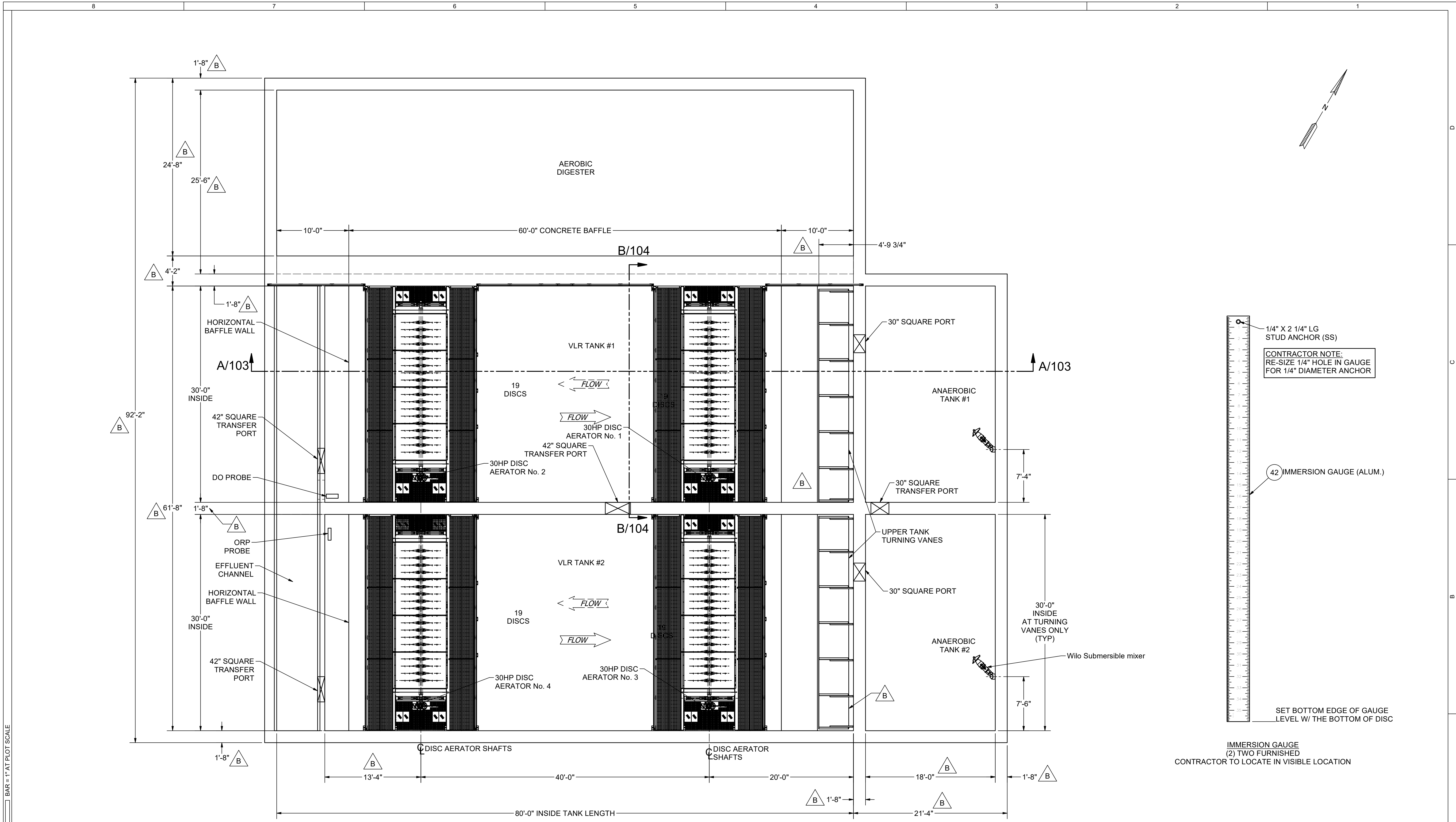
SIMPSON STRONG-TIE AT-XP @ HIGH STRENGTH ACRYLIC ADHESIVE ANCHORING SYSTEM
CONTRACTOR NOTE:
ADHESIVE CARTRIDGE FITS A STANDARD "CONTRACTOR QUALITY" CAULK GUN NOT SUPPLIED BY EVOQUA WT



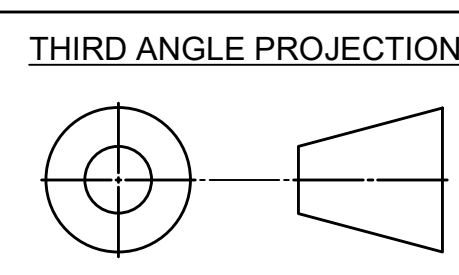
SECTION Z/103

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	B. KARTHI	2022-08-01	GENERAL ARRANGEMENT - SPECIFICATIONS (2) NEW VERTICAL LOOP REACTOR TANKS COMPLETE W/ (4) 30 HP DISC AERATOR ASSEMBLIES		
	R. RAJA	2022-08-02	CLIENT	CITY OF JEFFERSON JEFFERSON, GA	
	APPD BY:	DATE			
	J. KINNEY	2022-08-02			
	MGD BY:	SCALE			
	N/A	NTS			
<p>FOR RECORD ONLY</p>			<p>EVOQUA WATER TECHNOLOGIES WAUKESHA WI USA +1 262-547-0141</p>		
PROJ/PROD NUMBER	CODE	FILE/DRAWING NUMBER	SHEET	REV	
2033/001848	M-GA01	453130-101	1 OF 1	B	

B	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED AS PER CUSTOMER COMMENTS	2022-11-21	B. KARTHI	R. RAJA	R. VANSEL	
A	RELEASED FOR CONSTRUCTION	2022-08-01	B. KARTHI	R. RAJA	R. VANSEL	



VERTICAL LOOP REACTOR PLAN



CONTRACTOR NOTE:
 ALL HANDRAIL, GRATING AND MOUNTING HARDWARE (NOT FURNISHED BY EVOQUA WT)
 CONTRACTOR WILL BE REQUIRED TO FIELD DRILL AND/OR TAP HOLES FOR MOUNTING EQUIPMENT.
 SEE O&M MANUAL FOR REPAIRING GALVANIZING AFTER DRILLING.

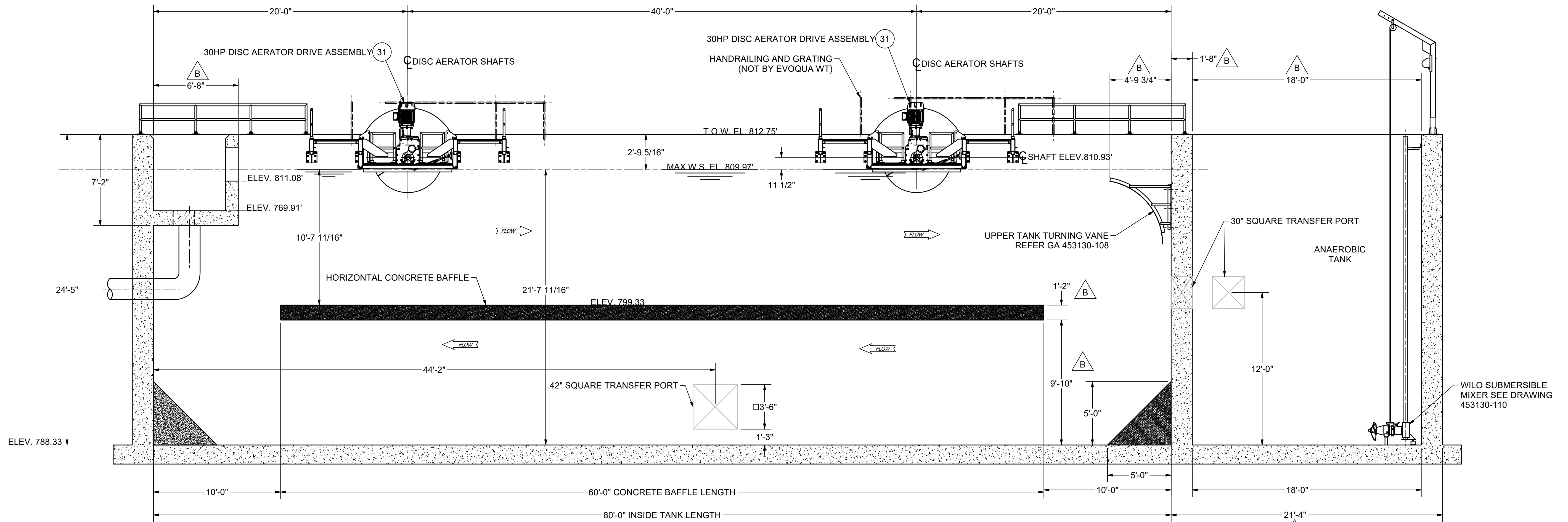
FOR RECORD ONLY

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DWN BY:	DATE:	TITLE:	GENERAL ARRANGEMENT - PLAN VIEW (2) NEW VERTICAL LOOP REACTOR TANKS COMPLETE W/ (4) 30HP DISC AERATOR ASSEMBLIES		
B.KARTHI	2022-08-01	CLIENT:	CITY OF JEFFERSON JEFFERSON, GA		
CKD BY:	DATE:				
R.RAJA	2022-08-02				
APPD BY:	DATE:				
R.VANSEL	2022-08-02				
MGD BY:	SCALE:				
J.KINNEY	1 : 75				
PART NUMBER:	PROJ/PROD NUMBER:	CODE:	FILE/DRAWING NUMBER:	SHEET:	REV:
N/A	2033/001848	M-GA01	453130-102	1 OF 1	B

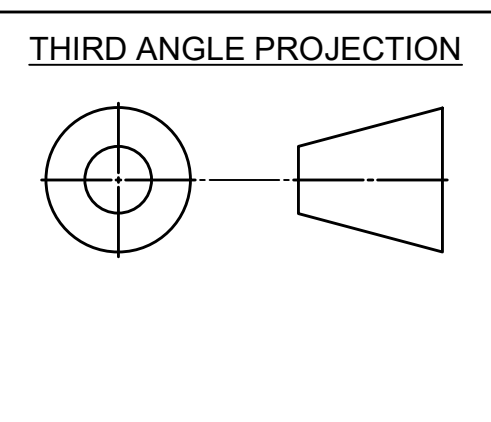
REV	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED AS PER CUSTOMER COMMENTS	2022-11-21	B.KARTHI	R.RAJA	R.VANSEL	
A	SUBMITTING FOR APPROVAL	2022-08-01	B.KARTHI	R.RAJA	R.VANSEL	

STD:22x34_D_v4.3
 BAR = 1" AT PLOT SCALE



SECTION VIEW A/102

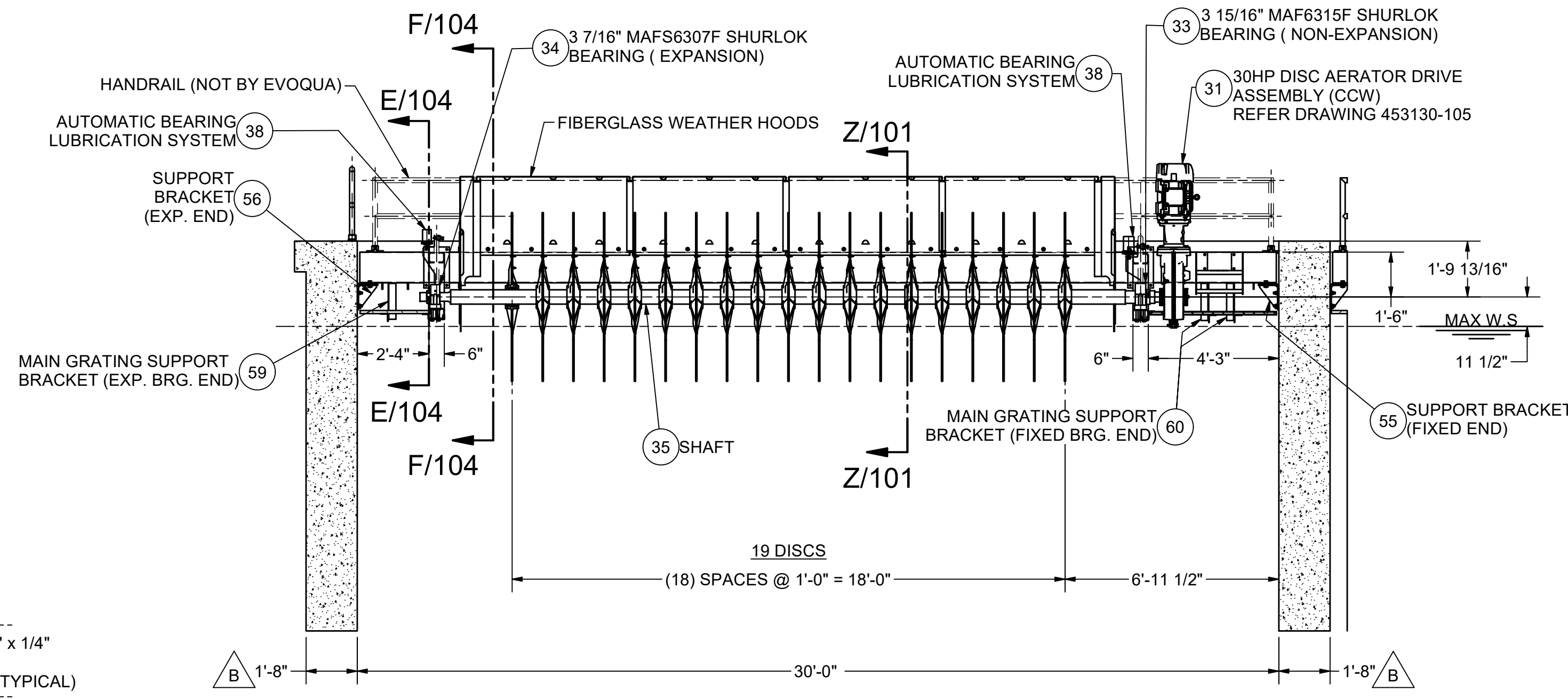
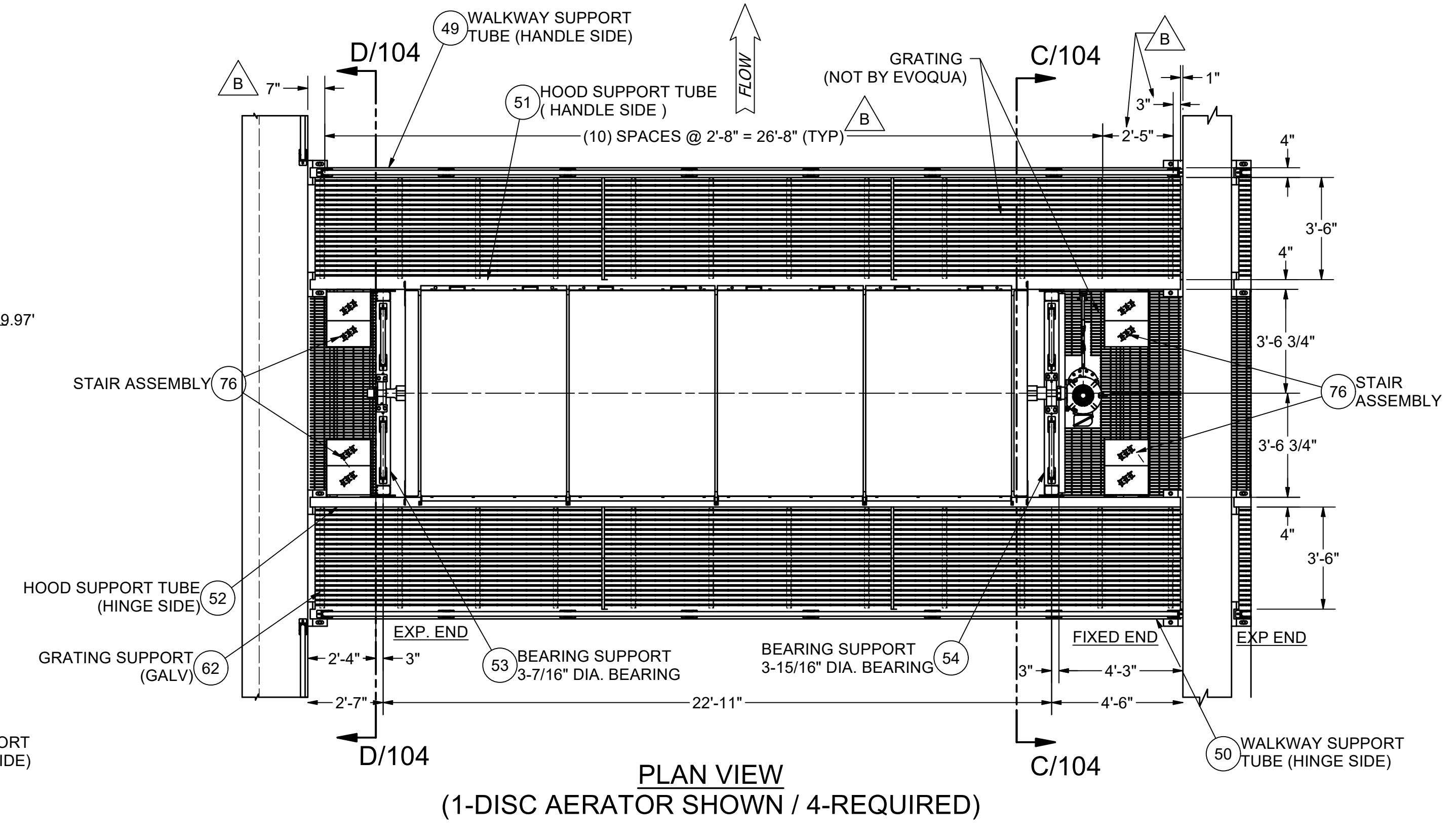
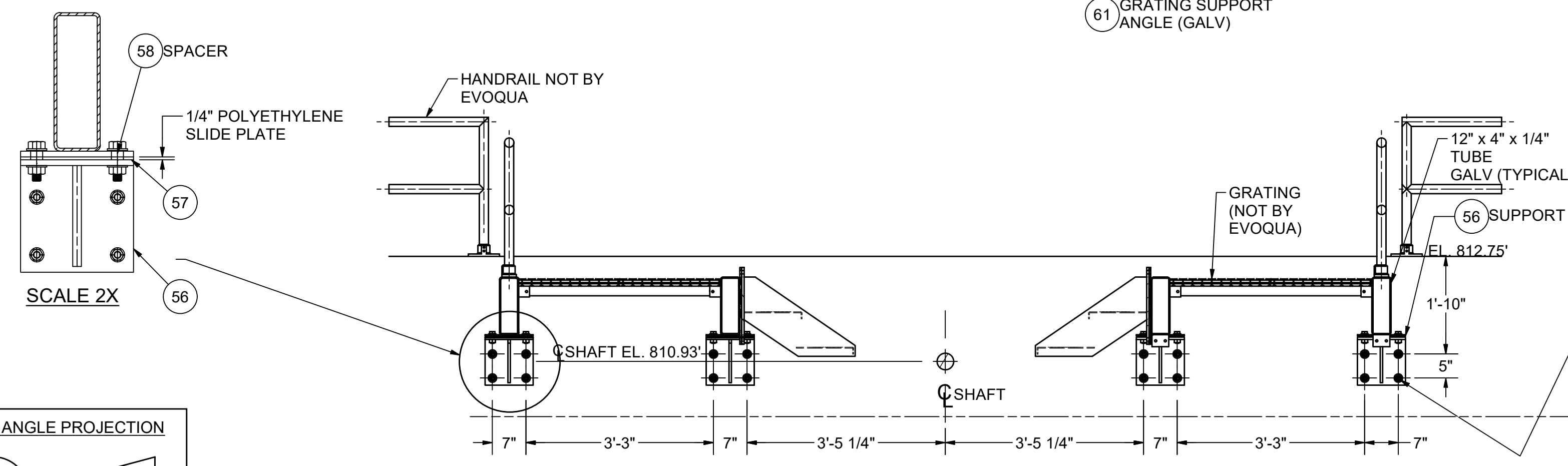
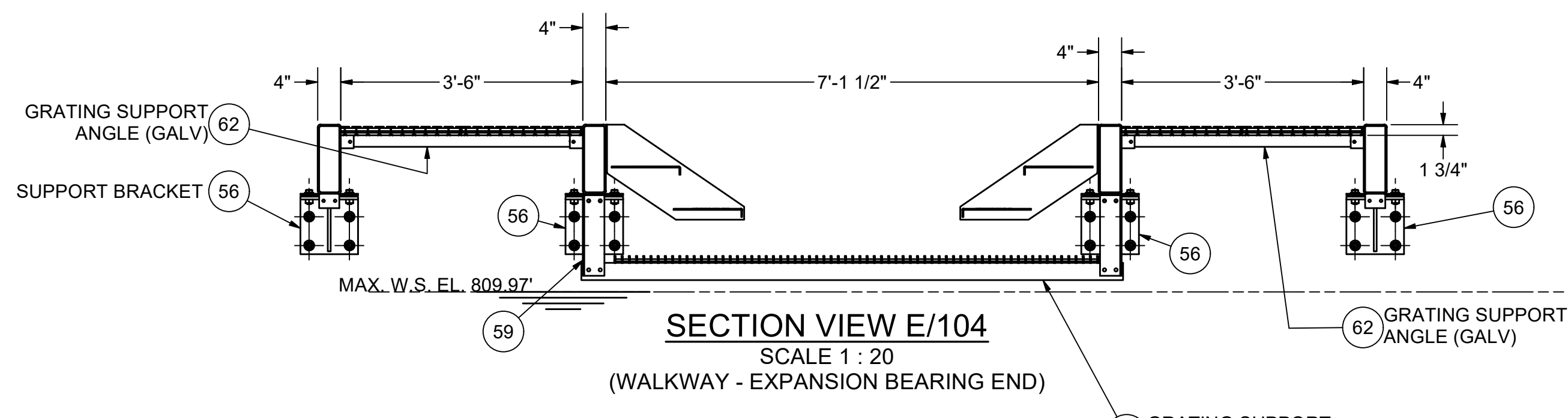
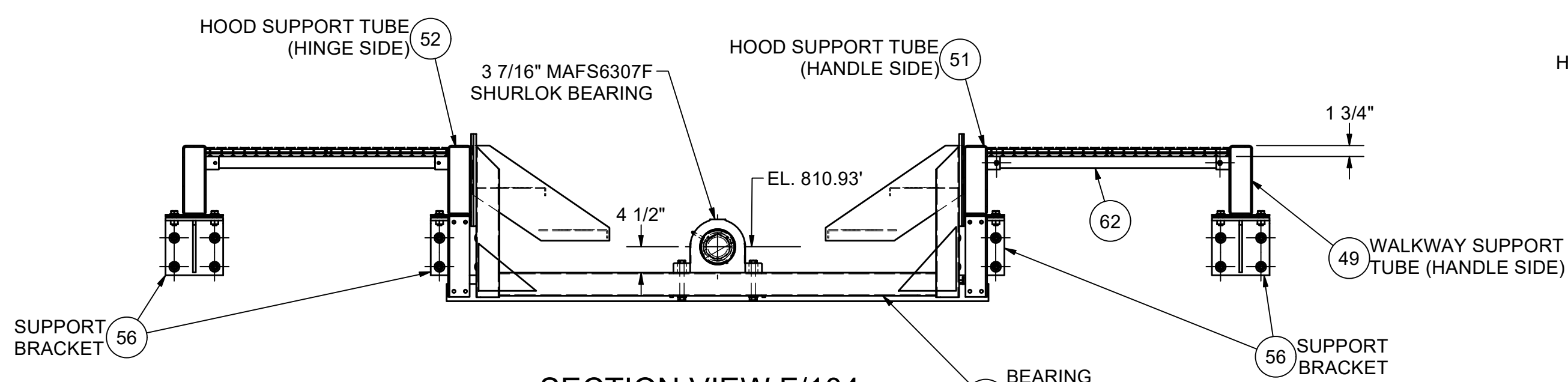
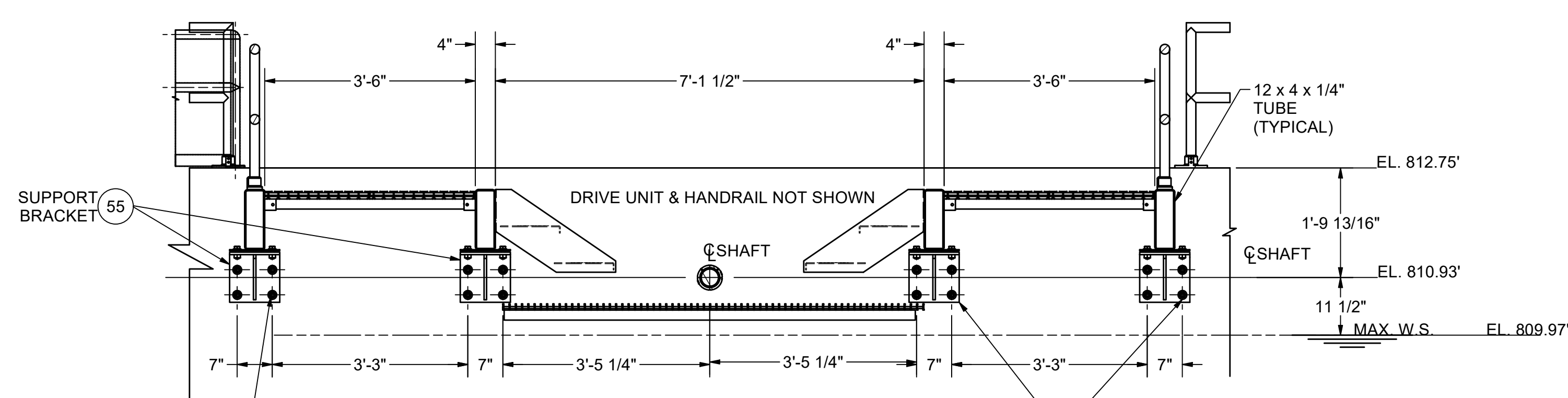
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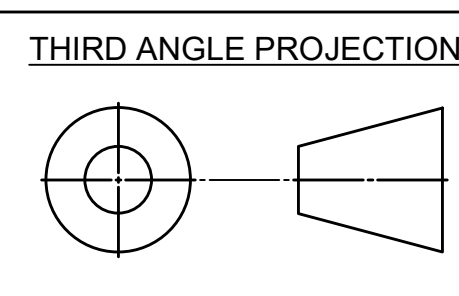
FOR RECORD ONLY

REV	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED AS PER CUSTOMER COMMENTS	2022-11-21	B.KARTHI	R.RAJA	R.VANSEL	
A	SUBMITTED FOR APPROVAL	2022-08-01	B.KARTHI	R.RAJA	R.VANSEL	

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PART NUMBER	PROJ/PROD NUMBER	CODE	FILE/DRAWING NUMBER	SHEET	REV
N/A	2033/001848	M-GA01	453130-103	1 OF 1	B



CONTRACTOR NOTE:
ALL HANDRAIL, GRATING AND MOUNTING HARDWARE (NOT FURNISHED BY EVOQUA WT)
CONTRACTOR WILL BE REQUIRED TO FIELD DRILL AND/OR TAP HOLES FOR MOUNTING EQUIPMENT.



REV	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED AS PER CUSTOMER COMMENTS	2022-11-21	B.KARTHI	R.RAJA	R.VANSEL	
A	SUBMITTED FOR APPROVAL	2022-08-01	B.KARTHI	R.RAJA	R.VANSEL	

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DWN BY:	DATE:	TITLE:
B.KARTHI	2022-08-01	GENERAL ARRANGEMENT - SECTION VIEW
CKD BY:	DATE:	(2) NEW VERTICAL LOOP REACTOR TANKS COMPLETE
R.RAJA	2022-08-01	W/ (4) 30HP DISC AERATOR ASSEMBLIES
APPD BY:	DATE:	CLIENT:
R.VANSEL	2022-08-01	CITY OF JEFFERSON
MGD BY:	SCALE:	JEFFERSON, GA
J.KINNEY	NTS	

PART NUMBER: N/A

PROJ/PROD NUMBER: 2033/001848

CODE: M-GA01

FILE/DRAWING NUMBER: 453130-104

SHEET: 1 OF 1

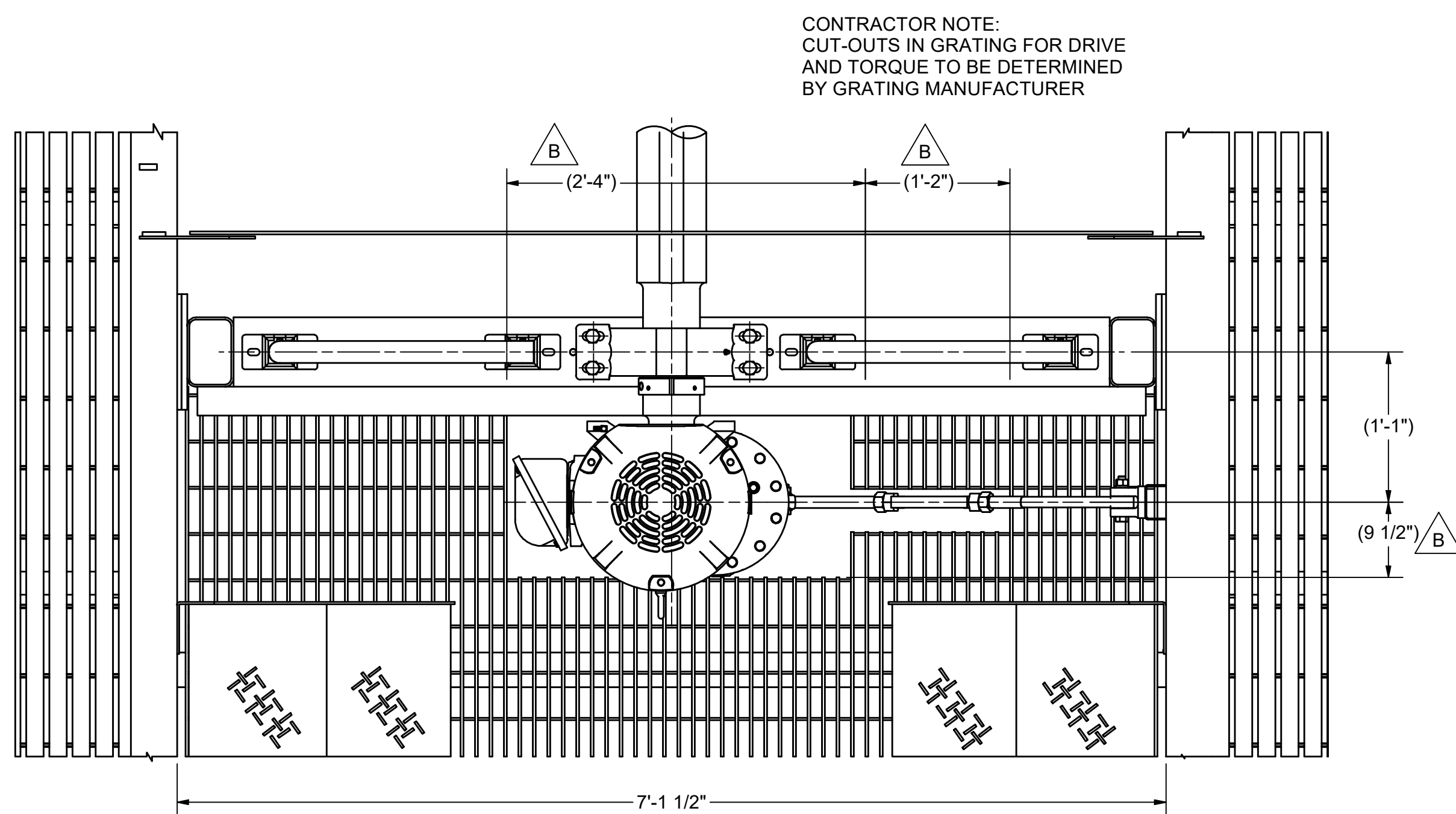
REV: B

EVOQUA WATER TECHNOLOGIES
WAUKESHA WI USA
+1 262-547-0141

STD:22x34_D_v4.3 BAR = 1" AT PLOT SCALE

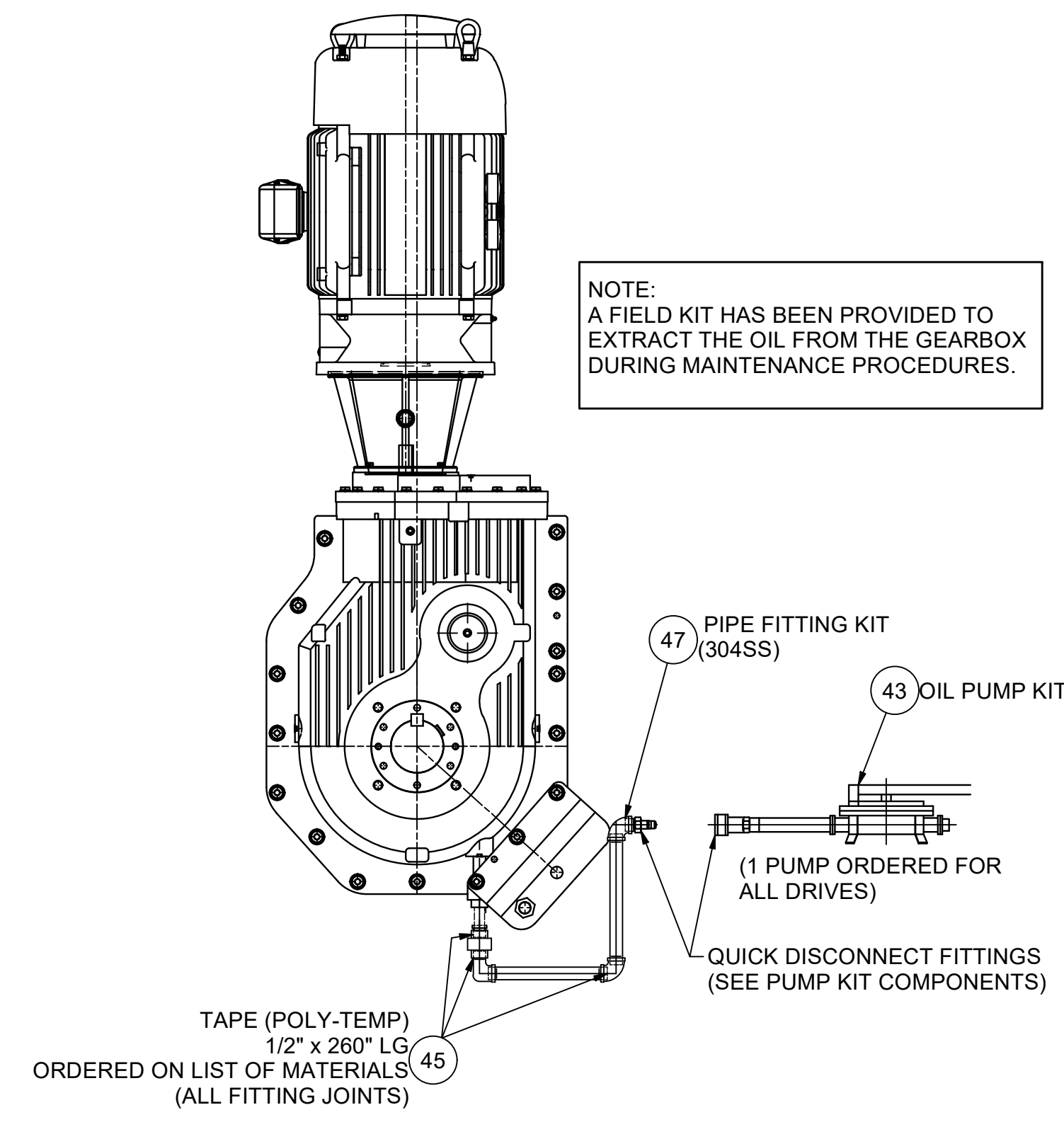
MATERIAL FOR ONE 453130-105-100 W3T568045 ESTIMATED WEIGHT : 1008.40

REF. SYMBOL	QUANTITY	PART NUMBER	DESCRIPTION
* 1	1	W3T568045	ASSEMBLED ORBAL DRIVE MACHINERY.
	1	M6H34T28C	MANUFACTURER: DODGE MTA-6307
	1	M6H34T	MODEL: SHAFT MOUNTED HELICAL GEAR REDUCER
			UNIT SIZE: CLASS II, SF:1.74, MECH RATING: 52.1 @ 52 MAX RPM
			REDUCTION: DOUBLE
			EXACT RATIO: 34:1
			SHAFT DIAMETER: 3-7/16"
			MOTOR FRAME: 286TC (280 C-FACE)
			OUTPUT SPEED: 52 MAX. RPM
	1	906020TDNC	TA6307TB X 3-7/16" TAPER BUSHING KIT (NICKEL COMPOSITE)
	1	906109ZINC	TA6307RA TIE ROD ASSEMBLY (ZINC COAT)
	1	M6-28C	MTA6, 280 C-FACE ADAPTER KIT AND COUPLING
	1	430035	3/4" SOC. HD. PI PLUG - COATED DRAIN PLUG
	1	472300	MTA2-8 VERTICAL POSITION D BREATH ASSEMBLY
	1	M6RELIAKITLV02	MTA-6307 RELIABILITY BASE KIT LEVEL 2
		---	NOTE: DRIVE ASSEMBLY TO BE PREPARED FOR LONG TERM STORAGE
* 2	1		MANUFACTURER: BALDOR
			MOTOR: 30 HP, PREMIUM EFFICIENT, SEVERE DUTY
			VOLTAGE: 460 , PHASE: 3 , HERTZ: 60
			ENCLOSURE: TEFC-INVERTER DUTY NEMA MG1, PART 31
			CT SPEED RANGE: 15:1
			FULL LOAD SPEED: 1800 RPM NOMINAL
			SERVICE FACTOR: 1.15 ON SINE WAVE & 1.0 ON PWM
			CLASS INSUL: F (AMBIENT TEMPERATURE: 40 C)
			FRAME: 286TC , MOUNTING: C-FACE
			TERMINAL BOX LOCATION: F-1
			NEMA DESIGN: "A" OR "B"
			DUTY CYCLE: CONTINUOUS DUTY
			MOTOR COMPLETE WITH DRIP COVER
			MOTOR COMPLETE WITH THERMOSTAT AND
			INTERNAL SPACE HEATER

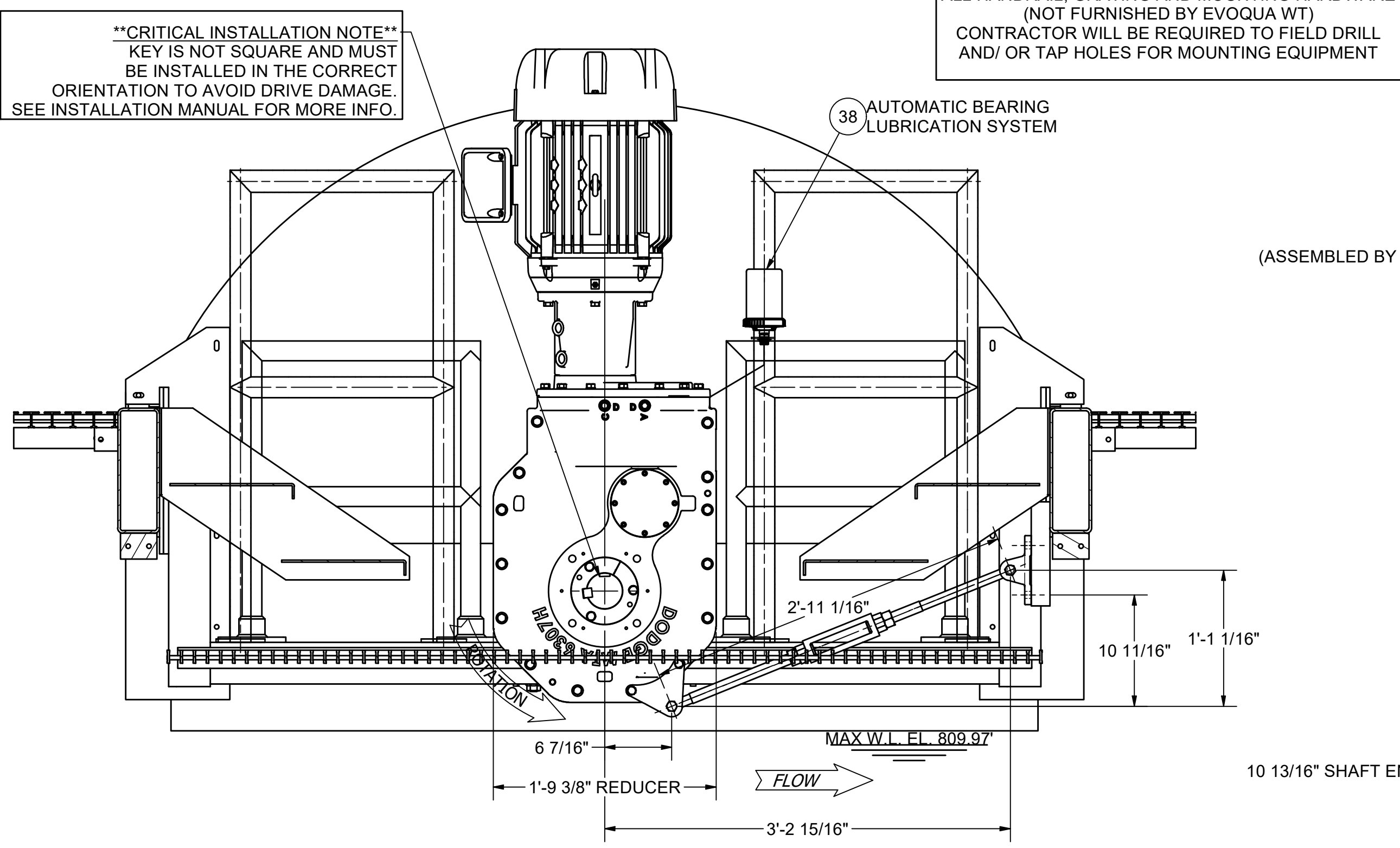


CONTRACTOR NOTE: CUT-OUTS IN GRATING FOR DRIVE AND TORQUE TO BE DETERMINED BY GRATING MANUFACTURER

NOTE: STAIR ASSEMBLY NOT SHOWN FOR CLARITY (REFER GA 453130-106)

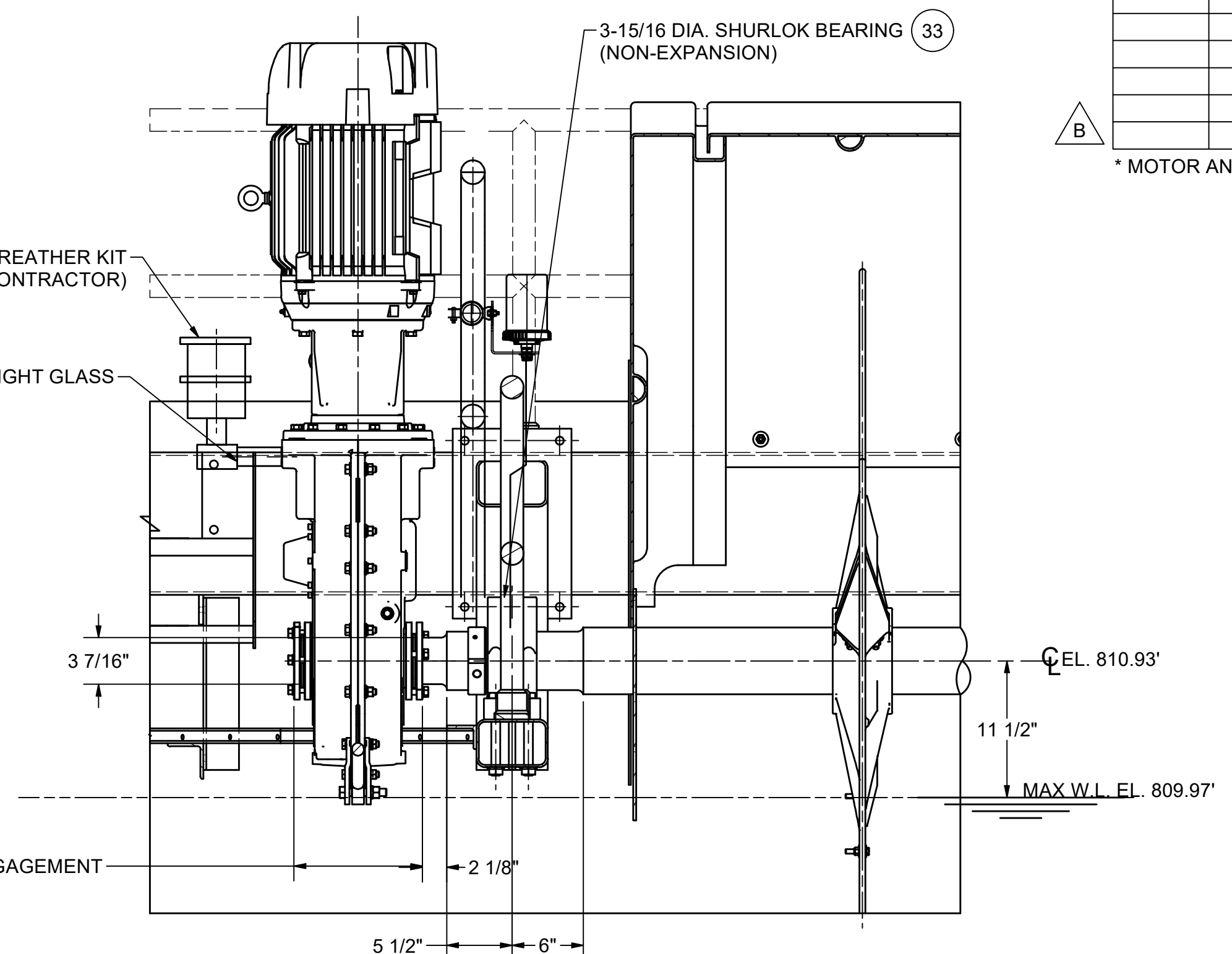


NOTE: A FIELD KIT HAS BEEN PROVIDED TO EXTRACT THE OIL FROM THE GEARBOX DURING MAINTENANCE PROCEDURES.



CRITICAL INSTALLATION NOTE
KEY IS NOT SQUARE AND MUST BE INSTALLED IN THE CORRECT ORIENTATION TO AVOID DRIVE DAMAGE. SEE INSTALLATION MANUAL FOR MORE INFO.

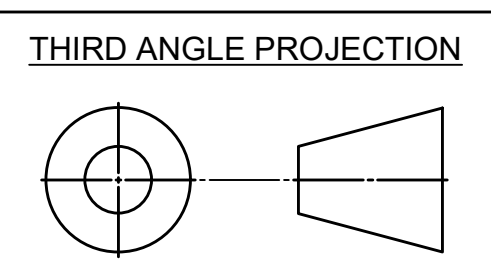
CONTRACTOR NOTE: ALL HANDRAIL, GRATING AND MOUNTING HARDWARE (NOT FURNISHED BY EVOQUA WT) CONTRACTOR WILL BE REQUIRED TO FIELD DRILL AND/ OR TAP HOLES FOR MOUNTING EQUIPMENT



* MOTOR AND REDUCER TO BE FACTORY ASSEMBLED BY DODGE

VENDOR TO FURNISH:
1-CERTIFIED DIMENSION SHEETS
1-OPERATION AND MAINTENANCE MANUALS
1-SPARE PARTS LIST
1-DATA SHEETS TO INCLUDE FULL LOAD CURRENT, LOCKED MOTOR CURRENT, MOTOR CODE NO. AND MODEL NO.

SAFETY HAZARD WARNING LABELS LABELS ARE AFFIXED ON "EVOQUA WT" EQUIPMENT WHEN A VISUAL WARNING IS APPROPRIATE. THE EQUIPMENT OWNER IS RESPONSIBLE FOR KEEPING THESE LABELS VISIBLE AND IN GOOD CONDITION. REPLACEMENT LABELS ARE AVAILABLE FROM THE EVOQUA WT PARTS DEPARTMENT. VENDOR TO PLACE OR INSTALL APPROPRIATE OSHA GUARD AND SAFETY LABELS AS REQUIRED PRIOR TO SHIPPING.



REV	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED AS PER CUSTOMER COMMENTS	2022-11-21	B.KARTHI	R.RAJA	R.VANSEL	
A	SUBMITTED FOR APPROVAL	2022-08-01	B.KARTHI	R.RAJA	R.VANSEL	

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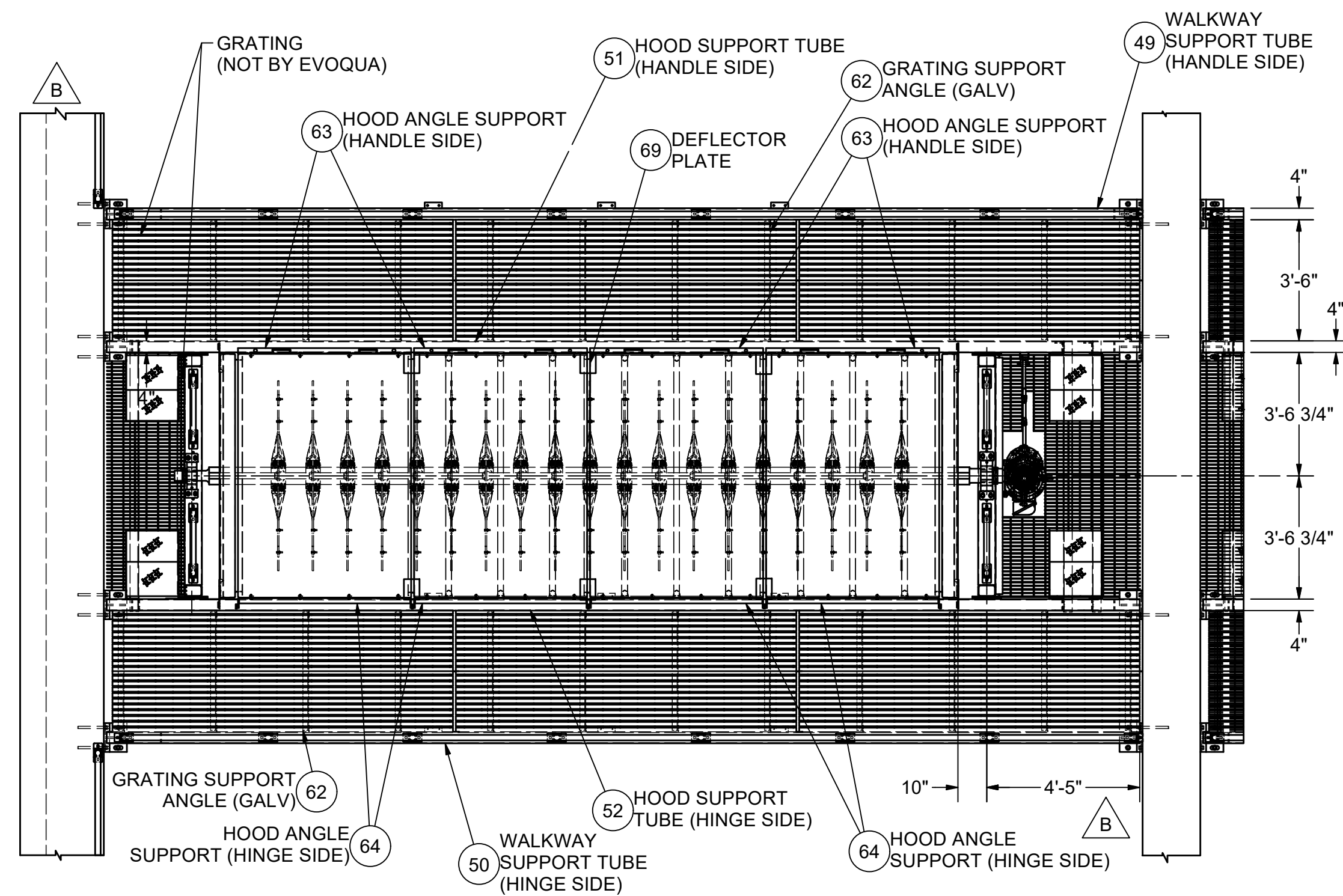
FOR RECORD ONLY

DWN BY:	DATE	TITLE
B.KARTHI	2022-08-01	GENERAL ARRANGEMENT
CKD BY:	DATE	30HP DODGE MTA6307 SHAFT MOUNT DRIVE ASSEMBLY (CW ROTATION)
R.RAJA	2022-08-02	
APPD BY:	DATE	CLIENT
R.VANSEL	2022-08-02	CITY OF JEFFERSON
MGD BY:	SCALE	JEFFERSON, GA
J.KINNEY	1 : 50	

EVOQUA WATER TECHNOLOGIES WAUKESHA WI USA +1 262-547-0141

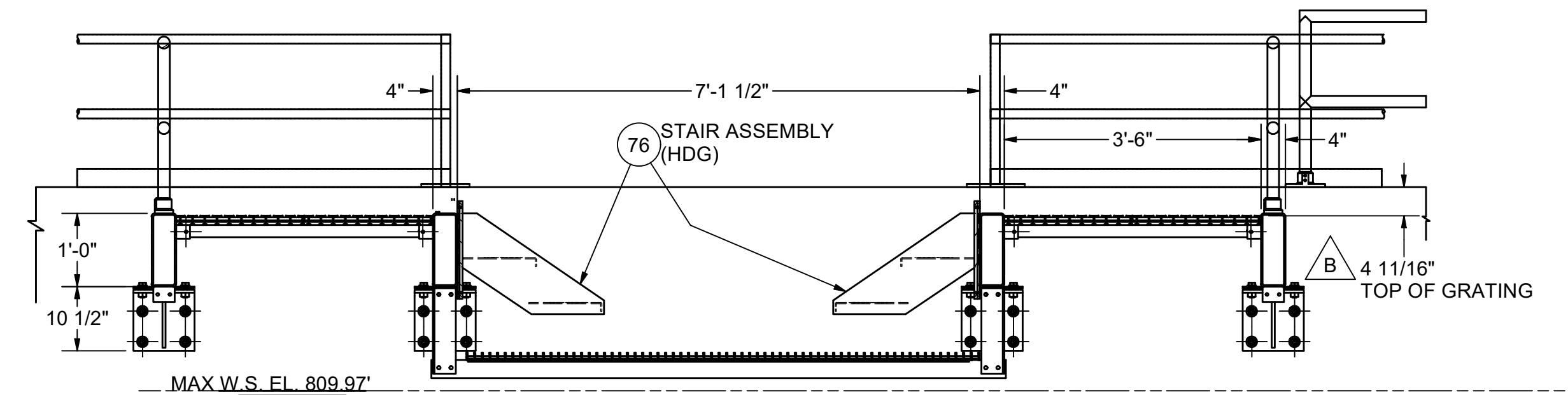
PROJ/PROD NUMBER	CODE	FILE/DRAWING NUMBER	SHEET	REV
2033/001848	M-GA01	453130-105	1 OF 1	B

STD:22x34_D v4.3 BAR = 1" AT PLOT SCALE

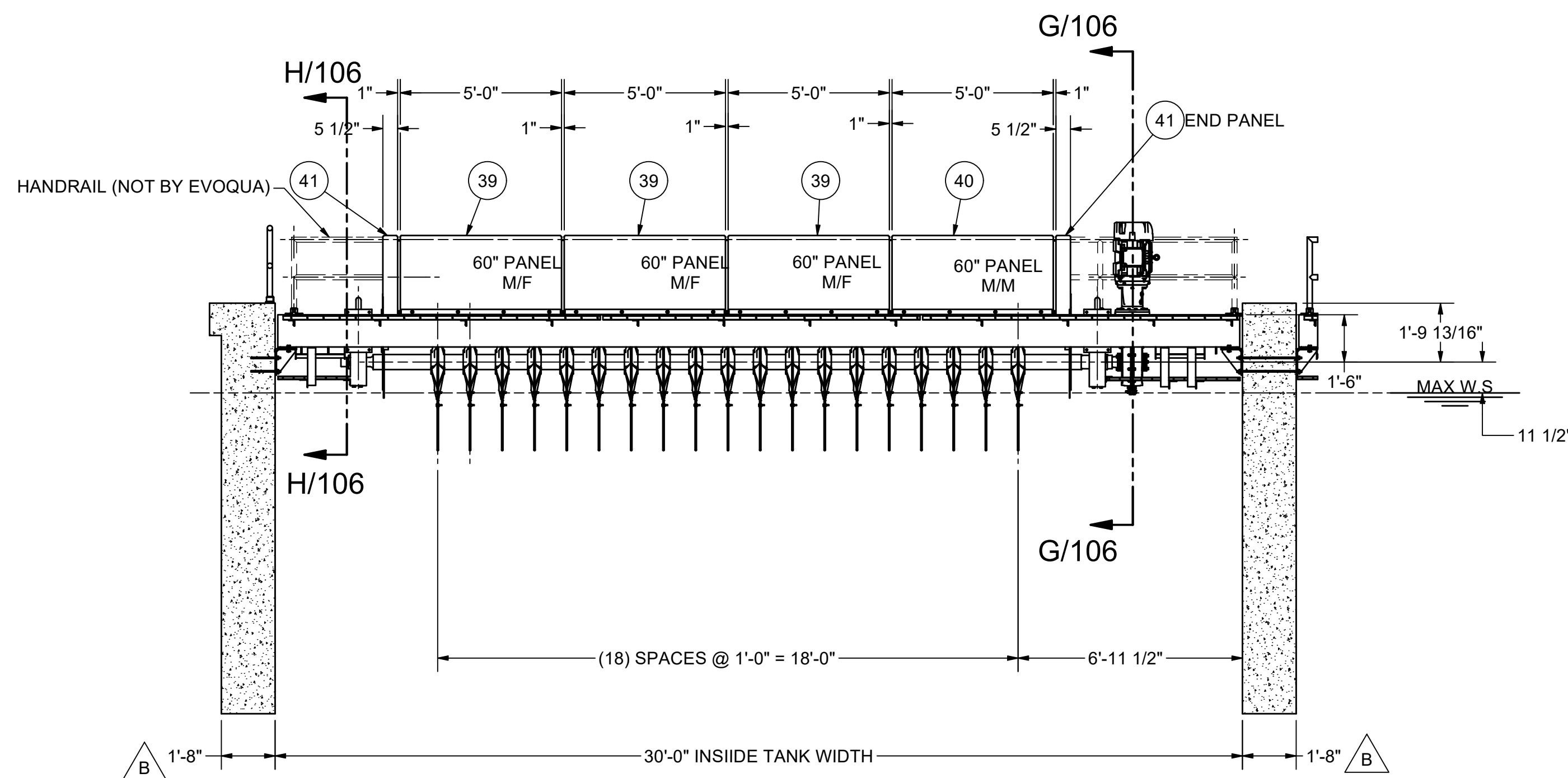


PLAN VIEW B
(1 - DISC AERATOR SHOWN / 4 REQUIRED)

CONTRACTOR NOTE:
ALL HANDRAIL, GRATING AND MOUNTING HARDWARE
(NOT FURNISHED BY EVOQUA WT)
CONTRACTOR WILL BE REQUIRED TO FIELD DRILL
AND/OR TAP HOLES FOR MOUNTING EQUIPMENT.

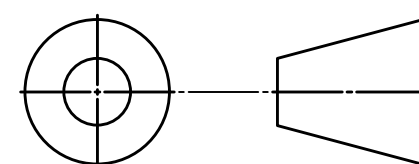


SECTION VIEW H/106



SECTION VIEW G/106

THIRD ANGLE PROJECTION



STD:22334_D_v4.3 BAR = 1" AT PLOT SCALE

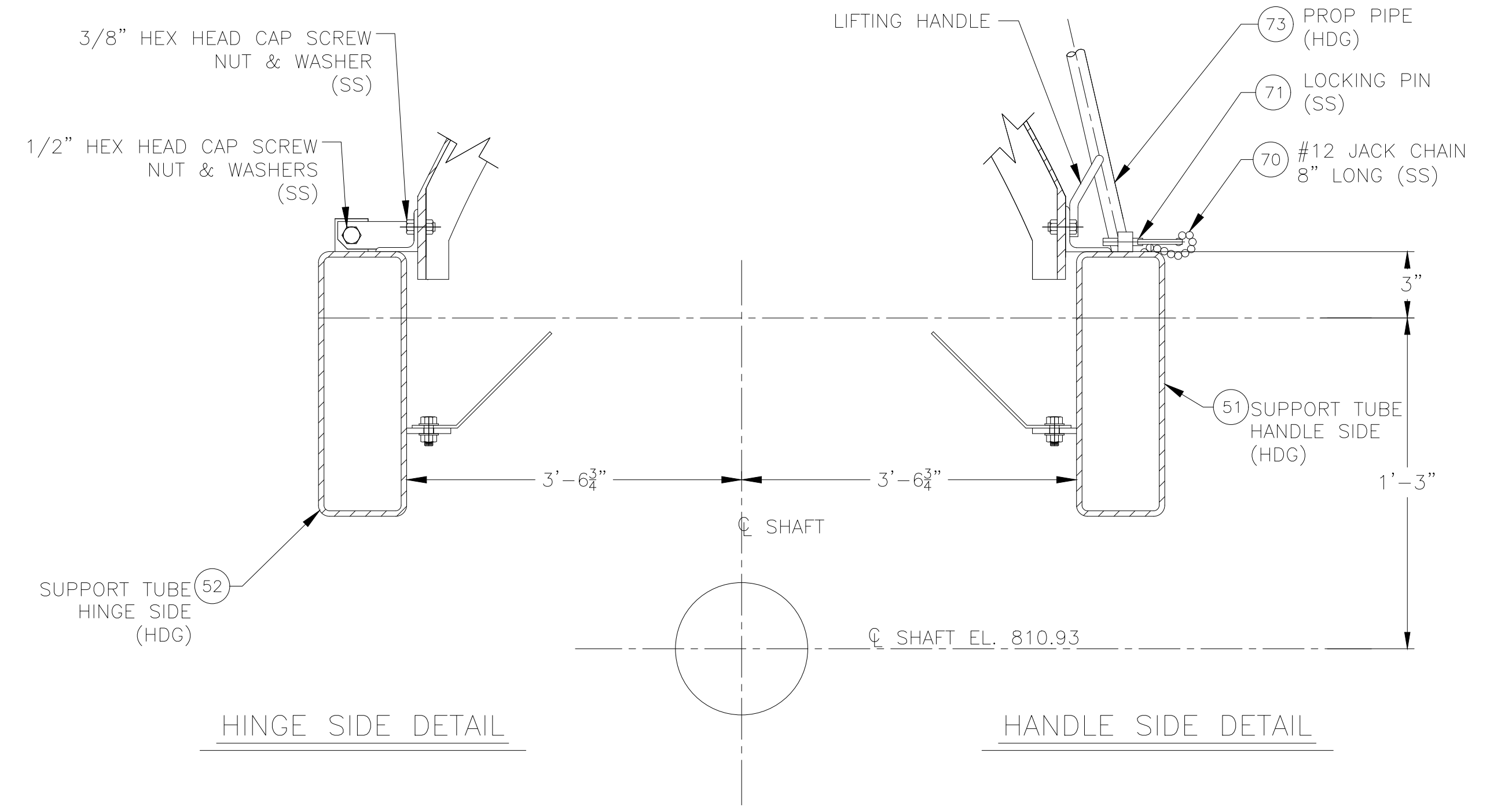
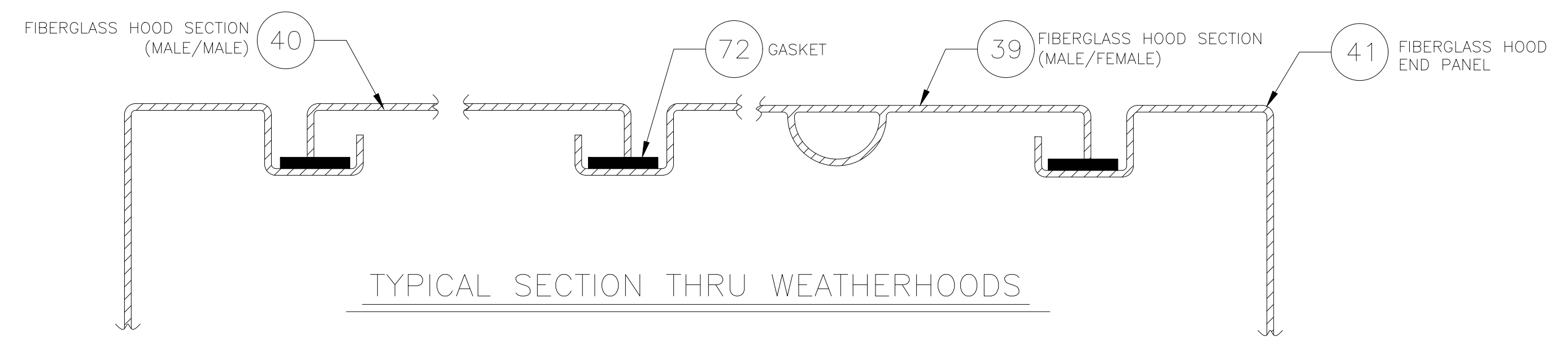
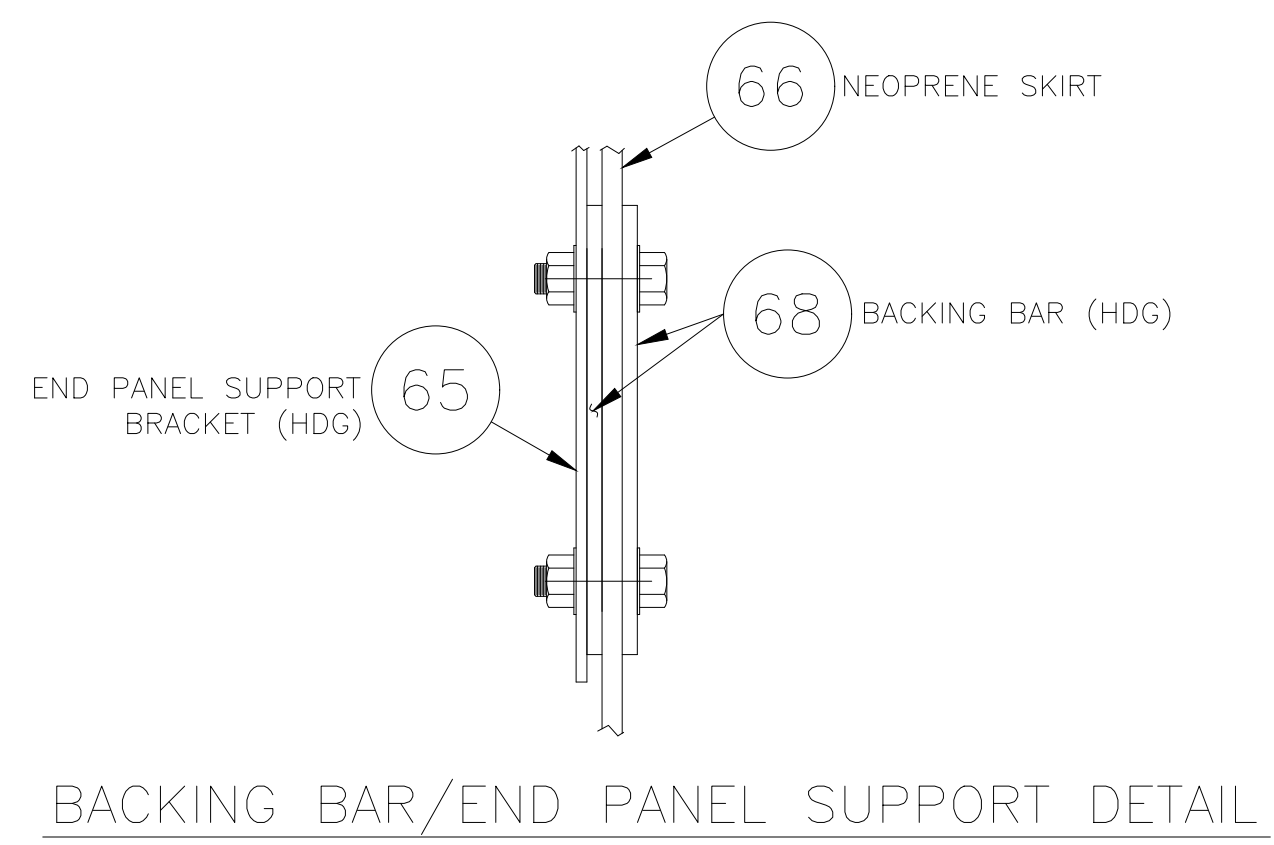
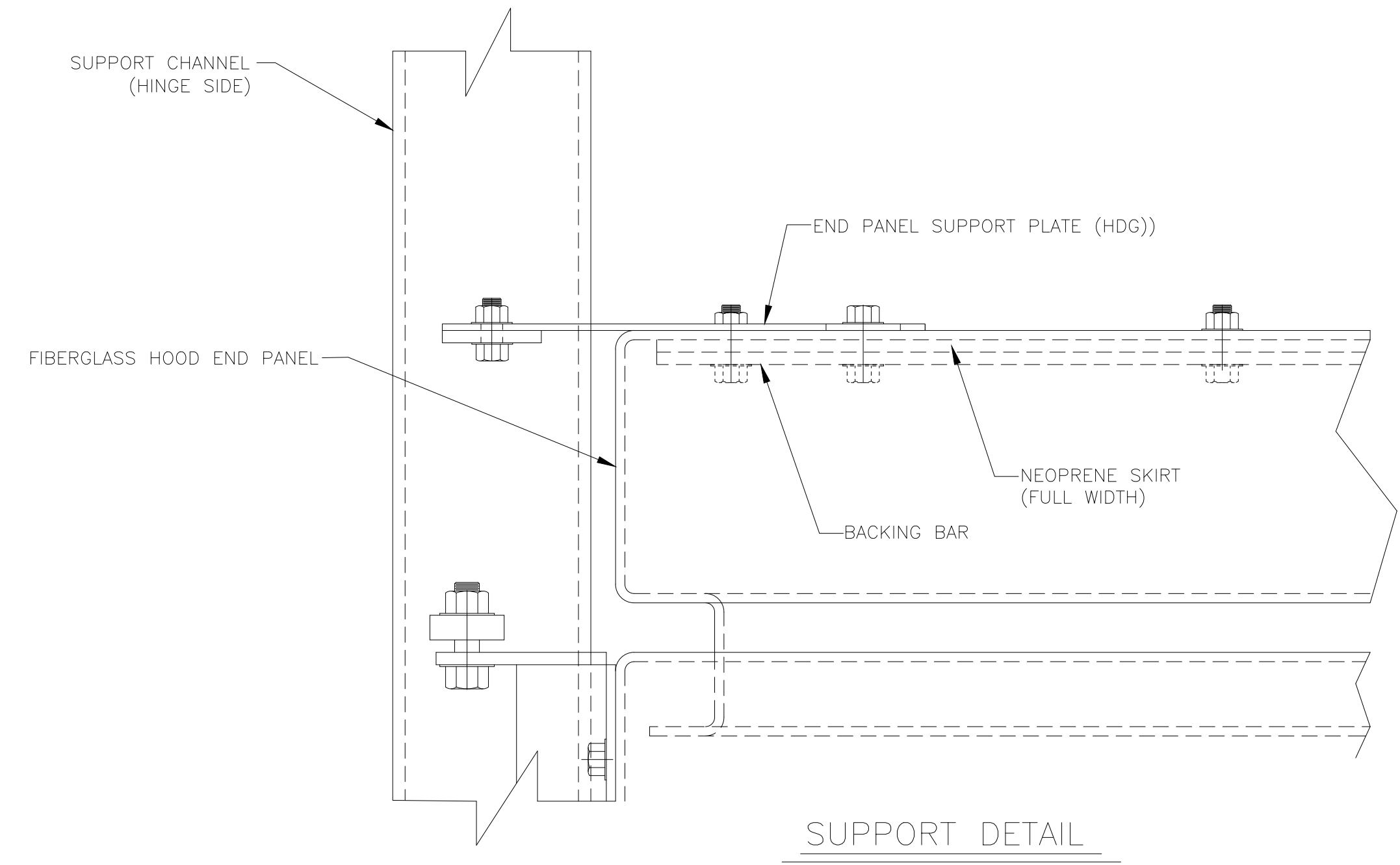
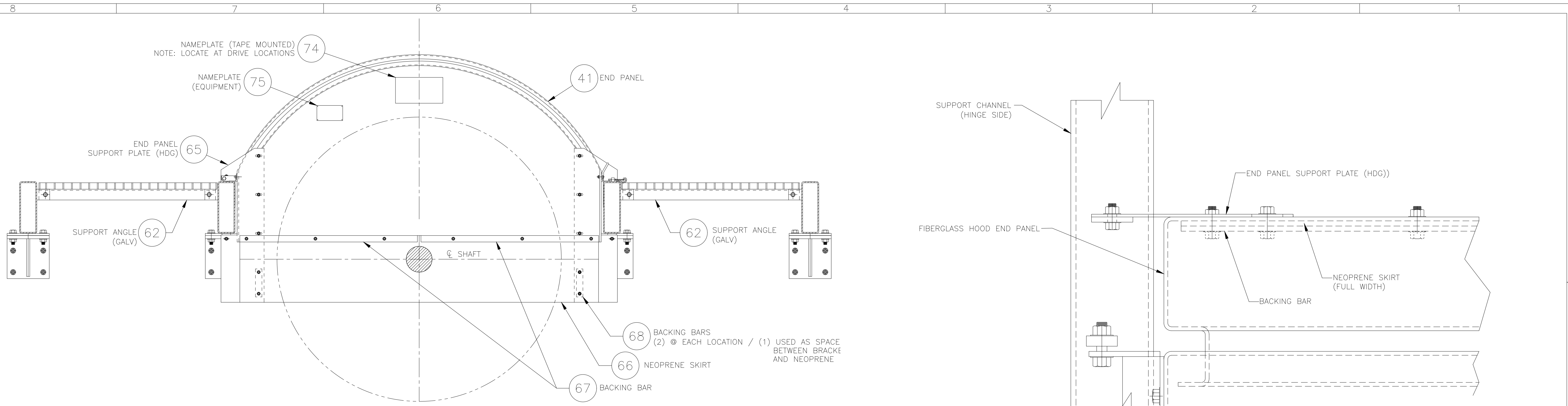
REV	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED AS PER CUSTOMER COMMENTS	2022-11-21	B.KARTHI	R.RAJA	R.VANSEL	
A	SUBMITTED FOR APPROVAL	2022-08-01	B.KARTHI	R.RAJA	R.VANSEL	

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DWN BY: B.KARTHI
DATE: 2022-08-01
CKD BY: R.RAJA
DATE: 2022-08-04
APPD BY: R.VANSEL
DATE: 2022-08-04
MGD BY: J.KINNEY
SCALE: 1:50
PART NUMBER: N/A

TITLE: GENERAL ARRANGEMENT - PLAN & SECTION VIEW
(2) NEW VERTICAL LOOP REACTOR TANKS COMPLETE
FIBER WEATHERHOOD ASSEMBLIES
CLIENT: CITY OF JEFFERSON
JEFFERSON, GA
EVOQUA WATER TECHNOLOGIES
WAUKESHA WI USA
+1 262-547-0141
PROJ/PROD NUMBER: 2033/001848
CODE: M-GA01
FILE/DRAWING NUMBER: 453130-106
SHEET: 1 OF 1
REV: B

FOR RECORD ONLY



GENERAL DESCRIPTION:

THE COVERS ARE AN INDUSTRIAL GRADE ENCLOSURE FABRICATED OF FIBERGLASS REINFORCED PLASTIC BY THE CONTACT MOLD PROCEDURE. EACH SECTION IS A CONTINUOUS ARCH. SECTIONS ARE JOINED TO EACH OTHER AND END PANELS BY OVERLAPPING CORRUGATIONS.

MATERIAL:

THE EXTERIOR OF THE COVER SHALL CONSIST OF POLYESTER GELCOAT, PIGMENTED TO PROVIDE RESISTANCE TO ULTRAVIOLET RADIATION. THE MAIN BODY SHALL CONSIST OF CHAOPPED STRAND FIBERGLASS EMBEDDED IN POLYESTER RESIN.

THE WEATHER HOODS SHALL HAVE THE FOLLOWING MINIMUM PHYSICAL PROPERTIES:

- TENSILE STRENGTH (AVE.) = 12,000 P.S.I.
- FLEXUAL STRENGTH (AVE.) = 20,000 P.S.I.
- FLEXUAL MODULUS (AVE.) = 900,000 P.S.I.
- GLASS CONTENT (AVE.) = 27%
- THICKNESS = 3/16"
- COLOR = (SEATTLE GRAY)

WEATHER HOODS SHALL BE DESIGNED FOR THE FOLLOWING COMBINED LOADS:

- SNOW LOAD = 40 LBS./ SQ. FT.
- WIND LOAD = 100 MPH

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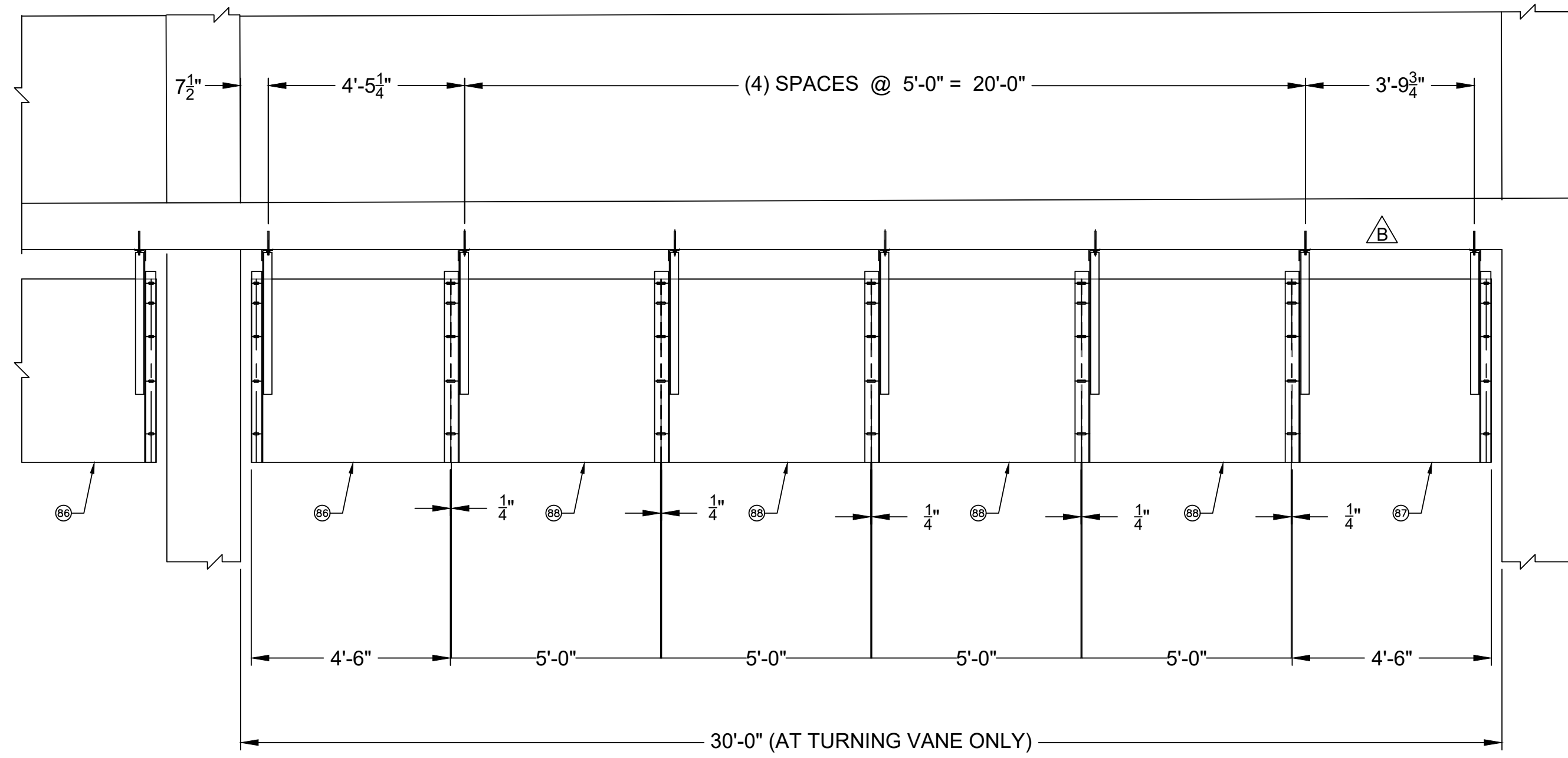
REV	DESCRIPTION	DATE	DWN	CHKD	APVD	ECN
B	UPDATED BALLOON NUMBER	22-11-21	B.KARTI	R.RAJA	R.VAN	
A	SUBMITTED FOR APPROVAL	22-08-04	B.KARTI	R.RAJA	R.VAN	

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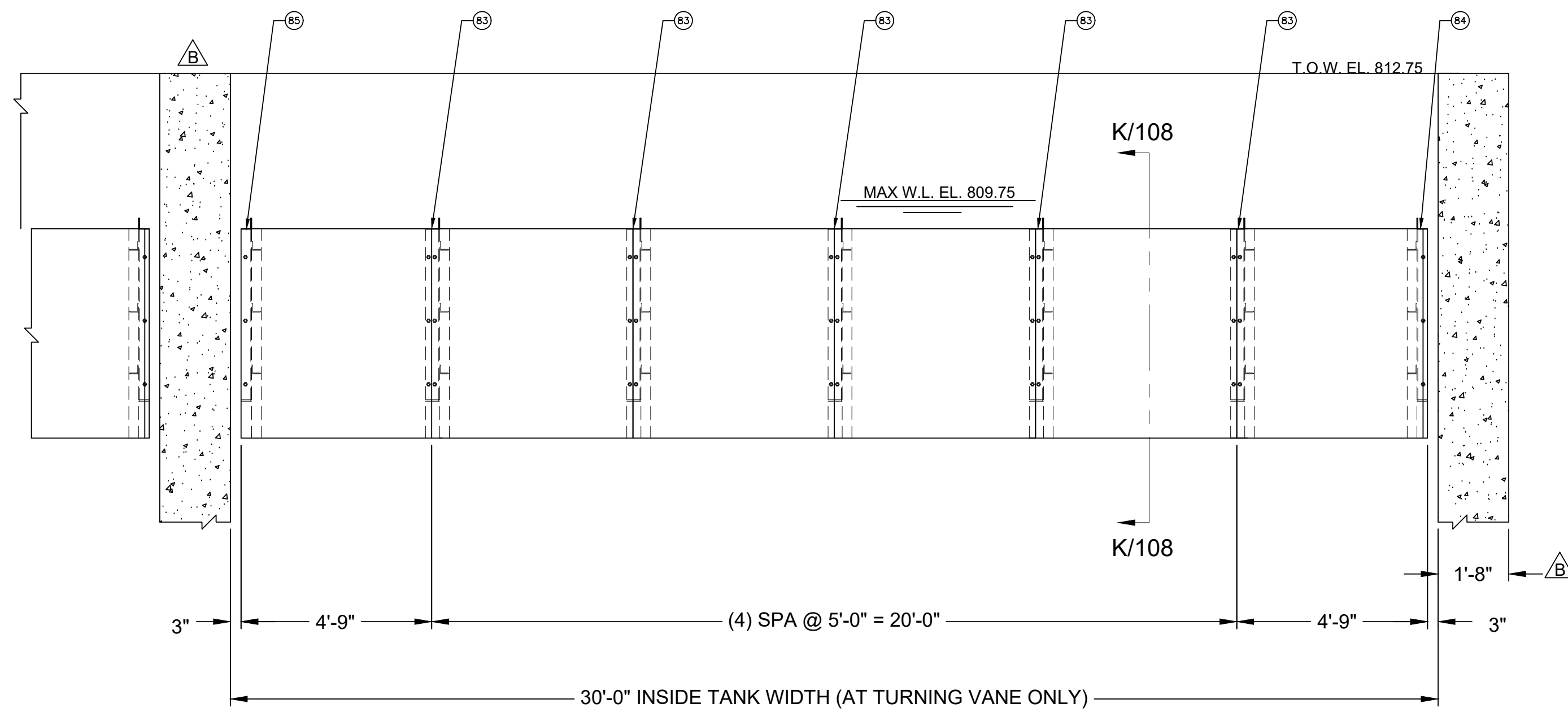
DWN BY:	DATE	TITLE			
B.KARTHI	22-08-04	GENERAL ARRANGEMENT - SECTIONS AND DETAILS (2) NEW VERTICAL LOOP REACTOR TANKS FIBERGLASS WEATHER HOOD ASSEMBLIES			
CKD BY:	DATE	CLIENT			
R.RAJA	22-08-04	CITY OF JEFFERSON JEFFERSON, GA			
APPD BY:	DATE				
R.VANSEL	22-08-04				
MGD BY:	SCALE				
J.KINNEY	22-08-04				
PART NUMBER	PROJ/PROD NUMBER	CODE	FILE/DRAWING NUMBER	SHEET	REV
N/A	2033/001848	M-GA01	453130-107	1 OF 1	B



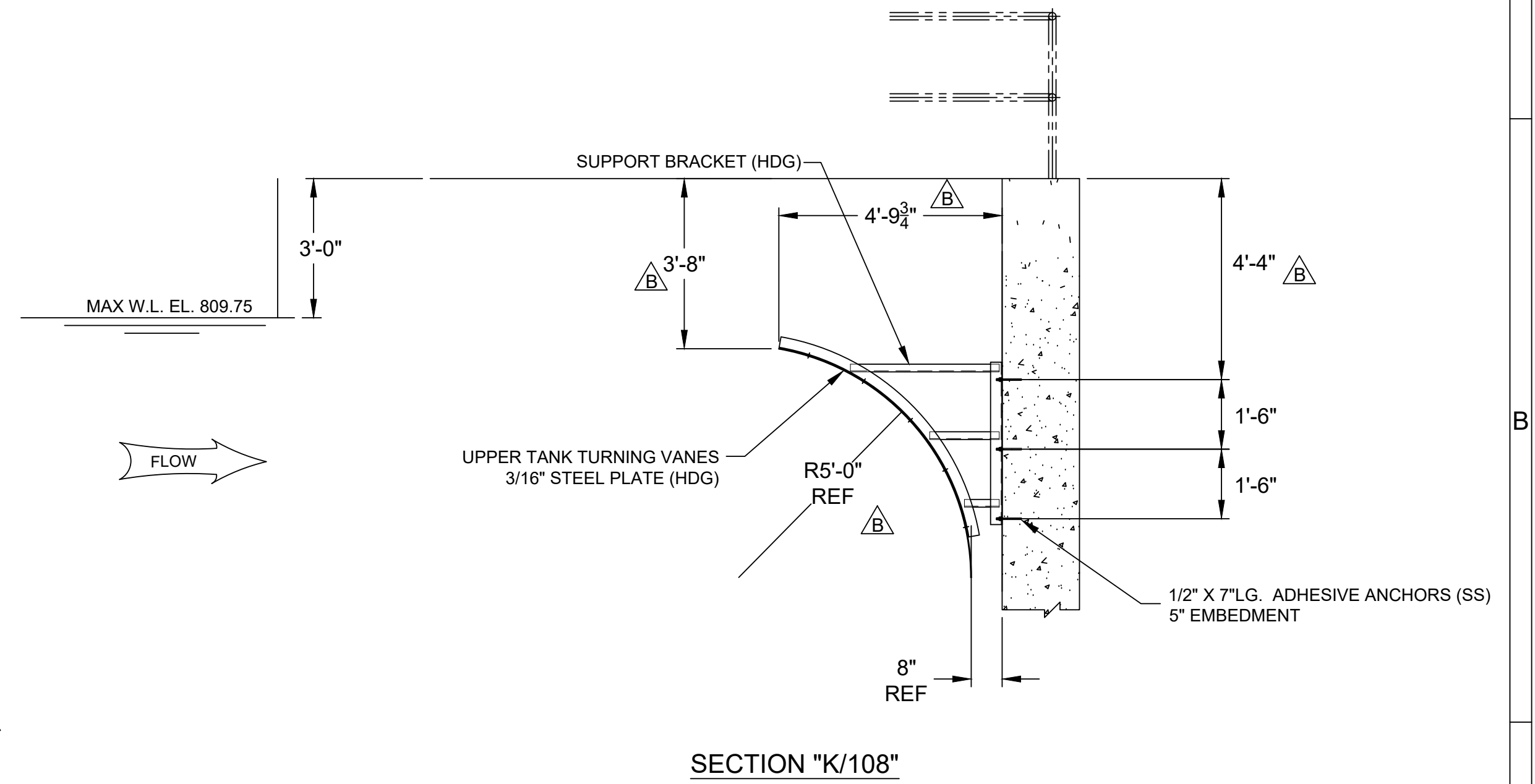
Doc Type: STD:22x34_D.2.0
 BAR = 1" AT PLOT SCALE Group:



PLAN VIEW - UPPER TURNING VANE ASSEMBLY
VLR TANKS #1 AND #2



TYPICAL UPPER TURNING VANE SUPPORTS
VLR TANKS #1 AND #2

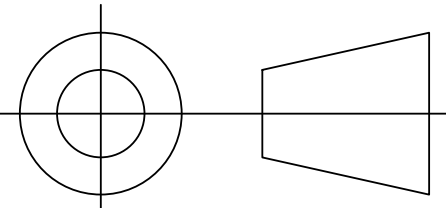


SECTION "K/108"

FOR RECORD ONLY

STD:22x34_D_V4.0
BAR = 1" AT PLOT SCALE

THIRD ANGLE PROJECTION



UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
ALL WEIGHTS ARE POUNDS AND EACH
DRAWN PER ASME Y14.5M

STANDARD TOLERANCE	MACHINED SURFACES
.XX ± .06	250/√
XXX ± .005	
XIX ± 1/16	
ANG ± 0.50°	

TAG / EQUIPMENT

REV	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED AS PER CUSTOMER COMMENTS	2022-11-21	B.KARTHI	R.RAJA	R.VANSEL	
A	ISSUED FOR CONSTRUCTION	2022-08-04	B.KARTHI	R.RAJA	R.VANSEL	

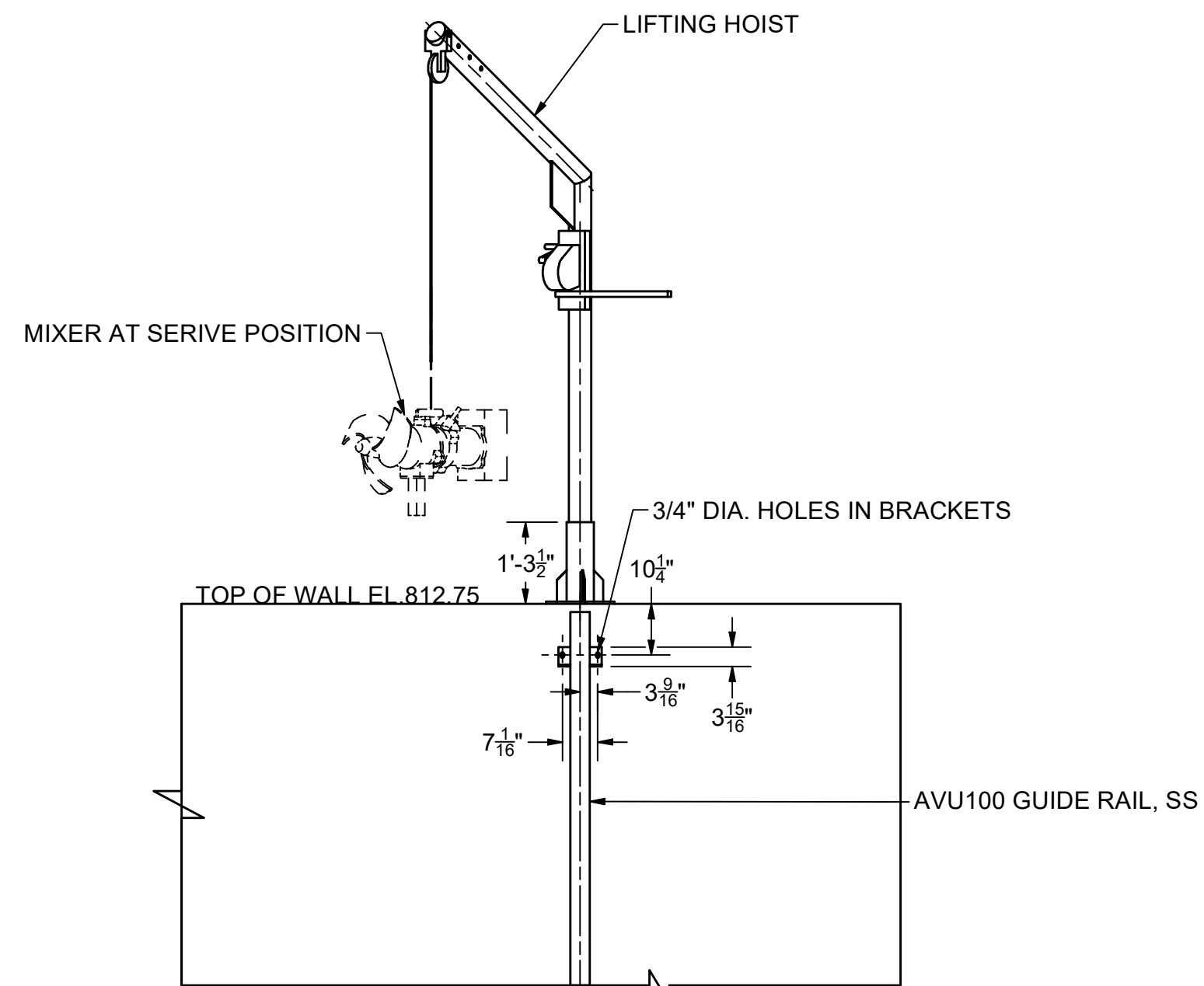
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DWN BY:	DATE
B.KARTHI	2022-08-04
CKD BY:	DATE
R.RAJA	2022-08-04
APPD BY:	DATE
R.VANSEL	2022-08-04
MGD BY:	SCALE
J.KINNEY	NTS

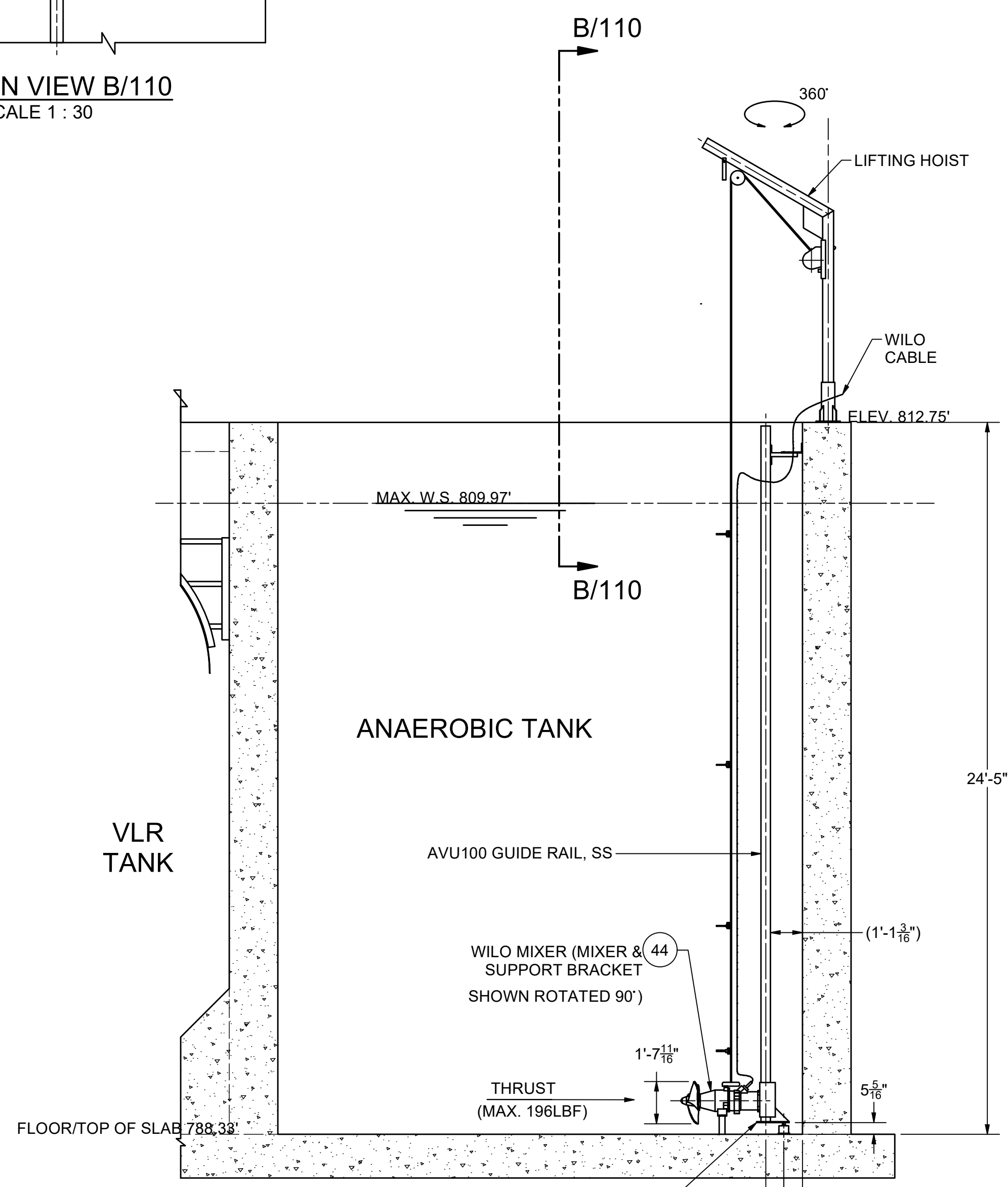
TITLE	GENERAL ARRANGEMENT VERTICAL LOOP REACTOR UPPER TURNING VANE ASSEMBLIES
CLIENT	CITY OF JEFFERSON JEFFERSON, GA
PROJ/PROJ NUMBER	2033/001848
CODE	M-GA01
FILE/DRAWING NUMBER	453130-108
SHEET	1 OF 1
REV	B



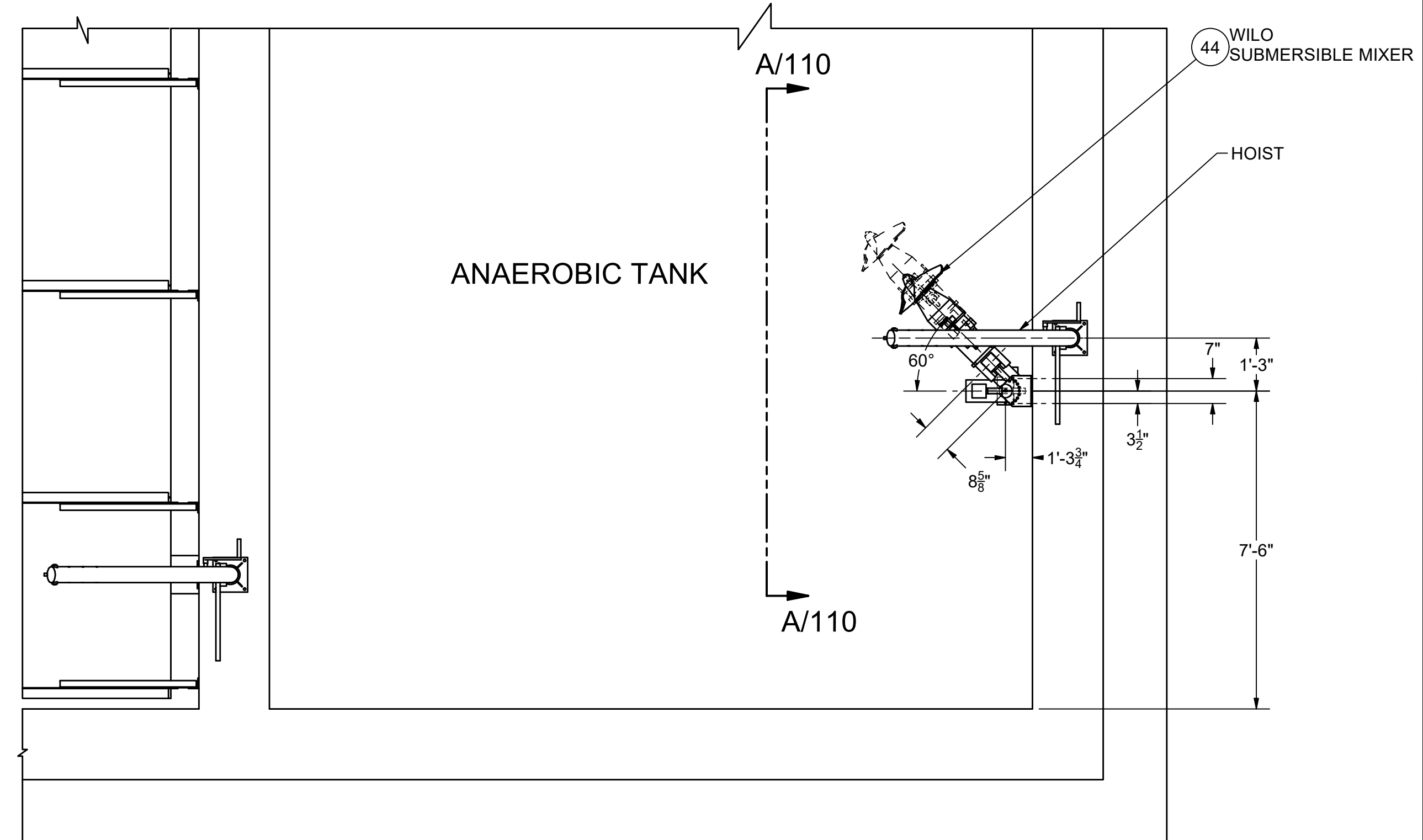
EVOQUA WATER TECHNOLOGIES
WAUKESHA WI USA
+1 262-547-0141



SECTION VIEW B/110
SCALE 1 : 30



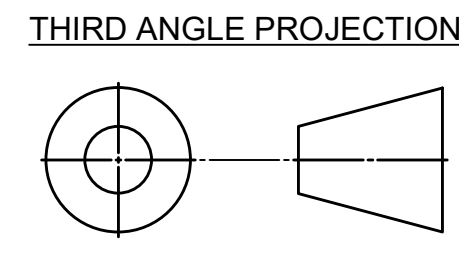
SECTION VIEW A/110
SCALE 1 : 40



WILO USA, LLC SUBMERSIBLE MIXER
REFER GA-102 FOR PLAN VIEW ANAEROBIC TANK
WT. = 224.9 LBS

- 44 WILO MODEL NUMBER TR50-2.40-4/8V SUBMERSIBLE MIXER
- EVOQUA WT PART NUMBER : W3T568047
- EACH COMPLETE
- W/ 39'-4 7/16" OF POWER CABLE(7X1.5),
- 4.4 HP 460V, 3 PHASE, 60 HZ, EXPLOSION PROOF (XP-RATED) MOTOR
- THERMAL AND MOISTURE SENSOR W/ 1X1.5 CABLE
- CERAM C0(HOUSING), HANDLE GRIP
- FRAME, M2/100
- BINDER, UNIVERSAL
- CABLE GUIDE ROPE #2
- MIXER FOOT SUPPORT
- AVU100 GUIDE RAIL, 304SS (6M + 2M EXTENSION - CUT-TO-FIT, FIELD WELD BY OTHERS)
- GUIDE RAIL FIXATION SET NO.7(2XM16 CONCRETE ANCHOR, 316SS)
- GUIDE RAIL FIXATION SET NO.3(2XM12 CONCRETE ANCHOR, 316SS)
- COMBINATION MOISTURE + THERMAL RELAY (INSTALLATION IN CONTROLS BY OTHERS)
- HHV E/EH 250kg HOIST 304SS, HAND WINCH 304SS, 6MM X 12M CABLE 316SS
- HOIST BASE - FLOOR MOUNT, 304SS
- HOIST FIXATION SET #1(4XM16 CONCRETE ANCHOR, 304SS)

STD:22x34_D_v4.3 BAR = 1" AT PLOT SCALE



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REV	DESCRIPTION	DATE	DWN	CKD	APPD	ECN
B	UPDATED BALLOON NUMBER	2022-11-22	B.KARTHI	R.RAJA	R.VANSEL	
A	SUBMITTED FOR APPROVAL	2022-08-01	B.KARTHI	R.RAJA	R.VANSEL	

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CKD BY: R.RAJA	DATE: 2022-08-03	CLIENT: CITY OF JEFFERSON		
APPD BY: R.VANSEL	DATE: 2022-08-03	JEFFERSON, GA		
MGD BY: J.KINNEY	SCALE: 1:50	EVOQUA WATER TECHNOLOGIES		
PART NUMBER: W3T568047	PROJ/PROD NUMBER: 2033/001848	CODE: M-GA01	FILE/DRAWING NUMBER: 453130-110	
			SHEET: 1 OF 1	
			REV: B	