THE APPROVED CONSTRUCTION PLANS AND ALL ENGINEERING MUST BE POSTED ON THE JOB AT ALL INSPECTIONS IN A VISIBLE AND READILY ACCESSIBLE LOCATION.

Approval of submitted plans is not an approval of omissions or oversight by this office or noncompliance with any applicable regulations of local government. The contractor is responsible for making sure that the building complies with all applicable building codes and regulations of the local government.

City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE
RayC
05/31/2024
5:16:43 PM

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

QUANTUM
CONSULTING ENGINEERS

April 12, 2024

Separate approval by L & I is required for factory built eFRAME™ Enclosures. Contact L & I Factory Assembled Structures and provide verification for inspections.

STRUCTURAL CALCULATIONS
(Permit Submittal)

CENTERIS DATA CENTER VOLTAGE PARK GENERATOR ANCHORAGE
1023 39th Avenue SE
Puyallup, WA 98374

Quantum Job Number: 23444.01

SCOTT H. TINKER
STATE OF WASHINGTON
36098
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

Prepared for:
CENTERIS DATA CENTERS
18300 Cascade Avenue S
Seattle, WA 981188

Prepared by:
QUANTUM CONSULTING ENGINEERS
1511 Third Avenue, Suite 323
Seattle, WA 98101
TEL 206.957.3900
FAX 206.957.3901

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address: 1015 39th Ave SE Puyallup, WA 98374

Coordinates: 47.1590004, -122.2794422

Elevation: 489 ft

Timestamp: 2023-12-01T15:13:57.333Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	67 mph
MRI 25-Year	73 mph
MRI 50-Year	78 mph
MRI 100-Year	82 mph
Risk Category I	92 mph
Risk Category II	97 mph
Risk Category III	104 mph
Risk Category IV	108 mph

ASCE 7-10

MRI 10-Year	72 mph
MRI 25-Year	79 mph
MRI 50-Year	85 mph
MRI 100-Year	91 mph
Risk Category I	100 mph
Risk Category II	110 mph
Risk Category III-IV	115 mph

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

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Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

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The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address:	1015 39th Ave SE Puyallup, WA 98374
Coordinates:	47.1590004, -122.2794422
Elevation:	489 ft
Timestamp:	2023-12-01T15:14:56.409Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	III
Site Class:	D-default

Basic Parameters

Name	Value	Description
S_S	1.257	MCE_R ground motion (period=0.2s)
S_1	0.433	MCE_R ground motion (period=1.0s)
S_{MS}	1.508	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.005	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.914	Coefficient of risk (0.2s)
CR_1	0.898	Coefficient of risk (1.0s)
PGA	0.5	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.6	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	1.257	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.375	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.433	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.483	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APP'D
ALL	A	ORIGINAL SUBMITTAL	5/19/2022	DMG
ALL	B	CUSTOMER COMMENTS	5/23/2022	JPR
ALL	C	480V PANEL BOARD	6/2/2022	DMG

DRAWING SET OUTLINE

SHEET 1	COVER SHEET
SHEET 2	BILL OF MATERIALS
SHEET 3	ELEVATION VIEWS
SHEET 4	ELEVATION VIEWS
SHEET 5	SECTION VIEWS
SHEET 6	ELECTRICAL DETAILS
SHEET 7	CONTROL AND WIRING DETAILS
SHEET 8	DIODE LAYOUT DETAILS
SHEET 9	TANK DETAILS
SHEET 10	NFPA 30 PANEL DETAILS
SHEET 11	CONCRETE PAD DETAILS

PROJECT NAME:

CAT 3516C-HD 2,500KW W/ ALUMINUM UL2200 SOUND ATTENUATED ENCLOSURE

PROJECT NOTES:

1) GENSET: CATERPILLAR 3516C–HD, 2,500KW
   WEIGHT: 42,000 LBS,
   DIMENSIONS: 280.16"L X 90.12"W X 117.53"H
   ENGINE DWG # 593–3169
2) ENCLOSURE WALLS: 0.08" ALUMINUM PANELS
3) ENCLOSURE FRAME: 2"x2"x0.125" AL TUBING
4) ENCLOSURE COLOR: TRAFFIC GREY.
5) ESTIMATED TOTAL PACKAGE WEIGHT: 86,500 LBS DRY
6) INTERIOR LINING: PERFORATED GALVANIZED STEEL
6) SOUND ATTENUATION LEVEL: LEVEL 2, 85dBA AT 23FT (AVG FREE FIELD)
7) SOUND ATTENUATION MATERIAL: 2" ROCKWOOL.
8) SUBBASE FRAME SHALL BE PROVIDED W/ 8 LIFTING POINTS.
9) ENCLOSURE UL 2200 LISTED, 130MPH WIND LOAD.
10) DESIGN AIR FLOW:
    INTO ENCLOSURE: 102,586 CFM, 0.0710 LBS./FT3
    OUT OF ENCLOSURE: 110,698 CFM, 0.06F1 LBS./FT3
    MAX AMBIENT SPEC: 123°F@2460FT ASL.
11) TANK INFORMATION:
    TANK UL 142 LISTED, NFPA–30 COMPLIANT.
    USABLE GALLONS: 8,400
    NOMINAL GALLONS: 8,614
    ESTIMATED TANK WEIGHT (DRY): 18,750 LBS

GENERAL NOTES:

1) DIMENSIONS AND WEIGHTS PROVIDED IN THESE DOCUMENTS ARE ESTIMATES BASED ON CALCULATION.

DRAWING FOR APPROVAL
NOT FOR CONSTRUCTION PURPOSES

APPROVED AS DRAWN ☐
APPROVED AS NOTED ☐
REVISE AS NOTED, RESUBMIT ☐

SIGNATURE DATE

NAME (PLEASE PRINT) TITLE

CUSTOMER:

REFERENCE: ALUM. 0.080" SKIN ON ALUM. 2x2x0.125 TUBING

UNITS REQ'D: 16

THIRD–ANGLE PROJECTION

DO NOT SCALE

REVISION C

DATE 6/2/2022

GENERAL ARRANGEMENT SUBMITTAL
COVER SHEET

DRW.	DMG	JOB SERIAL NO.	22–0804, 22–0805, 22–0806, 22–0952
CHK.	JPR		
APP.	KYB		
APP.	X	SCALE: NTS	SHEET 1 OF 11

created using AutoCAD

ITEM	QTY.	ITEM DESCRIPTION	SHT #	SUPPLIER	MFG. DWG. #
1	1	CUSTOMER PROVIDED CATERPILLAR 3516C–HD (2,500kW) GENSET.	3,4,9	–	593–3169
2	1	ENCLOSURE: 2"x2"x0.125" ALUM. TUBING COVERED IN 0.08" ALUMINUM PANELS. SLOPED ROOF. WIND RATING 130 MPH.	3,4		
		WALK–IN DESIGN. 2" ROCKWOOL. LEVEL 2. 85dBA AT 23FT (AVG FREE FIELD).			
3	4	40" SINGLE ACCESS MAINTENANCE DOORS FITTED WITH WATERTIGHT RUBBER SEALS, DRIP LEDGES AND ALL FITTED WITH HEAVY DUTY	3,4		
		REFRIGERATOR STYLE CHROME PLATED HANDLES, KEYED–ALIKE & PAD LOCKABLE. HEAVY DUTY ALUMINUM PIANO HINGES FITTED WITH			
		PANIC RELEASE, DOOR–HOLD–BACK LATCH AND BULB SEAL.			
4	1	24"x36" SINGLE ACCESS MAINTENANCE DOORS FITTED WITH WATERTIGHT RUBBER SEALS, DRIP LEDGES AND ALL FITTED WITH HEAVY DUTY	3,4		
		REFRIGERATOR STYLE CHROME PLATED HANDLES, KEYED–ALIKE & PAD LOCKABLE. HEAVY DUTY ALUMINUM PIANO HINGES FITTED WITH			
		PANIC RELEASE, DOOR–HOLD–BACK LATCH AND BULB SEAL.			
5	1	REAR PLENUM WITH BIRDSCREENING FOR VERTICAL AIR INTAKE. FITTED WITH MOTORIZED INTAKE LOUVERS (QTY 6).	3		CD–100
6	1	FRONT PLENUM WITH BIRDSCREENING FOR VERTICAL RADIATOR AIR DISCHARGE. FITTED W/ GRAVITY DISCHARGE LOUVERS (QTY 6).	3		CB–600
7	1	EXHAUST SILENCER: ø80x27, CRITICAL GRADE, INTERNALLY INSULATED, DISC–TYPE.	3,4		TBD
8	1	EXHAUST 90° ELBOW WITH WELDED RAINGUARD (SHIP LOOSE).	3,4		TBD
9	2	FLEXIBLE CONNECTOR TO ENGINE.	3,4		TBD
10	1	RAINCAP (SHIP LOOSE).	3,4		TBD
11	1	8,400 GALLON SUBBASE TANK, NFPA–30 COMPLIANT.	3,4,8		
		UL 142 LISTED, STEEL DESIGN DIESEL FUEL TANK WITH HEAVY DUTY SIDE CHANNELS. PAINTED WITH			
		TWO COATS OF BLACK FINISH. DOUBLE WALL W/ 110% RUPTURE BASIN FOR SECONDARY CONTAINMENT.			
		VENT/FILL/ALARM PACKAGE INCLUDING: UL/NFPA SIZED EMERGENCY VENTS & 2" NORMAL VENT,			
		MULTIPLE FUEL ALARM SWITCHES, MANUAL LOCKING FILL CAP, VISUAL FUEL LEVEL GAUGE AND LEAK			
		DETECTION SWITCH. INSTALL AND WIRE FUEL TANK LEVEL SWITCHES, CRITICAL HIGH–LOW FUEL LEVEL ALARMS			
		AND LEAK DETECTION ALARM TO ENGINE TERMINAL STRIP. YES TO PROVIDE AND INSTALL BRAIDED STAINLESS STEEL FUEL SUPPLY AND			
		RETURN LINES TO AND FROM ENGINE. SITE PIPING BY OTHERS.			
12	1	MORRISON 918S PANEL.	3,5,9,10		
13	1	CAT BATTERY SET (8) AND CABLES. YES TO SUPPLY BATTERY RACK.	3		LF–5478
14	8	PROVIDE AND INSTALL BATTERY HEATER PADS.	3,7		
15	2	20A BATTERY CHARGER	3	–	2860177
16	1	WIRE AND INSTALL DIODE(s) FOR CUSTOMER PROVIDED BATTERY SELECTOR.	3,7		BBS–800
17	1	150A, 120/208V, 3Ø, BASIC CIRCUIT BREAKER TYPE LOAD CENTER.	3,6		S3054B3150
18	1	CUSTOMER PROVIDED 4000A TRISTAR DOCKING STATION.	3,6		LF–9903
19	1	45kVA DRY TRANSFORMER, 480V PRIMARY: 120/208V SECONDARY, 3Ø. MOUNTED ON THE WALL.	3,6		HT45A3B2–D16
20	1	100AMP, 480V, 3Ø, BASIC CIRCUIT BREAKER TYPE POWER PANEL.	3,7		P1E18MC250AT
21	4	120VAC 48" LED LIGHT FIXTURES.	3,6		VT3005450P
22	2	24VDC VAPOR PROOF LIGHT FIXTURES.	3,6		VX100DG
23	1	60 MINUTE TIMER FOR DC LIGHTS.	3,6		FD60MHW
24	2	3–WAY SWITCHES, WALL MOUNTED, W/WEATHERPROOF COVER.	3,6		2097
25	3	DUPLEX GFCI RECEPTACLE.	3,6		CS20AC3W
26	1	4.5kW SPACE HEATER, THERMOSTATICALLY CONTROLLED.	3,6		LPW204ST
27	2	DAYTON 484X38 EXHAUST FAN INSTALLED IN DISCHARGE WALL.	3,4,6		484X38
28	1	THERMOSTAT FOR EXHAUST FAN.	3,6		8426
29	1	E–STOP, BREAK GLASS, NEMA–3R (SHIP LOOSE).	3,6		ST120SN3RBP2
30	1	ALL WIRING TO AND FROM ELECTRICAL ACCESSORIES IS TO BE INSTALLED IN ELECTRICAL METALLIC	N/S		
		TUBING (EMT) AND LIQUID TIGHT FLEXIBLE CONDUIT. SHORE POWER TO BE PROVIDED BY CUSTOMER.			
31	1	7.5 GALLON SPILL BUCKET W/ 4" NPT FILL PORT.	3,9		518CC–0100 AC
32	1	OVERFILL PREVENTION VALVE SET AT 95%, DROP TUBE TO BE 6" FROM BOTTOM OF TANK.	3,9		9095X–2200AV
33	1	CHECK VALVE ON FUEL SUPPLY.	3,9		7746K822
34	1	PROVIDE AND INSTALL TRIPLEX RACOR FILTER WITH SHUT OFF VALVES.	3,9		79100FHV30
35	1	INSTALL CUSTOMER PROVIDED FUEL POLISHING SYSTEM WIRED TO EMCP FOR STATUS.	3,6,9		CFS1500–CPSO–BH
36	1	INSTALL CUSTOMER PROVIDED FUEL FLOW METER.	3,9		
37	1	PROVIDE AND INSTALL BRAIDED STAINLESS STEEL FUEL LINES.	3		
38	1	INSTALL CUSTOMER PROVIDED 5 GALLON KENCO OIL TANK.	3,9		
39	2	SUPPLY AND INSTALL CLOSED CRANKCASE VENTILATION CANISTER.	3		CCV12000
40	1	SUPPLY AND INSTALL ROCHESTER FUEL GAUGE W/ 240 30 OHM. OIL &	3,9		
41	1	WATER DRAIN BULKHEAD FITTINGS (3/4" MALE JIC).	3		2700–12–12
42	14	VIBRATION ISOLATORS.	3,4,9		579–3582
43	2	ALUMINUM PERSONAL TRAVEL RESTRAINT SYSTEM TIE–OFF.	3,4		
44	1	SMALL DOCUMENT HOLDER.	3		9000–07
45	2	INSTALL REMOVABLE ACCESS PANEL FOR FOR DOCKING STATION ELECTRICAL ACCESS.	3		
46	1	PROVIDE RADIATOR COOLANT, AND FILL RADIATOR PRIOR TO SHIPPING.	N/S		
47	1	INSTALL CUSTOMER PROVIDED SURGE PROTECTOR.	3	–	
48	1	BREAK APART PACKAGE FOR SHIPPING. (TANK ENCLOSURE & GENSET). DO NOT INSTALL ATAAC PIPE FOR SHIPPING.	N/S		
49	1	REMOVABLE COVER/TOP PLATE FOR STUB–UP AREA.			

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APP'D
ALL	A	ORIGINAL SUBMITTAL	5/19/2022	DMG
ALL	B	CUSTOMER COMMENTS	5/23/2022	JPR
ALL	C	480V PANEL BOARD	6/2/2022	DMG

SHIP LOOSE ITEMS TO BE INSTALLED AT SITE BY OTHERS

ITEM	QTY.	ITEM DESCRIPTION
8	1	EXHAUST 90° ELBOW
10	1	RAINCAP.
29	1	E–STOP.
	1	CAT BOX.

DRAWING FOR APPROVAL
NOT FOR CONSTRUCTION PURPOSES

APPROVED AS DRAWN ☐
APPROVED AS NOTED ☐
REVISE AS NOTED, RESUBMIT ☐

SIGNATURE DATE

NAME (PLEASE PRINT) TITLE

CUSTOMER:

REFERENCE: ALUM. 0.080" SKIN ON ALUM. 2x2x0.125 TUBING

UNITS REQ'D: 16

THIRD–ANGLE PROJECTION

DO NOT SCALE

REVISION C

DATE 6/2/2022

GENERAL ARRANGEMENT SUBMITTAL
B.O.M.

DRW.	DMG
CHK.	JPR
APP.	KYB
APP.	X

JOB SERIAL NO. 22–0804, 22–0805, 22–0806, 22–0952

SCALE: NTS SHEET 2 OF 11

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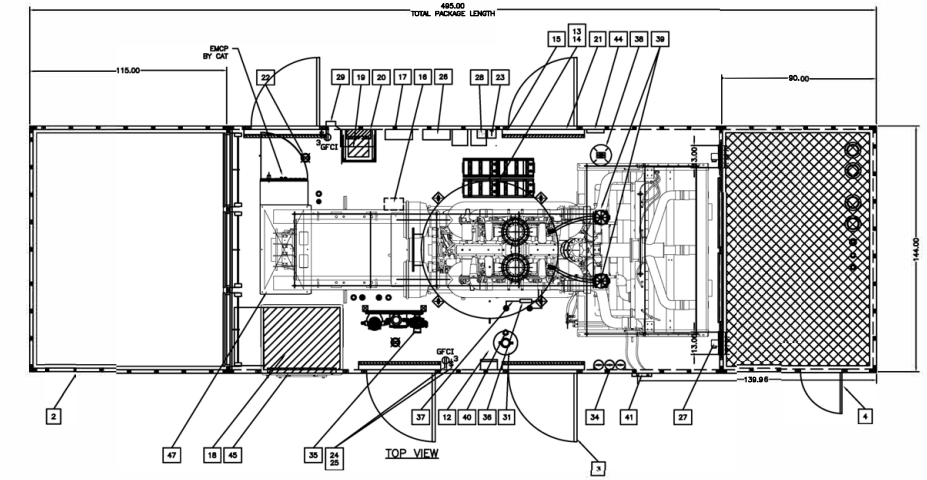
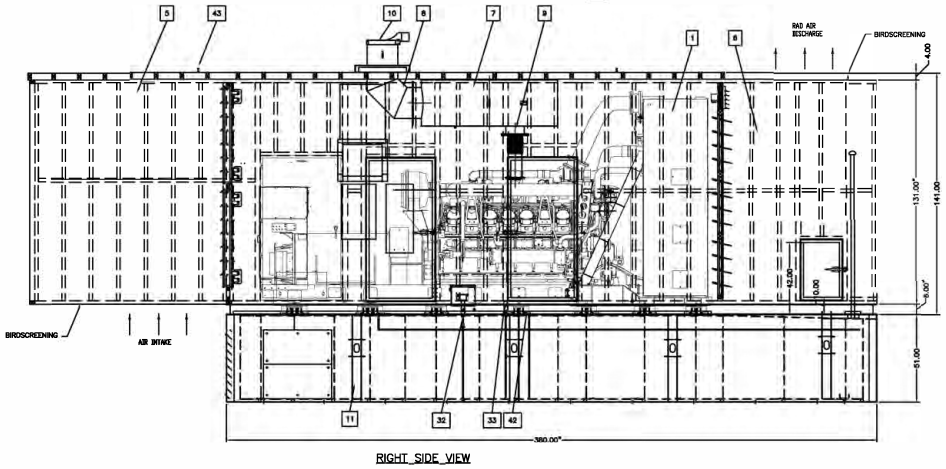
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APP'D
ALL	A	ORIGINAL SUBMITTAL	5/19/2022	DMG
ALL	B	CUSTOMER COMMENTS	5/23/2022	JPR
ALL	C	480V PANEL BOARD	6/2/2022	DMG





RIGHT SIDE VIEW

DRAWING FOR APPROVAL
NOT FOR CONSTRUCTION PURPOSES

APPROVED AS DRAWN ☐
APPROVED AS NOTED ☐
REVISE AS NOTED, RESUBMIT ☐

SIGNATURE | DATE

NAME (PLEASE PRINT) | TITLE

CUSTOMER:

THIRD-ANGLE PROJECTION

REFERENCE: ALUM. 0.080" SKIN ON ALUM. 2x2x0.125 TUBING

UNITS REQ'D: 16

DO NOT SCALE

REVISION C

DATE 6/2/2022

ELEVATION VIEWS

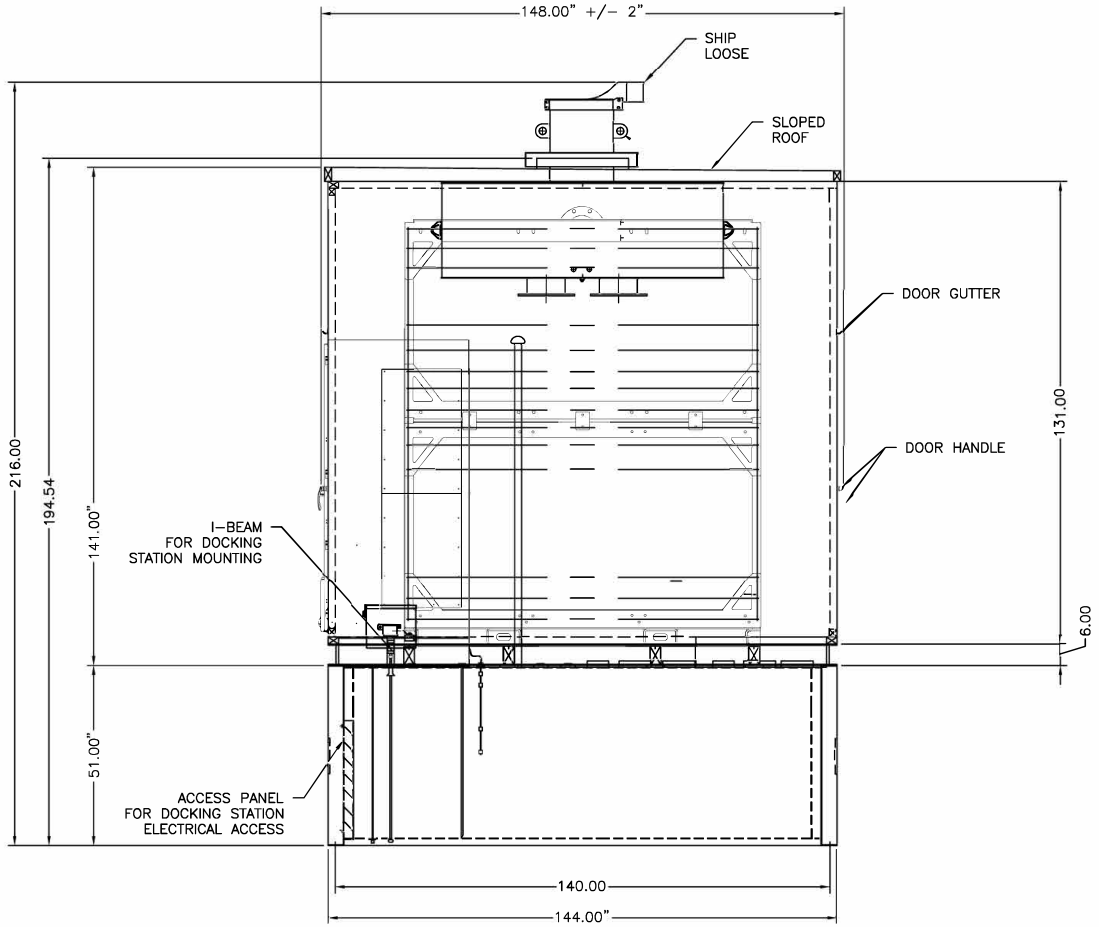
DRW.	DMG
CHK.	JPR
APP.	KYB
APP.	X

JOB SERIAL NO. 22-0804, 22-0805, 22-0806, 22-0952

SCALE: NTS | SHEET 1 OF 11

created using AutoCAD

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APP'D
ALL	A	ORIGINAL SUBMITTAL	5/19/2022	DMG
ALL	B	CUSTOMER COMMENTS	5/23/2022	JPR
ALL	C	480V PANEL BOARD	6/2/2022	DMG



FRONT VIEW

DRAWING FOR APPROVAL
NOT FOR CONSTRUCTION PURPOSES

APPROVED AS DRAWN ☐
APPROVED AS NOTED ☐
REVISE AS NOTED, RESUBMIT ☐

SIGNATURE DATE

NAME (PLEASE PRINT) TITLE

CUSTOMER:

REFERENCE: ALUM. 0.080" SKIN ON ALUM. 2x2x0.125 TUBING

UNITS REQ'D: 16

THIRD-ANGLE PROJECTION

DO NOT SCALE

REVISION C

CKD

DATE 6/2/2022

GENERAL ARRANGEMENT SUBMITTAL
ELEVATION VIEWS

DRW. DMG	JOB SERIAL NO. 22-0804, 22-0805, 22-0806, 22-0952
CHK. JPR	
APP. KYB	
APP. X	SCALE: NTS SHEET 4 OF 11

created using AutoCAD

Ground Supported Tank For Liquids Seismic Design

IBC 2021, ASCE 7-16 Chapter 15

Seismic Criteria:

Site Class:	D	R:	3	ASCE Table 15.4-2 Flat Bottom Ground Supported
S_s:	1.26			Steel Tanks Mechanically Anchored
S_1:	0.43	L:	10	Tank Length
S_{Ds}:	1.01	h:	3.145	Top of Liquid, ft
S_{D1}:	0.54	Tc:	2.0155	ASCE EQ 15.7-12
I_E:	1.25	T_L:	6	ASCE Figure 22-14

$T_S=S_{D1}/S_{DS}$ 0.53

$T_i<T_S$ Conservative

$\therefore S_{ai}=S_{ds}=$ 1.01 ASCE EQ 15.7-7

$T_c<T_L$

$\therefore S_{ac}=1.5S_{D1}/T_c=$ 0.402 ASCE EQ 15.7-10

$V_i= S_{ai}\, I_E/(R)$ 0.42 Wi ASCE EQ 15.7-5

$V_c= S_{ac}\, I_E/(1.5)$ 0.33 Wc ASCE EQ 15.7-6

2500 KW CAT Generator Foundation Design

IBC 2021, ASCE 7-16, ACI 318-19

1.) Generator

Enclosure Weight:	25.8	kips	Total Height H:	192	in
Generator Weight:	42	kips	Total Width B:	148	in
Tank Weight:	18.8	kips	Total Width L:	495	in
Tank Capacity:	8614	gal	Tank Int. Height H_T:	51	in
Liquid S.G.:	0.88		Tank Int. Width W_T:	140	in
Liquid Weight:	63.2	kips	Tank Int. Length L_T:	380	in
Snow Load:	25	psf			

2) Seismic Design per ASCE 7-16 Chapter 15 Non-Building Structure Procedure

Lateral System

Flat Bottom Ground Supported
Steel Tanks Mechanically Anchored

R:	3.0	ASCE Table 15.4-2
Ω_0:	2.0	ASCE Table 15.4-2
C_d:	2.5	ASCE Table 15.4-2
I_E:	1.25	

Lateral Loads

Lateral resistance is provided by the steel tank anchored to the concrete slab.
See Ground Supported Tank For Liquids Seismic Design Spreadsheet

Vi =	0.42 Wi		ASCE EQ 15.7-5
Vc =	0.33 Wi		ASCE EQ 15.7-6
Enclosure EQ = Vi * We =	10.8	kips	
Generator EQ = Vi * Wg =	17.7	kips	
Tank EQ = Vi * Wt =	7.9	kips	
Liquid Wi =	22.8	kips	ACI 350.3-06 EQ 9-15
Liquid Wc =	3.8	kips	ACI 350.3-06 EQ 9-16
Liquid EQ = Vi*Wi+Vc*Wc =	10.8	kips	

2500 KW CAT Generator Foundation Design

IBC 2021, ASCE 7-16, ACI 318-19

2) Seismic Design per ASCE 7-16 Chapter 15 Non-Building Structure Procedure

Shear Connection

V = ΣEQ =	47.2	kips	Assume 3/4" Hilti KB3 SS		
Number of Anchors =	22.0		with 3 1/4" embed.		
Anchor Shear = 0.7*V*Ω/# =	3.01	kips/anchor < ASD Capacity =	5.7	kips	OK

Overturning Resistance About Width

	C.O.G.		EQ		OT Moment	
Enclosure	121.5	in	10.8	kips	110	k-ft
Generator	88.8	in	17.7	kips	131	k-ft
Tank	25.5	in	7.9	kips	16.8	k-ft
Liquid	25.5	in	10.8	kips	23	k-ft
			M_{OT} =		280	k-ft

	Moment Arm		DL		Res. Moment	
Resisting Dead Load	74	in	86.5	kips	533	k-ft
Resisting Liquid	74	in	63.2	kips	390	k-ft
			M_R =		923	k-ft

F.O.S. = M_R / M_{OT} = 3.3 OK Full Tank

F.O.S. = M_R / M_{OT} = 2.1 OK Empty Tank

3) Wind Design per ASCE 7-16 Chapter 29 Non-Building Structure Procedure

Wind Speed V:	104.0	mph	ASCE 7-16 Risk Category III
Exposure Cat.	B		
Exposure Coe Kz:	0.62		Table 26.10-1 (H = 20')
Direction Coe. Kd:	0.85		Table 26.6-1
Topo Coe. Kzt:	1.00		Sec. 26.8
V_Pressure qz =	14.6	psf	EQ 26.10-1
Gust Factor G:	0.85		Sec 26.11
Af =	660	sqft	
h/d =	1.30		
Cf =	1.31		Figure 29.4-1
F =	10.72	kips	EQ 29.4-1

Shear Connection

WL < EQ Shear Connection OK By Inspection

Overturning Resistance About Width

M_{OT} = F*H/2	86	k-ft
M_R = DL*W/2	533	k-ft (Exclude Liquid Weight)
F.O.S. = M_R / M_{OT} =	6.2	OK

TANK NOTES:

1. ALL FITTINGS TO BE CARBON STEEL WELD FLANGES (UNLESS OTHERWISE NOTED)
2. EXTERIOR FINISH: "BLACK" - TKP – STANDARD TANK/BASE PAINT, MARINE INLAND
3. INNER TANK DIMENSIONS: 450.50"L x 137.875"W x 37.742"H
4. APPROXIMATE USEABLE TANK CAPACITY: 8,300 GALLONS @ 90 %
5. ACTUAL TANK VOLUME (100%): 9,458 GALLONS
6. APPROXIMATE TANK WEIGHT: 22,000 LBS

NOTES:

1. GENERATOR, KOHLER KD2500 OPEN, ALT: KH08430TO4D
   DIMENSIONS: 264.4"L X 114.8"W X 130.0"H
   WEIGHT: 53,363 LBS
   DRAWING # : ADV-8925
2. TOTAL AIRFLOW REQUIRED: 97345 CFM
3. SOUND ATTENUATION LEVEL: 15 dB(A) REDUCTION AT 23 FEET
4. INSULATION: 2" MAT-FACED MICRO-AIRE DUCT BOARD
5. LINING: MILL-FINISH PERFORATED ALUMINUM
6. ENCLOSURE WALLS: 4" ALUMINUM TUBE WELDED FRAME
7. ENCLOSURE ROOF: 2" ALUMINUM TUBE WELDED FRAME
8. ENCLOSURE DIMENSIONS: 556"L x 158"W x 161"H
9. ENCLOSURE WEIGHT (APPROX.): 12,000 LBS
10. ENCLOSURE COLOR: 1302 "INDUSTRIAL GREY"
11. ENCLOSURE SHALL BE PROVIDED w / 4-POINT LIFTING LUGS
12. TOTAL PACKAGE WEIGHT:87,363 LBS

Sheet List Table

Sheet Number	Sheet Title
1	COVER SHEET
2	SPECIAL INSTRUCTIONS
3	ASSEMBLY
4	SA LVL 1 ENCLOSURE RIGHT VIEW
5	SA LVL 1 ENCLOSURE END VIEW
6	ELECTRICAL PLAN
7	UL 142 DIESEL FUEL TANK
8	INSIDE PLATFORM
9	SUGGESTED PAD LAYOUT
10	ANCHOR DETAIL
11	E1
12	E2
13	E3
14	E4
15	E5

REVISIONS:

REVISION LEVEL	REVISION DESCRIPTION	SHEET OF CHANGE(S)	ENGINEER	DATE
00	INITIAL RELEASE (QUOTE # 94802REV1)		JAL	10/8/2021
01	REVISED TO REFLECT QUOTE# 94802REV3		JAL	10/26/2021
02				
03				
04				

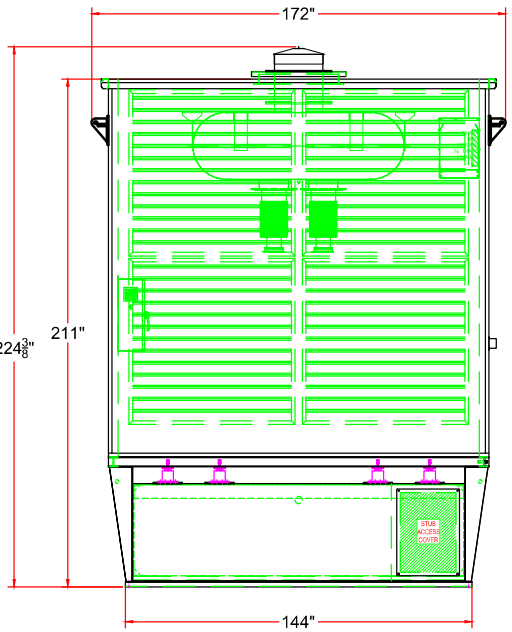
DRAWING ACCEPTED FOR PRODUCTION	
SIGNATURE	
PRINT NAME-TITLE	DATE / /

1	ENCLOSURE WIND-LOAD RATED AT 120 MPH
2	ENCLOSURE DOORS TO HAVE PAD LOCKABLE PANIC HARDWARE (CRASH BARS), KASON DOOR HANDLE UPGRADE 316SS. INCLUDES HOLD OPEN BRACKETS
3	FUMES DISPOSAL TUBE TO BE ROUTED INTO DISCHARGE PLENUM
4	MOTORIZED INTAKE LOUVERS AND GRAVITY EXHAUST LOUVERS
5	SILENCER, EXHAUST FLANGES, AND EXHAUST FLEXES TO BE WRAPPED IN THERMAL WRAP INSULATION BLANKETS WITH SPRINGS
6	ENCLOSURE ELECTRICAL PACKAGE OPTION THAT INCLUDES A 100 AMP MAIN 3 PHASE PANEL BOARD, UP TO (6) LED LIGHTS, (2) 20A GFCI OUTLETS, AND (2) SWITCHES. ALSO INCLUDES GENERATOR ACCESSORY CONNECTIONS FOR JACKET WATER HEATER, BATTERY CHARGER, AND ALTERNATOR HEATER. INCLUDES INSTALL OF CUSTOMER SUPPLIED BATTERY CHARGER (IF SHIPPED LOOSE).
7	
8	EMERGENCY STOP BUTTON BREAK GLASS STATION INSTALLED ON ENCLOSURE EXTERIOR, NEMA 4X NON-METALLIC
9	TWO 5KW SPACE HEATER WITH THERMOSTAT INSTALLED IN ENCLOSURE
10	TWO EXHAUST FANS AND THERMOSTAT INSTALLED IN ENCLOSURE
11	PROVIDE AND INSTALL TRANSFORMER, 30 KVA 3 PHASE WITH A 60AMP FUSED DISCONNECT
12	ROOF-MOUNTED (2) HEAVY DUTY STEEL D-RINGS WITH STAINLESS STEEL PLATE
13	2" AIR GAP UNDERNEATH FUEL TANK FOR VISUAL INSPECTION
14	INSTALL CUSTOMER SUPPLIED OIL LEVELER. INCLUDES TANK BRACKET AND LABOR TO INSTALL. DOES NOT INCLUDE OIL OR FINAL ENGINE RUNNING ADJUSTMENTS
15	7-1/2 GALLON FILL/SPILL BUCKET W/ PAD LOCKABLE LID
16	OVERFILL PREVENTION VALVE (2" CAMLOK CONNECTOR) INSTALLED IN FILL/SPILL BUCKET SET @ 90%
17	FUEL FILL EXTENSION FOR STATIC DISCHARGE (FUEL FILL EXTENDED TO 6" FROM BOTTOM OF TANK). USE DROP TUBE ON OPV

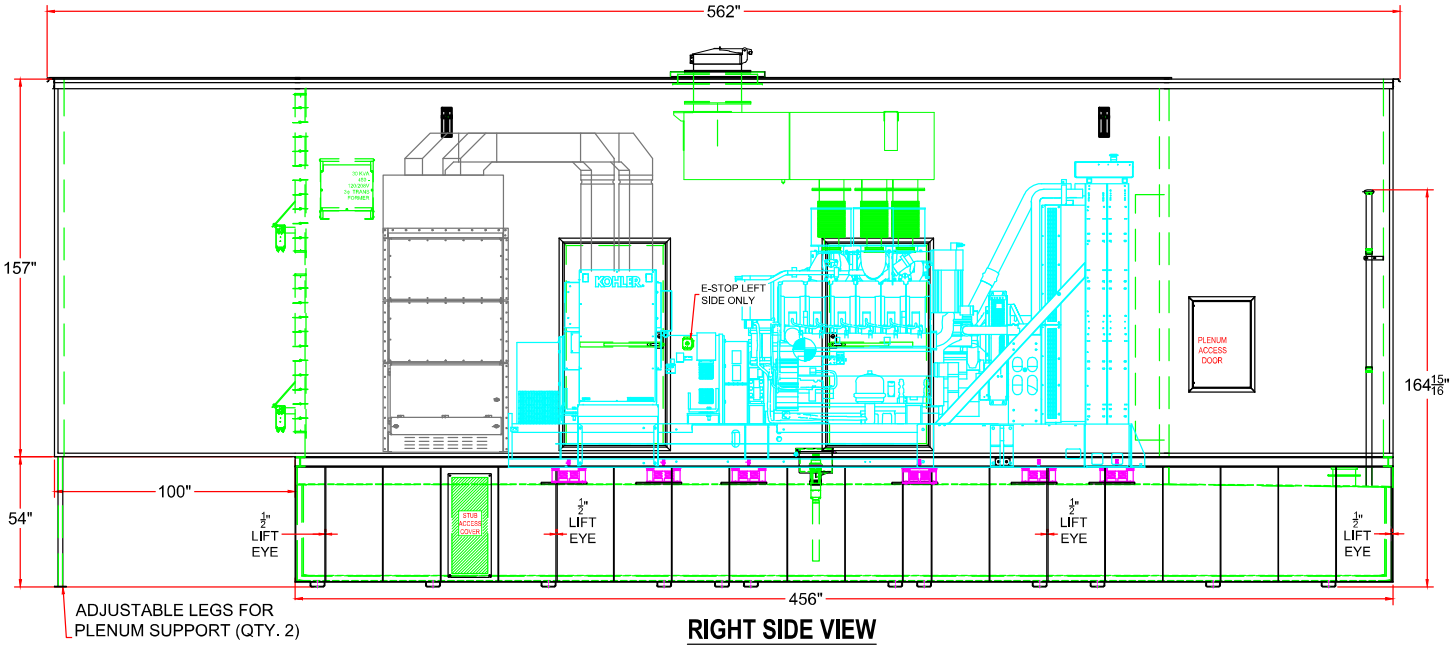
18	-LOW FUEL SWITCH (STAINLESS) AT 25% -HIGH FUEL SWITCH (STAINLESS) AT 85% -CRITICAL HIGH FUEL SWITCH (STAINLESS) AT 90% -CRITICAL LOW FUEL SWITCH (STAINLESS) AT 10%
19	INSTALL CUSTOMER SUPPLIED FUEL POLISHER SYSTEM ON FUEL TANK, INCLUDES MOUNTING BRACKET, PIPING, HOSES, ELECTRICAL CONNECTION TO PANEL BOARD
20	NORMAL VENT EXTENSION, 2" NPT X 12' ABOVE GRADE, EXTERIOR TO HOUSING
21	
22	REMOTE ANNUNCIATOR - 5 RED LIGHT (24 VDC) UL LISTED NEMA4 ENCLOSURE STANDARD WITH AUDIBLE ALARM HORN AND SILENCE/RESET BUTTON. TYPICAL ARRANGEMENT FOR CRITICAL HIGH FUEL LEVEL (90%), HIGH FUEL LEVEL (85%) (CITY OF DENVER), LOW FUEL LEVEL (25%), CRITICAL LOW FUEL LEVEL (10%) AND RUPTURE BASIN ALARM POINTS
23	MOUNT GENSET AND INSTALL FUEL LINES. BALL VALVES INSTALLED IN THE SUPPLY/RETURN LINE TO/FROM THE ENGINE
24	ENCLOSURE TO BE PREPPED FOR SHIPMENT BY CLOSING OFF PLENUM OPENINGS AND EXPOSED ENCLOSURE SIDES THAT WILL OVERHANG FREIGHT CARRIER TRAILER
25	KD SERIES OPTIONS: - NO BARIUM, CALCIUM, COPPER, LEAD, MAGNESIUM, PHOSPHOROUS, POTASSIUM, SODIUM, OR ZINC IN FUEL LINE SYSTEM. - STANDARD LOW FUEL SWITCH UPGRADED TO STAINLESS STEEL. - TO USE FACTORY SUPPLIED FUEL LINES TO CONNECT TO TANK. - IF MULTIPLE FUEL LINES ARE NEEDED MFG TO SUPPLY FLEX LINES WITH A STAINLESS STEEL CONNECTION FITTING (JIC).
26	COATING FOR INSIDE OF INNER TANK, (ITL). INCLUDES NEAR-WHITE SAND BLAST
27	SS FUEL LINES IN LIEU OF STANDARD FUEL LINES, 36" PER
28	CHECK VALVE INSTALLED IN ENGINE FUEL SUPPLY LINE. 1" FNPT
29	PROVIDE AND INSTALL 240-30 OHM SENDER, WIRE TO CONTROL PANEL FOR CUSTOMER TO CONNECT
30	ONE ALUMINUM PLATFORM WITH MOLDED FIBERGLASS GRATING

31	MFG TO SUPPLY FACTORY WITNESS TESTING AT MFG LOCATION PER SPEC (FOR THE 1ST UNIT ONLY) STORAGE IN THE TANK FOR THIS PROJECT) -MFG TO SUPPLY LOAD BANK, TRANSFORMER, CABLING, AND CONNECTIONS FOR TESTING TO BE COMPLETED
32	STAMPED PE DRAWINGS AND CALCULATIONS FOR WIND/SEISMIC CERTIFICATION FOR ENCLOSURE DESIGN TO BE SUPPLIED BY A STATE OF CO PROFESSIONAL ENGINEER
33	THREE YEAR WARRANTY

PLEASE NOTE THAT THE FOLLOWING ITEMS WILL SHIP LOOSE AND REQUIRE ON-SITE ASSEMBLY BY OTHERS	
1	NORMAL VENT PIPING
2	EXHAUST ELBOW AND RAIN CAP
3	FUEL TANK
4	GENERATOR
5	ENCLOSURE
6	ONE ALUMINUM PLATFORM



REAR VIEW



RIGHT SIDE VIEW

ENCL. WEIGHT	TANK WEIGHT	GEN. WEIGHT	TOTAL WEIGHT
12,000 LBS.	22,000 LBS.	53,363 LBS.	***87,363 LBS.***

CUSTOMER:

KOHLER KD2500 OPEN, ALT: KH08430TO4D

THIRD-ANGLE PROJECTION

DESCRIPTION ASSEMBLY

DESIGNATION DL3

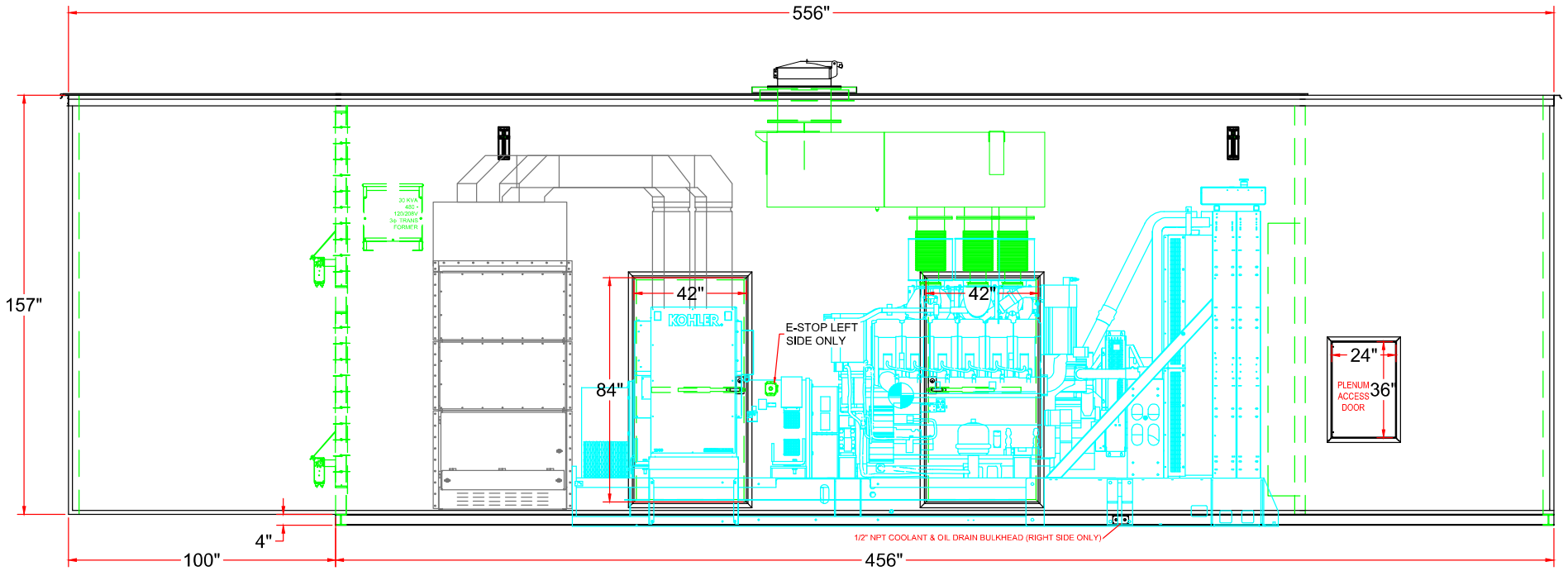
USEABLE GALLONS / dBA REDUCTION

8,300 AT 90% / 15

DRW.	JAL
CHK.	SH
APP.	-
DATE	10/26/2021

SCALE:

SHEET 3 OF 15



RIGHT SIDE VIEW

EXHAUST LIST		
QTY.	PART	PART #
1	18" RAINCAP	
1	20" EXHAUST STACK, 20" ANSI FLANGE O.E., 7.25" OAL	
1	20" EXHAUST STACK, 20" ANSI FLANGE O.E., 20" FLOATING ANSI FLANGE O.E., 12.75" OAL	
1	20" O-SERIES CRITICAL GRADE SILENCER	
1	INSULATION BLANKET W/ SPRINGS FOR SILENCER	
1	20" ANSI FLANGE GASKET	
2	20" ANSI NUT, BOLT, GASKET KIT	
3	10" ANSI NUT, BOLT, GASKET KIT	
1	INSULATION BLANKET W/ SPRINGS FOR 20" ANSI FLANGE	
3	INSULATION BLANKET W/ SPRINGS FOR 10" ANSI FLANGE	
3	6" CUSTOM FLARED FLANGE / 10" ANSI FLOATING FLANGE 26" FLEX ASSEMBLY	
3	INSULATION BLANKET W/ SPRINGS FOR FLEX	

NOTE: DRAIN BULKHEAD FOR REFERENCE ONLY. ACTUAL LOCATION TO BE DETERMINED BY TECHNICIAN.

ENCL. WEIGHT	TANK WEIGHT	GEN. WEIGHT	TOTAL WEIGHT
12,000 LBS.	22,000 LBS.	53,363 LBS.	***87,363 LBS.***

CUSTOMER:

KOHLER KD2500 OPEN, ALT: KH08430T04D

DESCRIPTION: SA LVL 1 ENCLOSURE RIGHT VIEW

THIRD-ANGLE PROJECTION

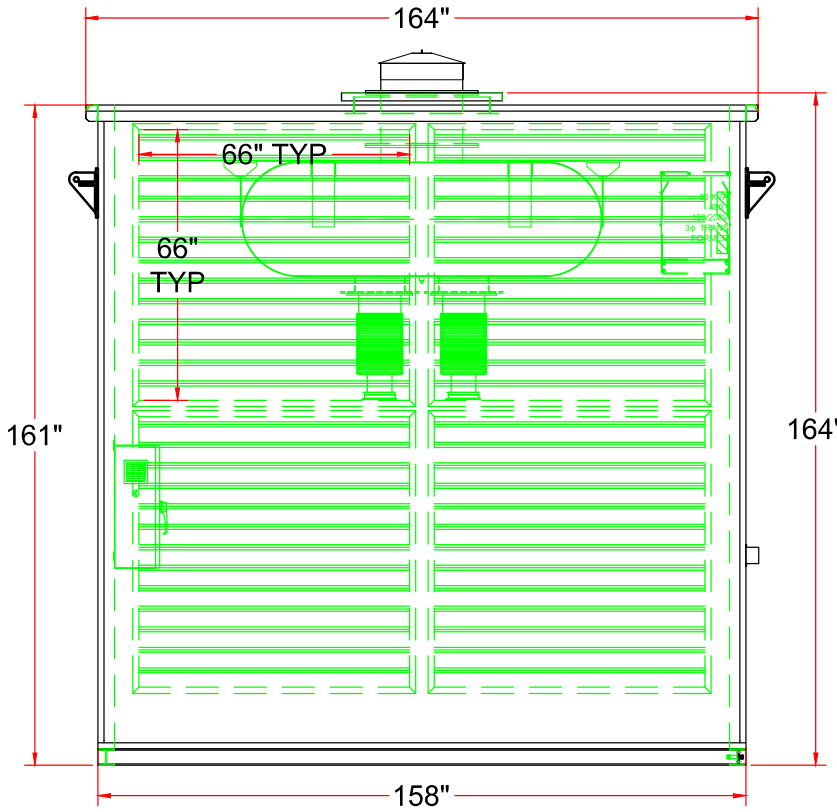
DESIGNATION: DL3

dBA REDUCTION: 15

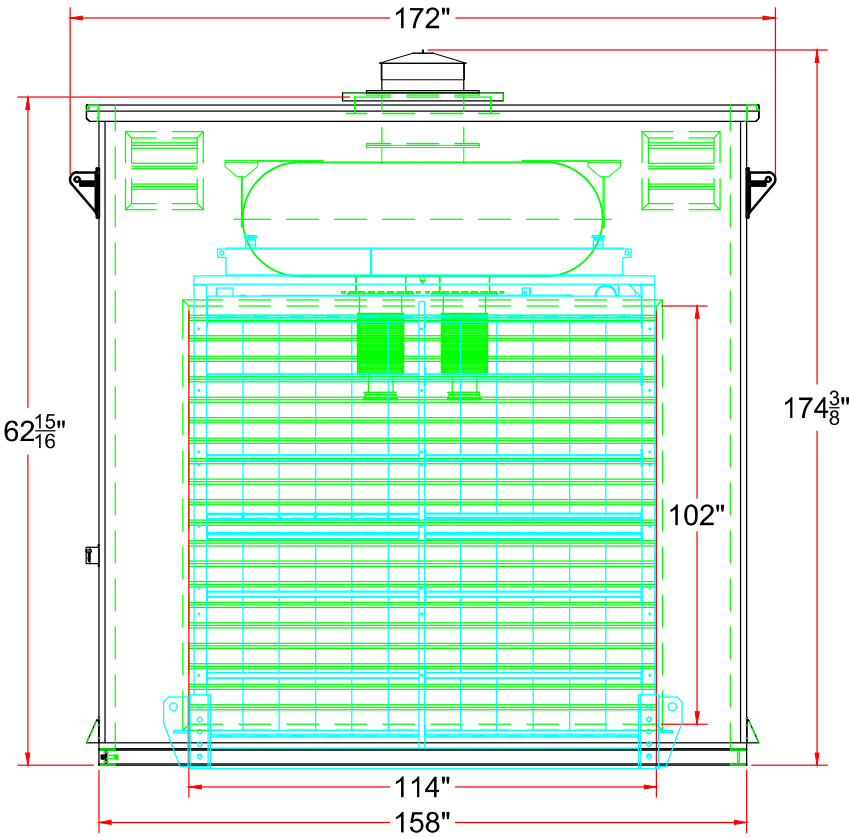
DRW.	JAL
CHK.	SH
APP.	-
DATE	10/26/2021

SCALE:

SHEET 4 OF 15



REAR VIEW



FRONT VIEW

ENCL. WEIGHT	TANK WEIGHT	GEN. WEIGHT	TOTAL WEIGHT
12,000 LBS.	22,000 LBS.	53,363 LBS.	***87,363 LBS.***

CUSTOMER:

KOHLER KD2500 OPEN, ALT: KH08430T04D

DESCRIPTION: SA LVL 1 ENCLOSURE END VIEW

THIRD-ANGLE PROJECTION

DESIGNATION: DL3

dBA REDUCTION

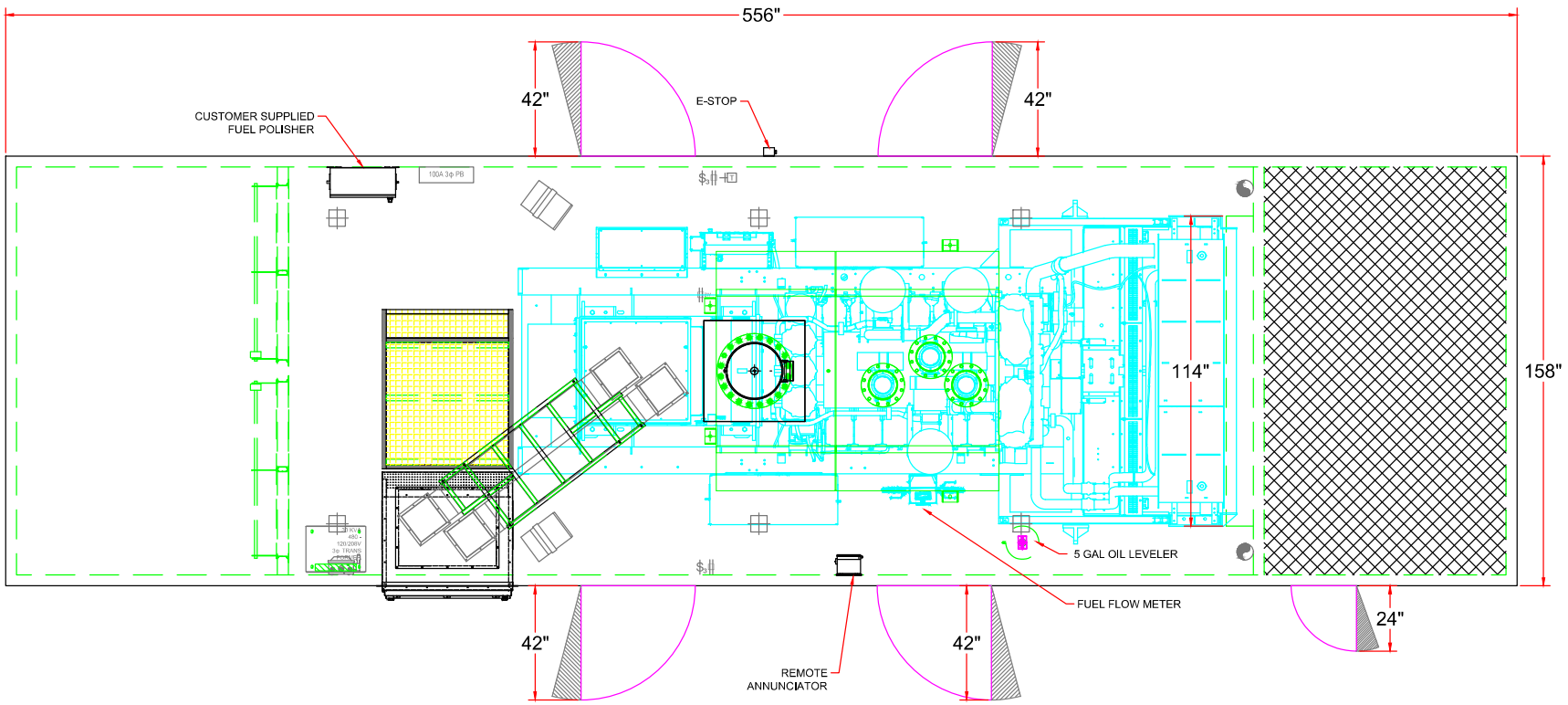
15

DRW.	JAL
CHK.	SH
APP.	-
DATE	10/26/2021

SCALE:

SHEET 5 OF 15

DAMPER LIST		
QTY.	DIMENSIONS	PART #
4	66"W X 66"H	CD-101 (MOTOR IN AIRSTREAM) 552-317
1	114"W X 102"H	CB-601 551-563
2	16"W X 16"H	CB-600 551-053



PANEL DESIGNATION	EG1	AIC RATING	10,000
VOLTAGE AND PHASE	208/120VAC 3 PHASE	ENCLOSURE	NEMA 1
PANEL BUS SIZE	250A	MANUFACTURER	SIEMENS
MAIN TYPE	MAIN BREAKER		
MAIN AMPS	100		

CKT #	CB TRIP	LOAD AMPS	FEED	LOAD IN AMPS A PH	LOAD IN AMPS B PH	LOAD IN AMPS C PH	FEED	LOAD AMPS	CB TRIP	CKT #
1	20	10	GFCI	33.3			5KW SPACE HEATER	23.3	30	2
3	20	3	INTERIOR LIGHTS		26.3			23.3		4
5	20	6	BATTERY CHARGER #1			29.3	5KW SPACE HEATER	23.3	30	6
7	20	6	BATTERY CHARGER #2	29.3				23.3		8
9	20	6	BATTERY CHARGER #3		35		6KW COOLANT HEATER	29	40	10
11	20	6	BATTERY CHARGER #4			35		29	40	12
13	20	10	EXHAUST FAN/LOUVERS	10						14
15	20	10	FUEL POLISHER		10					16
17						0				18
19				0						20
21					0					22
23						0				24
25				0						26
27					0					28
29						0				30
			PHASE AMPS TOTAL	72.6	71.3	64.3				
			PANEL AMPS MAX PHASE		72.6					
			MINIMUM PANEL SIZE AT 80% LOADING	=	90.75	AMPS				

- SURFACED MOUNTED LED LIGHT FIXTURE
- GROUND FAULT INTERRUPTED DUPLEX OUTLET
- 3-WAY SWITCH
- THERMOSTAT
- 5KW CEILING MOUNT HEATER WITH THERMOSTAT (240V)
- EXHAUST FAN - VENTED TO OUTSIDE
- 100A 3 PHASE PANEL BOARD

NOTE: THE LIGHTING FIXTURES SHOWN ARE REPRESENTATIVE OF QUANTITY ONLY. ACTUAL LOCATION WILL BE DETERMINED AT TIME OF INSTALLATION FOR MAXIMUM ILLUMINATION OF THE ENCLOSURE.

ENCL. WEIGHT	TANK WEIGHT	GEN. WEIGHT	TOTAL WEIGHT
12,000 LBS.	22,000 LBS.	53,363 LBS.	***87,363 LBS.***

CUSTOMER:

KOHLER KD2500 OPEN, ALT: KH08430TO4D

DESCRIPTION ELECTRICAL PLAN

THIRD-ANGLE PROJECTION

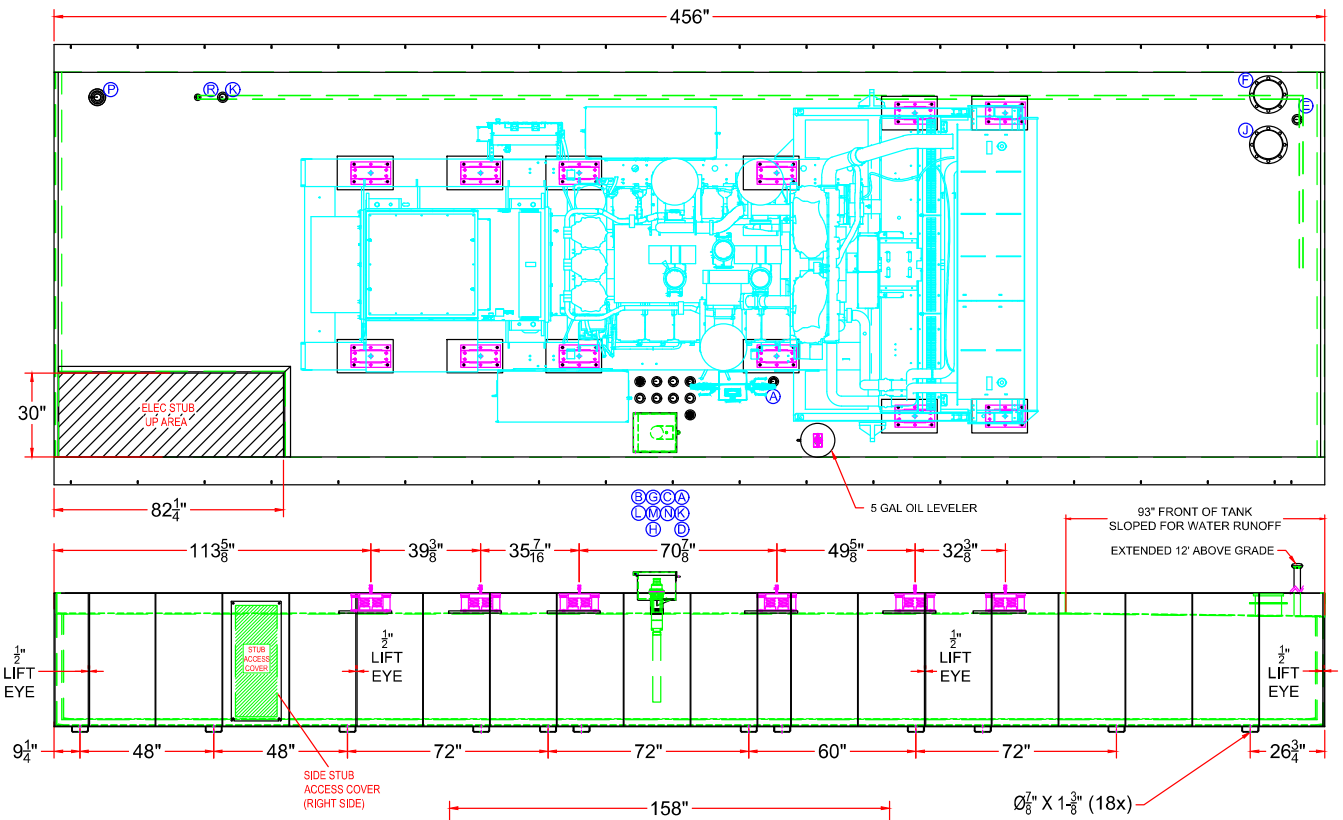
DESIGNATION

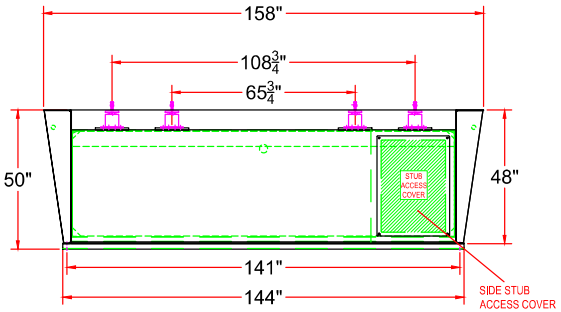
DL3

DRW.	JAL
CHK.	SH
APP.	-
DATE	10/26/2021

SCALE:

SHEET 6 OF 15





FITTING	DESCRIPTION	LENGTH
A	2" X 1" NPT FUEL PORT DROP TUBE W/ BALL VALVE (QTY: 2) W/ CHECK VALVE ON FUEL SUPPLY LINE (QTY. 1)	36-7/8"
B	1-1/2" NPT 240-30 OHM FUEL SENDER	35-1/5"
C	2" NPT STAINLESS LOW FUEL SWITCH AT 25%	28-1/8"
D	1-1/2" NPT FUEL GAUGE	35-1/5"
E	2" NPT NORMAL VENT, EXTENDED 12' ABOVE GRADE	
F	8" ANSI FLANGE EMERGENCY VENT (PRIMARY)	
G	2" NPT TOP MOUNT LEAK DETECTION SWITCH & DRAIN PORT	
H	4" NPT 7-1/2 GALLON FILL SPILL BUCKET W/ OVERFILL PREVENTION VALVE (2" CAMLOK CONNECTION) AT 90% W/ STATIC DISCHARGE	
J	8" ANSI FLANGE EMERGENCY VENT (SECONDARY)	
K	2" NPT SPARE FITTINGS (QTY 2)	
L	2" NPT STAINLESS HIGH FUEL SWITCH AT 85%	5-5/8"
M	2" NPT STAINLESS CRITICAL LOW FUEL SWITCH AT 10%	33-3/4"
N	2" NPT STAINLESS CRITICAL HIGH FUEL SWITCH AT 90%	3-3/4"
P	2" NPT WITH 2" X 1" DOUBLE TAP BUSHING AND DROP TUBE WITH 1" IN-LINE CHECK VALVE FOR CONNECTION OF FUEL POLISHER SYSTEM	36-7/8"
R	1" NPT DROP TUBE FOR CONNECTION OF FUEL POLISHER SYSTEM (INTERNALLY PIPE TO OPPOSITE END OF TANK)	

ENCL. WEIGHT	TANK WEIGHT	GEN. WEIGHT	TOTAL WEIGHT
12,000 LBS.	22,000 LBS.	53,363 LBS.	***87,363 LBS.***

CUSTOMER:

KOHLER KD2500 OPEN, ALT: KH08430TO4D

DESCRIPTION: UL 142 DIESEL FUEL TANK

THIRD-ANGLE PROJECTION

DESIGNATION: DL3

USEABLE GALLONS / ACTUAL GALLONS

8,300 AT 90% / 9,458

DRW.	JAL
CHK.	SH
APP.	-
DATE	10/26/2021
SCALE:	
SHEET	7 OF 15

2500 KW Kohler Generator Foundation Design

IBC 2021, ASCE 7-16, ACI 318-19

1.) Generator

Enclosure Weight:	12.0	kips	Total Height H:	211	in
Generator Weight:	53.4	kips	Total Width B:	158	in
Tank Weight:	22.0	kips	Total Width L:	562	in
Tank Capacity:	9458	gal	Tank Int. Height H_T:	37.74	in
Liquid S.G.:	0.88		Tank Int. Width W_T:	137.88	in
Liquid Weight:	69.4	kips	Tank Int. Length L_T:	450.5	in
Snow Load:	25	psf			

2) Seismic Design per ASCE 7-16 Chapter 15 Non-Building Structure Procedure

Lateral System

Flat Bottom Ground Supported
Steel Tanks Mechanically Anchored

R:	3.0	ASCE Table 15.4-2
Ω_0:	2.0	ASCE Table 15.4-2
C_d:	2.5	ASCE Table 15.4-2
I_E:	1.25	

Lateral Loads

Lateral resistance is provided by the steel tank anchored to the concrete slab.
See Ground Supported Tank For Liquids Seismic Design Spreadsheet

Vi =	0.42 Wi	ASCE EQ 15.7-5
Vc =	0.33 Wi	ASCE EQ 15.7-6

Enclosure EQ = Vi * We =	5.1	kips
Generator EQ = Vi * Wg =	22.5	kips
Tank EQ = Vi * Wt =	9.3	kips

Liquid Wi =	25.0	kips	ACI 350.3-06 EQ 9-15
Liquid Wc =	4.1	kips	ACI 350.3-06 EQ 9-16
Liquid EQ = Vi*Wi+Vc*Wc =	11.9	kips	

2500 KW Kohler Generator Foundation Design

IBC 2021, ASCE 7-16, ACI 318-19

2) Seismic Design per ASCE 7-16 Chapter 15 Non-Building Structure Procedure

Shear Connection

V = ΣEQ =	48.7	kips	Kohler spec calls for a 3/4" Hilti KB3 SS
Number of Anchors =	24.0		with 3 1/4" embed.
Anchor Shear = 0.7*V*Ω/# =	2.84	kips/anchor < ASD Capacity = 5.7 kips	OK

Overturning Resistance About Width

	C.O.G.		EQ		OT Moment	
Enclosure	132.5	in	5.1	kips	55.8	k-ft
Generator	93.3	in	22.5	kips	175	k-ft
Tank	24.0	in	9.3	kips	18.5	k-ft
Liquid	24.0	in	11.9	kips	23.8	k-ft
				M_{OT} =	273	k-ft

	Moment Arm		DL		Res. Moment	
Resisting Dead Load	79	in	87.4	kips	575	k-ft
Resisting Liquid	79	in	69.4	kips	457	k-ft
				M_R =	1032	k-ft

F.O.S. = M_R / M_{OT} = 3.8 OK Full Tank

F.O.S. = M_R / M_{OT} = 2.3 OK Empty Tank

3) Wind Design per ASCE 7-16 Chapter 29 Non-Building Structure Procedure

Wind Speed V:	104.0	mph	ASCE 7-16 Risk Category III
Exposure Cat.	B		
Exposure Coe Kz:	0.62		Table 26.10-1 (H = 20')
Direction Coe. Kd:	0.85		Table 26.6-1
Topo Coe. Kzt:	1.00		Sec. 26.8
V_Pressure qz =	14.6	psf	EQ 26.10-1
Gust Factor G:	0.85		Sec 26.11
Af =	823	sqft	
h/d =	1.34		
Cf =	1.31		Figure 29.4-1
F =	13.3802	kips	EQ 29.4-1

Shear Connection

WL < EQ Shear Connection OK By Inspection

Overturning Resistance About Width

M_{OT} = F*H/2	118	k-ft
M_R = DL*W/2	575	k-ft (Exclude Liquid Weight)
F.O.S. = M_R / M_{OT} =	4.9	OK

KWIK Bolt 3 Expansion Anchor 3.3.6

Table 8 - Stainless Steel KWIK Bolt 3 Allowable Loads in Normal-Weight Concrete[1]

Anchor Diameter in. (mm)	Embedment Depth in. (mm)	f'_c = 2000 psi (13.8 MPa)		f'_c = 3000 psi (20.7 MPa)		f'_c = 4000 psi (27.6 MPa)		f'_c = 6000 psi (41.4 MPa)	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
1/4 (6.4)	1-1/8 (29)	260 (1.2)	595 (2.6)	320 (1.4)		380 (1.7)	725 (3.2)	470 (2.1)	
	2 (51)	540 (2.4)	675 (3.0)	625 (2.8)	675 (3.0)	705 (3.1)	805 (3.6)	910 (4.0)	805 (3.6)
	3 (76)	685 (3)		750 (3.3)		810 (3.6)			
3/8 (9.5)	1-5/8 (41)	605 (2.7)	880 (3.9)	670 (3.0)	1110 (4.9)	730 (3.2)	1345 (6.0)	950 (4.2)	1690 (7.5)
	2-1/2 (64)	1285 (5.7)	1570 (7.0)	1430 (6.4)	1570 (7.0)	1575 (7.0)	1590 (7.1)	1940 (8.6)	1590 (7.1)
	3-1/2 (89)	1620 (7.2)		1755 (7.8)		1885 (8.4)		2035 (9.1)	
1/2 (12.7)	2-1/4 (57)	1015 (4.5)	1875 (8.3)	1230 (5.5)	2130 (9.5)	1450 (6.4)	2380 (10.6)	1620 (7.2)	2740 (12.2)
	3-1/2 (89)	1445 (6.4)	3010 (13.4)	1975 (8.8)	3010 (13.4)	2510 (11.2)	3045 (13.5)	2655 (11.8)	3045 (13.5)
	4-3/4 (121)	1990 (8.9)		2250 (10.0)				2985 (13.3)	
5/8 (15.9)	2-3/4 (70)	1650 (7.3)	2875 (12.8)	1755 (7.8)	3485 (15.5)	1860 (8.3)	4095 (18.2)	2335 (10.4)	4625 (20.6)
	4 (102)	2455 (10.9)	4625 (20.6)	2900 (12.9)	4625 (20.6)	3340 (14.9)	4625 (20.6)	4395 (19.5)	
	5-1/2 (140)	3480 (15.5)		3885 (17.3)		4290 (19.1)		6260 (27.8)	
3/4 (19.1)	3-1/4 (83)	1550 (6.9)	3945 (17.5)	1950 (8.7)	4260 (18.9)	2350 (10.5)	5645 (25.1)	2610 (11.6)	5645 (25.1)
	4-3/4 (121)	2510 (11.2)	5535 (24.6)	3250 (14.5)	5535 (24.6)	3870 (17.2)		4670 (20.8)	
	8 (203)	2930 (13.0)		3735 (16.6)		4530 (20.2)		5120 (22.8)	
1 (25.4)	4-1/2 (114)	3120 (13.9)	6080 (27.0)	3870 (17.2)	6770 (30.1)	4610 (20.5)	7470 (33.2)	4800 (21.4)	7470 (33.2)
	6 (152)	4400 (19.6)	7470 (33.2)	6400 (28.5)	7470 (33.2)	7200 (32.0)		7330 (32.6)	
	9 (229)	5600 (24.9)		8000 (35.6)		9390 (41.8)		9390 (41.8)	

1 Intermediate load values for other concrete strengths and embedments can be calculated by linear interpolation.