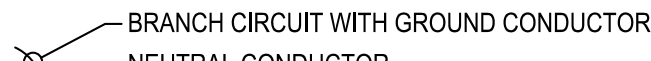





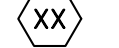
REFERENCE SYMBOLS & WIRING

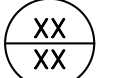

BRANCH CIRCUIT WITH GROUND CONDUCTOR



NEUTRAL CONDUCTOR



PHASE CONDUCTOR



HOMERUN ARROW



PLAN NOTE MARK



SHEET REFERENCE MARK


MECHANICAL EQUIPMENT NOTE MARK



SHOP EQUIPMENT NOTE MARK



KITCHEN EQUIPMENT NOTE MARK

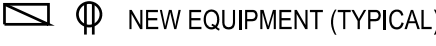

FEEDER MARK



[+ XX"] STANDARD MOUNTING HEIGHT TO CENTER UNLESS OTHERWISE NOTED ON DRAWINGS


LINETYPE LEGEND


UNDER GROUND


ABOVE GROUND, IN WALL, CEILING, ETC


NEW EQUIPMENT (TYPICAL)


EXISTING EQUIPMENT (TYPICAL)


DEMOLISHED EQUIPMENT (TYPICAL)

ABBREVIATIONS

(E)

EXISTING TO REMAIN

(F)

FUTURE

(R)

EXISTING TO BE RELOCATED

(D)

EXISTING TO BE DEMOLISHED

AC

ALTERNATING CURRENT

A, AMP

AMPERES

AFF

ABOVE FINISHED FLOOR

AFG

ABOVE FINISHED GRADE

AFI

ARC FAULT CIRCUIT INTERRUPTER

AHJ

AUTHORITY HAVING JURISDICTION

AIC

EQUIPMENT SHORT CIRCUIT INTERRUPT RATING

AL

ALUMINUM

ATS

AUTOMATIC TRANSFER SWITCH

AUX

AUXILIARY

AWG

AMERICAN WIRE GAUGE

C

CONDUIT

CB

CIRCUIT BREAKER

CKT

CIRCUIT

CO

CARBON MONOXIDE

CR

CONTROLLED RECEPTACLE

CT

CURRENT TRANSFORMER

CU

COPPER

DC

DIRECT CURRENT

DISC

DISCONNECT

DIA

DIAMETER

DMX

DIGITAL MULTIPLEX

DWG

DRAWING

EF

EXHAUST FAN

EM

EMERGENCY

EMT

ELECTRICAL METALLIC TUBING

ENCL

ENCLOSURE

FA

FIRE ALARM

FAA

FIRE ALARM ANNUNCIATOR

FBO

FURNISHED BY OTHERS

FC

FOOT CANDLES

FLA

FULL LOAD AMPERES

FSD

FIRE & SMOKE DAMPER

GEN

GENERATOR

GFCI

GROUND FAULT CIRCUIT INTERRUPTER

GFEP

GROUND FAULT EQUIPMENT PROTECTION

GND

GROUND

HP

HORSEPOWER

HTR

HEATER

IG

ISOLATED GROUND

IR

INFRARED

INV

INVERTER

KCM

THOUSAND CIRCUAR MILS

KW

THOUSAND WATTS

KVA

THOUSAND VOLT-AMPERES

LTG

LIGHTING

LCP

LIGHTING CONTROL PANEL

MB

MAIN BREAKER

MCA

MINIMUM CIRCUIT AMPERES

MDP

MAIN DISTRIBUTION PANEL

MIN

MINIMUM

MLO

MAIN LUGS ONLY

NAC

NOTIFICATION APPLIANCE CIRCUIT

NEC

NATIONAL ELECTRICAL CODE

NEMA

NATIONAL ELECTRICAL MFR'S ASSOCIATION.

NTS

NOT TO SCALE

OFCI

OWNER FURNISHED, CONTRACTOR INSTALLED

OFIO

OWNER FURNISHED, OWNER INSTALLED

OS

OCCUPANCY SENSOR

PH, Ø

PHASE

PNL

PANEL

SDP

SUB DISTRIBUTION PANEL

TEL

TELEPHONE

TK

TOE KICK MOUNTED

TVSS

TRANSIENT VOLTAGE SURGE SUPPRESSION

TYP

TYPICAL

UC

UNDERCABINET

UPS

UNINTERRUPTIBLE POWER SUPPLY

USB

UNIVERSAL SERIAL BUS

V

VOLTS

VA

VOLT-AMPERES

VFD

VARIABLE FREQUENCY DRIVE

W

WATT


WP


WEATHERPROOF


XFMR

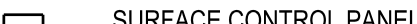
TRANSFORMER


DISTRIBUTION & EQUIPMENT



FLUSH ELECTRICAL PANEL



SURFACE ELECTRICAL PANEL



FLUSH CONTROL PANEL



SURFACE CONTROL PANEL


TRANSFORMER



VAULT

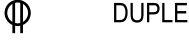

ABOVE GROUND JUNCTION BOX



METER AND SOCKET

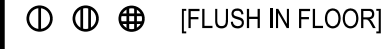

SERVICE ENTRANCE POWER POLE


POWER DEVICES



SINGLE RECEPTACLE

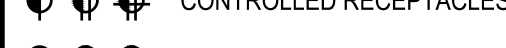

DUPLEX RECEPTACLE

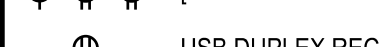

DOUBLE DUPLEX RECEPTACLE



[FLUSH IN FLOOR]



[ABOVE COUNTER]



[IN CEILING]



CONTROLLED RECEPTACLES



[ABOVE COUNTER]



USB DUPLEX RECEPTACLE

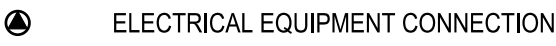

ISOLATED GROUND RECEPTACLES



GFCI, USB/GFCI, ISOLATED/GFCI



POWER/DATA BOX [RECESSED IN FLOOR]



POWER/DATA POLE

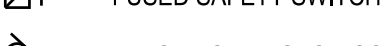

SPECIAL PURPOSE POWER RECEPTACLE



ELECTRICAL EQUIPMENT CONNECTION

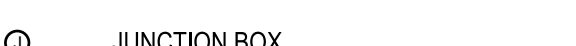

MAGNETIC STARTER



VARIABLE FREQUENCY DRIVE



SAFETY SWITCH



FUSED SAFETY SWITCH

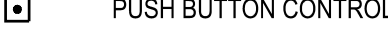

ELECTRICAL MOTOR CONNECTION



SINGLE POINT ELECTRICAL CONNECTION



JUNCTION BOX


JUNCTION BOX [IN FLOOR]



JUNCTION BOX WITH EMERGENCY CIRCUIT

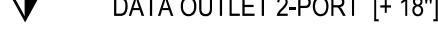

PUSH BUTTON CONTROL

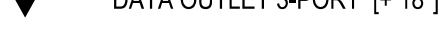

UP/DOWN/STOP PUSH BUTTON CONTROL

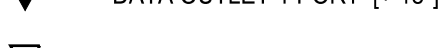

WALL HEATER


TELECOMMUNICATION DEVICES

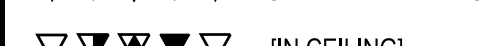

DATA OUTLET 1-PORT [+ 18"]



DATA OUTLET 2-PORT [+ 18"]


DATA OUTLET 3-PORT [+ 18"]



DATA OUTLET 4-PORT [+ 18"]

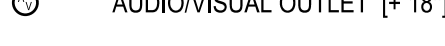

DATA OUTLET FOR WIRELESS NODE 1-PORT [+ 96"]

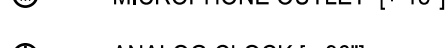

[ABOVE COUNTER]



[IN CEILING]


SIGNAL DEVICES



VOLUME CONTROL [+ 45"]



AUDIOVISUAL OUTLET [+ 18"]



MICROPHONE OUTLET [+ 18"]



ANALOG CLOCK [+ 96"]



TIME CLOCK/SWITCH



ANALOG CLOCK & SPEAKER [+ 96"]



DIGITAL CLOCK



DIGITAL CLOCK & SPEAKER [+ 96"]



SPEAKER [IN CEILING]


SPEAKER-WALL MOUNTED [+ 84"]



CALL BUTTON



THERMOSTAT [+ 45"]

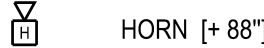

DMX CONTROL OUTLET

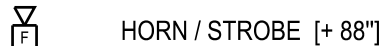

BUZZER


FIRE ALARM DEVICES



PULL STATION [+ 45"]



STROBE [+ 88"]



HORN [+ 88"]



HORN / STROBE [+ 88"]



SPEAKER / STROBE [+ 88"]

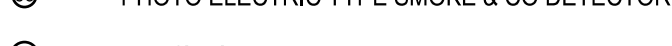

[IN CEILING]



HEAT DETECTOR



DUCT SMOKE DETECTOR



IONIZATION TYPE SMOKE DETECTOR



PHOTO ELECTRIC TYPE SMOKE DETECTOR



PHOTO ELECTRIC TYPE SMOKE & CO DETECTOR



FIRE/SMOKE DAMPER



FIRE DOOR RELEASE

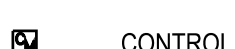

IR SMOKE DETECTOR TRANSMITTER



IR SMOKE DETECTOR RECEIVER



SPRINKLER FLOW SWITCH



SPRINKLER TAMPER SWITCH



BELL

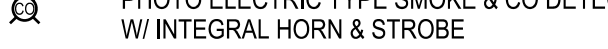

KNOX BOX



MAGNETIC DOOR HOLDER


CONTROL MODULE


ALARM MODULE


IONIZATION TYPE SMOKE DETECTOR
W/ INTEGRAL HORN & STROBE



PHOTO ELECTRIC TYPE SMOKE DETECTOR
W/ INTEGRAL HORN & STROBE



PHOTO ELECTRIC TYPE SMOKE & CO DETECTOR
W/ INTEGRAL HORN & STROBE

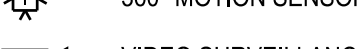
FIRE ALARM DESIGN BUILD NOTE:


PER SPECIFICATION SECTION 28 31 00 - THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING, FURNISHING, AND INSTALLING A COMPLETE FIRE ALARM SYSTEM, INCLUDING, BUT NOT LIMITED TO, ALL ADDRESSABLE FIRE ALARM PANELS, NAC PANELS, INITIATION DEVICES, MONITORING DEVICES, CONTROL DEVICES, ANNUNCIATION DEVICES, AND OTHER EQUIPMENT AS REQUIRED BY OTHER DIVISIONS OF THE SPECIFICATIONS AND LOCAL AHJ.


SECURITY DEVICES



GLASS BREAK DETECTOR



DIRECTIONAL MOTION SENSOR



360° MOTION SENSOR



VIDEO SURVEILLANCE CAMERA

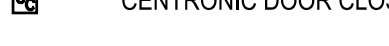

FLUSH AUTOMATIC DOOR ACTUATOR [+ 45"]



KEYPAD [+ 45"]

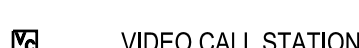

MAGNETIC DOOR SWITCH



ELECTRIC STRIKE



ELECTRIC LOCK



MAGNETIC DOOR LOCK


CENTRONIC DOOR CLOSER



CARD READER [+ 45"]



REQUEST TO EXIT DEVICE



VIDEO CALL STATION



VIDEO RECEIVER STATION


NURSE CALL


CORRIDOR LIGHT [ABOVE DOOR]



CORRIDOR LIGHT [IN CEILING]



EMERGENCY PULL CORD STATION



DUTY STATION

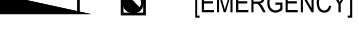

MASTER STATION


LIGHTING DEVICES

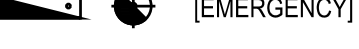

SURFACE MOUNTED LUMINAIRES



[EMERGENCY]



RECESSED LUMINAIRES



[EMERGENCY]



PENDANT MOUNTED LUMINAIRES



[EMERGENCY]



WALL MOUNTED LUMINAIRES



[EMERGENCY]



STRIP LUMINAIRE

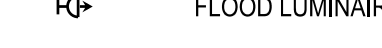

[EMERGENCY]

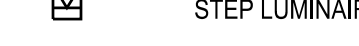

WALL WASH LUMINAIRES



TRACK LIGHTING SYSTEM



DIRECTIONAL LUMINAIRE [IN GRADE]



FLOOD LUMINAIRE



STEP LUMINAIRE

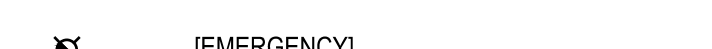

[EMERGENCY]



POLE ARM MOUNT LUMINAIRE

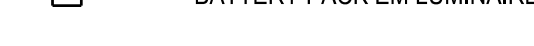

POLE TOP MOUNT LUMINAIRE

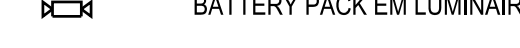

LIGHTED BOLLARD



[EMERGENCY]



BATTERY PACK EM LUMINAIRE [WALL MOUNT]



BATTERY PACK EM LUMINAIRE [CEILING MOUNTED]



EXIT SIGN [CEILING MOUNTED]



EXIT SIGN [WALL MOUNTED]



EXIT SIGN W/ EMERGENCY LIGHT



SINGLE-POLE SWITCH [+ 45"]



TWO-POLE SWITCH [+ 45"]



THREE-WAY SWITCH [+ 45"]



FOUR-WAY SWITCH [+ 45"]



OCCUPANCY SENSOR SWITCH [+ 45"]



OCCUPANCY SENSOR & DIMMER SWITCH [+ 45"]



DIMMER SWITCH [+ 45"]



LOW-VOLTAGE SWITCH [+ 45"]



KEYED SWITCH [+ 45"]



SWITCH WITH PILOT LIGHT [+ 45"]



MULTI-ZONE WALL POD [+ 45"]

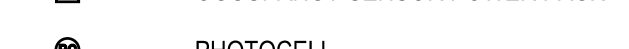

OCCUPANCY SENSOR 360° [CEILING MOUNTED]



DIRECTIONAL OCCUPANCY SENSOR [UNIVERSAL MOUNT]



OCCUPANCY SENSOR POWER PACK


PHOTOCELL



DAYLIGHT SENSOR

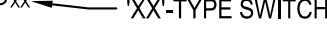

EMERGENCY LOAD TRANSFER DEVICE



LIGHTING CONTACTOR



ROOM CONTROLLER WITH (X) # RELAYS


SWITCH - LUMINAIRE CONTROL

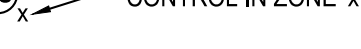

SWITCH FOR ZONE 'X'


'XX'-TYPE SWITCH


TYPE 'XX' LUMINAIRE


LUMINAIRE IN ZONE 'X'


CIRCUIT NUMBER


CONTROL IN ZONE 'X'

NOTE: SYMBOLS AND DEFINITIONS LISTED ON TITLE SHEET ARE TYPICAL OF ALL PROJECTS AND SOME MAY NOT BE PRESENT IN ANY GIVEN DRAWING SET.

DRAWING INDEX

DWG

DESCRIPTION

E0

ELECTRICAL TITLE SHEET

E1

FLOOR PLAN - ELECTRICAL

E2

ELECTRICAL SCHEDULES AND ONE-LINE

E3

ELECTRICAL - GENERATOR SLAB CALCULATIONS

E4

ELECTRICAL - GENERATOR SLAB CALCULATIONS

PROJECT SCOPE

• ADD DIESEL ENGINE GENERATOR AND AUTOMATIC TRANSFER SWITCH.

• ADD NEW EMERGENCY SUB-DISTRIBUTION PANEL.

• ADD NEW EMERGENCY PANEL 2E.

• CONNECT GYMNASIUM LIGHTING TO EMERGENCY POWER.

• CONNECT CORRIDOR LIGHTING TO EMERGENCY POWER.

• PROVIDE AND INSTALL CONCRETE FOR GENERATOR PAD.

• PROVIDE EMERGENCY POWER TO SELECT RECEPTACLES IN MAIN OFFICE.

• PROVIDE EMERGENCY POWER TO LUMINAIRES AT EXTERIOR EGRESS DOORS.

• UPGRADE EXISTING PANEL SCHEDULES TO REFLECT CHANGES. PROVIDE TYPEWRITTEN PANEL SCHEDULES.

• PROVIDE ARCHITECTURAL BARRIERS / GATE AROUND ENGINE GENERATOR.

• CONNECT MAIN OFFICE LIGHTING TO EMERGENCY CIRCUIT.

• TVSS SURGE SUPPRESSION DEVICES

PROJECT CONTACTS

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MKE

MKE & ASSOCIATES, INC.

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MECHANICAL AND ELECTRICAL SYSTEMS

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FAX: 503.892.1190
CONTACT: HANK BARLEEN
engineering@mke-inc.com

EXPIRES 12-31-22

DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT

SEXTON MOUNTAIN SCHOOL

BEAVERTON S.D.

15645 SW SEXTON MOUNTAIN

BEAVERTON, OR 97007

ISSUE DATE:

03-23-2022

SET TYPE:

Final Review Set

REVISIONS:

DRAWN BY:

DD

DESIGNED BY:

HB

CHECKED BY:

SL

MKE JOB #:

BV-5749

ELECTRICAL -
TITLE
SHEET

E0

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EXPIRES 12-31-22

DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT
SEXTON MOUNTAIN SCHOOL
BEAVERTON S.D.
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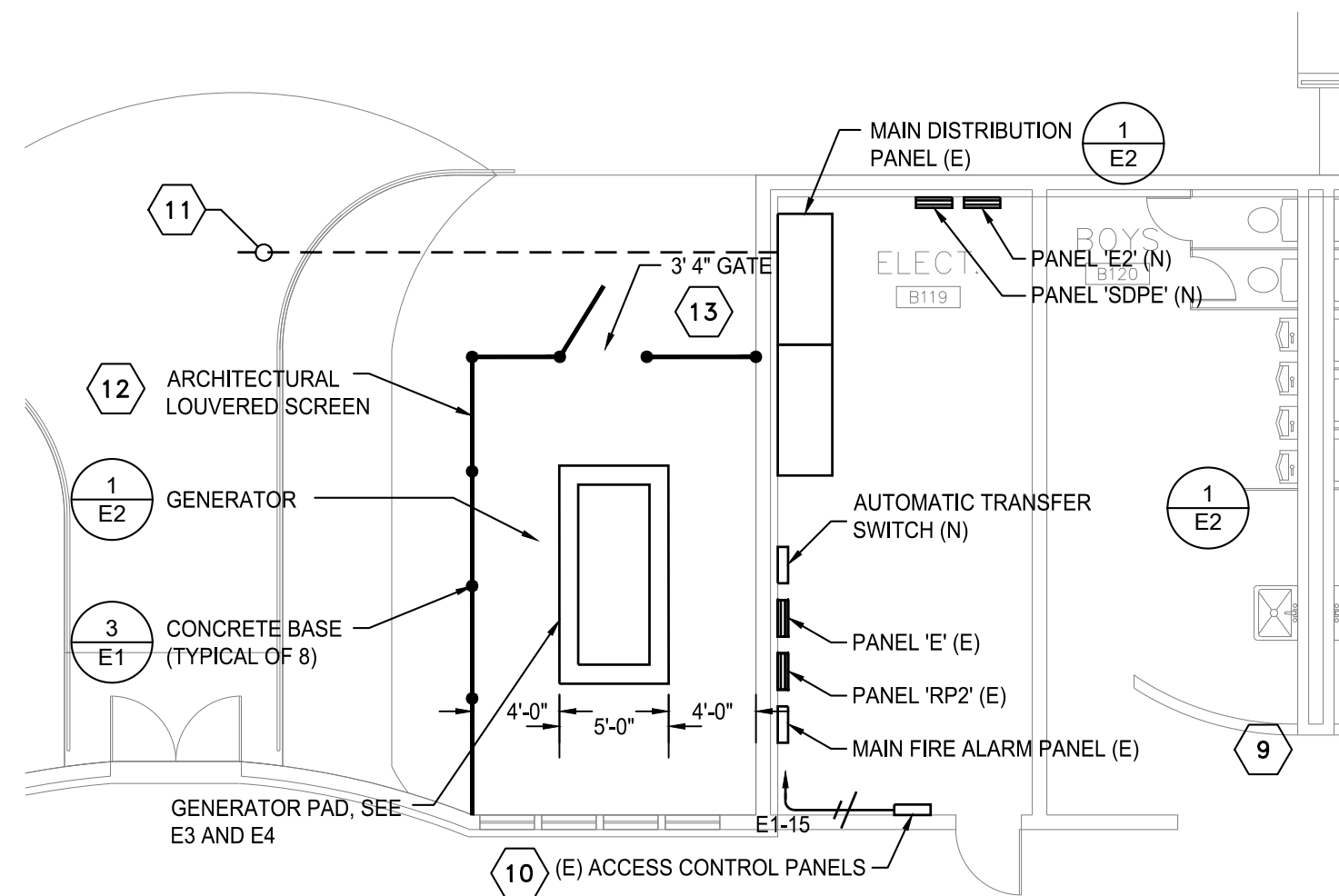
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MKE JOB #:

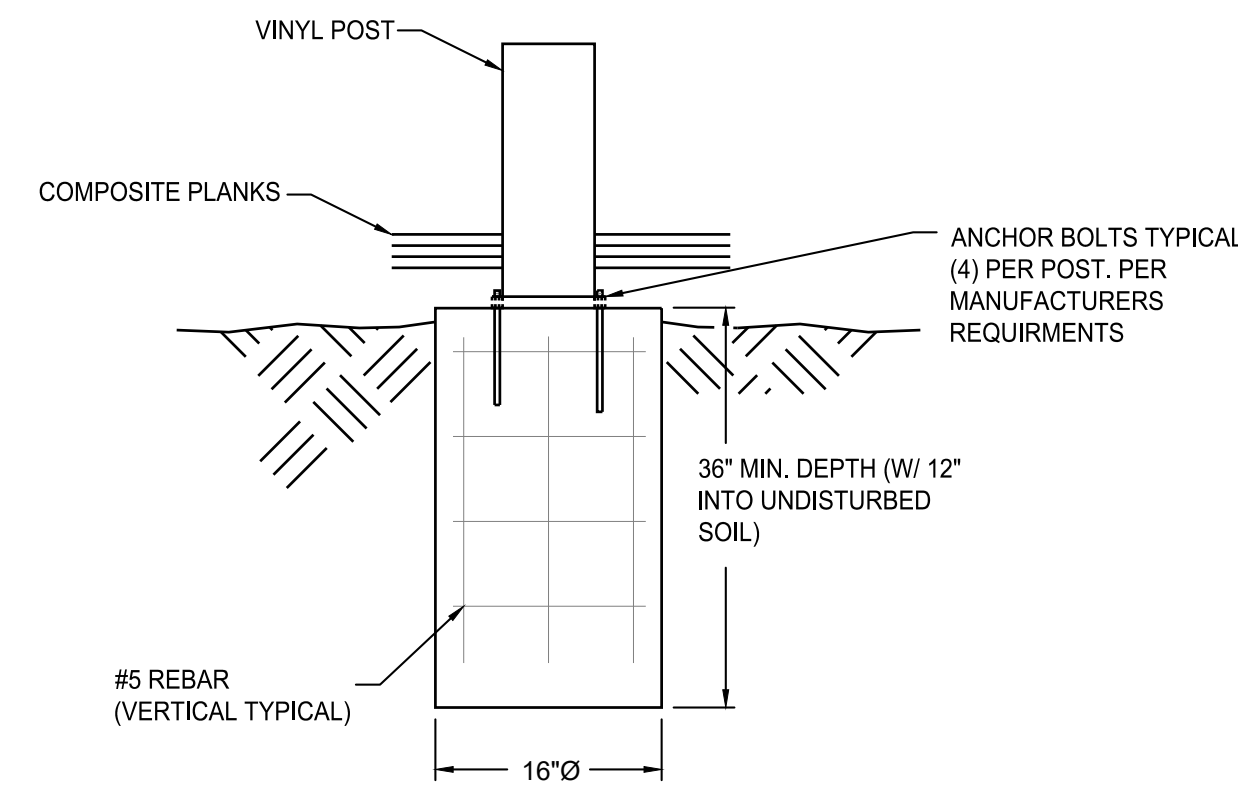
BV-5749

ELECTRICAL -
FLOOR
PLAN

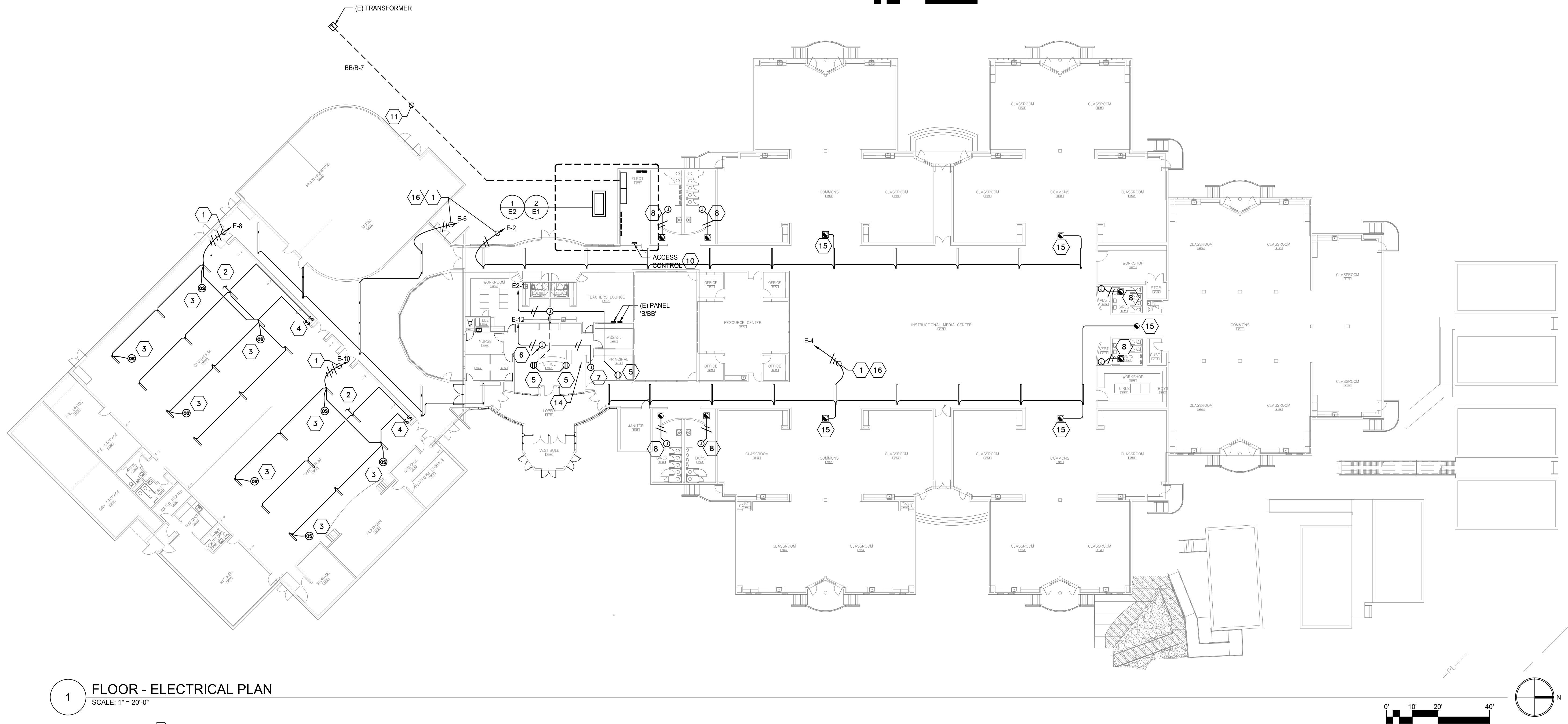
E1



2 ENLARGED ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"
0' 4' 8' 16'



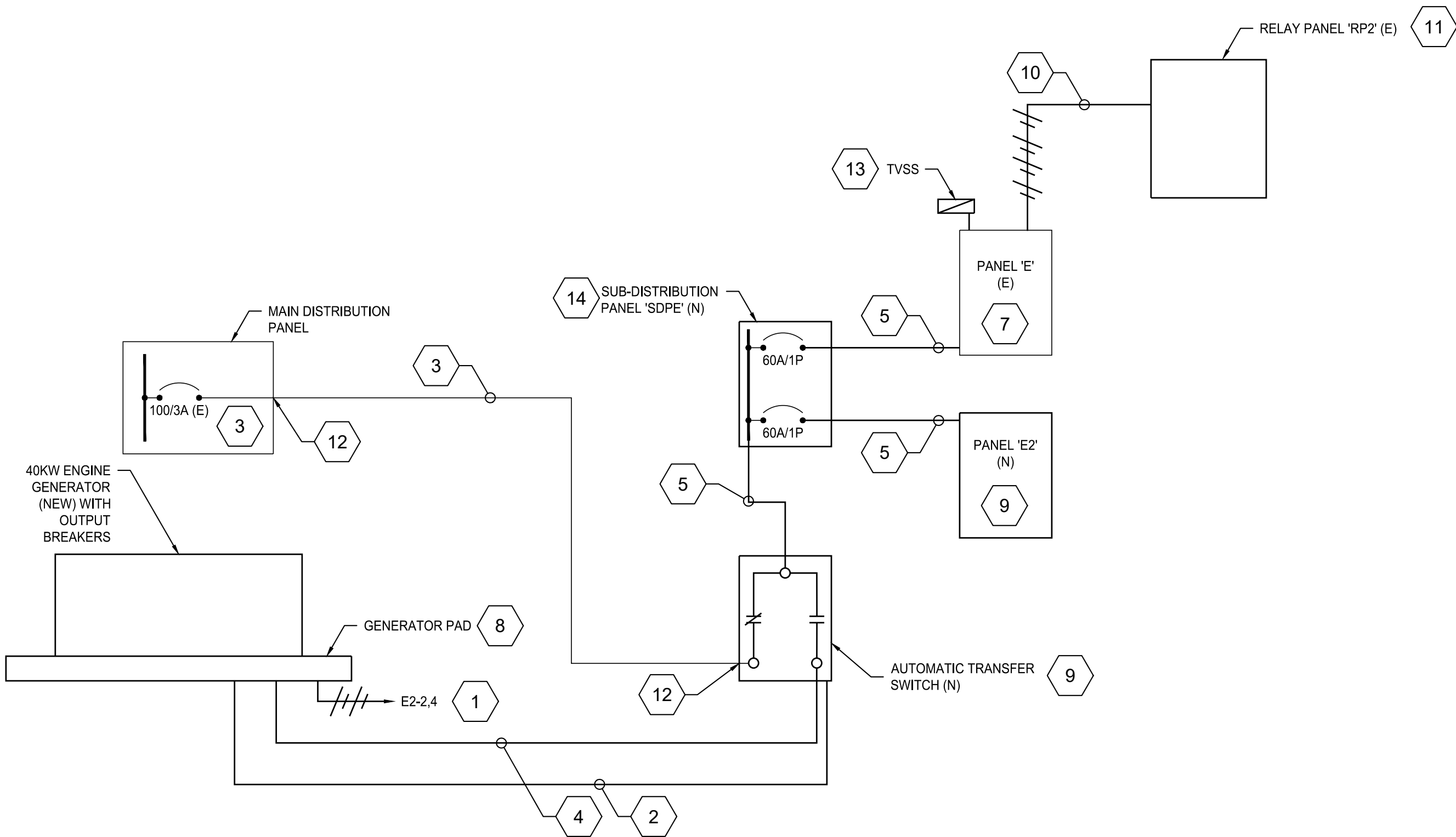
3 LOUVERED SCREEN BASE
N.T.S.



PLOTTED: DANIEL DERHEIMER 8/30/2022 8:38 AM
 5749E2- SEXTON MT

PANEL SCHEDULE											
PANEL: E (EXISTING)				MKE & ASSOCIATES, INC.				MOUNTING: SURFACE			
FED BY: GEN/MDP								BUS/MAIN: 100A			
LOC: ELECTRICAL ROOM		VOLTS 120/208		PHASE 3		WIRE 4					
C	DESCRIPTION	VA	A/P	No.	A B C	No.	A/P	VA	DESCRIPTION	C	
5	FACP ^	200	20/1	1	*	2	20/1	1440	L - CORRIDOR B ^	1	
5	INTRUSION ^	200	20/1	3	*	4	20/1	1440	L - CORRIDOR B ^	1	
1	L - B173 ^	1440	20/1	5	*	6	20/1	1440	L - CORRIDOR A ^	1	
	SPARE^		20/1	7	*	8	20/1	1512	L - GYM ^	1	
2	EXISTING ^	720	20/1	9	*	10	20/1	1512	L - GYM ^	1	
2	EXISTING ^	720	20/1	11	*	12	20/1	1248	L - MAIN OFFICE	1	
	SPARE		20/1	13	*	14	20/1	1080	L-EXTERIOR	1	
5	ACCESS CONTROL	400	20/1	15	*	16	20/1	900	L-EXTERIOR	1	
	SPARE		20/1	17	*	18	20/1	1100	L-EXTERIOR	1	
5	TVSS	1000	20/2	19	*	20	20/1	880	L-EXTERIOR	1	
5	*	1000	*	21	*	22			SPACE		
	SPARE		20/1	23	*	24			SPACE		
	SPACE			25	*	26			SPACE		
	SPACE			27	*	28			SPACE		
	SPACE			29	*	30			SPACE		
	SPACE			31	*	32			SPACE		
	SPACE			33	*	34			SPACE		
	SPACE			35	*	36			SPACE		
	SPACE			37	*	38			SPACE		
	SPACE			39	*	40			SPACE		
	SPACE			41	*	42			SPACE		
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)		FACTOR		CODE LOAD		
1. LIGHTS:		4,912	3,852	5,228	13,992		1.25		17,490		
2. RECEPTACLE:		0	720	720	1,440		*		1,440		
3. HEATING:		0	0	0	0		1.00		0		
4. KITCHEN:		0	0	0	0		1.00		0		
5. EQUIPMENT:		1,200	1,600	0	2,800		1.00		2,800		
6. MOTORS:		0	0	0	0		**		0		
7. MISC:		0	0	0	0		1.00		0		
TOTAL (VA):		6,112	6,172	5,948	18,232				21,730		
LARGEST MOTOR:		0 VA	TOTAL LOAD:		51 A		CODE DEMAND:		60 A		
# KITCHEN EQUIPMENT		0									
NOTES: ^: BREAKERS ARE EXISTING											
* FIRST 10 KVA + 50% OF THE BALANCE ** 125% OF THE LARGEST MOTOR + THE BALANCE											

PANEL SCHEDULE											
PANEL: E2 (NEW)				MKE & ASSOCIATES, INC.				MOUNTING: SURFACE			
FED BY: MDP/GEN								BUS/MAIN: 100A			
LOC: ELECTRICAL RM		VOLTS 120/208		PHASE 3		WIRE 4					
C	DESCRIPTION	VA	A/P	No.	A B C	No.	A/P	VA	DESCRIPTION	C	
2	R-OFFICE	720	20/1	1	*	2	20/1	1000	BLOCK HEATER	5	
5	HVAC CONTROLS	200	20/1	3	*	4	20/1	920	BATTERY CHARGER	5	
	SPARE		20/1	5	*	6	20/1	800	MDF	5	
	SPARE		20/1	7	*	8	20/2	1600	MDF-HVAC	6	
	SPARE		20/1	9	*	10	-	1600	-	6	
	SPARE		20/1	11	*	12			SPACE		
	SPARE		20/1	13	*	14			SPACE		
	SPACE			15	*	16			SPACE		
	SPACE			17	*	18			SPACE		
	SPACE			19	*	20			SPACE		
	SPACE			21	*	22			SPACE		
	SPACE			23	*	24			SPACE		
	SPACE			25	*	26			SPACE		
	SPACE			27	*	28			SPACE		
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)		FACTOR		CODE LOAD		
1. LIGHTS:		0	0	0	0		1.25		0		
2. RECEPTACLE:		720	0	0	720		*		720		
3. HEATING:		0	0	0	0		1.00		0		
4. KITCHEN:		0	0	0	0		1.00		0		
5. EQUIPMENT:		1,000	1,120	800	2,920		1.00		2,920		
6. MOTORS:		1,600	1,600	0	3,200		**		3,600		
7. MISC:		0	0	0	0		1.00		0		
TOTAL (VA):		3,320	2,720	800	6,840				7,240		
LARGEST MOTOR:		1,600 VA	TOTAL LOAD:		19 A		CODE DEMAND:		20 A		
# KITCHEN EQUIPMENT		0									
NOTES:							* FIRST 10 KVA + 50% OF THE BALANCE ** 125% OF THE LARGEST MOTOR + THE BALANCE				



1 REVISED EMERGENCY ONE-LINE DIAGRAM
 SCALE: NTS

KEYED NOTES:

- PROVIDE 120V, 20A DEDICATED CIRCUITS FOR BLOCK HEATER AND BATTERY CHARGER.
- PROVIDE 1-1/2" PVC TO AUTOMATIC TRANSFER SWITCH FOR MONITORING AND CONTROL.
- REDIRECT EXISTING 100A, 120V/208V, 3Ø FEEDER TO NEW AUTOMATIC TRANSFER SWITCH. DISCONNECT FROM EXISTING PANEL 'E'.
- PROVIDE (4) #4 XHHW, (1) #6 GND IN 1-1/2" PVC TO NEW AUTOMATIC TRANSFER SWITCHES. CONDUIT WILL BE EMT ABOVE GRADE AT ENTRY TO BUILDING. PROVIDE RIGID STEEL EUS.
- PROVIDE (4) #2 THHN, (1) #6 GND IN 1-1/2" EMT.
- PROVIDE (4) #4 THHN, (1) #6 GND IN 1-1/4" EMT.
- ADD BREAKERS TO EXISTING SQUARE-D PANELBOARD AS OUTLINED ON PANEL SCHEDULE.
- SEE STRUCTURAL ENGINEERING DRAWINGS/CALCULATIONS IN SPECIFICATIONS. PROVIDE AND INSTALL AS OUTLINED.
- PROVIDE AND INSTALL 100A, 120/208V, 3Ø, 4 WIRE AUTOMATIC TRANSFER SWITCH. SEE SPECIFICATIONS.
- PROVIDE (4) 20A/1P CIRCUITS TO EXISTING LIGHTING RELAYS FROM NEW 20A CIRCUITS IN PANEL E. DISCONNECT EXTERIOR LIGHTING CIRCUITS FROM NORMAL POWER PANEL AND CONNECT TO EMERGENCY PANEL E. CIRCUITS ARE LABELED: "PARKING LOT LTG. RELAY - 28, 30, 36, 40." REMOVE ALL BRANCH CIRCUITS TO EXISTING PANEL AND MODIFY PANEL SCHEDULE.
- EXISTING RELAY PANEL TO REMAIN. RELABEL PER NOTE 10.
- PROVIDE 90° GRC AT STUB TO ATS AND ENGINE GENERATOR
- PROVIDE AND INSTALL TVSS SURGE SUPPRESSION DEVICE ON EXISTING PANEL. ABB OVRT SPD40KA SERIES. PROVIDE 20A-3P BREAKER IN EXISTING PANEL FOR TVSS.
- PROVIDE AND INSTALL NEW 100A, 120/208V, 3 PHASE, 4 WIRE DISTRIBUTION PANEL. SEE SPECIFICATIONS.



DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT
 SEXTON MOUNTAIN SCHOOL
 BEAVERTON S.D.
 15645 SW SEXTON MOUNTAIN
 BEAVERTON, OR 97007

ISSUE DATE:

03-23-2022

SET TYPE:

Final Review Set

REVISIONS:

DRAWN BY:

DD

DESIGNED BY:

HB

CHECKED BY:

SL

MKE JOB #:

BV-5749

ELECTRICAL ONE-LINE AND SCHEDULES

E2

STRUCTURAL CALCULATIONS

PROJECT: BEAVERTON SD -SEXTON MTN ELEM. GENERATOR PAD
LOCATION: 15645 SW SEXTON MTN. RD.
BEAVERTON, OR
CLIENT: MKE & ASSOCIATES, INC.
DATE: NOVEMBER 18, 2020
PROJECT NUMBER: 21460



EXPIRES: 12-31-22

TABLE OF CONTENTS:

ITEM	SHEET NUMBER
GENERAL NOTES	N1 – N2
SKETCHES	SK1 – SK2
CALCULATIONS	C1 – C5

DESCRIPTION:

THIS DESIGN PACKAGE INCLUDES SKETCHES AND CALCULATIONS FOR ANCHORAGE OF ONE (1) GENERATOR UNIT AT THE ADDRESS NOTED ABOVE.

Specifier's comments:

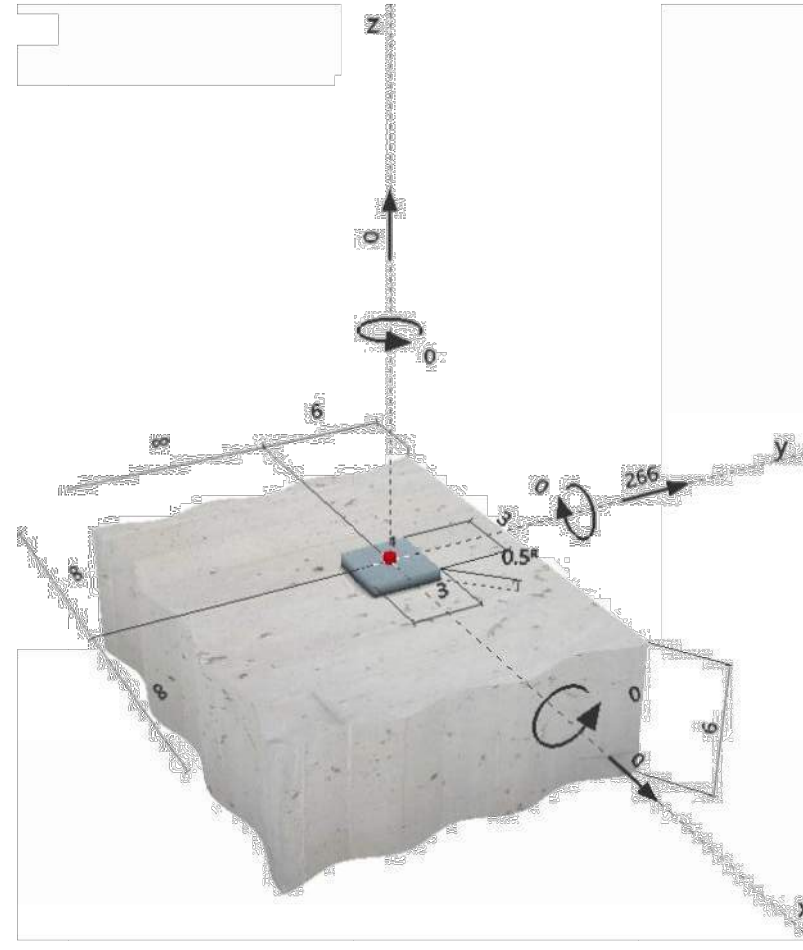
1 Input data

Anchor type and diameter: HIT-RE 500 V3 + HAS-V-36 (ASTM F1554 Gr.36) 1/2"
Effective embedment depth: $h_{ef,req} = 2.750$ in. ($h_{ef,lim} = 4.750$ in.)
Material: ASTM A 1554 Grade 36
Evaluation Service Report: ESR-3814
Issued | Valid: 1/1/2017 | 1/1/2019
Proof: Design method ACI 318-11 / Chem
Stand-off installation: $e_{as} = 0.000$ in. (no stand-off); $t = 0.500$ in.
Anchor plate: $l_a \times l_b \times t = 3.000$ in. x 3.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile: no profile
Base material: cracked concrete, 3000, $f'_c = 3,000$ psi; $h = 6.000$ in., Temp. short/long: 32/32 °F
Installation: hammer drilled hole, Installation condition: Dry
Reinforcement: tension: condition A, shear: condition A; no supplemental splitting reinforcement present
edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F) Tension load: yes (D.3.4.3 (d))
Shear load: yes (D.3.3.4.3 (c))



R - user is responsible to ensure a rigid base plate for the entered thickness with appropriate solutions (stiffeners,...)

Geometry [in.] & Loading [lb, in.lb]



C3

Input data and results must be checked for agreement with the existing conditions and for feasibility!
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2 Proof | Utilization (Governing Cases)

Loading	Proof	Design values [lb]		Utilization	
		Load	Capacity	P_u / P_n [%]	Status
Tension	-	-	-	- / -	-
Shear	Steel Strength	266	1,927	- / 14	OK
Loading		P_u	P_n	ζ	Utilization P_{uV} / P_n [%]
Combined tension and shear loads		-	-	-	-

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

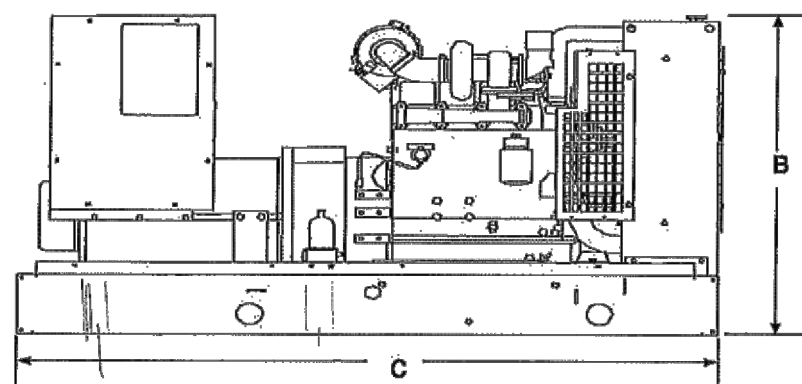
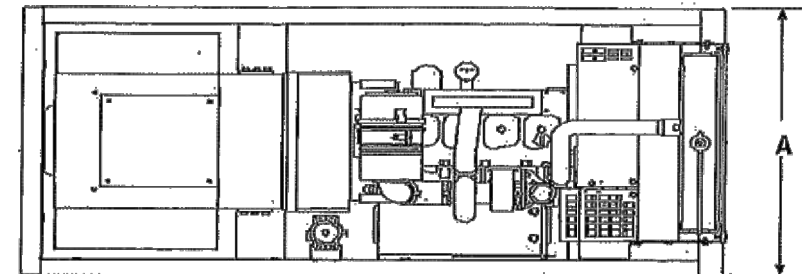
Fastening meets the design criteria!

4 Remarks: Your Cooperation Duties

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C4



This outline drawing is to provide representative configuration details for the model series.

See respective model data sheet for specific model outline drawing number.

Do not use for installation design

* ADD BED NO. FOR PUCK
* Puck size 60" x 120" PAD.

Model	Dim "A"		Dim "B"		Dim "C"		Weight Wet	
DGBB	40 in	1016 mm	47.5 in	1207 mm	82.8 in	2103 mm	1688 lb.	757 kg
DGBC	40 in	1016 mm	47.5 in	1207 mm	82.8 in	2103 mm	1688 lb.	757 kg
DGCA	40 in	1016 mm	47.5 in	1207 mm	82.8 in	2103 mm	1720 lb.	780 kg
DGCB	40 in	1016 mm	47.5 in	1207 mm	82.8 in	2103 mm	1720 lb.	780 kg

See your distributor for more information.

Onan Corporation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
612-574-5000
Fax: 612-574-8087

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Generator Set Series Sheet

Specifications May Change Without Notice

Onan Corporation 8-1013d

11/17/21, 5:02 PM

ATC Hazards by Location

Search Information

Address: 15645 SW Sexton Mountain Dr, Beaverton, OR 97007, USA
Coordinates: 45.45840870000001, -122.8373331
Elevation: 277 ft
Timestamp: 2021-11-18T01:02:01.912Z
Hazard Type: Seismic
Reference Document: ASCE7-16
Risk Category: III
Site Class: D-default



Basic Parameters

Name	Value	Description
S_S	0.861	MCE_R ground motion (period=0.2s)
S_1	0.402	MCE_R ground motion (period=1.0s)
S_{MS}	1.033	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.689	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	0.883	Coefficient of risk (0.2s)
CR_1	0.867	Coefficient of risk (1.0s)
PGA	0.394	MCE_G peak ground acceleration
F_{PGA}	1.206	Site amplification factor at PGA
PGA_M	0.475	Site modified peak ground acceleration

C5

https://hazards.atcouncil.org/#/seismic?lat=45.45840870000001&lng=-122.8373331&address=15645 SW Sexton Mountain Dr%2C Beaverton%2C OR 97007%2... 1/2

DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT SEXTON MOUNTAIN SCHOOL BEAVERTON S.D. 15645 SW SEXTON MOUNTAIN BEAVERTON, OR 97007

ISSUE DATE:

03-23-2022

SET TYPE:

Final Review Set

REVISIONS:

DRAWN BY:

DD

DESIGNED BY:

HB

CHECKED BY:

SL

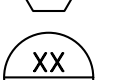
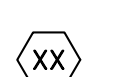


MKE JOB #:

BV-5749

ELECTRICAL -
GENERATOR SLAB
CALCULATIONS

E4

REFERENCE SYMBOLS & WIRING



XX

PLAN NOTE MARK

XX
XX

SHEET REFERENCE MARK

XX
XX


MECHANICAL EQUIPMENT NOTE MARK

XX


FEEDER MARK

[+ XX"]STANDARD MOUNTING HEIGHT TO CENTER UNLESS OTHERWISE NOTED ON DRAWINGS


LINETYPE LEGEND



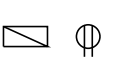
FENCING



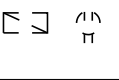
UNDER GROUND




ABOVE GROUND, IN WALL, CEILING, ETC



NEW EQUIPMENT (TYPICAL)



EXISTING EQUIPMENT (TYPICAL)



DEMOLISHED EQUIPMENT (TYPICAL)

ABBREVIATIONS

(E)

EXISTING TO REMAIN

(F)

FUTURE

(R)

EXISTING TO BE RELOCATED

(D)

EXISTING TO BE DEMOLISHED

AC

ALTERNATING CURRENT

A, AMP

AMPERES

AFF

ABOVE FINISHED FLOOR

AFG

ABOVE FINISHED GRADE

AFI

ARC FAULT CIRCUIT INTERRUPTER

AHJ

AUTHORITY HAVING JURISDICTION

AIC

EQUIPMENT SHORT CIRCUIT INTERRUPT RATING

AL

ALUMINUM

ATS

AUTOMATIC TRANSFER SWITCH

AUX

AUXILIARY

AWG

AMERICAN WIRE GAUGE

C

CONDUIT

CB

CIRCUIT BREAKER

CKT

CIRCUIT

CO

CARBON MONOXIDE

CR

CONTROLLED RECEPTACLE

CT

CURRENT TRANSFORMER

CU

COPPER

DC

DIRECT CURRENT

DISC

DISCONNECT

DIA

DIAMETER

DMX

DIGITAL MULTIPLEX

DWG

DRAWING

EF

EXHAUST FAN

EM

EMERGENCY

EMT

ELECTRICAL METALLIC TUBING

ENCL

ENCLOSURE

FA

FIRE ALARM

FAA

FIRE ALARM ANNUNCIATOR

FBO

FURNISHED BY OTHERS

FC

FOOT CANDLES

FLA

FULL-LOAD AMPERES

FSD

FIRE & SMOKE DAMPER

GEN

GENERATOR

GFCI

GROUND FAULT CIRCUIT INTERRUPTER

GFEP

GROUND FAULT EQUIPMENT PROTECTION

GND

GROUND

HP

HORSEPOWER

HTR

HEATER

IG

ISOLATED GROUND

IR

INFRARED

INV

INVERTER

KCM

THOUSAND CIRCUAR MILS

KW

THOUSAND WATTS

KVA

THOUSAND VOLT-AMPERES

LTG

LIGHTING

LCP

LIGHTING CONTROL PANEL

MB

MAIN BREAKER

MCA

MINIMUM CIRCUIT AMPERES

MDP

MAIN DISTRIBUTION PANEL

MIN

MINIMUM

MLO

MAIN LUGS ONLY

NAC

NOTIFICATION APPLIANCE CIRCUIT

NEC

NATIONAL ELECTRICAL CODE

NEMA

NATIONAL ELECTRICAL MFR'S ASSOCIATION.

NTS

NOT TO SCALE

OFCI

OWNER FURNISHED, CONTRACTOR INSTALLED

OFIO

OWNER FURNISHED, OWNER INSTALLED

OS

OCCUPANCY SENSOR

PH, Ø

PHASE

PNL

PANEL

SDP

SUB DISTRIBUTION PANEL

TEL

TELEPHONE

TK

TOE KICK MOUNTED

TVSS

TRANSIENT VOLTAGE SURGE SUPPRESSION

TYP

TYPICAL

UC

UNDERCABINET

UPS

UNINTERRUPTIBLE POWER SUPPLY

USB

UNIVERSAL SERIAL BUS

V

VOLTS

VA

VOLT-AMPERES

VFD

VARIABLE FREQUENCY DRIVE

W

WATT


WP

WEATHERPROOF

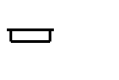
XFMR

TRANSFORMER

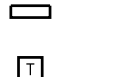
DISTRIBUTION & EQUIPMENT



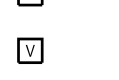
FLUSH ELECTRICAL PANEL



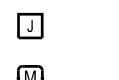
SURFACE ELECTRICAL PANEL




FLUSH CONTROL PANEL



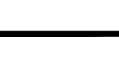
SURFACE CONTROL PANEL




TRANSFORMER



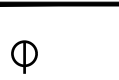
VAULT



ABOVE GROUND JUNCTION BOX




METER AND SOCKET




SERVICE ENTRANCE POWER POLE


POWER DEVICES




SINGLE RECEPTACLE




DUPLEX RECEPTACLE




DOUBLE DUPLEX RECEPTACLE




[FLUSH IN FLOOR]




[ABOVE COUNTER]




[IN CEILING]




CONTROLLED RECEPTACLES




[ABOVE COUNTER]




USB DUPLEX RECEPTACLE




ISOLATED GROUND RECEPTACLES




GFCI, USB/GFCI, ISOLATED/GFCI



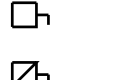
POWER/DATA BOX [RECESSED IN FLOOR]



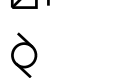
POWER/DATA POLE




SPECIAL PURPOSE POWER RECEPTACLE



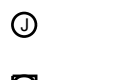
ELECTRICAL EQUIPMENT CONNECTION



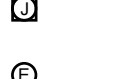
MAGNETIC STARTER




VARIABLE FREQUENCY DRIVE




SAFETY SWITCH




FUSED SAFETY SWITCH




ELECTRICAL MOTOR CONNECTION



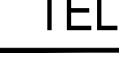
SINGLE POINT ELECTRICAL CONNECTION




JUNCTION BOX




JUNCTION BOX [IN FLOOR]




JUNCTION BOX WITH EMERGENCY CIRCUIT



PUSH BUTTON CONTROL




UP/DOWN/STOP PUSH BUTTON CONTROL




WALL HEATER


TELECOMMUNICATION DEVICES




DATA OUTLET 1-PORT [+ 18"]




DATA OUTLET 2-PORT [+ 18"]



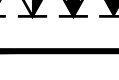
DATA OUTLET 3-PORT [+ 18"]



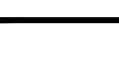
DATA OUTLET 4-PORT [+ 18"]



DATA OUTLET FOR WIRELESS NODE 1-PORT [+ 96"]




[ABOVE COUNTER]

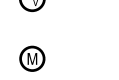


[IN CEILING]


SIGNAL DEVICES




VOLUME CONTROL [+ 45"]




AUDIOVISUAL OUTLET [+ 18"]



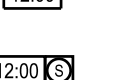
MICROPHONE OUTLET [+ 18"]



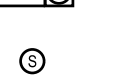
ANALOG CLOCK [+ 96"]



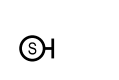
TIME CLOCK/SWITCH




ANALOG CLOCK & SPEAKER [+ 96"]




DIGITAL CLOCK




DIGITAL CLOCK & SPEAKER [+ 96"]




SPEAKER [IN CEILING]




SPEAKER-WALL MOUNTED [+ 84"]




CALL BUTTON



THERMOSTAT [+ 45"]

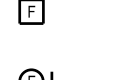


DMX CONTROL OUTLET




BUZZER


FIRE ALARM DEVICES




PULL STATION [+ 45"]



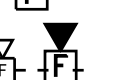
STROBE [+ 88"]



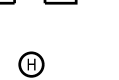
HORN [+ 88"]




HORN / STROBE [+ 88"]



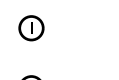
SPEAKER / STROBE [+ 88"]




[IN CEILING]



HEAT DETECTOR



DUCT SMOKE DETECTOR



IONIZATION TYPE SMOKE DETECTOR




PHOTO ELECTRIC TYPE SMOKE DETECTOR






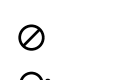
PHOTO ELECTRIC TYPE SMOKE & CO DETECTOR




FIRE/SMOKE DAMPER



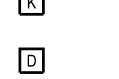
FIRE DOOR RELEASE




IR SMOKE DETECTOR TRANSMITTER




IR SMOKE DETECTOR RECEIVER



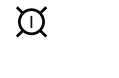
SPRINKLER FLOW SWITCH



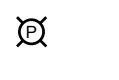
SPRINKLER TAMPER SWITCH




BELL




KNOX BOX



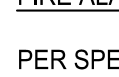
MAGNETIC DOOR HOLDER



CONTROL MODULE



ALARM MODULE



IONIZATION TYPE SMOKE DETECTOR W/ INTEGRAL HORN & STROBE

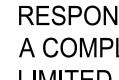


PHOTO ELECTRIC TYPE SMOKE DETECTOR W/ INTEGRAL HORN & STROBE





PHOTO ELECTRIC TYPE SMOKE & CO DETECTOR W/ INTEGRAL HORN & STROBE


FIRE ALARM DESIGN BUILD NOTE:

PER SPECIFICATION SECTION 28 31 00 - THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING, FURNISHING, AND INSTALLING A COMPLETE FIRE ALARM SYSTEM, INCLUDING, BUT NOT LIMITED TO, ALL ADDRESSABLE FIRE ALARM PANELS, NAC PANELS, INITIATION DEVICES, MONITORING DEVICES, CONTROL DEVICES, ANNUNCIATION DEVICES, AND OTHER EQUIPMENT AS REQUIRED BY OTHER DIVISIONS OF THE SPECIFICATIONS AND LOCAL AHJ.

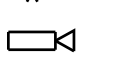
SECURITY DEVICES




GLASS BREAK DETECTOR




DIRECTIONAL MOTION SENSOR



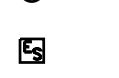
360° MOTION SENSOR




VIDEO SURVEILLANCE CAMERA




FLUSH AUTOMATIC DOOR ACTUATOR [+ 45"]



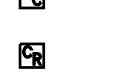
KEYPAD [+ 45"]




MAGNETIC DOOR SWITCH



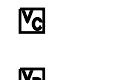
ELECTRIC STRIKE




ELECTRIC LOCK




MAGNETIC DOOR LOCK




CENTRONIC DOOR CLOSER



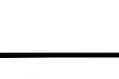
CARD READER [+ 45"]



REQUEST TO EXIT DEVICE

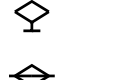


VIDEO CALL STATION




VIDEO RECEIVER STATION


NURSE CALL




CORRIDOR LIGHT [ABOVE DOOR]




CORRIDOR LIGHT [IN CEILING]



EMERGENCY PULL CORD STATION





DUTY STATION




MASTER STATION

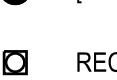
LIGHTING DEVICES







SURFACE MOUNTED LUMINAIRES



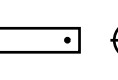



[EMERGENCY]







RECESSED LUMINAIRES



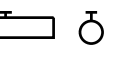


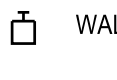
[EMERGENCY]







PENDANT MOUNTED LUMINAIRES



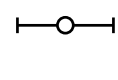


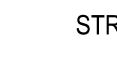
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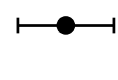


WALL MOUNTED LUMINAIRES






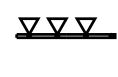
[EMERGENCY]



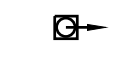
STRIP LUMINAIRE



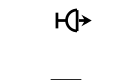
[EMERGENCY]




WALL WASH LUMINAIRES




TRACK LIGHTING SYSTEM




DIRECTIONAL LUMINAIRE [IN GRADE]




FLOOD LUMINAIRE



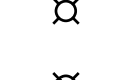
STEP LUMINAIRE




[EMERGENCY]




POLE ARM MOUNT LUMINAIRE




POLE TOP MOUNT LUMINAIRE




LIGHTED BOLLARD



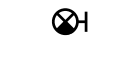
[EMERGENCY]




BATTERY PACK EM LUMINAIRE [WALL MOUNT]



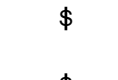
BATTERY PACK EM LUMINAIRE [CEILING MOUNTED]



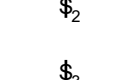
EXIT SIGN [CEILING MOUNTED]



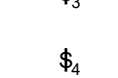
EXIT SIGN [WALL MOUNTED]




EXIT SIGN W/ EMERGENCY LIGHT




\$SINGLE-POLE SWITCH [+ 45"]




\$2TWO-POLE SWITCH [+ 45"]



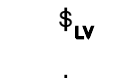
\$3THREE-WAY SWITCH [+ 45"]



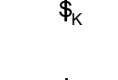
\$4FOUR-WAY SWITCH [+ 45"]



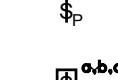
\$OOSOCCUPANCY SENSOR SWITCH [+ 45"]




\$OOSD OCCUPANCY SENSOR & DIMMER SWITCH [+ 45"]




\$bDIMMER SWITCH [+ 45"]




\$lvLOW-VOLTAGE SWITCH [+ 45"]




\$kKEYED SWITCH [+ 45"]




\$pSWITCH WITH PILOT LIGHT [+ 45"]




\$MABMULTI-ZONE WALL POD [+ 45"]



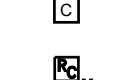
\$360OCCUPANCY SENSOR 360° [CEILING MOUNTED]



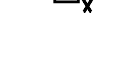
\$DIRECTIONAL OCCUPANCY SENSOR [UNIVERSAL MOUNT]




\$OCCUPANCY SENSOR POWER PACK



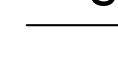
\$PHOTOCCELL



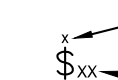
\$DAYLIGHT SENSOR



\$ELTD EMERGENCY LOAD TRANSFER DEVICE



\$LCONTACTOR



\$RxROOM CONTROLLER WITH [X] # RELAYS

SWITCH - LUMINAIRE CONTROL



SWITCH FOR ZONE 'X'



'XX'-TYPE SWITCH



TYPE 'XX' LUMINAIRE



LUMINAIRE IN ZONE 'X'



CIRCUIT NUMBER



CONTROL IN ZONE 'X'

NOTE: SYMBOLS AND DEFINITIONS LISTED ON TITLE SHEET ARE TYPICAL OF ALL PROJECTS AND SOME MAY NOT BE PRESENT IN ANY GIVEN DRAWING SET.

DRAWING INDEX

DWG

DESCRIPTION

E0

ELECTRICAL TITLE SHEET

E1

FLOOR PLAN - ELECTRICAL

E2

ELECTRICAL DETAILS & PLANS

E3

POWER DISTRIBUTION

E4

PANEL SCHEDULES

E5

ELECTRICAL- GENERATOR SLAB CALCULATIONS

E6

ELECTRICAL- GENERATOR SLAB CALCULATIONS

PROJECT SCOPE

•

ADD DIESEL ENGINE GENERATOR AND AUTOMATIC TRANSFER SWITCH.

•

REMOVE EXISTING MAIN DISTRIBUTION PANEL.

•

ADD NEW MAIN DISTRIBUTION PANEL.

•

ADD NEW SUB-DISTRIBUTION PANEL.

•

PROVIDE NEW PGE ELECTRICAL SERVICE EXTENSION FROM EXISTING POLE MOUNTED TRANSFORMERS.

•

ADD NEW EMERGENCY PANELS 2E1, 2E2, 2LS1, AND 2LS2.

•

ADD NEW PGE TERMINAL / CURRENT TRANSFORMER SECTION.

•

ADD NEW METER BASE.

•

PROVIDE NEW PANELBOARDS AND BREAKERS FOR PANELS A, G, H, AND L.

•

CONNECT GYMNASIUM LIGHTING TO EMERGENCY PANEL.

•

ADD EMERGENCY LIGHTING TO EGRESS PATH.

•

PROVIDE AND INSTALL CONCRETE FOR GENERATOR PAD.

•

PROVIDE AND INSTALL CONCRETE FOR GENERATOR / SWITCHGEAR EXTERIOR YARD.

•

PROVIDE EMERGENCY POWER TO SELECT RECEPTACLES IN MAIN OFFICE.

•

PROVIDE EMERGENCY POWER TO MDf ROOM SERVERS AND HVAC.

•

PROVIDE EMERGENCY POWER TO FIRE ALARM SYSTEM.

•

PROVIDE EMERGENCY POWER ACCESS CONTROL SYSTEMS.

•

PROVIDE EMERGENCY POWER TO LUMINAIRES AT EXTERIOR EGRESS DOORS.

•

UPGRADE EXISTING PANEL SCHEDULES TO REFLECT CHANGES. PROVIDE TYPEWRITTEN PANEL SCHEDULES.

•

PROVIDE NEW CHAIN LINK FENCE, GATE, AND CONCRETE FILLED TRAFFIC BOLLARDS.

•

CONNECT MAIN OFFICE LIGHTING TO EMERGENCY CIRCUIT.

PROJECT CONTACTS

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engineering@mke-inc.com

For Information Only

Not for Construction

EXPIRES 12-31-22

DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT

FIR GROVE ELEMENTARY

BEAVERTON S.D.

6300 SW WILSON AVE.

BEAVERTON, OR 97008

ISSUE DATE:

03-23-2022

SET TYPE:

Final Review

REVISIONS:

DRAWN BY:

DD

DESIGNED BY:

HB

CHECKED BY:

SL

MKE JOB #:

BV-5749

ELECTRICAL -

TITLE

SHEET

E0



EXPIRES 12-31-22

DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT
FIR GROVE ELEMENTARY
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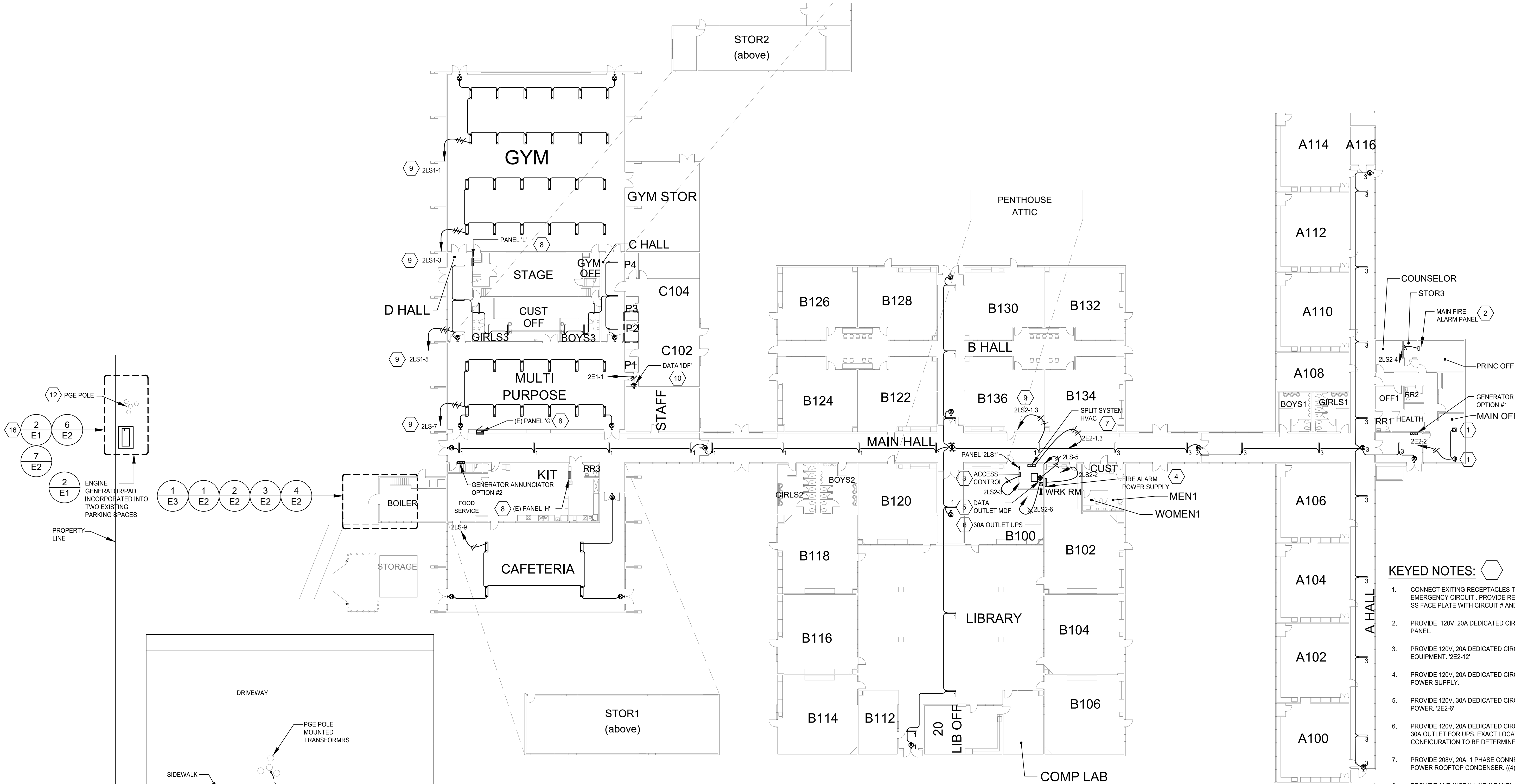
BV-5749

ELECTRICAL -

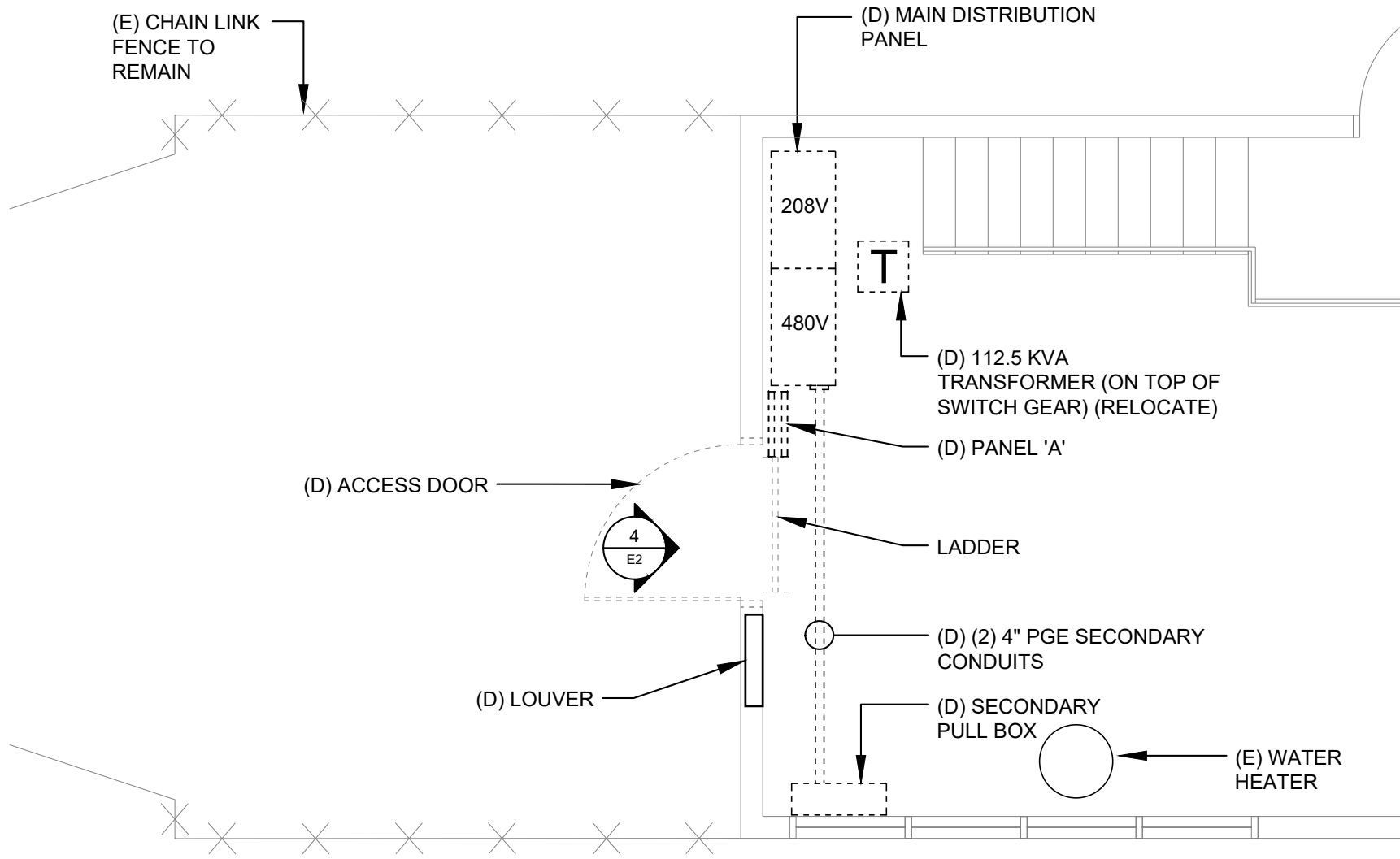
FLOOR

PLAN

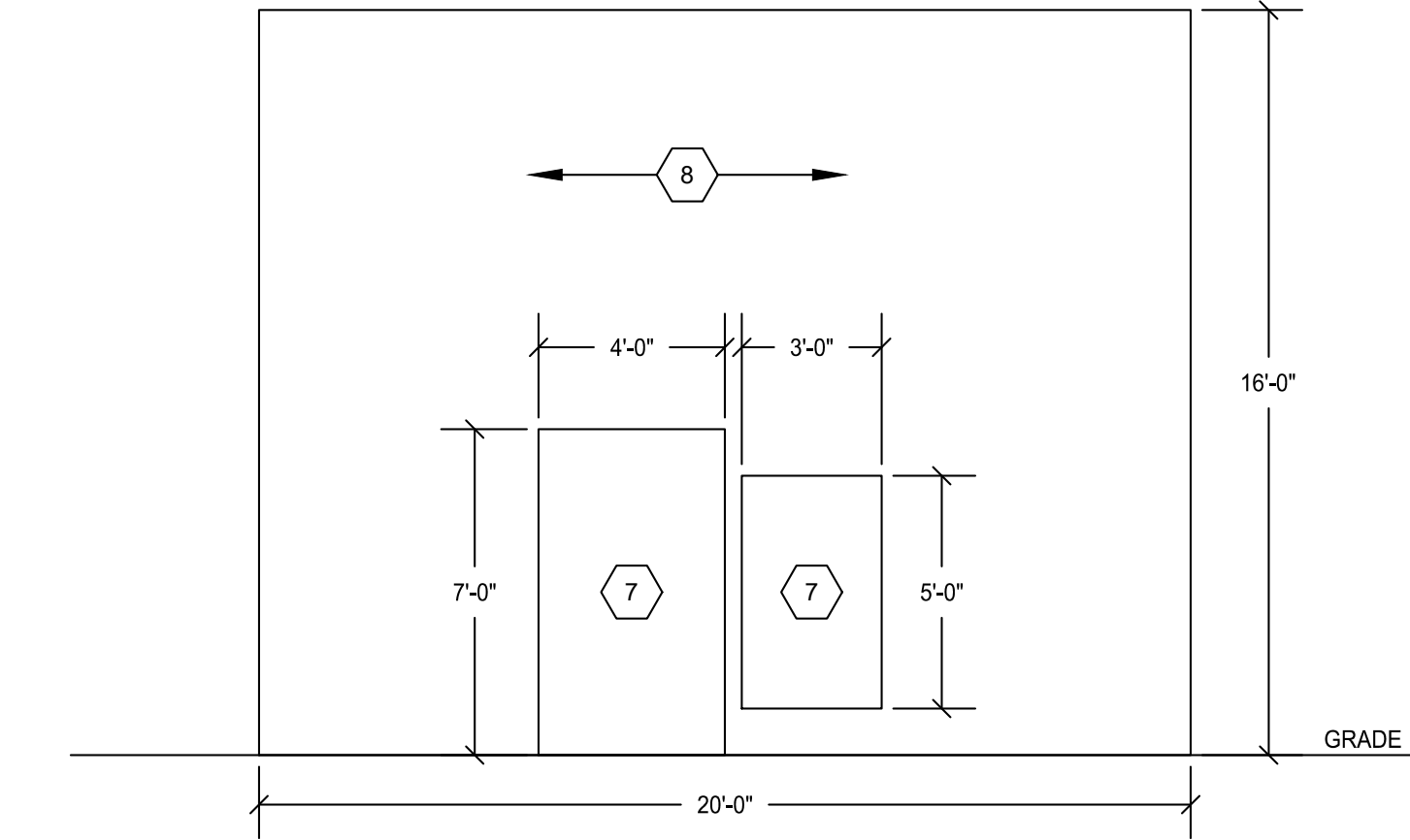
E1



PLOTTED: DANIEL DERHEIMER 7/29/2022 10:05 AM
 5749E2 - FIR GROVE



1 BOILER RM. - ELECTRICAL DEMO
 SCALE: 1/4" = 1'-0"



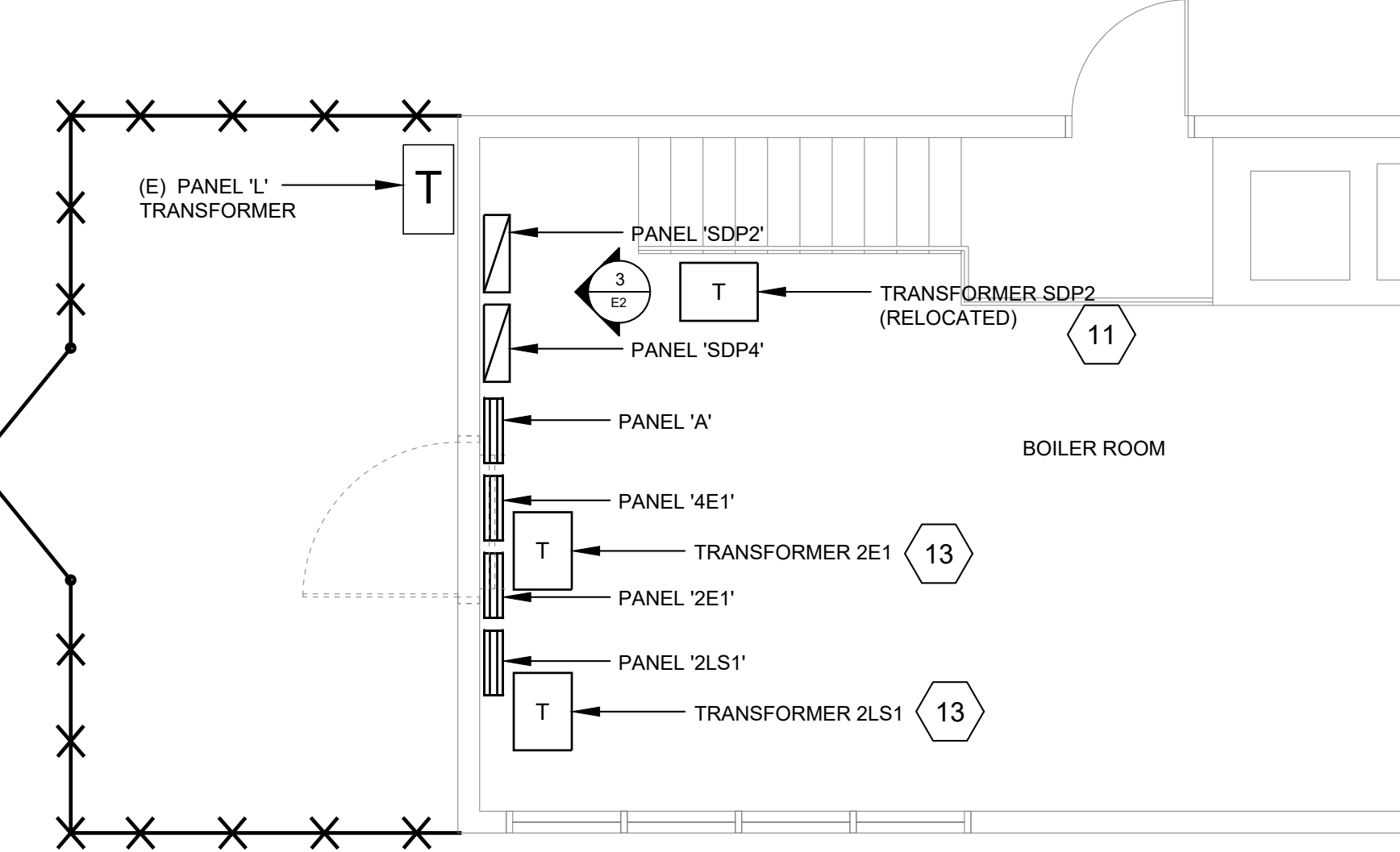
4 WALL REPAIR DETAIL
 SCALE: 1/4" = 1'-0"

ALTERNATE #2

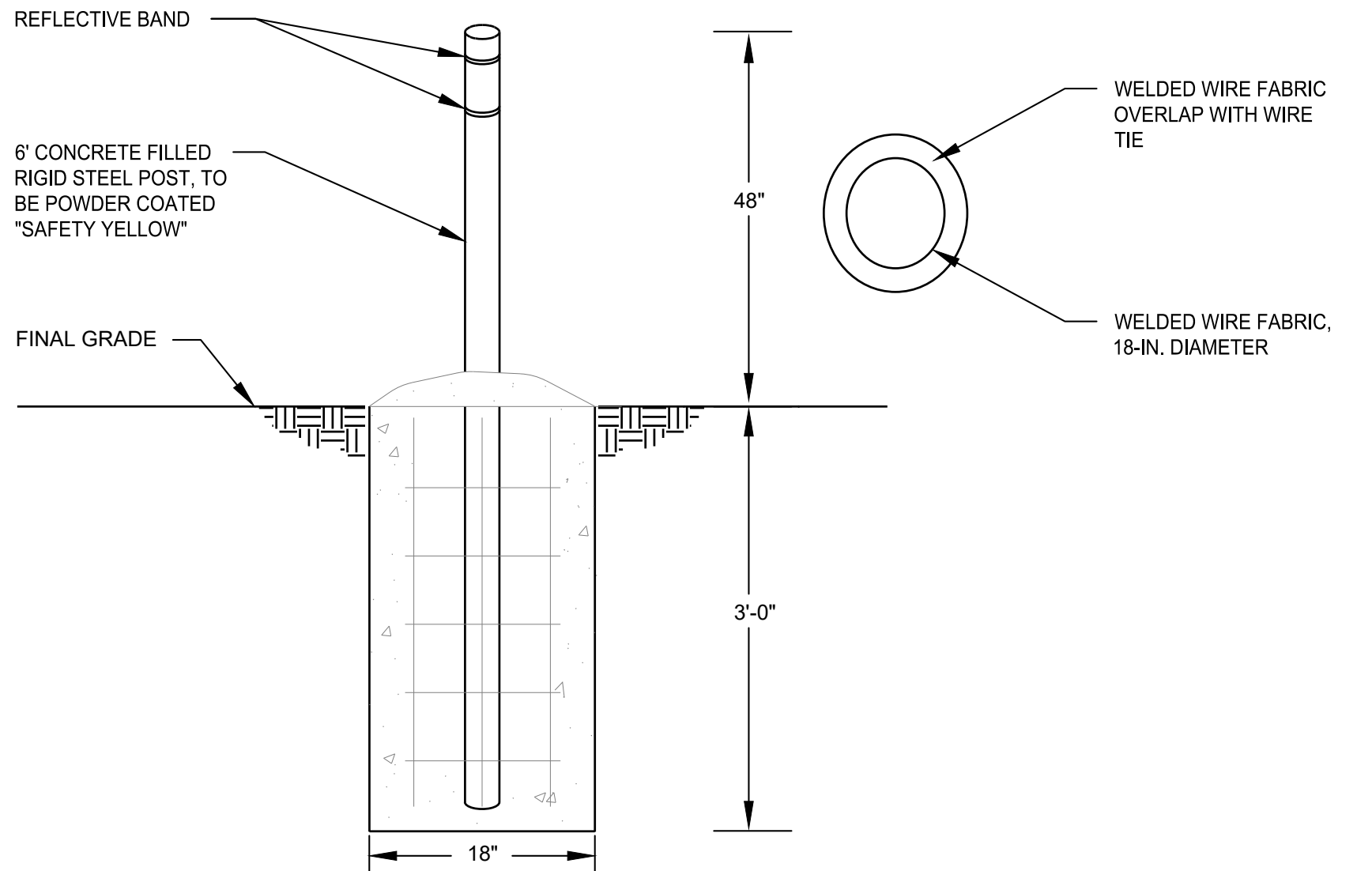
PROVIDE DEDUCTIVE ALTERNATE TO REMOVE FIVE (5)
 TRAFFIC BOLLARDS FROM CONTRACT.

KEYED NOTES:

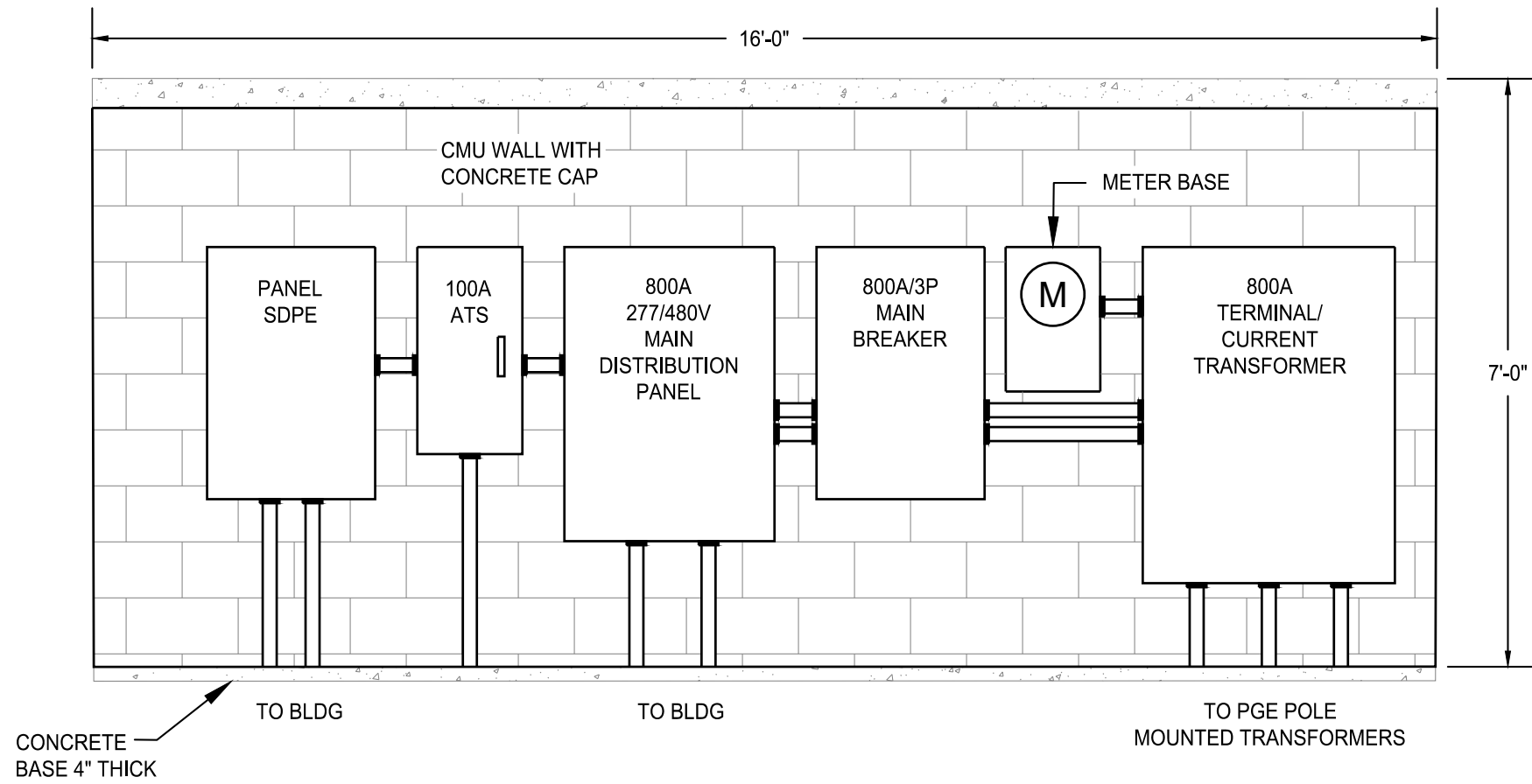
- PROVIDE AND INSTALL NEMA 3R TERMINAL/CURRENT TRANSFORMER SECTION PER PGE REQUIREMENTS.
- PROVIDE AND INSTALL METER BASE PER PGE REQUIREMENTS.
- PROVIDE AND INSTALL NEMA 3R MAIN DISTRIBUTION PANEL/SECTION ON EXTERIOR OF BUILDING.
- PROVIDE AND INSTALL (3) 5" PVC SCHEDULE 40 CONDUITS TO EXISTING PGE POLE MOUNTED TRANSFORMERS. CONTRACTOR TO PROVIDE TRENCH, BACKFILL, COMPACTION, PAVING PATCH, AND LOCATES. NOTE: IF DESIRED CONTRACTOR MAY UTILIZE A DIRECTIONAL BORE INSTEAD OF TRENCH.
- PROVIDE AND INSTALL 100A, 277/480V, 3 PHASE AUTOMATIC TRANSFER SWITCH AS OUTLINED IN ELECTRICAL SPECIFICATION.
- MAINTAIN EXISTING CONDUCTORS. EITHER SPLICE CONDUCTOR IN WIREWAY OR EXTEND EXISTING CONDUCTORS TO NEW BREAKER. PROVIDE RIGID CONDUIT SLEEVE EXTENSION TO NEW WIREWAY.
- CONTRACTOR TO REMOVE EXISTING DOOR AND LOUVER, INFILL DOOR AND LOUVER UTILIZING 6" STUD WALL CONSTRUCTION WITH BATT INSULATION. PROVIDE WEATHERPROOF SHEETROCK AND SIDING TO MATCH EXISTING, ON EXTERIOR WALL. PATCH ENTIRE ASSEMBLY.
- CONTRACTOR TO PAINT ENTIRE WALL WITH COLOR AS SELECTED BY BEAVERTON SCHOOL DISTRICT.
- PROVIDE FEEDER EXTENSION TO NEW BREAKERS IN SDP4 AND SPD2 VIA NEW EMT CONDUITS. OVERSIZING CONDUITS FOR MULTIPLE FEEDERS ACCEPTABLE.
- PROVIDE FOUR (4) 12" X 8" DEEP WIREWAYS FOR EXTENSION OF FEEDERS TO BREAKERS IN SDP4 AND SPD2.
- RELOCATE EXISTING 112.5KW 480V/208V, 3Ø TRANSFORMER FROM TOP OF EXISTING GEAR TO FLOOR. PROVIDE 3" HOUSEKEEPING PAD.
- MAINTAIN EXISTING CHAIN LINK FENCE.
- PROVIDE AND INSTALL 15KW 480V/208V, 3Ø, 4W TRANSFORMERS. PROVIDE WALL MOUNT BRACKET TO MOUNT ABOVE PANELBOARDS. SEE SPECIFICATION.
- PROVIDE AND INSTALL 6" HIGH CHAIN LINK FENCE WITH POST IMBEDS A NEW CONCRETE SLAB.
- SEE SHEETS E5 AND E6 FOR STRUCTURAL DETAILS FOR GENERATOR SLAB.
- PATCH/REPAIR ASPHALT TO ORIGINAL CONDITION.



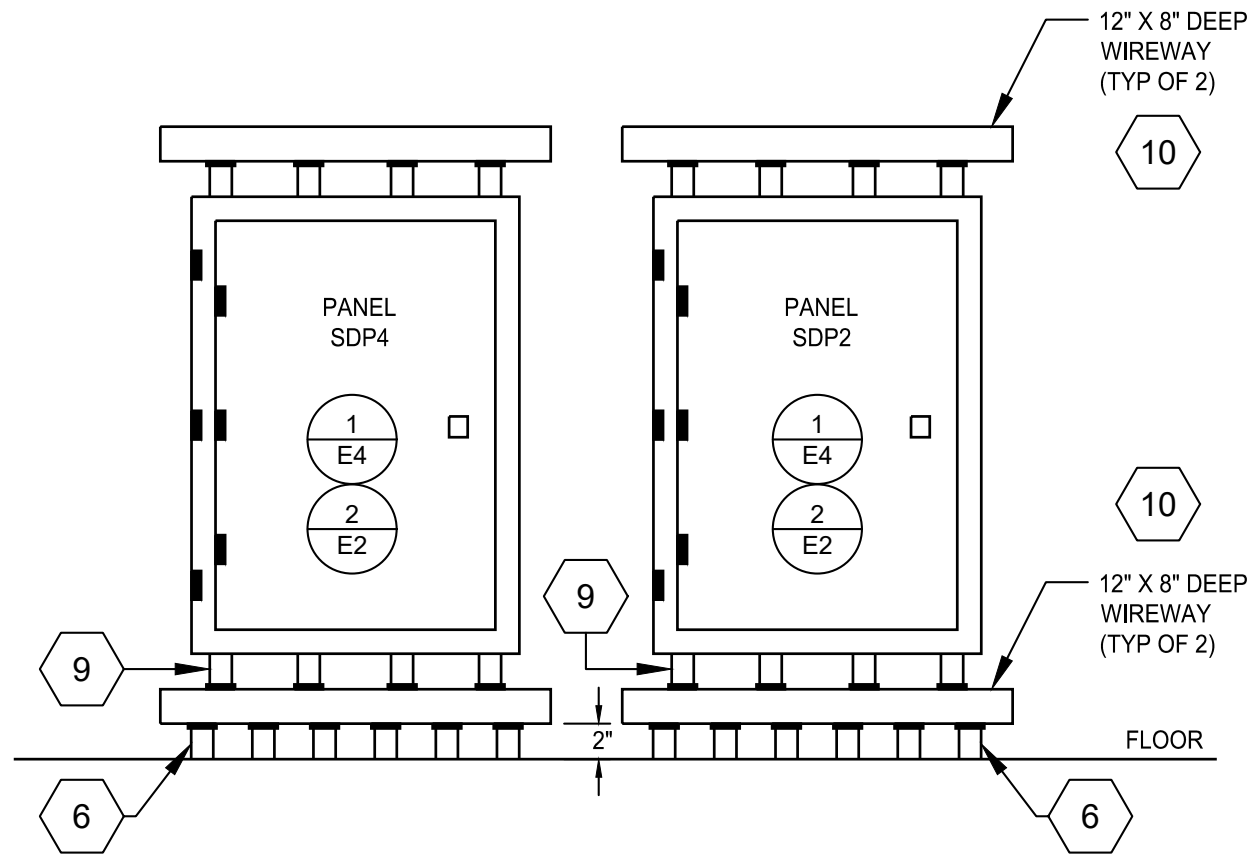
2 BOILER RM. - ELECTRICAL
 SCALE: 1/4" = 1'-0"



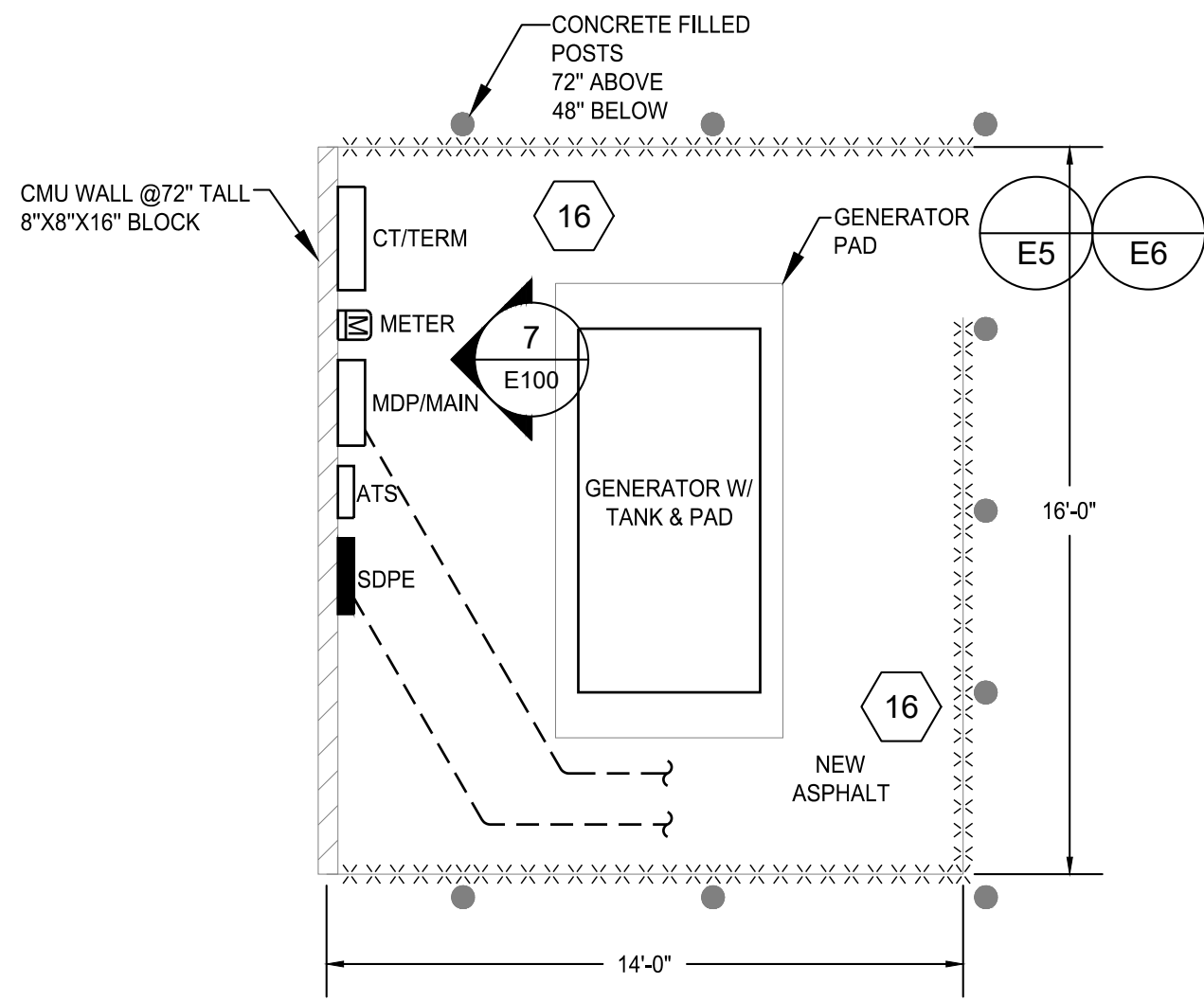
5 BARRIER POSTS
 N.T.S.



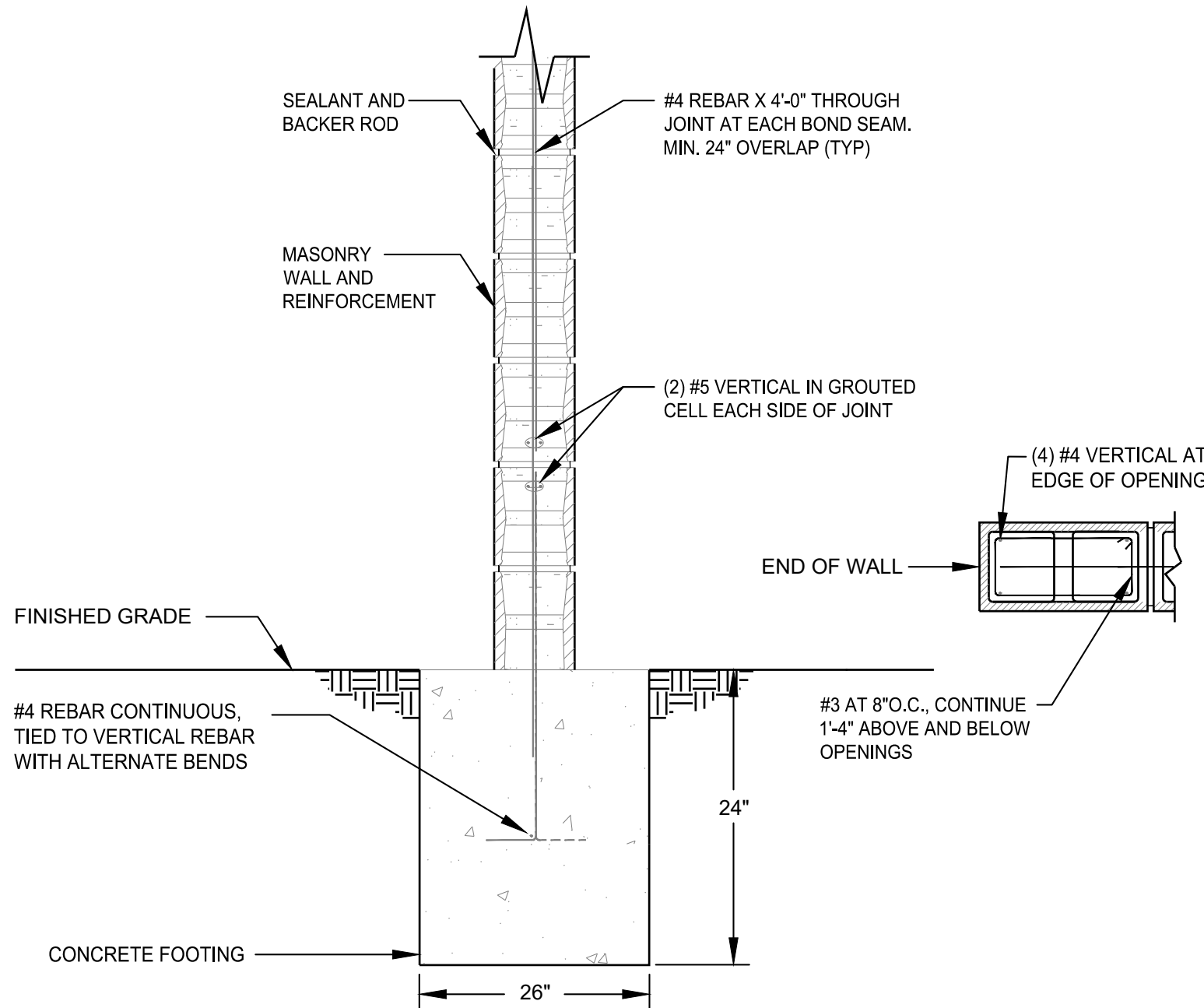
7 SWITCHGEAR ELEVATION
 1/2"=1'-0"



3 DISTRIBUTION PANEL ELEVATION
 N.T.S.



6 GENERATOR PAD DETAIL
 1/4"=1'-0"



8 CMU WALL & JAMB DETAIL
 N.T.S.

DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT
 FIR GROVE ELEMENTARY
 BEAVERTON S.D.
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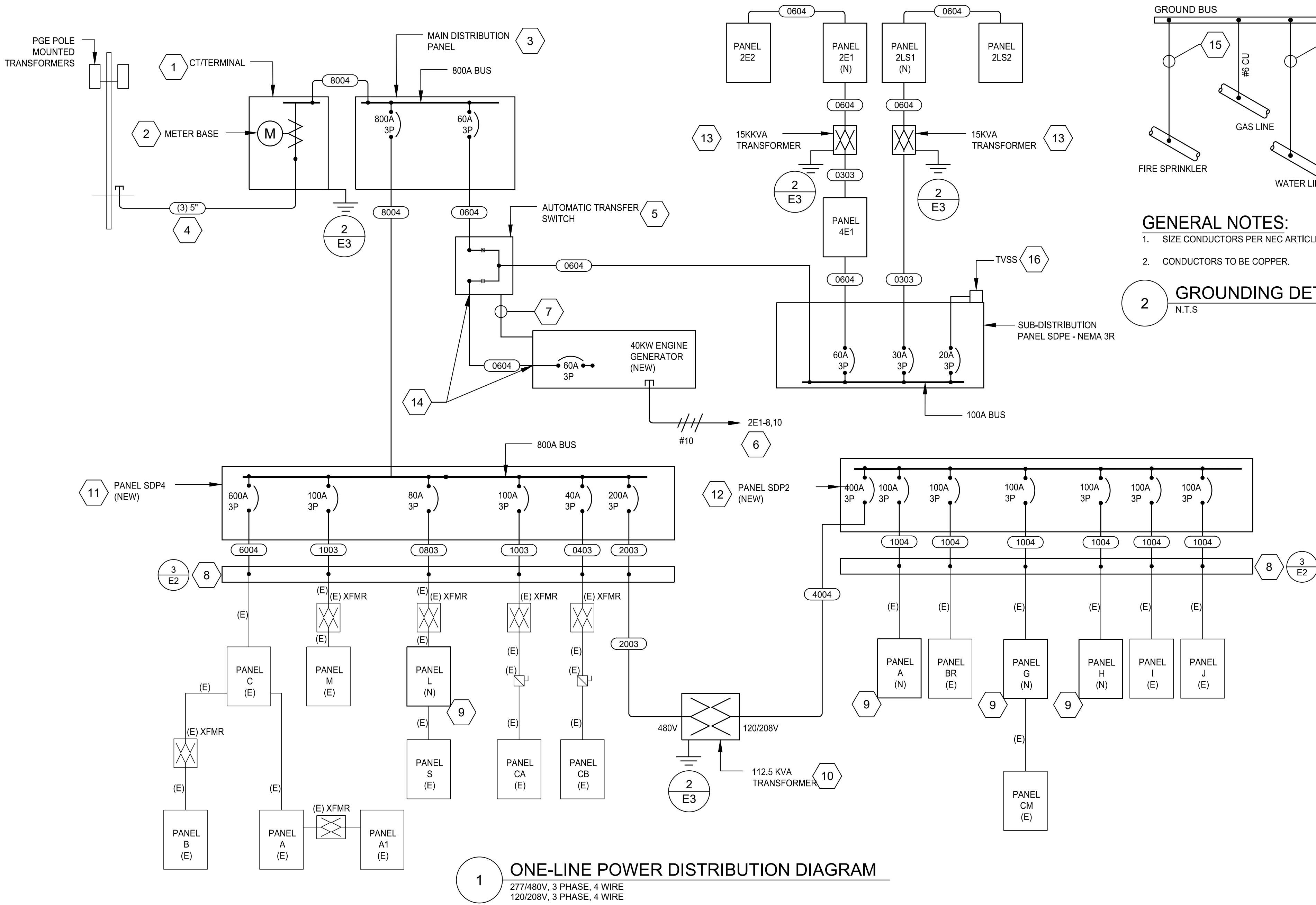
ELECTRICAL -

DETAILS

& PLANS

E2

PLOTTED: DANIEL DERHEIMER 7/26/2022 10:43 AM
 5749E3 - FIR GROVE



1 ONE-LINE POWER DISTRIBUTION DIAGRAM
 277/480V, 3 PHASE, 4 WIRE
 120/208V, 3 PHASE, 4 WIRE

PANEL SCHEDULE												
PANEL: A			MKE & ASSOCIATES, INC.				MOUNTING: SURFACE					
FED BY: SDP2							BUS/MAIN: 100A MLO					
LOC: BOILER ROOM			VOLTS 120/208		PHASE 3		WIRE 4					
C	DESCRIPTION	VA	A/P	No.	A	B	C	No.	A/P	VA	DESCRIPTION	C
1	L - FLOODS	820	20/1	1	*			2	20/1	700	R-BOILER	2
2	R - BOILER ROOM	720	20/1	3	*			4	20/1	1,280	L-COVERED AREA	1
2	SUMP PUMP	720	20/1	5	*	*		6	20/1	1100	WATER PUMP	6
1	L - COVERED AREA	1280	20/1	7	*	*		8	20/1	1500	WATER TANK	3
6	STEAM VALVE	720	20/1	9	*	*		10	20/1		SPARE	
6	COMPRESSOR	1100	20/3	11	*	*		12	20/1		SPARE	
6	*	1100	*	13	*	*		14	20/1		SPARE	
6	*	1100	*	15	*	*		16	20/1		SPARE	
6	OIL BURNER	1200	20/3	17	*	*		18	20/1		SPARE	
6	*	1200	*	19	*	*		20	20/1		SPARE	
6	*	1200	*	21	*	*		22	20/1		SPARE	
6	VACUUM PUMP	1200	20/3	23	*	*		24			SPACE	
6	*	1200	*	25	*	*		26			SPACE	
6	*	1200	*	27	*	*		28			SPACE	
	SPARE		20/1	29	*	*		30			SPACE	
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)			FACTOR		CODE LOAD		
1. LIGHTS:		2,100	1,280	0	3,380			1.25		4,225		
2. RECEPTACLE:		700	720	720	2,140			*		2,140		
3. HEATING:		1,500	0	0	1,500			1.00		1,500		
4. KITCHEN:		0	0	0	0			1.00		0		
5. EQUIPMENT:		0	0	0	0			1.00		0		
6. MOTORS:		3,500	4,220	4,600	12,320			**		ID LARGEST MOTOR		
7. MISC:		0	0	0	0			1.00		0		
TOTAL (VA):		7,800	6,220	5,320	19,340					7,865		
LARGEST MOTOR:		1,200 VA	TOTAL LOAD:		54 A			CODE DEMAND:		22 A		
# KITCHEN EQUIPMENT		0										
NOTES:							* FIRST 10 KVA + 50% OF THE BALANCE ** 125% OF THE LARGEST MOTOR + THE BALANCE					

PANEL SCHEDULE												
PANEL: 2E1			MKE & ASSOCIATES, INC.				MOUNTING: SURFACE			BUS/MAIN: 100A MLO		
FED BY: 4E1												
LOC: BOILER ROOM			VOLTS 120/208		PHASE 3		WIRE 4					
C	DESCRIPTION	VA	A/P	No.	A	B	C	No.	A/P	VA	DESCRIPTION	C
5	R-IDF	400	20/1	1	*			2	60/3	2000	PANEL 2E2	5
	SPARE		20/1	3	*			4	*	2000	*	5
	SPARE		20/1	5	*			6	*	2000	*	5
	SPARE		20/1	7	*			8	20/1	900	BATTERY CHARGER	3
	SPARE		20/1	9	*			10	20/1	800	BLOCK HEATER	3
	SPACE			11	*			12			SPACE	
	SPACE			13	*			14			SPACE	
	SPACE			15	*			16			SPACE	
	SPACE			17	*			18			SPACE	
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)		FACTOR			CODE LOAD		
1. LIGHTS:		0	0	0	0		1.25			0		
2. RECEPTACLE:		0	0	0	0		*			0		
3. HEATING:		900	800	0	1,700		1.00			1,700		
4. KITCHEN:		0	0	0	0		1.00			0		
5. EQUIPMENT:		2,400	2,000	2,000	6,400		1.00			6,400		
6. MOTORS:		0	0	0	0		**			0		
7. MISC:		0	0	0	0		1.00			0		
TOTAL (VA):		3,300	2,800	2,000	8,100							
LARGEST MOTOR:		0 VA	TOTAL LOAD:		23 A		CODE DEMAND:			23 A		
# KITCHEN EQUIPMENT		0										
NOTES:							* FIRST 10 KVA + 50% OF THE BALANCE					
							** 125% OF THE LARGEST MOTOR + THE BALANCE					

PANEL SCHEDULE												
PANEL: 2E2			MKE & ASSOCIATES, INC.				MOUNTING: SURFACE					
FED BY: 2E1												
LOC: MDF ROOM			VOLTS 120/208		PHASE 3		WIRE					
C	DESCRIPTION	VA	A/P	No.	A	B	C	No.	A/P	VA	DESCRIPTION	C
6	HVAC SPLIT	1500	20/2	1	*			2	20/1	360	R - MAIN OFFICE	2
6	*	1500	*	3	*			4	20/1		SPARE	
	SPACE			5	*	*		6	20/1		SPARE	
	SPACE			7	*	*		8	20/1		SPARE	
	SPACE			9	*	*		10			SPACE	
	SPACE			11	*	*		12			SPACE	
	SPACE			13	*	*		14			SPACE	
	SPACE			15	*	*		16			SPACE	
	SPACE			17	*	*		18			SPACE	
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)		FACTOR			CODE LOAD		
1. LIGHTS:		0	0	0	0		1.25			0		
2. RECEPTACLE:		360	0	0	360		*			360		
3. HEATING:		0	0	0	0		1.00			0		
4. KITCHEN:		0	0	0	0		1.00			0		
5. EQUIPMENT:		0	0	0	0		1.00			0		
6. MOTORS:		1,500	1,500	0	3,000		**			ID LARGEST MOTOR		
7. MISC:		0	0	0	0		1.00			0		
TOTAL (VA):		1,860	1,500	0	3,360					360		
LARGEST MOTOR:		1,500 VA	TOTAL LOAD:		9 A		CODE DEMAND:			1 A		
# KITCHEN EQUIPMENT		0										
NOTES:							* FIRST 10 KVA + 50% OF THE BALANCE ** 125% OF THE LARGEST MOTOR + THE BALANCE					

KEYED NOTES:

- PROVIDE AND INSTALL NEMA 3R TERMINAL/CURRENT TRANSFORMER SECTION PER PGE REQUIREMENTS.
- PROVIDE AND INSTALL METER BASE PER PGE REQUIREMENTS.
- PROVIDE AND INSTALL NEMA 3R MAIN DISTRIBUTION PANEL/SECTION ON EXTERIOR OF BUILDING.
- PROVIDE AND INSTALL (3) 5" PVC SCHEDULE 40 CONDUITS TO EXISTING PGE POLE MOUNTED TRANSFORMERS. CONTRACTOR TO PROVIDE TRENCH, BACKFILL, COMPACTION, PAVING PATCH, AND LOCATES. NOTE: IF DESIRED CONTRACTOR MAY UTILIZE A DIRECTIONAL BORE INSTEAD OF TRENCH.
- PROVIDE AND INSTALL 100A, 277/480V, 3 PHASE AUTOMATIC TRANSFER SWITCH AS OUTLINED IN ELECTRICAL SPECIFICATION. NEMA 3R.
- PROVIDE TWO (2) 120V, 20A CIRCUITS FOR BLOCK HEATER AND BATTERY CHARGER.
- PROVIDE 1-1/4" PVC TO AUTOMATIC TRANSFER SWITCH.
- PROVIDE FOUR (4) 12" X 8" DEEP WIREWAYS FOR EXTENSION OF FEEDERS TO BREAKERS IN SDP4 AND SDP2.
- REPLACE EXISTING PANELS WITH NEW PANELS. MAINTAIN EXISTING FEEDER. PROVIDE OAK TRIM TO ALLOW PANEL TO BE INSTALLED FLUSH IN WALL. SEE PANEL SCHEDULES FOR BREAKERS/DATA.
- RELOCATE EXISTING 112.5KVA 480V/208V, 3Ø TRANSFORMER FROM TOP OF EXISTING GEAR TO FLOOR. PROVIDE 3" HOUSEKEEPING PAD.
- PROVIDE AND INSTALL NEW 277V/480V, 3Ø, 4W SUB-DISTRIBUTION AT SAME LOCATION AS EXISTING 480V SDP. SEE SPECIFICATIONS.
- PROVIDE AND INSTALL NEW 120V/208V, 3Ø, 4W SUB-DISTRIBUTION PANEL AT SAME LOCATION AS EXISTING 208V SDP SECTION. SEE SPECIFICATIONS.
- PROVIDE AND INSTALL 15KVA 480V/208V, 3Ø, 4W TRANSFORMERS. PROVIDE WALL MOUNT BRACKET TO MOUNT ABOVE PANELBOARDS. SEE SPECIFICATION.
- PROVIDE GRC 90'S FOR STUB FROM GENERATOR TO ATS. UTILIZE GRC 90'S AT EACH END.
- GROUNDING ELECTRODE CONDUCTOR PER SERVICE SIZE: 400A = #2 CU, 600A = #1/0 CU, 800-1,000A = #2/0 CU, ≥1,200A = #3/0 CU.
- PROVIDE AND INSTALL TVSS SURGE SUPPRESSION DEVICE ON SDPE. ABB OVRT SPD40KA SERIES. PROVIDE 20A-3P BREAKER IN EXISTING PANEL FOR TVSS.

GENERAL NOTES:

- SIZE CONDUCTORS PER NEC ARTICLE 250.
- CONDUCTORS TO BE COPPER.

2 GROUNDING DETAIL

N.T.S

COPPER 4-WIRE FEEDER CONDUCTOR SCHEDULE
 (THHN/THWN COPPER PHASE & NEUTRAL CONDUCTOR ONLY)
 (THHN/THWN COPPER GROUND CONDUCTOR)



DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT
FIR GROVE ELEMENTARY
BEAVERTON S.D.
6300 SW WILSON AVE.
BEAVERTON, OR 97008

ISSUE DATE:

03-23-2022

SET TYPE:

Final Review

REVISIONS:

DRAWN BY:

DD

DESIGNED BY:

HB

CHECKED BY:

SL

MKE JOB #:

BV-5749

ELECTRICAL -
PANEL
SCHEDULES

E4

PANEL SCHEDULE												
PANEL: 2LS1		MKE & ASSOCIATES, INC.				MOUNTING: SURFACE						
FED BY: SDPE		BUS/MAIN:										
LOC:		VOLTS		PHASE		WIRE						
		120/208		3		4						
C	DESCRIPTION	VA	A/P	No.	A	B	C	No.	A/P	VA	DESCRIPTION	C
1	L-GYM	1008	20/1	1	*			2	60/3	2000	PANEL 2LS2	5
1	L-GYM	1008	20/1	3	*			4	*	2000	*	5
1	L-GYM	1008	20/1	5	*		*	6	*	2000	*	5
1	L-GYM	1008	20/1	7	*			8	20/1		SPARE	
1	L-CAFETERIA	328	20/1	9	*			10	20/1		SPARE	
	SPACE			11	*		*	12	20/1		SPARE	
	SPACE			13	*		*	14	20/1		SPARE	
	SPACE			15	*		*	16			SPACE	
	SPACE			17	*		*	18			SPACE	
				19	*		*	20				
				21	*		*	22				
				23	*		*	24				
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)			FACTOR		CODE LOAD		
1. LIGHTS:		2,016	1,336	1,008	4,360			1.25		5,450		
2. RECEPTACLE:		0	0	0	0			*		0		
3. HEATING:		0	0	0	0			1.00		0		
4. KITCHEN:		0	0	0	0			1.00		0		
5. EQUIPMENT:		2,000	2,000	2,000	6,000			1.00		6,000		
6. MOTORS:		0	0	0	0			**		0		
7. MISC:		0	0	0	0			1.00		0		
TOTAL (VA):		4,016	3,336	3,008	10,360					11,450		
LARGEST MOTOR:		0 VA	TOTAL LOAD:		29 A			CODE DEMAND:		32 A		
# KITCHEN EQUIPMENT		0										
NOTES:								* FIRST 10 KVA + 50% OF THE BALANCE				
								** 125% OF THE LARGEST MOTOR + THE BALANCE				

PANEL SCHEDULE											
PANEL: 2LS2		MKE & ASSOCIATES, INC.				MOUNTING: SURFACE					
FED BY: 2LS1						BUS/MAIN: 100A					
LOC: BOILER ROOM		VOLTS 120/208		PHASE 3		WIRE 4					
C	DESCRIPTION	VA	A/P	No.	A B C	No.	A/P	VA	DESCRIPTION	C	
1	L-CORRIDOR	1260	20/1	1	*	2	20/1	240	FIRE ALARM PWR	5	
1	L-CORRIDOR	200	20/1	3	*	4	20/1	240	FACP	5	
5	SERVER	400	20/1	5	*	6	20/1		SPARE		
5	SERVER	2100	30/1	7	*	8	20/1		SPARE		
5	ACCESS CONTROL	200	20/1	9	*	10	20/1		SPARE		
	SPACE			11	*	12	20/1		SPARE		
	SPACE			13	*	14			SPACE		
	SPACE			15	*	16			SPACE		
	SPACE			17	*	18			SPACE		
	SPACE			19	*	20			SPACE		
	SPACE			21	*	22			SPACE		
	SPACE			23	*	24			SPACE		
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)		FACTOR		CODE LOAD		
1. LIGHTS:		1,260	200	0	1,460		1.25		1,825		
2. RECEPTACLE:		0	0	0	0		*		0		
3. HEATING:		0	0	0	0		1.00		0		
4. KITCHEN:		0	0	0	0		1.00		0		
5. EQUIPMENT:		2,340	440	400	3,180		1.00		3,180		
6. MOTORS:		0	0	0	0		**		0		
7. MISC:		0	0	0	0		1.00		0		
TOTAL (VA):		3,600	640	400	4,640				5,005		
LARGEST MOTOR:		0 VA	TOTAL LOAD:		13 A		CODE DEMAND:		14 A		
# KITCHEN EQUIPMENT		0									
NOTES:						* FIRST 10 KVA + 50% OF THE BALANCE ** 125% OF THE LARGEST MOTOR + THE BALANCE					

PANEL SCHEDULE											
PANEL: G		MKE & ASSOCIATES, INC.				MOUNTING: FLUSH (1)					
FED BY: SDP2						BUS/MAIN: 200A MLO					
LOC: GYM		VOLTS 120/208		PHASE 3		WIRE 4					
C	DESCRIPTION	VA	A/P	No.	A B C	No.	A/P	VA	DESCRIPTION	C	
1	L-PLAY ROOM	1180	20/1	1	*	2	20/1	900	POWER PARK	2	
1	L-PLAY ROOM	1180	20/1	3	*	4	40/3	4000	DISHWASER	4	
2	LOFT	440	20/1	5	*	6	*	4000	*	4	
2	R-GYM	720	20/1	7	*	8	*	4000	*	4	
1	L-CORRIDOR		20/1	9	*	10	20/1	720	R-KITCHEN	2	
1	L-KITCHEN		20/1	11	*	12	20/1	720	R-KITCHEN	2	
1	L-STORAGE		20/1	13	*	14	20/1	1180	L-CAFETERIA	1	
2	R-KITCHEN		20/1	15	*	16	20/1	1180	L-CAFETERIA	1	
2	R-PLAY ROOM		20/1	17	*	18	20/1	720	R-KITCHEN	2	
6	EF		20/1	19	*	20	20/1	1180	L-CAFETERIA	1	
6	EF-GYM		20/1	21	*	22	20/1	1180	L-CAFETERIA	1	
2	R-GYM		20/1	23	*	24	20/1		SPARE		
2	R-CAFETERIA		20/1	25	*	26	20/1	420	GA	2	
	SPARE		20/1	27	*	28	20/1		SPARE		
	SPARE		20/1	29	*	30	20/1	720	DISPOSAL	6	
	SPARE		20/1	31	*	32			SPACE		
	SPARE		20/1	33	*	34			SPACE		
	SPARE		20/1	35	*	36			SPACE		
	SPACE			37	*	38			SPACE		
	SPACE			39	*	40			SPACE		
	SPACE			41	*	42			SPACE		
<u>LOAD CODE (VA)</u>							<u>FACTOR</u>		<u>CODE LOAD</u>		
1. LIGHTS:		3,540	3,540	0	7,080		1.25		8,850		
2. RECEPTACLE:		2,040	720	1,880	4,640		*		4,640		
3. HEATING:		0	0	0	0		1.00		0		
4. KITCHEN:		4,000	4,000	4,000	12,000		1.00		12,000		
5. EQUIPMENT:		0	0	0	0		1.00		0		
6. MOTORS:		0	0	720	720		**		ID LARGEST MOTOR		
7. MISC:		0	0	0	0		1.00		0		
TOTAL (VA):		9,580	8,260	6,600	24,440				25,490		
LARGEST MOTOR:		720 VA	TOTAL LOAD:		68 A		CODE DEMAND:		71 A		
# KITCHEN EQUIPMENT		1									
NOTES: (1) PROVIDE OAK TRIM (1"x4") TO ALLOW FLUSH TRIM.							* FIRST 10 KVA + 50% OF THE BALANCE				
							** 125% OF THE LARGEST MOTOR + THE BALANCE				

PANEL SCHEDULE												
PANEL: H		MKE & ASSOCIATES, INC.				MOUNTING: FLUSH (1)						
FED BY: SDP2						BUS/MAIN: 100A MLO						
LOC: KITCHEN		VOLTS 120/208		PHASE 3		WIRE 4						
C	DESCRIPTION	VA	A/P	No.	A	B	C	No.	A/P	VA	DESCRIPTION	C
4	HEATWELL	1500	20/3	1	*			2	20/1		SPARE	
4	*	1500	*	3	*			4	20/1		SPARE	
4	*	1500	*	5	*	*		6	20/1		SPARE	
4	OVEN	1500	20/2	7	*			8	20/1		SPARE	
4	*	1500	*	9	*	*		10	20/1		SPARE	
	SPARE		20/1	11	*	*		12	20/1		SPARE	
4	FREEZER	1500	20/3	13	*	*		14	20/1		SPARE	
4	*	1500	*	15	*	*		16	20/1		SPARE	
4	*	1500	*	17	*	*		18			SPACE	
	SPACE			19	*	*		20			SPACE	
	SPACE			21	*	*		22			SPACE	
	SPACE			23	*	*		24			SPACE	
	SPACE			25	*	*		26			SPACE	
	SPACE			27	*	*		28			SPACE	
	SPACE			29	*	*		30			SPACE	
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)			FACTOR		CODE LOAD		
1. LIGHTS:		0	0	0	0	1.25			0			
2. RECEPTACLE:		0	0	0	0	*			0			
3. HEATING:		0	0	0	0	1.00			0			
4. KITCHEN:		4,500	4,500	3,000	12,000	0.90			10,800			
5. EQUIPMENT:		0	0	0	0	1.00			0			
6. MOTORS:		0	0	0	0	**			0			
7. MISC:		0	0	0	0	1.00			0			
TOTAL (VA):		4,500	4,500	3,000	12,000				10,800			
LARGEST MOTOR:		0 VA	TOTAL LOAD:			33 A	CODE DEMAND:		30 A			
# KITCHEN EQUIPMENT		3										
NOTES: (1) PROVIDE OAK TRIM (1"x4") TO ALLOW FLUSH TRIM.												
* FIRST 10 KVA + 50% OF THE BALANCE ** 125% OF THE LARGEST MOTOR + THE BALANCE												

STRUCTURAL CALCULATIONS

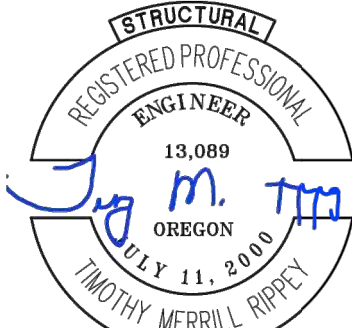
PROJECT: BEAVERTON SD – FIR GROVE ELEM. GENERATOR PAD

LOCATION: 6300 SW WILSON AVE.
BEAVERTON, OR

CLIENT: MKE & ASSOCIATES, INC.

DATE: NOVEMBER 18, 2020

PROJECT NUMBER: 21460



EXPIRES: 12-31-22

TABLE OF CONTENTS:

ITEM	SHEET NUMBER
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SKETCHES	SK1 – SK2
CALCULATIONS	C1 – C5

DESCRIPTION:

THIS DESIGN PACKAGE INCLUDES SKETCHES AND CALCULATIONS FOR ANCHORAGE OF ONE (1) GENERATOR UNIT AT THE ADDRESS NOTED ABOVE.

GENERAL STRUCTURAL NOTES

CODE REQUIREMENTS:

CONFORM TO THE 2018 INTERNATIONAL BUILDING CODE AS AMENDED BY THE 2019 OREGON STRUCTURAL SPECIALTY CODE, REFERENCED HEREFTER AS IBC.

DESIGN CRITERIA:

DESIGN WAS BASED ON THE STRENGTH AND DEFLECTION CRITERIA OF THE IBC. IN ADDITION TO THE DEAD LOADS, THE FOLLOWING LOADS WERE USED FOR DESIGN:

GENERATOR UNIT = 2520 LBS

SEISMIC IMPORTANCE FACTOR I_e : 1.25

SITE CLASS: D (ASSUMED)

$S_DS = 0.698$

BASIC WIND SPEED (3-SEC GUST, ULTIMATE): 103 MPH

WIND EXPOSURE: B

BUILDING RISK CATEGORY: III

TEMPORARY CONDITIONS:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR STRUCTURAL STABILITY OF THE NEW AND EXISTING STRUCTURES AND WALLS DURING CONSTRUCTION. THE STRUCTURE SHOWN ON THE DRAWINGS HAS BEEN DESIGNED FOR STABILITY UNDER THE FINAL CONFIGURATION ONLY.

EARTHWORK:

MAINTAIN THE EXCAVATION FREE FROM GROUND WATER FOR THE TIME REQUIRED TO COMPLETE THE WORK IN A PROPER WORKMANLIKE MANNER. REMOVE LOOSE OR DISTURBED SOIL FROM THE BOTTOMS OF EXCAVATION. FOOTINGS SHALL BEAR ON UNDISTURBED NATIVE SOIL OR ENGINEERED STRUCTURAL FILL.

WHERE COMPACTED AREAS ARE DISTURBED BY CONSTRUCTION OPERATIONS OR ADVERSE WEATHER, OVER EXCAVATE AND BACKFILL WITH 3/4" MINUS CRUSHED ROCK COMPACTED TO MINIMUM OF 95% OF THE DRY DENSITY AS MEASURED BY AASHTO T180. AT DISTURBED AREAS WITHIN 3'-0" OF BUILDING FOUNDATIONS COMPACT TO MINIMUM 95% OF THE DRY DENSITY AS MEASURED BY AASHTO T180.

CAST-IN-PLACE CONCRETE:

MIX DESIGN: PREPARE DESIGN MIXES FOR EACH TYPE OF CONCRETE. PROPORTION MIXES BY EITHER LABORATORY TRIAL BATCH OR FIELD EXPERIENCE METHODS, USING MATERIALS TO BE EMPLOYED ON THE WORK FOR EACH CLASS OF CONCRETE REQUIRED. FURNISH CERTIFIED REPORTS OF EACH PROPOSED MIX FOR EACH TYPE OF WORK OF THIS SECTION. THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS, ALONG WITH TEST DATA AS REQUIRED, A MINIMUM OF TWO WEEKS PRIOR TO PLACING CONCRETE.

ADMIXTURES: AIR ENTRAINING AGENT IN ACCORDANCE WITH ASTM C260 AND WATER-REDUCING ADMIXTURE CONFORMING TO ASTM 494, USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, MAY BE INCORPORATED IN CONCRETE DESIGN MIXES. AN AIR-ENTRAINING AGENT CONFORMING TO ASTM C260 SHALL BE USED IN CONCRETE MIXES FOR EXTERIOR HORIZONTAL SURFACES EXPOSED TO WEATHER. THE AMOUNT OF ENTRAINED AIR SHALL BE 5% - 7% BY VOLUME. FLY ASH SHALL CONFORM TO ASTM C 618 AND SHALL BE LIMITED TO A 15% MAXIMUM BY CEMENT WEIGHT.

CONCRETE WORK SHALL CONFORM TO ACI 301. CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS PER ASTM C39, AND SHALL BE AS FOLLOWS:

SLABS: $f'_c = 4,000$ PSI AT 28 DAYS. (MINIMUM CEMENT CONTENT = 517 LBS)

ABSOLUTE WATER/CEMENT RATIO BY WEIGHT:

$f'_c = 4000$ PSI (0.50 NON-AIR ENTRAINED, 0.45 AIR ENTRAINED)

HOT AND COLD WEATHER REQUIREMENTS FOR CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.

SLEEVES, OPENINGS, CONDUIT, AND OTHER EMBEDDED ITEMS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE

TMR TM RIPPEY
CONSULTING ENGINEERS
7650 SW Beveland Street
Suite 100
Tigard, Oregon 97223
Phone: (503) 443-3900

BY: KJM	DATE: _____
CHK BY: _____	DATE: _____
JOB #: 21460	
SHEET: N1	OF: _____

APPROVED BY THE STRUCTURAL ENGINEER BEFORE POURING. CONDUITS EMBEDDED IN SLABS SHALL NOT BE LARGER THAN ONE THIRD OF THE THICKNESS OF THE SLAB AND SHALL NOT BE SPACED CLOSER THAN THREE DIAMETERS ON CENTER. PROVIDE 3/4" CHAMFERS ON ALL EXPOSED CONCRETE EDGES UNLESS NOTED OTHERWISE.

CONCRETE REINFORCING STEEL:

REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60 FOR DEFORMED BARS, UNLESS OTHERWISE NOTED. REINFORCING STEEL TO BE WELDED SHALL CONFORM TO ASTM A706. REINFORCING STEEL TO BE HOT DIP GALVANIZED SHALL CONFORM TO ASTM 767. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A82 AND A185.

REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 LATEST EDITION ("DETAILS AND DETAILING CONCRETE REINFORCEMENT").

UNLESS NOTED OTHERWISE ON THE DRAWINGS LAP SPLICE LENGTHS SHALL BE 50 BAR DIAMETERS

REINFORCING STEEL SHALL HAVE PROTECTION AS FOLLOWS:

CONDITION: MINIMUM COVER:
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"

CONCRETE EXPOSED TO EARTH AND WEATHER:
NO.6 THROUGH NO.18 BARS 2"

CONCRETE ACCESSORIES:

CONCRETE EPOXY/ADHESIVE ANCHORS SHALL BE INSTALLED WITH "HILTI HIT-RE 500 V3" (OR ENGINEER APPROVED EQUIVALENT) INSTALLED PER MANUFACTURER'S GUIDELINES AND CURRENT ESR REPORT, AND SHALL MEET THE FOLLOWING CRITERIA:

- ADHESIVE ANCHORS SHALL BE INSTALLED BY QUALIFIED PERSONNEL TRAINED TO INSTALL ADHESIVE ANCHORS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND WITH STRICT ADHERENCE TO THE PROVISIONS WITHIN THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
- AT THE TIME OF ANCHOR INSTALLATION, IN ACCORDANCE WITH ACI 318-11 SECTION D.2.2, ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM AGE OF 21 DAYS.

MECHANICAL:

THE CONTRACTOR SHALL COORDINATE SEISMIC RESTRAINTS OF ELECTRICAL EQUIPMENT, MECHANICAL, PLUMBING, FIRE SPRINKLER, MACHINERY, AND ASSOCIATED PIPING WITH THE STRUCTURE. ANY CONNECTIONS TO STRUCTURE NOT CONFORMING TO SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA), OR SPECIFICALLY DETAILED ON THE MECHANICAL ENGINEERS DRAWINGS, SHALL BE DESIGNED IN ACCORDANCE OF THESE GENERAL NOTES, BY AN ENGINEER REGISTERED IN THE STATE OF OREGON, AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FABRICATION.

INSPECTION:

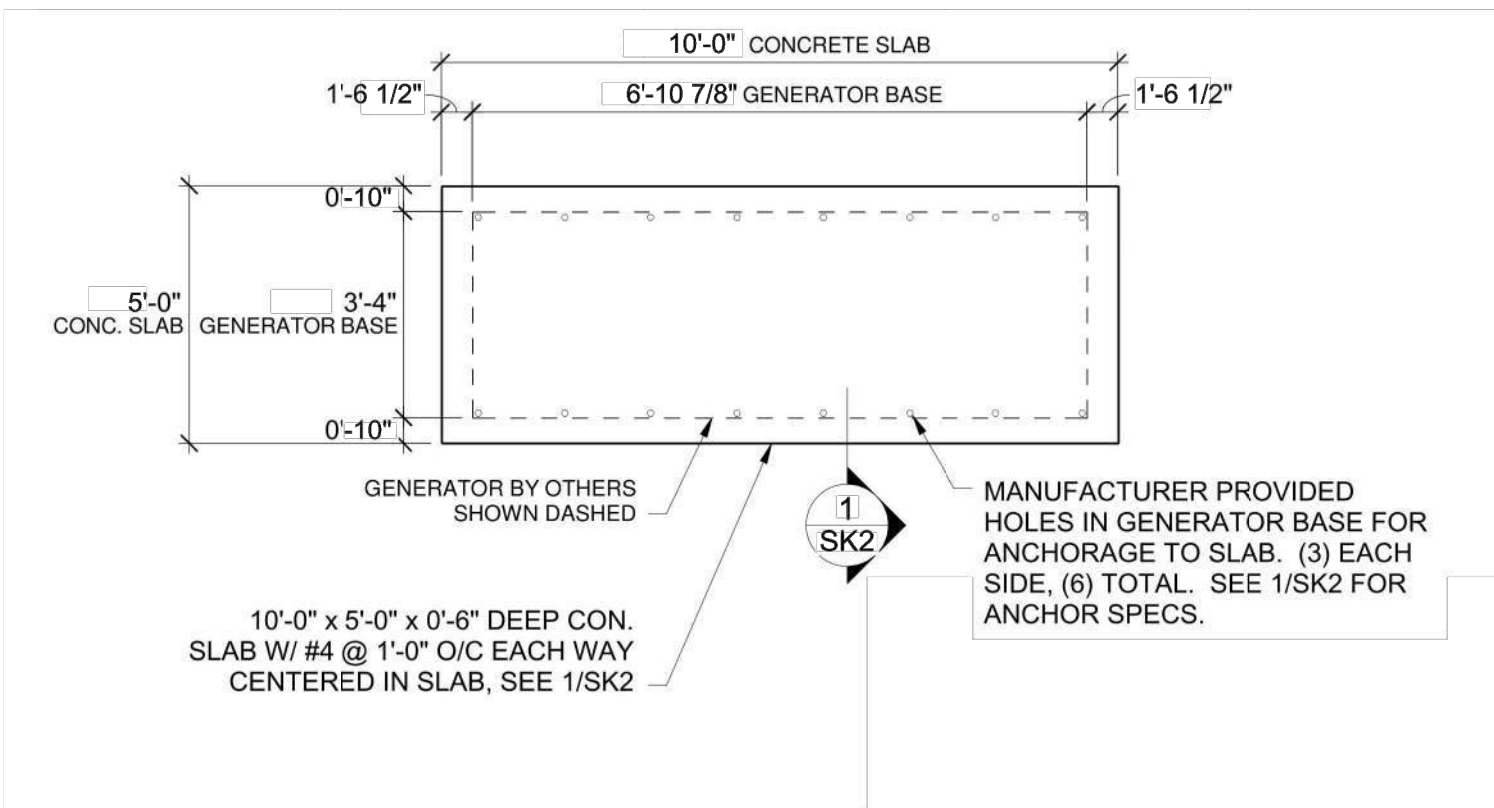
SPECIAL INSPECTIONS: IN ACCORDANCE WITH SECTION 1704 OF THE IBC AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS. SPECIAL INSPECTIONS ARE TO BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY EMPLOYED BY THE OWNER FOR THE AREAS INDICATED BELOW.

- ADHESIVE ANCHOR (PERIODIC)
- PLACEMENT OF CONCRETE AND CONCRETE REINFORCING (PERIODIC)

THE CONTRACTOR AND SPECIAL INSPECTOR SHALL NOTIFY THE ENGINEER OF RECORD OF ANY ITEM NOT COMPLYING WITH THE PROJECT SPECIFICATIONS AND/OR APPLICABLE CODES BEFORE PROCEEDING WITH ANY WORK INVOLVING THAT ITEM. THE ENGINEER OF RECORD WILL REVIEW THE ITEM AND DETERMINE ACCEPTABILITY. IF WORK INVOLVING THAT ITEM PROCEEDS WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD THEN THE WORK WILL BE CONSIDERED NON-COMPLIANT.

TMR TM RIPPEY
CONSULTING ENGINEERS
7650 SW Beveland Street
Suite 100
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Phone: (503) 443-3900

BY: KJM	DATE: _____
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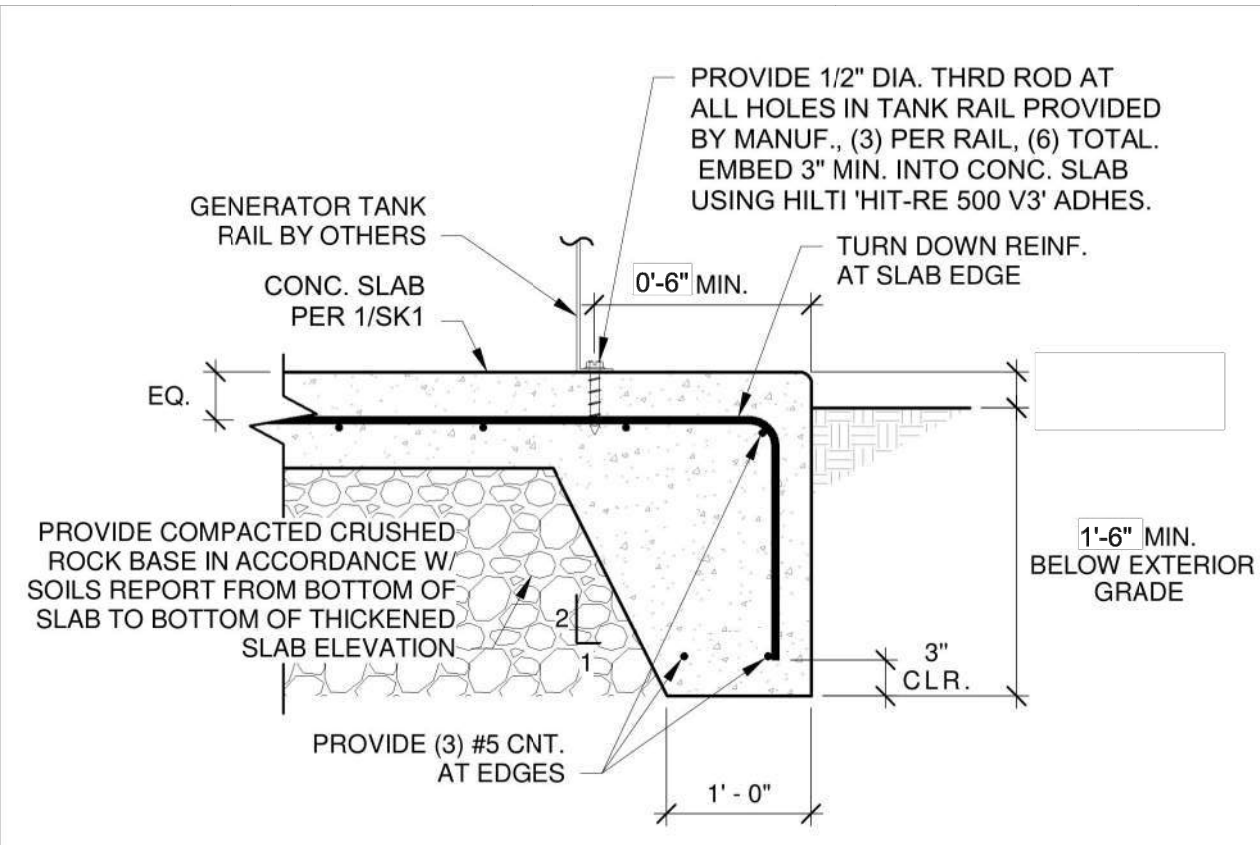


1 SK1 GENERATOR SLAB PLAN

TMR TM RIPPEY
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7650 S.W. Beveland St, Suite 100
Tigard, Oregon 97223
Phone (503) 443-3900

FIR GROVE ELEMENTARY SCHOOL
GENERATOR ANCHORAGE

BY: KJ DATE: _____
CHK BY: _____ DATE: _____
JOB NO. 21460
SHEET SK1 OF: _____



1 SK2 GENERATOR SLAB DETAIL

TMR TM RIPPEY
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Tigard, Oregon 97223
Phone (503) 443-3900

FIR GROVE ELEMENTARY SCHOOL
GENERATOR ANCHORAGE

BY: KJ DATE: _____
CHK BY: _____ DATE: _____
JOB NO. 21460
SHEET SK2 OF: _____

Generator Pad & Anchorage

$V = 103 \text{ mph}$ (Risk Cat. III) EXP. B
 $S_{DS} = 0.698$

Generator wgt (w/ fuel) = $1720 \text{ lbs} + 800 \text{ lbs} = 2520 \text{ lbs}$
 $C.O.E. = 1/8 (47.5) = 15.8"$

Wind: Ch 29.4

$F = q_z G C_F A_F$
 $\rightarrow q_z = 0.00256 (0.57) (1.0) (0.60) (1.0) (105)^2 = 14.5 \text{ psf}$
 $G = 0.85$
 $C_F (h/D = 0.72) = 1.3$

$F = (14.5 \text{ psf}) (0.85) (1.3) (59.5' \times 82.8') = 548.2 \text{ lbs. @ } 1/2 (59.5) = 30"$
 $16.02 > 16 \text{ o.k.}$

Seismic:

$F_p = 0.4 A_s S_{DS} W_p (1 + 2 \frac{Z}{F}) = 0.4 (1) (0.703) \frac{W_p}{(R_p / I_p)} (1) = 0.1687 W_p$
 $F_{pmn} = 0.3 (0.703) (1.5) W_p = 0.316 W_p \leftarrow \text{controls}$
 $F_p = 0.316 (2520 \text{ lbs}) = 797 \text{ lbs.}$

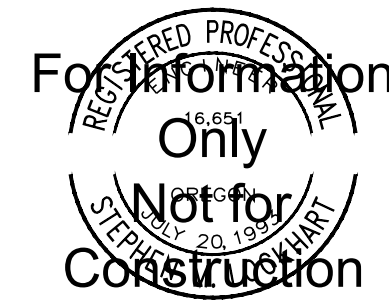
O.T. Check:

$(0.9 - 0.2)(0.703) D + E: M_o = (797 \text{ lbs}) (15.8') = 1049 \text{ lb-ft}$
 $M_R = (0.1584) (2520 \text{ lbs}) (30'/2) = 3030 \text{ lb-ft} > M_o$
 $V = 797 \text{ lbs} / 6 \text{ anchors} = 133 \text{ lbs/anchor} \times (52 = 2.0) = 266 \text{ lbs}$
 $\rightarrow 133 \text{ lbs} \times 2' \text{ embed capacity} = 192 \text{ lbs} > 266 \text{ lbs.}$

O.B. + W. $M_o = (548.2 \text{ lbs}) (30') = 1371 \text{ lb-ft} < 2020$ o.k.

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JOB NO. 21460
SHEET C1 OF: _____



EXPIRES 12-31-22

DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT
FIR GROVE ELEMENTARY
BEAVERTON S.D.
6300 SW WILSON AVE.
BEAVERTON, OR 97008

ISSUE DATE:

03-23-2022

SET TYPE:

Final Review

REVISIONS:

DRAWN BY:

DD

DESIGNED BY:

HB

CHECKED BY:

SL

MKE JOB #:

BV-5749

ELECTRICAL -
GENERATOR SLAB
CALCULATIONS

E5

PLOTTED: DANIEL DERHEIMER 3/22/2022 4:10 PM
 574966 - FIR GROVE

This outline drawing is to provide representative configuration details for the model series.

See respective model data sheet for specific model outline drawing number.

Do not use for installation design

* Add 60 lbs. for fuel

* Finish a 60" x 120" pad.

Model	Dim "A"	Dim "B"	Dim "C"	Weight Wet
DGBB	40 in 1016 mm	47.5 in 1207 mm	82.8 in 2103 mm	1688 lb. 767 kg
DGBC	40 in 1016 mm	47.5 in 1207 mm	82.8 in 2103 mm	1688 lb. 767 kg
DGCA	40 in 1016 mm	47.5 in 1207 mm	82.8 in 2103 mm	1720 lb. 780 kg
DGCB	40 in 1016 mm	47.5 in 1207 mm	82.8 in 2103 mm	1720 lb. 780 kg

Onan Corporation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
612-574-5000
Fax: 612-574-8067

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Cummins is a registered trademark of Cummins Engine Company

Generator Set Series Sheet Specifications May Change Without Notice Onan Corporation S-1018d

See your distributor for more information.

Onan

Onan Corporation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
612-574-5000
Fax: 612-574-8067

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Generator Set Series Sheet Specifications May Change Without Notice Onan Corporation S-1018d

Profis Anchor 2.7.8

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Specifie: _____

Address: _____

Phone | Fax: _____

E-Mail: _____

Page: 1

Project: _____

Sub-Project | Pos. No.: _____

Date: 3/20/2020

Specifie's comments:

1 Input data

Anchor type and diameter: HIT-RE 500 V3 + HAS-V-36 (ASTM F1554 Gr.36) 1/2"

Effective embedment depth: $h_{ef,req} = 2.750$ in. ($h_{ef,min} = 4.750$ in.)

Material: ASTM A 1554 Grade 36

Evaluation Service Report: ESR-3814

Issued | Valid: 1/1/2017 | 1/1/2019

Proof: Design method ACI 318-11 / Chem

Stand-off installation: $e_b = 0.000$ in. (no stand-off); $t = 0.500$ in.

Anchor plate: $l_a \times l_b \times t = 3.000$ in. x 3.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)

Profile: no profile

Base material: cracked concrete, 3000 , $f_c' = 3,000$ psi; $h = 6.000$ in., Temp. short/long: 32/32 °F

Installation: **hammer drilled hole, Installation condition: Dry**

Reinforcement: tension: condition A, shear: condition A; no supplemental splitting reinforcement present

edge reinforcement: none or < No. 4 bar

Seismic loads (cat. C, D, E, or F) Tension load: yes (D.3.3.4.3 (d))

Shear load: yes (D.3.3.5.3 (c))

* - user is responsible to ensure a rigid base plate for the entered thickness with appropriate solutions (stiffeners,...)

Geometry [in.] & Loading [lb, in.lb]

C3

Input data and results must be checked for agreement with the existing conditions and for plausibility!
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Sub-Project | Pos. No.: _____

Date: 3/20/2020

2 Proof | Utilization (Governing Cases)

Loading	Proof	Design values [lb]		Utilization		Status
		Load	Capacity	β_h / β_v [%]	β_h / β_v [%]	
Tension	-	-	-	-	-	-
Shear	Steel Strength	266	1,927	- / 14	-	OK

Loading	β_h	β_v	ζ	Utilization $\beta_{h,v}$ [%]	Status
Combined tension and shear loads	-	-	-	-	-

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

4 Remarks; Your Cooperation Duties

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FAX: 503.892.1190
CONTACT: HANK BARLEEN
engineering@mke-inc.com

For Information Only

Not for Construction

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E6