



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:

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DD

DESIGNED BY:

HB

CHECKED BY:

SL

MKE JOB #:

BV-5749

ELECTRICAL -

TITLE

SHEET

E0

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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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°]
- §₂ TWO-POLE SWITCH [+ 45°]
- §₃ THREE-WAY SWITCH [+ 45°]
- §₄ FOUR-WAY SWITCH [+ 45°]
- §₄ₒ OCCUPANCY SENSOR SWITCH [+ 45°]
- §₄ₒₒ OCCUPANCY SENSOR & DIMMER SWITCH [+ 45°]
- §₄ₒₒ DIMMER SWITCH [+ 45°]
- §₄ₒₒ LOW-VOLTAGE SWITCH [+ 45°]
- §₄ₒₒ KEYED SWITCH [+ 45°]
- §₄ₒₒ 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
- ▭ₓ ROOM CONTROLLER WITH [X] # RELAYS

SWITCH - LUMINAIRE CONTROL

- SWITCH FOR ZONE 'X'
- §₄ₒₒ 'XX'-TYPE SWITCH
- ▭ₓₓ TYPE 'XX' LUMINAIRE
- ▭ₓₓ LUMINAIRE IN ZONE 'X'
- CIRCUIT NUMBER
- ₓ 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.

FIRE ALARM DEVICES

- ▭ PULL STATION [+ 45°]
- STROBE [+ 88°]
- ▭ HORN [+ 88°]
- ▭ HORN / STROBE [+ 88°]
- ▭ₓ 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°]
- ▭ₓ 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

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
- ▭ₓₓ ANALOG CLOCK & SPEAKER [+ 96°]
- ▭ₓₓ DIGITAL CLOCK
- ▭ₓₓ DIGITAL CLOCK & SPEAKER [+ 96°]
- SPEAKER [IN CEILING]
- ₓₓ SPEAKER-WALL MOUNTED [+ 84°]
- CALL BUTTON
- THERMOSTAT [+ 45°]
- ▭ DMX CONTROL OUTLET
- ▭ BUZZER

REFERENCE SYMBOLS & WIRING

- BRANCH CIRCUIT WITH GROUND CONDUCTOR
- NEUTRAL CONDUCTOR
- PHASE CONDUCTOR
- HOMERUN ARROW
- PLAN NOTE MARK
- XX SHEET REFERENCE MARK
- XX MECHANICAL EQUIPMENT NOTE MARK
- XX SHOP EQUIPMENT NOTE MARK
- XX KITCHEN EQUIPMENT NOTE MARK
- XX 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 CIRCULAR 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 MFGR'S ASSOCIATION.
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	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



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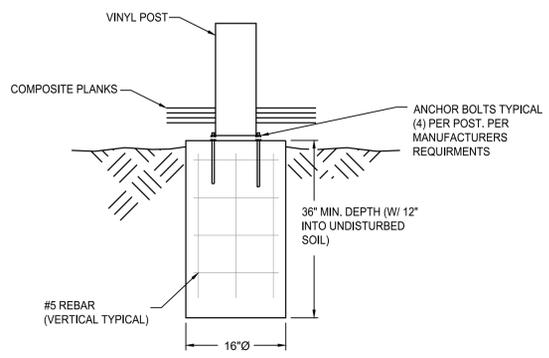
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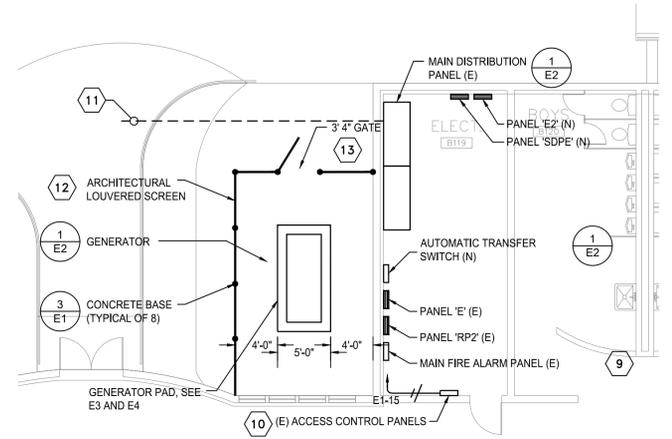
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**ELECTRICAL -
FLOOR
PLAN**

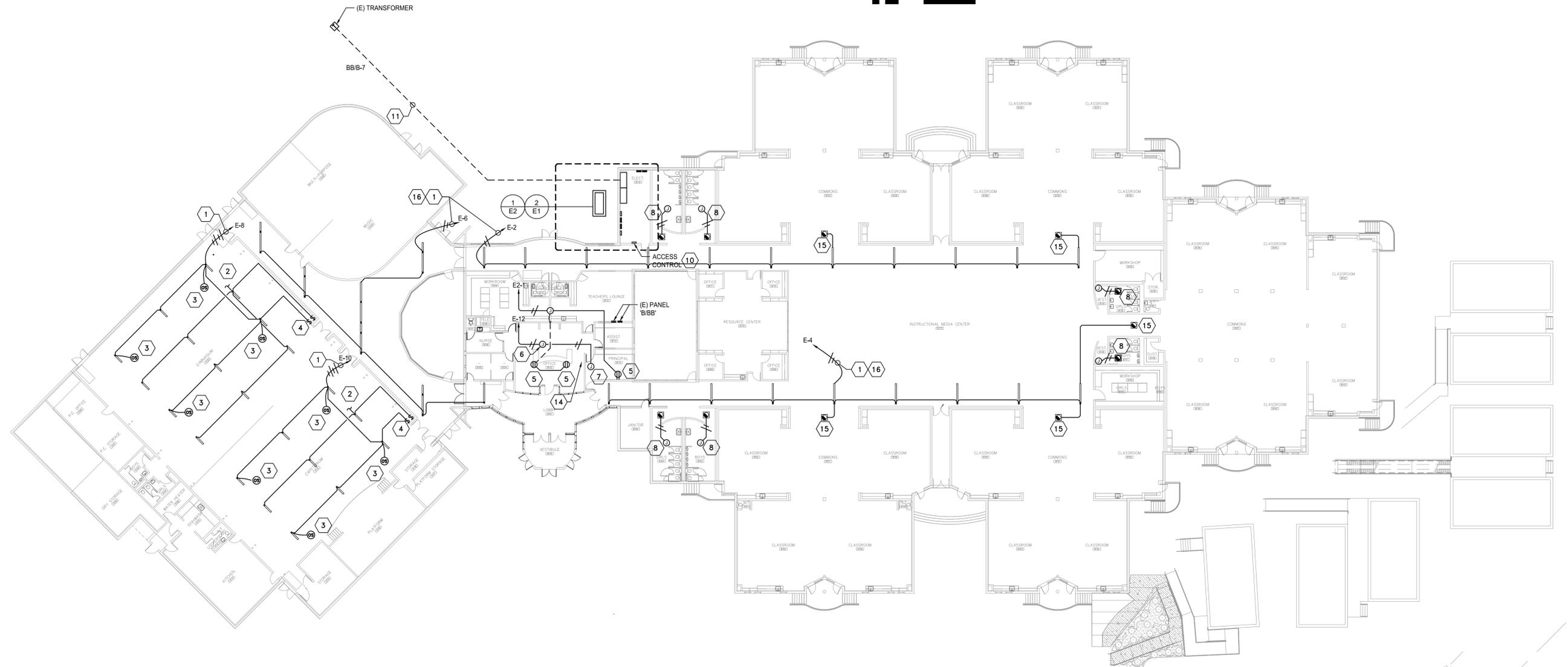
E1



3 LOUVERED SCREEN BASE
N.T.S.



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



1 FLOOR - ELECTRICAL PLAN
SCALE: 1" = 20'-0"

KEYED NOTES:

- CONNECT EXISTING 18 FLUORESCENT LUMINAIRES TO 120V, 20A CIRCUIT BREAKER IN PANEL 'E'. PROVIDE 3W/10 IN 3/4" EMT TO EXISTING PANEL. INSTALL UL 924 DEVICE. MAINTAIN EXISTING SWITCHING AND NORMAL POWER TO NEW UL 924 DEVICE.
- MAINTAIN NORMAL POWER LIGHTING CIRCUIT TO EXISTING LUMINAIRES. REMOVE CONDUCTORS TO EMERGENCY LUMINAIRES. REMOVE LUMINAIRE CIRCUIT CONNECTION TO PANEL 'AA'. MODIFY PANEL SCHEDULE TO REMOVE. PROVIDE NEW TYPEWRITTEN PANEL SCHEDULE.
- PROVIDE NEW OCCUPANCY SENSORS ON CEILING TO CONTROL EMERGENCY LUMINAIRES. OCCUPANCY SENSORS SHALL BE SET TO FAIL 'ON'.
- MAINTAIN WALL SWITCHES FOR NORMAL POWERED AND EMERGENCY LUMINAIRES.
- PROVIDE 120V, 20A DEDICATED CIRCUIT FOR FLOOR RECEPTACLES IN MAIN OFFICE AND RECEPTACLE SERVING PRINCIPAL COMPUTER. DISCONNECT RECEPTACLES/CONDUCTORS FROM NORMAL PANEL B/BB CIRCUIT. PROVIDE NEW TYPEWRITTEN PANEL SCHEDULE TO REMOVE CIRCUIT.
- INTERCEPT EXISTING CIRCUIT B/BB-7 AND CONNECT TO NEW EMERGENCY LIGHTING CIRCUIT FOR FRONT OFFICE AND PRINCIPAL'S OFFICE. MODIFY EXISTING PANEL B/BB PANEL SCHEDULE.
- CONNECT PRINCIPAL OFFICE LUMINAIRES TO NEW EMERGENCY CIRCUIT. DISCONNECT FROM EXISTING NORMAL POWER CIRCUIT. MODIFY PANEL SCHEDULES TO REFLECT MODIFICATION.
- CONNECT ONE LUMINAIRE IN EACH RESTROOM TO EXISTING EMERGENCY CIRCUIT. DOWNLIGHT AT ENTRY HAS EMERGENCY CIRCUIT. REDIRECT NORMAL POWER CIRCUIT TO BYPASS NEW EMERGENCY LUMINAIRE.
- MAINTAIN EMERGENCY CIRCUIT TO FACP.
- CONNECT ACCESS CONTROL EQUIPMENT TO 120V, 20A EMERGENCY CIRCUIT.
- EXISTING SECONDARY FEEDER FROM TRANSFORMER TO MAIN DISTRIBUTION PANEL. CONTRACTOR TO PROVIDE LOCATES AND LOCATE NEW GENERATOR AS REQUIRED TO CLEAR SECONDARY UNDERGROUND.
- PROVIDE AND INSTALL ARCHITECTURAL LOUVERED SCREEN. 5'X5'X72" HIGH VINYL POSTS WITH 60" WIDE X 72" HIGH COMPOSITE LOUVERED PANEL. SYSTEM TO BE ENGINEERED AND PROVIDED BY PANSFIELD. LOUVERS SHALL BE 6'X1" PROFILE. COLOR TO BE SELECTED BY OWNER.
- DISCONNECT EXISTING FUTURE FROM EXISTING CIRCUIT AND CONNECT TO NEW EMERGENCY CIRCUIT. REMOVE EXISTING BATTERY BALLAST AND INSTALL BLANK COVER PLATE AT REMOTE INDICATOR LIGHT IN CEILING.
- DISCONNECT EXISTING FUTURE FROM NORMAL POWER WIRING AND EXTEND EXISTING NORMAL POWER WIRING TO ADJACENT FIXTURES TO BY PASS FIXTURES CONNECTED TO NEW EMERGENCY CIRCUIT.





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PANEL SCHEDULE										
PANEL: E (EXISTING)		MOUNTING: SURFACE			BUS/MAIN: 100A					
FED BY: GEN/MDP		VOLTS: 120/208			PHASE: 3		WIRE: 4			
LOC: ELECTRICAL ROOM										
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	
	SPARE			25	*	26			SPACE	
	SPARE			27	*	28			SPACE	
	SPARE			29	*	30			SPACE	
	SPARE			31	*	32			SPACE	
	SPARE			33	*	34			SPACE	
	SPARE			35	*	36			SPACE	
	SPARE			37	*	38			SPACE	
	SPARE			39	*	40			SPACE	
	SPARE			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				

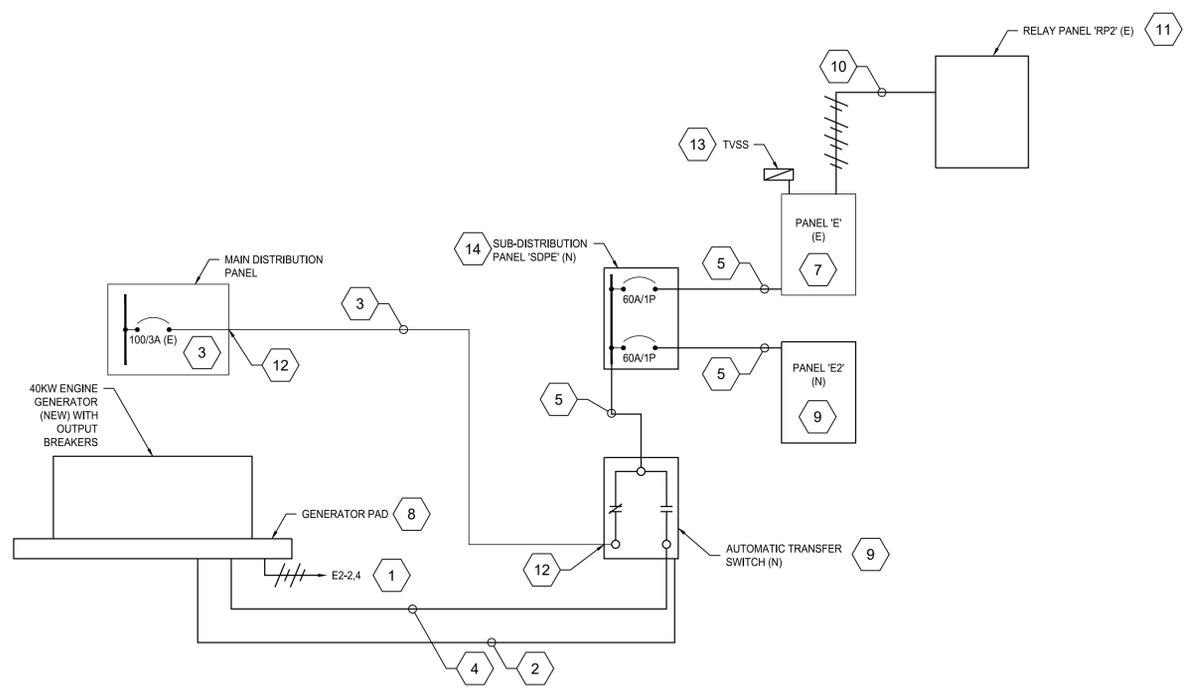
NOTES: ^ BREAKERS ARE EXISTING * FIRST 10 KVA + 50% OF THE BALANCE
 ** 125% OF THE LARGEST MOTOR + THE BALANCE

PANEL SCHEDULE										
PANEL: E2 (NEW)		MOUNTING: SURFACE			BUS/MAIN: 100A					
FED BY: MDP/GEN		VOLTS: 120/208			PHASE: 3		WIRE: 4			
LOC: ELECTRICAL RM										
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	
	SPARE		20/1	15	*	16			SPACE	
	SPARE			17	*	18			SPACE	
	SPARE			19	*	20			SPACE	
	SPARE			21	*	22			SPACE	
	SPARE			23	*	24			SPACE	
	SPARE			25	*	26			SPACE	
	SPARE			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.

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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



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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 HEREINAFTER 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)
SDS = 0.689

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

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By: KJM Date:
Sexton Mtn Elementary School
Generator Anchorage
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 SPICE 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:	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 ENGINEER'S 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.

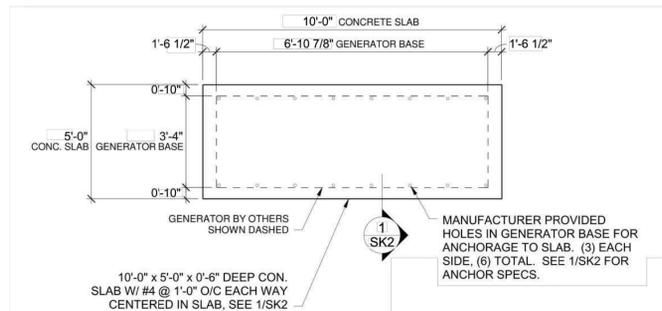
INSPECTION: SPECIAL INSPECTIONS: IN ACCORDANCE WITH SECTION 1704 OF THE IBC AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS. SPECIAL INSPECTIONS ARE TO BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY EMPLOYED BY THE OWNER FOR THE AREAS INDICATED BELOW.

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

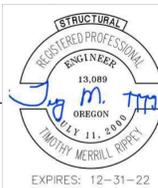
THE CONTRACTOR AND SPECIAL INSPECTOR SHALL NOTIFY THE ENGINEER OF RECORD OF ANY ITEM NOT COMPLYING WITH THE PROJECT SPECIFICATIONS AND/OR APPLICABLE CODES BEFORE PROCEEDING WITH ANY WORK INVOLVING THAT ITEM. THE ENGINEER OF RECORD WILL REVIEW THE ITEM AND DETERMINE ACCEPTABILITY. IF WORK INVOLVING THAT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

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By: KJM Date:
Sexton Mtn Elementary School
Generator Anchorage
Job #: 21460
Sheet: N2 Of

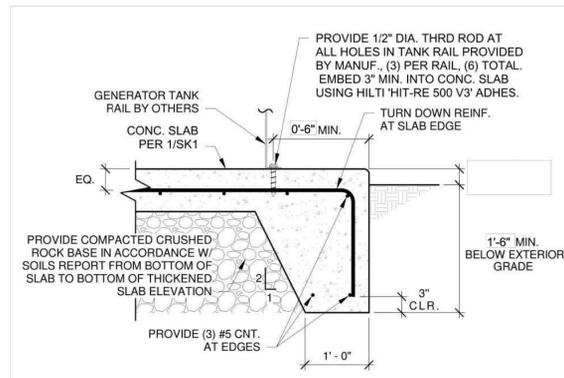


1 SK1 GENERATOR SLAB PLAN

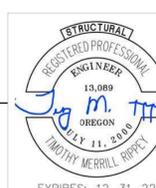


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By: KJ Date:
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Job #: 21460
Sheet: SK1 Of



1 SK2 GENERATOR SLAB DETAIL



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By: KJ Date:
Sexton Mountain Elementary School
Generator Anchorage
Job #: 21460
Sheet: SK2 Of

Generator Pad Anchorage
 $V = 103 \text{ mph}$ (Risk Cat. III) Exp. B
 $S_{DS} = 0.689$
Generator wgt (w/ fuel) = 1720 lbs + 800 lbs = 2520 lbs.
 $C_{D,E1} = 1/2 (1.5) = 15.8"$

Wind: ch 29.4
 $F = q_z G C_f A_f$
 $q_z = 0.00256 (0.85) (1.0) (0.80) (103)^2 = 11.5 \text{ psf}$
 $G = 0.85$
 $C_f (h/D = 0.72) = 1.3$
 $F = (11.5 \text{ psf}) (0.85) (1.3) (59.5' \times 82.8') = 548.2 \text{ lbs. @ } 1/2 (1.5) = 30"$

Seismic:
 $F_p = 0.4 A_s S_{DS} W_p (1 + 2 \frac{h}{h_t}) = \frac{0.4 (0.703) (11.5) (1)}{(2.5/1.5)} = 0.1687 \text{ wp}$
 $F_{pmn} = 0.3 (0.703) (1.5) W_p = 0.316 \text{ wp} \leftarrow \text{controls}$
 $F_p = 0.316 (2520 \text{ lbs}) = 797 \text{ lbs.}$

O.T. Check:
 $(0.9 - 0.2) (0.703) D + E: M_0 = (797 \text{ lbs}) (15.8') = 1049 \text{ lb-ft}$
 $M_R = (0.754) (2520 \text{ lbs}) (30'/2) = 3030 \text{ lb-ft} > M_0$
 $V = 797 \text{ lbs} / 6 \text{ anchors} = 133 \text{ lbs/anchor} \times (52 = 2.0) = 266 \text{ lbs.}$
 $\rightarrow 1/2" \times 3" \text{ embed. capacity} = 1927 \text{ lbs.} > 266 \text{ lbs.}$

$0.9D + W: M_0 = (548.2 \text{ lbs}) (30') = 1371 \text{ lb-ft} < 3020$



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By: KS Date:
Sexton Mountain Elementary School
Generator Slab Calculations
Job #: 21460
Sheet: C1 Of

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	

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



TABLE OF CONTENTS:

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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.

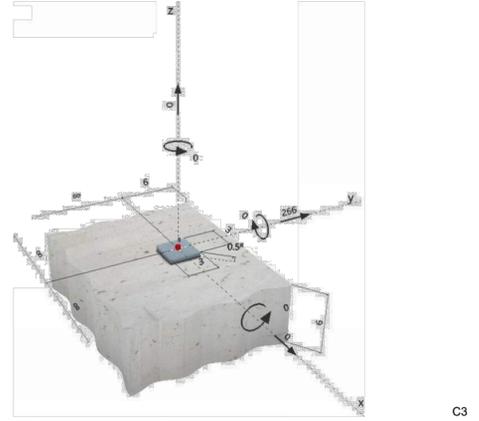
Specifier's comments:

1 Input data

Anchor type and diameter: HIT-RE 500 V3 + HAS-V-36 (ASTM F1554 Gr.36) 1/2"
Effective embedment depth: $f_{u,req} = 2.750$ in. ($f_{u,lim} = 4.750$ 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: $e_{ns} = 0.000$ in. (no stand-off); $t = 0.500$ in.
Anchor plate: $l_x, l_y, t = 3.000$ 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 N_o 4 bar
Seismic loads (cat. C, D, E, or F) Tension load: yes (D.3.3.4.3 (d))
Shear load: yes (D.3.3.4.3 (c))

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

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



Input data and results must be checked for agreement with the existing conditions and for feasibility!
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C3

2 Proof Utilization (Governing Cases)

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

3 Warnings

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

Fastening meets the design criteria!

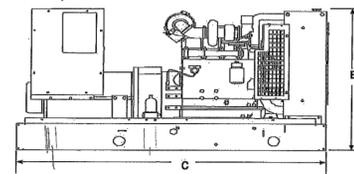
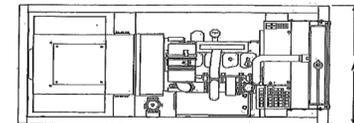
4 Remarks: Your Cooperation Duties

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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 6" HD. FIRE PUCK
* Anchor # 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.



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Generator Set Series Sheet Specifications May Change Without Notice Onan Corporation 8-1013d

C2

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

ATC Hazards by Location



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
PGAM	0.475	Site modified peak ground acceleration

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

C5

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



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

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, 2L1S1, AND 2L1S2.
•	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	
BEAVERTON SCHOOL DISTRICT	
MICHAEL LAMBERTY	EMAIL: MICHAEL_LAMBERTY@BEAVERTON.K12.OR.US
JAMES STEELE	EMAIL: JAMES_STEELE@BEAVERTON.K12.OR.US
MKE & ASSOCIATES, INC.	
HANK BARLEEN	EMAIL: HANKB@MKE-INC.COM
DANIEL DERHEIMER	EMAIL: DANIELD@MKE-INC.COM

LIGHTING DEVICES	
	SURFACE MOUNTED LUMINAIRES
	RECESSED LUMINAIRES
	PENDANT MOUNTED LUMINAIRES
	WALL MOUNTED LUMINAIRES
	STRIP LUMINAIRE
	WALL WASH LUMINAIRES
	TRACK LIGHTING SYSTEM
	DIRECTIONAL LUMINAIRE [IN GRADE]
	FLOOD LUMINAIRE
	STEP LUMINAIRE
	POLE ARM MOUNT LUMINAIRE
	POLE TOP MOUNT LUMINAIRE
	LIGHTED BOLLARD
	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
	PHOTOCCELL
	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.	

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

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°]
	AUDIO/VISUAL 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

REFERENCE SYMBOLS & WIRING	
	BRANCH CIRCUIT WITH GROUND CONDUCTOR
	NEUTRAL CONDUCTOR
	PHASE CONDUCTOR
	HOMERUN ARROW
	PLAN NOTE MARK
	SHEET REFERENCE MARK
	MECHANICAL EQUIPMENT NOTE MARK
	FEEDER MARK
	STANDARD MOUNTING HEIGHT TO CENTER UNLESS OTHERWISE NOTED ON DRAWINGS

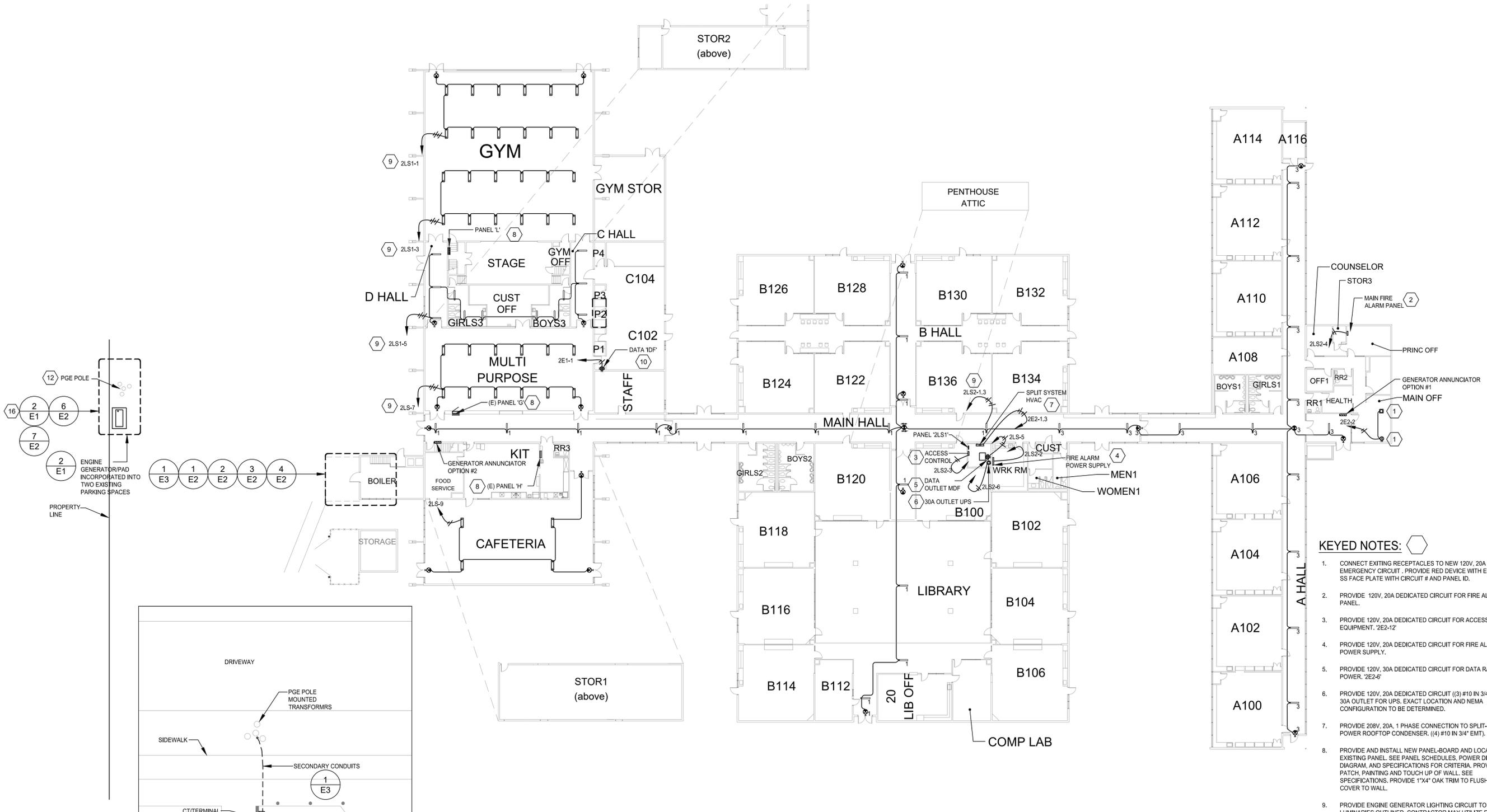
LINETYPE LEGEND	
	FENCING
	UNDER GROUND
	ABOVE GROUND, IN WALL, CEILING, ETC
	NEW EQUIPMENT (TYPICAL)
	EXISTING EQUIPMENT (TYPICAL)
	DEMOLISHED EQUIPMENT (TYPICAL)

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 CIRCULAR 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 MFG'S ASSOCIATION.
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	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

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

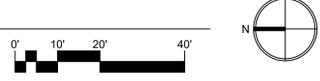
ISSUE DATE:	03-23-2022
SET TYPE:	Final Review
REVISIONS:	
DRAWN BY:	DD
DESIGNED BY:	HB
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MKE JOB #:	BV-5749
ELECTRICAL - FLOOR PLAN	

E1

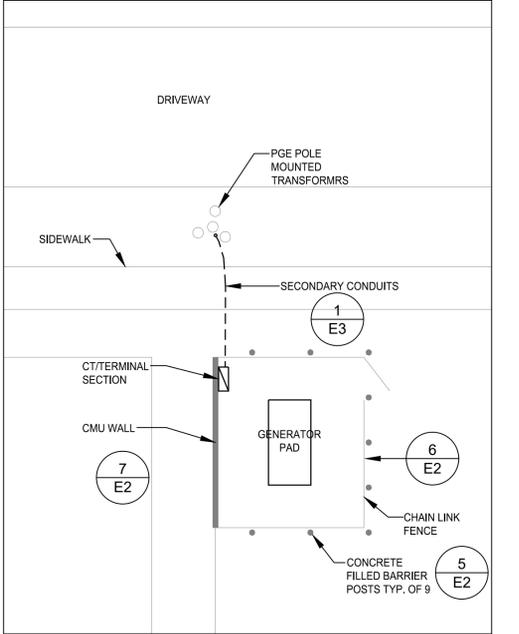


- KEYED NOTES:**
- CONNECT EXISTING RECEPTACLES TO NEW 120V, 20A EMERGENCY CIRCUIT. PROVIDE RED DEVICE WITH ENGRAVED SS FACE PLATE WITH CIRCUIT # AND PANEL ID.
 - PROVIDE 120V, 20A DEDICATED CIRCUIT FOR FIRE ALARM PANEL.
 - PROVIDE 120V, 20A DEDICATED CIRCUIT FOR ACCESS CONTROL EQUIPMENT. 2E2-12
 - PROVIDE 120V, 20A DEDICATED CIRCUIT FOR FIRE ALARM POWER SUPPLY.
 - PROVIDE 120V, 30A DEDICATED CIRCUIT FOR DATA RACK POWER. 2E2-6
 - PROVIDE 120V, 20A DEDICATED CIRCUIT ((3) #10 IN 3/4" EMT) TO 30A OUTLET FOR UPS. EXACT LOCATION AND NEMA CONFIGURATION TO BE DETERMINED.
 - PROVIDE 208V, 20A, 1 PHASE CONNECTION TO SPLIT-SYSTEM. POWER ROOFTOP CONDENSER. ((4) #10 IN 3/4" EMT).
 - PROVIDE AND INSTALL NEW PANEL-BOARD AND LOCATION OF EXISTING PANEL. SEE PANEL SCHEDULES, POWER DISTRIBUTION DIAGRAM, AND SPECIFICATIONS FOR CRITERIA. PROVIDE WALL PATCH, PAINTING AND TOUCH UP OF WALL. SEE SPECIFICATIONS. PROVIDE 1"X4" OAK TRIM TO FLUSH PANEL COVER TO WALL.
 - PROVIDE ENGINE GENERATOR LIGHTING CIRCUIT TO EACH LUMINARIES OUTLINED. CONTRACTOR MAY UTILIZE EXISTING CONDUCTOR IF CONDUCTORS ARE IN SEPARATE CONDUIT. MAINTAIN LIGHTING CONTROL.
 - PROVIDE 120V, 20A DEDICATED CIRCUIT FOR SERVER POWER RACK IN IDF.
 - PROVIDE AND INSTALL 3-5" CONDUITS FOR PGE SECONDARY CONDUCTORS. PROVIDE TRENCHING(?) ASPHALT AND COMPACTED BACKFILL FROM POWER POLE TO TERMINAL SECTION. APPROXIMATELY 120' FIELD VERIFY.
 - PGE POWER POLE IS EXISTING. ELL UP AT BASE OF POLE AS DIRECTED BY PGE.
 - PROVIDE AND INSTALL 6" DEEP X 12" DEEP X 20" WIDE CONCRETE SLAB WITH #4 REBAR, 1'-0" O.C. EACH WAY, CENTERED IN SLAB FOR GARBAGE DUMPSTER. LEVEL GROUND PRIOR TO SLAB INSTALLATION. CONTRACTOR TO PROVIDE SHOP DRAWING SHOWING SLAB WARPING AND SLOPES FOR OWNER REVIEW.
 - PROVIDE AND INSTALL 8'-0" H. CHAIN LINK FENCE WITH GREEN SLATS. PROVIDE POST IMBEDS IN NEW SLAB.
 - SEE ONE-LINE RISER DIAGRAM FOR GENERATOR FEEDERS, BLOCK HTR/CHARGER POWER, AND MONITORING CABLES/CONDUIT.
 - NEW GENSET WILL BE INSTALLED IN TWO PARKING SPOTS. DEMOLISH/REMOVE ALL ASPHALT FOR NEW CONCRETE PAD. REPAIR ASPHALT BACK TO EDGE OF NEW GENERATOR PAD.

1 ELECTRICAL - FLOOR PLAN
 1"=20'-0"

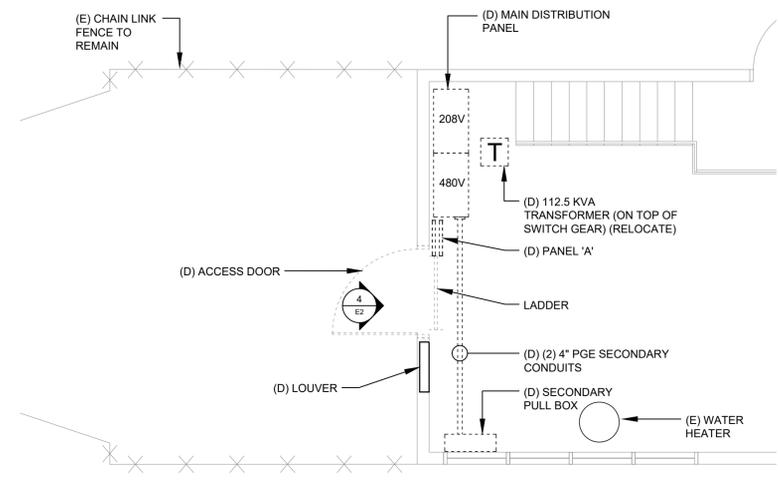


ALTERNATE #1
 PROVIDE DEDUCTIVE ALTERNATE TO EXERCISE OPTION #2 FOR PLACEMENT OF EMERGENCY GENERATOR ANNUNCIATOR. DATA/MONITORING CABLE WILL BE INSTALLED IN 1" EMT.

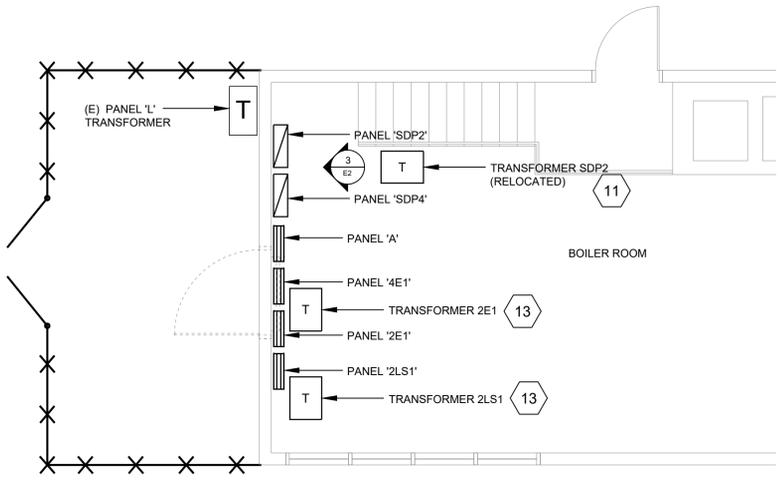


2 ENLARGED GENERATOR PLAN
 1/8" = 1'-0"

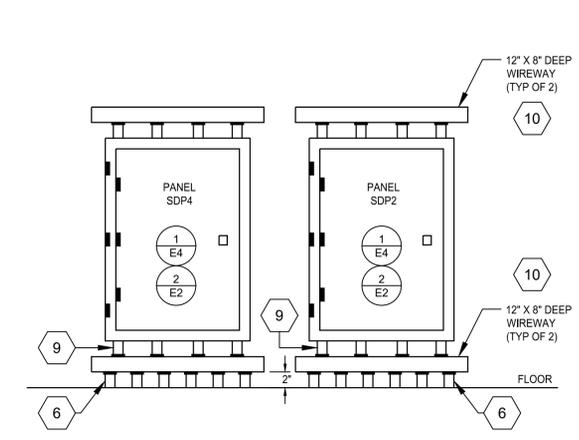
GENERAL NOTE:
 CONTRACTOR TO REMOVE CURB AND ASPHALT TO PROVIDE SPACE FOR NEW GENERATOR, FENCE, AND CMU WALL. REPAIR CURB AND ASPHALT TO ORIGINAL CONDITION.



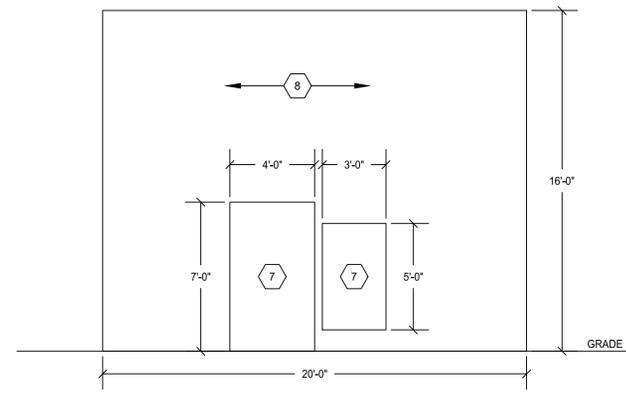
1 BOILER RM. - ELECTRICAL DEMO
 SCALE: 1/4" = 1'-0"



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

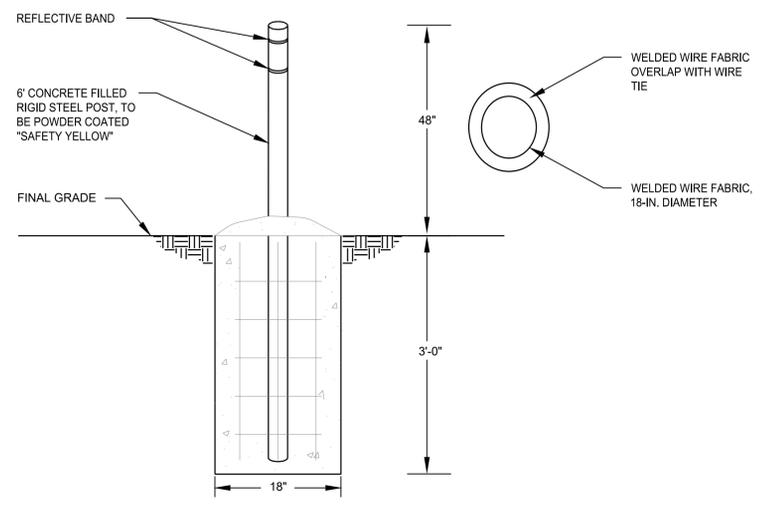


3 DISTRIBUTION PANEL ELEVATION
 N.T.S.

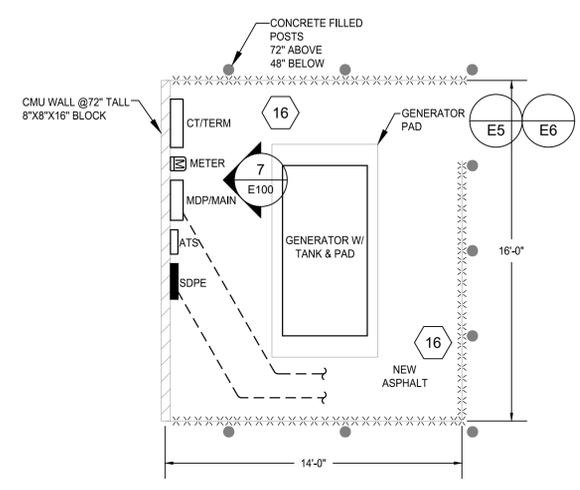


4 WALL REPAIR DETAIL
 SCALE: 1/4" = 1'-0"

ALTERNATE #2
 PROVIDE DEDUCTIVE ALTERNATE TO REMOVE FIVE (5) TRAFFIC BOLLARDS FROM CONTRACT.



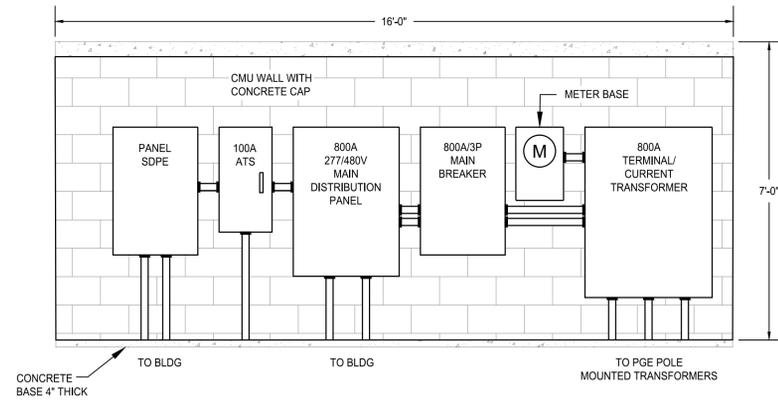
5 BARRIER POSTS
 N.T.S.



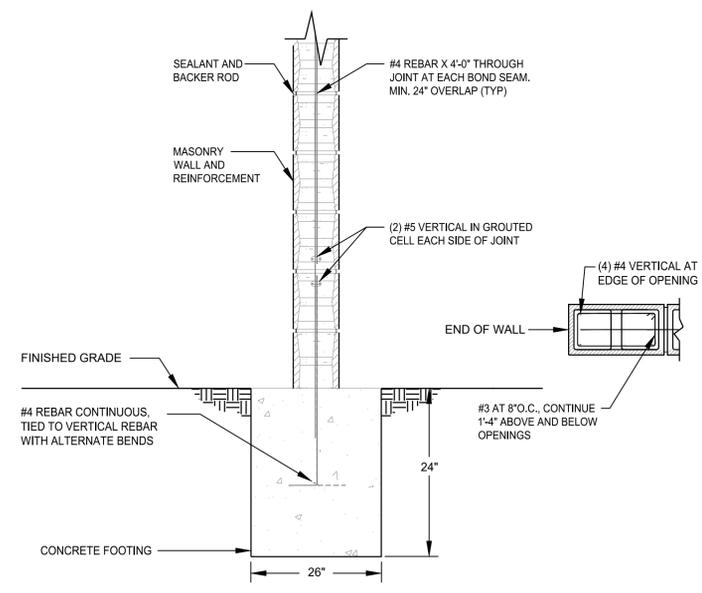
6 GENERATOR PAD DETAIL
 1/4"=1'-0"

KEYED NOTES:

1. PROVIDE AND INSTALL NEMA 3R TERMINAL/CURRENT TRANSFORMER SECTION PER PGE REQUIREMENTS.
2. PROVIDE AND INSTALL METER BASE PER PGE REQUIREMENTS.
3. PROVIDE AND INSTALL NEMA 3R MAIN DISTRIBUTION PANEL/SECTION ON EXTERIOR OF BUILDING.
4. PROVIDE AND INSTALL (3) 5\"/>



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



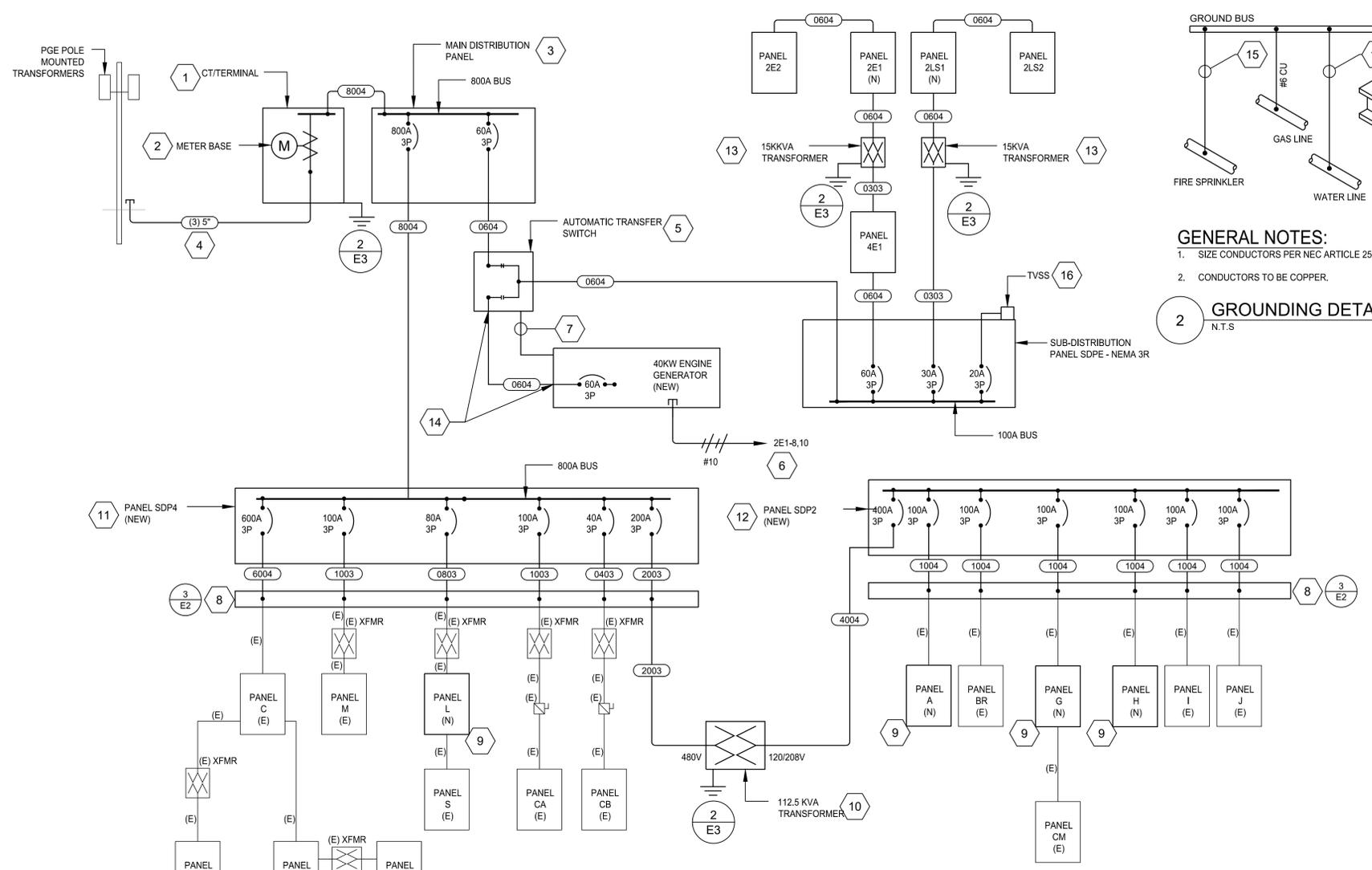
8 CMU WALL & JAMB DETAIL
 N.T.S.



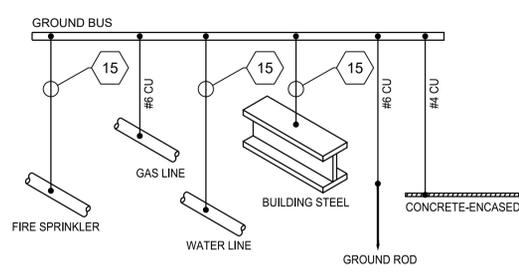
DISTRICT-WIDE FIRE ALARM RESILIENCY-8331 PROJECT
FIR GROVE ELEMENTARY
 BEAVERTON S.D.
 6300 SW WILSON AVE.
 BEAVERTON, OR 97008

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 SL
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 ELECTRICAL -
 POWER DISTRIBUTION
 DIAGRAM

E3



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



2 GROUNDING DETAIL
 N.T.S

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 = #10 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.

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

TAG	CONDUIT	CONDUCTOR	EQUIPMENT GROUND
0304	1/2"	4 #10	#10
0404	3/4"	4 #8	#10
0504	1"	4 #6	#10
0604	1"	4 #6	#10
0704	1 1/4"	4 #4	#8
0804	1 1/4"	4 #3	#6
0904	1 1/4"	4 #3	#6
1004	1 1/2"	4 #2	#6
1254	1 1/2"	4 #1	#6
1504	2"	4 #1/0	#6
1754	2"	4 #2/0	#6
2004	2"	4 #3/0	#6
2254	2 1/2"	4 #4/0	#4
2504	3"	4 #250KCM	#4
3004	3"	4 #350KCM	#4
4004	4"	4 #600KCM	#3
6004	(2) 3" EACH W/	4 #350KCM	#1
8004	(2) 4" EACH W/	4 #600KCM	#1/0
10004	(4) 3" EACH W/	4 #250KCM	#2/0

ALUMINUM 4-WIRE FEEDER CONDUCTOR SCHEDULE
 (ALUMINUM PHASE & NEUTRAL CONDUCTORS)
 (ALUMINUM GROUND CONDUCTOR)

TAG	CONDUIT	CONDUCTOR	EQUIPMENT GROUND
0304	1/2"	4 #10	#10
0404	3/4"	4 #8	#10
0504	1"	4 #6	#10
0604	1"	4 #6	#10
0704	1 1/4"	4 #4	#8
0804	1 1/4"	4 #3	#6
0904	1 1/4"	4 #3	#6
1004	1 1/2"	4 #2	#6
1254	1 1/2"	4 #1	#6
1504	2"	4 #1/0	#6
1754	2"	4 #2/0	#6
2004	2"	4 #3/0	#6
2254	2 1/2"	4 #4/0	#4
2504	3"	4 #250KCM	#4
3004	3"	4 #350KCM	#4
4004	4"	4 #600KCM	#3
6004	(2) 3" EACH W/	4 #350KCM	#1
8004	(2) 4" EACH W/	4 #600KCM	#1/0
10004	(4) 3" EACH W/	4 #250KCM	#2/0

COPPER 2&3-WIRE FEEDER CONDUCTOR SCHEDULE
 (THIN/THWN COPPER PHASE (& NEUTRAL) CONDUCTOR ONLY)
 (THIN/THWN COPPER GROUND CONDUCTOR)

TAG	CONDUIT	CONDUCTOR	EQUIPMENT GROUND
0202	1/2"	2 #12	#12
0303	1/2"	3 #10	#10
0403	3/4"	3 #8	#10
0503	3/4"	3 #6	#10
0603	3/4"	3 #6	#10
0703	1"	3 #4	#8
0803	1 1/4"	3 #3	#6
0903	1 1/4"	3 #3	#6
1003	1 1/4"	3 #2	#6
1253	1 1/2"	3 #1	#6
1503	1 1/2"	3 #1/0	#6
1753	2"	3 #2/0	#6
2003	2"	3 #3/0	#6
2253	2"	3 #4/0	#4
2503	2 1/2"	3 #250KCM	#4
3003	3"	3 #350KCM	#4
4003	3"	3 #600KCM	#3

ALUMINUM 2&3-WIRE FEEDER CONDUCTOR SCHEDULE
 (ALUMINUM PHASE (& NEUTRAL) CONDUCTOR ONLY)
 (ALUMINUM GROUND CONDUCTOR)

TAG	CONDUIT	CONDUCTOR	EQUIPMENT GROUND
0202	1/2"	2 #12	#12
0303	1/2"	3 #10	#10
0403	3/4"	3 #8	#10
0503	3/4"	3 #6	#10
0603	3/4"	3 #6	#10
0703	1"	3 #4	#8
0803	1 1/4"	3 #3	#6
0903	1 1/4"	3 #3	#6
1003	1 1/4"	3 #2	#6
1253	1 1/2"	3 #1	#6
1503	1 1/2"	3 #1/0	#6
1753	2"	3 #2/0	#6
2003	2"	3 #3/0	#6
2253	2"	3 #4/0	#4
2503	2 1/2"	3 #250KCM	#4
3003	3"	3 #350KCM	#4
4003	3"	3 #600KCM	#3

PANEL SCHEDULE											
MKE & ASSOCIATES, INC.											
MOUNTING: SURFACE											
BUS/MAIN: 100A MLO											
FED BY: SDP2											
LOC: BOILER ROOM											
VOLTS			PHASE			WIRE					
120/208			3			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				
6	COMPRESSOR	1100	20/3	11	*	12	20/1				
6	*	1100	*	13	*	14	20/1				
6	*	1100	*	15	*	16	20/1				
6	OIL BURNER	1200	20/3	17	*	18	20/1				
6	*	1200	*	19	*	20	20/1				
6	*	1200	*	21	*	22	20/1				
6	VACUUM PUMP	1200	20/3	23	*	24	20/1				
6	*	1200	*	25	*	26	20/1				
6	*	1200	*	27	*	28	20/1				
6	SPARE			29	*	30	20/1				
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											
MKE & ASSOCIATES, INC.											
MOUNTING: SURFACE											
BUS/MAIN: 100A MLO											
FED BY: 4E1											
LOC: BOILER ROOM											
VOLTS			PHASE			WIRE					
120/208			3			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	
	SPARE		20/1	11	*	12					
	SPARE		20/1	13	*	14					
	SPARE		20/1	15	*	16					
	SPARE		20/1	17	*	18					
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		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											
MKE & ASSOCIATES, INC.											
MOUNTING: SURFACE											
BUS/MAIN:											
FED BY: 2E1											
LOC: MDF ROOM											
VOLTS			PHASE			WIRE					
120/208			3			4					
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			SPARE		
	SPACE			11	*	12			SPARE		
	SPACE			13	*	14			SPARE		
	SPACE			15	*	16			SPARE		
	SPACE			17	*	18			SPARE		
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				



EXPIRES 12-31-22

PANEL SCHEDULE										
PANEL:		2LS1		MOUNTING:		SURFACE		BUS/MAIN:		
FED BY:		SDPE		VOLTS			PHASE		WIRE	
LOC:		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			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					
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		MOUNTING:		SURFACE		BUS/MAIN:		
FED BY:		2LS1		VOLTS			PHASE		WIRE	
LOC:		BOILER ROOM		120/208		3		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					
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		MOUNTING:		FLUSH (1)		BUS/MAIN:		
FED BY:		SDP2		VOLTS			PHASE		WIRE	
LOC:		GYM		120/208		3		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
	SPACE		20/1	27	*	28	20/1		SPARE	
	SPACE		20/1	29	*	30	20/1	720	DISPOSAL	6
	SPACE		20/1	31	*	32			SPACE	
	SPACE		20/1	33	*	34			SPACE	
	SPACE		20/1	35	*	36			SPACE	
	SPACE		20/1	37	*	38			SPACE	
	SPACE		20/1	39	*	40			SPACE	
	SPACE		20/1	41	*	42			SPACE	
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)	FACTOR	CODE LOAD			
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					
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		MOUNTING:		FLUSH (1)		BUS/MAIN:		
FED BY:		SDP2		VOLTS			PHASE		WIRE	
LOC:		KITCHEN		120/208		3		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	
	SPACE		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		20/1	19	*	20			SPACE	
	SPACE		20/1	21	*	22			SPACE	
	SPACE		20/1	23	*	24			SPACE	
	SPACE		20/1	25	*	26			SPACE	
	SPACE		20/1	27	*	28			SPACE	
	SPACE		20/1	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					
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				

PANEL SCHEDULE										
PANEL:		L		MOUNTING:		FLUSH (1)		BUS/MAIN:		
FED BY:		SDP4 VIA TRANSFORMER		VOLTS			PHASE		WIRE	
LOC:		GYM CORRIDOR		120/208		3		4		PROVIDE FEED THRU LUGS TO PANEL 'S'
C	DESCRIPTION	VA	A/P	No.	A B C	No.	A/P	VA	DESCRIPTION	C
3	WATER HTR	1500	20/1	1	*	2	20/1	920	L-G SHOWER	1
1	L-CORRIDOR	1100	20/1	3	*	4	20/1	460	L-BOYS	1
1	L-BOYS/IEF	920	20/1	5	*	6	20/1	460	L-GIRLS	1
1	L-GIRLS	920	20/1	7	*	8	20/1		SPARE	
2	R-AUDITORIUM	1180	20/1	9	*	10	20/1	900	L-FRONT FLOORDS	1
2	R-AUDITORIUM	1180	20/1	11	*	12	20/1	720	R-LOFT	2
1	L-LOFT/STORAGE	760	20/1	13	*	14	20/1	760	L-LOFT	1
1	L-PARKING	900	20/1	15	*	16	20/1	200	IRRIGATION CONTROL	5
	SPACE		20/1	17	*	18	20/1		SPARE	
	SPACE		20/1	19	*	20	20/1		SPARE	
	SPACE		20/1	21	*	22	20/1		SPARE	
	SPACE		20/1	23	*	24	20/1		SPARE	
	SPACE		20/1	25	*	26			SPACE	
	SPACE		20/1	27	*	28			SPACE	
	SPACE		20/1	29	*	30			SPACE	
LOAD CODE (VA)		PH A	PH B	PH C	TOTAL (VA)	FACTOR	CODE LOAD			
1. LIGHTS:		3,360	3,360	1,380	8,100	1.25	10,125			
2. RECEPTACLE:		0	1,180	1,900	3,080	*	3,			

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



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SKETCHES	SK1 - SK2
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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 HEREINAFTER 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)
SDS = 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 = 4000 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

FIR GROVE ELEMENTARY SCHOOL
GENERATOR ANCHORAGE
Job #: 21460
Sheet: N1 OF

By: KJM Date: _____
Chk By: _____ Date: _____

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 ENGINEER'S 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.

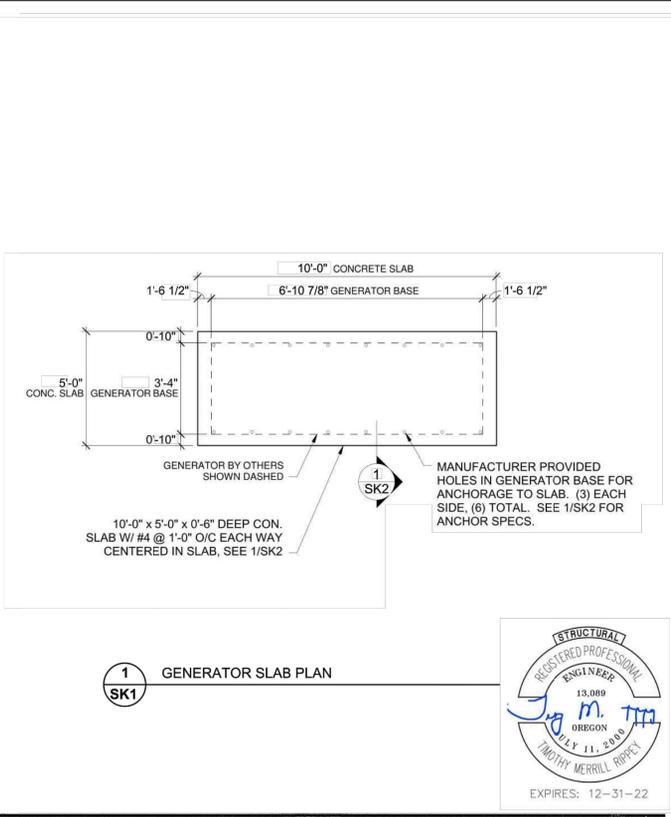
- ADHESIVE ANCHOR (PERIODIC)
- PLACEMENT OF CONCRETE AND CONCRETE REINFORCING (PERIODIC)

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.

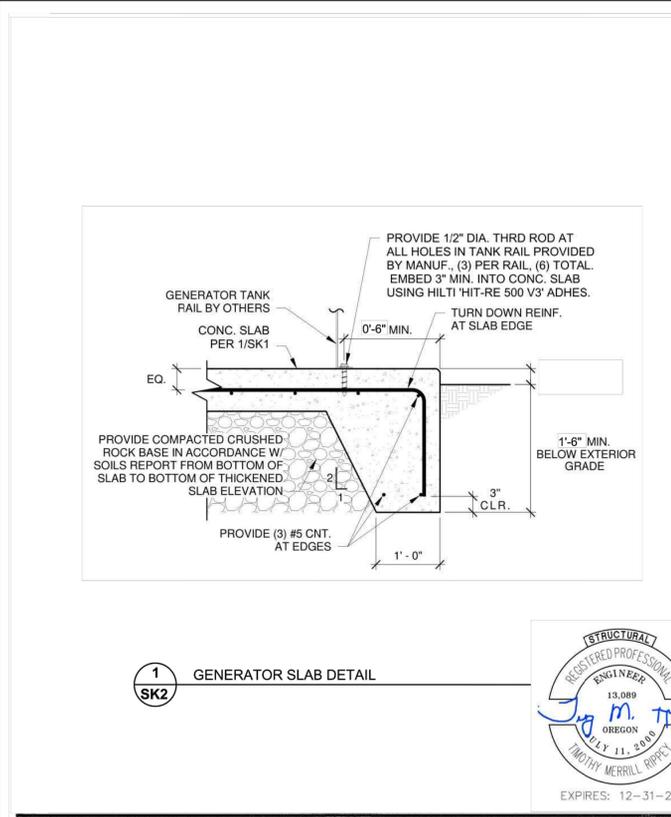
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Tigard, Oregon 97223
Phone: (503) 443-3900

FIR GROVE ELEMENTARY SCHOOL
GENERATOR ANCHORAGE
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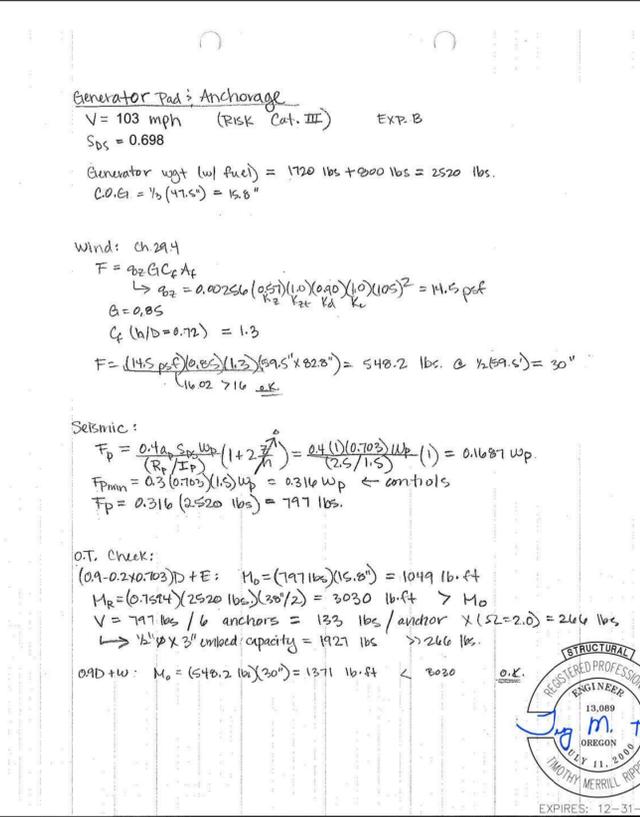
By: KJM Date: _____
Chk By: _____ Date: _____



1 SK1 GENERATOR SLAB PLAN



1 SK2 GENERATOR SLAB DETAIL



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	

HILTI
Profis Anchor 2.7.8

www.hilti.us
Company: | Page: 1
Specifier: | Project: |
Address: | Sub-Project I Pos. No.: |
Phone / Fax: | Date: 3/20/2020
E-Mail: |

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: $f_{u,eff} = 2.750$ in. ($f_{u,base} = 4.750$ 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: $e_p = 0.000$ in. (no stand-off); $t = 0.500$ in.

Anchor plate: $l_x \times l_y \times t = 3.000$ 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 feasibility!
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HILTI
Profis Anchor 2.7.8

www.hilti.us
Company: | Page: 2
Specifier: | Project: |
Address: | Sub-Project I Pos. No.: |
Phone / Fax: | Date: 3/20/2020
E-Mail: |

2 Proof I Utilization (Governing Cases)

Loading	Proof	Design values [lb]		Utilization		Status
		Load	Capacity	$f_u / f_{u,R}$ [%]	$f_v / f_{v,R}$ [%]	
Tension	-	-	-	-	-	-
Shear	Steel Strength	266	1,927	- / 14	-	OK

3 Warnings

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

Fastening meets the design criteria!

4 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
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C4

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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 PUEA
* Finish w/ 60" x 120" PAD.

Model	Dim "A"	Dim "B"	Dim "C"	Weight Wet
DGGB	40 in 1016 mm	47.5 in 1207 mm	82.8 in 2103 mm	1689 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

See your distributor for more information.

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Minneapolis, MN 55432
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C2

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

11/17/21, 4:53 PM ATC Hazards by Location

ATC Hazards by Location

Search Information

Address: 6300 SW Wilson Ave, Beaverton, OR 97008, USA

Coordinates: 45.47372240000001, -122.8182661

Elevation: 256 ft

Timestamp: 2021-11-18T00:53:22.583Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: III

Site Class: D-default

Basic Parameters

Name	Value	Description
S_S	0.872	MCE_R ground motion (period=0.2s)
S_1	0.404	MCE_R ground motion (period=1.0s)
S_{MS}	1.047	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.698	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	0.885	Coefficient of risk (0.2s)
CR_1	0.867	Coefficient of risk (1.0s)
PGA	0.398	MCE_G peak ground acceleration
F_{PGA}	1.202	Site amplification factor at PGA
PGA_M	0.479	Site modified peak ground acceleration

C5

https://hazards.atcouncil.org/#/seismic?lat=45.47372240000001&long=-122.8182661&address=6300%20SW%20Wilson%20Ave%20Beaverton%20OR%2097008%20USA 1/2

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For Information Only
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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

E6