



Project No: KCL #21088

Date: 2021.10.31

PERMIT SET

Revision	Date

Drawing Name:  
**ELECTRICAL GENERAL  
NOTES AND SYMBOLS**

Drawing #:

## E000

### INSTALLATION NOTES - ELECTRICAL

- CONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS PRIOR TO BID.
- INCREASE CONDUCTOR SIZES ON 120V-1 PHASE CIRCUITS EXCEEDING 100 FEET TO CENTER OF LOAD TO ACCOUNT FOR VOLTAGE DROP.
- RACEWAYS AND BOXES ARE SHOWN DIAGRAMMATICALLY ONLY AND INDICATE THE GENERAL AND APPROXIMATE LOCATION. THE LAYOUT DOES NOT NECESSARILY SHOW THE TOTAL NUMBER OF RACEWAYS OR BOXES FOR THE CIRCUITS REQUIRED. NOR ARE THE LOCATIONS OF INDICATED RUNS INTENDED TO SHOW THE ACTUAL ROUTING OF THE RACEWAYS.
- LIGHT FIXTURES, SWITCHES, DEVICES, ETC. ARE SHOWN IN PREFERRED LOCATION. E.C. RESPONSIBLE FOR MODIFYING CONDUIT, HANGERS, CIRCUITING, ETC. TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
- PROVIDE A DEDICATED GREEN INSULATED GROUND CONDUCTOR TO ALL DEVICES. THE CONDUIT SYSTEM SHALL NOT BE USED AS THE ONLY EQUIPMENT GROUNDING METHOD. DO NOT INSTALL DEVICES BACK TO BACK ON OPPOSITE SIDES OF WALL. MAINTAIN MINIMUM OF 8" DISTANCE BETWEEN WHEREVER APPLICABLE.
- BALANCE THE LOAD ON PANELS AS EVENLY AS POSSIBLE DURING INSTALLATION. CIRCUIT NUMBERING SHOWN ON PLANS MAY BE ADJUSTED.
- PROVIDE FINAL TYPED PERMANENT PANEL DIRECTORY AT PROJECT COMPLETION. CONTRATOR IS RESPONSIBLE FOR OPENINGS IN WALLS CREATED BY THEIR WORK. PENETRATIONS SHALL BE SEALED IN ACCORDANCE WITH THE RATINGS OF THE AFFECTED WALL. REFER TO ARCHITECTURAL CODE PLAN FOR RATED WALLS.

### INSTALLATION NOTES - LIGHTING

- UNLESS NOTED OTHERWISE, CONNECT ALL EMERGENCY BATTERY FIXTURES WITH AN UN-SWITCHED LEG OF THE LIGHTING CIRCUIT THAT SERVES THE SPACE THE EMERGENCY FIXTURE IS LOCATED WITHIN. NORMAL SWITCHING SCHEME SHOULD BE MAINTAINED UNDER NORMAL OPERATING OF EMERGENCY FIXTURES DESIGNATED. WIRE PER EMERGENCY FIXTURE OR TRANSFER DEVICE INSTRUCTIONS.
- VERIFY CEILING TYPE (IE. GRID, GYP) WITH ARCHITECTURAL REFLECTED CEILING PLANS PRIOR TO RELEASE OF LIGHTING FIXTURE EQUIPMENT PACKAGE. ADJUST FIXTURE TYPE, CONSTRUCTION, FLANGE, OR OTHER COORDINATION DETAILS AS REQUIRED FOR CEILING TYPE.
- OCCUPANCY SENSORS SHOWN ON PLANS ARE SUGGESTED LOCATIONS ONLY AND MUST BE VERIFIED WITH SPECIFIC MANUFACTURER GUIDELINES AND INSTALLATION RECOMMENDATIONS AS NOTED IN LIGHTING CONTROL SHOP DRAWINGS. ADJUST LOCATIONS AS REQUIRED TO MEET MANUFACTURER GUIDELINES.
- PROVIDE LIGHTING CONTROL SYSTEMS AS A COMPLETE OPERATING SYSTEM AND INCLUDE MATERIAL AND INSTALLATION FOR ALL POWER PACKS, ACCESSORIES, CONTROLLERS, AND WIRING REQUIRED FOR THE SYSTEM.

### CODE NOTES - ELECTRICAL

- THE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND NATIONAL CODES.
- THE CURRENT ADOPTED EDITION OF THE ELECTRICAL CODE SHALL BE THE STANDARD FOR THE ELECTRICAL INSTALLATION, NEC 2017. VERIFY WITH LOCAL OFFICIALS WHEN PERMITS ARE OBTAINED. NOTIFY DESIGN TEAM OF ANY DISCREPANCIES BETWEEN THE PROJECT MANUAL OR DRAWINGS AND THE GOVERNING CODE.
- INSTALLATION SHALL FOLLOW ALL REQUIREMENTS OF THE ADAAG - AMERICANS WITH DISABILITIES ACT.

### BUILDING EQUIPMENT COORDINATION NOTES - ELECTRICAL

- REFER TO HVAC, PLUMBING, AND FIRE PROTECTION EQUIPMENT CONNECTION SCHEDULE FOR COORDINATION DETAILS BETWEEN MECHANICAL AND ELECTRICAL SYSTEMS.
- THE ELECTRICAL SYSTEMS SHALL BE PROVIDED AND INSTALLED UNDER THIS CONTRACT TO MEET THE REQUIREMENTS OF THE SPECIFIED MECHANICAL SYSTEMS. THE ENTIRE PROJECT DOCUMENTS AND MANUALS SHALL BE REFERENCED AS A COMPLETE PROJECT. ELECTRICAL CONTRACTOR SHALL REFER TO ALL SCHEDULES, DETAILS, AND NOTES AND PROVIDE ELECTRICAL EQUIPMENT, WIRING, AND INSTALLATION REQUIRED UNDER THIS PROJECT.
- PROVIDE ELECTRICAL CONNECTIONS AND ACCESSORIES INCLUDING STARTERS, DISCONNECTS, CONTROL, WIRING, ETC. AS REQUIRED FOR THE BUILDING MECHANICAL EQUIPMENT. INFORMATION HEREIN AND ON THE DRAWINGS IS FOR GENERAL DESCRIPTION AND ESTIMATING PURPOSES ONLY. VERIFY VOLTAGE, AMPERAGE, PHASE, INRUSH, ETC. FOR EACH ITEM OF EQUIPMENT BEFORE PROCEEDING WITH WIRING FOR IT, WIRING DETAILS SHALL BE IN ACCORDANCE WITH INSTRUCTIONS TO BE FURNISHED BY THE SUPPLIERS OF THE EQUIPMENT AS NECESSARY TO PROVIDE PROPER OPERATION OF THE EQUIPMENT.
- REVIEW MECHANICAL EQUIPMENT SHOP DRAWINGS FOR COMPLIANCE AND COORDINATION WITH ELECTRICAL CONNECTIONS. NOTIFY ENGINEER IF CHANGES TO ELECTRICAL CONNECTIONS, WIRING, AND BREAKER REQUIREMENTS ARE NECESSARY TO ACCOMMODATE EQUIPMENT BEING SUPPLIED.
- NO ELECTRICAL DISTRIBUTION EQUIPMENT SHALL BE RELEASED UNTIL ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL INFRASTRUCTURE HAS BEEN SUBMITTED AND APPROVED. ADJUSTMENTS TO BREAKER SIZES AND SIMILAR CHANGES MUST BE MADE TO ELECTRICAL EQUIPMENT PRIOR TO RELEASE, FABRICATION, AND SHIPPING OF ELECTRICAL EQUIPMENT. COORDINATE SCHEDULING OF SHOP DRAWINGS WITH ALL TRADES SUCH AS NOT TO CAUSE ANY DELAYS TO PROJECT.
- PROVIDE DISCONNECTS RATED FOR EQUIPMENT AS REQUIRED AND AS INDICATED WITHIN EQUIPMENT CONNECTION SCHEDULE. MOUNTING OF DISCONNECTS SHOULD BE COORDINATED TO ALLOW FOR REMOVAL OF MECHANICAL EQUIPMENT WITHOUT NEEDING TO REMOVE THE DISCONNECT AND MINIMIZE WIRING WORK REQUIRED.
- ALL MECHANICAL EQUIPMENT DISCONNECTS SHALL BE HEAVY DUTY TYPE AND RATED FOR THE ENVIRONMENT THEY SERVE. EXTERIOR DISCONNECTS SHALL BE RATED A MINIMUM OF 3R OR AS INDICATED.
- VERIFY LOCATION OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR. ADJUST ELECTRICAL INSTALLATION AS REQUIRED.

### DEMOLITION AND RENOVATION NOTES - ELECTRICAL

- THE ELECTRICAL DEMOLITION DRAWING SHOWING EXISTING CONDITIONS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND ORIGINAL DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST WHICH ARE NOT SHOWN, AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER SIMILAR TO THOSE ITEMS WHICH ARE SHOWN.
- CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH EXISTING ELECTRICAL SYSTEM WHICH WILL BE AFFECTED BY THE DEMOLITION WORK. CONTRACTOR SHALL OBTAIN PERMISSION FROM OWNER'S REPRESENTATIVE TO SHUT OFF SERVICES OR SYSTEMS WHICH MAY AFFECT OTHER AREAS BEYOND THE LIMITS OF THE DEMOLITION AREA. SUCH PERMISSION WILL BE GRANTED ONLY AFTER OWNER'S REPRESENTATIVE IS INFORMED OF THE REASON FOR AND DURATION OF THE SHUTDOWN AND IS SATISFIED THAT THE SHUTDOWN CAN BE MADE WITH AS LITTLE INCONVENIENCE TO OTHER AREAS AS POSSIBLE.
- PROVIDE PLANT, LABOR, AND MATERIALS TO REMOVE ELECTRICAL FACILITIES AND CLEAR THE AREA TO RECEIVE THE NEW WORK TO BE PROVIDED UNDER THIS CONTRACT.
- CONDUITS, BOXES, ETC., SHALL BE REMOVED AS REQUIRED BY WALL AND CEILING DEMOLITION AND ADJACENT REMOVALS. REMOVE EXISTING WIRING FOR REMOVED DEVICES.
- ALL WIRING FOR REMODELED AREAS SHALL BE NEW UNLESS SPECIFICALLY NOTED OTHERWISE. ALL CONDUIT SHALL BE NEW UNLESS SPECIFICALLY NOTED OTHERWISE OR WHERE FIELD VERIFIED FOR SUITABLE USE WHEN LOCATED WITHIN EXISTING BLOCK WALLS OR BELOW SLABS.
- BRANCH CIRCUITS TO BE DISCONNECTED SHALL BE IDENTIFIED AS TO LOCATION OR ITEM SERVED BEFORE DISCONNECTING.
- CIRCUITS SERVING AREAS BEYOND THE DEMOLITION AREA SHALL BE MAINTAINED. EXTEND AND/OR RECONNECT NEW WIRING TO EXISTING AS REQUIRED TO MAINTAIN EXISTING CIRCUITS.
- EXISTING BUILDING SYSTEMS THAT ARE NOT AFFECTED BY THE SCOPE OF THE PROJECT ARE TO BE KEPT OPERATIONAL IN OCCUPIED AREAS OF THE BUILDING THROUGH THE DURATION OF THE PROJECT. COORDINATE REQUIRED OUTAGES WITH THE OWNER IN ADVANCE OF SHUT DOWN.
- INSTALL STAINLESS STEEL COVER PLATE OVER HOLE AT REMOVED DEVICE LOCATIONS, INCLUDING BUT NOT LIMITED TO, RECEPTACLES, SWITCHES, JUNCTION BOXES, ETC. PROVIDE CUTTING AND PATCHING OF EXISTING CONSTRUCTION AS REQUIRED FOR THE PROPER COMPLETION OF THE DEMOLITION WORK AND THE INSTALLATION OF THE NEW WORK.
- EQUIPMENT AND DEVICES SHOWN AS EXISTING OR AS REMOVE/RELOCATE SHALL BE PROTECTED AND HANDLED WITH APPROPRIATE CARE SO AS TO MAINTAIN FULL FUNCTIONAL AND AESTHETIC INTEGRITY OF THE DEVICE.
- REMOVED EQUIPMENT AND SYSTEMS SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS OTHERWISE NOTED. ALL MATERIALS NOT SALVAGED BY THE OWNER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR PROPER DISPOSAL.

### FIRE DETECTION AND ALARM SYMBOLS

	MANUAL FIRE ALARM PULL STATION
	SMOKE DETECTOR
	DUCT SMOKE DETECTOR
	CARBON MONOXIDE DETECTOR
	HEAT DETECTOR
	COMBINATION HORN WITH STROBE - WALL MOUNTED
	STROBE - WALL MOUNTED
	ADDRESSABLE INPUT MODULE
	ADDRESSABLE OUTPUT MODULE
	FIRE ALARM CONTROL PANEL + EMERGENCY COMMUNICATIONS PANEL

### GENERAL SYMBOLS

	JUNCTION BOX, CEILING OR FLOOR MOUNTED.
	JUNCTION BOX, WALL MOUNTED, ELEVATION AS NOTED.
	CIRCUIT HOMERUN, CONCEALED CONDUIT OR CABLE
	KEYNOTE
	EQUIPMENT IDENTIFICATION TAG. REFER TO EQUIPMENT CONNECTION SCHEDULE
	DETAIL DRAWING REFERENCE TAG, SIM-SIMILAR, TYP-TYPICAL, OPP-OPPOSITE SHEET REFERENCE

### GROUNDING AND BONDING SYMBOLS

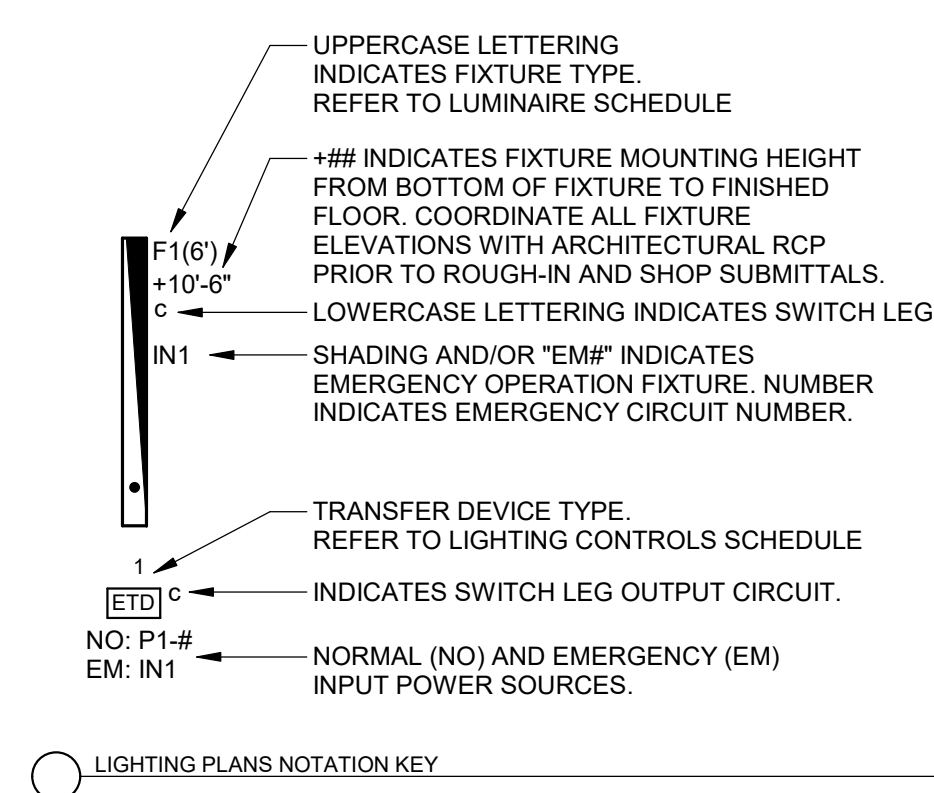
	GROUND BAR
	TELECOMMUNICATIONS MAIN GROUND BAR
	TELECOMMUNICATIONS GROUND BAR
SEE RISER DIAGRAM AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS	

### TELECOMMUNICATIONS INFRASTRUCTURE SYMBOLS

	DATA CABLING - SEE SCHEDULE FOR EXACT REQUIREMENTS
	WIRELESS ACCESS POINT- SEE SCHEDULE FOR EXACT REQUIREMENTS
	CABLE TELEVISION LOCATION - RADIO GRADE CABLING
SEE RISER DIAGRAM AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS	

### ELECTRICAL ABBREVIATIONS

A	DEVICE MOUNTED +8" ABOVE COUNTER TOP (VERIFY LOCATION)	NIC	NOT IN CONTRACT
AFF	ABOVE FINISHED FLOOR	NM	NONMETALLIC
ATS	AUTOMATIC TRANSFER SWITCH	NTS	NOT TO SCALE
C	CEILING	OC	OWNER CENTER
CB	CIRCUIT BREAKER	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
CT	CURRENT TRANSFORMER	OFOI	OWNER FURNISHED, OWNER INSTALLED
E	EXISTING ITEM TO REMAIN	R	EXISTING ITEM TO BE REMOVED
EC	ELECTRICAL CONTRACTOR	RR	EXISTING ITEM TO BE REMOVED AND RELOCATED
EM	EMERGENCY LIGHT FIXTURE	RN	EXISTING ITEM TO BE REMOVED AND REPLACED WITH NEW
ER	NEW LOCATION OF EXISTING ITEM	SCCR	SHORT CIRCUIT CURRENT RATING
F	ROUGH IN FOR FUTURE DEVICE	T	TAMPER PROOF DEVICE
FAAP	FIRE ALARM ANNUNCIATOR PANEL	TCC	TEMPERATURE CONTROL CONTRACTOR
FACP	FIRE ALARM CONTROL PANEL	TV	TELEVISION
FSD	FIRE SMOKE DAMPER	TYP	TYPICAL
G	GROUND FAULT CIRCUIT INTERRUPTER	UPS	UNINTERRUPTIBLE POWER SUPPLY
GND	GROUND	V	VOLTS
KVA	KILO-VOLT-AMPERES	VA	VOLT-AMPERES
KW	KILOWATTS	WG	WIREGUARD COVER
MC	MECHANICAL CONTRACTOR	WP	WEATHERPROOF DEVICE
MCB	MAIN CIRCUIT BREAKER	WR	WEATHER RESISTANT DEVICE
MDP	MAIN DISTRIBUTION PANEL	+24"	INDICATES MOUNTING HEIGHT CENTER LINE OF DEVICE TO FINISHED FLOOR
MLO	MAIN LUGS ONLY		
N	NEW DEVICE IN EXISTING LOCATION		



### POWER SYMBOLS

	DUPLEX RECEPTACLE, CEILING MOUNT
	DUPLEX RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
	DUPLEX GFCI RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
	DUPLEX RECEPTACLE, MOUNTED WITHIN WATER COOLER HOUSING, VERIFY HEIGHT, CONNECT TO GFCI, CIRCUIT BREAKER OR REMOTE WALL DEVICE.
	DUPLEX GFCI WEATHER RESISTANT RECEPTACLE WITH WEATHER-PROOF IN-USE COVER, TAMPER-RESISTANT, WALL MOUNT +24", OR AS NOTED
	QUADRAPLEX RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
	QUADRAPLEX GFCI RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
	SPECIAL RECEPTACLE, WALL MOUNT +18", OR AS NOTED, REFER TO ELECTRICAL EQUIPMENT CONNECTION SCHEDULE FOR RECEPTACLE TYPE
	EQUIPMENT CONNECTION, REFER TO ELECTRICAL EQUIPMENT CONNECTION SCHEDULE FOR CONNECTION TYPE
	EQUIPMENT CONNECTION, WALL MOUNT +18", OR AS NOTED, REFER TO ELECTRICAL EQUIPMENT CONNECTION SCHEDULE FOR CONNECTION TYPE
	JUNCTION BOX, WITH PULL STRING, WALL MOUNT, REFER TO PLAN OR DETAIL FOR MOUNTING HEIGHT
	GROUND BAR
	SURGE PROTECTIVE DEVICE
	SAFETY DISCONNECT SWITCH
	VFD
	VFD WITH INTEGRAL DISCONNECT
	EMERGENCY PUSH BUTTON
	PANELBOARD - SURFACE MOUNTED
	PANELBOARD - RECESSED IN WALL
	DISTRIBUTION PANELBOARD/SWITCHBOARD - SURFACE MOUNTED AS NOTED.
	CORD REEL, CEILING MOUNTED - REFER TO DETAIL
	GENERATOR
	GROUND RING

### LIGHTING SYMBOLS

	RECESSED LIGHT FIXTURE, LETTER INDICATES SWITCH LEG (TYPICAL), SHADING INDICATES EMERGENCY LIGHT (TYPICAL)
	ROUND LIGHT FIXTURE - SURFACE MOUNTED
	SURFACE MOUNTED STRIP FIXTURE
	LINEAR PENDANT MOUNTED FIXTURE
	WALL MOUNTED STRIP LIGHT FIXTURE.
	EMERGENCY LIGHT FIXTURE, WALL MOUNT, +96" OR AS NOTED
	EMERGENCY LIGHT FIXTURE, CEILING MOUNT
	EXIT SIGN, WALL MOUNT +96", SHADED AREAS INDICATE NUMBER OF FACES, ARROWS INDICATE SIGN ARROWS
	EXIT SIGN, CEILING MOUNT, SHADED AREAS INDICATE NUMBER OF FACES, ARROWS INDICATE SIGN ARROWS
	EXTERIOR LIGHT FIXTURE, WALL MOUNT +10", OR AS NOTED
	INTERIOR LIGHT FIXTURE, WALL MOUNT
	EXTERIOR FLOOD LIGHT FIXTURE, REFER TO LIGHT FIXTURE SCHEDULE
	CEILING FAN
	SINGLE POLE SWITCH, WALL MOUNT +48", OR AS NOTED, LETTER INDICATES SWITCH LEG
	THREE WAY SWITCH, WALL MOUNT +48", OR AS NOTED, LETTER INDICATES SWITCH LEG
	OCCUPANCY SENSOR, WALL MOUNT +48" OR AS NOTED, NUMBER INDICATES TYPE, LETTER INDICATES SWITCH LEG, REFER TO LIGHTING CONTROLS SCHEDULE
	OCCUPANCY SENSOR, CEILING MOUNT, NUMBER INDICATES TYPE, LETTER INDICATES SWITCH LEG, REFER TO LIGHTING CONTROLS SCHEDULE
	DAYLIGHTING SENSOR, CEILING MOUNT, NUMBER INDICATES TYPE, LETTER INDICATES SWITCH LEG, REFER TO LIGHTING CONTROLS SCHEDULE

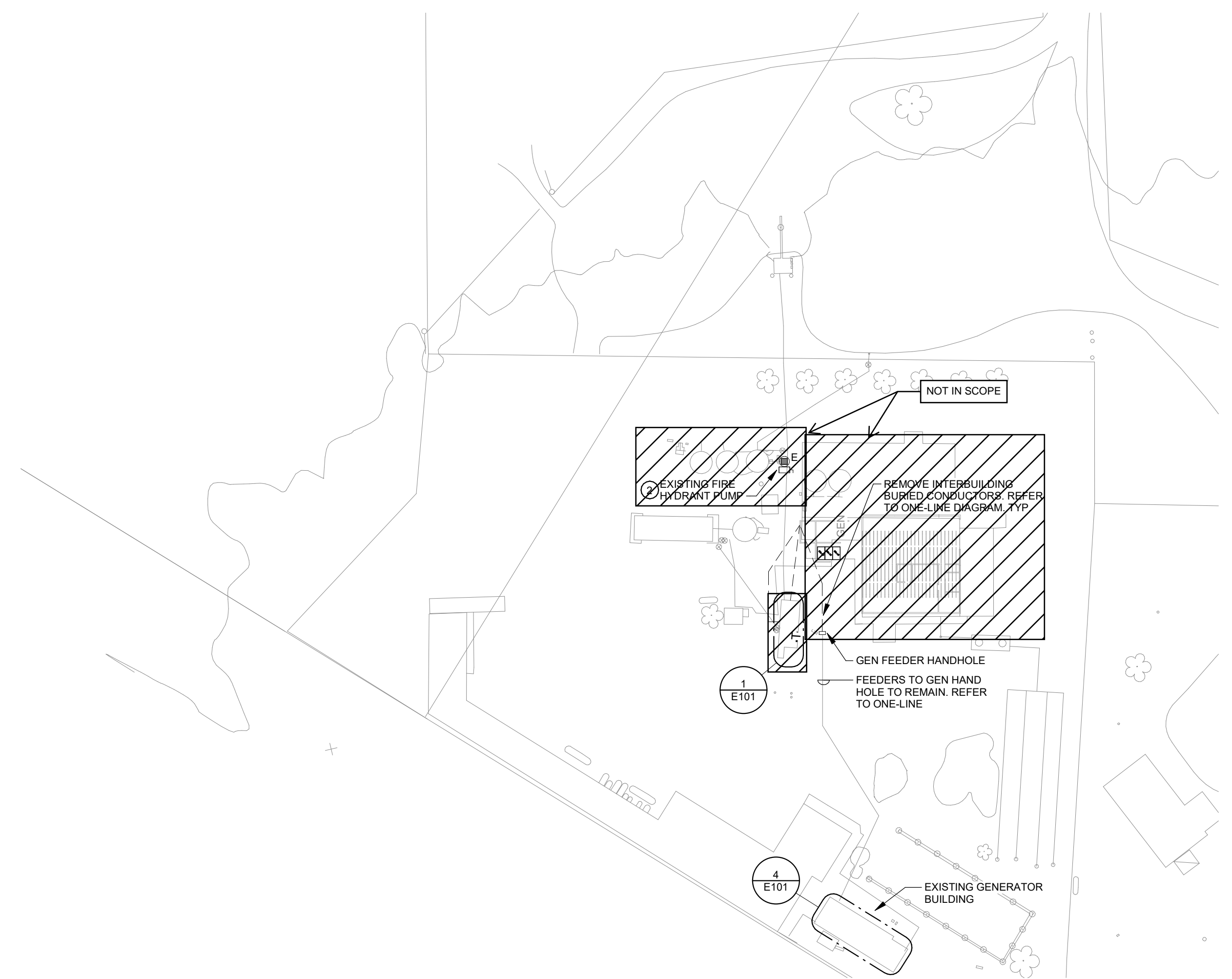


### KEYNOTES #

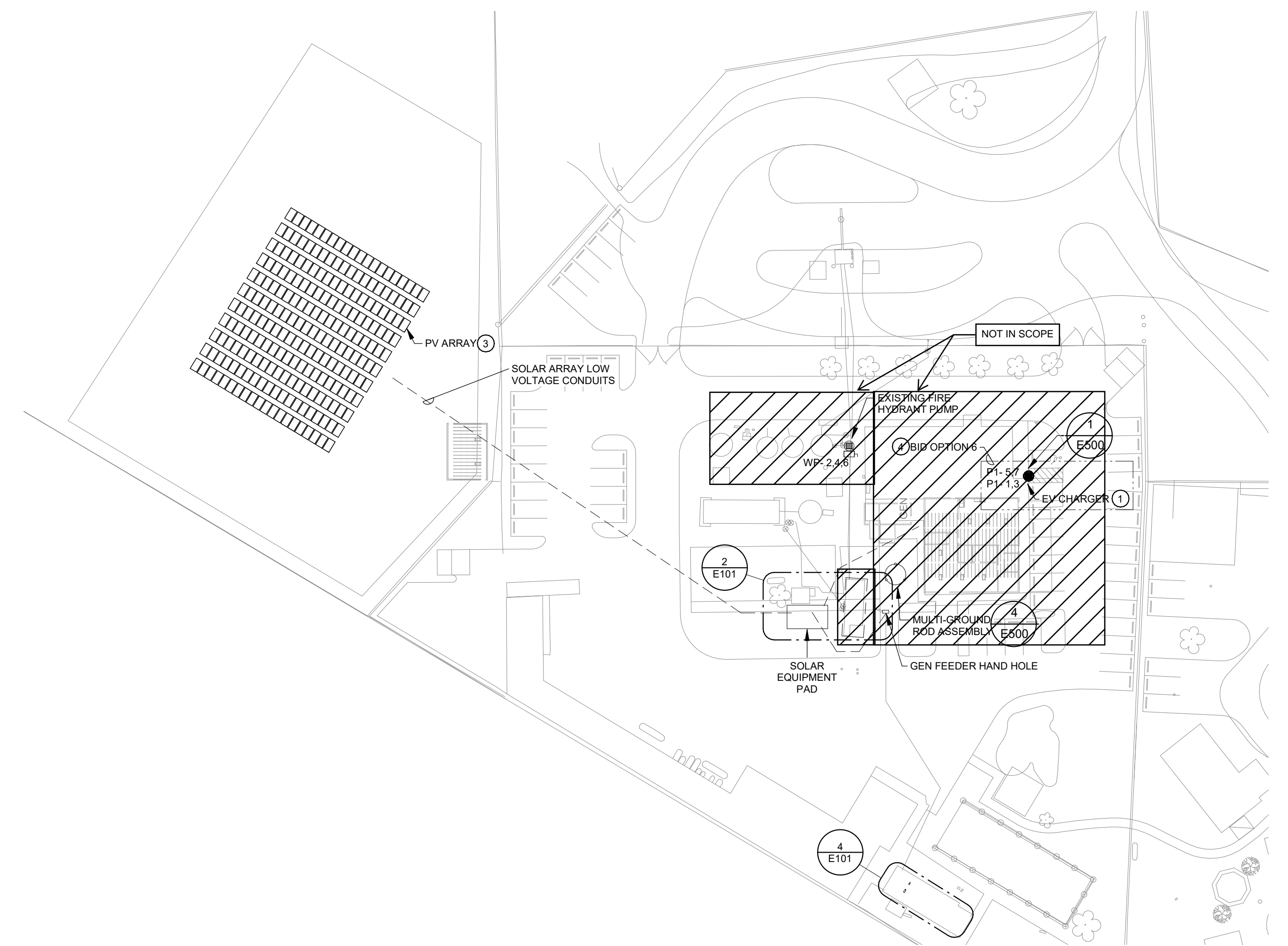
- 1 PROVIDE AND INSTALL FULLY OPERATIONAL LEVEL 2 NETWORKED DUAL PORT PUBLIC USE CHARGING STATION EQUAL TO LEVITON EVR-GREEN 4000 SERIES CPHUS-BPMBX-CPAPB-PCBX-CPCM. FREE STANDING BOLLARD TYPE WITH CONCRETE BASE MOUNTING KIT. NEMA 3R ENCLOSURE. DUAL CHARGING PORTS WITH INTEGRAL CABLE MANAGEMENT. CHARGEPOINT NETWORK SERVICE ENABLED WITH INTEGRAL LTE CELLULAR SIM CARD NETWORK CAPABLE. COLOR LCD DISPLAY AND RFID CARD READER. POWERED THROUGH (2) 208V 40A2P SINGLE PHASE CIRCUITS. INTEGRAL SURGE SUPPRESSION. FULLY UL LISTED FOR APPLICATION. PROVIDE AS A COMPLETE PACKAGE INCLUDING ALL MANUFACTURER REQUIRED START-UP SERVICES, PROGRAMMING, STANDARD WARRANTY, AND 5 YEAR SERVICE PLAN WITH PURCHASE OF EQUIPMENT, BEGINNING AT SUBSTANTIAL COMPLETION.
- 2 MAINTAIN EXISTING UNDERGROUND ELECTRICAL FROM WELL PUMP BUILDING TO EXISTING HYDRANT PUMP. REFER TO ENLARGED PLANS AND ONE-LINE DIAGRAMS.
- 3 PV ARRAY SHOWN IS FOR QUANTITY AND APPROXIMATE LAYOUT ESTIMATION ONLY. FINAL RACKING LAYOUT REQUIREMENTS AND SPACING DETERMINED BY DELEGATED DESIGN SOLAR ENGINEER. MAINTAIN REQUIRED CLEARANCES/SPACES FOR OPTIMAL RADIANCE ABSORPTION. REFER TO SPECIFICATIONS AND DETAILS. MAINTAIN REQUIRED CLEARANCES TO GROUNDED SYSTEM PER NFPA 1.
- 4 BID OPTION: BASE BID, PROVIDE CIRCUIT ROUGH-IN AND CONDUIT STUB-UP TO LOCATION SHOWN FOR FUTURE EV CHARGER INSTALLATION. UNDER BID OPTION PROVIDE AND FULLY INSTALL EV CHARGER AS INDICATED.

### POWER GENERAL NOTES

- A. COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION HAS TRANSPIRED. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
- B. COORDINATE ELECTRICAL REQUIREMENTS FOR MECHANICAL UNITS WITH M.C. AND FINAL MECHANICAL SHOP DRAWINGS.
- C. PROVIDE PENETRATIONS REQUIRED FOR ROUTING RACEWAYS THROUGH THE BUILDING. COORDINATE FIRE RATED WALL PENETRATIONS AND PROVIDE CONDUIT SLEEVES AND FIRE STOPPING TO MAINTAIN RATING.



1 ELECTRICAL SITE PLAN - DEMOLITION  
1" = 50'-0"



2 ELECTRICAL SITE PLAN - NEW CONSTRUCTION  
1" = 50'-0"

## STAR SCHOOL MAKERSPACE RENOVATIONS

145 Leupp Rd, Flagstaff, AZ 86004

Project No: KCL #21088

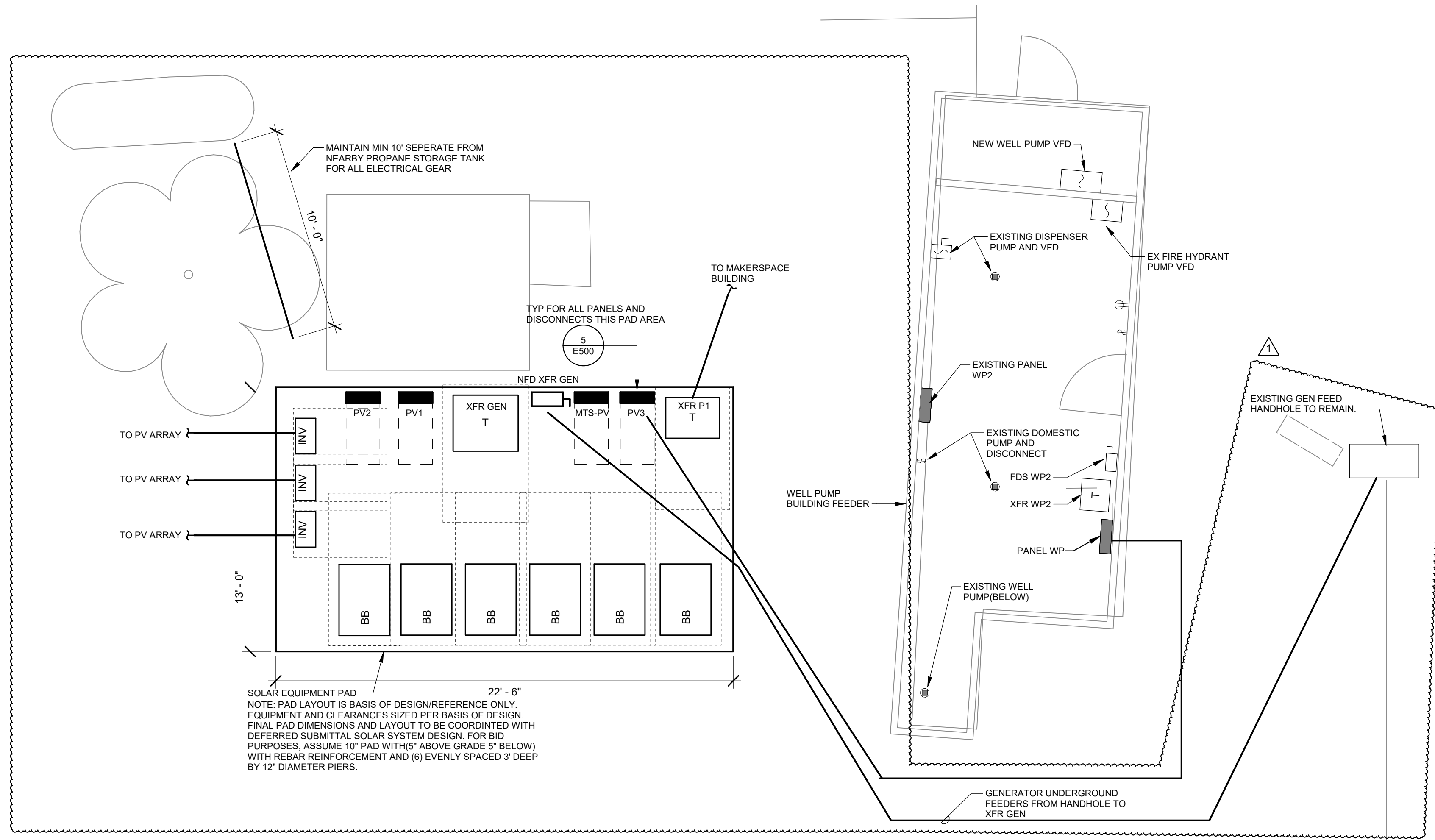
Date: 2021.10.31

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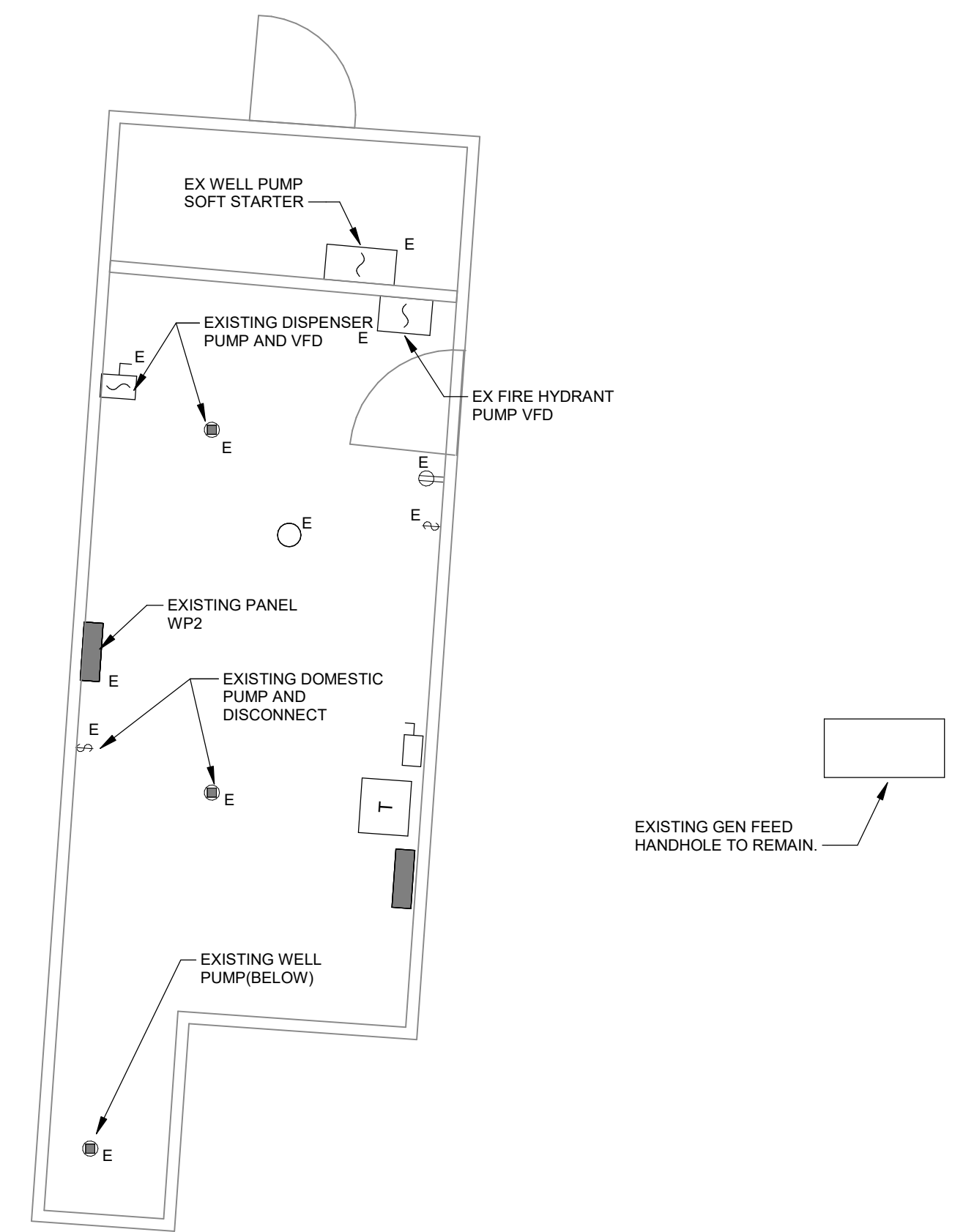
Revision	Date

Drawing Name:  
ELECTRICAL SITE PLAN

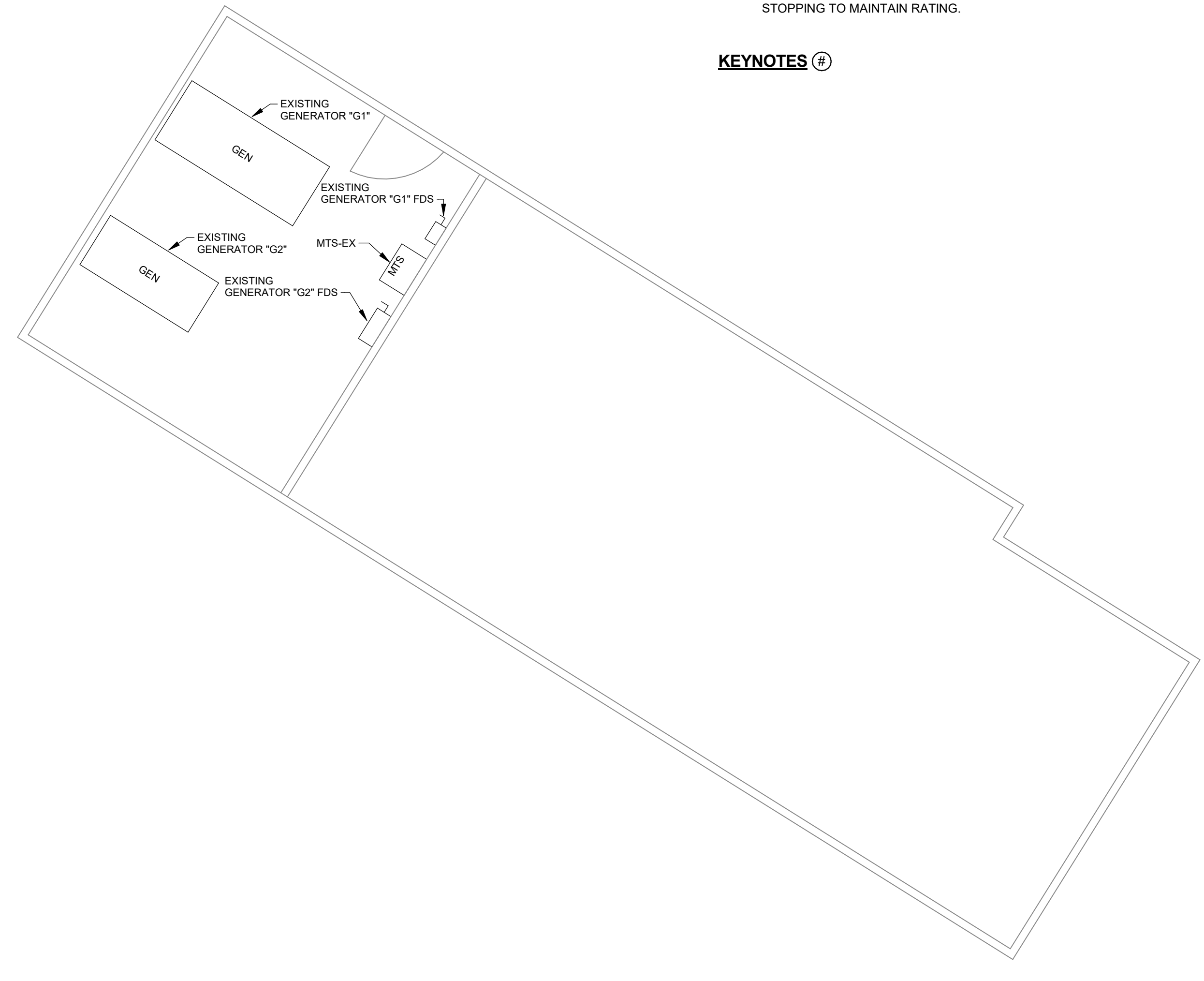
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**E001**



2 WELL PUMP BUILDING - NEW CONSTRUCTION  
1/4" = 1'-0"



1 WELL PUMP BUILDING - DEMOLITION  
1/4" = 1'-0"



4 GENERATOR BUILDING - EXISTING CONDITIONS  
1/4" = 1'-0"

### ELECTRICAL DEMOLITION NOTES

- DEMOLITION DRAWINGS PRESENT LAYOUT OF EXISTING CONDITIONS AND MAJOR MECHANICAL/ELECTRICAL ITEMS. THEY ARE NOT TO BE CONSTRUED AS COMPLETE IN REPRESENTATION OF ACCESSORIES AND INCIDENTALS TO BE REMOVED, REPLACED, OR REWORKED. NOR SHOULD ACCESSIBILITY BE INFERRED. THE CONTRACTOR IS RESPONSIBLE TO FAMILIARIZE THEMSELVES WITH THE BUILDING AND EXISTING CONDITIONS. PRIOR TO THE SUBMITTING OF A BID FOR THIS PROJECT.
- REMOVE ELECTRICAL FACILITIES AND CLEAR THE AREA TO RECEIVE THE NEW WORK TO BE PROVIDED UNDER THIS CONTRACT.
- THIS ELECTRICAL DEMOLITION DRAWING SHOWING EXISTING CONDITIONS HAS BEEN PREPARED BASED ON FIELD OBSERVATION AND ORIGINAL DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST WHICH DO NOT SHOW, AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER SIMILAR TO THOSE ITEMS WHICH DO SHOW. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS. CONDUITS, BOXES, ETC., SHALL BE REMOVED AS REQUIRED BY WALL AND CEILING DEMOLITION AND REMOVALS. WIRING SHALL BE REMOVED. ALL WIRING FOR THE REMODELED AREAS SHALL BE NEW UNLESS SPECIFICALLY NOTED OTHERWISE. ALL BRANCH CIRCUITS TO BE DISCONNECTED SHALL BE IDENTIFIED AS TO LOCATION OR ITEM SERVED BEFORE DISCONNECTING. CIRCUITS SERVING AREAS BEYOND THE IMMEDIATE DEMOLITION AREA SHALL BE MAINTAINED.
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- PANELBOARDS, DISCONNECTS, FIXTURES, WIRING DEVICES, SIGNAL DEVICES, ETC., SHOWN ON PLANS SHALL BE REMOVED UNLESS NOTED OTHERWISE. REMOVAL SHALL BE DONE IN A TIMELY MANNER IN ACCORDANCE WITH THE GENERAL DEMOLITION WORK. COORDINATE WITH THE OWNER AND OTHER CONTRACTORS.
- ABBREVIATIONS:  
E - EXISTING ITEM TO REMAIN  
ER - NEW LOCATION OF EXISTING ITEM  
N - NEW ITEM IN EXISTING LOCATION  
R - EXISTING ITEM TO BE REMOVED, PATCH AND/OR COVER  
RN - REPLACE EXISTING WITH NEW  
RR - EXISTING ITEM TO BE REMOVED AND RELOCATED

### POWER GENERAL NOTES

- COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION HAS TRANSPIRED. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
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- PROVIDE PENETRATIONS REQUIRED FOR ROUTING RACEWAYS THROUGH THE BUILDING. COORDINATE FIRE RATED WALL PENETRATIONS AND PROVIDE CONDUIT SLEEVES AND FIRE STOPPING TO MAINTAIN RATING.

### KEYNOTES #

Project No: KCL #21088

Date: 2021.10.31

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Revision	Date
1 Addendum #2	2024.04.09

Drawing Name:  
ELECTRICAL ENLARGED FLOOR PLANS

Drawing #:





EXPIRES 06/30/2024

Project No: KCL #21088

Date: 2021.10.31

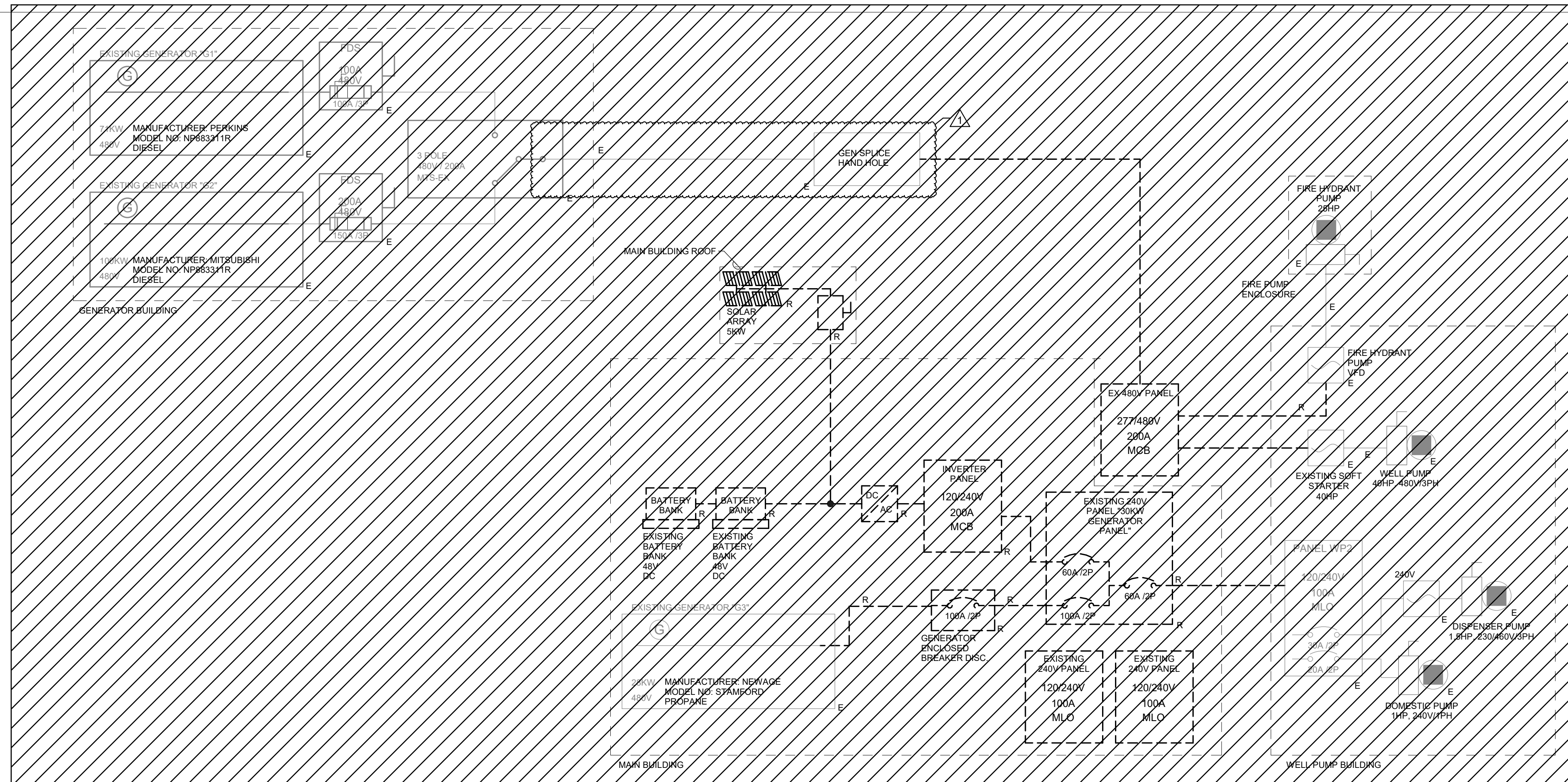
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#	Revision	Date
1	Addendum #2	2024.04.09

Drawing Name:  
ELECTRICAL ONE-LINE DIAGRAMS

Drawing #:

# E300



1 ELECTRICAL RISER DIAGRAM - DEMOLITION  
NOT TO SCALE

### PV AND ENERGY STORAGE SYSTEM NARRATIVE:

- PROVIDE SELF-SUFFICIENT ENERGY STORAGE AND PV SYSTEM, INDEPENDANT FROM UTILITY GRID. SYSTEM SHALL BE DESIGNED, DOCUMENTED AND STAMPED BY A QUALIFIED AND LICENSED PV SYSTEMS ENGINEER.
- SYSTEM SHALL COMPLY WITH REQUIREMENTS OF NEC 705 AND NEWC 706.
- SYSTEM MINIMUM CRITERIA:
  - 108KW DC SOLAR PANELS:
    - BASIS OF DESIGN:
      - (224) HANHWA Q CELLS Q PEAK DUO XL G10.3/BFG 485W MONOCRYSTALLINE MODULE.
    - 20% EFFICIENCY
    - 25 YEAR WARRANTY
  - 180KVA INVERTER SYSTEM:
    - BASIS OF DESIGN:
      - (3) SOL ARK 60K-3P-480V
      - SUITABLE FOR 277/480V 3 PHASE CONFIGURATION.
      - ANTI-ISLANDING PROTECTION.
  - 360 KWH LITHIUM BATTERY STORAGE SYSTEM
    - BASIS OF DESIGN:
      - (6) 60 KWH SOL ARK L3 60K-HV-60-IP55
      - 100Ah
      - 98% EFFICACY
      - 10 YEAR PRORATED WARRANTY
  - PROVIDE AC COUPLED ENERGY STORAGE AND PV SYSTEM. PROVIDE SYSTEM WITH COMPATIBLE AC/DC INVERTERS, CHARGE CONTROLLERS, MONITORING SYSTEM, USER INTERFACE CONTROLLERS.
  - PROVIDE WIRE RACKS, AND OTHER APPURTENANCES AND ELECTRICAL EQUIPMENT NECESSARY FOR COMPLETE SYSTEM INSTALLATION.
  - SYSTEM SHALL BE CAPABLE OF POWERING 40HP WELL PUMP WITH SOFT STARTER UNDER NORMAL CONDITIONS.

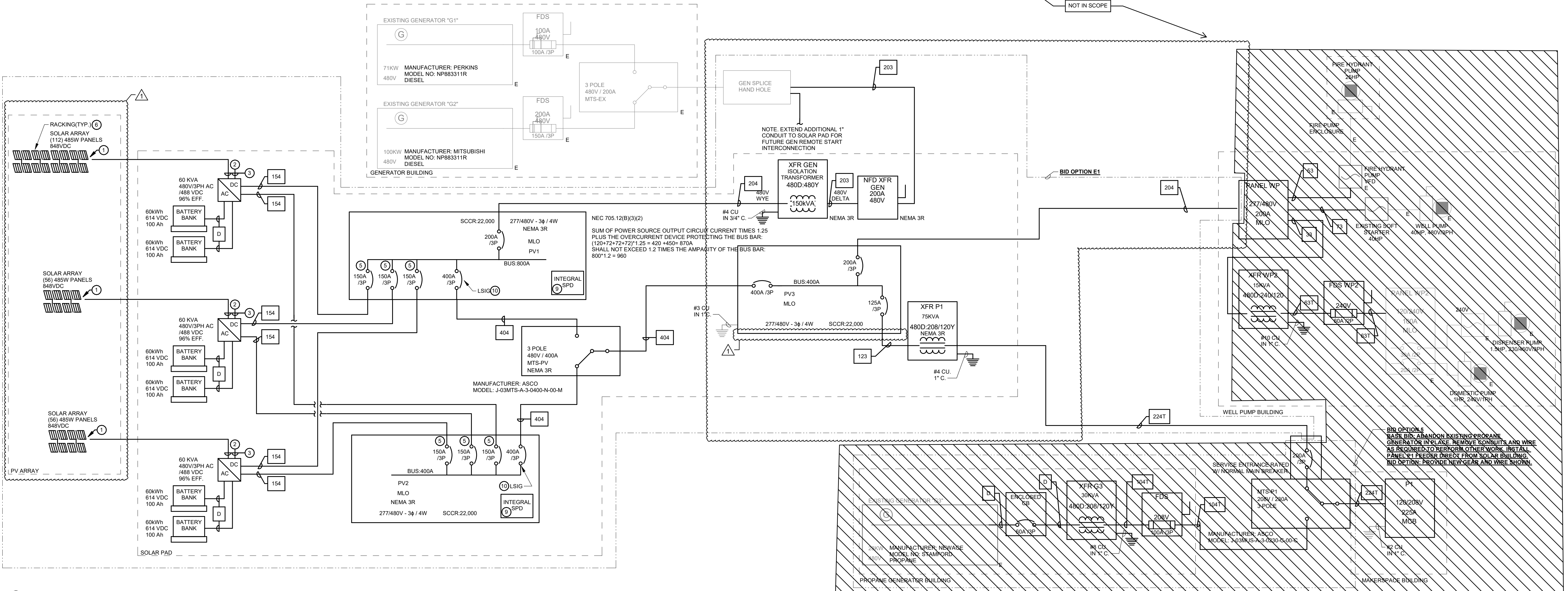
### RISER DIAGRAM GENERAL NOTES

- DIAGRAM INDICATES OVERALL LAYOUT OF ELECTRICAL DISTRIBUTION SYSTEM. REFER TO FLOOR PLANS FOR EQUIPMENT LOCATIONS.
  - USE COPPER CONDUCTORS UNLESS OTHERWISE INDICATED.
  - MATCH NEUTRAL CONDUCTOR SIZE TO THE PHASE CONDUCTORS UNLESS OTHERWISE NOTED.
  - ALL WIRING SHALL BE IN RACEWAY AS NOTED. REFER TO SPECIFICATIONS FOR CONDUIT APPLICATION REQUIREMENTS.
  - INSTALL UTILITY TRANSFORMER PAD, METERING EQUIPMENT, AND SERVICE ENTRANCE FEEDERS IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS.
- Ⓞ RISER DIAGRAM KEYED NOTES:
- PROVIDE PV MODULES WITH DC ISOLATOR/DISCONNECT SWITCHES. QUANTITY OF ISOLATORS DETERMINED BY DESIGNER/PANEL MANUFACTURER BASED UPON MAXIMUM STRING LENGTH.
  - PROVIDE MONITORING SYSTEM WITH WEB ACCESSIBLE INTERFACE INCLUDING COMPLETE SYSTEM EQUIPMENT LAYOUT, DEVICE CODES, MODULE/ARRAY LEVEL PERFORMANCE MONITORING, AND EXTRACTABLE DATA STORAGE.
  - PROVIDE CABLES/CONDUIT SIZED PER MANUFACTURERS REQUIREMENTS AND LOCAL CODES. ROUTE IN EMT CONDUIT WHERE INTERIOR LOCATED, IMC CONDUIT WHERE EXTERIOR LOCATED.
  - SIZE PANELBOARD BUS PER NEC
  - ADJUST QUANTITY AND SIZE OF ENERGY STORAGE/PV SYSTEM OVERCURRENT DEVICES TO MATCH INVERTER RATINGS AND QUANTITY PROVIDED
  - PROVIDE SOLAR PV ARRAY RACKING EQUIPMENT AND INSTALLATION WITH PANEL ARRANGEMENT INSTALLED/OPTIMIZED FOR LOCAL CONDITIONS. MAINTAIN REQUIRED EQUIPMENT WORKING CLEARANCES.
  - PROVIDE DC BUS BETWEEN BATTERY STORAGE SYSTEM AND GRID FORMING INVERTERS.
  - PROVIDE ALL CODE REQUIRED GROUNDING AND BONDING FOR SOLAR SYSTEM INSTALLATION. FINAL REQUIREMENTS VERIFIED WITH SOLAR DESIGNER.
  - PROVIDE PANEL WITH INTEGRAL SURGE PROTECTION DEVICE PER SPECIFICATIONS
  - PROVIDE BREAKERS EQUIPED WITH LSIG FUNCTION TO FACILITATE SELECTIVE COORDINATION.

### FEEDER SCHEDULE

NOTE: ALL CONDUCTORS THHN COPPER UNLESS OTHERWISE NOTED.

TAG	PHASE	GROUND	CONDUIT
33	1- SET (3) #8	#10	(1) 1"
53	1- SET (3) #8	#10	(1) 1"
63T	1- SET (3) #6	#8	(1) 1"
73	1- SET (3) #4	#8	(1) 1"
104T	1- SET (4) #3	#8	(1) 1 1/4"
123	1- SET (3) #1	#6	(1) 1 1/2"
154	1- SET (4) #1/0	#6	(1) 2"
203	1- SET (3) #3/0	#4	(1) 2"
204	1- SET (4) #3/0	#4	(1) 2 1/2"
224T	1- SET (4) #4/0	#4	(1) 2 1/2"
404	1- SET (4) 500 MCM	#3	(1) 4"
D	1- SET (3) #6	#10	(1) 1"
F	1- SET (4) #3	#8	(1) 1 1/4"
I	1- SET (4) #2/0	#4	(1) 2"
K	1- SET (3) 500 MCM	#3	(1) 4"



2 ELECTRICAL RISER DIAGRAM - NEW CONSTRUCTION  
NOT TO SCALE



**BRANCH PANEL: WP**  
 LOCATION: STORAGE 107  
 SUPPLY FROM: SURFACE  
 ENCLOSURE: TYPE 1  
 VOLTAGE: 480/277 WYE  
 PHASES: 3  
 WIRES: 4  
 SCCR RATING: 19,000 A  
 MAINS TYPE: MCB  
 MAINS RATING: 225 A  
 MCB RATING: 200 A

NOTES:

CIRCUIT DESCRIPTION	B	AMP	CKT NO	A	B	C	CKT NO	AMP	P	CIRCUIT DESCRIPTION
WELL PUMP	3	90 A	1	14411	14422		2	60 A		FIRE HYDRANT PUMP
			5				6			
YER WP2	2	30 A	7	0	0		8	20 A	1	SPARE
SPARE	1	20 A	11				10	20 A	1	SPARE
SPARE	1	20 A	13	0	0		14	20 A	1	SPARE
SPARE	1	20 A	15				16	20 A	1	SPARE
SPARE	1	20 A	17				18	20 A	1	SPARE
SPARE	1	20 A	19	0	0		20	20 A	1	SPARE
SPARE	1	20 A	21				22	20 A	1	SPARE
SPARE	1	20 A	23				24	20 A	1	SPARE
SPARE	1	20 A	25	0	0		26	20 A	1	SPARE
SPARE	1	20 A	27				28	20 A	1	SPARE
SPARE	1	20 A	29	0	0		30	20 A	1	SPARE
				36533 VA	23963 VA		36533 VA			
				86 A	86 A		86 A			

LEGEND:  
 \*G\* INDICATES GFCI TYPE BREAKER

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS
POWER	71499 VA	100.00%	71499 VA	TOTAL CONN. LOAD: 71499 VA
				TOTAL EST. DEMAND: 71499 VA
				TOTAL CONN.: 86 A
				TOTAL EST. DEMAND: 86 A

NOTES:

**BRANCH PANEL: P1**  
 LOCATION: STORAGE 107  
 SUPPLY FROM: SURFACE  
 ENCLOSURE: TYPE 1  
 VOLTAGE: 120/208 WYE  
 PHASES: 3  
 WIRES: 4  
 SCCR RATING: 19,000 A  
 MAINS TYPE: MCB  
 MAINS RATING: 400 A  
 MCB RATING: 400 A

NOTES:

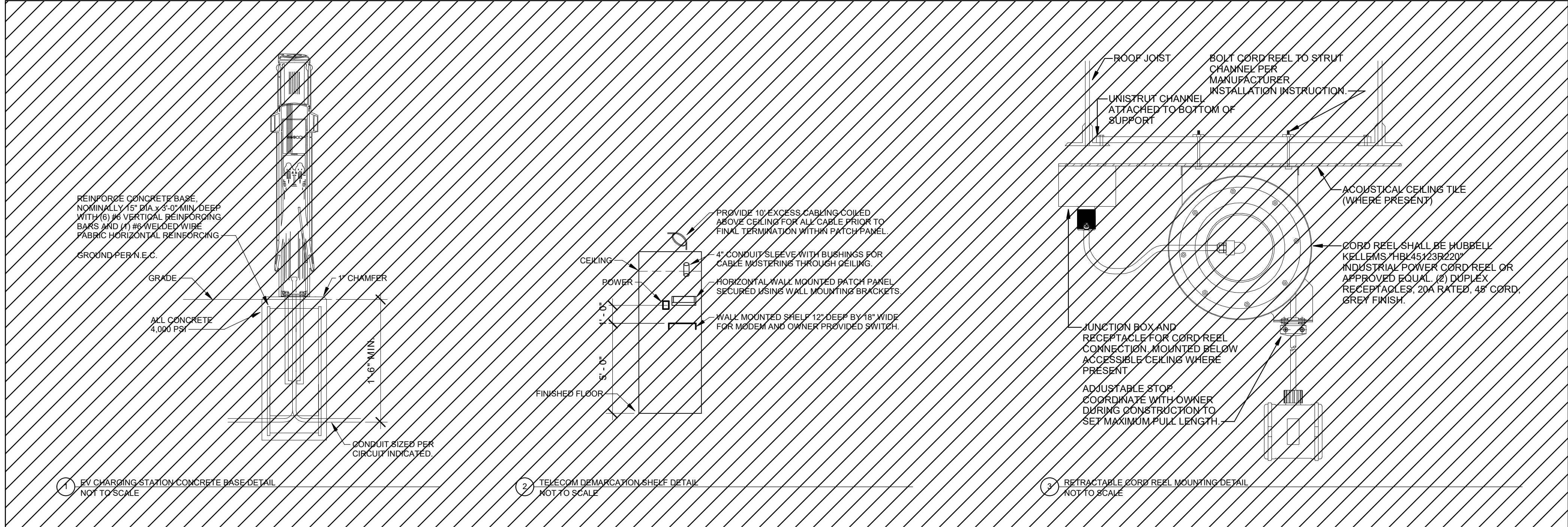
CIRCUIT DESCRIPTION	P	AMP	CKT NO	A	B	C	CKT NO	AMP	P	CIRCUIT DESCRIPTION
EV Charger	2	40 A	1	3160	0		2	20 A	1	DUCT RETRACTION
			3		3120	1090	4	20 A	1	RECEPTACLE
EV Charger	2	40 A	5	3120	960		6	20 A	1	RECEPTACLE
			7				8	20 A	1	ICE MAKER
RJK-1	2	25 A	11		1445	900	12	20 A	1	BOTTLING MACHINE
			13	1638	2950		14	20 A	G	WASHER
CK-1	2	25 A	15				16	30 A	S	DRYER
			18		1659	2500	19			
WALK-IN COOLER EVAPORATOR	1	28 A	17			154	18	20 A	1	RECEPTACLE
WALK-IN COOLER AUX	1	28 A	19	285	368		20	20 A	1	RECEPTACLE
GENBUILDING POWER	1	28 A	21		1916	2200	22	20 A	1	FRIDGE
EF-1	1	28 A	23			500	24	20 A	1	FRIDGE
WATER HEATER	1	20 A	25	180	1200		26	20 A	1	FRIDGE
RECEPTACLE	1	20 A	27		360	2800	28	20 A	1	FRIDGE
RECEPTACLE	1	20 A	29			360	30	20 A	1	FRIDGE
RECEPTACLE	1	20 A	31		360		32			
RECEPTACLE	1	20 A	33		368		34			
RECEPTACLE	1	20 A	35			800	36			
RECEPTACLE	1	20 A	37	1650			38			
RECEPTACLE	1	20 A	39		720		40			
RECEPTACLE	1	20 A	41			720	42			
LIGHTING	1	20 A	43	1215			44			
			45				46			
			47				48			
			49				50			
			51				52			
			53				54			
				6748 VA	15443 VA		10994 VA			
				137 A	135 A		91 A			

LEGEND:  
 \*G\* INDICATES GFCI TYPE BREAKER

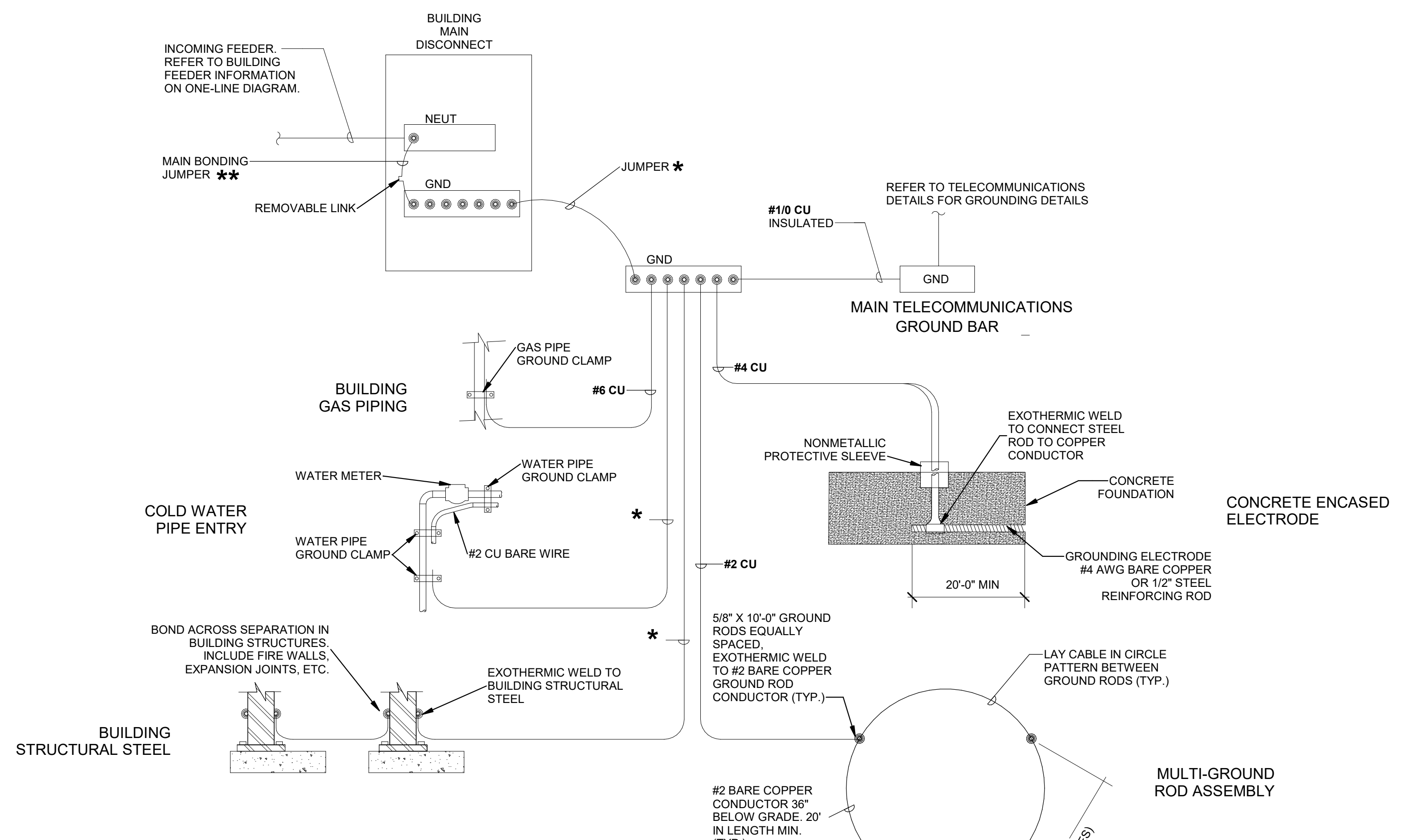
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED...	PANEL TOTALS
LIGHTING	1365 VA	125.00%	1365 VA	TOTAL CONN. LOAD: 42088 VA
LIGHTING - EXTERIOR	8 VA	125.00%	8 VA	TOTAL EST. DEMAND: 38769 VA
Other	0 VA	0.00%	0 VA	TOTAL CONN.: 117 A
POWER	19395 VA	100.00%	19395 VA	TOTAL EST. DEMAND: 102 A
RECEPTACLE	24320 VA	73.45%	18660 VA	

NOTES:

NOT IN SCOPE  
NO SCOPE  
THIS SHEET



NOT IN SCOPE

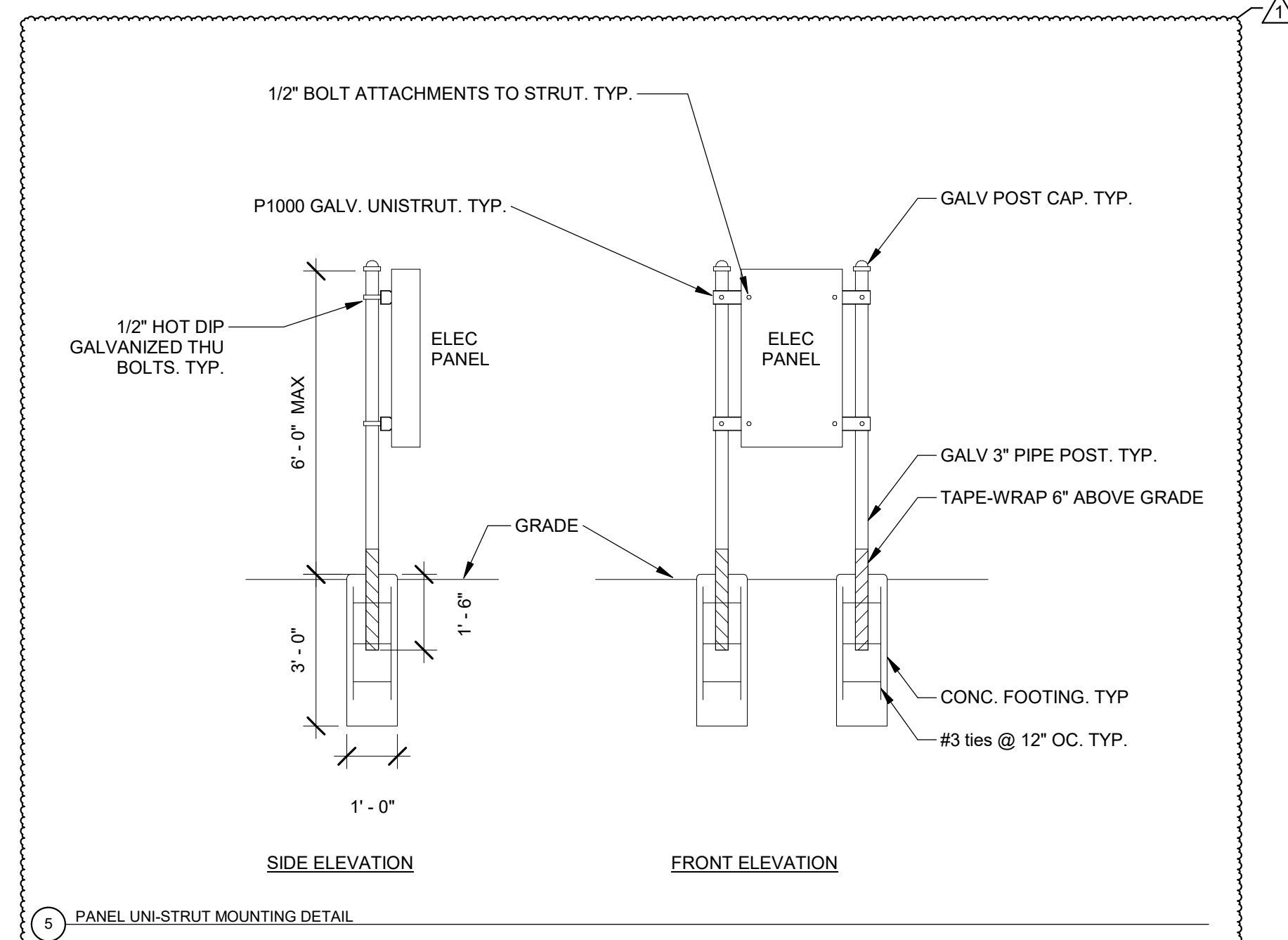


\* SIZE GROUNDING ELECTRODE CONDUCTOR AND BONDING PER NEC 250.66 AND TABLE BELOW. ALL CONDUCTORS TO BE COPPER. TABLE BASED ON NEC 2017. TABLE 250.66 GROUNDING ELECTRODE CONDUCTOR FOR ALTERNATING-CURRENT SYSTEMS

SIZE OF LARGEST UNGROUNDING CONDUCTOR OR EQUIVALENT AREA FOR PARALLEL CONDUCTORS (AWG/KCMIL)	ALUMINUM OR COPPER-CLAD AL	SIZE OF GROUNDING ELECTRODE CONDUCTOR (AWG/KCMIL)
COPPER		COPPER
#2 OR SMALLER	#1/0 OR SMALLER	#8
#1 OR #1/0	#2/0 OR #3/0	#6
#2/0 OR #3/0	#4/0 OR 250	#4
OVER #3/0 THROUGH 350	OVER 250 THROUGH 500	#2
OVER 350 THROUGH 600	OVER 500 THROUGH 900	#1/0
OVER 600 THROUGH 1100	OVER 900 THROUGH 1750	#2/0
OVER 1100	OVER 1750	#3/0

\*\* SIZE BONDING JUMPER PER NEC 250.102. USE TABLE ABOVE FOR ALL CONDUCTORS BETWEEN #2 AND 1100. ALL INCOMING CONDUCTORS OVER 1100 CU OR 1750 AL SHALL BE SIZED PER THE TABLE 250.102(C). SERVICE EQUIPMENT SHALL BE SUPPLIED WITH BONDING JUMPER FROM THE MANUFACTURER.

- NOTES
- A. ALL AVAILABLE GROUNDING ELECTRODES WHICH ARE PRESENT AT THE BUILDING OR STRUCTURE SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM (GES). ADDITIONAL CODE-REQUIRED GROUNDING CONNECTIONS NOT SHOWN SHALL BE PROVIDED. CONNECTIONS WHICH ARE ENCASED, UNDERGROUND, OR INACCESSIBLE SHALL BE EXOTHERMIC WELD.
  - B. ALL BONDING JUMPERS CONNECTING GROUNDING ELECTRODES TO THE GES SHALL BE SIZED EQUAL TO THE GROUNDING ELECTRODE CONDUCTOR (GEC) IN ACCORDANCE WITH NEC 250.53(C). OTHER BONDING JUMPERS SHALL BE SIZED AS OTHERWISE DESCRIBED IN NEC ARTICLE 250. CONDUCTORS SHALL BE BARE COPPER UNLESS OTHERWISE NOTED.
  - C. REFER TO SPECIFICATIONS FOR ADDITIONAL PRODUCT AND MATERIAL REQUIREMENTS. GROUNDING AND BONDING METHODS AND MATERIALS SHALL COMPLY WITH NEC ARTICLE 250.
  - D. REFER TO TECHNOLOGY DETAILS FOR ADDITIONAL REQUIREMENTS RELATED TO TELECOM GROUNDING.



## STAR SCHOOL MAKERSPACE RENOVATIONS

145 Leupp Rd, Flagstaff, AZ 86004

Project No: KCL #21088  
Date: 2021.10.31  
PERMIT SET

Rev	Revision	Date
1	Addendum #2	2024.04.09

Drawing Name:  
ELECTRICAL DETAILS

Drawing #:  
**E500**