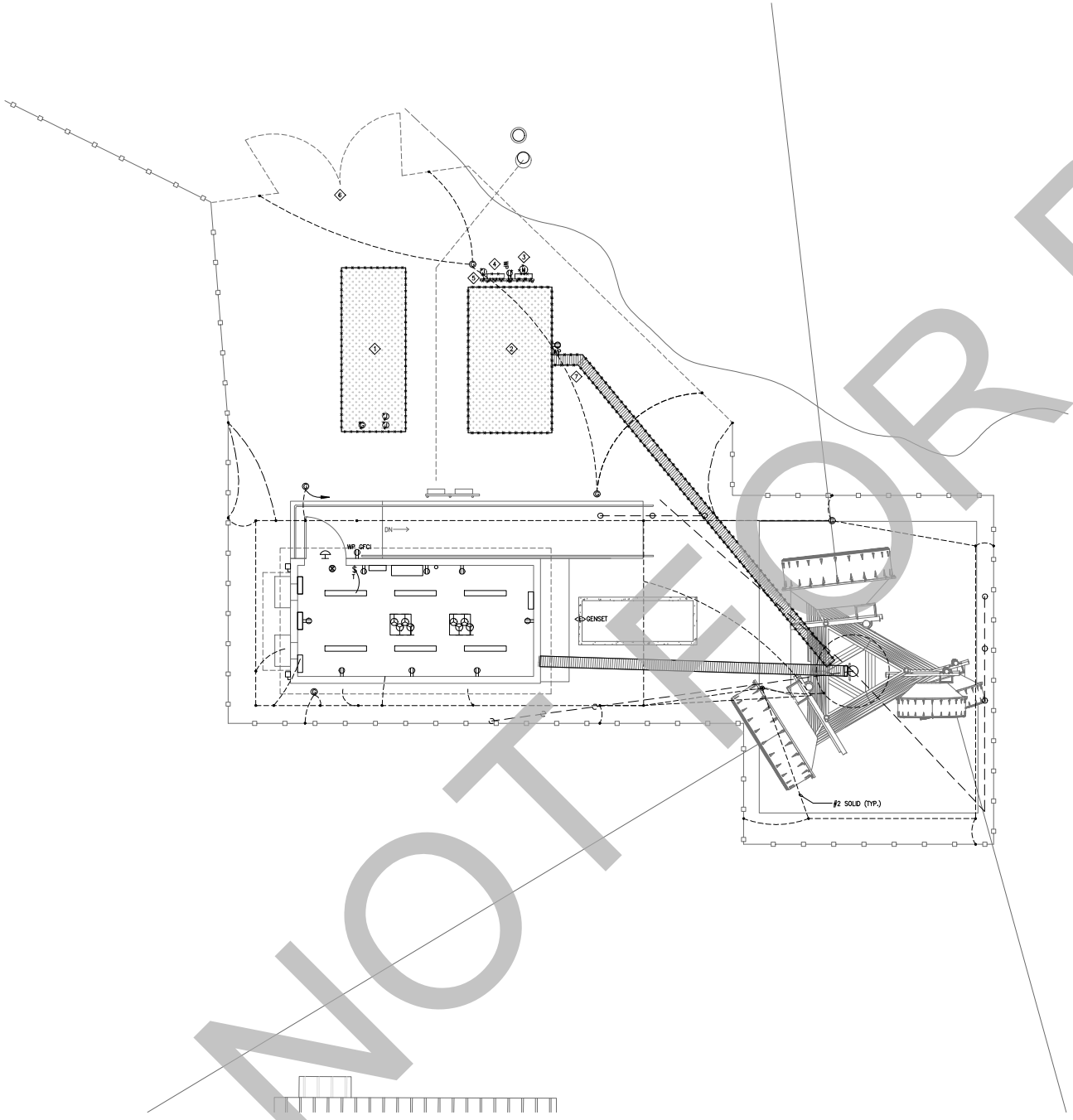

1 ELECTRICAL SITE PLAN PHASE 4 - DEMO
SCALE: 1/4" = 1' - 0"

GENERAL SHEET NOTES

A. CONTRACTOR SHALL SEE SEQUENCE OF CONSTRUCTION AT SUMMARY OF WORK.

B. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING EQUIPMENT/DEVICES/COMPONENTS PRIOR TO ANY DEMOLITION.

C. CONTRACTOR SHALL FIELD VERIFY AND LOCATE ALL EXISTING GROUND GRID AND CONNECTION POINTS PRIOR TO ANY DEMOLITION. EXISTING GROUNDING SYSTEM SHALL BE PROTECTED IN PLACE UON.

D. CONTRACTOR SHALL SUBMIT METHOD OF PROCEDURE (MOP) TO COUNTY OF SAN BERNARDINO FOR APPROVAL PRIOR TO ANY POWER SHUTDOWN/INTERRUPTION. TEMPORARY GENERATOR, AIR CONDITIONING AND LIGHTING SHALL BE PROVIDED DURING POWER SHUTDOWN. TEMPORARY GENERATOR FUEL SHALL BE RESPONSIBLE BY CONTRACTOR.

E. EXISTING GROUND WIRES SHALL BE PROTECTED IN PLACE. IF DAMAGED, CONTRACTOR IS RESPONSIBLE TO REPAIR AND RECONNECT WITH NEW GROUND WIRES/GROUND RODS/GROUND PLATES.

REFERENCE SHEET NOTES

1. RETURN TEMP PORTABLE GENERATOR ON TRAILER.
2. RETURN TEMP PORTABLE BUILDING BACK TO COUNTY YARD. COORDINATE WITH COUNTY FOR EXACT LOCATION. ALL NEW OPENINGS SHALL BE PATCHED AND CLOSED.
3. REMOVE SCE METER, INCOMING FEEDER, AND PANEL. COORDINATE WITH SCE AND COUNTY FOR POWER CUTOVER SCHEDULE. PERMANENT EQUIPMENT BUILDING HAS TO BE FULLY TESTED, INSPECTED AND FUNCTIONAL PRIOR TO ANY DEMOLITION OR POWER SHUTDOWN.
4. REMOVE TEMP MTS.
5. REMOVE H-FRAME AND ASSOCIATED RECEPTACLE, JUNCTION BOXES, CONDUITS.
6. AFTER PERMANENT GATES/FENCES ARE INSTALLED, TEMPORARY FENCES AND GATES SHALL BE REMOVED.
7. SALVAGE TEMP ICE BRIDGE AND ASSOCIATED SUPPORT, AND COORDINATE WITH COUNTY TO DELIVER TO COUNTY EQUIPMENT YARD. VERIFY WITH COUNTY FOR DELIVERY LOCATION. COORDINATE WITH COUNTY FOR CABLES RELOCATION TO PERMANENT ICE BRIDGE.

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ISSUE		
MARK	DATE	DESCRIPTION
	06/14/23	95% CD
	01/12/24	100% CD

SOBE PROJECT NO:	2102276
DATE:	10/09/21
DRAWN BY:	CADD
CHECKED BY:	AC
APPROVED BY:	AC

SHEET TITLE
ELECTRICAL SITE PLAN PHASE 4 - DEMO

SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE

ED-1.5

NOT FOR BID

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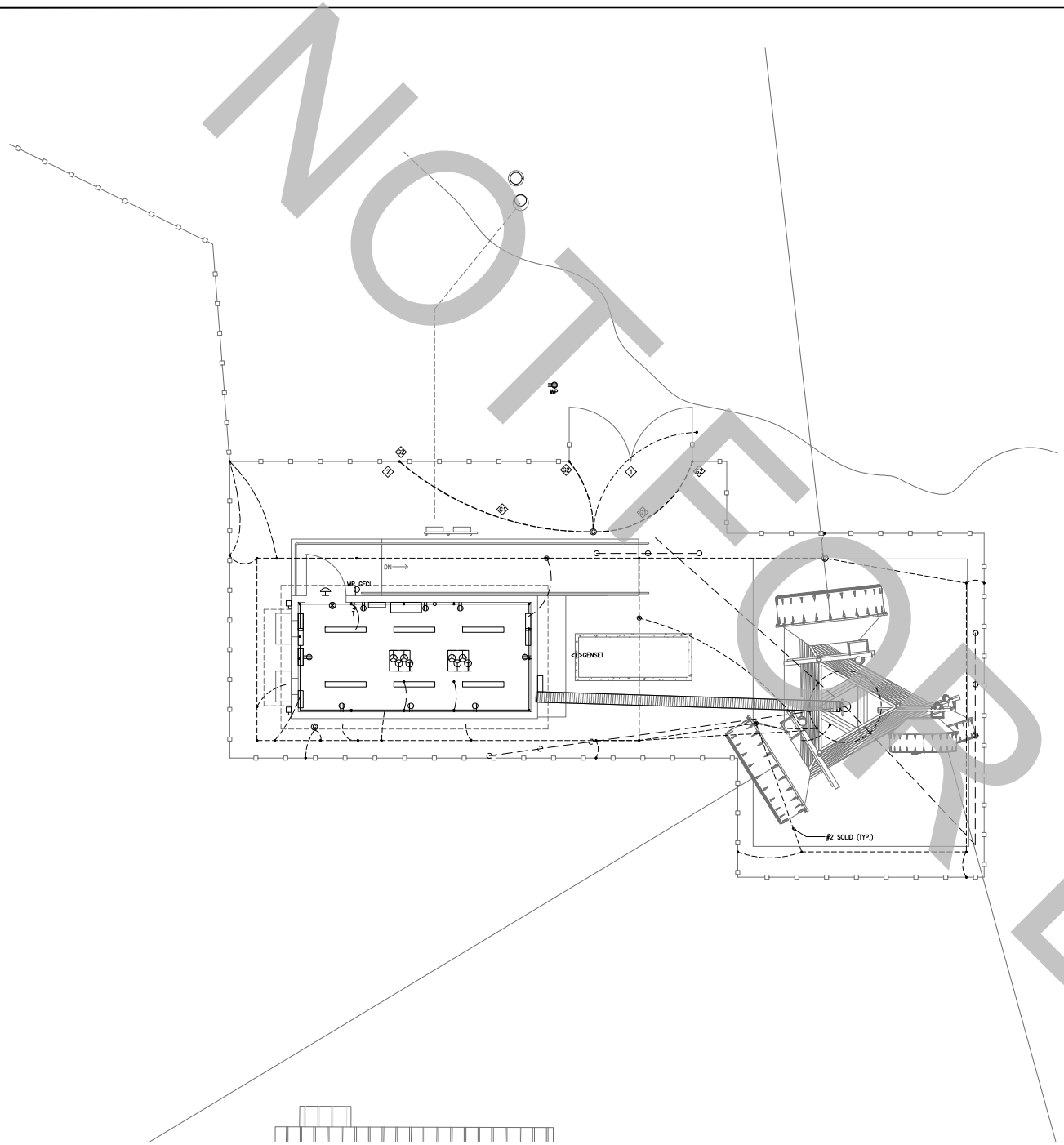

1 ELECTRICAL SITE PLAN PHASE 4 - NEW
SCALE: 1/4" = 1' - 0"

NOT FOR BID

GENERAL SHEET NOTES

A. NEW GROUND ROD AT GROUND WELL SHALL BE CONNECTED TO EXISTING SITE GROUNDING AND NEW GROUND LOOP UNDER CONCRETE PAD.

B. CONTRACTOR SHALL PERFORM GROUNDING RESISTANCE TEST PRIOR TO THE CONSTRUCTION AS THE GROUNDING RESISTANCE BASE LINE. CONTRACTOR SHALL PERFORM SECOND GROUNDING RESISTANCE TEST AFTER GROUNDING SYSTEM IS INSTALLED TO CONFIRM THE RESISTANCE IS LESS THAN 5 OHMS. IF IT IS MORE THAN 5 OHMS, CONTRACTOR SHALL PERFORM ADDITIONAL GROUNDING MITIGATION PER BELOW.

C. IF GROUNDING SYSTEM CANNOT REACH 5 OHMS WITH ADDITIONAL GROUNDING PLATES, FURNISH AND INSTALL LYNCONITE II AS BACKFILL TO SURROUND THE XIT SYSTEMS DURING INSTALLATION. IT IS BASED ON NATURAL CLAY FORMED BY VOLCANIC ACTION. SPECIALLY PROCESSED TO BE VERY ELECTRICALLY CONDUCTIVE. LYNCONITE II ENHANCES THE PERFORMANCE OF THE GROUNDING SYSTEM. IT IS MIXED WITH WATER (14 GALS/BAG) UNTIL A SLURRY IS FORMED (SIMILAR TO PANCAKE BATTER) AND PUMPED OR POURED AROUND THE ELECTRODE IN THE HOLE.

D. CONTRACTOR SHALL BE RESPONSIBLE TO SCAN (OR POLE HOLE) UNDERGROUND UTILITIES AND REBAR LOCATION PRIOR TO ANY SAWCUTTING OR TRENCHING.

E. COORDINATE WITH COUNTY OF SAN BERNARDINO FOR SEQUENCE OF REMOVAL OF EXISTING GENERATOR/ATS. MOP SHALL BE SUBMITTED AND APPROVED BY COUNTY OF SAN BERNARDINO PRIOR TO ANY DISCONNECTION/DEMOLITION. PROVIDE TEMPORARY GENERATOR, LIGHTING AND HVAC TO DATA ROOM AS REQUIRED BY COUNTY OF SAN BERNARDINO.

F. ALL SPARE CIRCUIT BREAKERS SHALL BE TAG AND TURN TO "OFF" POSITION.

G. ALL CEILING HUNG CONDUITS SHALL BE SUPPORTED PER DETAIL AND CODE REQUIREMENT.

H. CONTRACTOR IS RESPONSIBLE FOR ALL OBTAINING PERMITS, FEES AND REMOVAL OF ALL DEBRIS/MATERIALS/SOILS PER LOCAL JURISDICTION REQUIREMENT.

I. GROUNDING TASK LIST:
- ***a. EXCAVATE 12"X36" DITCH AS SPECIFIC AROUND THE EQUIPMENT AND BUILDING FOR THE GROUNDING LOOP AND XIT GROUNDING RODS. NOTICE TO EXCAVATION CONTRACTOR: SOIL IN REGION IS HARD AND ROCKY. EXCAVATION OF TRENCH MAY REQUIRE SPECIALIZED EQUIPMENT.
- ***b. INSTALL HORIZONTAL XIT GROUNDING RODS PER MANUFACTURER SPECIFICATIONS OF SPECIFIED LENGTH AND DIAMETER WITH CONCRETE TRAFFIC RATED BOX AND LID AT THE CONNECTION END.
- ***c. INSTALL 4/0 STRANDED COPPER GROUNDING CABLE IN EXCAVATED TRENCH.
- ***d. BACKFILL GROUNDING RODS AND GROUND WIRES EXCAVATION AREA WITH (APPROX. 6" OF) BETONITE MIXTURE PER MANUFACTURE'S SPECIFICATION.
- ***e. BACKFILL EXCAVATED PATH WITH NO.2 CABON FILL.
- ***f. LAND MECHANICAL GROUNDING CABLE TO EQUIPMENT WITH EXOTHERMIC WELDS.
- ***g. ALL COPPER CABLE CONNECTIONS ARE TO BE EXOTHERMIC UNLESS NOTED.
- ***h. EXOTHERMICALLY WELD GROUNDING SYSTEM LEGS TO EXISTING FENCE POSTS ICE BRIDGE. ABOVE GROUND CONNECTIONS TO FENCING SHALL USE NO.2 STRANDED COPPER WIRE WITHIN NON-METALLIC SEAL TIGHT. FENCES AND MOVING OBJECT THAT ARE TO BE GROUNDED SHALL BE INSTALLED SIMLARLY WITH THE ADDITION OF A 12" STRAIN RELIEF LOOP AT EACH PIVOT POINT.
- ***i. IDENTIFY LOCATION OF EXISTING SHELTER AND TOWER HALOS MAKE CONNECTIONS.
- ***j. TRENCH SHALL BE BACKFILLED WITH SPOILS.
- ***k. SPOILS FROM EXCAVATION SHALL BE DISPERSED ON OR NEAR THE SITE AT THE DIRECTION OF THE PROJECT MANAGER. SPOILS IN NO WAY SHALL INTERFERE WITH WATER RUNOFF OR ROADS.
- ***l. TEST NEW GROUNDING SYSTEM PER COUNTY OF SAN BERNARDINO.
- ***m. GROUNDING TEST REPORT SHALL BE SUBMITTED FOR COUNTY AND EEOR REVIEW AND APPROVAL PRIOR TO CLOSE-OUT.

J. LIGHT WEIGHT SLURRY (2 SACKS) SHALL BE INSTALLED ON TOP OF GROUND WIRING AT ALL LOCATIONS.

E. EXISTING GROUND WIRES SHALL BE PROTECTED IN PLACE. IF DAMAGED, CONTRACTOR IS RESPONSIBLE TO REPAIR AND RECONNECT WITH NEW GROUND WIRES/GROUND RODS/GROUND PLATES.

F. CONDUITS SHALL BE STUB UP IN 45 DEGREE FROM UNDERGROUND TO 6" ABOVE FINISH FLOOR. NO 90 DEGREE BEND IS ALLOWED FOR TELECOM/ANTENNA TOWER CABLES.

REFERENCE SHEET NOTES

1. PROVIDE PERMANENT SWING-OUT GATES WITH LOCKABLE DEVICE PER ARCHITECTURAL AND STRUCTURAL PLAN.
2. PROVIDE PERMANENT FENCES MATCHING EXISTING.

G1. PROVIDE UNDERGROUND BARE COPPER #2 GROUND WIRES

G2. CAD-WALD THEM TO PERMANENT FENCES AND GATES. MATCH EXISTING.

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SHEET TITLE
ELECTRICAL SITE PLAN PHASE 4 - NEW

SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE

E-1.5

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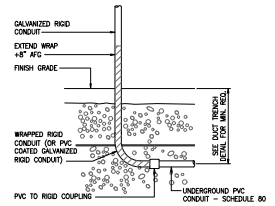
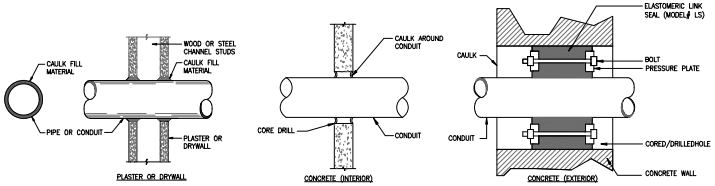
NOT TO BE RUBBED



9 PVC TO RIGID CONDUIT TRANSITION
SCALE: N.T.S.



4 WALL PENETRATIONS
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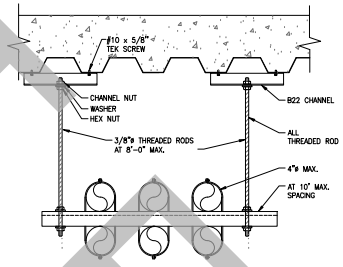
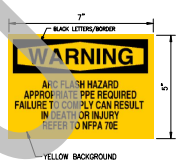


8 SUSPENDED CONDUIT MOUNTING
SCALE: N.T.S.

AUTO START/STOP SIGN

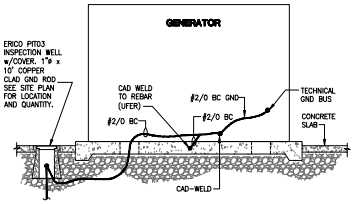
MOUNT ON STANDARD FIBERGLASS PANEL

HAZARDOUS VOLTAGE SIGN



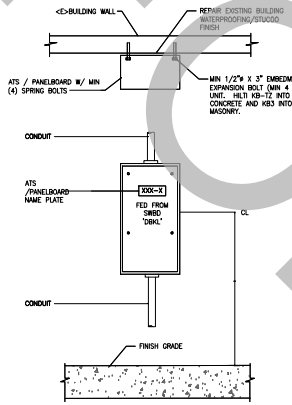
ARC FLASH WARNING LABEL

6 SIGNAGE
SCALE: N.T.S.

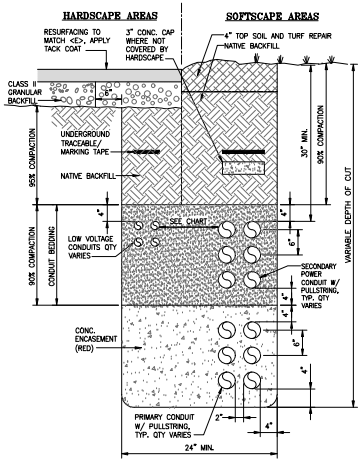


3 FEEDER NAMEPLATE
SCALE: N.T.S.

2 ELECTRICAL EQUIPMENT GROUNDING SECTION
SCALE: N.T.S.



7 ATS/PANEL MOUNTING DETAIL
SCALE: N.T.S.



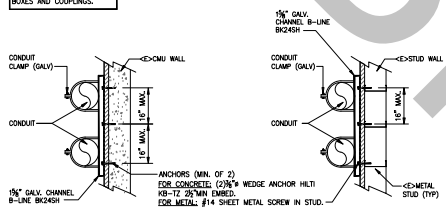
MINIMUM CLEARANCE REQUIREMENTS (INCHES)

	PC	SC	G	TEL	TV	LV	W
PRIMARY CONDUIT (OVER 600V) (PC)	–	8	36	36	36	36	36
SECONDARY POWER CONDUIT (SC)	8	–	12	12	12	12	36
GAS (G)	36	12	–	12	12	12	36
TELEPHONE (TEL)	36	12	12	–	2	2	36
CATV (TV)	36	12	12	2	–	2	36
OTHER LOW VOLTAGE (LV)	36	12	12	2	2	–	36
WET UTILITIES (W)	36	36	36	36	36	36	–

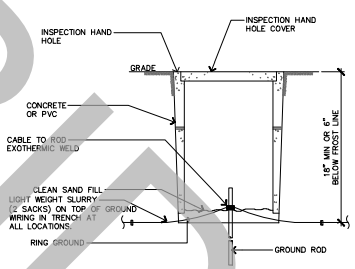
NOTES:
1. UTILITY OWNED AND END-USER CONDUITS AND TRENCH SHALL NOT BE COMBINED.
2. PROVIDE 12" SEPARATION WHEN CROSSING "WET" UTILITIES.

10 TRENCHING DETAIL
SCALE: N.T.S.

NOTES:
PROVIDE CONDUIT SUPPORT MAXIMUM OF EVERY 10ft AND WITHIN 3ft FROM ELECTRICAL BOXES AND COUPLINGS.



5 CONDUIT SUPPORT
SCALE: N.T.S.



NOTE: INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 6" IN WIDTH/DIAMETER

1 GROUND ROD WITH ACCESS
SCALE: N.T.S.

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APPROVED BY:	–

SHEET TITLE
ELECTRICAL DETAILS

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E-5.1

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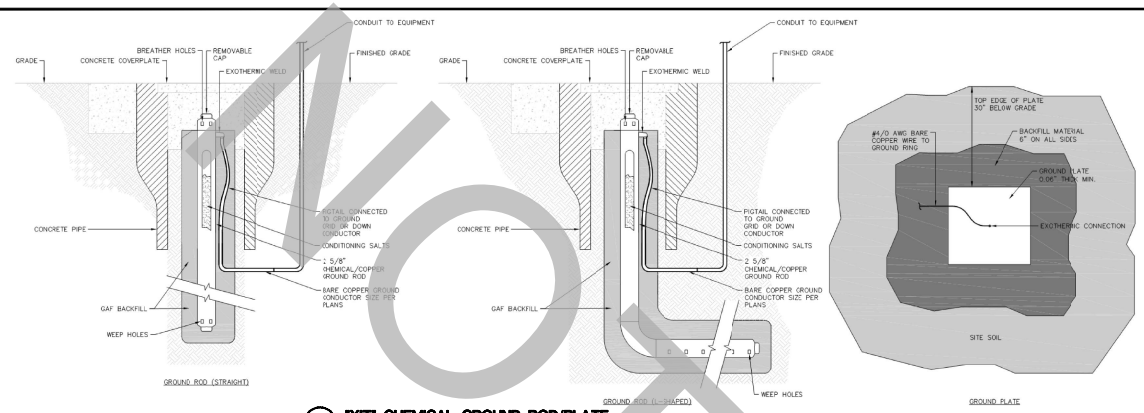
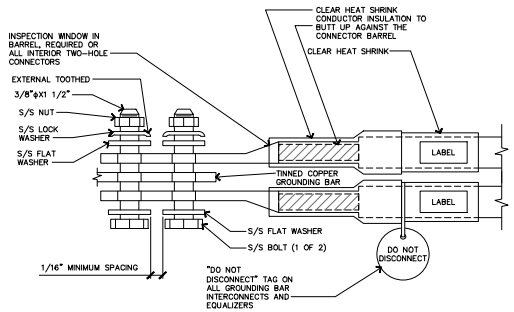


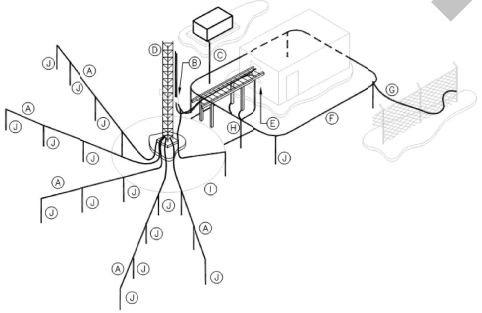
9 "XIT" CHEMICAL GROUND ROD/PLATE

SCALE: N.T.S.



3 INTERIOR TWO HOLES LUG

SCALE: N.T.S.



A. GROUNDING RADIALS
B. MONOPOL: GROUND BUS BAR AND DOWN CONDUCTOR
C. GENERATOR GROUNDING CONDUCTOR
D. MONOPOL:
E. EXTERNAL GROUND BUS BAR
F. SHELTER GROUND RING INSTALLED AT LEAST 36" FROM BUILDING FOUNDATION.
G. FENCE GROUNDING CONDUCTOR
H. GROUND RING BONDING CONDUCTORS
I. TOWER GROUND RING (INSTALLED AT LEAST 24" FROM MONOPOLE FOUNDATION.
J. EATHING ELECTRODES (GROUND RODS OR PLATES TO ACHIEVE REQUIRED RESISTANCE)

8 EXTERNAL GROUNDING ELECTRODE SYSTEM

SCALE: N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PROTECTORS

CABLE ENTRY PORTS (HATCH PLATES) (2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (2 AWG)
TELCO GROUND BAR (2 AWG)
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (2 AWG)
+24V POWER SUPPLY RETURN BAR (2 AWG)
–48V POWER SUPPLY RETURN BAR (2 AWG)
RECTIFIER FRAMES
COAX SUPPRESSION

SECTION "A" – SURGE ABSORBERS

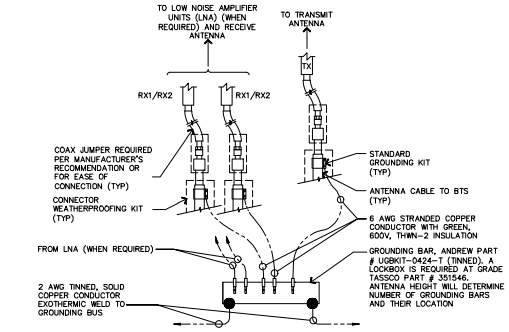
INTERIOR GROUND RING (2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (2 AWG)
BUILDING STEEL (IF AVAILABLE) (2 AWG)

SECTION "I" – ISOLATED GROUND ZONE

ALL COMMUNICATIONS EQUIPMENT FRAMES
ISOLATED GROUND BAR – IGB (2 AWG)

DETAIL NOTES:

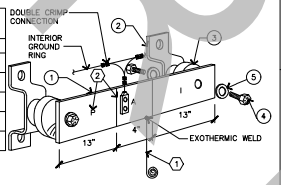
1. EXOTHERMICALLY WELD 2 AWG BARE TINNED SOLID COPPER CONDUCTOR TO GROUND BAR. ROUTE CONDUCTOR TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "I") WITH 1" HIGH LETTERS.



2 ANTENNA GROUNDING BAR

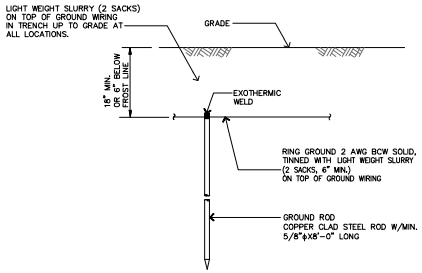
SCALE: N.T.S.

NEWTON INSTRUMENT COMPANY, INC. BUTNER, N.C. OR APPROVED EQUAL			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	1/4"X4"X30"	SOLID GND. BAR
2	2	A-6056	WALL MTG. BRKT.
3	2	3061-4	INSULATORS
4	4	3012-1	5/8"-11X1" H.H.C.S.
5	4	3015-8	5/8 LOCKWASHER



5 GROUND BAR

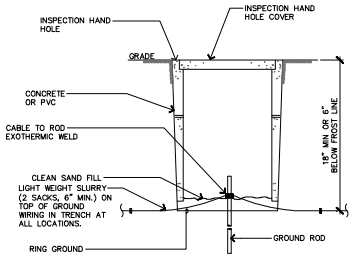
SCALE: N.T.S.



1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.

7 GROUND ROD

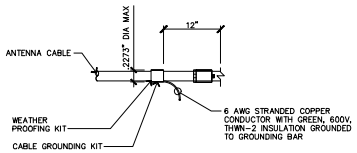
SCALE: N.T.S.



NOTE: INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 6" IN WIDTH/DIAMETER

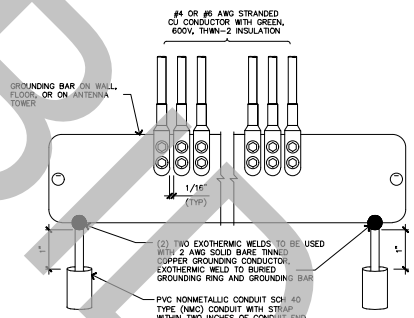
6 GROUND ROD WITH ACCESS

SCALE: N.T.S.



4 CONNECTION OF CABLE GROUND KIT

SCALE: N.T.S.



1 INSTL. OF GRND. CONDUCTOR TO GRND. BAR

SCALE: N.T.S.

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ELECTRICAL DETAILS

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E-5.2

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<N>PANEL	'A'	VOLTAGE	120/ 240 V
LOCATION	–	TYPE	NQOD
AIC RATING	22 KAIC	PHASE	1 WIRE 3

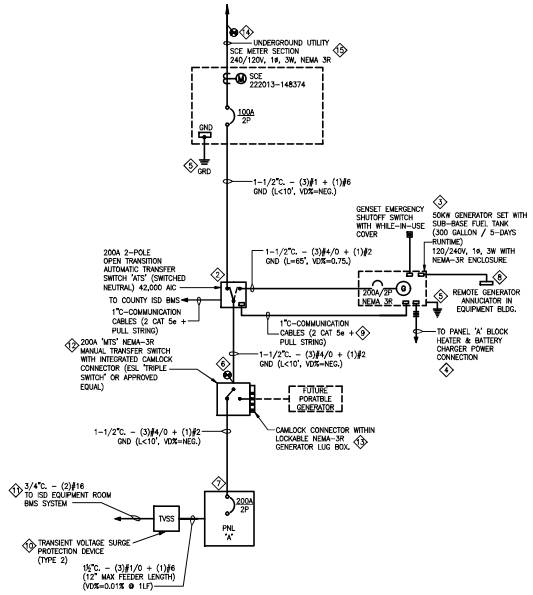
	DESCRIPTION	BRKR P	BRKR T	LOL	KVA LOAD A	KVA LOAD B	KVA LOAD A	KVA LOAD B	LOL	BRKR P	BRKR T	DESCRIPTION	
1	MP RECEPTACLES	1	20	0.0	0.9		0.9		0.0	1	20	TWIST LOCK RECEPTACLE	2
3	RECEPTACLES	1	20	0.0		0.7		0.5	0.0	1	20	TWIST LOCK RECEPTACLE	4
5	HVAC EQUIPMENT CONTROL PANEL	1	20	0.0	0.5		1.5		0.0	2	30	30A MP RECEPTACLE	6
7	GENERATOR BLOCK HEATER	1	20	0.0		0.5		1.5	0.0	-	-	-----	8
9	GENERATOR BATTERY CHARGER	1	20	0.0	0.5		1.5		0.0	2	30	30A MP RECEPTACLE	10
11	AC UNIT AC-2	2	35	X 0.7	2.1			1.5	0.0	-	-	-----	12
13	-----	-	-	X 0.7	2.1		0.5		0.0	1	20	TWIST LOCK RECEPTACLE	14
15	AC UNIT AC-1	2	35	X 0.7	2.1			0.5	0.0	1	20	TWIST LOCK RECEPTACLE	16
17	-----	-	-	X 0.7	2.1		1.5		0.0	2	30	30A MP RECEPTACLE	18
19	LIGHTS	1	20	0.0		0.4		1.5	0.0	-	-	-----	20
21	SPARE	1	20	0.0			1.5		0.0	2	30	30A MP RECEPTACLE	22
23	SPARE	1	20	0.0				1.5	0.0	-	-	-----	24
25	SPARE	1	20	0.0					0.0	1	20	SPARE	26
27	SPARE	1	20	0.0					0.0	1	20	SPARE	28
29	SPARE	1	20	0.0					0.0	1	20	SPARE	30
31	SPARE			0.0					0.0	1	20	SPARE	32
33	SPACE			0.0					0.0	1	20	SPARE	34
35	SPACE			0.0					0.0	1	20	SPARE	36
37	SPACE			0.0					0.0			SPACE	38
39	SPACE			0.0					0.0			SPACE	40
41	SPACE			0.0					0.0			SPACE	42
	SUBTOTAL				2.9	7	7	7	0.0			SUBTOTAL	

MCB OR MLO	MCB	TOTAL LOAD PHASE A	14 KVA
MAIN CIRCUIT BREAKER RATING	225 AMPS	TOTAL LOAD PHASE B	14 KVA
BUSRATING	225 AMPS		
MOUNTING	SURFACE	TOTAL LOL (NEC/CEC 215.2.A.1)	3 KVA
		TOTAL PANEL LOAD (KVA)	32 KVA
		TOTAL PANEL LOAD (AMPS)	132 AMPS

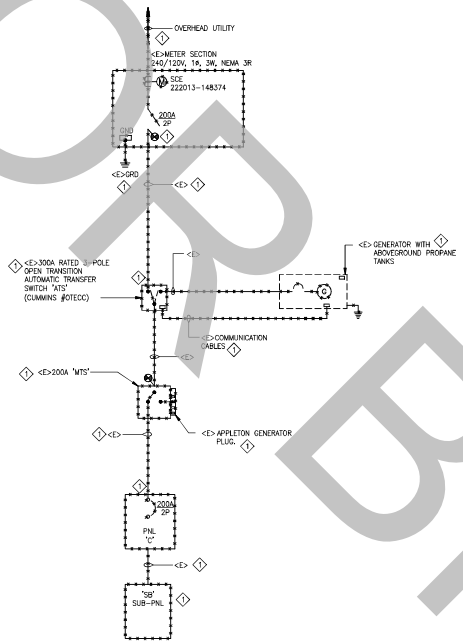
OPTIONS
1 DOOR-IN-DOOR ENCLOSURE
2 COPPER BUSSING
3 PROVIDE INTEGRATED 200A MP RATED TRANSIENT VOLTAGE SURGE PROTECTION DEVICE (TYPE 2)

V 17

3 PANEL SCHEDULE
SCHEMATIC



1 ELECTRICAL SINGLE LINE DIAGRAM - NEW WORK
SCHEMATIC



1 ELECTRICAL SINGLE LINE DIAGRAM - DEMO
SCHEMATIC

GENERAL SHEET NOTES

A. ALL EQUIPMENT SHALL HAVE COPPER BUSSING AND WIRING. ALL TRANSFORMERS SHALL HAVE COPPER WINDING.

B. PROVIDE NEW PRINTED PANEL SCHEDULE AT PANEL DOOR FOR ALL AFFECTED PANEL OR SWITCHBOARD.

C. POWER SHUTDOWN OR CUTOVER SHALL BE APPROVED BY COUNTY OF SAN BERNARDINO PRIOR TO ANY WORK. COORDINATE WITH COUNTY OF SAN BERNARDINO FOR SEQUENCE OF REMOVAL OF EXISTING GENERATOR/ATS. MOP SHALL BE SUBMITTED AND APPROVED BY COUNTY OF SAN BERNARDINO PRIOR TO ANY DISCONNECTION/DEMOLITION. PROVIDE TEMPORARY GENERATOR, LIGHTING AND HVAC TO DATA ROOM AS REQUIRED BY COUNTY OF SAN BERNARDINO.

D. CONTRACTOR IS RESPONSIBLE TO MATCH NEW EQUIPMENT WITH EXISTING EQUIPMENT RATING.

REFERENCE SHEET NOTES

1. DEMOLISH EXISTING ELECTRICAL DEVICES/EQUIPMENT PER PHASING PLAN. COORDINATE WITH SCE AND COUNTY PRIOR TO ANY WORK. SUBMIT MOP (METHOD OF PROCEDURE) FOR ALL POWER SHUTDOWN, POWER CUTOVER FOR APPROVAL. TEMPORARY POWER, LIGHTING AND HVAC SHALL BE PROVIDED DURING CONSTRUCTION.
2. FURNISH AND INSTALL ATS PER SPECIFICATION. COORDINATE WITH MANUFACTURER FOR EXACT REQUIREMENT.
3. FURNISH AND INSTALL GENERATOR PER SPECIFICATION AND FLOOR PLAN. COORDINATE WITH MANUFACTURER FOR EXACT REQUIREMENT.
4. PROVIDE (2)120V CIRCUITS TO GENERATOR FOR BLOCK HEATER AND BATTERY CHARGER. VERIFY WITH GENERATOR MANUFACTURER FOR EXACT REQUIREMENT.
5. GROUNDING WITHIN GROUND WELL PER FLOOR PLAN AND DETAIL.
6. INTERCEPT AND EXTEND TO EXISTING MANUAL TRANSFER SWITCH. FIELD VERIFY FOR EXACT POINT OF CONNECTION.
7. CONNECT MTS TO <E>PANEL 'A'. FIELD VERIFY FOR FEEDER EXACT ROUTING.
8. PROVIDE COMMUNICATION WIRING IN 3/4" CONDUIT BETWEEN GENERATOR ANNUNICATOR AND GENERATOR FOR GENERATOR STATUS.
9. PROVIDE COMMUNICATION CONNECTION TO ATS FOR GENERATOR START. COORDINATE WITH MANUFACTURER FOR EXACT REQUIREMENT.
10. FURNISH AND INSTALL AC TRANSIENT VOLTAGE SURGE SUPPRESSOR (ACDATA SOLUTION #SB2XRR). INSTALL SUPPRESSOR BELOW EXISTING PANEL. VERIFY WITH MANUFACTURER FOR EXACT REQUIREMENT.
11. FURNISH AND INSTALL ALARM CONNECTION TO <E>BMS. COORDINATE WITH SBC ISD FOR <E>BMS TERMINATION. VERIFY WITH MANUFACTURER FOR EXACT REQUIREMENT.
12. FURNISH AND INSTALL MANUAL TRANSFER SWITCH. VERIFY WITH COUNTY OF SAN BERNARDINO FLEET MANAGEMENT FOR EXACT REQUIREMENT.
13. FURNISH AND INSTALL CAMLOCK CONNECTOR FOR FUTURE PORTABLE GENERATOR. VERIFY WITH COUNTY OF SAN BERNARDINO FLEET MANAGEMENT FOR EXACT REQUIREMENT.
14. COORDINATE WITH SCE AND PROVIDE UNDERGROUND FEEDER REQUIREMENT AND ROUTING. CONTRACTOR SHALL BE RESPONSIBLE SCE DESIGN FEE OF UNDERGROUND FEEDER.
15. FURNISH AND INSTALL NEMA-3R SCE METER WITH CIRCUIT BREAKER PER SCE REQUIREMENT AND FLOOR PLAN.

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800MHz UPGRADE SKYLAND PEAK TOWER

ISSUE		
MARK	DATE	DESCRIPTION
	06/14/23	95% CD
	01/12/24	100% CD

SOBE PROJECT NO:	2102276
DATE:	10/09/21
DRAWN BY:	–
CHECKED BY:	–
APPROVED BY:	–

SHEET TITLE
ELECTRICAL SINGLE INE DIAGRAM

SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE

E-7.1

NOT FOR BID

THIS DRAWING IS 30" X 42" AT FULL SIZE, 15" X 21" AT HALF SIZE. © 2015 BY SALAS O'BRIEN ENGINEERS, INC.

THIS DRAWING IS 30" X 42" AT FULL SIZE, 15" X 21" AT HALF SIZE. © 2015 BY SALAS O'BRIEN ENGINEERS, INC.

STRUCTURAL GENERAL NOTES

I. DESIGN CRITERIA:

1. APPLICABLE CODES:
   2022 CALIFORNIA BUILDING CODE
2. GRAVITY LOADS
   60 PSF ROOF DEAD LOAD
   20 PSF ROOF LIVE LOAD
   75 PSF ROOF SNOW LOAD
3. SEISMIC LOADS:
   RISK CATEGORY: IV
   SITE CLASS: D
   IMPORTANCE FACTOR I: 1.5
   SITE ACCELERATIONS Ss: 2.016g
   Sms: 2.419g
   Sds: 1.613g
4. WIND LOADS
   125 MPH ULTIMATE WIND SPEED
   EXPOSURE C
5. TOWER BASE REACTIONS (LRFD) – PRELIMINARY
   MOMENT = 3050 FT-KIPS
   SHEAR = 66 KIPS
   AXIAL = 19 KIPS
6. GEOTECHNICAL REPORT:
   BSK ASSOCIATES, GEOTECHNICAL ENGINEERING INVESTIGATION, SKYLAND PEAK ANTENNA PROJECT, CRESTLINE, SAN BERNARDINO COUNTY, CALIFORNIA, BSK PROJECT C21-287-118, NOVEMBER 1, 2021

   BEARING CAPACITIES: DEAD PLUS LIVE LOAD 3000 PSF
   TOTAL LOAD INCLUDING WIND & SEISMIC 4000 PSF

II. GENERAL:

1. ALL MATERIALS AND WORKMANSHIP SHALL BE OF A QUALITY COMPATIBLE WITH THE REQUIREMENTS OF THE 2022 EDITION OF THE CALIFORNIA BUILDING CODE AND ALL LOCAL CITY AND COUNTY ORDINANCES, WHICHEVER MAY APPLY.
2. ALL WORK SHOWN ON THESE DRAWINGS IS NEW UNLESS NOTED EXISTING (E).
3. THE CONDITIONS SHOWN FOR EXISTING CONSTRUCTION REFLECT INFORMATION SHOWN ON THE ORIGINAL CONSTRUCTION DRAWINGS AND DRAWINGS DESCRIBING SUBSEQUENT BUILDING IMPROVEMENTS. THE CONTRACTOR SHALL REFER TO ALL AVAILABLE DRAWINGS AND FIELD OBSERVATIONS FOR VERIFICATION OF EXISTING CONDITIONS AS REQUIRED.
4. THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS AND CONDITIONS BEFORE THE START OF ANY CONSTRUCTION, ORDERING OR FABRICATING ANY MATERIAL. ANY DISCREPANCIES BETWEEN THE CONDITIONS FOUND AND THOSE SHOWN ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER FOR CLARIFICATION BEFORE WORK PROCEEDS.
5. ALL OMISSION AND CONFLICTS BETWEEN THE VARIOUS ELEMENTS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.
6. IT SHALL BE THE CONTRACTORS SOLE RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING, FORMWORK, ETC., AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION, AND TO HOLD ALL NEW OR REVISED ELEMENTS IN PLACE UNTIL FINAL SUPPORT CONDITIONS ARE COMPLETED.
7. THE CONTRACTOR SHALL PROTECT ALL PIPES, DUCTS, ARCHITECTURAL FINISHES, AND UTILITIES FROM DAMAGE DURING CONSTRUCTION AND RESTORE ALL DAMAGED ITEMS TO ORIGINAL CONDITION, UNLESS NOTED OTHERWISE.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WHETHER SHOWN HEREON OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE OF REPAIR OR REPLACEMENT IN CONJUNCTION WITH THE PROSECUTION OF THIS WORK.
9. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WELDING NEAR WOOD OR OTHER FLAMMABLE MATERIALS.
10. THE CONTRACTOR IS RESPONSIBLE TO FURNISH AND MAINTAIN NECESSARY BARRICADES, COVERINGS OR OTHER PROTECTIVE DEVICES AS NEEDED TO PROTECT EQUIPMENT, ADJACENT SURFACES AND MEET SAFETY REQUIREMENTS. THE CONTRACTOR SHALL REMOVE THESE MATERIALS ONCE THE PROJECT HAS BEEN COMPLETED.
11. WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR SIMILAR WORK. THE CONTRACTOR SHALL CONFIRM THE USE OF SIMILAR DETAILS WITH THE STRUCTURAL ENGINEER PRIOR TO COMMENCEMENT OF THE WORK.
12. THE INFORMATION AND DETAILS FOR THE EXISTING STRUCTURE SHOWN ON THE STRUCTURAL DOCUMENTS ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE STRUCTURAL DRAWINGS.
13. THE CONTRACTOR SHALL REVIEW THE EXISTING CONDITIONS PRIOR TO THE START OF WORK AND DURING THE COURSE OF CONSTRUCTION TO DETERMINE THE PRESENCE, IF ANY, OF ASBESTOS OR OTHER HAZARDOUS MATERIALS. IF DISCOVERED, THE CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER AND TAKE APPROPRIATE PRECAUTIONARY MEASURE TO CONTAIN HAZARDOUS MATERIALS UNTIL THE OWNER CAN DEVELOP AN APPROPRIATE DISPOSITION PLAN.
14. THE STRUCTURAL SYSTEMS HAVE BEEN DESIGNED TO CARRY THE SUPERIMPOSED LIVE LOADS AS PRESCRIBED BY THE CALIFORNIA BUILDING CODE AND IN ACCORDANCE WITH STANDARD ENGINEERING PRACTICES, WITH NO SPECIAL PROVISIONS TO CARRY CONCENTRATED LOADS FROM STORAGE AND HANDLING OF CONSTRUCTION MATERIALS OR FROM OPERATION OF CONSTRUCTION EQUIPMENT.

III. ADDITIONAL SAFETY NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SAFETY. THE FOLLOWING REQUIREMENTS ARE NOT INTENDED TO BE A COMPLETE LIST, BUT ARE ADDITIONAL SAFETY REQUIREMENTS FOR THE CONTRACTOR. OBSERVATION VISITS TO THE SITE BY THE ENGINEER SHALL NOT BE DEEMED AS INSPECTION.
2. THE STRUCTURE SHOWN IN THESE DRAWINGS IS STRUCTURALLY SOUND ONLY IN ITS COMPLETE FORM. THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS, ETC IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND HAS NOT BEEN CONSIDERED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE AT ALL TIMES DURING CONSTRUCTION.
3. AN ERECTION PLAN IS REQUIRED FOR MOST CONSTRUCTION PHASES. CONTRACTOR SHALL DETERMINE ALL CONSTRUCTION PHASES WHICH REQUIRE ERECTION PLANS ACCORDING TO ALL APPLICABLE SAFETY REGULATIONS. A CERTIFIED COPY OF SUCH ERECTION PLANS SHALL REMAIN ON THE CONSTRUCTION SITE AT ALL TIMES.
4. CONTRACTOR SHALL DETERMINE IF A CAL OSHA PERMIT IS REQUIRED, IF SO, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN SUCH PERMIT.
5. ALL TEMPORARY FLOOR AND ROOF OPENINGS LACKING GUARDRAILS SHALL BE ADEQUATELY COVERED AND DESIGNED TO RESIST CONSTRUCTION TRAFFIC LOADS.

IV. SPECIAL INSPECTION:

1. SPECIAL INSPECTIONS AND OBSERVATION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 1704 AND 1706 OF THE CBC 2022, AND IS REQUIRED FOR THE FOLLOWING UNLESS SPECIFICALLY NOTED OTHERWISE:
   A. CONCRETE REINFORCING STEEL PLACEMENT
   B. PLACEMENT OF CONCRETE & GROUT
   C. CONCRETE & GROUT COMPRESSION TESTS
   D. INSTALLATION OF EMBEDDED ANCHOR BOLTS, EXPANSION ANCHORS AND EPOXY ANCHORS.
   E. SUBGRADE PREPARATION AND COMPACTION
   F. MASONRY WALL CONSTRUCTION PER CBC-2022 SECTION 1705.4, TMS 402/ACI 530/ASCE 5, AND TMS 602/ACI 530.1/ASCE 6.
2. ALL WELDERS SHALL BEAR CURRENT QUALIFICATION CERTIFICATES FOR THE MATERIAL, WELDING POSITIONS, AND WELDING PROCESSES EMPLOYED IN THE WORK. CERTIFICATES FOR EACH WELDER SHALL BE CHECKED BY THE WELDING INSPECTOR PRIOR TO WELDING.
3. WELDING INSPECTORS SHALL BE QUALIFIED FOR THE METHODS EMPLOYED IN THE WORK AS PER ASNT AND AWS D1.1 REQUIREMENTS.
4. THE SPECIAL INSPECTOR SHALL BRING ALL DISCREPANCIES IMMEDIATELY TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF NOT CORRECTED TO THE SATISFACTION OF THE INSPECTOR, THE DISCREPANCIES SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE DISTRICT AND STRUCTURAL ENGINEER.
5. THE SPECIAL INSPECTOR SHALL FURNISH TIMELY INSPECTION REPORTS TO THE DISTRICT AND THE STRUCTURAL ENGINEER FOR REVIEW AND ACCEPTANCE. THE INSPECTOR SHALL ALSO SUBMIT A FINAL REPORT, SIGNED BY HIMSELF AND BEARING THE SEAL AND SIGNATURE OF A CIVIL ENGINEER REGISTERED IN CALIFORNIA, STATING WHETHER THE WORK REQUIRING INSPECTION WAS IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CBC.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REPLACING ALL WORK WHICH IS DETERMINED BY TESTING AND INSPECTION NOT TO COMPLY WITH SPECIFIED STANDARDS.

V. SUBMITTALS:

1. PRIOR TO PROCEEDING WITH THE WORK, THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE STRUCTURAL ENGINEER FOR REVIEW:
   A. CONCRETE REINFORCING STEEL PLACEMENT
   B. PLACEMENT OF CONCRETE & GROUT
   C. CONCRETE & GROUT COMPRESSION TESTS
   D. INSTALLATION OF EMBEDDED ANCHOR BOLTS, EXPANSION ANCHORS AND EPOXY ANCHORS.
   E. SUBGRADE PREPARATION AND COMPACTION
   F. MASONRY WALL CONSTRUCTION PER CBC-2022 SECTION 1705.4, TMS 402/ACI 530/ASCE 5, AND TMS 602/ACI 530.1/ASCE 6.
2. REVIEW OF SUBMITTALS BY THE STRUCTURAL ENGINEER IS ONLY FOR GENERAL CONFORMANCE WITH DESIGN INTENT. REVIEW OF THE DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR COMPLETING THE WORK IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.
3. INDICATE PROFILES, SIZES, SPACING, AND LOCATIONS OF STRUCTURAL MEMBERS, CONNECTIONS, ATTACHMENTS, FASTENERS, CAMBERS, HOLES AS PER CONSTRUCTION DRAWINGS.
4. SHOP DRAWINGS SHALL SHOW CONNECTIONS AS INDICATED ON CONSTRUCTION DRAWINGS. WHERE ALTERNATIVE CONNECTIONS ARE SUBSTITUTED FOR THOSE INDICATED ON THE CONSTRUCTION DRAWINGS, SUBMIT DATA (CALCULATIONS OR TEST) DEMONSTRATING THAT THEY ARE OF EQUIVALENT OR SUPERIOR STRENGTH, STIFFNESS AND DUCTILITY TO THOSE SHOWN ON THE CONSTRUCTION DRAWINGS FOR STRUCTURAL ENGINEER'S APPROVAL. CLEARLY INDICATE ALL ALTERNATIVELY DETAILED CONNECTIONS ON SHOP DRAWINGS.
5. SUBMIT THE FOLLOWING TO THE STRUCTURAL ENGINEER FOR RECORD PURPOSES:
   A. MILL CERTIFICATES AND TEST REPORTS FOR ALL REINFORCING STEEL
   B. MILL CERTIFICATES AND TEST REPORTS FOR ALL STRUCTURAL STEEL

VI. CONCRETE & REINFORCING:

1. ALL CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 318-19, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".
2. REINFORCING BARS AND DOWELS SHALL BE DEFORMED BARS AND SHALL CONFORM TO ASTM SPECIFICATION A615 OR A706, GRADE 60.
3. MINIMUM CLEAR DISTANCES BETWEEN REINFORCING STEEL AND FACE OF CONCRETE ARE AS FOLLOWS:
   A. CONCRETE CAST AGAINST & PERMANENTLY EXPOSED TO EARTH OR WEATHER:
      ALL BAR SIZES 3"
   B. CONCRETE EXPOSED TO EARTH OR WEATHER:
      #6 BAR AND LARGER 2"
      #5 BAR AND SMALLER 1-1/2"
   C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND:
      #14 BAR AND LARGER 1-1/2"
      #11 BAR AND SMALLER 3/4"
4. WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, THE EXISTING SURFACE SHALL BE SOUND, CLEAN, FREE OF PAINT AND LATANCE, AND ROUGHENED TO EXPOSE AGGREGATE. A BONDING AGENT ("WELDCRETE" BY LARSEN PRODUCTS, OR APPROVED EQUAL) SHALL BE APPLIED TO EXISTING CONCRETE SURFACES PRIOR TO PLACING NEW CONCRETE AGAINST EXISTING CONCRETE.
5. CONCRETE SHALL BE NORMAL WEIGHT AGGREGATE CONCRETE & SHALL HAVE A MINIMUM TWENTY-EIGHT DAY COMPRESSIVE STRENGTH (f'c) OF 4,500 PSI UNLESS OTHERWISE NOTED.
6. CEMENT SHALL CONFORM TO ASTM C-150, TYPE I.
7. AGGREGATES SHALL BE HARD ROCK AND SHALL CONFORM TO ASTM C-33.
8. READY-MIX CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH ASTM C-94.
9. PROJECTING CORNERS SHALL BE FORMED WITH A 3/4-INCH CHAMFER, UNLESS OTHERWISE NOTED.
10. ALL PIPES AND DUCTS THROUGH CONCRETE SHALL BE SLEEVED. VERIFY OPENINGS WITH PLUMBER AND ELECTRICIAN.

VII. ANCHORS & DOWELS:

1. INSTALL ALL CONCRETE ANCHORS IN ACCORDANCE WITH THE REQUIREMENTS GIVEN IN THE ICOLA RESEARCH COMMITTEE RECOMMENDATIONS FOR THE ANCHOR. ALL INSTALLED ANCHORS SHALL HAVE SPECIAL INSPECTION.
2. CONCRETE EXPANSION ANCHORS SHALL BE HILTI KWIK BOLT TZ2 STAINLESS STEEL WEDGE ANCHORS OR EQUAL. INSTALL PER ICC ESR-4266. SPECIAL INSPECTION IS REQUIRED.
3. EPOXY ANCHORS AND DOWELS SHALL BE HILTI HIT-RE 500 V3 OR EQUAL. INSTALL PER ICC ESR-3814. SPECIAL INSPECTION IS REQUIRED.
4. SUBSTITUTIONS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO INSTALLATION.
5. WHEN INSTALLING DRILLED-IN ANCHORS IN EXISTING CONCRETE MEMBERS, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCEMENT AND THE DRILLED-IN ANCHOR.
6. INSTALLATION OF DRILLED IN EXPANSION-TYPE AND EPOXY ANCHORS SHALL BE CONTINUOUSLY INSPECTED BY THE OWNER'S REPRESENTATIVE. 25 PERCENT OF ALL EXPANSION-TYPE ANCHORS (ALTERNATE BOLTS IN ANY GROUP) AND 10 PERCENT EPOXY ANCHORS SHALL BE TESTED BY THE OWNER'S TESTING LABORATORY FOR THE PULLOUT LOADS OR TORQUE AS INDICATED IN THE TABLES BELOW. IF ANY ANCHOR FAILS, IT SHALL BE REPLACED AND THE IMMEDIATELY ADJACENT BOLTS SHALL ALSO BE TESTED AT CONTRACTOR'S EXPENSE. TESTING SHALL BE PER FOLLOWING SCHEDULES.

WEDGE ANCHOR EXPANSION BOLTS – HILTI KWIK BOLT TZ2

ANCHOR DIAMETER (IN)	MINIMUM EMBEDMENT (IN)	TORQUE TEST PER MANUFACTURER RECOMMENDATIONS (FT-LBS)	
		CARBON STEEL	STAINLESS STEEL
3/8	2 1/2	30	30
1/2	3	50	40
5/8	3 3/4	40	60
3/4	4 1/2	110	125

EPOXIED DOWELS

REBAR SIZE (GRADE 60)	MINIMUM EMBEDMENT (IN)	TEST LOAD IN NORMAL WEIGHT CONCRETE (LBS)	
		2,500 PSI CONCRETE	4,000 PSI CONCRETE
No. 3	3.5	2900	3260
No. 4	4	4430	6300
No. 5	5	5820	8340
No. 6	7	9210	11400
No. 7	7.5	11365	13700
No. 8	8	15190	18100

EPOXIED THREADED ROD (ASTM A36) OR SS (AISI 304/316)

ROD SIZE (IN)	MINIMUM EMBEDMENT (IN)	TEST LOAD IN NORMAL WEIGHT CONCRETE (LBS)	
		2,500 PSI CONCRETE	4,000 PSI CONCRETE
3/8	3	2820	3400
1/2	4	4240	5500
5/8	5	6900	7900
3/4	6	7700	11900
7/8	7	11900	15100
1	8	13250	16800
1 1/4	12	24400	31100

VIII. MASONRY

1. MASONRY CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF ACI 530.1-11/ASCE 6-11/TMS 602-11 "SPECIFICATION FOR MASONRY STRUCTURES".
2. CONCRETE BLOCK, TYPE I. GRADE N-1. ALL WALLS TO BE SOLID GROUTED.
3. ALL UNITS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH fm' OF 2000 PSI.
4. MORTAR USED SHALL BE TYPE S WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI AT 28 DAYS. MIX ONE PART PORTLAND CEMENT, ONE HALF PART LIME PUTTY, FOUR AND ONE-HALF PARTS SAND.
5. GROUT USE SHALL CONFORM TO A.S.T.M. DESIGNATION C476-71 WITH A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI AT 28 DAYS. USE ONE PART CEMENT, THREE PARTS SAND AND TWO PARTS PEA GRAVEL TO BE OF FLUID CONSISTENCY.
6. PROVIDE CLEAN-OUTS IN THE BOTTOM COURSE OF MASONRY FOR EACH GROUT POUR WHEN THE GROUT POUR EXCEEDS 5'-4" PER ACI 530.1-11/ASCE6-11/TMS 602-11 "SPECIFICATION FOR MASONRY STRUCTURES"
7. THE GROUT LIFT HEIGHT SHALL NOT EXCEED 12.67 FEET WHEN THE MASONRY HAS CURED FOR 4 HOURS. THE GROUT SLUMP IS MAINTAINED BETWEEN 10 AND 11 INCHES, AND NO INTERMEDIATE REINFORCED BOND BEAMS ARE PLACED BETWEEN THE TOP AND BOTTOM OF THE POUR HEIGHT. OTHERWISE THE GROUT LIFT HEIGHT SHALL NOT EXCEED 5'-4"
8. THE THICKNESS OF GROUT BETWEEN BLOCK UNITS AND REINFORCING STEEL SHALL BE NOT LESS THAN ¼" AND NOT LESS THAN ¼" BETWEEN PARALLEL REINFORCING BARS.
9. IF WORK IS STOPPED FOR ONE HOUR OR LONGER, PROVIDE HORIZONTAL CONSTRUCTION JOINTS BY STOPPING THE GROUT 1 ½" BELOW THE TOP OF BLOCK.
10. REINFORCING BARS AND DOWELS SHALL BE DEFORMED BARS AND SHALL CONFORM TO ASTM SPECIFICATION A615 OR A706, GRADE 60.
11. REINFORCING STEEL TO LAP WHERE SPLICED 50 DIAMETERS.
12. REINFORCEMENT SHALL BE SUPPORTED TO PREVENT DISPLACEMENTS BEYOND TOLERANCES ALLOWED BY 3.4 OF ACI 530.1 PRIOR TO GROUTING.
13. CONTINUOUS SPECIAL INSPECTION IS REQUIRED U.N.O.

IX. STRUCTURAL STEEL:

1. ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) PUBLICATION "SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL BUILDINGS".
2. AT CONTRACTORS OPTION, SHEAR TABS FOR STEEL BEAMS MAY BE FIELD WELDED TO BEAM WEBS TO FACILITATE ERECTION.
3. COMPLETE WELDING PROCEDURE SHALL BE SUBMITTED TO AND APPROVED BY THE STRUCTURAL ENGINEER OF RECORD AND THE BUILDING DEPARTMENT BEFORE ANY WELDING IS COMMENCED.
4. STRUCTURAL STEEL SHALL BE AS FOLLOWS:

BEAMS AND COLUMNS	ASTM A572 GR 50 OR ASTM A992
GUSSET PLATE	ASTM A36
ANGLES	ASTM A36
CHANNELS	ASTM A36
TUBE STEEL	ASTM A500 (GRADE B)
CONTINUITY PLATES	ASTM A572 (GRADE 50)
BASE PLATES (LESS THAN 4" THK.)	ASTM A572 (GRADE 50)
BASE PLATES (GREATER THAN 4" THK.)	ASTM A572 (GRADE 42)
MISC. PLATES	ASTM A36
PIPE COLUMNS	ASTM A53 TYPE "E" OR "S" (GR B)
STIFFENER/SHEAR PLATES	ASTM A36

5. FABRICATE STRUCTURAL STEEL MEMBERS IN ACCORDANCE WITH AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS AND AISC CODE OF STANDARD PRACTICE.
6. FABRICATE STRUCTURAL ELEMENTS IN THE LARGEST SECTIONS PRACTICAL, CONSIDERING TRANSPORT AND ERECTION REQUIREMENTS.
7. ALL WELDING SHALL BE PERFORMED UNDER A PRE-QUALIFIED OR QUALIFIED BY TEST WELDING PROCEDURE, PER AWS D1.1. SUBMIT WRITTEN WELDING PROCEDURES FOR EACH CLASS OF WELD (POSITION, PROCESS, MATERIAL TYPE, FILLER METAL TYPE, JOINT PREPARATION, PRE-HEAT, POST-HEAT AND THICKNESS) FOR BOTH PRE-QUALIFIED AND QUALIFIED BY TEST PROCEDURES AS PER AWS D1.1. FOR QUALIFIED BY TEST PROCEDURES, SUBMIT TEST DATA AS PER AWS D1.1.
8. ALL WELDING SHALL BE DONE BY THE SHIELDED ARC PROCESS USING APPROVED ELECTRODES PER AWS SPECIFICATION E70XX (LOW HYDROGEN ELECTRODES). WELDING SHALL CONFORM TO THE LATEST EDITION OF AWS D1.1 AND SHALL BE PERFORMED BY CERTIFIED WELDERS QUALIFIED UNDER THE PROCEDURES CONTAINED THEREIN.
9. ALL BOLT HOLES IN STEEL SHALL BE 1/16" LARGER THAN THE NOMINAL BOLT DIAMETER UNLESS OTHERWISE NOTED.
10. ALL STRUCTURAL STEEL SHAPES EXPOSED TO WEATHER SHALL RECEIVE A GALVANIZED ZINC COATING OF 2.3 OUNCES PER SQUARE FOOT IN ACCORDANCE WITH ASTM A123 AFTER SHOP FABRICATION. ALL HARDWARE FOR SUCH STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
11. REPAIR DAMAGED GALVANIZED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY THE APPLICATION OF STICK OR THICK PASTE MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING, AS APPROVED BY THE STRUCTURAL ENGINEER. CLEAN AREAS TO BE REPAIRED AND REMOVE THE SLAG FROM THE WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTE; SPREAD THE MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE THE EXCESS MATERIAL OFF.

ERECTION OF STEEL:

1. ERECT STRUCTURAL STEEL IN ACCORDANCE WITH AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC CODE OF STANDARD PRACTICE AND AISC SPECIFICATION FOR HIGH STRENGTH BOLTED CONNECTIONS.
2. MAKE PROVISION FOR ERECTION LOADS, AND FOR SUFFICIENT TEMPORARY BRACING TO MAINTAIN STRUCTURE SAFE, PLUMB, AND IN TRUE ALIGNMENT UNTIL COMPLETION OF ERECTION AND INSTALLATION OF PERMANENT BRACING.
3. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT APPROVAL OF STRUCTURAL ENGINEER UNLESS SPECIFICALLY NOTED ON CONSTRUCTION DRAWINGS OR APPROVED SHOP DRAWINGS.
4. AFTER ERECTION, INSPECTION AND TESTING OF STEEL (EXCEPT GALVANIZED STEEL, OR STEEL TO BE IN CONTACT WITH OR EMBEDDED IN CONCRETE), PRIME WELDS, ABRASIONS, AND SURFACES NOT SHOP PRIMED, OR DAMAGED. USE A PRIMER COMPATIBLE WITH SHOP COAT.
5. AFTER ERECTION, INSPECTION AND TESTING OF GALVANIZED STEEL, REPAIR DAMAGED GALVANIZED COATING AND GALVANIZE WELDS.

ERECTION TOLERANCES:

1. MAXIMUM VARIATION FROM PLUMB: 1/8 INCH PER TEN FEET.
2. MAXIMUM OFFSET FROM TRUE ALIGNMENT: 1/4 INCH.

X. METAL DECK:

1. METAL DECK SHALL BE FORMED STEEL DECK AS MANUFACTURED BY VERCO INCORPORATED OR APPROVED EQUAL. DECK SHALL BE FABRICATED FROM GALVANIZED STEEL CONFORMING TO ASTM A653, "STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT-DIP PROCESS", STRUCTURAL QUALITY. COATING SHALL CONFORM TO CLASSIFICATION G60.
2. ALL OPENINGS REQUIRED IN THE DECK WHICH ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE CUT IN THE FIELD ONLY AS APPROVED BY THE ENGINEER.

ABBREVIATIONS

AB	ANCHOR BOLT
AFF	ABOVE FINISHED FLOOR
ADD'L	ADDITIONAL
AGG	AGGREGATE
ALT	ALTERNATE
ARCH	ARCHITECT OR ARCHITECTURAL
BFF	BELOW FINISHED FLOOR
BDRM	BEDROOM
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BOT	BOTTOM
BTWN	BETWEEN
<->	CENTERLINE
CJ	CEILING JOISTS
CMU	CONCRETE MASONRY UNIT(S)
CALCS	CALCULATIONS
CLG	CEILING
CLR	CLEAR OR CLEARANCE
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUATION OR CONTINUOUS
CONTR	CONTRACTOR
COR	CORNER
DF	DOUGLAS FIR
DL	DEAD LOAD
DS	DOWNSPOUT
DBL	DOUBLE
DET	DETAIL
DIA OR ø	DIAMETER
DIM	DIMENSION
DN	DOWN
(E)	EXISTING
EJ	EXPANSION JOINT
ELEV	ELEVATION
EN	EDGE NAIL
EA	EACH
ES	EACH SIDE
EQ	EQUAL
EW	EACH WAY
EXT	EXTERIOR
(F)	FUTURE
FJ	FLOOR JOIST
FLR	FLOOR
FS	FAR SIDE
FOUND OR FND	FOUNDATION
FP	FIREPLACE
FT	FLOOR TRUSS
FTG	FOOTING
GSM	GALVANIZED SHEET METAL
GA	GAUGE
GALV	GALVANIZED
GLU-LAM, GLB	GLUE LAMINATED BEAM
GYP BD	GYPSUM BOARD
HD	HOLDDOWN
HORIZ	HORIZONTAL
HDR	HEADER
HGR	HANGER
INFO	INFORMATION
INSUL	INSULATION OR INSULATED
INT	INTERIOR
INTER	INTERSECTION
JT	JOINT
LB OR #	POUND OR NUMBER
LL	LIVE LOAD
LNG	LONG OR LENGTH
LSL	TIMBER STRAND
LTWT OR LW	LIGHTWEIGHT
LVL	LAMINATED VENEER LUMBER
MAX	MAXIMUM
MB	MACHINE BOLT
MEP	MECHANICAL, ELECTRICAL AND PLUMBING
MFR OR MANU	MANUFACTURER
MIN	MINIMUM
ML	MICROLLAM
MSTR	MASTER
(N)	NEW
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
O/	OVER
OC	ON CENTER
OPT	OPTIONAL
-P OR PL	PLATE
PSF	POUNDS PER SQUARE FOOT
PSL	PARALLAM
PT	PRESSURE TREATED
PAR	PARALLEL
PERF	PERFORATED
PERP	PERPENDICULAR
PLHT	PLATE HEIGHT
PLYWD OR PLY	PLYWOOD
PR	PAIR
RCP	REINFORCED CONCRETE PIPE
RECOM OR REC	RECOMMENDATIONS
REINF	REINFORCING
REQ'D	REQUIRED
REBAR	REINFORCING BAR(S)
RJ	ROOF JOIST
RM	ROOM
RR	ROOF RAFTER
RT	ROOF TRUSS
RWD	REDWOOD
SAD	SEE ARCHITECTURAL DRAWINGS
SCD	SEE CIVIL DRAWINGS
SED	SEE ELECTRICAL DRAWINGS
SMD	SEE MECHANICAL DRAWINGS
SCHD	SCHEDULE
SOG	SLAB ON GRADE
SW	SHEARWALL
TEMP	TEMPORARY
TOC	TOP OF CONCRETE
TOW	TOP OF WALL
T/P	TOP PLATE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VERT	VERTICAL
W/	WITH
WWM	WELDED WIRE MESH
WD	WOOD
WINDOW	WNDW

STRUCTURAL DRAWING INDEX

S-0.1	GENERAL NOTES & ABBREVIATIONS
S-1.1	PARTIAL SITE & FOUNDATION PLAN – PHASES 0 & 1
S-1.2	PARTIAL SITE & FOUNDATION PLAN – PHASE 2
S-1.3	PARTIAL SITE & FOUNDATION PLAN – PHASES 3 & 4
S-2.1	(N) BUILDING FOUNDATION & ROOF FRAMING
S-3.1	(N) TOWER ELEVATIONS & REQUIREMENTS
S-5.1	DETAILS
S-5.2	DETAILS
S-5.3	DETAILS

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REGISTERED PROFESSIONAL ENGINEER
STEVEN C. TEE
C 75 Exp. 12-31-2025
STRUCTURAL
STATE OF CALIFORNIA

CPS Project No.: S1351

COUNTY OF SAN BERNARDINO

10.10.1237

800MHz UPGRADE
SKYLAND PEAK TOWER

ISSUE		
MARK	DATE	DESCRIPTION
	11/30/22	50% CD SUBMITTAL
	06/09/23	95% CD SUBMITTAL
	09/24/23	95% CD SUBMITTAL
	01/12/24	100% CD SET
	07/12/24	TEMP SHELTER REVISION

SOBE PROJECT NO:	
DATE:	01/10/22
DRAWN BY:	TD
CHECKED BY:	TCE
APPROVED BY:	TCE

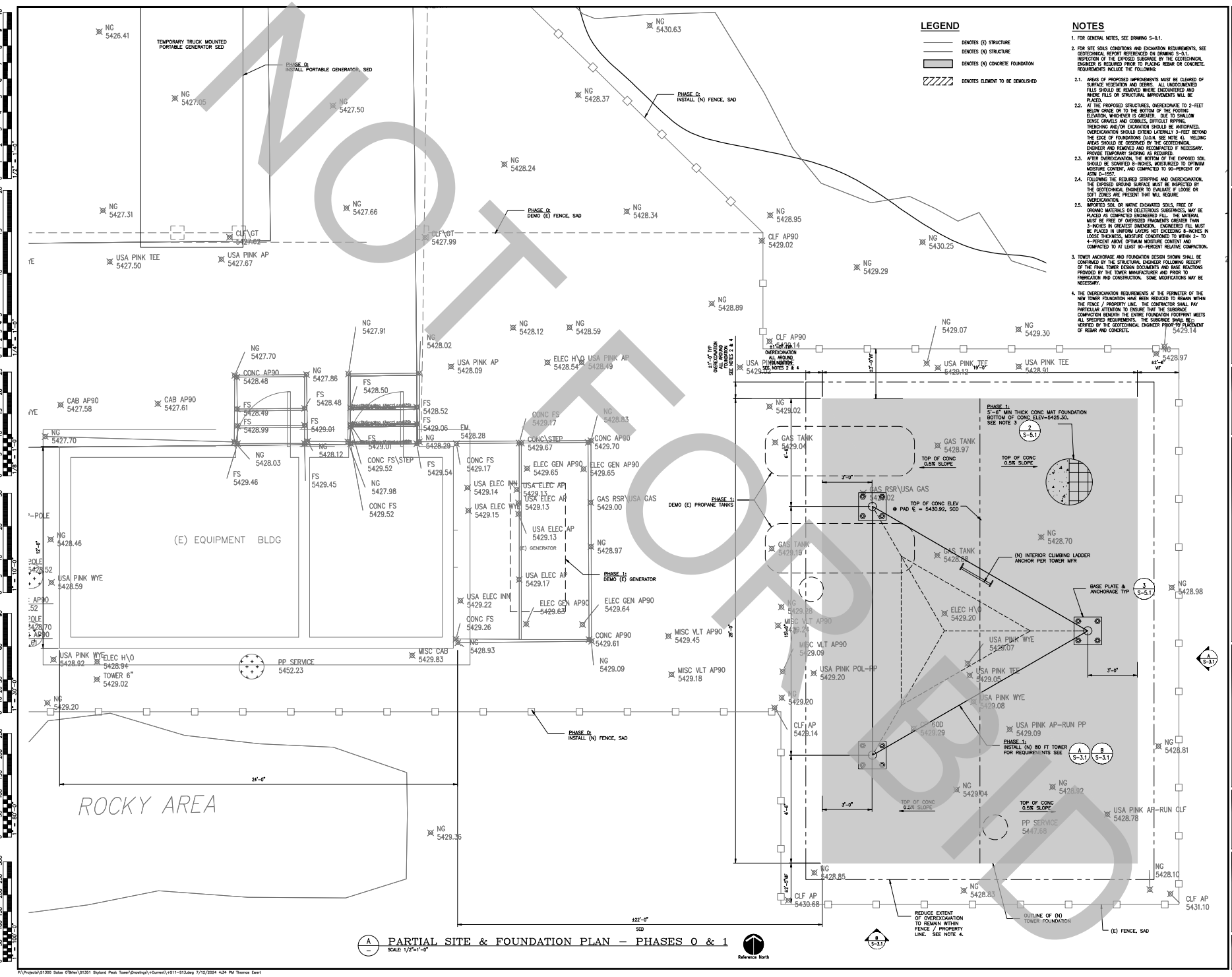
SHEET TITLE
STRUCTURAL
GENERAL NOTES & ABBREVIATIONS

SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE

S-0.1

NOT FOR BID

\\CPSGLOBALSERVER\share1\Projects\S1300 Salas O'Brien\S1351 Skyland Peak Tower\Drawings\+Current\+S01.dwg 7/12/2024 4



A PARTIAL SITE & FOUNDATION PLAN – PHASES 0 & 1
SCALE: 1/2"=1'-0"

LEGEND

- DENOTES (E) STRUCTURE
- DENOTES (N) STRUCTURE
- DENOTES (N) CONCRETE FOUNDATION
- DENOTES ELEMENT TO BE DEMOLISHED

NOTES

1. FOR GENERAL NOTES, SEE DRAWING S-0.1.
2. FOR SITE SOILS CONDITIONS AND EXCAVATION REQUIREMENTS, SEE GEOTECHNICAL REPORT REFERENCED ON DRAWING S-0.1. INSPECTION OF THE EXPOSED SUBGRADE BY THE GEOTECHNICAL ENGINEER IS REQUIRED PRIOR TO PLACING REBAR OR CONCRETE. REQUIREMENTS INCLUDE THE FOLLOWING:
   - 2.1. AREAS OF PROPOSED IMPROVEMENTS MUST BE CLEARED OF SURFACE VEGETATION AND DEBRIS. ALL UNDOCUMENTED FILLS SHOULD BE REMOVED WHERE ENCOUNTERED AND WHERE FILLS OR STRUCTURAL IMPROVEMENTS WILL BE PLACED.
   - 2.2. AT THE PROPOSED STRUCTURES, OVEREXCAVATE TO 2-FEET BELOW GRADE OR TO THE BOTTOM OF THE FOOTING ELEVATION, WHICHEVER IS GREATER. DUE TO SHALLOW DENSE GRAVELS AND COBBLES, DIFFICULT RIPPING, TRENCHING AND/OR EXCAVATION SHOULD BE ANTICIPATED. OVEREXCAVATION SHOULD EXTEND LATERALLY 3-FEET BEYOND THE EDGE OF FOUNDATIONS (U.O.N. SEE NOTE 4). YIELDING AREAS SHOULD BE OBSERVED BY THE GEOTECHNICAL ENGINEER AND REMOVED AND RECOMPACTED IF NECESSARY. PROVIDE TEMPORARY SHORING AS REQUIRED.
   - 2.3. AFTER OVEREXCAVATION, THE BOTTOM OF THE EXPOSED SOIL SHOULD BE SCARIFIED 8-INCHES, MOISTURIZED TO OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 90-PERCENT OF ASTM D-1557.
   - 2.4. FOLLOWING THE REQUIRED STRIPPING AND OVEREXCAVATION, THE EXPOSED GROUND SURFACE MUST BE INSPECTED BY THE GEOTECHNICAL ENGINEER TO EVALUATE IF LOOSE OR SOFT ZONES ARE PRESENT THAT WILL REQUIRE OVEREXCAVATION.
   - 2.5. IMPORTED SOIL OR NATIVE EXCAVATED SOILS, FREE OF ORGANIC MATERIALS OR DELETERIOUS SUBSTANCES, MAY BE PLACED AS COMPACTED ENGINEERED FILL. THE MATERIAL MUST BE FREE OF OVERSIZED FRAGMENTS GREATER THAN 3-INCHES IN GREATEST DIMENSION. ENGINEERED FILL MUST BE PLACED IN UNIFORM LAYERS NOT EXCEEDING 8-INCHES IN LOOSE THICKNESS, MOISTURE CONDITIONED TO WITHIN 2- TO 4-PERCENT ABOVE OPTIMUM MOISTURE CONTENT AND COMPACTED TO AT LEAST 90-PERCENT RELATIVE COMPACTION.
3. TOWER ANCHORAGE AND FOUNDATION DESIGN SHOWN SHALL BE CONFIRMED BY THE STRUCTURAL ENGINEER FOLLOWING RECEIPT OF THE FINAL TOWER DESIGN DOCUMENTS AND BASE REACTIONS PROVIDED BY THE TOWER MANUFACTURER AND PRIOR TO FABRICATION AND CONSTRUCTION. SOME MODIFICATIONS MAY BE NECESSARY.
4. THE OVEREXCAVATION REQUIREMENTS AT THE PERIMETER OF THE NEW TOWER FOUNDATION HAVE BEEN REDUCED TO REMAIN WITHIN THE FENCE / PROPERTY LINE. THE CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO ENSURE THAT THE SUBGRADE COMPACTION BENEATH THE ENTIRE FOUNDATION FOOTPRINT MEETS ALL SPECIFIED REQUIREMENTS. THE SUBGRADE SHALL BE VERIFIED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF REBAR AND CONCRETE.

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SHEET TITLE
STRUCTURAL
PARTIAL SITE & FOUNDATION PLAN PHASES 0 & 1

SCALE: AS NOTED
THIS DRAWING IS 30" X 42" AT FULL SIZE

S-1.1

NOT TO BE USED

THIS DRAWING IS 30" X 42" AT FULL SIZE, 15" X 21" AT HALF SIZE. © 2015 BY SALAS O'BRIEN ENGINEERS, INC.

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