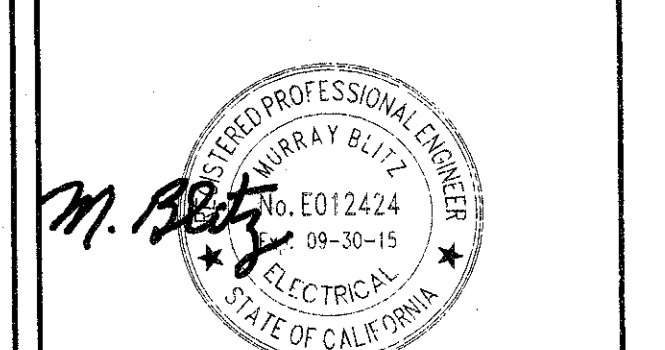


# CITY OF TORRANCE

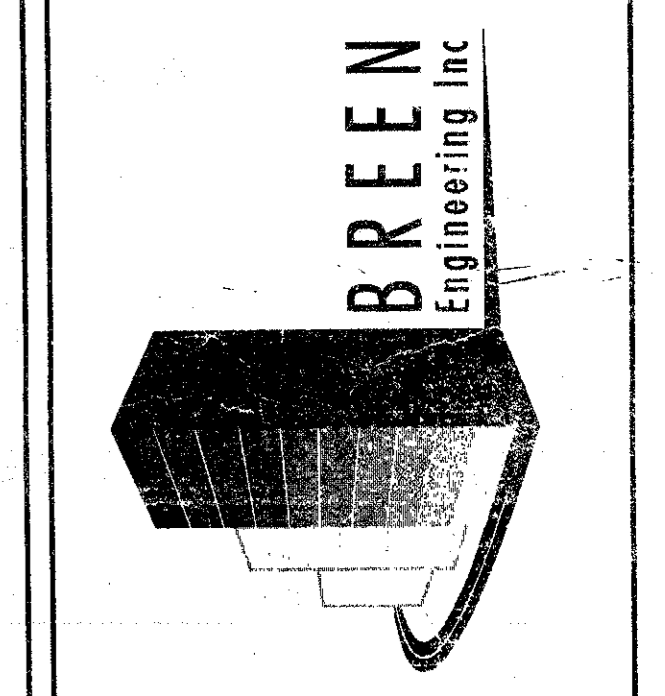
## GENERAL AVIATION CENTER TORRANCE MUNICIPAL AIRPORT

### TORRANCE AIRPORT EOC GENERATOR

REV.	DATE	DESCRIPTION
0	07/03/13	DATE
1	07/03/13	CLIENT/PAID CHECK ISSUANCE
2	07/03/13	OK



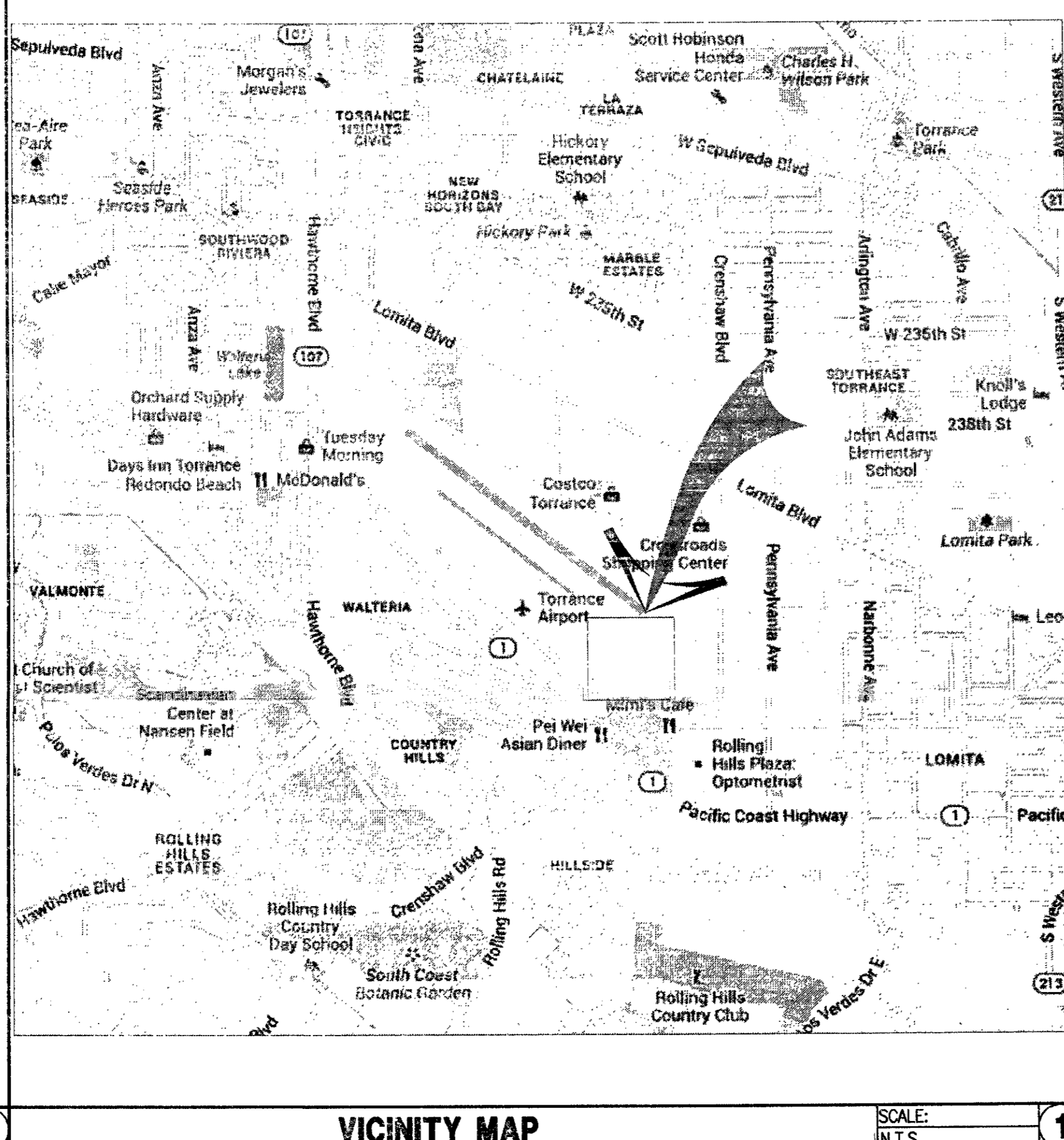
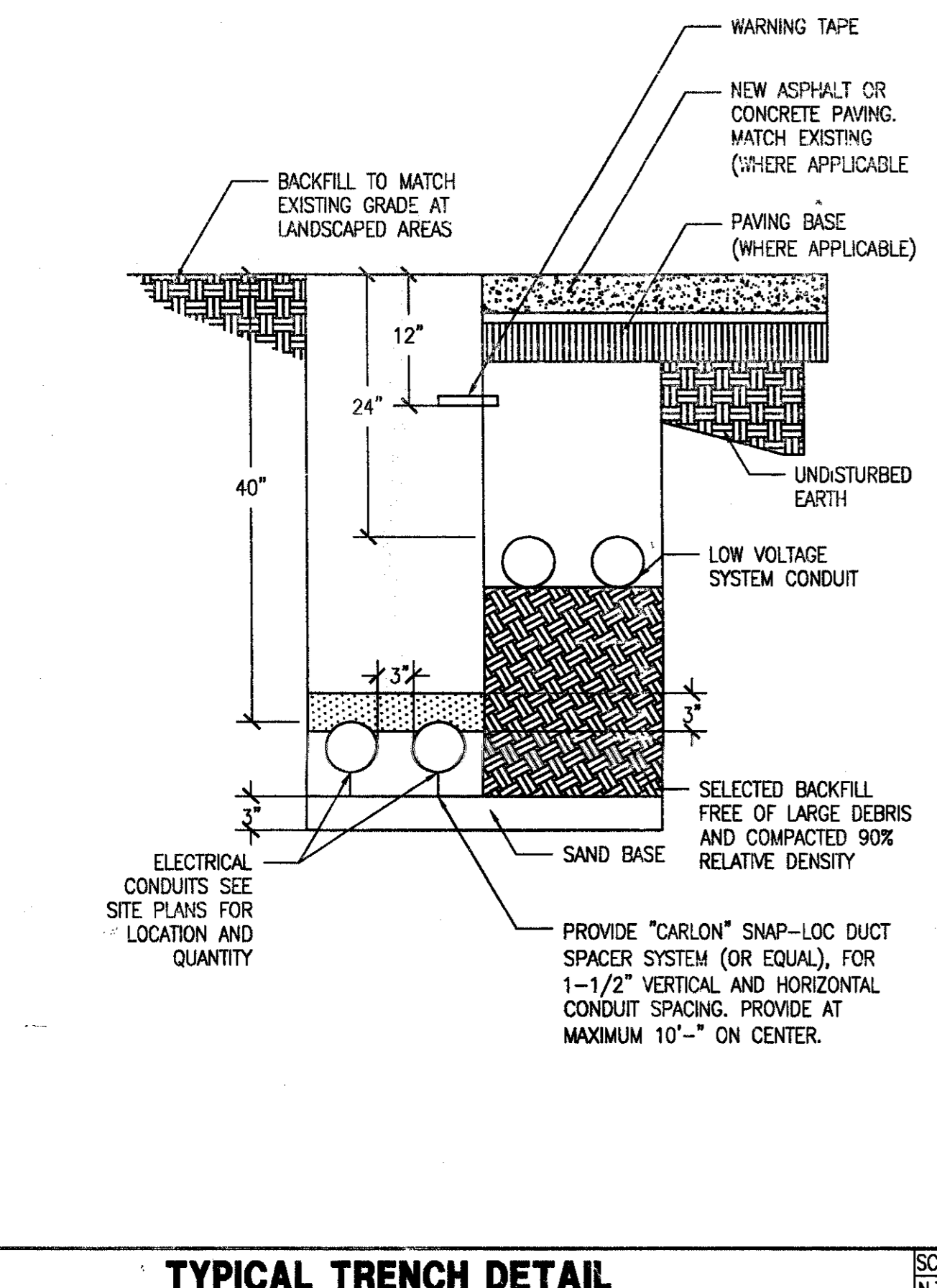
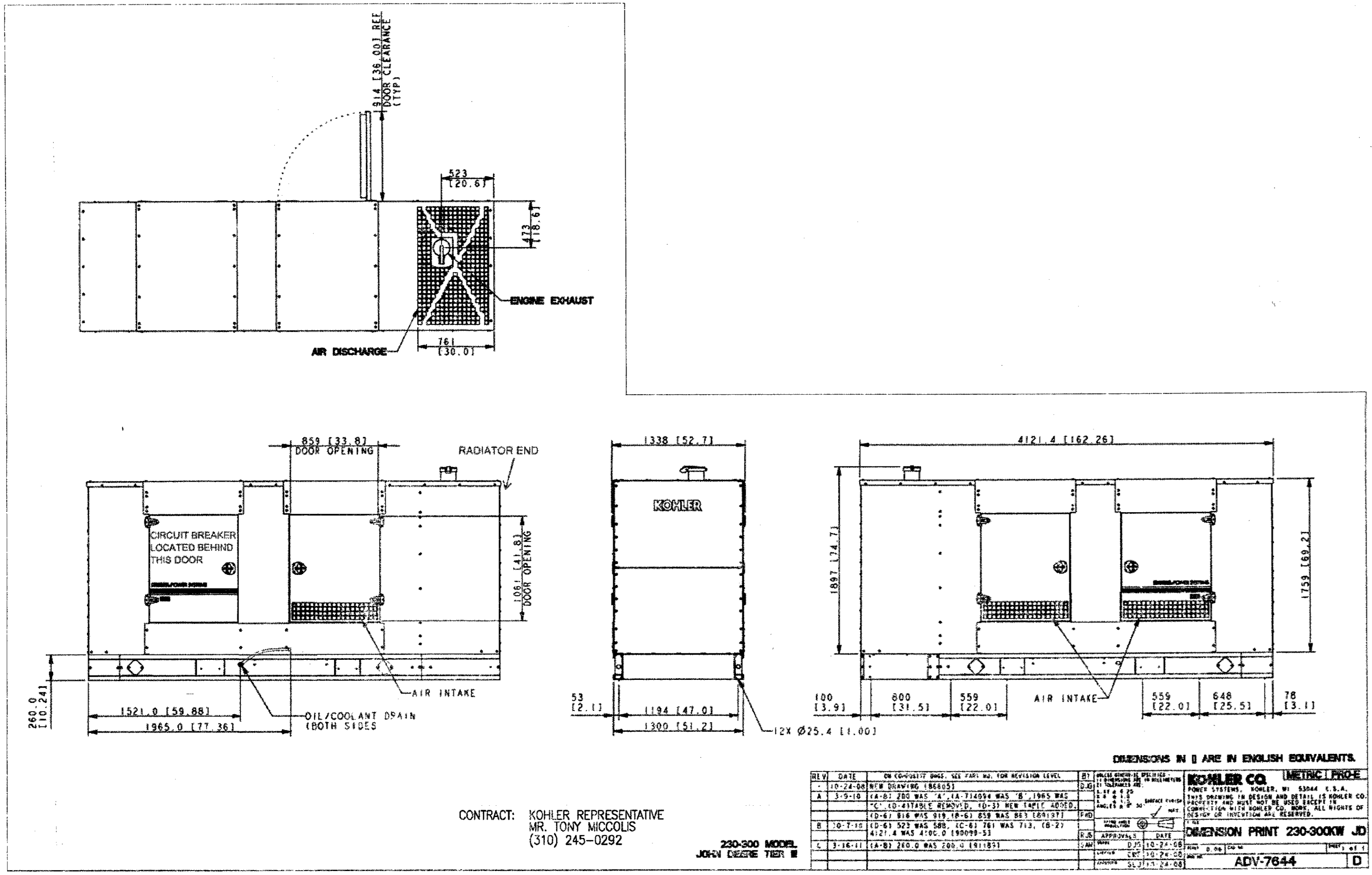
1983 WEST 190TH STREET, SUITE 200  
TORRANCE, CA 90504  
TEL: (310) 464-8404  
FAX: (310) 464-8408  
EMAIL: www.breeneng.com



ELECTRICAL NOTES, SYMBOLS, INDEX  
DETAIL AND SHEET INDEX

GENERAL AVIATION CENTER  
TORRANCE MUNICIPAL AIRPORT  
3801 AIRPORT DRIVE  
TORRANCE, CALIF. 90503

DATE:	07/03/13
SCALE:	AS NOTED
PROJECT NUMBER:	307-13-001
DRAWN BY:	CK/RS
CHECKED BY:	DM
DRAWING NUMBER:	E-1



- #### GENERAL NOTES
- THE DRAWINGS DESCRIBE THE SYSTEMS, FURNISH ALL MATERIAL AND DO ALL WORK REQUIRED AS INDICATED ON THE DRAWINGS. SPECIFICATIONS UNLESS OTHERWISE NOTED, FURNISH AND INSTALL ALL NEW MATERIAL AND EQUIPMENT AS REQUIRED TO PRODUCE A COMPLETE OPERATING SYSTEM. ALL WORK SHALL COMPLY WITH 2010 EDITION OF THE ELECTRICAL CODE, BASED ON 2010 CALIFORNIA ELECTRICAL (BASED ON 2008 NEC) CODE.
  - CODES AND PERMITS: ALL ELECTRICAL EQUIPMENT, INSTALLATION, ETC., SHALL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES, INCLUDING CALIFORNIA TITLE 24, CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING PARTS OF TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR):  
TITLE 24, PART 2, CCR (2010 CALIFORNIA BUILDING CODE W/AMENDMENTS)  
TITLE 24, PART 3, CCR (2010 CALIFORNIA ELECTRICAL CODE W/AMENDMENTS)  
TITLE 24, PART 4, CCR (2010 CALIFORNIA MECHANICAL CODE W/AMENDMENTS)  
TITLE 24, PART 5, CCR (2010 CALIFORNIA PLUMBING CODE W/AMENDMENTS)  
TITLE 24, PART 9, CCR (2010 CALIFORNIA FIRE CODE W/AMENDMENTS)  
2010 CALIFORNIA GREEN BUILDING STANDARDS CODES  
CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS & INSPECTIONS.
  - PROVIDE AND INSTALL ALL MATERIALS IN CONFORMANCE WITH APPLICABLE CODES, LOCAL CITY AMENDMENTS, ORDINANCES, AND LOCAL AUTHORITIES HAVING JURISDICTION. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE INSPECTING AUTHORITY AND THE MANUFACTURER'S RECOMMENDATIONS.
  - FOR PURPOSES OF CLARITY AND LEGIBILITY, THE ELECTRICAL DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC. THE SIZE AND LOCATION OF EQUIPMENT IS SHOWN TO SCALE WHEREVER POSSIBLE. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS.
  - THE SYMBOLS DESIGNATING CONDUIT SIZES AND QUANTITIES OF BRANCH CIRCUIT WIRING DO NOT INCLUDE THE EQUIPMENT GROUNDING CONDUCTOR REQUIRED. INSTALL REQUIRED EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS, SIZE PER CEC 250-122. EQUIPMENT GROUNDING CONDUCTOR SHALL BE GREEN.
  - BEFORE SUBMITTING BID, BECOME THOROUGHLY FAMILIAR WITH ACTUAL EXISTING CONDITIONS AT THE BUILDING. THE INTENT OF THE WORK IS SHOWN ON THE DRAWINGS AND DESCRIBED HEREINAFTER. BY THE ACT OF SUBMITTING A BID PROPOSAL FOR WORK, THE CONTRACTOR SHALL BE DEEMED TO HAVE MADE SUCH A STUDY AND EXAMINATION AND TO ACCEPT ALL CONDITIONS PRESENT AT THE SITE. NO REQUEST FOR ADDITIONAL PAYMENT SHALL BE CONSIDERED AS VALID, DUE TO FAILURE TO ALLOW FOR CONDITIONS WHICH MAY EXIST.
  - REFER TO ALL DRAWINGS FOR ADDITIONAL INFORMATION. EXACT EQUIPMENT LOCATION, MOUNTING HEIGHTS, MOUNTING REQUIREMENTS AND MAKE ALL FINAL ELECTRICAL CONNECTIONS TO ALL ELECTRICAL EQUIPMENT AS REQUIRED.
  - CONTRACTOR TO COORDINATE WITH OTHER TRADES AND/OR MANUFACTURER CUT SHEETS FOR ADDITIONAL INFORMATION, EQUIPMENT INSTALLATION, MOUNTING REQUIREMENTS AND TO MAKE FINAL CONNECTIONS OF ALL ELECTRICAL EQUIPMENT.
  - CONTRACTOR'S BID SHALL BE BASED ON ALL WORK SHOWN ON THE PLANS AND SPECIFICATIONS. ALL PREMIUM TIME COSTS REQUIRED SHALL BE INCLUDED IN HIS BID. IF CONTRACTOR PROPOSES TO SUBSTITUTE FOR EQUIPMENT SPECIFIED, HE SHALL SUBMIT HIS REQUEST FOR CONSIDERATION TO THE OWNER AND ENGINEER PRIOR TO THE BID. IN WRITING. ALL SUBSTITUTIONS MUST BE REVIEWED BY THE ENGINEER. SUCH REVIEW SHALL NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE AT HIS OWN EXPENSE FOR ANY CHANGES RESULTING FROM HIS PROPOSED SUBSTITUTIONS WHICH MAY AFFECT OTHER PARTS OF HIS OWN WORK OR THE WORK OF OTHER CONTRACTORS.
  - ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BEAR THE UNDERWRITERS LABEL (UL) AND BE INSTALLED IN THE MANNER FOR WHICH THEY ARE DESIGNED AND APPROVED.
  - ANY SUBSTITUTIONS OF SPECIFIED MATERIALS REQUIRE WRITTEN NOTIFICATION BY THE CONTRACTOR AND FORMAL APPROVAL BY OWNER REPRESENTATIVE AND/OR THE ENGINEER.
  - WHENEVER CONDUITS PENETRATE A PERIMETER WALL, IT IS TO BE SEALED IN AN APPROVED MANNER.
  - ISOLATED EQUIPMENT GROUNDING CONDUCTOR INSULATION SHALL BE GREEN WITH A YELLOW STRIPE. EQUIPMENT GROUNDING CONDUCTOR SHALL BE GREEN.
  - ALL DEVICES INSTALLED OUTSIDE OR SUBJECT TO WATER SPRAY SHALL BE APPROVED FOR WEATHER LOCATION. ALL DEVICES SUBJECT TO VAPORS, STEAM AND MOISTURE SHALL BE APPROVED FOR DAMP LOCATION. FOR WALL MOUNTED OUTLETS EXACT LOCATION AND MOUNTING HEIGHTS.
  - PROVIDE NAMEPLATES FOR ALL NEW PANELBOARDS, DISTRIBUTION BOARDS "CIRCUIT BREAKERS", DISCONNECTS, PULL BOXES, CABINETS AND ALL ELECTRICAL EQUIPMENT IDENTIFIED BY NAME ON DRAWINGS.
  - IN ADDITION TO JUNCTION BOXES INDICATED ON DRAWINGS, INSTALL JUNCTION BOXES AND PULL BOXES FOR CABLE SPLICES, CABLE PULLING AND CONNECTIONS NECESSARY FOR THE INSTALLATION OF A COMPLETE OPERATING SYSTEM. JUNCTION BOXES AND PULL BOXES SHALL BE ACCESSIBLE. LABEL JUNCTION BOXES AND PULL BOXES WITH APPROPRIATE DESIGNATION, MAXIMUM (3) 90° BENDS.
  - MAIN ELECTRICAL FEEDER CONDUITS SHALL BE RIGID METAL CONDUITS UNLESS OTHERWISE NOTED OR AS ALLOW BY APPLICABLE CODES. STEEL FLEXIBLE CONDUITS FOR SHORT EQUIPMENT CONNECTIONS, EQUIPMENT CONNECTIONS SUBJECT TO VIBRATIONS AND EQUIPMENT LOCATED OUTSIDE OR SUBJECT TO WATER SPRAY MAKE CONNECTIONS WITH LIQUID-TIGHT CONDUIT AND WEATHERPROOF COMPONENTS. LENGTH IS LIMITED TO SIX FEET, PROVIDE EQUIPMENT GROUNDING CONDUCTOR SIZE PER 2010 DEC TABLE 250-122.
  - PAINT ALL NEW EXPOSED ELECTRICAL RACEWAYS, CABINETS, ENCLOSURES AND FITTINGS TO MATCH ADJACENT FINISHES. EXPOSED CONDUIT RUNS SHALL BE INSTALLED AS CLOSED AS POSSIBLE TO THE CEILING.
  - PROVIDE PULL STRING IN EMPTY CONDUITS INSTALLED AS PART OF THIS PROJECT.
  - UNLESS OTHERWISE NOTED PROVIDE COPPER CONDUCTORS, MINIMUM SIZE #12 AWG. PROVIDE SOLID CONDUCTORS #10 AWG AND SMALLER UNLESS OTHERWISE NOTED. PROVIDE STRANDED CONDUCTORS #8 AWG AND LARGER UNLESS OTHERWISE NOTED. USE CONDUCTORS WITH THIN/THIN 600 VOLTS INSULATION FOR SIZES #8 AWG AND SMALLER, UNLESS OTHERWISE NOTED. CONDUCTORS #4 AWG AND LARGER SHALL BE THAW INSULATION, UNLESS OTHERWISE NOTED.
  - DELIVER ALL CONDUCTORS TO THE JOB SITE IN ORIGINAL UNBROKEN CARTON OR REEL, PROPERLY TAGGED WITH U.L. LABEL, SIZE, MANUFACTURER'S TRADE NAME AND THE DATE MANUFACTURED.
  - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN WORK AREA CLEAR OF DEBRIS ON DAILY BASIS DURING CONSTRUCTION.
  - NO PIPING, DUCTS OR EQUIPMENT FOREIGN TO ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE LOCATED WITHIN DEDICATED WORKING SPACE OF EQUIPMENT, INCLUDING THE DEDICATED SPACE BETWEEN THE TOP OF EQUIPMENT TO THE STRUCTURAL CEILING ABOVE. ALL FOREIGN INSTALLATION WITHIN THE SPACE (I.E. FIRE SPRINKLER, ETC) SHALL BE INSTALLED IN ACCORDANCE WITH NEC 110.26(F)(1)(c).
  - USE PLASTIC COATED SELF-STICKING MARKERS SUCH AS THOMAS & BETTS E-Z CODE FOR IDENTIFICATION OF CONDUCTORS AND METAL EDGE BANDED PAPER TAGS ON PULL ROPES.

#### TERMS AND ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AT	AT
A	AMPERES
APPARATUS	INDICATES SWITCHGEARS, DISTRIBUTION BOARDS, TRANSFORMERS, ETC.
AS	AMP SWITCH
BKBD	BACKBOARD
C.O.	CONDUIT ONLY
CWL	COLD WATER LINE
#	PHASE OR DIAMETER
DN	DOWN
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRIC OR ELECTRICAL
EM	EMERGENCY
EQUIP.	EQUIPMENT
EXIST.	EXISTING
FDR.	FEEDER, INDICATES CONDUIT AND CONDUCTORS
FLA	FULL LOAD AMPERES
GC	GENERAL CONTRACTOR
GND	GROUND
HP	HORSEPOWER
IND.	INDICATED
JB	JUNCTION BOX
KVA	KILOVOLT AMPERES
KW	KILOWATT
KWH	KILOWATT HOUR
LCL	LONG CONTINUOUS LOAD
MFR.	MANUFACTURER
MH	MOUNTING HEIGHT
N.T.S.	NOT TO SCALE
PB	PULLBOX
PNL	PANEL
PROVIDE	INDICATED ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL
SWBD	SWITCHBOARD
TRANSF.	TRANSFORMER
TYP.	TYPICAL
U.G.	UNDERGROUND
U.O.N.	UNLESS OTHERWISE NOTED
V	VOLT
VA	VOLT AMPERES
VD	VOLTAGE DROP
W	WATTS
WR	WEATHERPROOF

#### ELECTRICAL SHEET INDEX

SHEET NO.	SHEET TITLE	CURRENT ISSUE
E-1	ELECTRICAL NOTES, SYMBOLS, DETAIL AND SHEET INDEX	
E-2	SITE ELECTRICAL PLAN AND SINGLE LINE DIAGRAM	
E-3	PARTIAL DEMO AND NEW PROPOSED ELECTRICAL PLANS	
S-1	SITE PLAN	
S-2	STRUCTURAL DETAILS	

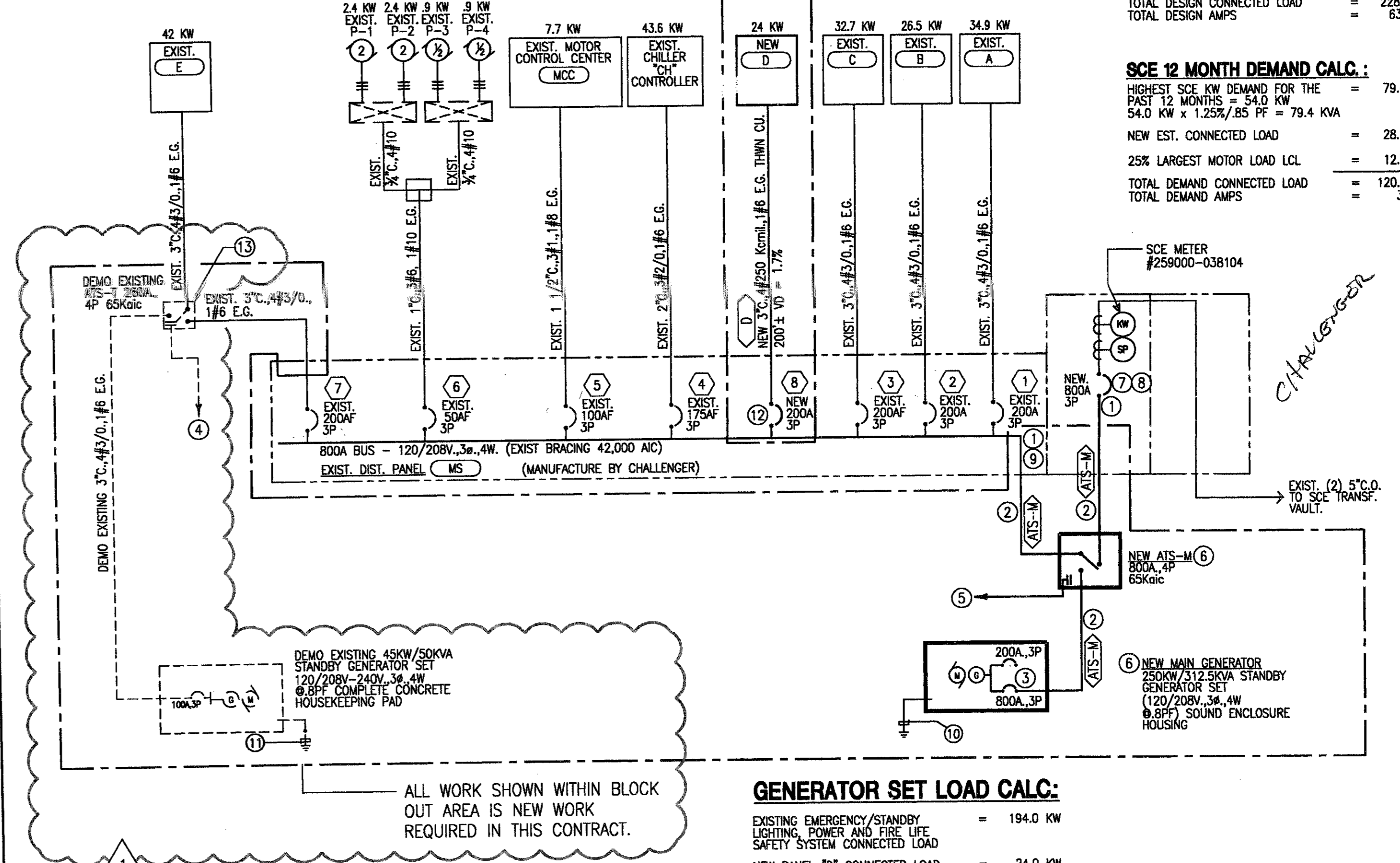
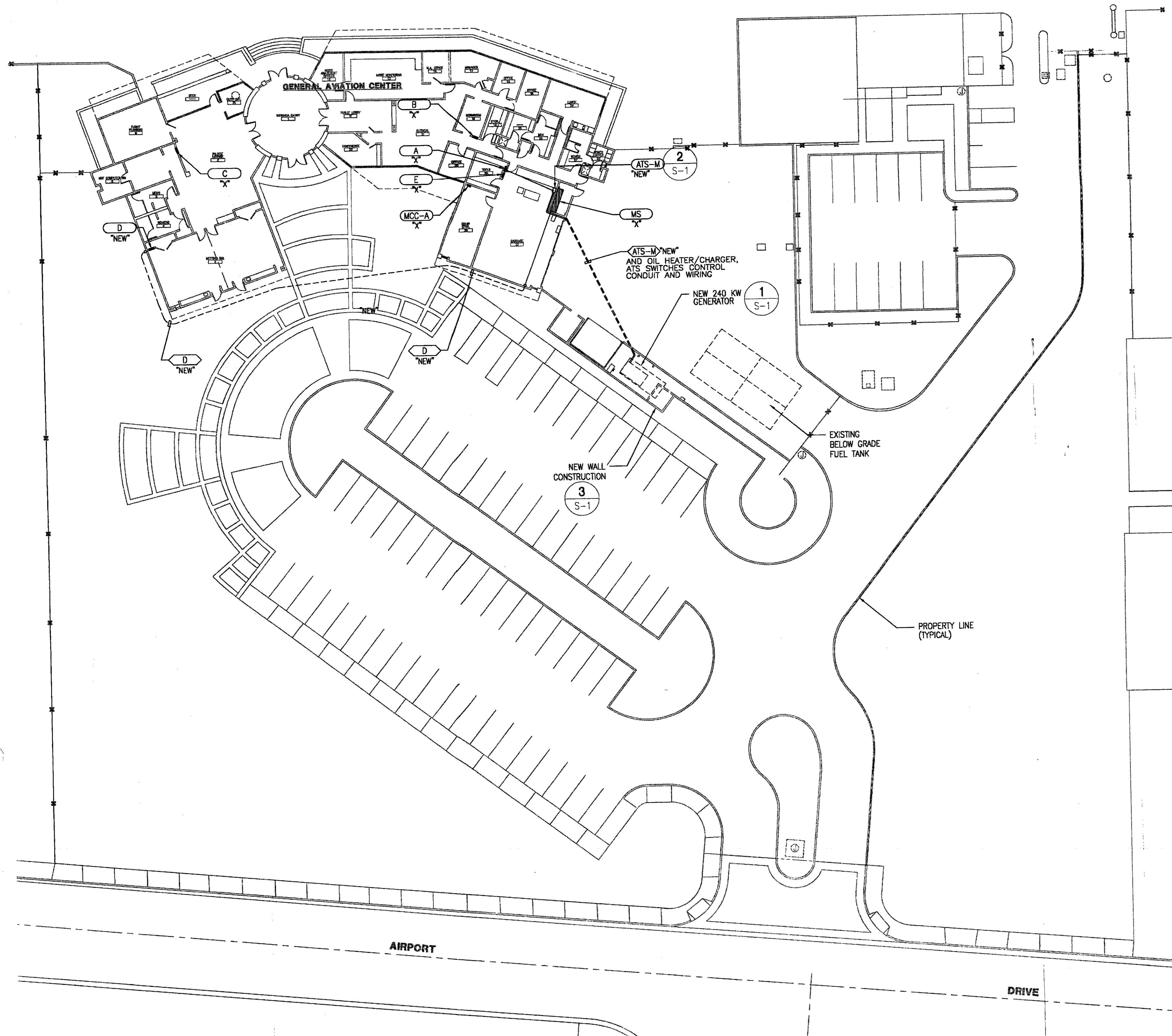
#### ELECTRICAL SYMBOLS LEGEND

SYMBOL	DESCRIPTION
⊕	GROUND TYPE DUPLEX RECEPTACLE, WALL MOUNTED
⊖	FLEXIBLE CONNECTION TO EQUIPMENT
⊞	SURFACE MOUNTED CABINET OR EQUIPMENT AS NOTED. +6" -0" TO TOP
⊞	FLUSH MOUNTED CABINET OR EQUIPMENT AS NOTED +6" -0" TO TOP
⊞	SURFACE MOUNTED BRANCH CIRCUIT PANELBOARD
⊞	FLUSH MOUNTED BRANCH CIRCUIT PANELBOARD
⊞	SWITCHBOARD, DISTRIBUTION BOARD
⊞	TELEPHONE PLYWOOD BACKBOARD SIZE AS INDICATED ON PLANS
"T1B"	"DRY TYPE" TRANSFORMER DESIGNATION
—	CONDUIT RUN IN OR BELOW FLOOR SLAB OR UNDERGROUND - 3/4" C. MINIMUM
—	CONDUIT RUN CONCEALED IN WALL OR ABOVE FINISHED CEILING - 1/2" C.
—	CONDUIT RUN EXPOSED
—	2#12, 3/4" C.
—	3#12, 3/4" C.
—	4#12, 3/4" C.
—	5#12, 3/4" C.
—	6#12, 3/4" C.
—	7#12, 3/4" C.
—	8#12, 3/4" C.
—	9#12, 3/4" C.
—	10#12, 3/4" C.
—	2#10, 3/4" C.
—	3#10, 3/4" C.
—	4#10, 3/4" C.
—	5#10, 3/4" C.
—	6#10, 3/4" C.
—	7#10, 3/4" C.
—	8#10, 3/4" C.
—	9#10, 3/4" C.
—	10#10, 3/4" C.
—	2#8, 3/4" C.
—	3#8, 3/4" C.
—	4#8, 3/4" C.
—	5#8, 3/4" C.
—	6#8, 3/4" C.
—	7#8, 3/4" C.
—	8#8, 3/4" C.
—	9#8, 3/4" C.
—	10#8, 3/4" C.
—	WIRE SIZE OTHER THAN #12, #10 OR #8 IS NOTED ON EACH CONDUIT RUN WITH SIZE OF CONDUIT (I.E. 3/8" - 1" C.) SEE GENERAL NOTE #41.
—	EXISTING CONDUIT RUN
HA-1,2,5	HASH MARKS INDICATES THE QUANTITY OF CONDUCTORS REQUIRED. NO HASH MARKS INDICATES 2 #12 AWG. CONDUCTORS LARGER THAN SIZE #12 AWG ARE INDICATED NEXT TO HASH MARKS
⊞	INDICATE HOMERUN TO DESIGNATED PANEL BOARD, SWITCH GEAR, OR SIGNAL CABINET WHEN SHOWN INDICATE THE FOLLOWING: BRANCH CIRCUIT NUMBERS HOUSE PANEL OR DISTRIBUTION PANEL LOW VOLTAGE 115/24 VAC TRANSFORMER MOUNTED ABOVE CEILING BY EDWARD OR EQUAL PUSH BUTTON OUTLET AT +4" -0" A.F.F. FOR DOOR BELL SYSTEM DOOR BELL WITH LOW VOLTAGE 115/24 VAC TRANSFORMER WALL MOUNTED 6"-6" A.F.F. BY NUTONE OR EQUAL.
(P1A)	INDICATES REFERENCE TO PANELBOARD "P1A"
2A	ELECTRICAL FEEDER DESIGNATION
⊞	REFERENCE NOTE DESIGNATION
⊞	METERING AND TEST BLOCKS AS REQUIRED BY THE UTILITY SERVING AGENCY
⊞	CIRCUIT BREAKER
⊞	GROUND
⊞	MOTOR (NUMBER INSIDE SYMBOL DESIGNATES HP OF MOTOR)

NOTE: FOR ADDITIONAL SYSTEM SYMBOLS AND WIRING LEGEND REFER TO SITE PLANS AND RISER DIAGRAMS

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DWG/PDF Created on: Sep 26, 2013 3:26pm Plotted By: csk File Name: H:\Projects\07 City of Torrance\13-001 Airport EOC\CAD\Electrical\2 ELECTRICAL SITE PLAN.dwg  
 CURRENT PHASE: ###  
 CURRENT REVISION: ###



**DESIGN LOAD CALC.:**  
 EXISTING DESIGN CONNECTED LOAD = 194.0 KW  
 NEW EST. DESIGN CONNECTED LOAD = 24.0 KW  
 25% LARGEST MOTOR LOAD LCL = 10.8 KW  
 TOTAL DESIGN CONNECTED LOAD = 228.8 KW  
 TOTAL DESIGN AMPS = 535.3 A

**SCE 12 MONTH DEMAND CALC.:**  
 HIGHEST SCE KW DEMAND FOR THE PAST 12 MONTHS = 54.0 KW  
 54.0 KW x 1.25% / BS PF = 79.4 KVA  
 NEW EST. CONNECTED LOAD = 28.2 KVA  
 25% LARGEST MOTOR LOAD LCL = 12.7 KVA  
 TOTAL DEMAND CONNECTED LOAD = 120.3 KVA  
 TOTAL DEMAND AMPS = 334.2A

**GENERATOR SET LOAD CALC.:**  
 EXISTING EMERGENCY/STANDBY LIGHTING POWER AND LIFE SAFETY SYSTEM CONNECTED LOAD = 194.0 KW  
 NEW PANEL "D" CONNECTED LOAD = 24.0 KW  
 TOTAL CONNECTED LOAD = 218 KW

**REFERENCE NOTES:**

- NEW ELECTRICAL FEEDER SERVING NEW STANDBY GENERATOR SET TO BE CONNECTED TO THE LOAD SIDE OF THE NEW CIRCUIT BREAKER AND THE SWITCHBOARD BUS SECTION. CONTRACTOR SHALL PROVIDE ALL LABOR, TOOLS AND MATERIAL REQUIRED TO CONNECT NEW FEEDERS WIRES BETWEEN THE EXISTING MAIN SWITCHBOARDS AND THE NEW AUTOMATIC TRANSFER SWITCH AS SHOWN. CONTRACTOR SHALL SCHEDULE WORK FOR AFTER OFFICE BUILDING BUSINESS HOURS. (SEE CONSTRUCTION NOTE 2).
- PROVIDE NEW ELECTRICAL FEEDERS (2 SET OF 4" C, 4#500 Kcmil, 1/2" O.D. THIN CU) AS REQUIRED TO INSTALL AND CONNECT NEW ATS SWITCH AS SHOWN. (SEE CONSTRUCTION NOTE 2).
- CONNECT TO CIRCUIT BREAKER WITHIN NEW GENERATOR SET.
- FROM EXISTING ATS SWITCH (AUX START/STOP CONTACTS) PROVIDE AND CONNECT NEW SIGNAL CONTROL WIRES (2" C, 2#12) TO ACTIVATED THE NEW GENERATOR SET.
- FROM NEW ATS SWITCH (AUX START/STOP CONTACTS) PROVIDE AND CONNECT TO NEW DIESEL GENERATOR SET START CIRCUIT CONTROL SIGNAL WIRES (2" C, 2#12).
- SEE SITE ELECTRICAL PLANS SHEET E-3 FOR LOCATION OF NEW GENERATOR SET, ATS SWITCH AND FOR ADDITIONAL INFORMATION.
- PRIOR TO BID AND AWARD OF CONTRACT CONTRACTOR SHALL CONTACT SWITCHGEAR MANUFACTURER TO DETERMINE WORK REQUIRED TO DEMO AND REMOVE EXISTING 800A FUSED SWITCH AND TO INSTALL NEW 800A 3P MAIN CIRCUIT BREAKER (BRACE FOR 65,000 AIC) AND EXISTING CABLE BUS LANDING LUGS REQUIRED FOR THE NEW FEEDER WIRE CONNECTIONS.
- NEW CIRCUIT BREAKER (BRACE FOR 65,000 AIC) TO ACCEPT (2) SET OF 4#500 KCMIL THIN CU WIRES.
- CONTRACTOR SHALL CONSULT WITH MANUFACTURE TO DETERMINE MATERIAL REQUIRED TO PROVIDE LANDING LUGS TO ACCEPT (2) SET OF 4#500 KCMIL THIN CU WIRES.
- 3/4" x 1/2" O.D. CU GROUND BONDED AND CONNECTED TO EXISTING 3/4" x 1/2" O.D. COPPER DRIVEN GROUND ROD.
- DISCONNECT EXISTING GENERATOR GROUND WIRE AND MAINTAIN EXISTING GROUND RODS FOR NEW GENERATOR GROUND CONNECTION.
- PROVIDE NEW CIRCUIT BREAKER AS SHOWN (BRACE FOR 65,000 AIC) COMPLETE WITH ALL MOUNTING HARDWARE. BREAKER SHALL MATCH AND BE COMPATIBLE WITH EXISTING SWITCHGEAR MANUFACTURER.
- EXISTING ATS SWITCH SCHEDULE FOR REMOVAL CONTRACTOR SHALL REFER TO SHEET 2/E-3 FOR ADDITIONAL INFORMATION, SCOPE OF WORK AND TEMPORARY EMERGENCY GENERATOR CONNECTIONS.

**CONSTRUCTION NOTES:**

- CONTRACTOR SHALL SCHEDULE ALL WORK SO NOT TO DISRUPT THE EXISTING BUILDING FACILITY AND/OR AIRPORT AIR TRAFFIC CONTROL TOWER STAFF AND PERSONNEL. ALL WORK SHALL BE SCHEDULED FOR BUSINESS OFF-HOURS.
- BECAUSE THE AIRPORT BUILDING FACILITY AND/OR AIRPORT AIR TRAFFIC CONTROL TOWER WILL BE OCCUPIED WHEN THE NEW GENERATOR SET, AUTOMATIC TRANSFER SWITCH AND ELECTRICAL FEEDERS ARE READY FOR CUT OVER AND RE-CONNECTION CONTRACTOR SHALL:
  - GIVE 2 WEEK (10 WORKING DAYS) NOTICE TO AIRPORT FACILITY MANAGEMENT TO ALLOW MANAGEMENT TO MAKE ANY ARRANGEMENT WITH AND/OR NOTIFY THE APPROPRIATE STAFF OF THE SHUT-DOWN PERIOD.
  - CUT-OVER AND RECONNECTION WORK SHALL BE SCHEDULED FOR BUSINESS OFF HOURS.
- CONTRACTOR SHALL SCHEDULE THE INSTALLATION AND CONNECTIONS OF NEW FEEDERS AT THE EXISTING MAIN SWITCHBOARD "MS" SO DOWN TIME IS KEPT TO A MINIMUM.

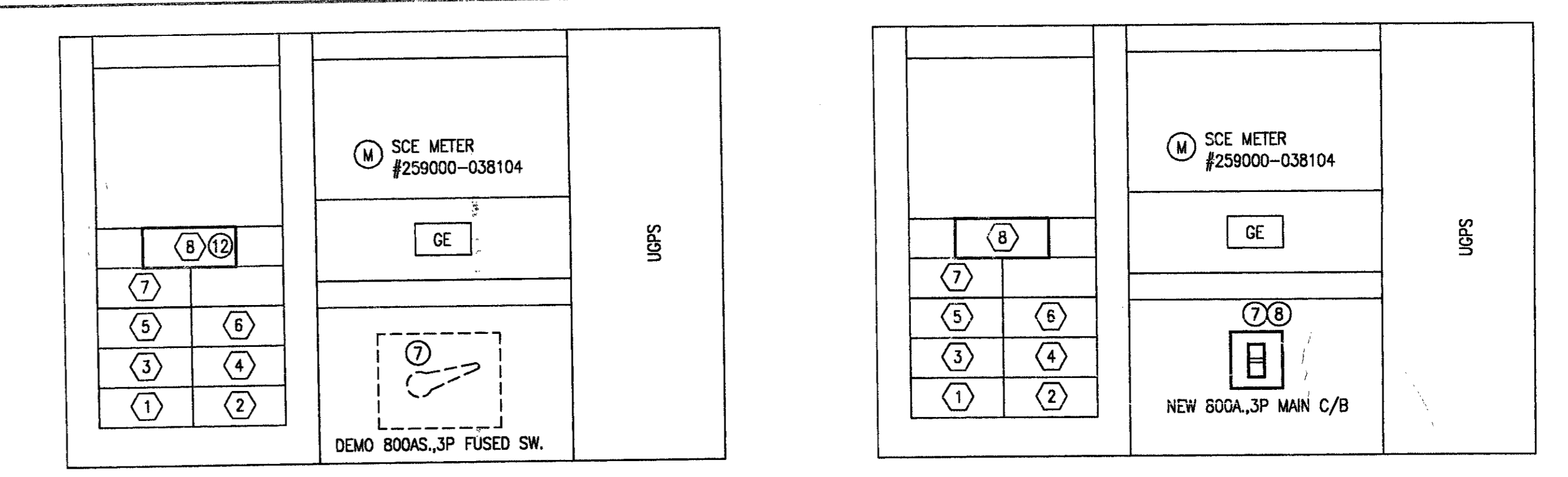
**SINGLE LINE DIAGRAM NOTES:**

- BECAUSE OF IN-PROPER LABELING ON EXISTING ELECTRICAL SWITCHGEAR PANELS, PHAS AND/OR TRANSFORMER UPON AWARD OF CONTRACT AND PRIOR TO ANY DEMO WORK CONTRACTOR SHALL PROVIDE ALL LABOR, TOOLS AND MATERIAL TO THOROUGHLY FIELD VERIFY ALL EXISTING ELECTRICAL DISTRIBUTION TO CONFIRM THE EXISTING ELECTRICAL INSTALLATION WHICH WILL BE AFFECTED BY DEMO AND/OR NEW WORK REQUIRED IN THIS CONTRACT.
- ALL NEW CIRCUIT BREAKERS PROVIDED IN THIS CONTRACT AT EXISTING MAIN SWITCHGEAR "MS" SHALL MATCH AND BE COMPATIBLE WITH EXISTING MAIN SWITCHGEAR INSTALLATION. NEW CIRCUIT BREAKER SHALL BE BRACED FOR MIN. 100,000 AIC AND CONTRACTOR SHALL VERIFY EXISTING SWITCHGEAR PRIOR TO ORDER PLACEMENT OF NEW CIRCUIT BREAKERS.
- ALL WORK SHOWN IS NEW UNLESS OTHERWISE NOTED EXISTING.

**SINGLE LINE DIAGRAM**

CUST NAME	CUST NUM	SERV ACCT NUM	SIC CODE	CURRENT RATE	METER NUM	SERVICE STREET ADDR	CITY NAME	ZIP	BILLING MO/YR	METER READ DATE	KWH USAGE	MAXIMUM KW	BILLING DAYS
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	JANUARY, 2012	01/24/12	15,930	42.0	33
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	FEBRUARY, 2012	02/23/12	18,194	38.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	MARCH, 2012	03/23/12	17,106	40.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	APRIL, 2012	04/23/12	17,984	42.0	31
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	MAY, 2012	05/22/12	15,864	38.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	JUNE, 2012	06/21/12	17,852	43.0	30
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	JULY, 2012	07/23/12	18,706	48.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	AUGUST, 2012	08/21/12	20,144	50.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	SEPTEMBER, 2012	09/20/12	22,792	54.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	OCTOBER, 2012	10/23/12	33,233	51.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	NOVEMBER, 2012	11/21/12	18,540	43.0	36
CITY OF TORRANCE	7420	2110195	4581	CS-2	259000-038104	3301 AIRPORT DR	TORRANCE	90505	DECEMBER, 2012	12/21/12	19,140	40.0	36

**UTILITY POWER USAGE RECORD FOR 2012**



**SWITCHBOARD DETAIL**

**SITE ELECTRICAL PLAN**

SCALE: 1" = 20'

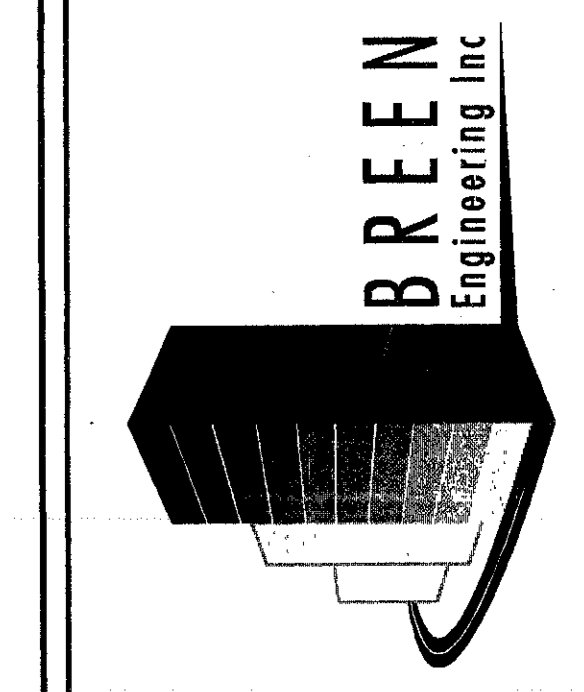
**SITE ELECTRICAL PLAN AND PARTIAL SINGLE LINE DIAGRAM**

**GENERAL AVIATION CENTER TORRANCE MUNICIPAL AIRPORT**  
 3801 AIRPORT DRIVE  
 TORRANCE, CALIF. 90505

DATE: 07/03/13  
 SCALE: AS NOTED  
 PROJECT NUMBER: 307-13-001  
 DRAWN BY: CW/BS  
 CHECKED BY: DM  
 DRAWING NUMBER: E-2



1983 WEST 190TH STREET, SUITE 200  
 TORRANCE, CA 90504  
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**GENERAL NOTES**

**FOUNDATIONS**

- ALLOWABLE SOIL BEARING PRESSURE TO BE ASSUMED TO BE 1,500 PSF.

**REINFORCED CONCRETE**

- CEMENT SHALL CONFORM TO ASTM C-150, SEE NOTE "5" BELOW FOR CEMENT TYPE REQUIRED BASED ON CONCRETE USE.
- AGGREGATES SHALL CONFORM TO ASTM C-33 FOR STRUCTURAL NORMAL WEIGHT CONCRETE (1" MAXIMUM SIZE).
- READY-MIX CONCRETE SHALL BE IN ACCORDANCE WITH ASTM C-94.
- CONCRETE DESIGN MIXES SHALL BE IN ACCORDANCE WITH C.B.C. SEC. 1905 AND SHALL BE SIGNED BY A PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF CALIFORNIA, AND HIRED BY CONTRACTOR.
- ALL CONCRETE SHALL SATISFY BOTH THE MINIMUM STRENGTH REQUIREMENT AND MAXIMUM WATER-CEMENT RATIO BY WEIGHT AS FOLLOWS:

CONCRETE USE	MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS F <sub>c</sub>	MAXIMUM WATER CEMENT RATIO BY WEIGHT	CEMENT TYPE
FOUNDATIONS AND SLAB ON GRADE	3,000 PSI	0.45	IV

- THE SLUMP SHALL BE 4" FOR ALL CONCRETE WORK.
- ADMITTURES MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
- ADMITTURES USED TO INCREASE THE WORKABILITY OF THE CONCRETE SHALL NOT BE CONSIDERED TO REDUCE THE SPECIFIED MINIMUM CEMENT CONTENT.
- ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS AND OTHER INSERTS SHALL BE SECURED IN POSITION AND INSPECTED BY THE BUILDING DEPARTMENT INSPECTOR PRIOR TO PLACING CONCRETE.

**CONCRETE MASONRY**

- MINIMUM 28 DAY COMPRESSIVE STRENGTH OF MASONRY ASSEMBLY: f<sub>m</sub> = 1,500 PSI.
- UNITS: NORMAL WEIGHT OPEN END BLOCKS CONFORMING TO ASTM C90, GRADE N.
- MORTAR: ASTM C270, TYPE S, f<sub>c</sub> = 1,800 PSI FOR f<sub>m</sub> = 1,500 PSI
- GROUT: COMPRESSIVE STRENGTH OF 2,000 PSI FOR f<sub>m</sub> = 1,500 PSI CMU. ALL CELLS SHALL BE FULL GROUTED.
- GROUTING OF ANY WALL SECTION SHALL BE COMPLETED IN ONE DAY WITH NO INTERRUPTIONS GREATER THAN ONE HOUR.
- BETWEEN GROUT POURS HORIZONTAL CONSTRUCTION JOINT SHALL BE FORMED BY STOPPING MASONRY AT THE SAME ELEVATION WITH THE GROUT STOPPING 1/2" BELOW A MORTAR JOINT, EXCEPT AT BOND BEAMS. THE GROUT POUR SHALL BE STOPPED A MINIMUM OF 1/2" BELOW THE TOP OF THE MASONRY.
- CLEAN OUTS SHALL BE PROVIDED FOR ALL GROUT POURS OVER 5 FEET IN HEIGHT. CLEAN OUTS SHALL BE PROVIDED IN THE BOTTOM COURSE AT ALL VERTICAL BARS, BUT SHALL NOT BE SPACED MORE THAN 32" ON CENTER. CLEAN OUTS SHALL BE SEALED AFTER INSPECTION AND BEFORE GROUTING.

**REINFORCING STEEL**

- BAR REINFORCEMENT SHALL CONFORM TO:  
ASTM A615, GRADE 60 ..... ALL REBAR U.N.O.  
ASTM A706, GRADE 60 ..... ALL WELDED REBAR
- WELDING OF REINFORCING STEEL SHALL CONFORM TO AWS D1.4
- WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
- REINFORCING DETAILING, BENDING AND PLACING SHALL BE IN ACCORDANCE WITH THE CRSI "MANUAL OF STANDARD PRACTICE" LATEST EDITION.
- LAPS AT BAR SPLICES SHALL BE PER EACH INDEPENDENT DETAIL UNLESS NOTED OTHERWISE.
- VERTICAL BARS IN WALLS SHALL BE ACCURATELY POSITIONED AT THE CENTER OF WALL, UNLESS OTHERWISE NOTED ON DETAILS, & SHALL BE TIED IN POSITION AT TOP AND BOTTOM AND AT INTERVALS NOT EXCEEDING 192 BAR DIA.
- MINIMUM CONCRETE COVER TO REINFORCING STEEL SHALL BE AS FOLLOWS U.N.O.:  
NEW CONCRETE PAD FORMED ON (E) SLAB ..... 2"
- ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS, AND INSERTS SHALL BE SECURED IN POSITION PRIOR TO PLACING CONCRETE OR GROUT.

**DESIGN CRITERIA**

APPLICABLE CODE: 2010 CALIFORNIA BUILDING CODE

**1. LATERAL LOADS**

<b>SEISMIC LOADS</b>		
SITE COORDINATES	N33.80473	W118.34753
SEISMIC IMPORTANCE FACTOR	I <sub>p</sub> = 1.5	
MAPPED SPECTRAL RESPONSE ACCELERATIONS	S <sub>s</sub> = 1.723	S <sub>1</sub> = 0.669
SITE CLASS	S <sub>w</sub> = D	
DESIGN SPECTRAL RESPONSE COEFFICIENTS	S <sub>ds</sub> = 1.148	S <sub>d1</sub> = 0.669
SEISMIC DESIGN CATEGORY	II	
SYSTEM/COMPONENT RESPONSE AMPLIFICATION FACTOR	R <sub>s</sub> = 1.0	
SYSTEM/COMPONENT RESPONSE MODIFICATION FACTOR	R <sub>m</sub> = 2.5	
HEIGHT IN STRUCTURE OF POINT OF ATTACHMENT, Z		
AVERAGE ROOF HEIGHT OF STRUCTURE, H		
	Z/H = 0.0 (@ GRADE)	

**SEISMIC DESIGN FORCE**  
**HORIZONTAL**  
 $F_p = 0.4 a_p S_{ds} W_p / (R_p I_p) + (1 + 2 Z/H)$   
 $= 0.276 W_p$

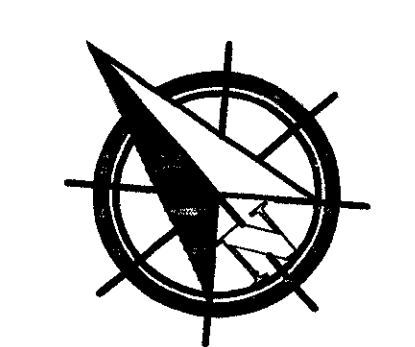
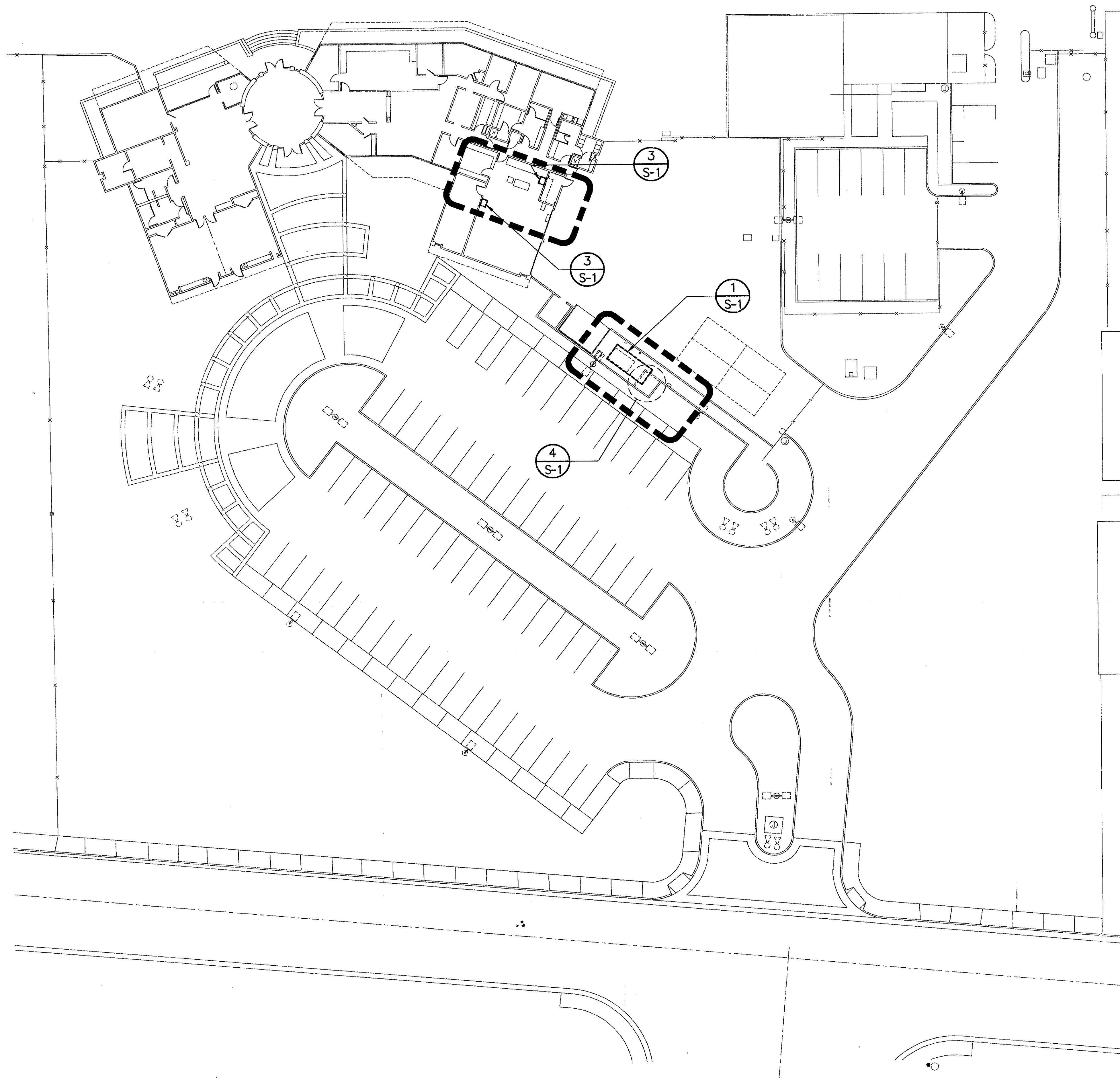
$F_p, min = 0.3 S_{ds} W_p$   
 $= 0.517 W_p$  GOVERNS

**VERTICAL**  
 $F_v = 0.2 S_{ds} W_p$   
 $= 0.345 W_p$

WHERE: S<sub>ds</sub> = THE DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETER IN THE SHORT PERIOD RANGE.  
 I<sub>p</sub> = COMPONENT IMPORTANCE FACTOR. I<sub>p</sub> SHALL BE TAKEN AS 1.5 PER ASCE 7-05 FOR ESSENTIAL FACILITIES.  
 W<sub>p</sub> = COMPONENT OPERATING WEIGHT (LBS)

**WIND DESIGN**

BASIC WIND SPEED	85.0 MPH
WIND IMPORTANCE FACTOR	I = 1.0
OCCUPANCY CATEGORY	II
WIND EXPOSURE	C

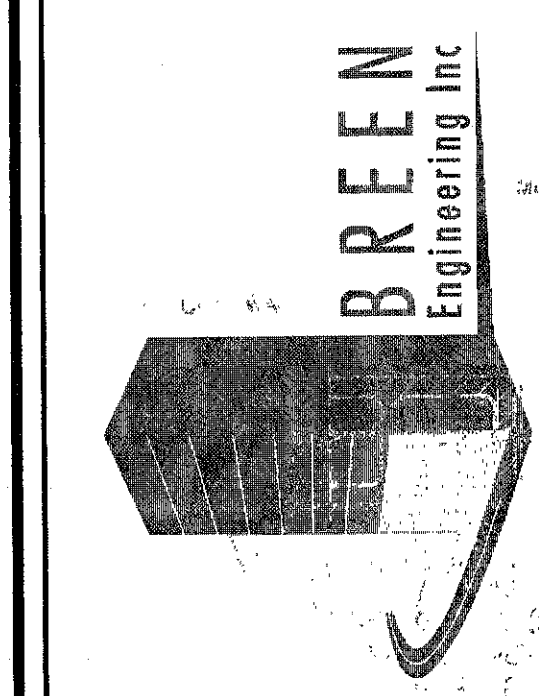


SCALE: 1" = 20'

DATE	07/24/2013
PROJECT NUMBER	13-0-01
DRAWN BY	JL
CHECKED BY	JL
DRAWING NUMBER	S-1



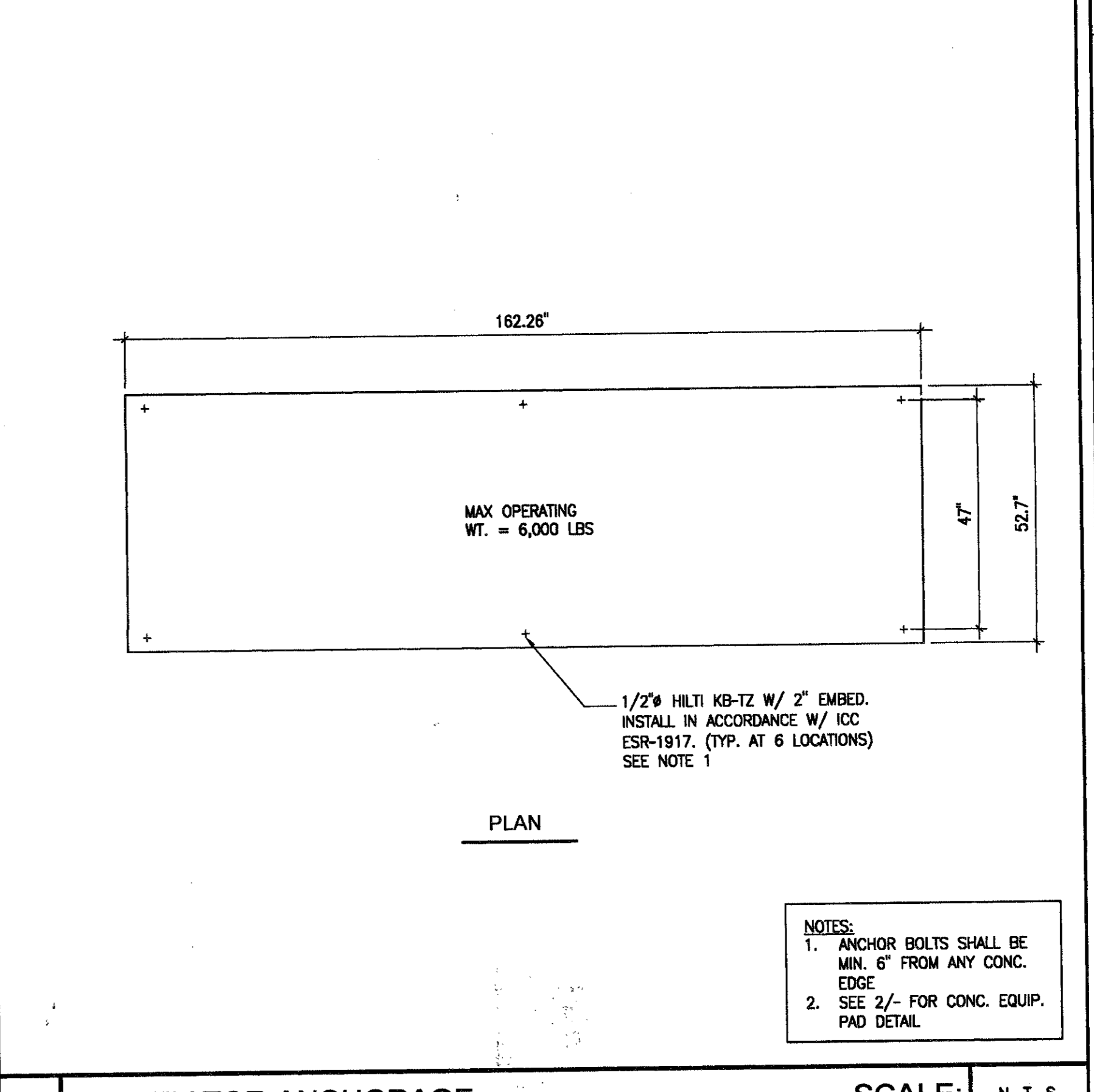
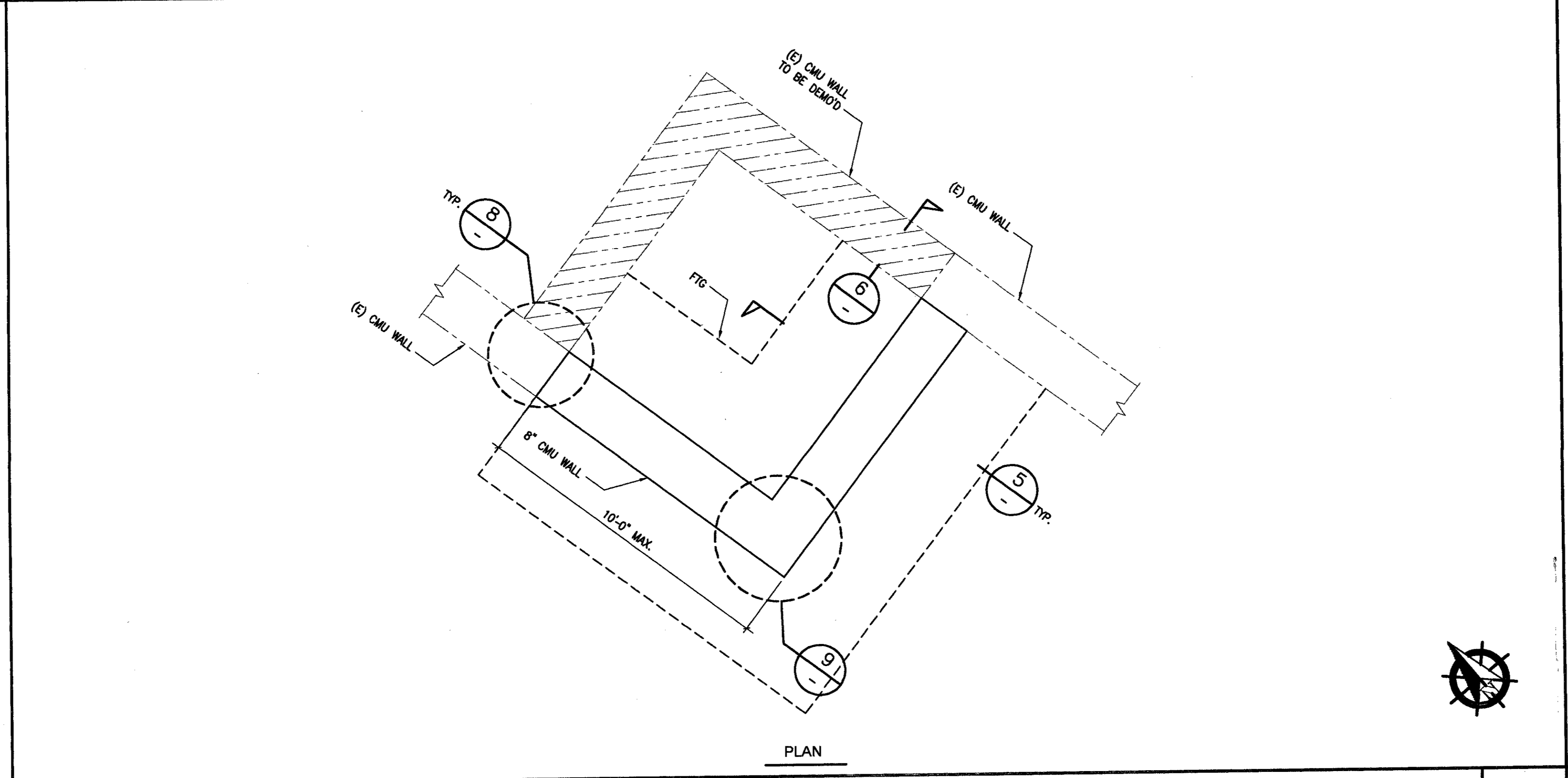
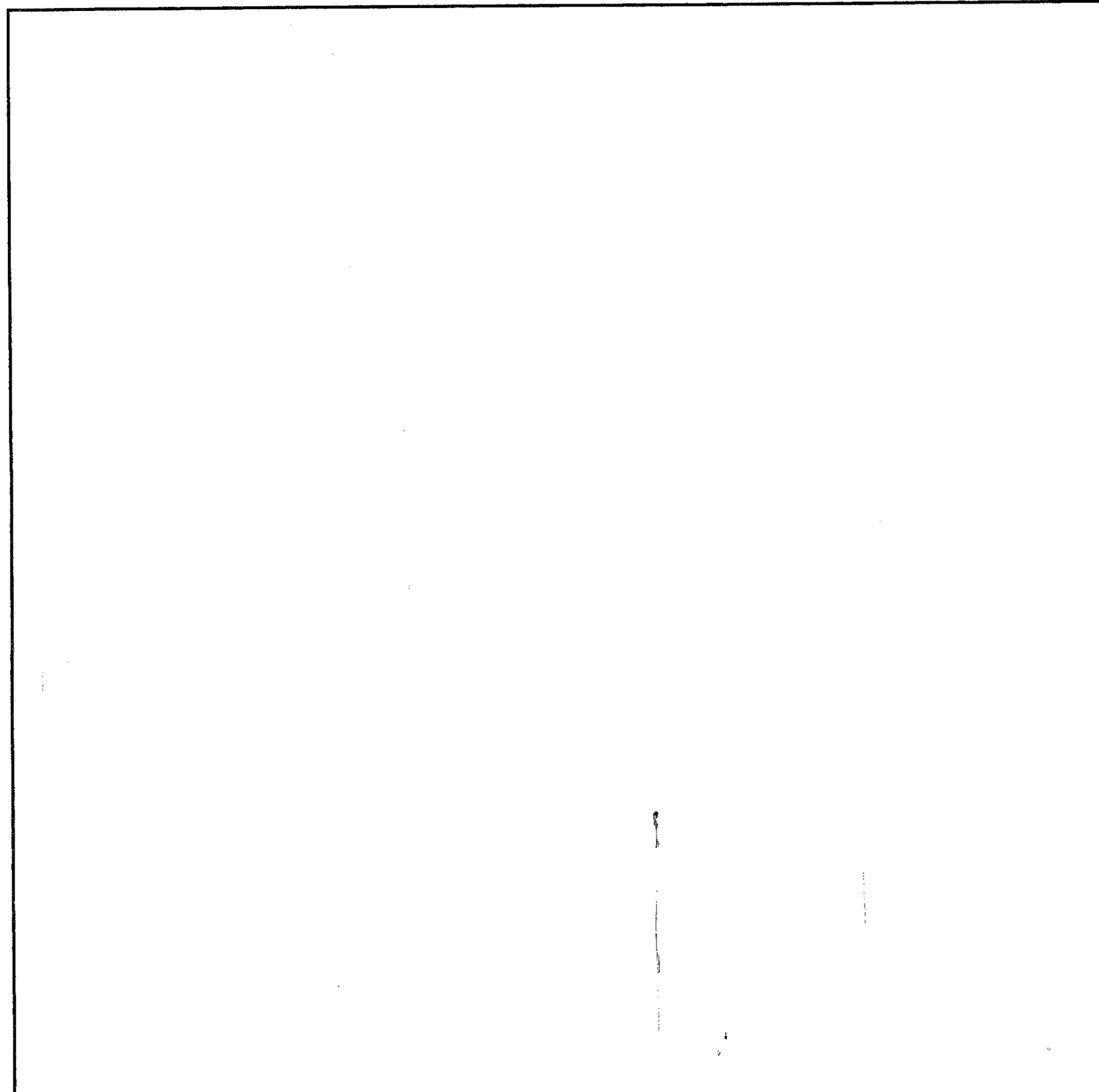
1043 WEST 100TH STREET, SUITE 200  
 TORRANCE, CA 90504  
 TEL: (310) 464-8404  
 FAX: (310) 464-8408  
 WWW: www.breeneng.com



**STRUCTURAL SITE PLAN**

**GENERAL AVIATION CENTER  
 TORRANCE MUNICIPAL AIRPORT**  
 SMALL AIRPORT DISTRICT  
 TORRANCE, CALIF., 90503

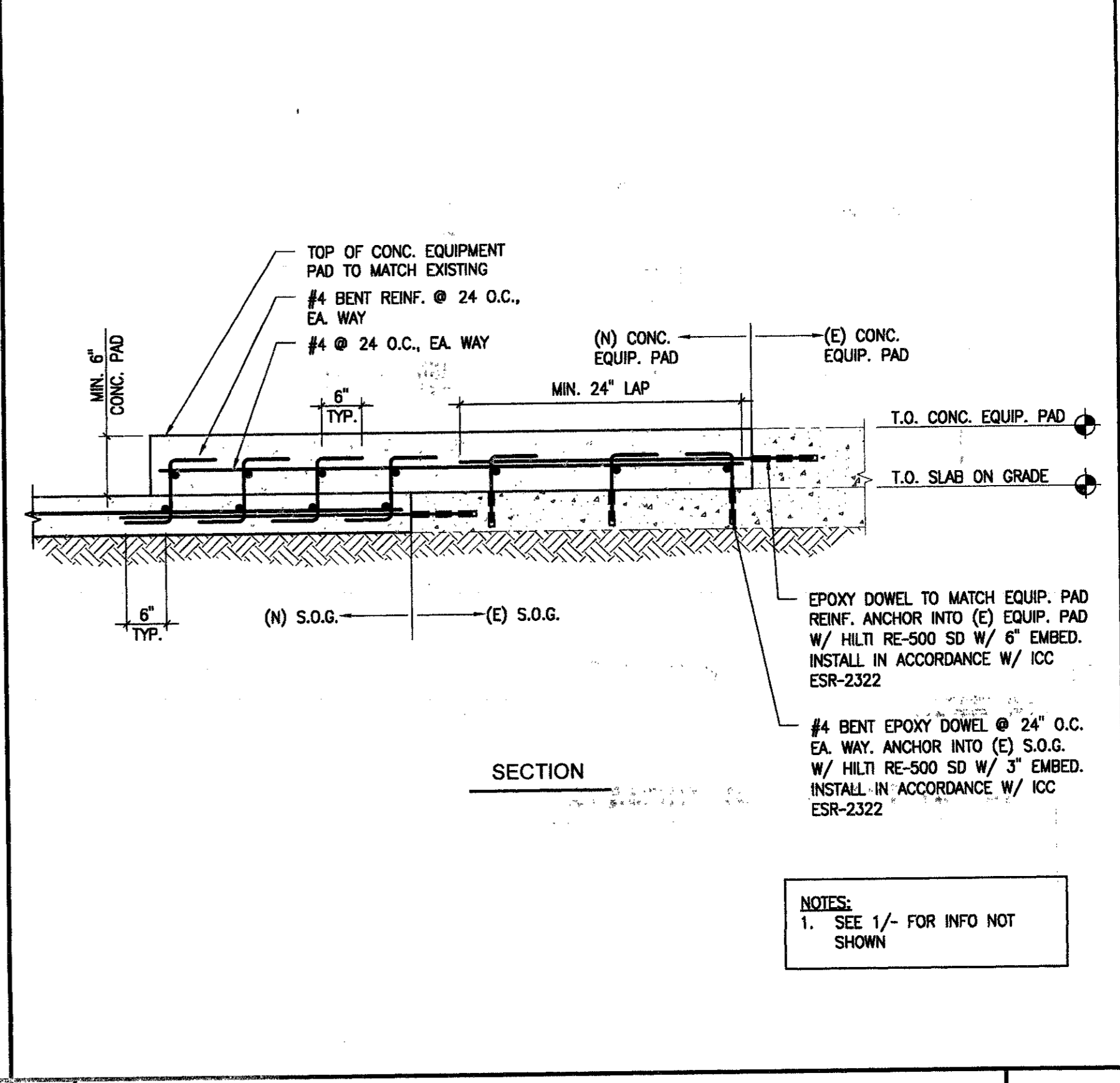
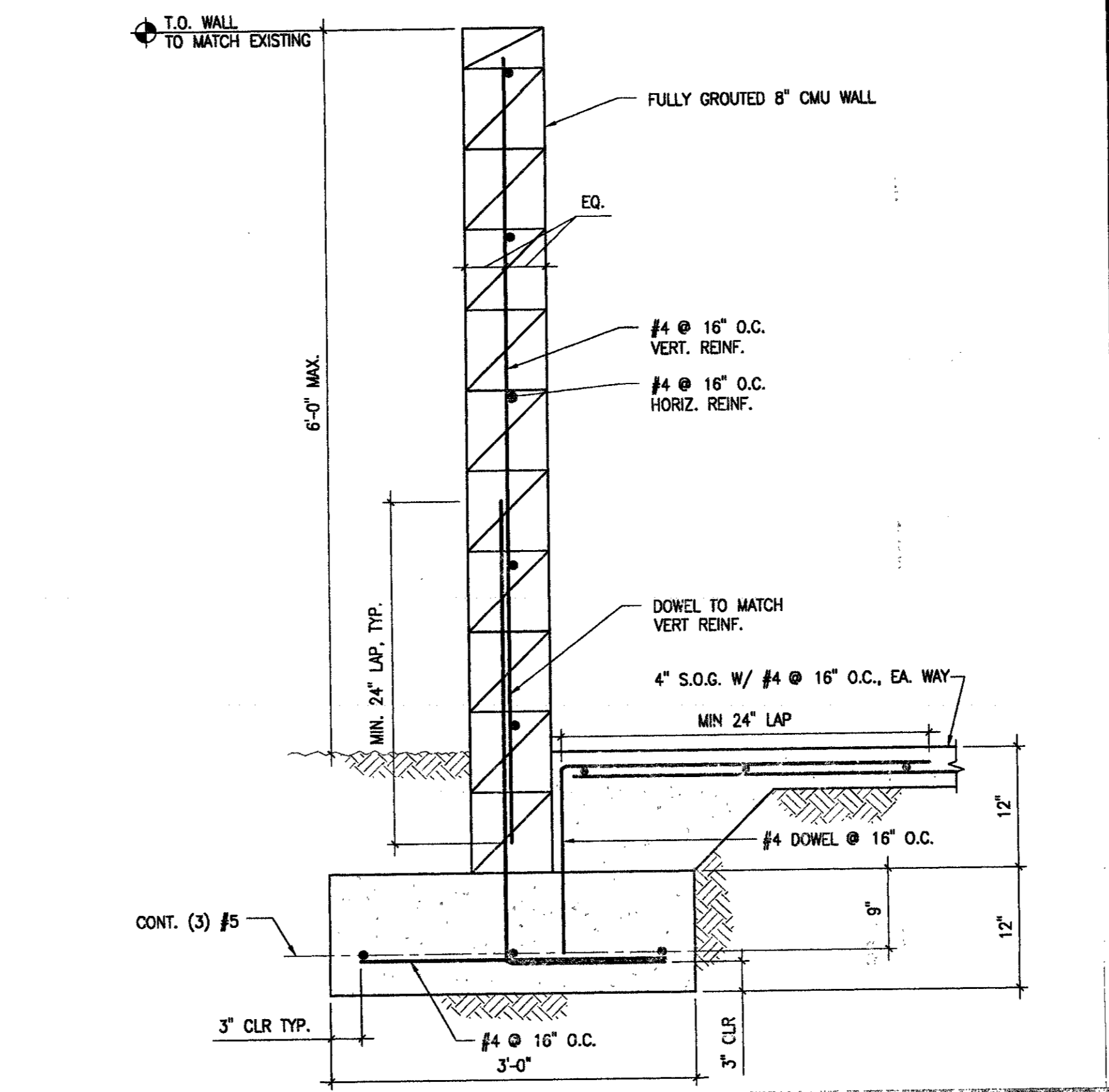
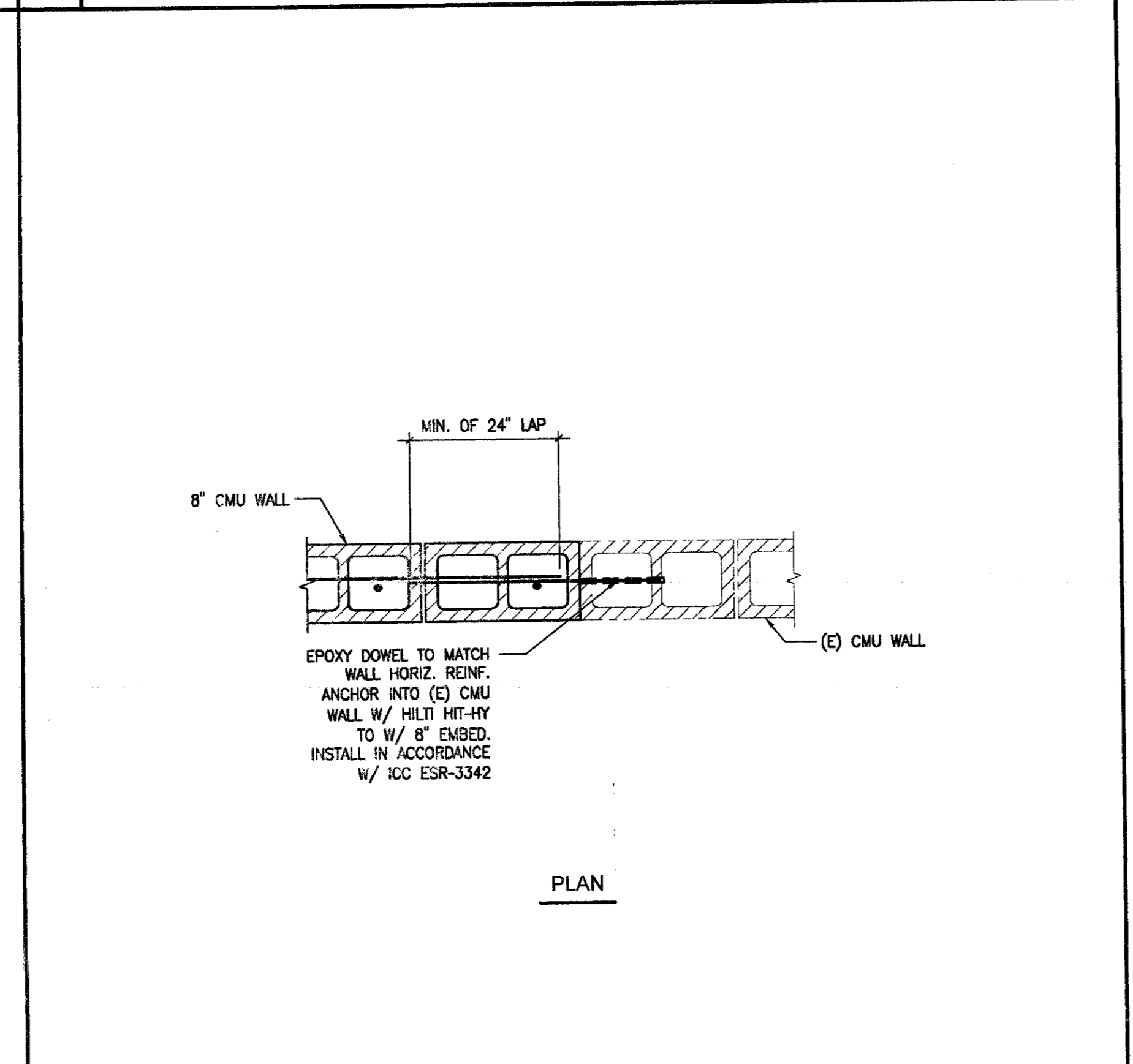
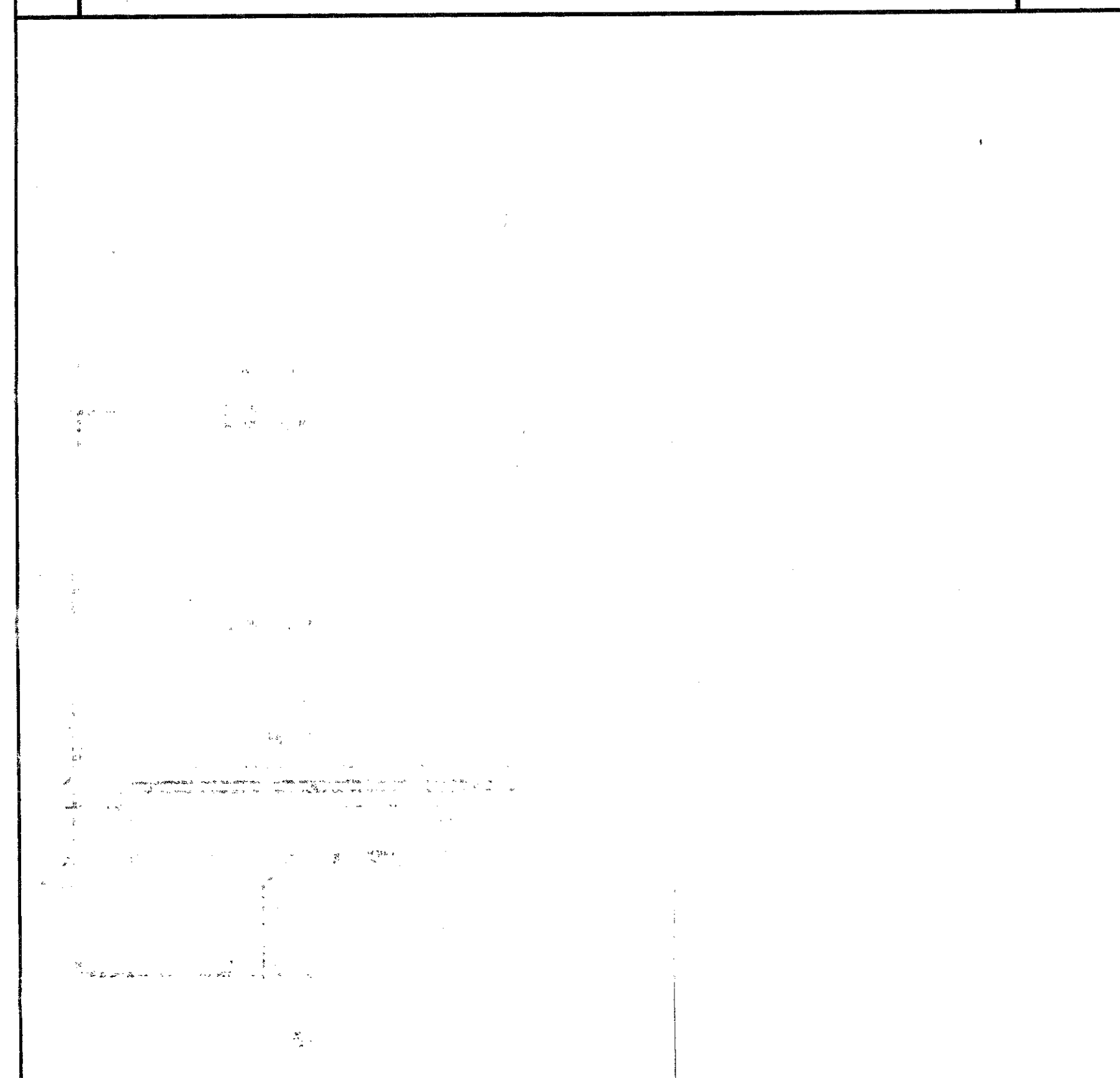
DATE: 07/27/2013  
 SCALE: 1" = 20'  
 PROJECT NUMBER: 13-0-01  
 DRAWN BY: JL  
 CHECKED BY: JL  
 DRAWING NUMBER: S-1



10 NOT USED SCALE: N/A

4 PARTIAL PLAN AT EQUIPMENT YARD SCALE: N.T.S.

1 GENERATOR ANCHORAGE SCALE: N.T.S.

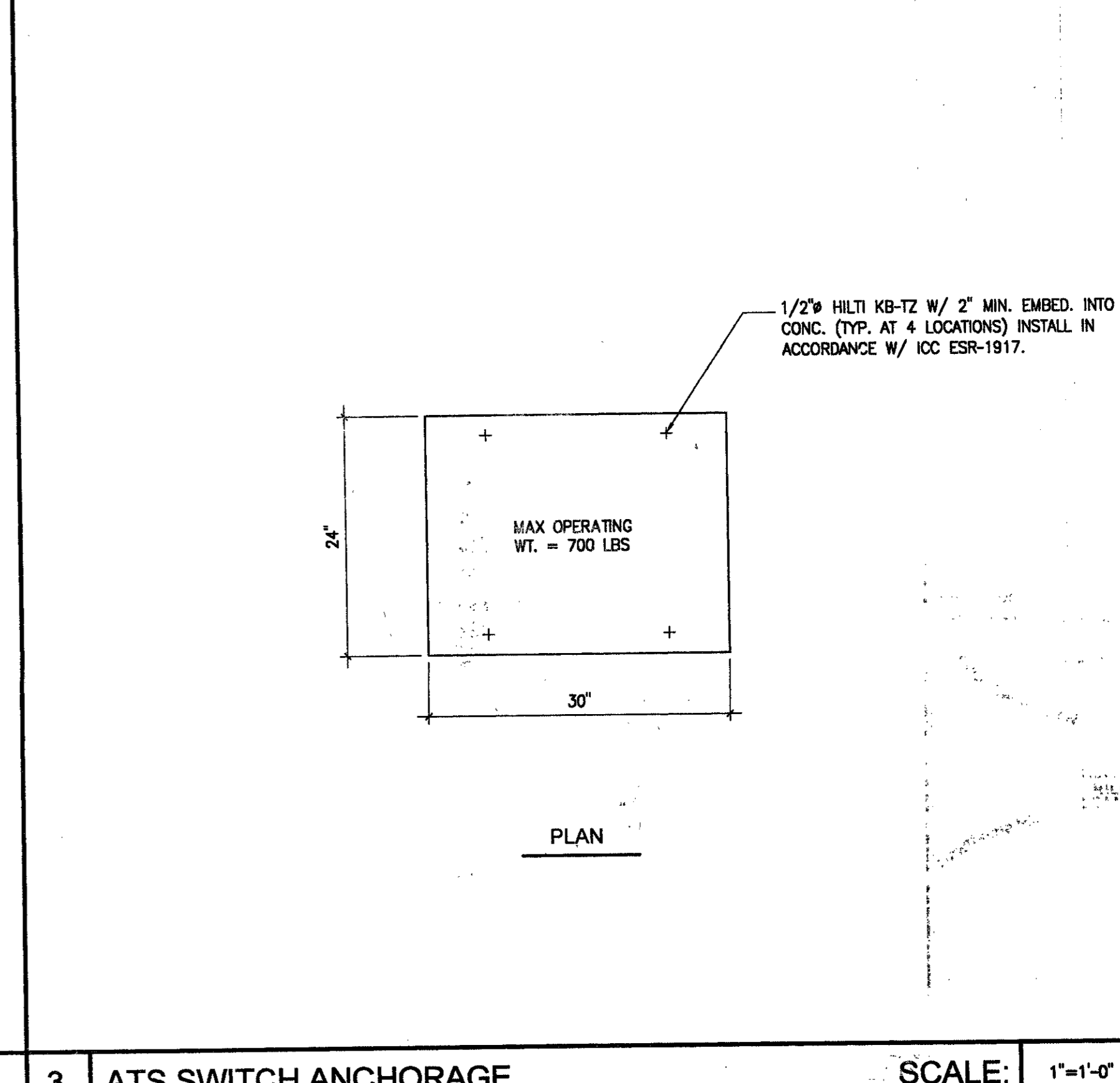
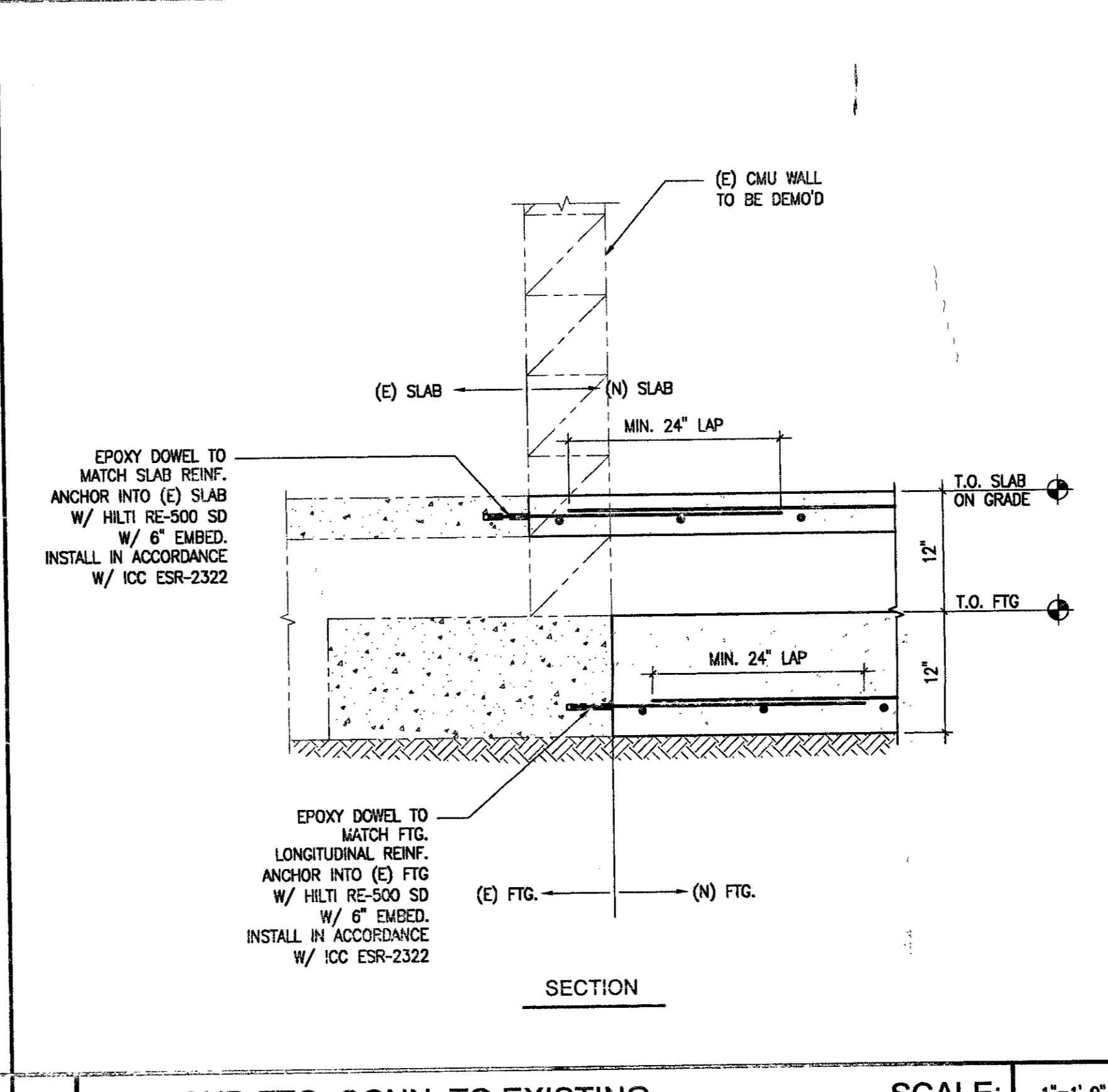
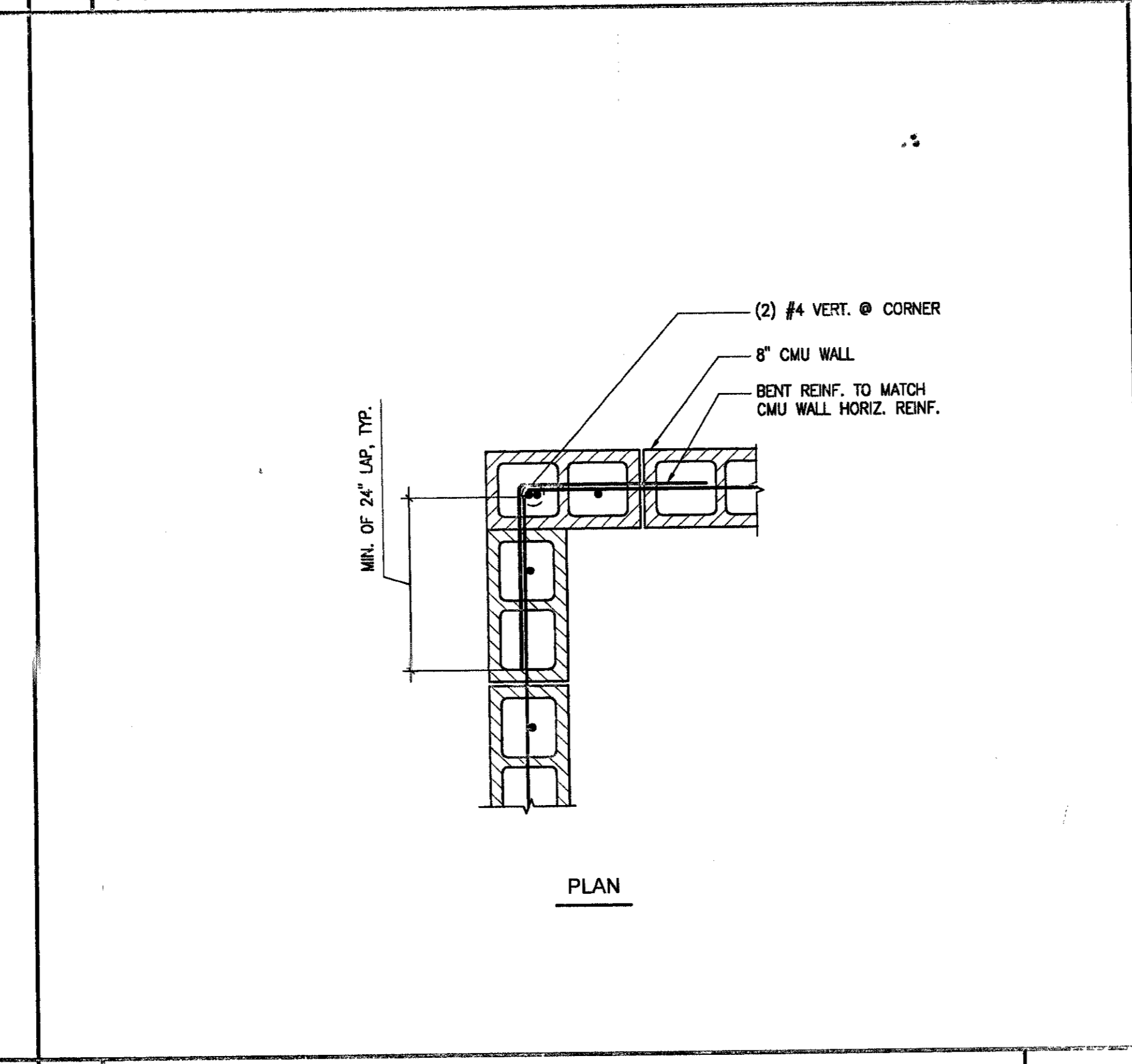
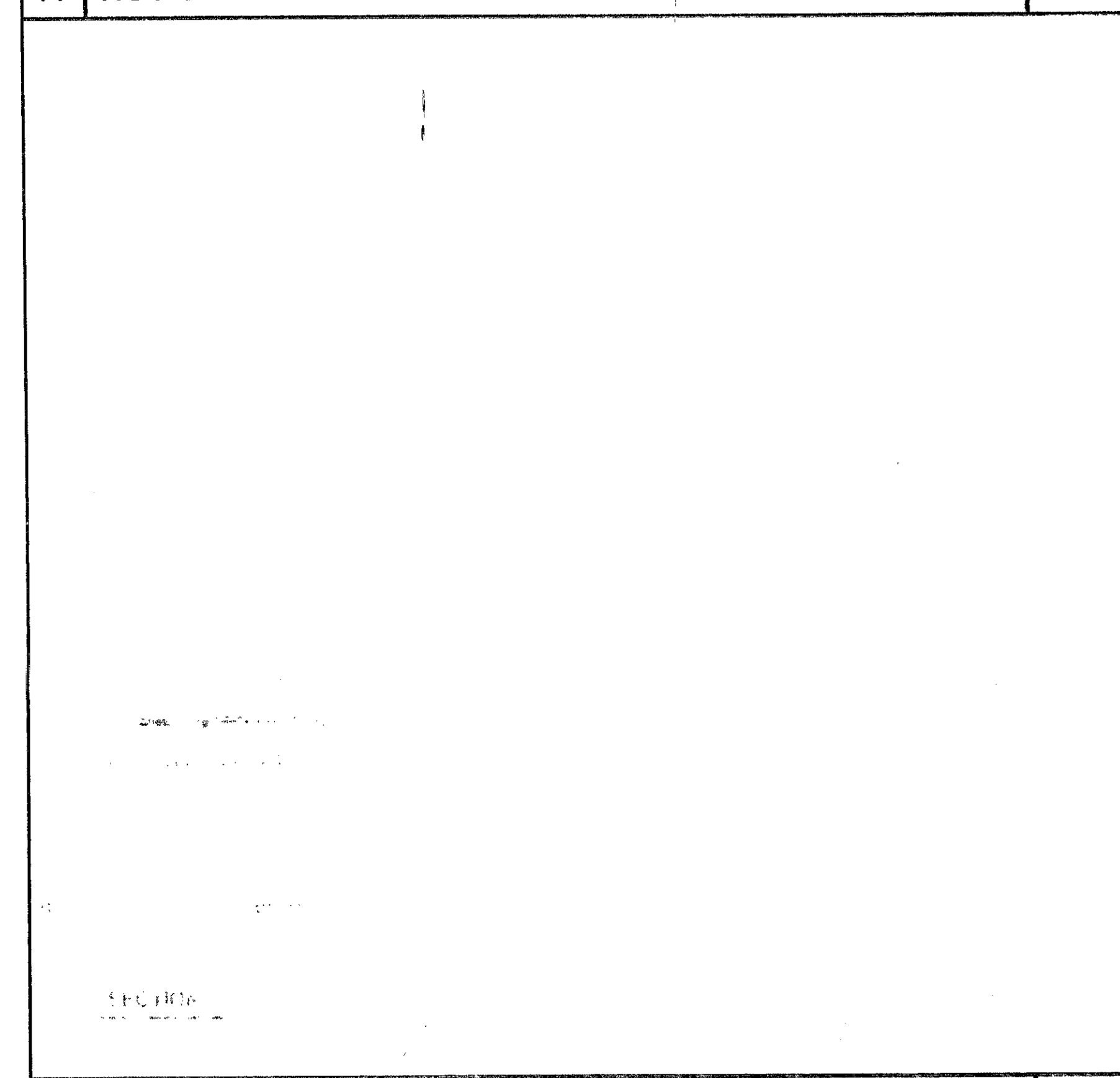


11 NOT USED SCALE: N/A

8 (N) CMU WALL TO (E) WALL CONN. SCALE: 1\"/>

5 TYP. WALL SECTION SCALE: 1\"/>

2 CONC. EQUIPMENT PAD DETAIL SCALE: 1\"/>



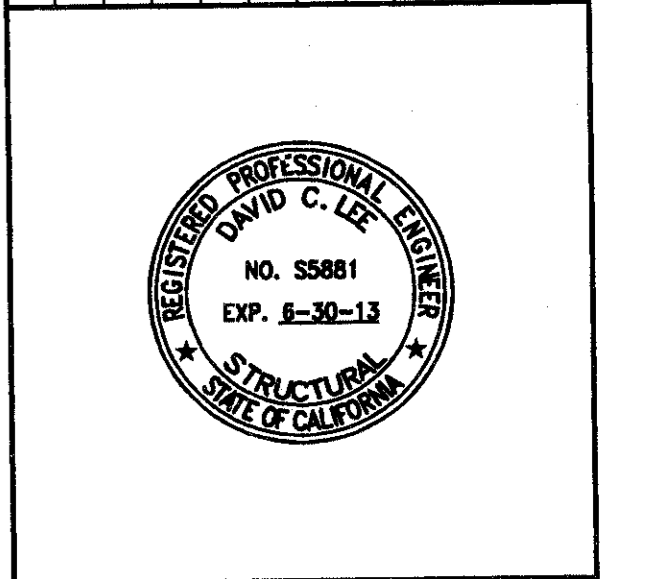
12 NOT USED SCALE: N/A

9 TYP. REINF. AT WALL CORNER SCALE: 1\"/>

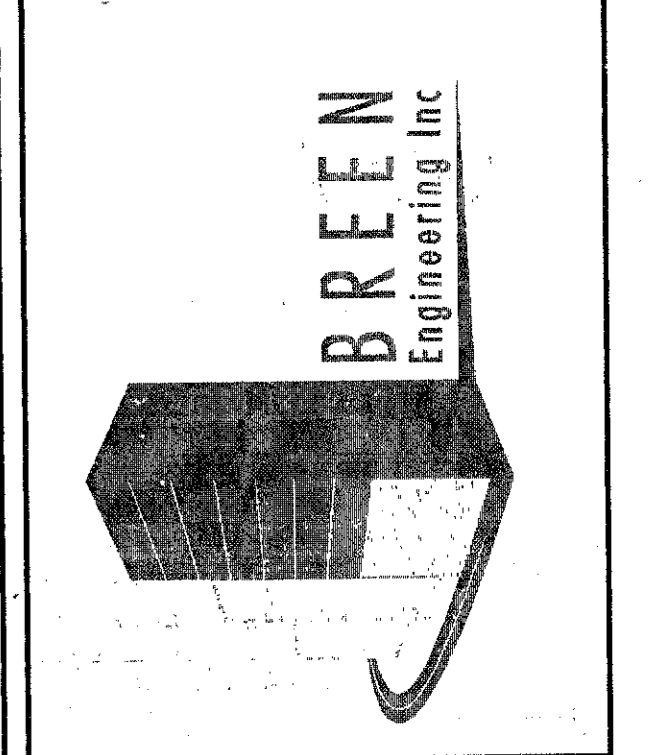
6 SLAB AND FTG. CONN. TO EXISTING SCALE: 1\"/>

3 ATS SWITCH ANCHORAGE SCALE: 1\"/>

DATE	07/20/13
BY	
REV.	
DESCRIPTION	



1883 WEST 180TH STREET, SUITE 200  
 TORRANCE, CA 90504  
 TEL: (310) 464-8404  
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**STRUCTURAL DETAILS**  
**GENERAL AVIATION CENTER**  
**TORRANCE MUNICIPAL AIRPORT**  
EXIST. AIRPORT BUILDING  
TORRANCE, CALIF. 90503

DATE	06/17/2013
SCALE	AS NOTED
PROJECT NUMBER	20-13-001
DRAWN BY	EL
CHECKED BY	EL
DRAWING NUMBER	S-2