

# ELECTRICAL SYMBOLS

- NOTE:** NOT ALL SYMBOLS ARE USED.
- WALL LIGHT/OUTLET FIXTURE. UPPER CASE LETTER WITH NUMBER INDICATES TYPE. SEE LIGHT FIXTURE SCHEDULE FOR TYPE. LOWER CASE LETTER INDICATES SWITCHING. NUMBER INDICATES BRANCH CIRCUIT(S).
  - DOWN LIGHT FIXTURE. UPPER CASE LETTER WITH NUMBER INDICATES TYPE. SEE LIGHT FIXTURE SCHEDULE FOR TYPE. LOWER CASE LETTER INDICATES SWITCHING. NUMBER INDICATES BRANCH CIRCUIT(S).
  - WALL WASH LIGHT FIXTURE. UPPER CASE LETTER WITH NUMBER INDICATES TYPE. SEE LIGHT FIXTURE SCHEDULE FOR TYPE. LOWER CASE LETTER INDICATES SWITCHING. NUMBER INDICATES BRANCH CIRCUIT(S).
  - FLOURESCENT LIGHT FIXTURE. UPPER CASE LETTER WITH NUMBER INDICATES TYPE. SEE LIGHT FIXTURE SCHEDULE FOR TYPE. LOWER CASE LETTER INDICATES SWITCHING. NUMBER INDICATES BRANCH CIRCUIT(S).
  - TRACK LIGHTING SYSTEM. TRIANGLES DENOTE TRACK HEADS. UPPER CASE LETTER WITH NUMBER INDICATES TYPE. SEE LIGHT FIXTURE SCHEDULE FOR TYPE. LOWER CASE LETTER INDICATES SWITCHING. NUMBER INDICATES BRANCH CIRCUIT(S).
  - EMERGENCY FLOURESCENT LIGHT FIXTURE SERVED BY EMERGENCY GENERATOR, WHERE "NL" INDICATED, ONE (1) BALLAST WITHING FIXTURE SHALL BE CIRCUITED UPSTREAM OF ANY CONTROL DEVICE. UPPER CASE LETTER WITH NUMBER INDICATES TYPE. SEE LIGHT FIXTURE SCHEDULE FOR TYPE. LOWER CASE LETTER INDICATES SWITCHING. NUMBER INDICATES BRANCH CIRCUIT(S).
  - EXIT SIGN. SHADED PORTION INDICATES FACE OF SIGN. SEE LIGHT FIXTURE SCHEDULE.
  - JUNCTION BOX IN ACCESSIBLE LOCATION ABOVE CEILING WITH FLEXIBLE CONDUIT CONNECTION TO LIGHT FIXTURE.
  - JUNCTION BOX IN ACCESSIBLE LOCATION.
  - SINGLE POLE SWITCH.
  - TWO (2) POLE SWITCH.
  - THREE-WAY SWITCH.
  - FOUR-WAY SWITCH.
  - MOTOR RATED SWITCH HORSEPOWER, VOLTAGE AND PHASE RATED WITH THERMAL OVERLOAD PROTECTION. NEMA 3R WHERE OUTSIDE.
  - FLEXIBLE CONDUIT CONNECTION TO EQUIPMENT. "WP" INDICATES LIQUID TIGHT AND WEATHERPROOF COVER.
  - SINGLE RECEPTACLE. SLASH LINE INDICATES MOUNTING IS ABOVE COUNTER.
  - DUPLEX RECEPTACLE. SLASH LINE INDICATES MOUNTING IS ABOVE COUNTER.
  - FOURPLEX RECEPTACLE. SLASH LINE INDICATES MOUNTING IS ABOVE COUNTER.
  - ISOLATED GROUND DUPLEX RECEPTACLE. SLASH LINE INDICATES MOUNTING IN ABOVE COUNTER.
  - ISOLATED GROUND FOURPLEX RECEPTACLE. SLASH LINE INDICATES MOUNTING IS ABOVE COUNTER.
  - FLUSH FLOOR OUTLET WITH DEVICE SYMBOLIZED. PROVIDE ITS BRASS DEVICE PLATE AND CARPET FLANGE, IN CARPETED AREAS. TELEPHONE AND DATA OUTLETS SHALL HAVE MIN. 1" C. WITH PULL STRINGS STUBBED UP INTO ACCESSIBLE CEILING SPACE. PROVIDE CONDUIT BUSHINGS ABOVE CEILING.
  - SPECIAL PURPOSE RECEPTACLE WITH NEMA CONFIGURATION NOTED, I.E.; 6-50, 15-20, ETC.
  - PROVIDE MULTIPLE CHANNEL LARGE RACEWAY EQUAL TO WIREMOLD 4000 SERIES. MOUNTED AT 44" AFF. PROVIDE WIREMOLD WITH 120V, 20A RECEPTACLES AND VOICE/DATA OUTLETS. QUANTITIES AS SHOWN. PROVIDE COORDINATE EXACT VOICE/DATA REQUIREMENTS AND MOUNTING LOCATIONS AND HEIGHTS WITH ARCHITECT AND UA PRIOR TO ROUGH-IN. PROVIDE ALL MOUNTING SUPPORT HARDWARE AND COUPLING, TRANSITIONS, AND OBSTACLE AVOIDANCE FITTINGS AS REQUIRED. PROVIDE LATEST FURNITURE SHOP DRAWINGS TO WIREMOLD FOR COORDINATION AND PROPER INSTALLATION.
  - NOTE:** REFER TO ABBREVIATIONS FOR RECEPTACLE SUBSCRIPTS.
  - DATA OUTLET. SLASH LINE INDICATES MOUNTING IS ABOVE COUNTER. PROVIDE JUNCTION BOX AND 3/4" CONDUIT WITH PULL STRING UP INTO ACCESSIBLE CEILING SPACE U.N.O. PROVIDE CONDUIT BUSHING ABOVE CEILING.
  - DATA AND COMMUNICATIONS JACK. SLASH LINE INDICATES MOUNTING IS ABOVE COUNTER. PROVIDE JUNCTION BOX AND 3/4" CONDUIT WITH PULL STRING INTO ACCESSIBLE CEILING SPACE U.N.O. PROVIDE CONDUIT BUSHING ABOVE CEILING.
  - 4"x4"x3/4" THICK FIRE RATED TELEPHONE BOARD. MOUNT AT 6" BELOW CEILING. PROVIDE #6 SOLID CU GROUND PER NEC #800.
  - CIRCUITS IN CONDUIT CONCEALED IN FLOOR OR BELOW GRADE. HACHURES INDICATE NUMBER OF PHASE AND NEUTRAL CONDUCTORS ONLY. WHERE NO HACHURES ARE SHOWN PROVIDE 2 #12 Cu, 1 #12 Cu G. WHERE WIRE IS NOTED ON HOMERUN TO BE LARGER THAN #12, PROVIDE SIZE WIRE AND CONDUIT INDICATE FOR ENTIRE LENGTH OF CIRCUIT. MINIMUM CONDUIT SIZE IS 3/4". PROVIDE A GROUNDING CONDUCTORS SIZED PER NEC 250 IN ALL RACEWAYS. GROUNDING CONDUCTORS ARE NOT NORMALLY SHOWN ON THE DRAWINGS.
  - CIRCUITS IN CONDUIT CONCEALED IN WALLS OR ABOVE CEILING.
  - HOMERUN TO PANELBOARD OR AS NOTED.
  - HEAVY DUTY DISCONNECT SWTCH. HORSEPOWER, VOLTAGE AND PHASE RATED. FUSED UNLESS NOTED "NF" (NON FUSED). SIZE FUSES PER EQUIPMENT MANUFACTURES NAMEPLATE RECOMMENDATIONS. PROVIDE NEMA 3R WHERE OUTSIDE.
  - AC MAGNETIC MOTOR STARTER. HORSEPOWER, VOLTAGE AND PHASE RATED. NUMBER OF POLES AS REQUIRED. FURNISH WITH (1) N.O./N.C. FIELD CONVERTIBLE AUXILIARY CONTACT AND 120V. CONTROL COIL. SINGLE SPEED NON-REVERSING U.N.O PROVIDE NEMA 3R WHERE OUTSIDE.
  - AC MOTOR STARTER. NEMA SIZE AS NOTED ON ONE-LINE DIAGRAM. PROVIDE NEMA 3R WHERE REQUIRED.
  - CONDUIT STUB-UP.
  - CONDUIT STUB-OUT. CAP AND MARK FOR FUTURE USE.
  - PANELBOARD. SURFACE OR FLUSH AS SCHEDULED.
  - MOTOR. SIZE AND RATING AS SHOWN. "EF" INDICATES 150 WATT EXHAUST FAN.
  - TELEVISION OUTLET. SLASH LINE INDICATES MOUNTING IS ABOVE COUNTER. PROVIDE 3/4" C. WITH PULL STRING UP INTO ACCESSIBLE CEILING SPACE U.N.O. PROVIDE CONDUIT BUSHING ABOVE CEILING.
  - PROVIDE SYSTEM FURNITURE POWER AND VOICE/DATA BASE FEEDS. PROVIDE SINGLE GANG MUDRING WITH PULL TAPE TO ACCESSIBLE CEILING SPACE FOR VOICE/DATA CABLING TO SYSTEM FURNITURE, UNO. MAKE FINAL CONNECTIONS AS REQUIRED.
  - SECURITY CARD READER. PROVIDE SINGLE GANG MUDRING AND 3/4" C. WITH PULL STRING UP TO ACCESSIBLE CEILING FOR WIRING BY SECURITY VENDOR. U.N.O.

# ONE LINE DIAGRAM SYMBOLS

- CURRENT TRANSFORMER.
- UTILITY METER.
- CIRCUIT BREAKER. AMPERE RATING AND # OF POLES INDICATED.
- FUSED SWITCH. AMPERE RATING AND # OF POLES INDICATED.
- FUSED PULL-OUT. AMPERE RATING AND # OF POLES INDICATED.
- INDICATES DRAW-OUT DEVICE.
- FUSE. AMPERE RATING INDICATED. (BUSSMANN DESIGNATION UNO)
- TRANSFORMER, DRY TYPE, PAD PAD MOUNT, WITH KVA, PRIMARY AND SECONDARY VOLTAGE, MINIMUM IMPEDANCE, AND "K" RATING AS NOTED. PROVIDE SEPERATELY DERIVED SOURCE GROUNDING PER NEC 250 SIZE AS NOTED. 150° C RISE UNO.
- MAGNETIC MOTOR STARTER. NEMA SIZE INDICATED. PROVIDE WITH OPTIONAL FEATURES SCHEDULED.
- GROUND. SIZE GROUNDING PER 2005 NATIONAL ELECTRICAL CODE. UNO
- CONDUCTOR TERMINATION POINT.

## PANELBOARD SYMBOL SCHEDULE

- INDICATES PROVIDE NEW 'LOCK-DOG' ON CIRCUIT BREAKER.
- INDICATES NEW LOAD ADDED TO EXISTING CIRCUIT BREAKER.
- INDICATES NEW LOAD AND NEW CIRCUIT BREAKER ADDED TO EXISTING BUSSED SPACE.
- INDICATES EXISTING LOAD REMOVED AND BREAKER TO BECOME SPARE.
- INDICATES EXISTING LOAD AND BREAKER REMOVED AND REPLACED WITH NEW BREAKER AND POSSIBLY NEW LOAD.
- INDICATES EXISTING LOAD & CIRCUIT BREAKER TO REMAIN - NO REVISION. EXISTING LOADS MAY HAVE BEEN ESTIMATED.
- CIRCUIT THRU LIGHTING CONTRACTOR. SEE WIRING DIAGRAM(S).
- INDICATES CONTINUOUS LOAD.
- INDICATES NON-CONTINUOUS LOAD.
- INDICATES SPARE CIRCUIT BREAKER.
- INDICATES BUSSED SPACE FOR FUTURE CIRCUIT BREAKER.
- INDICATES MOTOR LOAD.
- INDICATES GENERAL PURPOSE RECEPTACLE LOAD.

## OCCUPANCY SENSOR LEGEND

TYPE	DESCRIPTION AND CATALOG NUMBER
M	PIR WALL SWITCH WITH HAND LENS AUTO ON/OFF WITH OFF OVERRIDE. CATALOG #PW-100.
M	DUAL TECHNOLOGY CEILING/WALL MOUNTED WITH ADJUSTABLE MOUNTING BRACKET. PROVIDE WITH POWER PACK(S) AND WIRE PER MANUFACTURERS REQUIREMENTS. SWITCH(ES) AT DOOR SHALL BE FOR OFF OVERRIDE. CATALOG #DT-200 AND #BZ-150.
M	360° PIR EXTENDED RANGE CEILING MOUNTED. PROVIDE WITH POWER PACK(S) AND WIRE PER MANUFACTURERS REQUIREMENTS. SWITCH(ES) AT DOOR SHALL BE FOR OFF OVERRIDE. CATALOG #CI-300 AND #BZ-150.
U	360° 1000SF ULTRASONIC CEILING MOUNTED. PROVIDE WITH MATCHING POWER PACK(S) AND WIRE PER MANUFACTURERS REQUIREMENTS. SWITCH(ES) AT DOOR SHALL BE FOR OFF OVERRIDE. CATALOG #UT-300-2 WITH RELAY AND #BZ-150.
P	LIGHT SENSOR ADJUSTABLE FROM 1fc TO 1400fc. PROVIDE WITH MATCHING POWER PACK(S) AND WIRE PER MANUFACTURERS REQUIREMENTS. SET TIME DELAY TO 3min. CATALOG #LS-101 AND #BZ-150.
M T	DIGITAL TIME SWTCH (5min to 2h) 800W AT 120V OR 1200W AT 277V. CATALOG #TS-400.

- NOTES:**
- ALL CATALOG NUMBERS ARE WATTSTOPPER.
  - CONTRACTOR SHALL INCLUDE IN BID TO HAVE THE MANUFACTURER MAKE INSTALLATION DRAWINGS FOR ALL CONFIGURATIONS, FINAL ADJUSTMENTS OF SENSITIVITY AND AIMING OF ALL SENSORS.
  - ADJUST OCCUPANCY SENSOR TIME DELAY OFF PER OWNERS REQUIREMENTS UP TO 30min MAXIMUM.
  - CONNECT AND PROVIDE WIRING AS REQUIRED BY MANUFACTURER. ALL WIRING (INCLUDING LOW VOLTAGE) SHALL BE IN CONDUIT - 1/2" MINIMUM.
  - PROVIDE SUFFICIENT RELAYS/POWER PACKS FOR INSTALLATION SHOWN.
  - COORDINATE ALL TRIM AND DEVICE COLORS WITH ARCHITECT.
  - REFER TO CONTROL WIRING DIAGRAMS FOR ADDITIONAL REQUIREMENTS.
  - PROVIDE SENSORS WITH ISOLATED RELAY OR SLAVE RELAY THAT PROVIDES A DRY CONTACT FOR MONITORING OR CONTROL OF AIR MOVING SYSTEMS AS REQUIRED.

# FIRE ALARM SYMBOLS

- ADDRESSABLE INITIATING POINT / ZONE MODULE
- ADDRESSABLE RELAY POINT / ZONE MODULE
- HORN ONLY
- MANUAL PULL STATION
- SMOKE DETECTOR
- HEAT DETECTOR (SHOW TEMP RATING)
- MAGNETIC DOOR HOLDER
- DUCT SMOKE DETECTOR
- HORN STROBE
- STROBE ONLY
- DIGITAL ALARM COMMUNICATING TRANSMITTER
- FIRE ALARM ANNUNCIATOR
- FIRE ALARM CONTROL PANEL
- NOTIFICATION APPLIANCE CIRCUIT POWER SUPPLY
- SMOKE DETECTOR AND RELAY AT SMOKE FIRE DAMPER. RELAY SHALL BE CONTROLLED BY FIRE ALARM SYSTEM TO SHUT DOWN POWER TO SMOKE FIRE DAMPER (CLOSING DAMPER) UPON ALARM CONDITION OF ASSOCIATED SMOKE DETECTOR.
- ELEVATOR RECALL DESIGNATION
- ELEVATOR SHUNT TRIP
- FIRE SPRINKLER TAMPER / OSY / PIV VALVE SUPERVISORY SWITCH
- WATERFLOW DEVICE
- ELEVATOR SUPERVISORY RECALL PANEL
- REMOTE INDICATOR
- REMOTE TROUBLE INDICATOR

## FIRE ALARM SYMBOL NOTES

- NOT ALL SYMBOLS ARE USED.
- "C" DENOTES CEILING MOUNTED DEVICE.
- "I" DENOTES IONIZATION TYPE DETECTOR.
- "P" DENOTES PHOTOELECTRIC TYPE DETECTOR.
- MINIMUM C/N DELTA SHOWN NEXT TO DEVICE ON PLANS.
- MINIMUM TEMPERATURE RATING SHOWN NEXT TO DEVICE ON PLANS.
- "R" DENOTES DEVICE SHALL BE INSTALLED IN THE RETURN AIR DUCT.
- "S" DENOTES DEVICE SHALL BE INSTALLED IN THE SUPPLY AIR DUCT.
- "R/S" DENOTES DEVICE SHALL BE INSTALLED IN BOTH THE RETURN AND SUPPLY AIR DUCTS. ONE DEVICE PER DUCT, TWO TOTAL DEVICES. UNO.

# FIRE STOP/RESISTIVE NOTES

- ALL PENETRATIONS OF FIRE RESISTIVE FLOORS, SHAFTS, ROOF STRUCTURES, WALLS AND PARTITIONS SHALL BE PROTECTED IN ACCORDANCE WITH UNIFORM BUILDING CODE REQUIREMENTS INCLUDING BUT NOT LIMITED TO THE FOLLOWING REQUIREMENTS.
- THE CONTRACTORS SHALL BE RESPONSIBLE TO REVIEW EXISTING FACILITY DOCUMENTS AND DETERMINE THE LOCATIONS AS WELL AS THE FIRE RESISTIVE TIME AND TEMPERATURE RATINGS OF ALL FIRE RESISTIVE FLOORS, SHAFTS, WALLS, PARTITIONS, ETC. THE PROPER UL SYSTEM NUMBER FOR EACH TYPE OF PENETRATION FIRE STOP SHALL THEN BE DETERMINED AND PROVIDED. SHOP DRAWINGS SHALL BE PREPARED AND SUBMITTED TO INDICATE ALL NECESSARY FIRE STOP COMBINATIONS INCLUDING THE UL SYSTEM NUMBERS AND TYPICAL INSTALLATION DETAILS.
- FIRE RESISTIVE AND FIRE STOP MATERIALS SHALL BE IN ACCORDANCE WITH UNDERWRITERS' LABORATORIES (UL) LISTINGS FOR THROUGH-PENETRATION FIRE PROTECTION SYSTEMS. THE INSTALLATION OF ALL FIRE RESISTIVE AND FIRE STOP MATERIALS SHALL BE IN ACCORDANCE WITH THE UL LISTING AND MANUFACTURERS' REQUIREMENTS. THE CONTRACTOR SHALL OBTAIN SHOP DRAWING INSTALLATION DETAILS FROM THE MANUFACTURER WHICH INDICATE CONFORMANCE WITH THE UL REQUIREMENTS AND SPECIFY ALL INSTALLATION REQUIREMENTS WITH ALL VARIABLES DEFINED. THESE DRAWINGS SHALL BE AVAILABLE ON SITE FOR REVIEW BY THE LOCAL AUTHORITIES, THE OWNER AND ARCHITECT.
- OUTLETS (OPENINGS) IN WALLS OR PARTITIONS REQUIRING PROTECTED OPENINGS SHALL NOT EXCEED 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL OR PARTITION AREA.
- REFER TO TYPICAL FIRE RATED PENETRATION DETAILS NO. 1 & NO. 2 ON SHEET E.10 AND PROVIDE AS APPLICABLE PER THE ABOVE NOTES.

# GENERAL NOTES

- PRIOR TO ROUGH-IN AND FINAL CONNECTION, VERIFY ELECTRICAL CHARACTERISTICS AND EXACT LOCATION OF EQUIPMENT.
- COORDINATE THE SCHEDULE OF CONSTRUCTION WITH THE OWNER AND OTHER TRADES (PRIOR TO STARTING ANY WORK).
- GROUT AND SEAL ALL CONDUIT PENETRATIONS OF WALLS AND FLOOR SLABS TO PRESERVE FIRE RATING AND WATERTIGHT INTEGRITY.
- DRAWINGS SHOW EXISTING CONDITIONS OF THE SITE. AN ATTEMPT HAS BEEN MADE TO SHOW EXISTING BUILDINGS, DETAILS, ETC., BUT ACCURACY CANNOT BE GUARANTEED. VERIFY EXACT LOCATIONS OF ALL CIRCUITS, CONDUIT, PIPING, EQUIPMENT, ETC. VERIFY ALL BUILDING DETAILS.
- SEE SPECIFICATIONS.
- THE OWNER WILL OCCUPY THE EXISTING BUILDING DURING THE LIFE OF THIS CONTRACT AND ALL WORK SHALL BE SCHEDULED AT SUCH TIME AND IN SUCH A MANNER TO MINIMIZE INTERFERENCE AND INCONVENIENCE TO THE OWNER. THE ELECTRICAL CONTRACTOR MUST OBTAIN THE APPROVAL OF THE CONSTRUCTION MANAGER OR OWNER BEFORE STARTING ANY WORK WITHIN THE EXISTING BUILDING.
- EXISTING POWER OR LIGHTING CIRCUITS WHICH POWER DEVICES IN OTHER AREAS, AS WELL AS DEVICES IN THE DEMOLITION AREA (IF ANY), SHALL SHALL BE DISCONNECTED FOR AS SHORT A TIME AS NECESSARY. VERIFY WITH SITE PERSONNEL PRIOR TO THE DISCONNECTION OF ANY CIRCUITS.
- IF ANY EXISTING CIRCUIT CANNOT BE IDENTIFIED, THE CONTRACTOR SHALL USE A CIRCUIT TRACER TO DETERMINE ITS SOURCE. ARCING TO GROUND IS NOT AN ACCEPTABLE PRACTICE AT THIS FACILITY.

# DEVICE MOUNTING HEIGHTS

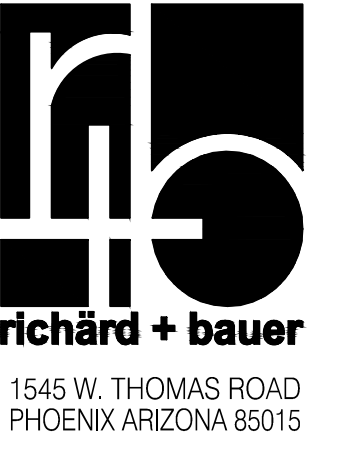
- NOTE:** ALL HEIGHTS ARE ABOVE FINISHED FLOOR AND TO THE CENTERLINE OF THE INSTALLED DEVICE U.N.O. THE ELECTRICAL CONTRACTOR SHALL ADJUST THE J-BOX MOUNTING HEIGHT ACCORDINGLY.
- RECEPTACLES +18"
  - TELEPHONE OUTLETS +18"
  - DATA OUTLETS +18"
  - ABOVE COUNTER RECEPTACLES, TELEPHONE, AND DATA OUTLETS VERIFY WITH ARCHITECT PRIOR TO ROUGH-IN.
  - SWITCHES +46"
  - DIMMERS +46"
  - OTHER CONTROLS +46"
  - TIME SWITCHES +60"
  - RECEPTACLE(S) LOCATED AT TMB +46"
  - FA MANUAL PULL STATION +46"
  - FA VISUAL DEVICES +80"
  - FA AUDIO DEVICES +80"
  - TELEVISION OUTLETS +96"
  - INTERCOM SPEAKERS +96"
  - CLOCKS +96"

# ABBREVIATIONS

- AFC.....AVAILABLE FAULT CURRENT
- AFF.....ABOVE FINISHED FLOOR
- AFG.....ABOVE FINISHED GRADE
- AIC.....AMPERE INTERRUPTING CAPACITY
- ATS.....AUTOMATIC TRANSFER SWITCH
- BF.....BASE FEED
- CAC/CRAC.....COMPUTER ROOM AIR CONDITIONING
- CF.....COMPACT FLOURESCENT
- DW.....DISHWASHER
- DISP.....DISPOSAL
- EC.....EVAPORATIVE COOLER
- EDF.....ELECTRIC DRINKING FOUNTAIN
- EF.....EXHAUST FAN
- EMT.....ELECTRICAL METALLIC TUBING
- EP.....EMERGENCY PHONE
- EUH.....ELECTRIC UNIT HEATER
- G/GRD.....COPPER GROUNDING/BONDING CONDUCTOR
- GF/GFP.....GROUND FAULT PROTECTED
- GFI/GFCI.....GROUND FAULT CIRCUIT INTERRUPTER
- HID.....HIGH INTENSITY DISCHARGED
- HPS.....HIGH PRESSURE SODIUM
- IG.....ISOLATED GROUND CONDUCTOR/RECEPTACLE
- IM.....ICE MACHINE/MAKER
- LC.....LIGHTING CONTACTOR
- LKH.....LOCKING HANDLE CIRCUIT BREAKER "LOCK-DOG"
- MCC.....MOTOR CONTROL CENTER
- MH.....METAL HALIDE
- N.....NEUTRAL CONDUCTOR
- NF.....NON-FUSED
- NIC.....NOT IN CONTRACT
- NL.....NIGHT LIGHT
- PNL.....PANEL
- PVC.....RIGID PVC CONDUIT, SCHEDULE 40 UNO
- RA/RAF.....RETURN AIR FAN
- RMC.....RIGID METAL CONDUIT
- SES.....SERVICE ENTRANCE SWITCHBOARD
- SF.....SUPPLY FAN
- ST.....SHUNT TRIP
- SWBD.....SWITCHBOARD
- TC.....TIME CLOCK
- TS.....TIME SWITCH
- UNO.....UNLESS NOTED OTHERWISE
- VFD.....VARIABLE FREQUENCY DRIVE
- WH.....WATER HEATER
- WR.....WEATHERROOF
- XFMR.....TRANSFORMER

# DEMOLITION NOTES

- ANY ELECTRICAL DEVICE OR EQUIPMENT NOT NOTED TO BE REMOVED OR RELOCATED SHALL REMAIN UNCHANGED. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO CONTACT THE ARCHITECT/ENGINEER REGARDING ANY ITEM IN QUESTION.
- WHERE ITEMS ARE NOTED TO BE REMOVED, ELECTRICAL CONTRACTOR SHALL:
  - A) REMOVE INDICATED ITEM.
  - B) REMOVE ANY ASSOCIATED CONDUIT AND WRING WHERE SURFACE MOUNTED OR ABOVE AN ACCESSIBLE CEILING.
  - C) PULL OUT ASSOCIATED WIRING, CUT OFF, CAP, and ABANDON CONDUIT WHERE CONCEALED IN WALLS OR PARTITIONS WHICH ARE REMAINING.
  - D) RETURN ALL REMOVED EQUIPMENT TO OWNER OR DISPOSE OF AS DIRECTED BY OWNER.
- WHERE ELECTRICAL CONTRACTOR REMOVES AN ITEM AND CIRCUITING TO OTHER ITEMS WILL BE INTERRUPTED, ELECTRICAL CONTRACTOR SHALL PROVIDE NEW CONDUIT, WIRE, BOXES, ETC. AS REQUIRED AND RECONNECT REMAINING ITEMS SO THEY WILL NOT BE INTERRUPTED.
- WHERE AN ITEM IS SHOWN TO BE RELOCATED, ELECTRICAL CONTRACTOR SHALL EXTEND WIRING AND CONDUIT TO THE APPROPRIATE NEW LOCATION AND PROVIDE ALL NECESSARY CONDUIT, WIRE, BOXES, ETC. AS REQUIRED. RECONNECT TO EXISTING CIRCUIT OR RECURUIT AS SHOWN. IF DEVICE IS NOT SALVAGABLE, ELECTRICAL CONTRACTOR SHALL PROVIDE A NEW DEVICE.
- THE FOLLOWING DEMOLITION SYMBOLS MAY BE USED AS WELL AS KEYED NOTES:
  - "R" = NEW LOCATION OF RELOCATED ITEM.
  - "X" = EXISTING ITEM TO REMAIN.
  - "XR" = EXISTING ITEM TO BE REMOVED.
  - "XRP" = EXISTING ITEM TO BE REPLACED WITH NEW IN SAME LOCATION AS SHOWN. EXTEND EXISTING CIRCUIT TO MATCH EXISTING U.N.O.
  - "XRR" = RELOCATE EXISTING ITEM TO NEW LOCATION AS SHOWN. EXTEND EXISTING CIRCUIT TO MATCH EXISTING U.N.O.



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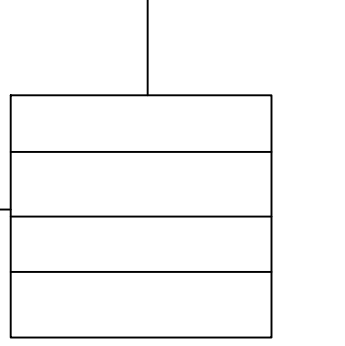


EXPIRES 6-30-2012  
GMP-ADDENDUM 1  
05/13/11  
OWNER REVIEW  
07/15/11

July 15, 2011  
Construction Documents  
r+b job # 0209  
U.A. # 08-8826

LABORATORY OF TREE-RING RESEARCH  
 BRYANT BANNISTER TREE-RING BUILDING  
 The University of Arizona - Tucson, Arizona

## KEYPLAN



## ELECTRICAL SYMBOLS



NONE

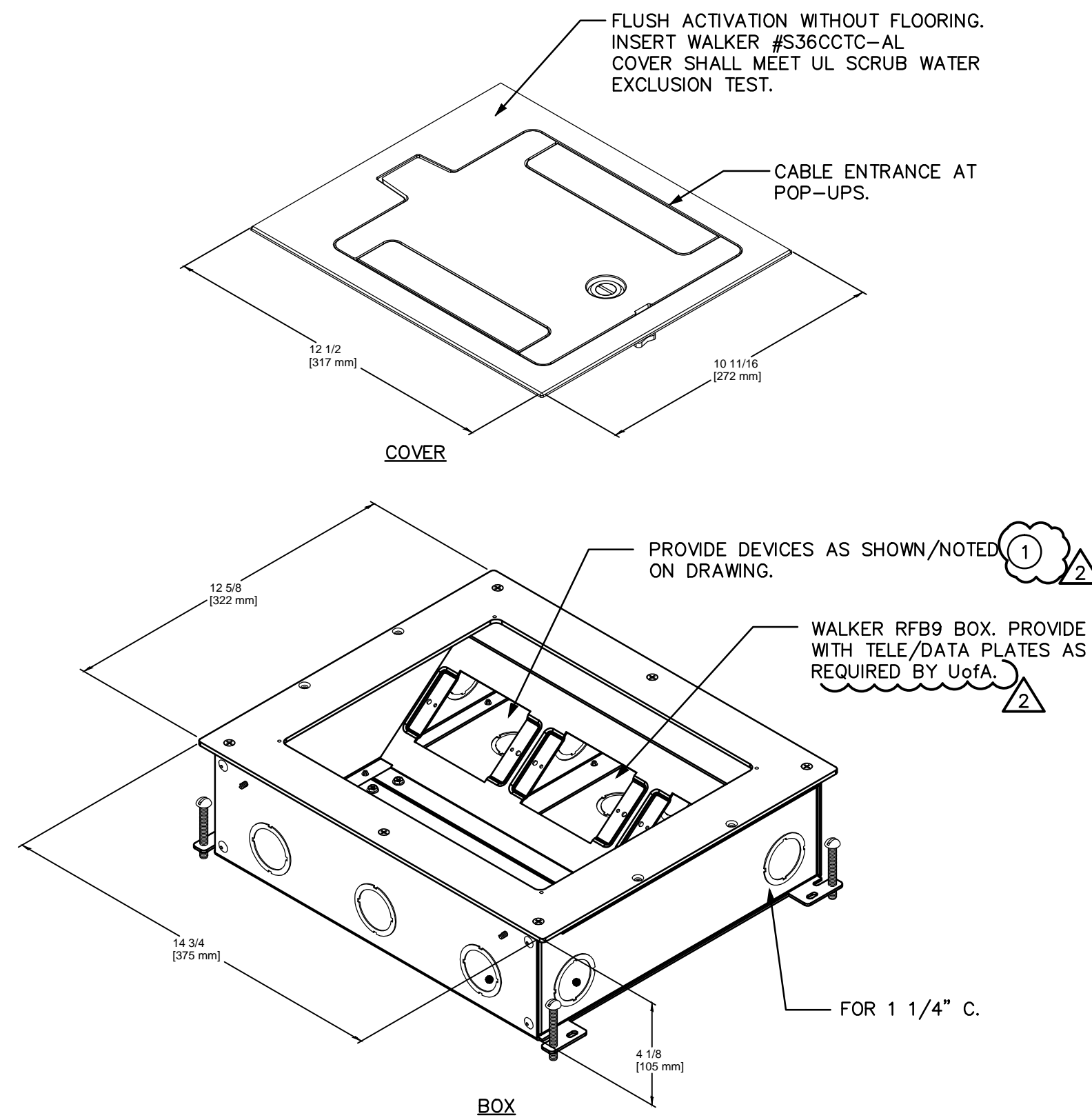
**ENERGY SYSTEMS DESIGN**  
7135 East Camelback Road  
Suite 275  
Scottsdale AZ 85251  
P: 480.481.4800  
F: 480.481.4903  
PROJECT # 081993.100  
DESIGN CONTACT RON KORTE

FILE: j:\2008\081093 UofA Tree Ring Laboratory\081093\_100 U of A Tree Ring\UofA Comments Rev 02\EOO-2REV02.dwg  
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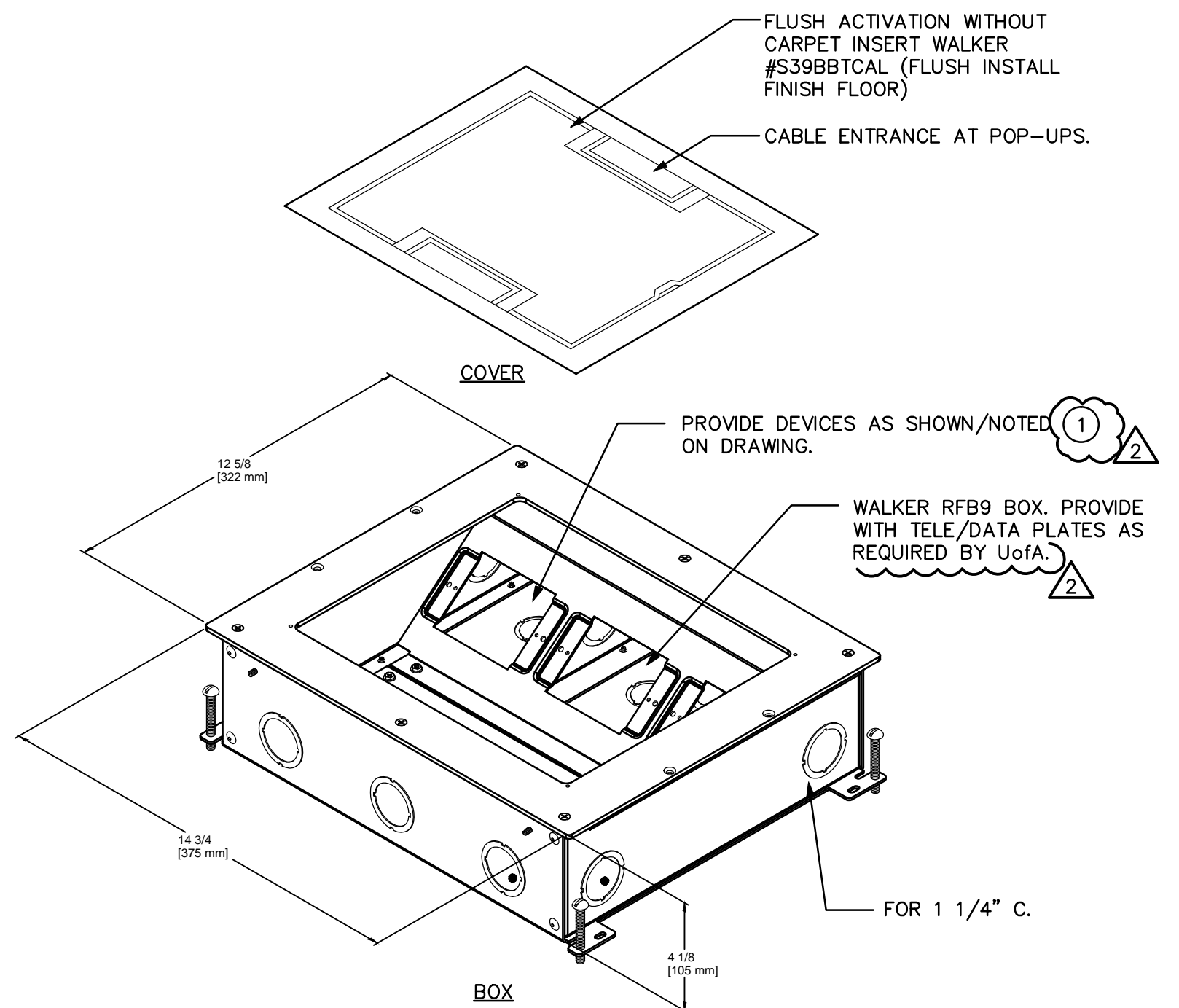
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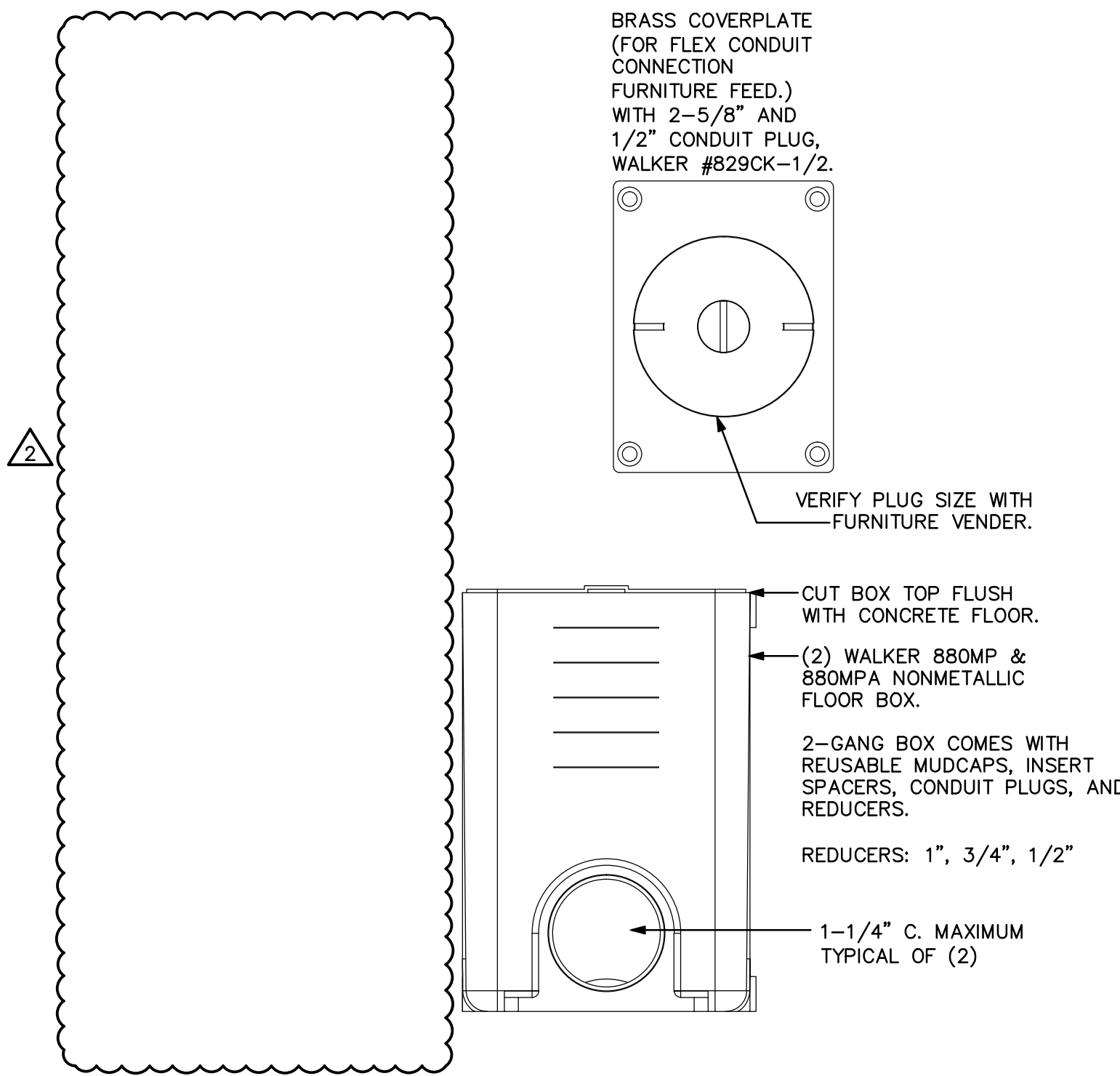
**L TELE C MM AN ECEPTACLE B ETAIL** 1  
SCALE: NOT TO SCALE



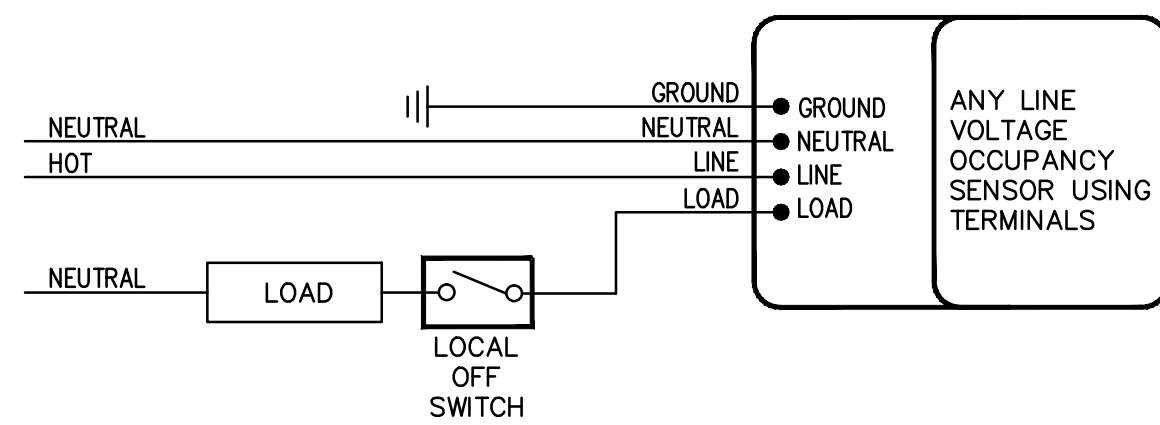
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**KEYED NOTES**

- 1 THE FITTINGS/PLATES FOR VOICE/DATA SERVICE SHALL ACCOMMODATE PANDUIT MINI-COM TYPE JACKS.



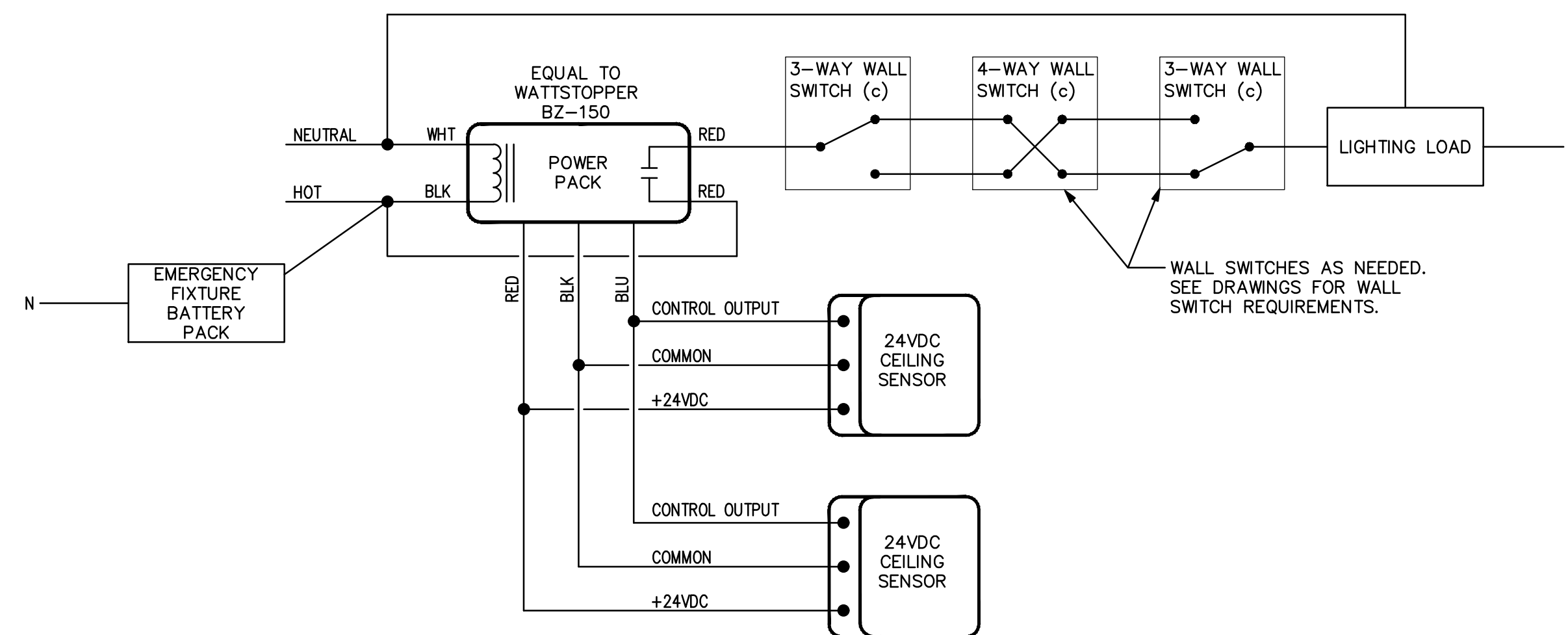
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**DETAIL NOTES:**

- 1. LOCATE CEILING MOUNTED MOTION SENSORS AS REQUIRED BY MANUFACTURER.
- 2. PROVIDE ENCLOSURES AS REQUIRED BY MANUFACTURER.
- 3. MAKE FINAL CONNECTIONS.
- 4. CATALOG NUMBERS ARE FOR WATTSTOPPER.
- 5. WIRE COLORS PER WATTSTOPPER.

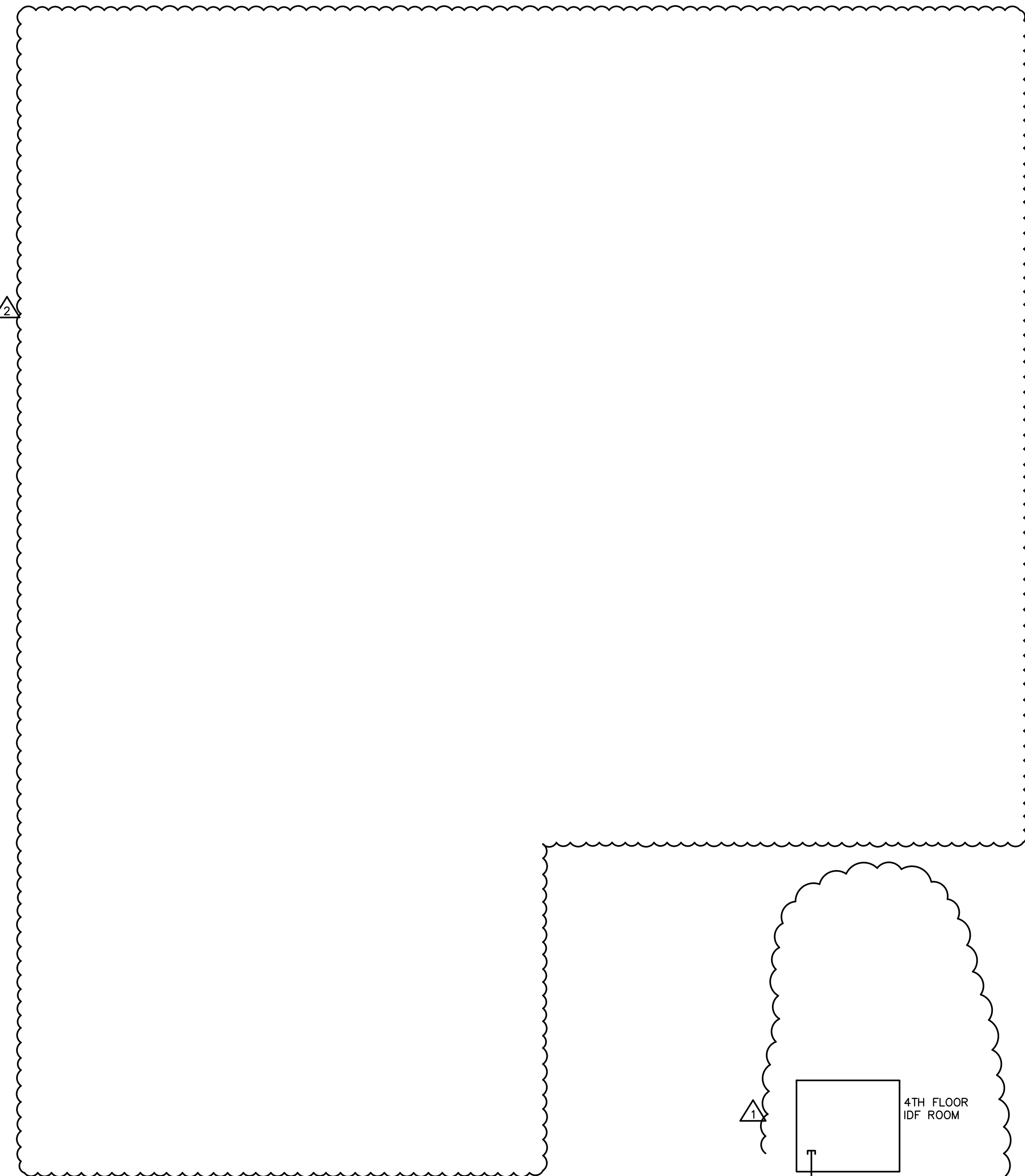
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SCALE: NOT TO SCALE



**DETAIL NOTES:**

- 1. LOCATE CEILING MOUNTED MOTION SENSORS AS REQUIRED BY MANUFACTURER.
- 2. PROVIDE ENCLOSURES AS REQUIRED BY MANUFACTURER.
- 3. MAKE FINAL CONNECTIONS.
- 4. REFER TO LIGHTING PLAN FOR BRANCH CIRCUITS.
- 5. CATALOG NUMBERS ARE FOR WATTSTOPPER.
- 6. WIRE COLORS PER WATTSTOPPER.

**TIPICAL I IN IA AM MULTIPLE ALL SWITCHIN** 4  
SCALE: NOT TO SCALE



**TELECOM SYSTEM CONDUIT RISER DIAGRAM**

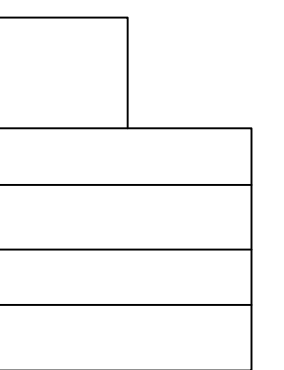
N.T.S.



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**BRYANT BANNISTER TREE-RING BUILDING**  
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KEYPLAN



ELECTRICAL NOTES

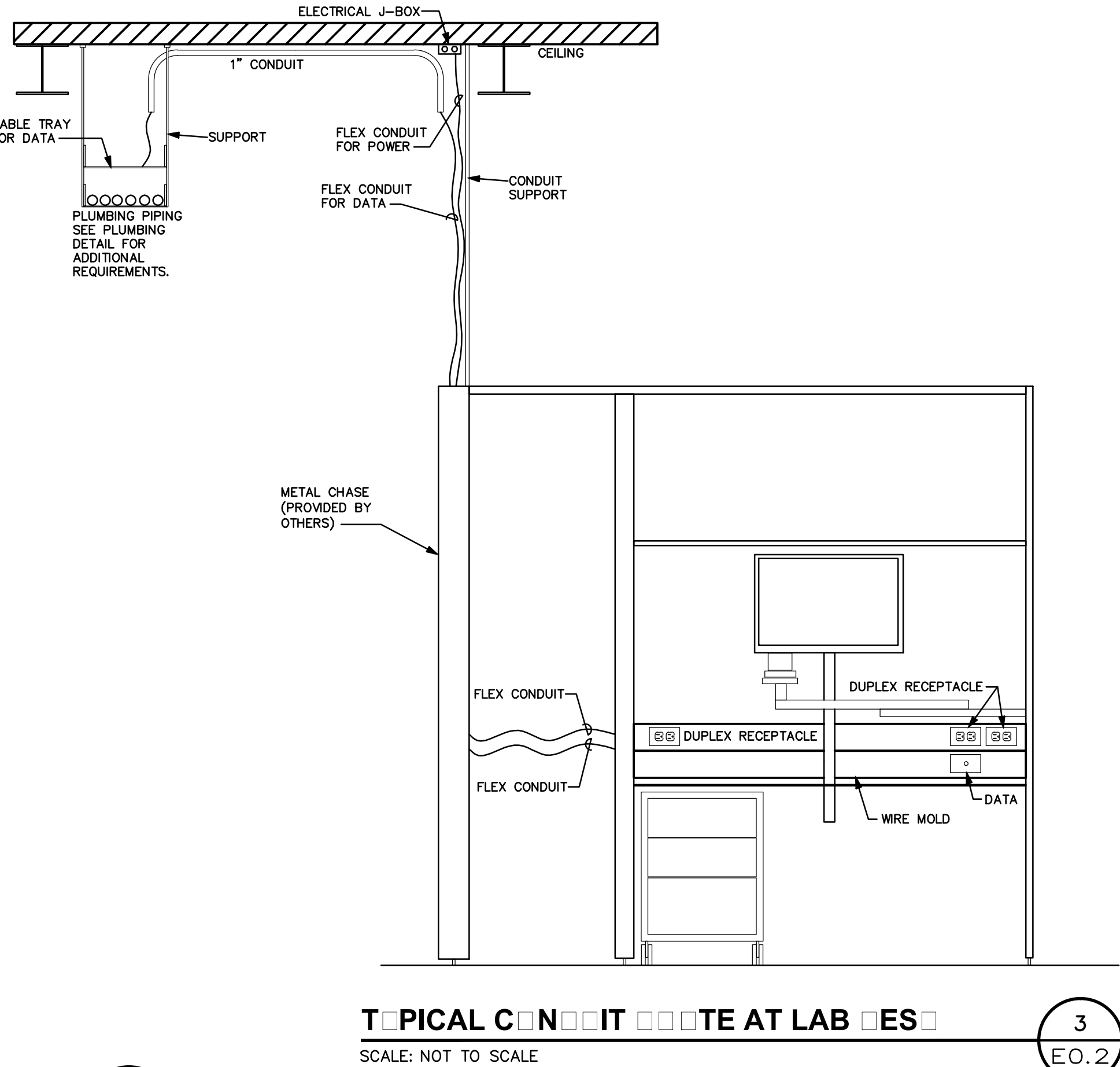
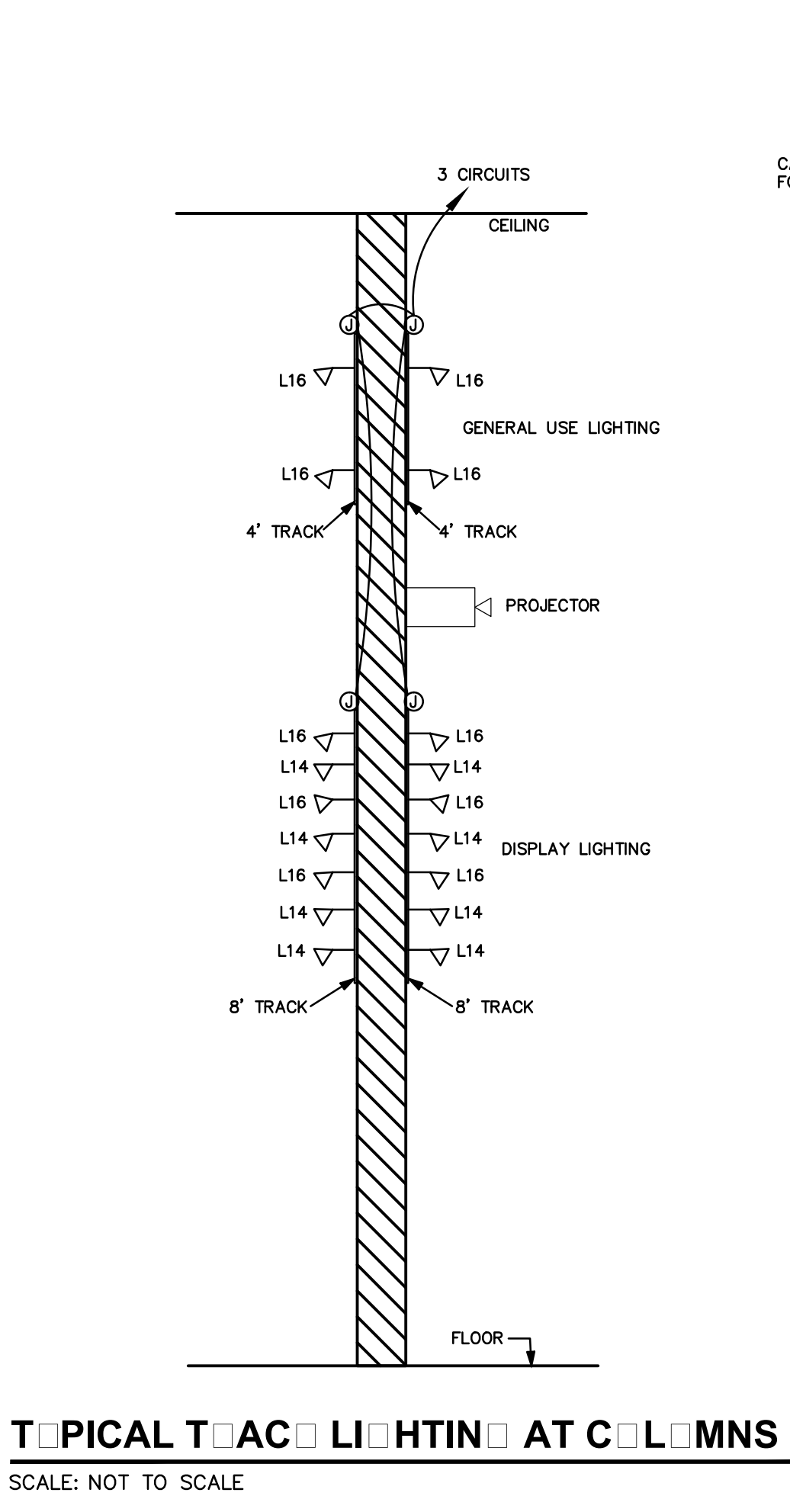
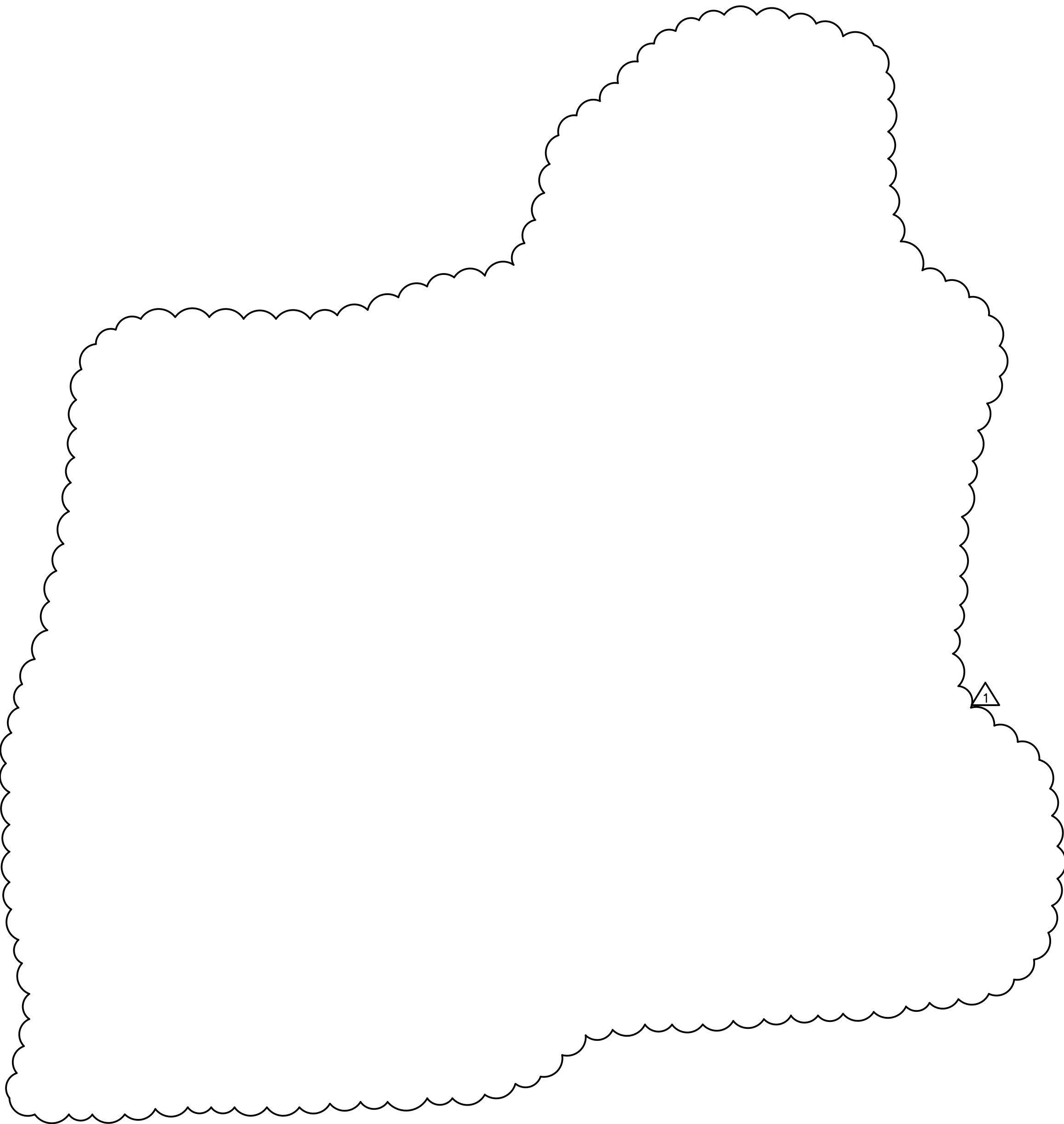
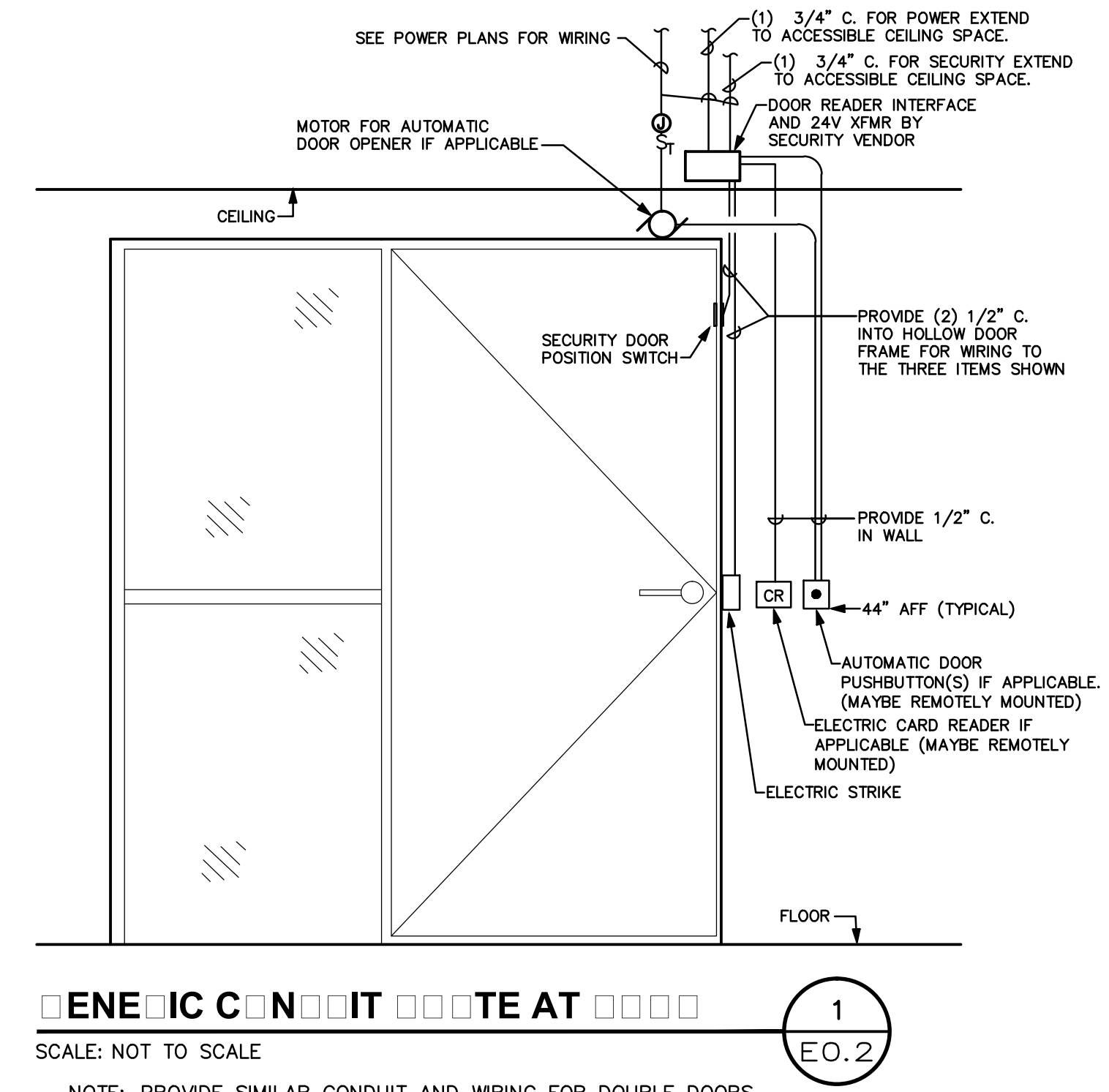
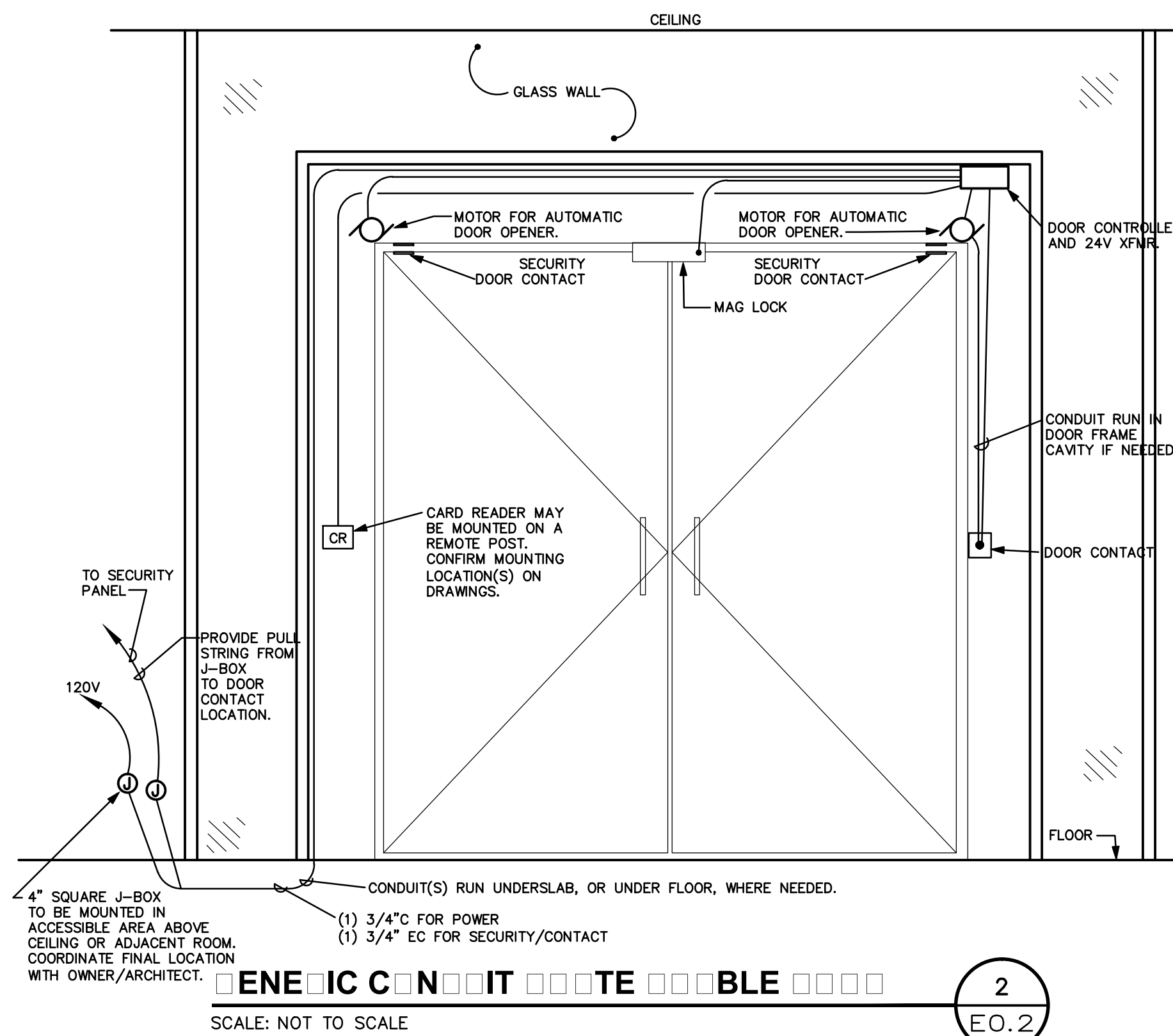
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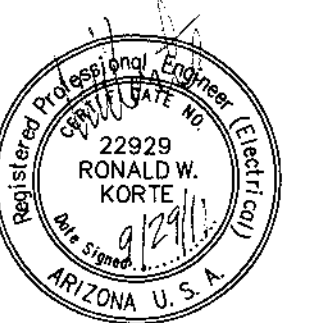
RELAY PANEL - 'LRP'						
PANEL SCHEDULE NAME	BRANCH CIRCUIT	RELAY NUMBER	DESCRIPTION	MONDAY THRU FRIDAY SCHEDULE ON TIMES	SATURDAY THRU SUNDAY SCHEDULE ON TIMES	OVERRIDE CONTROL
'HL2'	1	01	EXHIBIT 101 GENERAL LIGHTING (277V)	NORMAL BUSINESS HOURS	TBD	EMS
'HL2'	3	02	EXHIBIT 101 DISPLAY LIGHTING (277V)	NORMAL BUSINESS HOURS	TBD	EMS
'LL2'	-	03	-	-	-	-
'LL2'	2	04	EXTERIOR LIGHTING	DUSK TO DAWN	TBD	EMS
'LL2'	1	05	EXHIBIT 101 GENERAL LIGHTING (120V)	NORMAL BUSINESS HOURS	TBD	EMS
'LL2'	3	06	EXHIBIT 101 DISPLAY LIGHTING (120V)	NORMAL BUSINESS HOURS	TBD	EMS
'LL2'	5	07	EXHIBIT 101 DISPLAY LIGHTING (120V)	NORMAL BUSINESS HOURS	TBD	EMS
'LL2'	7	08	EXHIBIT 101 DISPLAY LIGHTING (120V)	NORMAL BUSINESS HOURS	TBD	EMS

**ALL RELAY PANELS SHALL CONTAIN THE FOLLOWING FEATURES**

- RELAY PANEL SHALL BE EQUAL TO WATTSTOPPER LP AND LP PLUS SERIES RELAY PANELS.
- PROVIDE RELAY PANEL WITH LOW VOLTAGE INPUTS AND RELAY OUTPUTS AS SPECIFIED. THERE SHALL BE A MINIMUM OF ONE LOW VOLTAGE INPUT TO ONE RELAY.
- PROVIDE RELAY PANEL WITH LCD SCREEN, ASTRONOMICAL CLOCK, AND 7-DAY SCHEDULER. RELAY PANEL SHALL BE PROGRAMMABLE BY INTERNAL KEYPAD. PROVIDE COMPUTER PROGRAMMING INTERFACE, HARDWARE AND SOFTWARE AS REQUIRED.
- PROVIDE 20A, 1hp, HEAVY DUTY, NORMALLY OPEN, MECHANICALLY LATCHING, AND 14KA SCCR RELAYS. EQUAL TO WATTSTOPPER HDR LOW VOLTAGE RELAY.
- PROVIDE MANUAL ON/OFF OVERRIDE SWITCH AND RELAY STATUS LED FOR EACH RELAY. BOTH SHALL BE LOCATED WITHIN THE RELAY PANEL ENCLOSURE.
- ALL 120V AND 277V TERMINATIONS SHALL USE #12 OR #10 AWG CONDUCTORS. REFER TO BRANCH CIRCUIT FOR VOLTAGE REQUIREMENTS.
- PROVIDE RELAY PANEL MANUFACTURER'S RECOMMENDED PHOTOCELL, OCCUPANCY SENSOR AND LOW VOLTAGE SWITCHES AS REQUIRED.
- PROVIDE SINGLE NEMA 1 ENCLOSURE TO ACCOMMODATE LIGHTING CONTACTORS FOR MULTI-POLE BRANCH CIRCUITS AND/OR EMERGENCY LUMINAIRES AS REQUIRED.
- PROVIDE RELAY PANEL MANUFACTURER RECOMMENDED 4-POLE, NORMALLY CLOSED, ELECTRICALLY HELD CONTACTOR AS REQUIRED. EQUAL TO WATTSTOPPER CxxxNC SERIES. CONTACTOR SHALL BE MOUNTED TO RELAY PANEL DIN-RAIL LOCATED INSIDE SAME ENCLOSURE AS ASSOCIATED RELAYS. REFER TO WIRING DIAGRAM.
- PROVIDE 4h TRAINING AFTER OWNER HAS OCCUPIED BUILDING AFTER ONE WEEK. INITIAL SETTINGS SHALL BE MADE AS DIRECTED BY OWNER.
- PROVIDE PROGRAMMING FOR REPEATING 2h TIME INTERVALS DURING THE SCHEDULED OFF HOURS FOR OCCUPANT OVERRIDES WITH THE LOCAL LOW VOLTAGE SWITCHING CONTROLS AS REQUIRED.
- PROVIDE BACNET PROTOCOL INTERFACE MODULES FOR CONTROL VIA THE FMS. THIS INCLUDES ALL TC/IP ACCESS MODULE(S) WITH ASSOCIATED SOFTWARE FOR CONTROL VIA INTRA/INTERNET ACCESS.
- RELAY PANEL SHALL INTERFACE WITH ENERGY MANAGEMENT SYSTEM (EMS). EMS SHALL BE THE MASTER POINT OF ON/OFF AND PROGRAMMING CONTROL FOR ALL RELAY PANELS IN THIS PROJECT. WIRE ALL PANELS TO EMS. PROVIDE RELAY PANEL WITH COMMUNICATION CABLING AND INTERFACES AS REQUIRED.

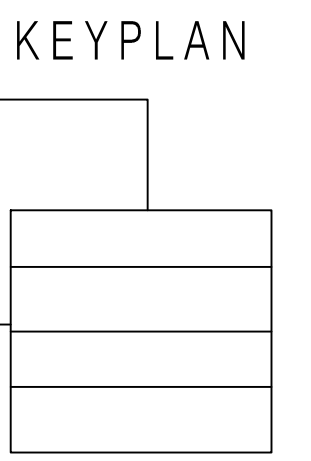


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EXPIRES 6-30-2012  
GMP-ADDENDUM 1  
05/13/11  
OWNER REVIEW  
07/15/11  
**July 15, 2011**  
**Construction Documents**  
r+b job # 0209  
U.A. # 08-8826

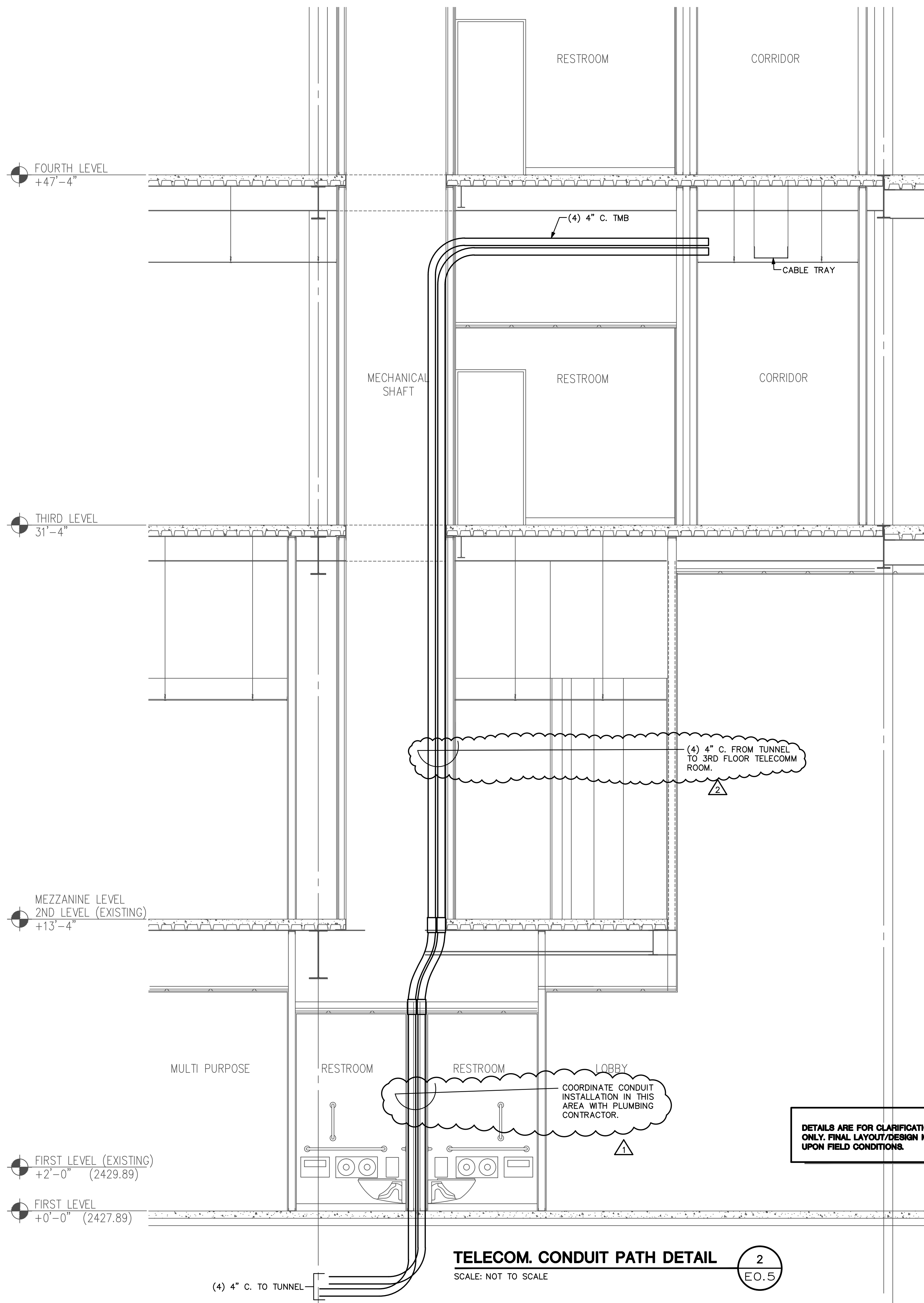
LABORATORY OF TREE-RING RESEARCH  
**BRYANT BANNISTER TREE-RING BUILDING**  
The University of Arizona - Tucson, Arizona



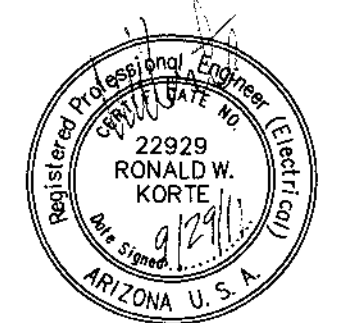
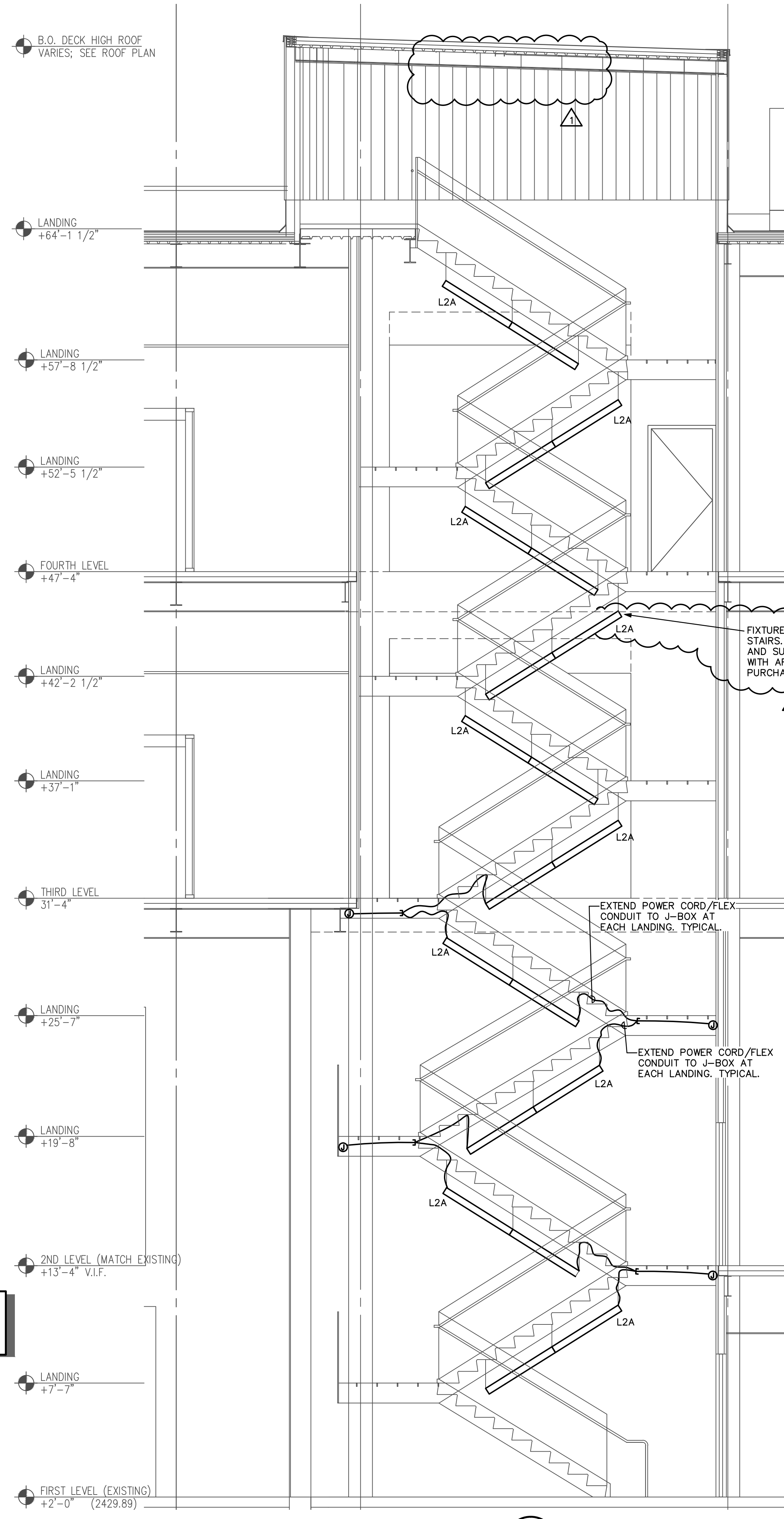
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PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:26am

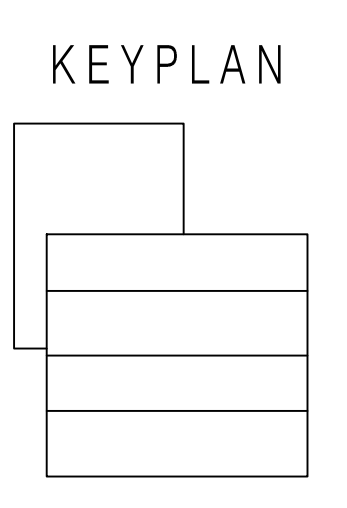


DETAILS ARE FOR CLARIFICATIONS AND DESIGN INTENT ONLY. FINAL LAYOUT/DESIGN MAY CHANGE DEPENDING UPON FIELD CONDITIONS.

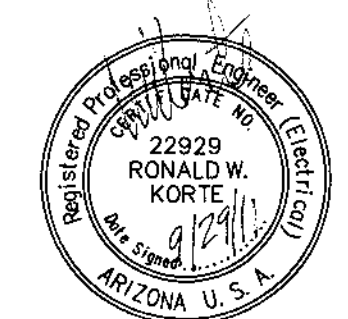


EXPIRES 6-30-2012  
 GMP-ADDENDUM 1  
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 r+b job # 0209  
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LABORATORY OF TREE-RING RESEARCH  
**BRYANT BANNISTER TREE-RING BUILDING**  
 The University of Arizona - Tucson, Arizona



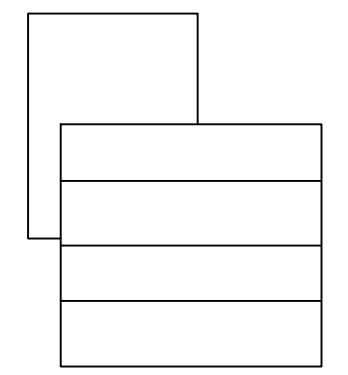
**esd** ENERGY SYSTEMS DESIGN  
 7135 East Camelback Road  
 Suite 275  
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 PROJECT # 081093.100  
 DESIGN CONTACT RON KORTE



EXPIRES 6-30-2012  
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LABORATORY OF TREE-RING RESEARCH  
**BRYANT BANNISTER TREE-RING BUILDING**  
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KEYPLAN



ELECTRICAL  
 SITE PLAN

**E1.0**

AS NOTED

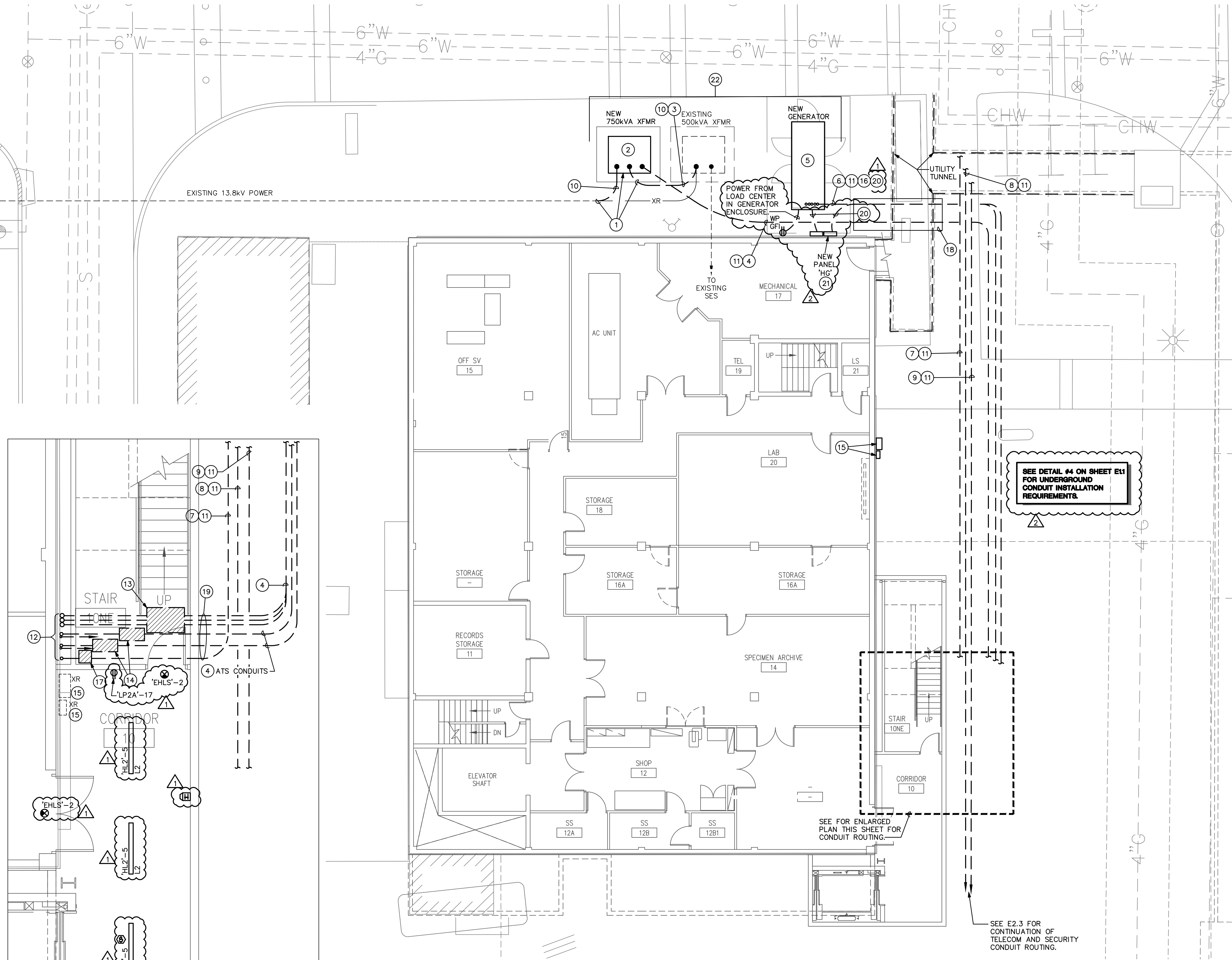
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PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:25am

**KEYED NOTES**

- 1 INTERCEPT EXISTING PRIMARY 13.8kV FEEDER BETWEEN EXISTING SWITCHING CABINET AND EXISTING 500kVA TRANSFORMER TO FEED NEW 750kVA TRANSFORMER. NEW TRANSFORMER SHALL FEED NEW BUILDING'S SES. EXISTING TRANSFORMER AND SES FOR MATH BLDG. TO REMAIN. VERIFY EXISTING CONDUIT FROM MANHOLE ADJACENT TO PMH-89 AND TUNNEL. COORDINATE WITH UA FACILITIES TO USE THIS CONDUIT TO MINIMIZE OUTAGE OF MATH BUILDING SERVICE. REUSE EXISTING CONDUIT AND PRIMARY CONDUCTORS BETWEEN EXISTING SWITCHING CABINET AND NEW TRANSFORMER. REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS. COORDINATE ALL OUTAGES WITH U OF A.
- 2 PROVIDE NEW TRANSFORMER MINIMUM 8" THICK, RAISED 4" AFG CONCRETE PAD. REFER TO ELECTRICAL ONE-LINE DIAGRAM AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 3 PROVIDE NEW CONDUIT AND 15kV CONDUCTORS BETWEEN NEW AND EXISTING TRANSFORMERS. REFER TO ELECTRICAL ONE-LINE DIAGRAM, SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 4 PROVIDE NEW SECONDARY CONDUIT AND CONDUCTORS BETWEEN NEW TRANSFORMER AND NEW SES. REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- 5 PROVIDE NEW GENERATOR WITH MINIMUM 8" THICK, RAISED 4" AFG CONCRETE PAD. COORDINATE LOCATION AND MAINTAIN 4' CLEARANCE ON ALL SIDES. REFER TO ELECTRICAL ONE-LINE DIAGRAM AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 6 PROVIDE NEW FEEDER, BRANCH CIRCUITS, AND CONTROL CONDUITS BETWEEN GENERATOR AND NEW AUTOMATIC TRANSFER SWITCHES. REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- 7 PROVIDE (1) 2" CONDUIT FROM THE TUNNEL SYSTEM FIRE ALARM INTERCONNECTION AND THE NEW BUILDING'S FIRE ALARM CONTROL PANEL.
- 8 PROVIDE (1) 2" CONDUIT FROM THE TUNNEL SYSTEM SECURITY INTERCONNECTION AND THE NEW BUILDING'S SECURITY CONTROL PANEL.
- 9 PROVIDE (4) 4" CONDUIT FROM THE TUNNEL SYSTEM TELECOM INTERCONNECTION AND THE NEW BUILDING'S TELECOM TERMINATION.
- 10 ROUTE NEW MEDIUM VOLTAGE SYSTEM UNDERGROUND CONDUITS A MINIMUM 36" BELOW GRADE WITH RED 3000psi CONCRETE ENCASEMENT PER U OF A STANDARDS.
- 11 ROUTE NEW UNDERGROUND CONDUITS A MINIMUM 24" BELOW GRADE PER U OF A STANDARDS.
- 12 PROVIDE COMMON CONDUIT RISER FOR POWER AND FA CONDUITS. ROUTE CONDUITS BETWEEN NEW PULL/SPLICE BOXES SHOWN AND EQUIPMENT ON SECOND FLOOR. PROVIDE UNISTRUT SUPPORTS AS REQUIRED.
- 13 PROVIDE 36"x24"x18" PULL BOX FASTENED TO CEILING IN STAIRWELL FOR POWER CONDUITS TO 'SES2'.
- 14 PROVIDE 12"x24"x12" PULL BOX FASTENED TO CEILING IN STAIRWELL FOR GENERATOR FEEDS TO ATS-LS AND ATS-SB. SEPARATE BOXES ARE REQUIRED.
- 15 RELOCATE EXISTING J-BOX TO NEW LOCATION NORTH OF NEW CONSTRUCTION ONE J-BOX IS FOR TEMPORARY POWER AND THE OTHER FOR TEMPORARY CONSTRUCTION COMMUNICATIONS. REWORK CONDUITS AND WIRING INSIDE BUILDING TO ACCOMMODATE NEW LOCATION. VERIFY LOCATION PRIOR TO STARTING WORK. EXISTING UNDERGROUND CONDUITS FROM J-BOXES RUNNING NORTH HAVE BEEN ABANDONED AND SHALL BE REMOVED.
- 16 PROVIDE (1) 1-1/2" CONDUIT BETWEEN GENERATOR LOAD CENTER AND DISTRIBUTION PANEL 'LDP2'. SEE ONE-LINE DIAGRAM.
- 17 PROVIDE 12"x12"x12" PULL BOX FASTENED TO CEILING IN STAIRWELL FOR FIRE ALARM SYSTEM CABLING.
- 18 CONDUITS ROUTED ABOVE TUNNEL AND NOT AT THE 24" MINIMUM DEPTH SHALL BE SLURRIED TO 6" ABOVE TOP OF CONDUITS. COORDINATE INSTALLATION WITH FIRE PROTECTION LINES ALSO BEING INSTALLED IN THIS AREA.
- 19 COORDINATE UNDERGROUND CONDUIT DEPTH TO ENTER STAIRWELL HOLDING CONDUITS AND J-BOXES AS HIGH AS POSSIBLE IN STAIRWELL.
- 20 PROVIDE POWER CONDUIT PER ONE-LINE PLUS (1) 1" C. FROM GENERATOR TO EACH ATS FOR CONTROL WIRING. PROVIDE (1) 1" C. FOR REMOTE ANNUNCIATOR WIRING.
- 21 PROVIDE GENERATOR OUTPUT PANEL INSTALLED ON BUILDING REMOTE FROM GENERATOR ENCLOSURE. SEE ONE-LINE DIAGRAM.
- 22 ALL EXTERIOR ELECTRICAL SHALL BE PAINTED U OF A APPROVED SAGE GREEN COLOR.

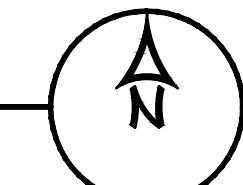


NOTE: SEE DETAIL 3 ON SHEET E1.1 FOR ADDITIONAL CONDUITS REQUIRED.

**ENLA □ □ STAI □ □ ELL PLAN** 1  
 SCALE: 1/4" = 1'-0"

**ELECTRICAL SITE PLAN**

SCALE: 1/8" = 1'-0"



SEE DETAIL #4 ON SHEET E1.1 FOR UNDERGROUND CONDUIT INSTALLATION REQUIREMENTS.

SEE FOR ENLARGED PLAN THIS SHEET FOR CONDUIT ROUTING.

SEE E2.3 FOR CONTINUATION OF TELECOM AND SECURITY CONDUIT ROUTING.

**esd**  
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PLOTTED BY: Anthony.Miranda

PLOTTED: 09.30.2011 - 11:28am

## INTERIOR LUMINAIRE SCHEDULE

MARK	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	LAMPS	VOLTAGE	MOUNTING	KEYED NOTES
L1	AXIS LIGHTING	BMR-F-FL-4-T5-1-W-UNV-E-1-DF	4' FLUOR. RECESS MOUNTED FIXTURE, FROSTED LENS WITH ELECTRONIC BALLAST	(1) 28W T5	277	RECESSED	4
L1A	AXIS LIGHTING	BMR-F-FL-8-T5-2-W-UNV-E-1-DF-E	8' FLUOR. RECESS MOUNTED FIXTURE, FROSTED LENS, ELECTRONIC BALLAST	(1) 28W T5 PER 4FT SECTION	277	RECESSED	4
L2	AXIS LIGHTING	BMD-F-FL-4-T5-1-W-UNV-E-CA	4' FLUOR. CABLE HUNG FIXTURE, FROSTED LENS WITH ELECTRONIC BALLAST	(1) 28W T5	277	CABLE	5
L2A	AXIS LIGHTING	BMD-F-FL-8-T5-2-W-UNV-E-CA	8' FLUOR. CABLE HUNG FIXTURE, FROSTED LENS WITH ELECTRONIC BALLAST	(1) 28W T5 PER 4FT SECTION	277	CABLE	5
L2B	AXIS LIGHTING	BMD-F-FL-12-T5-3-W-UNV-E-CA	12' FLUOR. CABLE HUNG FIXTURE, FROSTED LENS WITH ELECTRONIC BALLAST	(1) 28W T5 PER 4FT SECTION	277	CABLE	5
L2C	AXIS LIGHTING	BMD-F-FL-S#-T5-#-W-UNV-E-CA	FLUORESCENT CABLE HUNG FIXTURE, FROSTED LENS WITH ELECTRONIC BALLAST	(1) 28W T5 PER 4FT SECTION	277	CABLE	5 6
L2E	AXIS LIGHTING	BMD-F-FL-4-T5-2-W-UNV-E-CA-B1	4' FLUOR. CABLE HUNG FIXTURE, FROSTED LENS, ELECTRONIC BALLAST, EMRG. BATTERY PACK	(1) 28W T5	277	CABLE	
L3	LITHONIA	ZAL-2-28T5-277-MSSAC#	4' FLUOR. CABLE HUNG FIXTURE, WITH REFLECTOR AND ELECTRONIC BALLAST	(2) 28W T5	277	CABLE	5
L4	LITHONIA	LF6N-1/26TRT-F6W4A-MVOLT	6" RECESSED COMPACT FLUORESCENT WALL WASHER	(1) 26W TRT	277	RECESSED	
L5	LITHONIA	LF6N-1/26TRT-F6B5W-MVOLT	6" RECESSED COMPACT FLUORESCENT DOWNLIGHT WITH BAFFLE	(1) 26W TRT	277	RECESSED	
L6	LITHONIA	LF8N-1/26TRT-F8L54-MVOLT	8" RECESSED COMPACT FLUORESCENT WET LISTED	(1) 26W TRT	277	RECESSED	
L7	AXIS LIGHTING	BMS-F-FL-S#-T5-1-W-UNV-E-1-SB	FLUORESCENT SURFACE MOUNT FIXTURE, FROSTED LENS WITH ELECTRONIC BALLAST	(1) 28W T5 PER 4FT SECTION	277	SURFACE	6
L8	LITHONIA	PM3-F-B-1-28T5-12-LS-MVOLT	4' FLUOR. 1" WIDE 12 CELL TROFFER	(1) 28W T5	277	RECESSED	
L9	LBL LIGHTING	HS240-AM-SC-1B50-MRL	PENDENT CLUSTER	(1) 50W XENON	120	CABLE	5
L10	WAC LIGHTING	RAZ12-	UNDERCOUNTER LED MOUNTED END TO END	FURNISHED	120	SURFACE	
L11	EUREKA	2105-50-1-MG-AR111	RAIL MOUNTED SPOT LIGHT	(1) 50W MR16	120	SURFACE RAIL	PROVIDE MONORAIL AND ALL ACCESSORIES TO MAKE A COMPLETE SYSTEM
L12	LSI	VBP75W-5A-	PROJECTOR WITH GREEN GLASS FILTER AND TREE PATTERN	(1) 75W MR16	277	RAIL	PROVIDE MOUNTING HARDWARE AND ACCESSORIES BP75AC ANDBP75G5
L13	BETA LED	ESA-ADR-8-28-C-NDADJ-SSGC-XF-277-525-35K	8" ADJUSTABLE LED RECESSED CONE	(28) 1W LEDS	277	RECESSED	
L13B	BETA LED	ESA-ADR-8-28-C-NDADJ-SSGC-XF-277-525-35K	8" ADJUSTABLE LED RECESSED CONE	(28) 1W LEDS	120	RECESSED	
L14	EDISON PRICE	MINIMA 30MH-39-120 2C-SIL-LH30-UV/3.75	track lights (DISPLAY)	(1) 35W MH	120	VERTICAL TRACK	PROVIDE MONORAIL AND ALL ACCESSORIES TO MAKE A COMPLETE SYSTEM
L15	LITHONIA	LF6N-1/42TRT-F6B5W-MVOLT	6" RECESSED COMPACT FLUORESCENT DOWNLIGHT WITH BAFFLE	(1) 42W TRT	277	RECESSED	
L16	EDISON PRICE	MINIMA 30MH-70-120 2C-SIL-LH30-UV/3.75	track lights (DISPLAY)	(1) 70W MH	120	VERTICAL TRACK	PROVIDE MONORAIL AND ALL ACCESSORIES TO MAKE A COMPLETE SYSTEM
L17	LITHONIA	TWR15-100M-TB-LPI	FULL CUTOFF WALL PACK	(1) 100W MH	277	WALL	WITH PHOTOCELL
L18	BEGA	7550LED	40 WHITE LEDS WITH INTERGRAL 120V BALLAST	(40) 1W LEDS	120	SURFACE	
L19	AXIS LIGHTING	BMR-F-FL-4-T5-1-W-UNV-E-1-TB	4' FLUOR. RECESS MOUNTED FIXTURE, FROSTED LENS WITH ELECTRONIC BALLAST	(1) 28W T5	277	RECESSED GRID	4
L20	LITHONIA	C-2-78-32-MVOLT-WGCU-NST	4' FLUOR. CHAIN HUNG FIXTURE, WITH WIREGUARD AND ELECTRONIC BALLAST	(2) 28W T5	277	CHAIN	5
X	LITHONIA	LRP 1 x x x	LED EDGE LIT SINGLE FACE EXIT SIGN	LED INCLUDED	277	VARIES	3
X	LITHONIA	LRP 2 x x x	LED EDGE LIT DOUBLE FACE EXIT SIGN	LED INCLUDED	277	VARIES	3

## LUMINAIRE SCHEDULE GENERAL NOTES

- ELECTRICAL CONTRACTOR SHALL VERIFY FINISHES OF ALL LIGHTING PRODUCTS WITH ARCHITECT.
- ELECTRICAL CONTRACTOR SHALL VERIFY MOUNTING DETAILS OF ANY ATYPICAL LIGHT FIXTURES.
- ELECTRICAL CONTRACTOR SHALL VERIFY FINAL LUMINAIRE SELECTION WITH ARCHITECT AND GENERAL CONTRACTOR. NOTIFY ELECTRICAL ENGINEER WITH ANY LAMP WATTAGE CHANGES.
- ALL BALLASTS SHALL BE FUSED WITH GLASS TUBE FUSES TYPE HLR/GLR. HARMONIC DISTORTION SHALL BE LESS THAN 10%.
- LAMPS SHALL BE 4100K WITH CRI OF 85. LAMPS SHALL BE RATED FOR 24,000hrs. MINIMUM. LAMPS SHALL BE NON-HAZARDOUS AND DISPOSABLE BY NORMAL MEANS.

## LUMINAIRE SCHEDULE KEYED NOTES

- PROVIDE LUMINAIRE LOCATED IN ELEVATOR EQUIPMENT ROOM ONLY WITH 120V BALLAST. ALL OTHER BALLASTS SHALL BE 277V.
- PROVIDE LUMINAIRE WITH CHAIN WHERE SHOWN IN EXPOSED TO DECK AREAS.
- VERIFY MOUNTING TYPE AND DIRECTIONAL CHEVRONS WITH DRAWINGS PRIOR TO ORDERING.
- VERIFY FLANGE TYPE, (DRYWALL, DRYWALL SPACKLE OR FLANGELESS) WITH ARCHITECT.
- REFER TO ARCHITECTURAL DRAWINGS FOR LUMINAIRE MOUNTING HEIGHT.
- REFER TO ARCHITECTURAL DRAWINGS FOR LUMINAIRE LENGTH REQUIRED.

NOTE - ALTERNATE FIXTURES SHALL BE SUBMITTED USING THE PRIOR APPROVAL PROCESS. PHOTOMETRIC DRAWINGS ARE INCLUDED FOR REFERENCE. PRIOR APPROVAL SUBMITTALS SHALL INCLUDE PHOTOMETRIC DRAWINGS DEMONSTRATING EQUIVALENT LIGHTING.

	Above 600V	600 V and Below	Other Systems
Below Building Slabs	PVC or GRS, 36" deep, red concrete encasement, 3000 psi	PVC or GRS, 18" deep, no concrete encasement required	PVC or GRS, 24" deep, no concrete encasement required
Outside of Bldg.	PVC or GRS, 36" deep, red concrete encasement, 3000 psi	GRS, 36" deep, no encasement, or PVC, 24" deep with 2000 psi concrete encasement, plain	GRS, 36" deep, no encasement, or PVC, 24" deep with 2000 psi concrete encasement, plain
Outside of Bldg. Min. depth requirement cannot be met	Special permission required, Contact FDC Inspection		

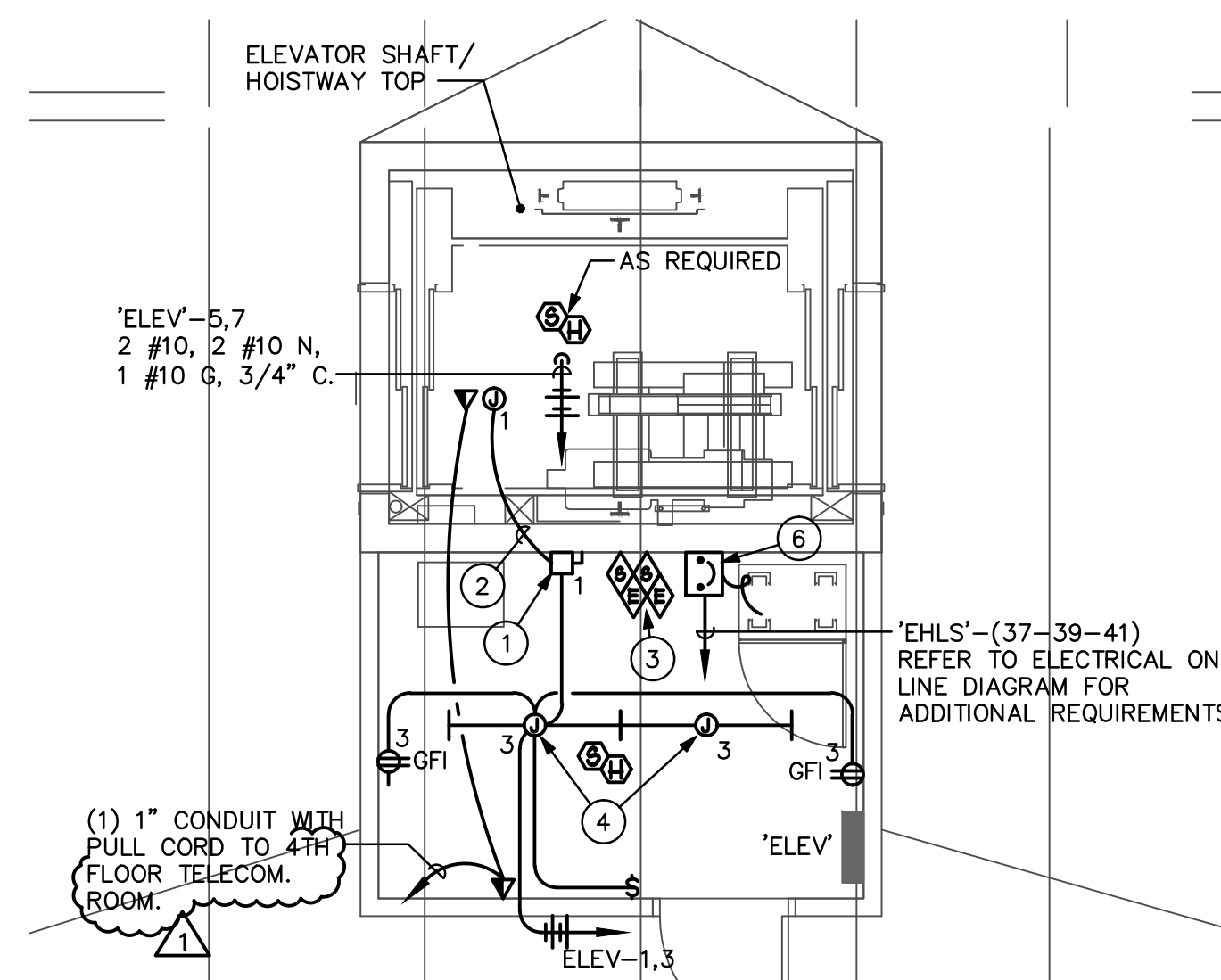
- Install not less than 4-#4 reinforcing bars tied to a square cage at 8' centers for conduits in bank under roadways.
- Concrete encased with a minimum envelope of 3" around each conduit where encasement is required.
- Minimum 3" spacing between outer diameter of conduits.
- Conduits to be used for high voltage cable shall be installed by journeymen electricians having minimum of five years experience in the installation, splicing, and testing of high voltage wiring. Contractor shall have class A-17 license for minimum of 2 years prior to work.
- Use bell adapters where conduits enter manholes.
- Concrete shall be red dyed utilizing red dye mixed into the concrete for a minimum of 5 minutes prior to pouring. Minimum of 1 bag of dye per 1 yd of concrete.
- For 4" diameter and larger GRS conduit bends, minimum bending radius shall be 48". Standard factory bends may be used for 3-1/2" diameter and smaller GRS conduit bends.
- Tie banks down and stake using rebar at each support.
- Spacers and supports to be at 5' centers.
- Conduits shall be cleaned and tested for continuity prior to installation of cables as follows:

- A steel sectional mandrel shall be pulled through the conduit. The mandrel outer diameter shall not be less than .5" less than the inside diameter of the conduit.
- Should the mandrel become stuck in the conduit then the length of conduit where the mandrel was stuck shall be condemned and replaced to the satisfaction of the U of A Electrical Engineer.
- The conduit shall then be swabbed out by pulling through a brush and/or rags which remove any additional debris from the conduit.
- Spare conduits shall receive a pull string and be capped at both ends. Spare conduit shall be identified as to other end. Spare conduit where subject to weather shall be sealed using a coupling and steel insert.

## UNDERGROUND CONDUIT AND DUCT BANK INSTALLATION REQUIREMENTS

SCALE: NOT TO SCALE

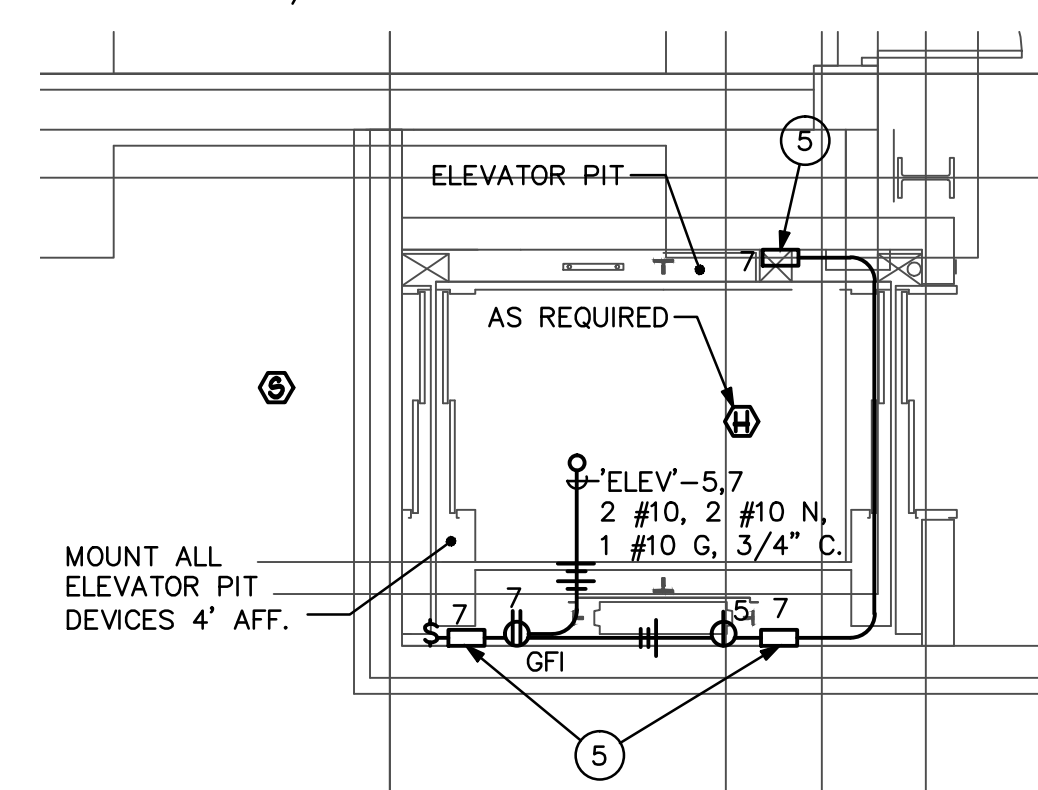
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E1.1



## ROOF LEVEL ENLARGED ELEVATOR MACHINE ROOM

SCALE: 1/4" = 1' - 0"

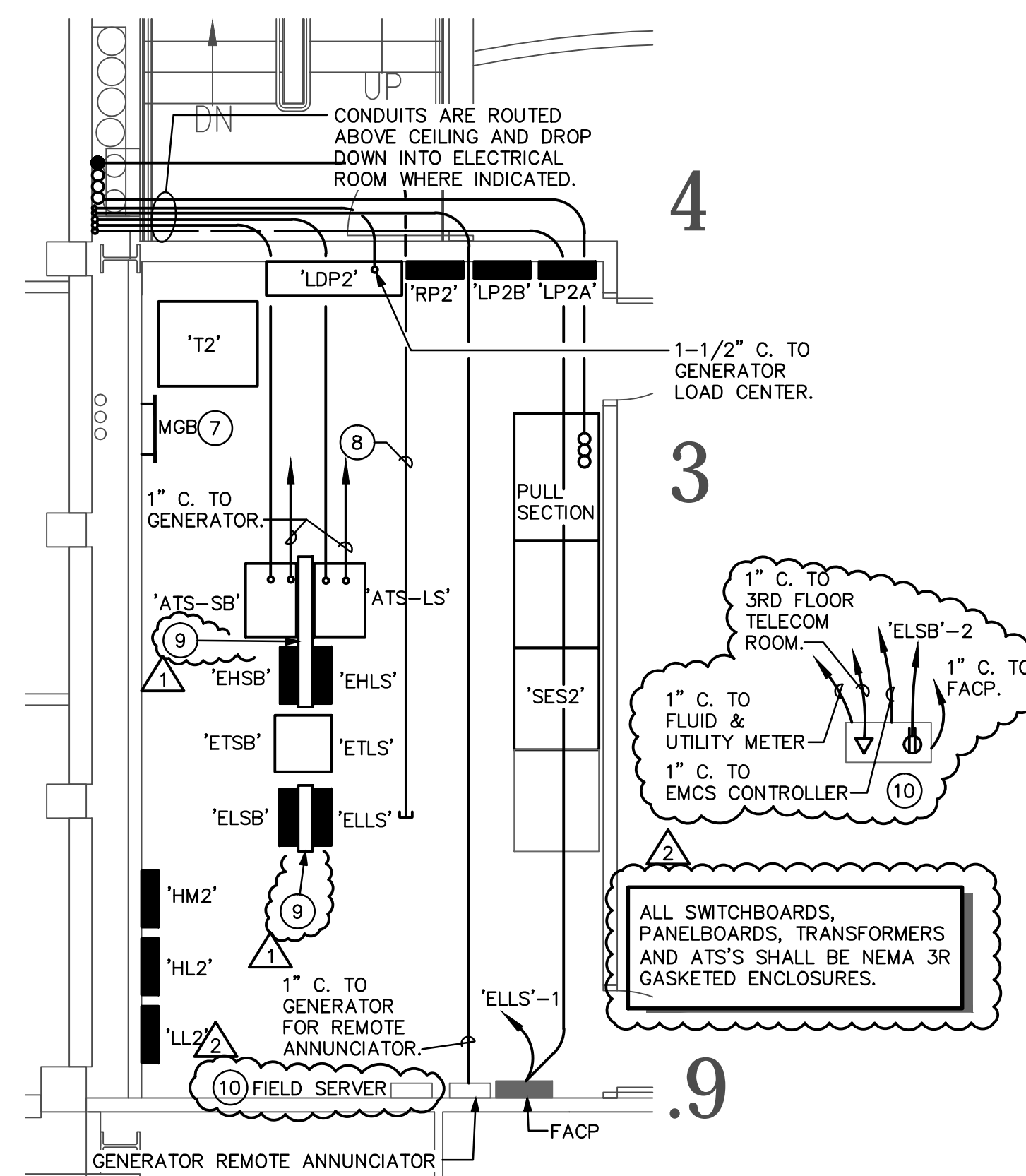
1  
E1.1



## BASEMENT LEVEL ELEVATOR SHAFT

SCALE: 1/4" = 1' - 0"

2  
E1.1



3  
E1.1

## SECOND LEVEL ENLARGED ELECTRICAL ROOM

SCALE: 1/4" = 1' - 0"

THE ELEVATOR HORSE POWER IS NOT KNOWN. CURRENT DESIGN IS SIZED FOR A 50hp MOTOR. THE ELECTRICAL CONTRACTOR SHALL VERIFY ELEVATOR MOTOR HORSE POWER PRIOR TO ORDERING ELEVATOR DISCONNECTS, FEEDER BREAKER AND ANY ROUGH-IN. ENGINEER AND U of A WILL NOT BE HELD ACCOUNTABLE FOR ADDITIONAL COSTS IF EQUIPMENT REQUIRES FEEDER LARGER THAN WHAT IS SHOWN. NOTIFY ELECTRICAL ENGINEER WITH ANY DISCREPNCIES.

## KEYED NOTES

- PROVIDE NEMA 1, 250V, 30A/2P FUSED DISCONNECT WITH (1) 15A CLASS J FUSE. DISCONNECT SHALL BE USED FOR ELEVATOR CAB LIGHTING DISCONNECTING MEANS.
- ROUTE CONDUIT/WIRING BACK TO CAB LIGHTING DISCONNECT.
- PROVIDE FIRE ALARM INTERFACE FOR ELEVATOR RECALL, SHUNT TRIP, AND CONTROL POWER MONITORING OPERATION. COORDINATE ADDITIONAL REQUIREMENTS WITH ELEVATOR AND FIRE ALARM CONTRACTORS. REFER TO SPECIFICATION 16720, ELEVATOR FIRE CONTROL DETAIL.
- PROVIDE CHAIN SUSPENDED, HEAVY DUTY, 4' FLUORESCENT STRIP LUMINAIRE WITH REFLECTOR, WIREGUARD, AND (3) 32W T8 LAMPS. EQUAL TO LITHONIA CATALOG # AFPST332.
- PROVIDE SURFACE MOUNTED, ENCLOSED, 2' FLUORESCENT LUMINAIRE WITH SURFACE CONDUIT ENTRY AND (2) 17W T8 LAMPS. EQUAL TO LITHONIA CATALOG # VSL2175SCESC. VERTICALLY MOUNT LUMINAIRE.
- PROVIDE ENCLOSED CIRCUIT BREAKER WITH SHUNT TRIP FOR ELEVATOR CONTROLLER POWER. REFER TO ONE-LINE DIAGRAM.
- PROVIDE MAIN GROUND BAR AND ALL INTERCONNECTIONS. SEE DETAIL 2, E5.0.
- PROVIDE 2" C. TO ROOF FOR FUTURE PHOTOVOLTAIC SYSTEM.
- PROVIDE UNISTRUT SUPPORTS FOR BACK-TO-BACK MOUNTED PANELS AND ATS'S. PROVIDE UNISTRUT SUPPORT FOR TRANSFORMER 'ETSU' TO BE INSTALLED ABOVE 'ETSU'.
- PROVIDE HOFFMAN BOX CAT. #C8D20166 POWER AND DATA CONNECTIONS PER BAS/FACP INTERFACE SCHEMATIC, SPECIFICATIONS 16720-D2.

ENERGY SYSTEMS DESIGN  
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F: 480.481.4903

PROJECT #  
081993.100

DESIGN CONTACT  
RON KORTE

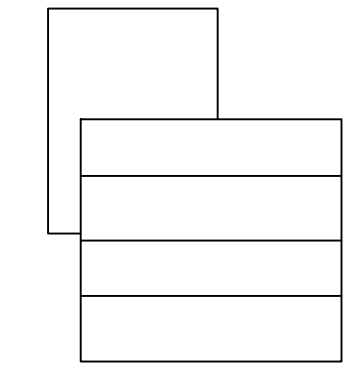
**richard +bauer**  
1545 W. THOMAS ROAD  
PHOENIX ARIZONA 85015  
PHN 602.264.1955  
FAX 602.264.9234

22929 RONALD W. KORTE  
Professional Engineer  
Arizona U.S.A.

EXPIRES 6-30-2012  
GMP-ADDENDUM 1  
05/13/11  
OWNER REVIEW  
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July 15, 2011  
Construction Documents  
r+b job # 0209  
U.A. # 08-8826

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**BRYANT BANNISTER TREE-RING BUILDING**  
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## KEYPLAN



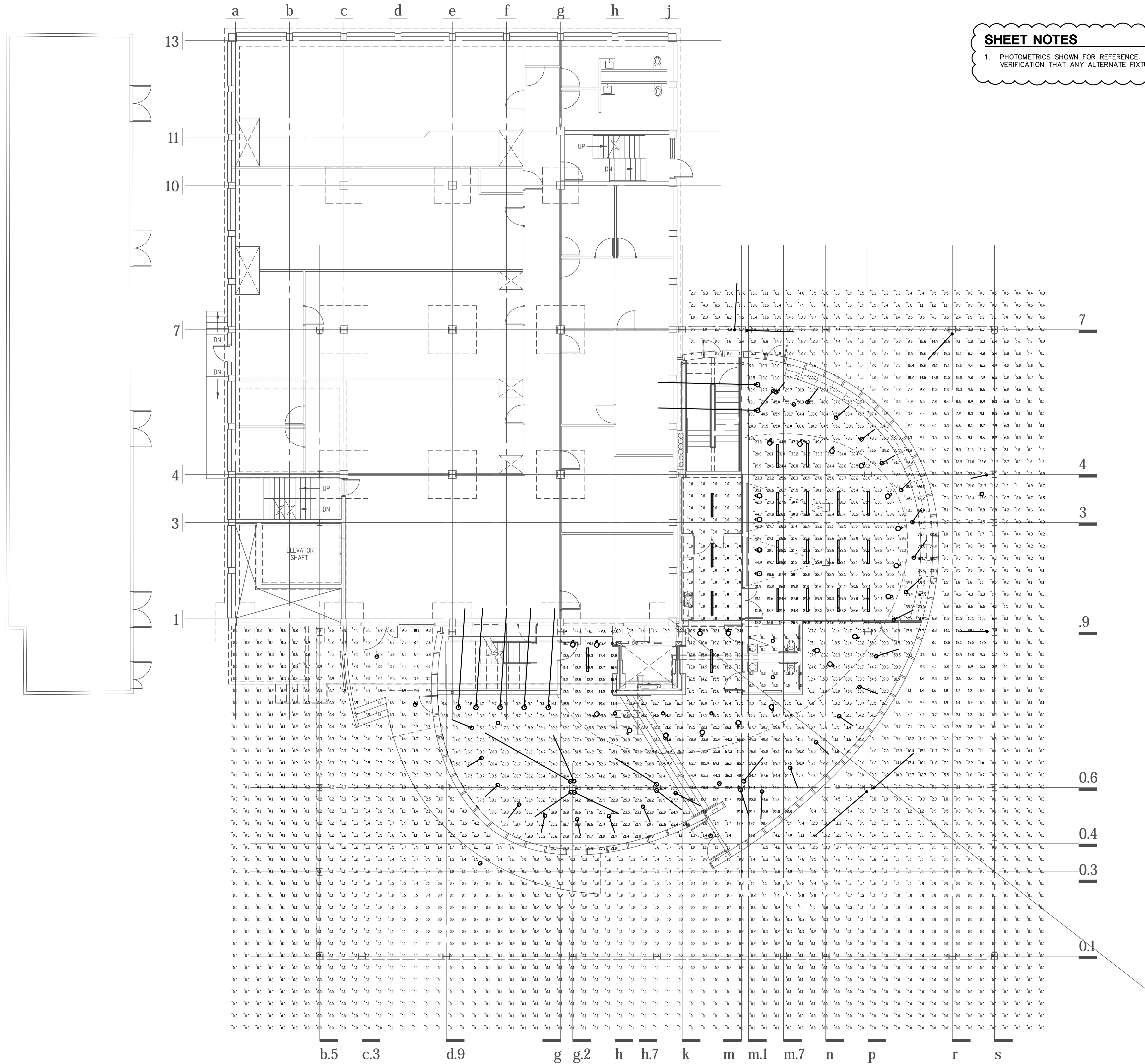
## ENLARGED POWER PLANS

E1.1  
AS NOTED

FILE: J:\2008\081093 UofA Tree Ring Laboratory\081093\_100 U of A Tree Ring Laboratory\081093\_100 U of A Tree Ring Laboratory Rev 02\E12.dwg

PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:29am



**SHEET NOTES**

1. PHOTOMETRICS SHOWN FOR REFERENCE. CONTRACTOR SHALL PROVIDE VERIFICATION THAT ANY ALTERNATE FIXTURES MEET PHOTOMETRICS SHOWN.

**PHOTOMETRICS - LEVEL 1**

SCALE: 1/8" = 1'-0"

**richard + bauer**

1545 W. THOMAS ROAD  
PHOENIX ARIZONA 85015

PHN 602.264.1955  
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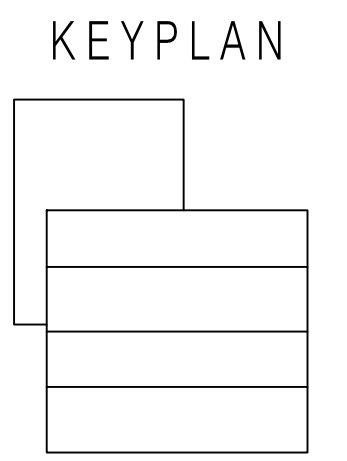
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GMP-ADDENDUM 1  
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OWNER REVIEW  
07/15/11

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r+b job # 0209  
U.A. # 08-8826

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PHOTOMETRICS LEVEL 1

**E12**

AS NOTED

**esd**

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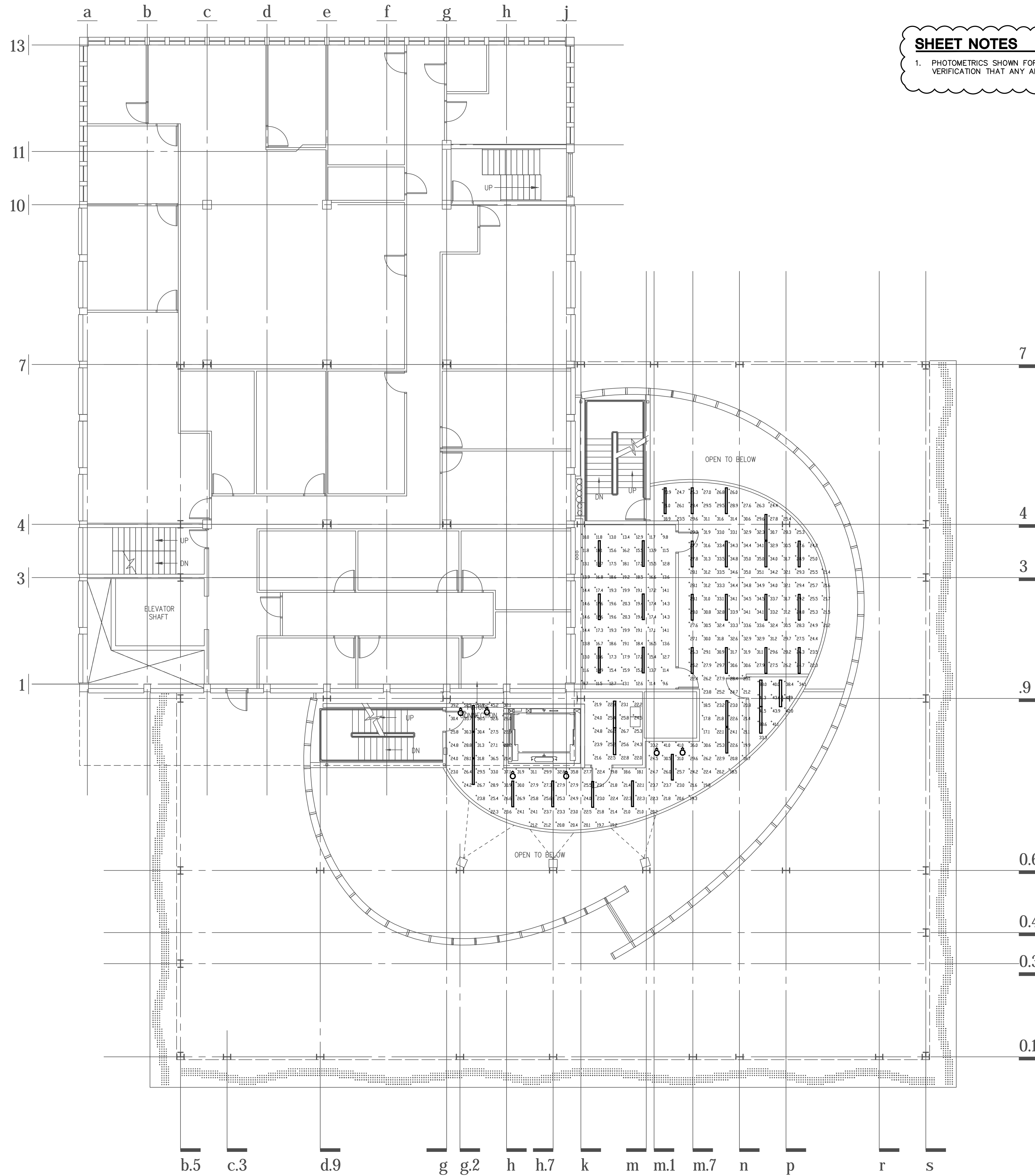
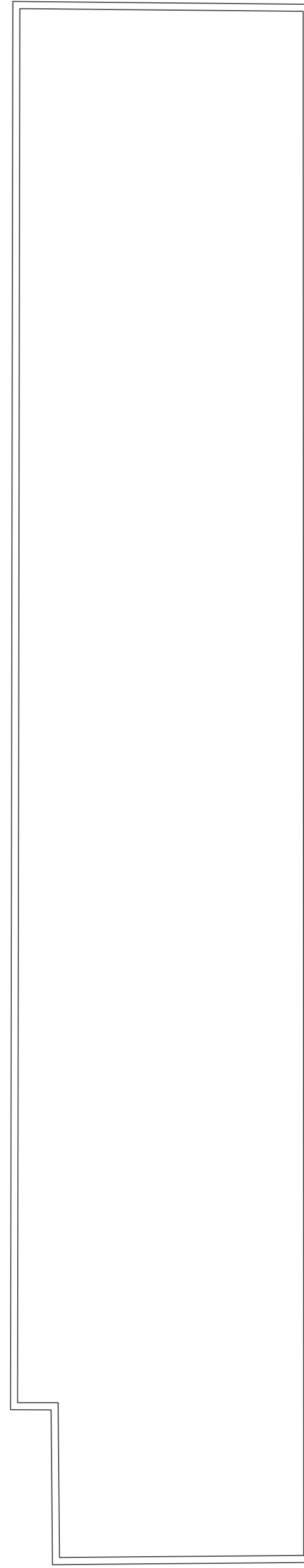
PROJECT #  
081093.100

DESIGN CONTACT  
RON KORTE

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PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:29am



**SHEET NOTES**  
1. PHOTOMETRICS SHOWN FOR REFERENCE. CONTRACTOR SHALL PROVIDE VERIFICATION THAT ANY ALTERNATE FIXTURES MEET PHOTOMETRICS SHOWN.

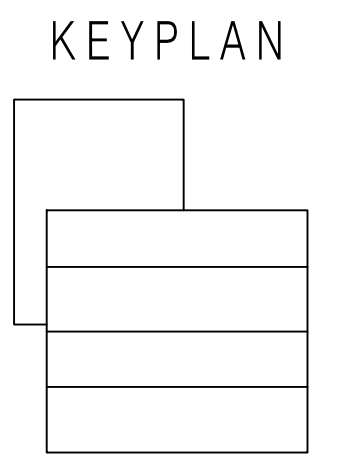
**PHOTOMETRICS - LEVEL 2**  
SCALE: 1/8" = 1'-0"

**esd**  
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Professional Engineer Seal for Ronald W. Korte, License No. 22929, State of Arizona. Includes project details: July 15, 2011 Construction Documents, r+b job # 0209, U.A. # 08-8826.

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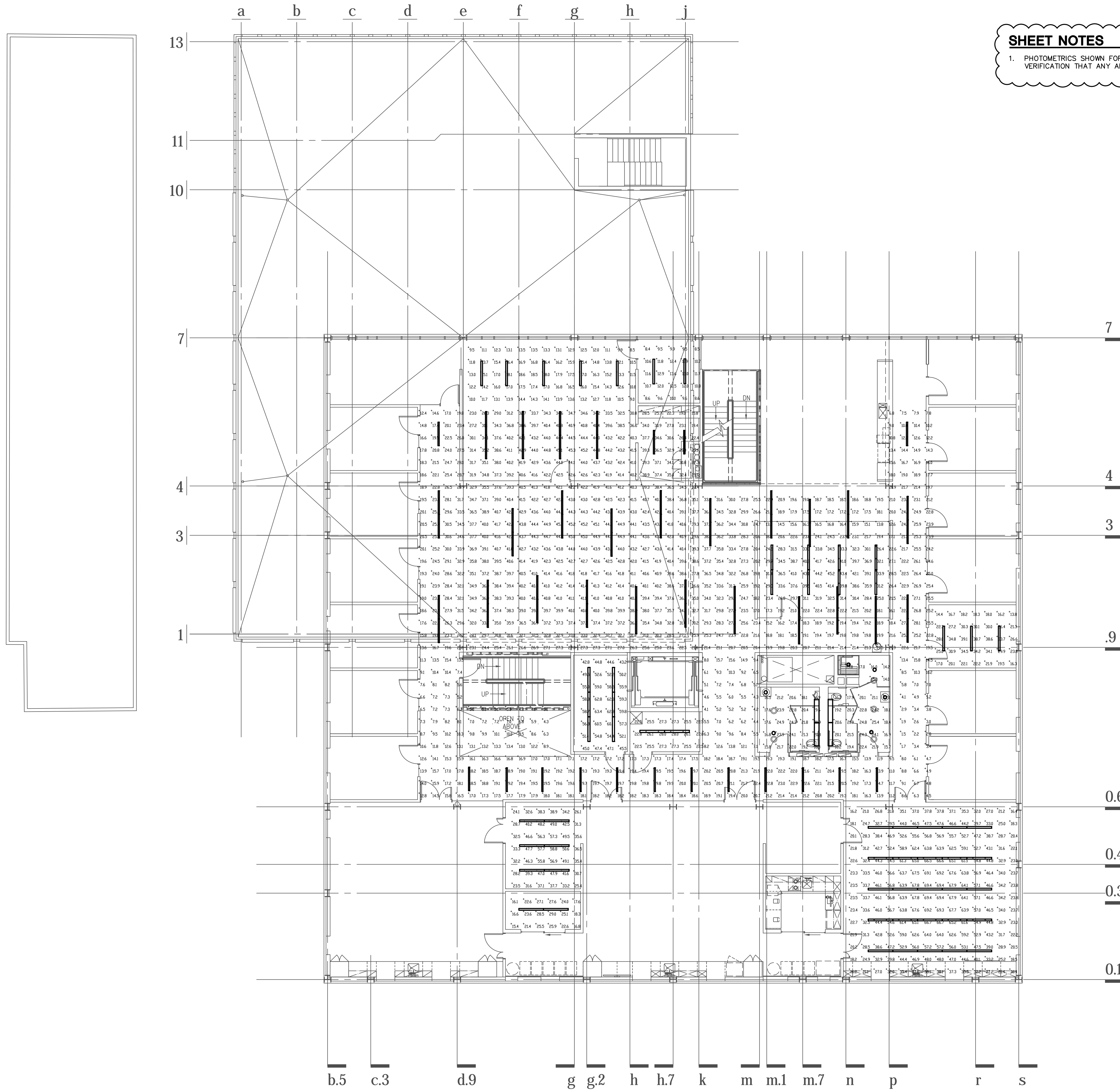
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LEVEL 2  
**E13**  
AS NOTED



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PLOTTED BY: Anthony.Miranda

PLOTTED: 09.30.2011 - 11:29am



**SHEET NOTES**

1. PHOTOMETRICS SHOWN FOR REFERENCE. CONTRACTOR SHALL PROVIDE VERIFICATION THAT ANY ALTERNATE FIXTURES MEET PHOTOMETRICS SHOWN.

**PHOTOMETRICS - LEVEL 3**

SCALE: 1/8" = 1'-0"

**richard + bauer**

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PHOENIX ARIZONA 85015

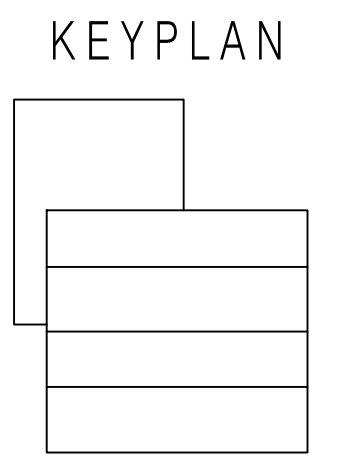
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PHOTOMETRICS  
LEVEL 3

**E1.4**

AS NOTED

**esd**

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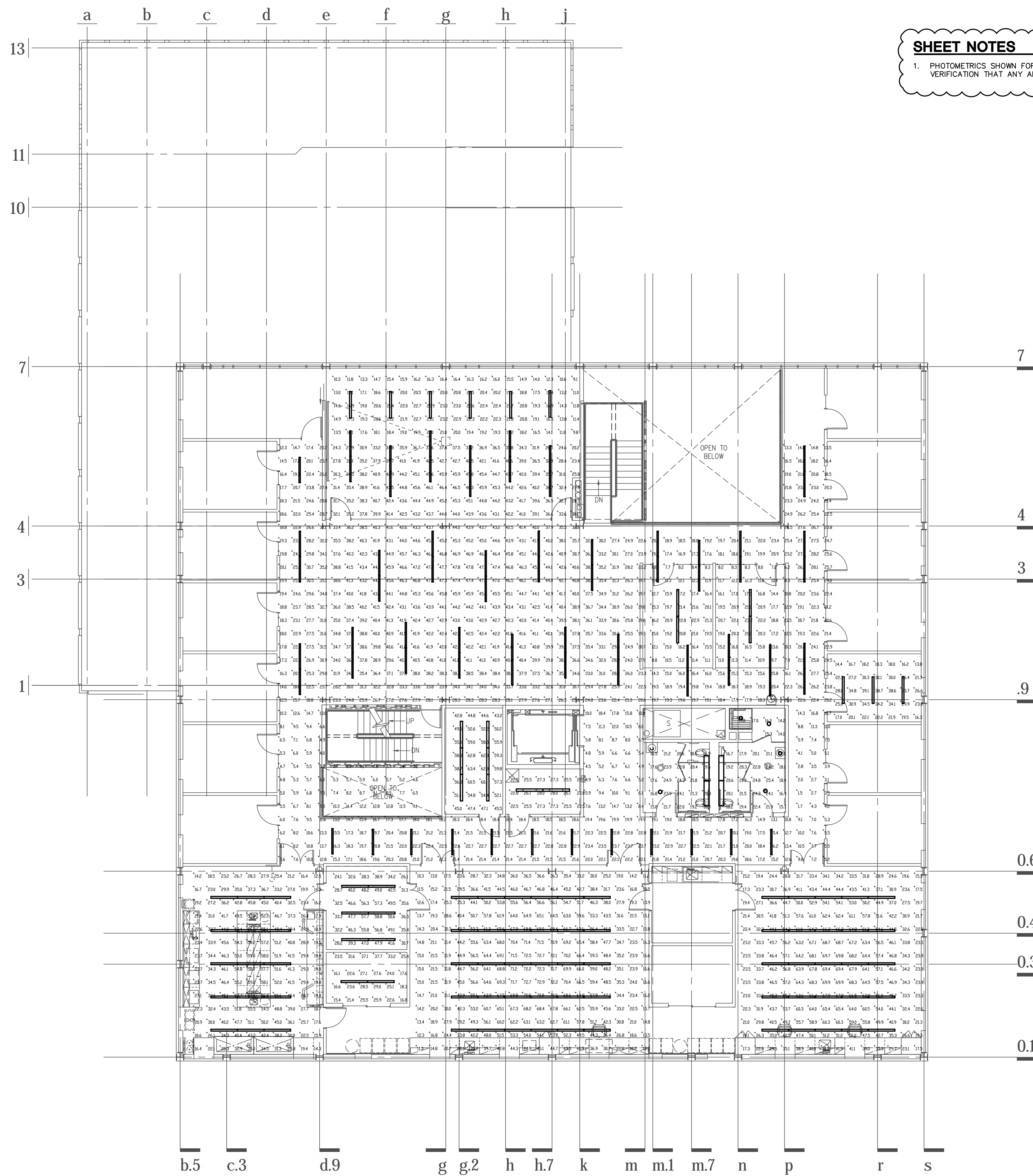
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081093.1.00

DESIGN CONTACT  
RON KORTE

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PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 -- 11:29am



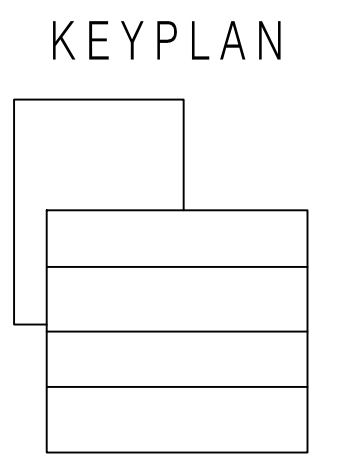
**SHEET NOTES**

1. PHOTOMETRICS SHOWN FOR REFERENCE. CONTRACTOR SHALL PROVIDE VERIFICATION THAT ANY ALTERNATE FIXTURES MEET PHOTOMETRICS SHOWN.

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PHOTOMETRICS  
 LEVEL 4  
**E15**  
 AS NOTED

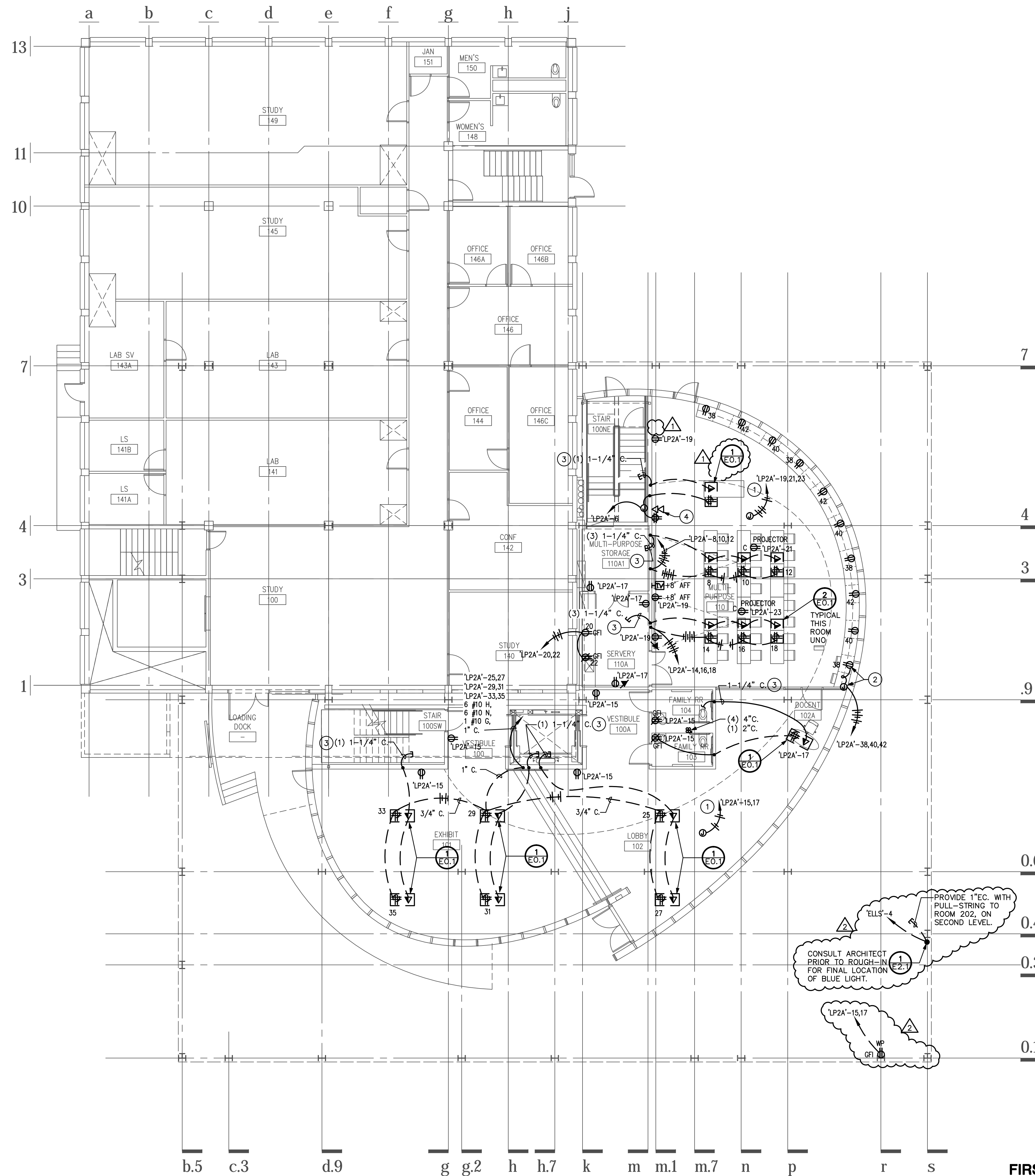
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 PROJECT #  
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 DESIGN CONTACT  
 RON KORTE

**PHOTOMETRICS - LEVEL 4**  
 SCALE: 1/8" = 1'-0"

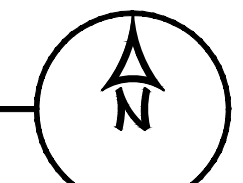
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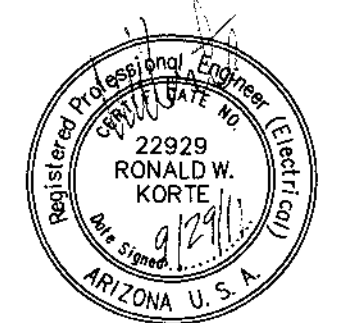
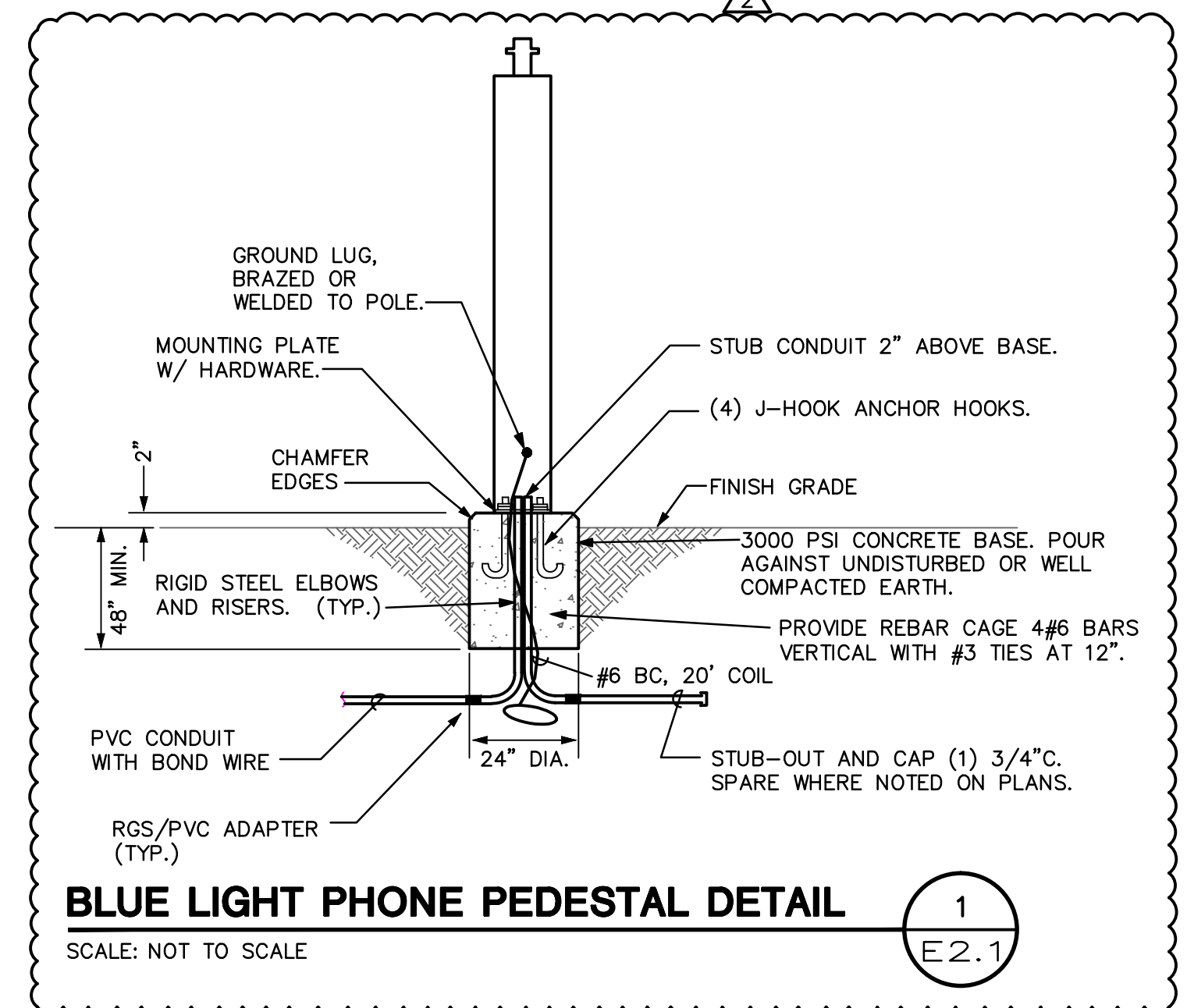
PLOTTED: 09.30.2011 - 11:32am



**FIRST LEVEL ELECTRICAL POWER PLAN**  
SCALE: 1/8" = 1'-0"

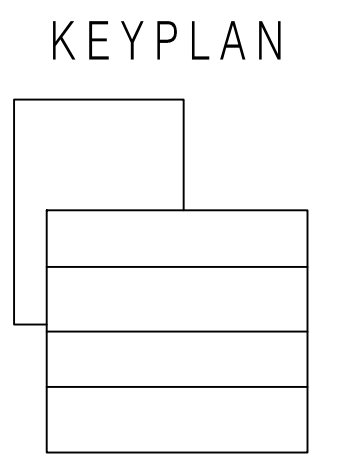


- KEYED NOTES**
- 1 J-BOX SHOWN FOR CLARITY AND INTENT. CONTRACTOR TO EXTEND BRANCH CIRCUITS AND CONDUIT TO FIXTURES INDICATED WITH BRANCH CIRCUIT NUMBER.
  - 2 COORDINATE INSTALLATION OF RECEPTACLES AND CONDUIT IN MILLWORK WITH ARCHITECT AND MILLWORK CONTRACTOR.
  - 3 CONDUIT SHALL BE INSTALLED TO 2ND FLOOR IDF ROOM.
  - 4 AT INSTRUCTOR STATION PROVIDE 2 GANG BOX WITH 2" EC TO ABOVE ACCESSIBLE CEILING FOR A/V AND PROVIDE 2 GANG BOX WITH 1-1/4" EC TO ABOVE ACCESSIBLE CEILING FOR TELECOMM.



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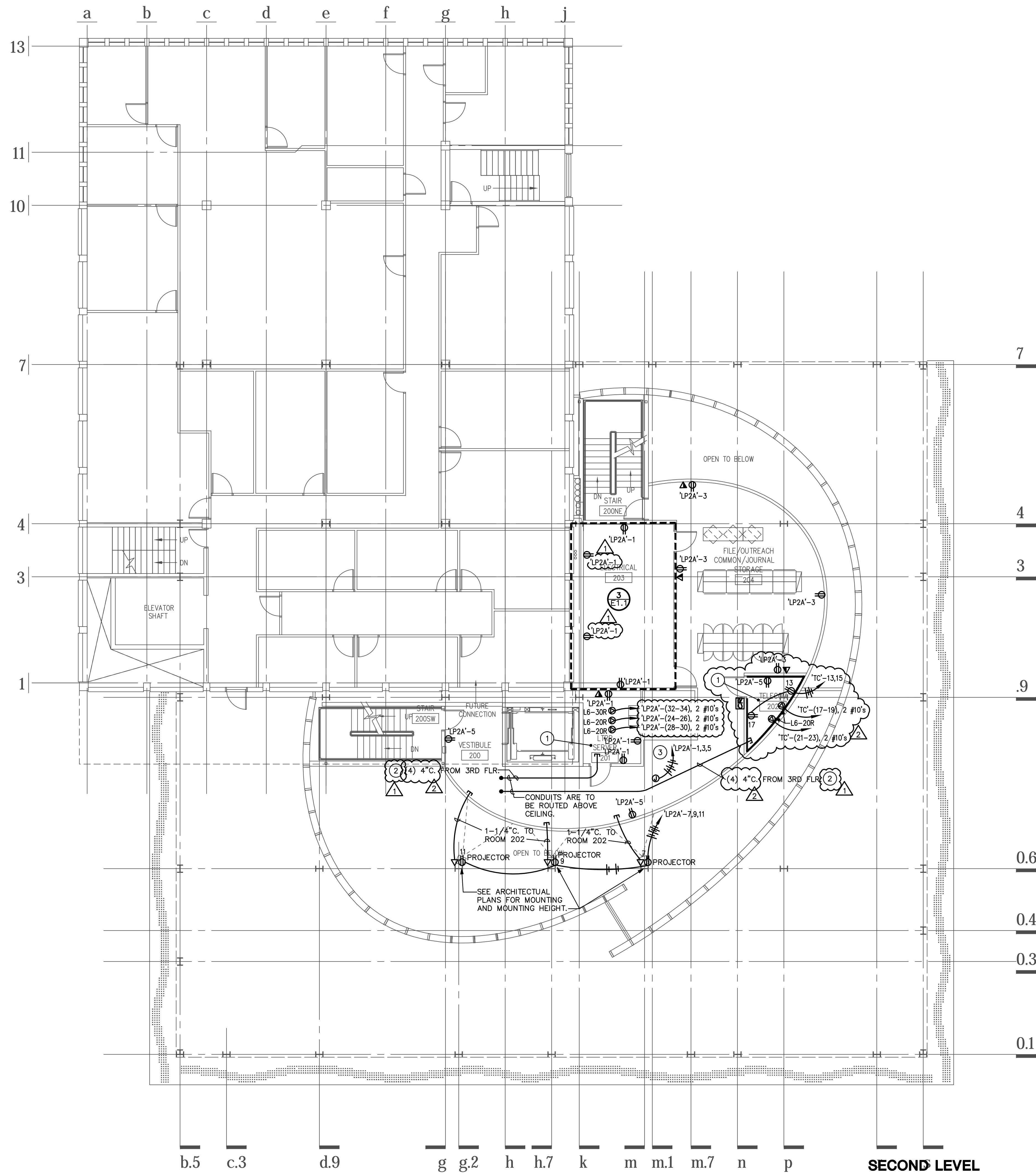
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PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:32am

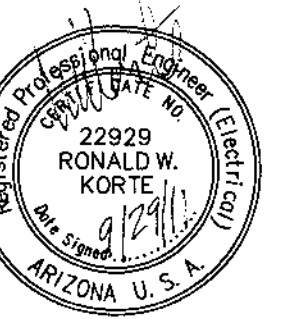


**SECOND LEVEL ELECTRICAL POWER PLAN**

SCALE: 1/8" = 1'-0"

**KEYED NOTES**

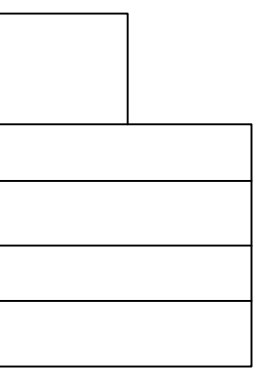
- 1 ALL WALLS LINED WITH 3/4", 4'x8' A-C GRADE PLYWOOD, FIRE RESISTANT, PAINTED WHITE.
- 2 (2) 2" C. TO 3RD FLOOR TELECOMM ROOM.
- 3 J-BOX SHOWN FOR CLARITY AND INTENT. CONTRACTOR TO EXTEND BRANCH CIRCUITS AND CONDUIT TO FIXTURES INDICATED WITH BRANCH CIRCUIT NUMBER.



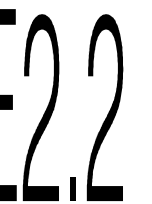
EXPIRES 6-30-2012  
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**July 15, 2011**  
**Construction Documents**  
 r+b job # 0209  
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LABORATORY OF TREE-RING RESEARCH  
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KEYPLAN



SECOND LEVEL POWER PLAN

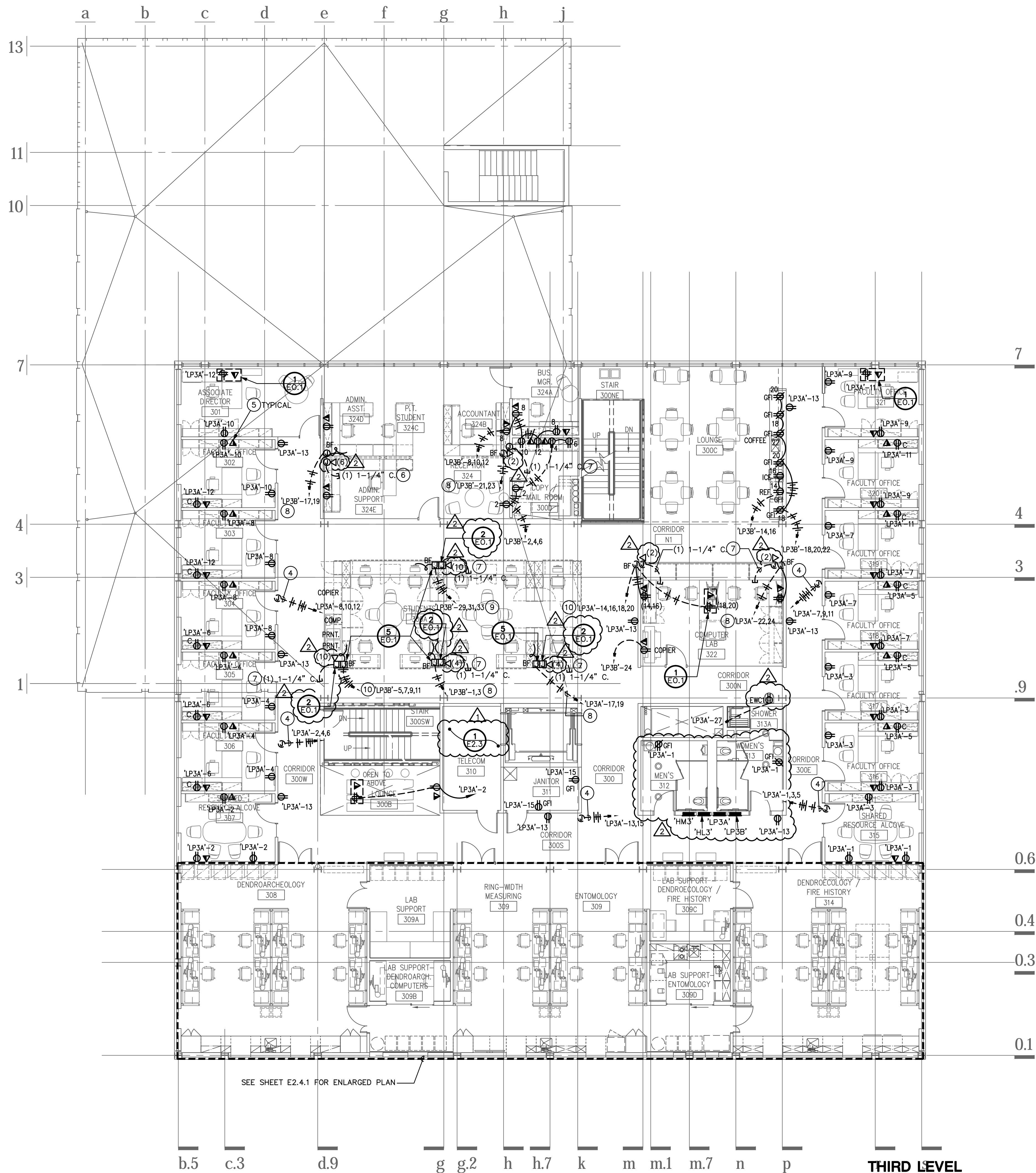


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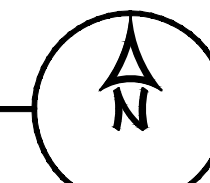
PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:30am



SEE SHEET E2.4.1 FOR ENLARGED PLAN

**THIRD LEVEL ELECTRICAL POWER PLAN**  
SCALE: 1/8" = 1'-0"

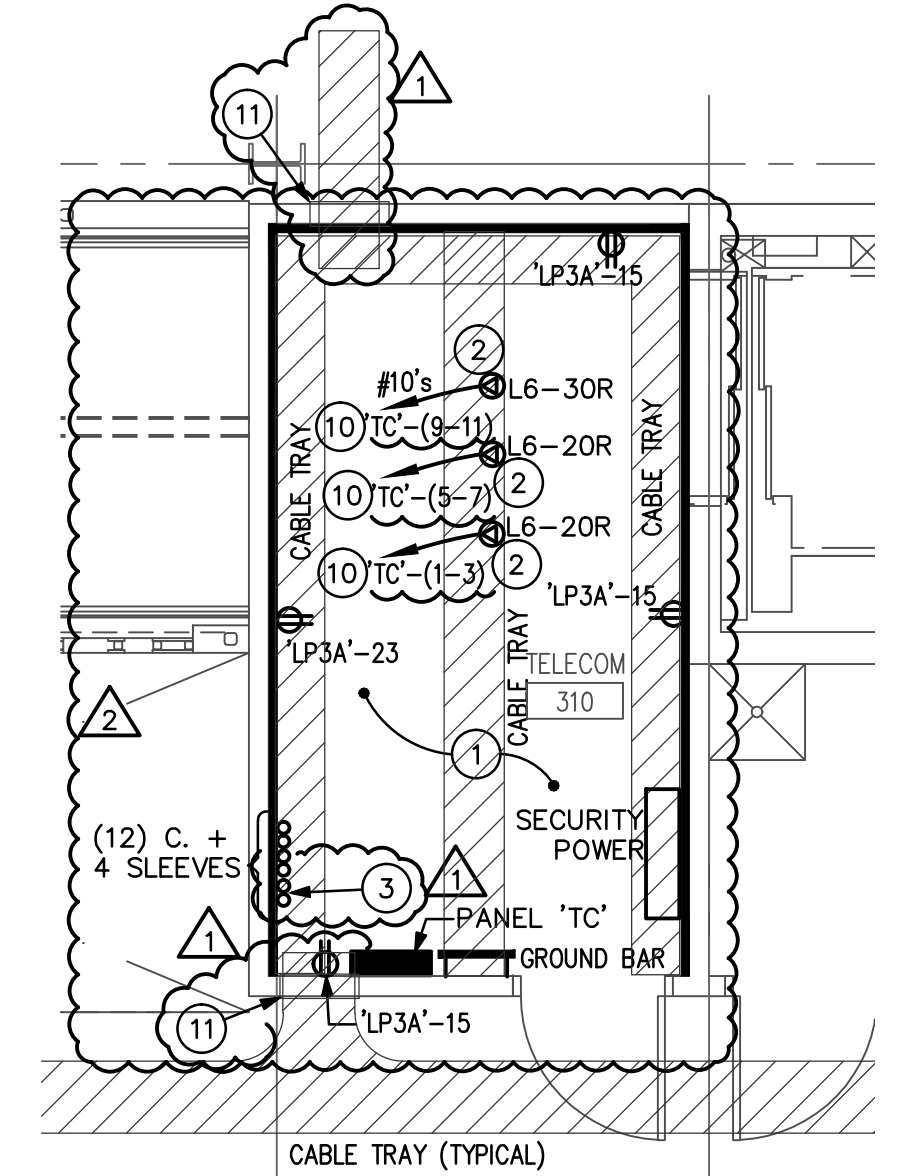


**SHEET NOTES**

- ALL POWER CIRCUITS AND DATA CONDUITS IN OPEN AREAS ARE TO BE ROUTED UNDERFLOOR. U.N.O.
- AREA ABOVE OFFICES IS OPEN TO MEW. ALL CONDUITS AND CABLE TRAY SHALL BE INSTALLED FLAT ABOVE OFFICE CEILING DECK OR IN DECK. COORDINATE ALL ROUTING WITH ARCHITECT PRIOR TO ROUGH-IN.
- ALL CONDUIT ABOVE OPEN AREAS SHALL BE INSTALLED AS HIGH AS POSSIBLE. RUNS BACK TO PANELS AND CABLE TRAYS SHALL BE GROUPED AND RUN TOGETHER. CONDUITS, J-BOXES, SUPPORTS, ETC. SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGH-IN.
- ALL CONDUIT, J-BOXES, SUPPORTS, ETC. ABOVE CEILINGS SHALL BE PAINTED. COORDINATE WITH GENERAL CONTRACTOR TO ENSURE ALL CONDUITS ARE PAINTED. NO EXCEPTIONS EXCEPT FIRE ALARM CONDUIT.
- PROVIDE A MINIMUM OF (4) 3/4" CONDUITS FROM ALL FLUSH MOUNTED PANEL BOARDS INTO ACCESSIBLE CEILING SPACE.

**KEYED NOTES**

- ALL WALLS LINED WITH 3/4", 4'x8' A-C GRADE PLYWOOD, FIRE RESISTANT, PAINTED WHITE.
- MOUNT RECEPTACLES ON UNISTRUT OVERHEAD OF THE RELAY RACKS. COORDINATE INSTALLATION WITH UITS.
- PROVIDE (4) 4"C EACH TO 2ND FLOOR IDF ROOM AND TO LTRR SERVER ROOM.
- J-BOX SHOWN FOR CLARITY AND INTENT. CONTRACTOR TO EXTEND BRANCH CIRCUITS AND CONDUIT TO DEVICES INDICATED WITH BRANCH CIRCUIT NUMBER.
- PROVIDE 1"C UP WALL AND ROUTE TO CABLE TRAY. SEE SHEET E4.4.
- PROVIDE 1-1/4" C. UP WALL AND ROUTE TO CABLE TRAY. SEE SHEET E4.4.
- PROVIDE 1-1/4" C. TO TELECOM ROOM FOR FLOOR BOX.
- PROVIDE 2 #12 H, 2 #12 N, 1 #12 IG, 1 #12 G IN 3/4"C.
- PROVIDE 3 #12 H, 2 #12 N, 1 #12 IG, 1 #12 G IN 3/4"C.
- PROVIDE 4 #10 H, 2 #10 N, 1 #10 IG, 1 #10 G IN 3/4"C.
- PROVIDE FIRE RATED CABLE TRAY PENETRATIONS COORDINATE WITH CABLING CONTRACTOR AND SEAL PENETRATION AFTER CABLE INSTALLATION IS COMPLETE.



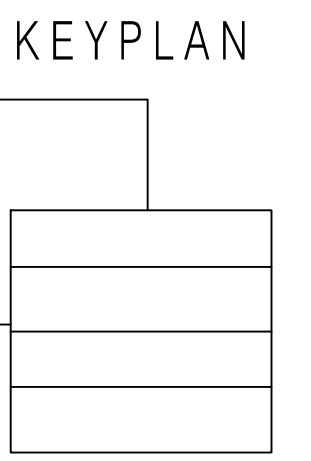
**ENLARGED TELECOM. ROOM - 3rd FLOOR**  
SCALE: 1/4" = 1'-0"

1  
E2.3



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U.A. # 08-8826

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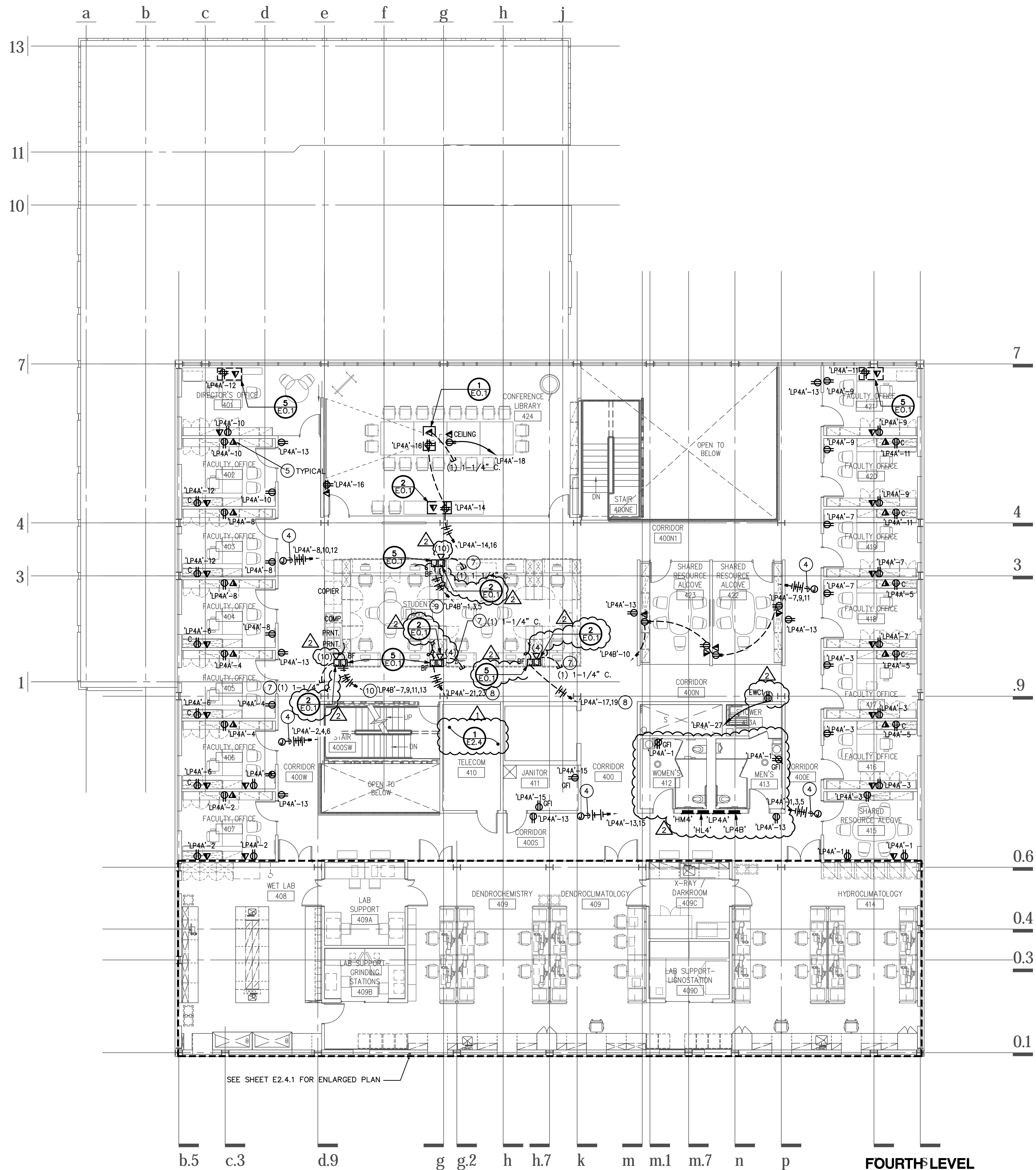
**esd** ENERGY SYSTEMS DESIGN  
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PROJECT # 081093.100  
DESIGN CONTACT RON KORTE

THIRD LEVEL POWER PLAN  
**E2.3**  
AS NOTED

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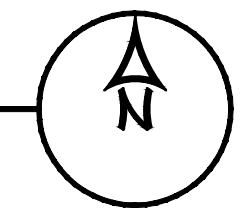
PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:33am



SEE SHEET E2.4.1 FOR ENLARGED PLAN

**FOURTH LEVEL ELECTRICAL POWER PLAN**  
SCALE: 1/8" = 1'-0"

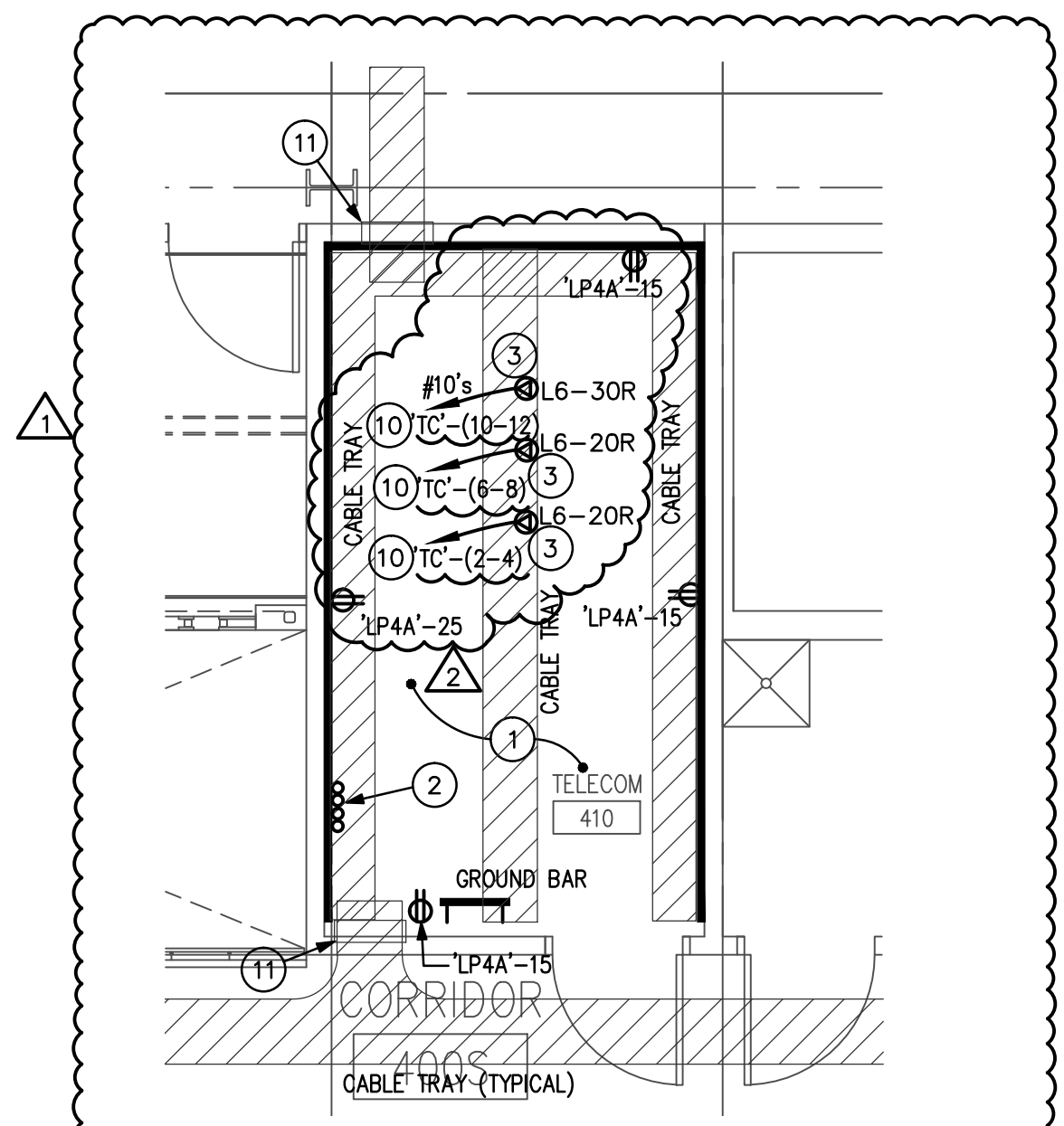


**SHEET NOTES**

1. ALL POWER CIRCUITS AND DATA CONDUITS IN OPEN AREAS ARE TO BE ROUTED UNDERFLOOR. U.N.O.
2. AREA ABOVE OFFICES IS OPEN TO VIEW. ALL CONDUITS AND CABLE TRAY SHALL BE INSTALLED FLAT ABOVE OFFICE CEILING DECK OR IN DECK. COORDINATE ALL ROUTING WITH ARCHITECT PRIOR TO ROUGH-IN.
3. ALL CONDUIT ABOVE OPEN AREAS SHALL BE INSTALLED AS HIGH AS POSSIBLE. RUNS BACK TO PANELS AND CABLE TRAYS SHALL BE GROUPED AND RUN TOGETHER. CONDUITS, J-BOXES, SUPPORTS, ETC. SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGH-IN.
4. ALL CONDUIT, J-BOXES, SUPPORTS, ETC. ABOVE CEILINGS SHALL BE PAINTED. COORDINATE WITH GENERAL CONTRACTOR TO ENSURE ALL CONDUITS ARE PAINTED. NO EXCEPTIONS EXCEPT FIRE ALARM CONDUIT.
5. PROVIDE A MINIMUM OF (4) 3/4" CONDUITS FROM ALL FLUSH MOUNTED PANEL BOARDS INTO ACCESSIBLE CEILING SPACE.

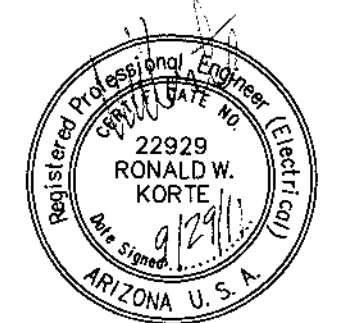
**KEYED NOTES**

- 1 ALL WALLS LINED WITH 3/4", 4'x8' A-C GRADE PLYWOOD, FIRE RESISTANT, PAINTED WHITE.
- 2 PROVIDE (4) 4"C SLEEVES BETWEEN 3RD AND 4TH FLOOR TELECOMM. ROOMS
- 3 MOUNT RECEPTACLES ON UNISTRUT OVERHEAD OF THE RELAY RACKS. COORDINATE INSTALLATION WITH UITS.
- 4 J-BOX SHOWN FOR CLARITY AND INTENT. CONTRACTOR TO EXTEND BRANCH CIRCUITS AND CONDUIT TO DEVICES INDICATED WITH BRANCH CIRCUIT NUMBER.
- 5 PROVIDE 1"C UP WALL AND ROUTE TO CABLE TRAY. SEE SHEET E4.3.
- 6 PROVIDE 1-1/4" C. UP WALL AND ROUTE TO CABLE TRAY. SEE SHEET E4.3.
- 7 PROVIDE 1-1/4" C. TO TELECOM ROOM FOR FLOOR BOX.
- 8 PROVIDE 2 #12 H, 2 #12 N, 1 #12 IG, 1 #12 G IN 3/4"C.
- 9 PROVIDE 3 #12 H, 2 #12 N, 1 #12 IG, 1 #12 G IN 3/4"C.
- 10 PROVIDE 4 #10 H, 2 #10 N, 1 #10 IG, 1 #10 G IN 3/4"C.
- 11 PROVIDE FIRE RATED CABLE TRAY PENETRATIONS COORDINATE WITH CABLING CONTRACTOR AND SEAL PENETRATION AFTER CABLE INSTALLATION IS COMPLETE.



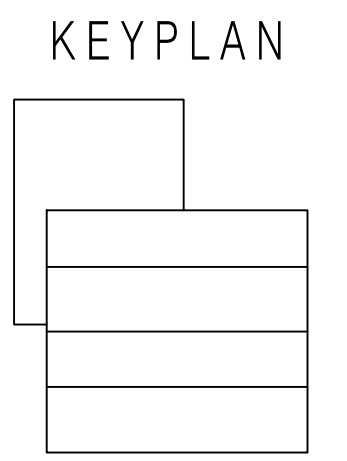
**ENLARGED TELECOM. ROOM - 4TH FLOOR**  
SCALE: 1/4" = 1'-0"

1 E2.4



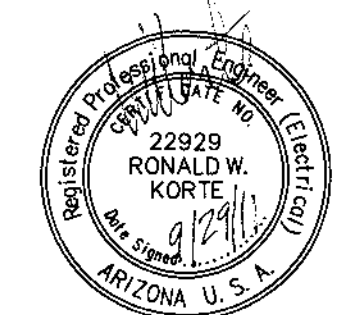
EXPIRES 6-30-2012  
GMP-ADDENDUM 1  
05/13/11  
OWNER REVIEW  
07/15/11  
**July 15, 2011 Construction Documents**  
r+b job # 0209  
U.A. # 08-8826

LABORATORY OF TREE-RING RESEARCH  
**BRYANT BANNISTER TREE-RING BUILDING**  
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FOURTH LEVEL POWER PLAN  
**E2.4**  
AS NOTED

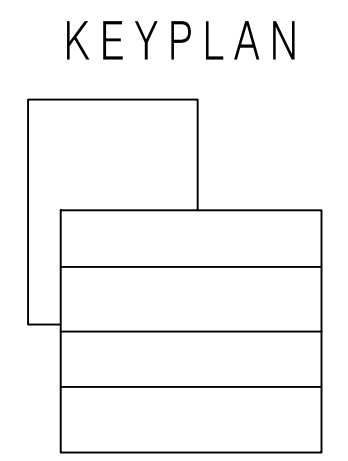
**esd** ENERGY SYSTEMS DESIGN  
7135 East Camelback Road Suite 275  
Scottsdale AZ 85251  
P: 480.481.4900  
F: 480.481.4903  
PROJECT # 081093.100  
DESIGN CONTACT RON KORTE



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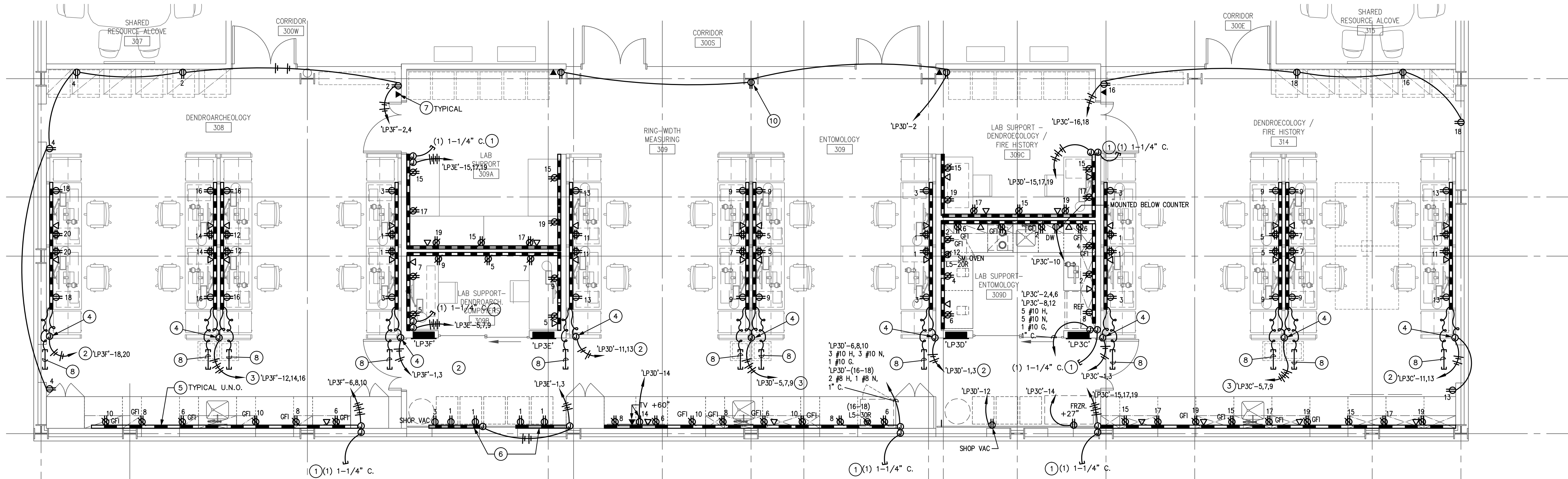


POWER PLANS  
 ENLARGED  
**E2.4.1**  
 AS NOTED

FILE: J:\2008\081093\_UoFA Tree Ring Laboratory\081093\_100 U of A Tree Ring Laboratory\081093\_100 U of A Tree Ring Laboratory\REV02.dwg

PLOTTED BY: Anthony.Miranda

PLOTTED: 09.30.2011 - 11:33am



**KEYED NOTES**

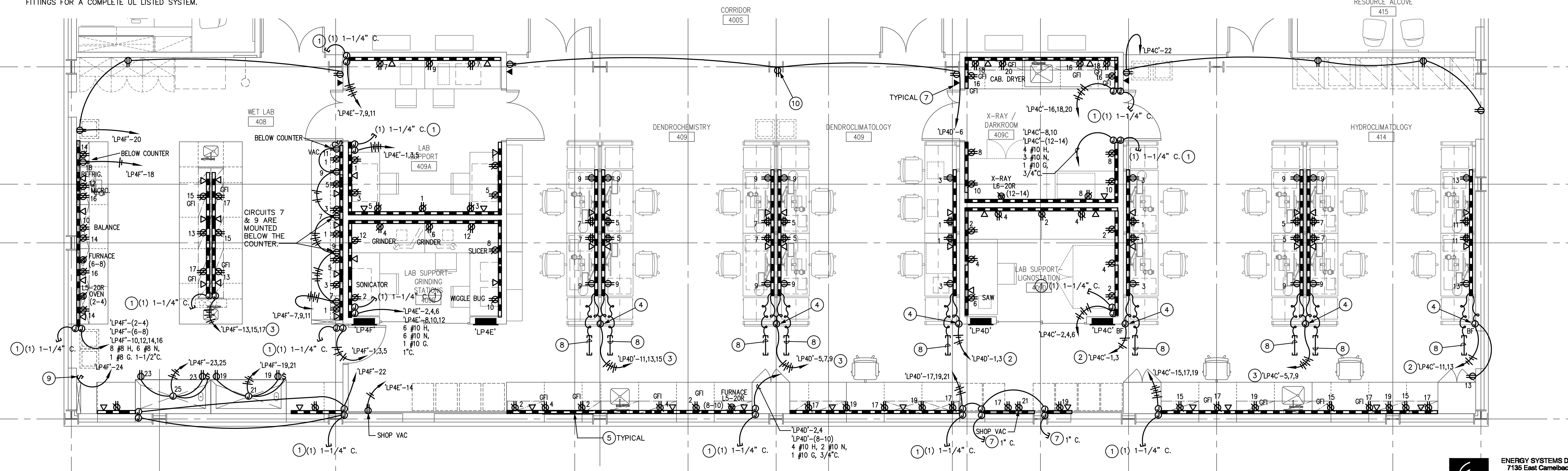
- 1 PROVIDE 1-1/4" C. UP WALL AND ROUTE TO CABLE TRAY. SEE SHEET E4.4.
- 2 PROVIDE 2 #12 H, 2 #12 N, 1 #12 G IN 3/4"C.
- 3 PROVIDE 3 #12 H, 3 #12 N, 1 #12 G IN 3/4"C.
- 4 PROVIDE FLEX CONDUIT FROM DECK MOUNTED J-BOX TO SUPPORT RACK AND DOWN TO FURNITURE CHASE (FURNITURE CHASE PROVIDED BY OTHERS). PROVIDE ADDITIONAL FLEX CONDUIT PARALLEL FROM WIREMOLD TO FURNITURE CHASE. SEE SHEET E0.2 DETAIL #3.
- 5 PROVIDE WIREMOLD, SERIES DS4000, STEEL, DUAL CHANNEL, SURFACE MOUNTED RACEWAY. VERIFY COLOR WITH ARCHITECT PRIOR TO PURCHASE. PROVIDE WIRING AND DEVICES AS SHOWN. PROVIDE SUPPORTS AND ALL FITTINGS FOR A COMPLETE UL LISTED SYSTEM.
- 6 PROVIDE WIREMOLD, SERIES 3000, STEEL, SINGLE CHANNEL, SURFACE MOUNTED RACEWAY. VERIFY COLOR WITH ARCHITECT PRIOR TO PURCHASE. PROVIDE WIRING AND DEVICES AS SHOWN. PROVIDE SUPPORTS AND ALL FITTINGS FOR A COMPLETE UL LISTED SYSTEM.
- 7 PROVIDE 1" C. UP WALL AND ROUTE TO CABLE TRAY. SEE SHEET E4.4.
- 8 PROVIDE 1" C. CONDUIT FROM WIRE RACK TO SUPPORT RACK AND DOWN TO FURNITURE CHASE (FURNITURE CHASE PROVIDED BY OTHERS). PROVIDE ADDITIONAL FLEX CONDUIT PARALLEL FROM WIREMOLD TO FURNITURE CHASE. SEE SHEET E0.2 DETAIL #3.
- 9 COORDINATE SWITCH LOCATION AND CONTROL WIRING WITH PLUMBING CONTRACTOR.
- 10 SEE ARCHITECTURAL DRAWINGS FOR MOUNTING DETAIL. TYPICAL OF ALL ELECTRICAL DEVICES MOUNTED TO AN EXPOSED BEAM.
- 11 CIRCUIT SPECIAL RECEPTACLE L6-30R TO 'TC'-(10-12), USE #10 WIRE. CIRCUIT (1) SPECIAL RECEPTACLE L6-20R TO 'TC'-(2-4) AND THE OTHER SPECIAL RECEPTACLE TO 'TC'-(6-8).

**THIRD LEVEL ELECTRICAL POWER PLAN**

SCALE: 1/4" = 1'-0"

**SHEET NOTES**

- 1. ALL CONDUIT ROUTING SHALL BE COORDINATE WITH ARCHITECT PRIOR TO ROUGH-IN. CONDUITS SHALL BE GROUPED TOGETHER AND HELD AS HIGH AS POSSIBLE AVOIDING CONFLICTS WITH MECHANICAL SYSTEMS AND PIPING.



**FOURTH LEVEL ELECTRICAL POWER PLAN**

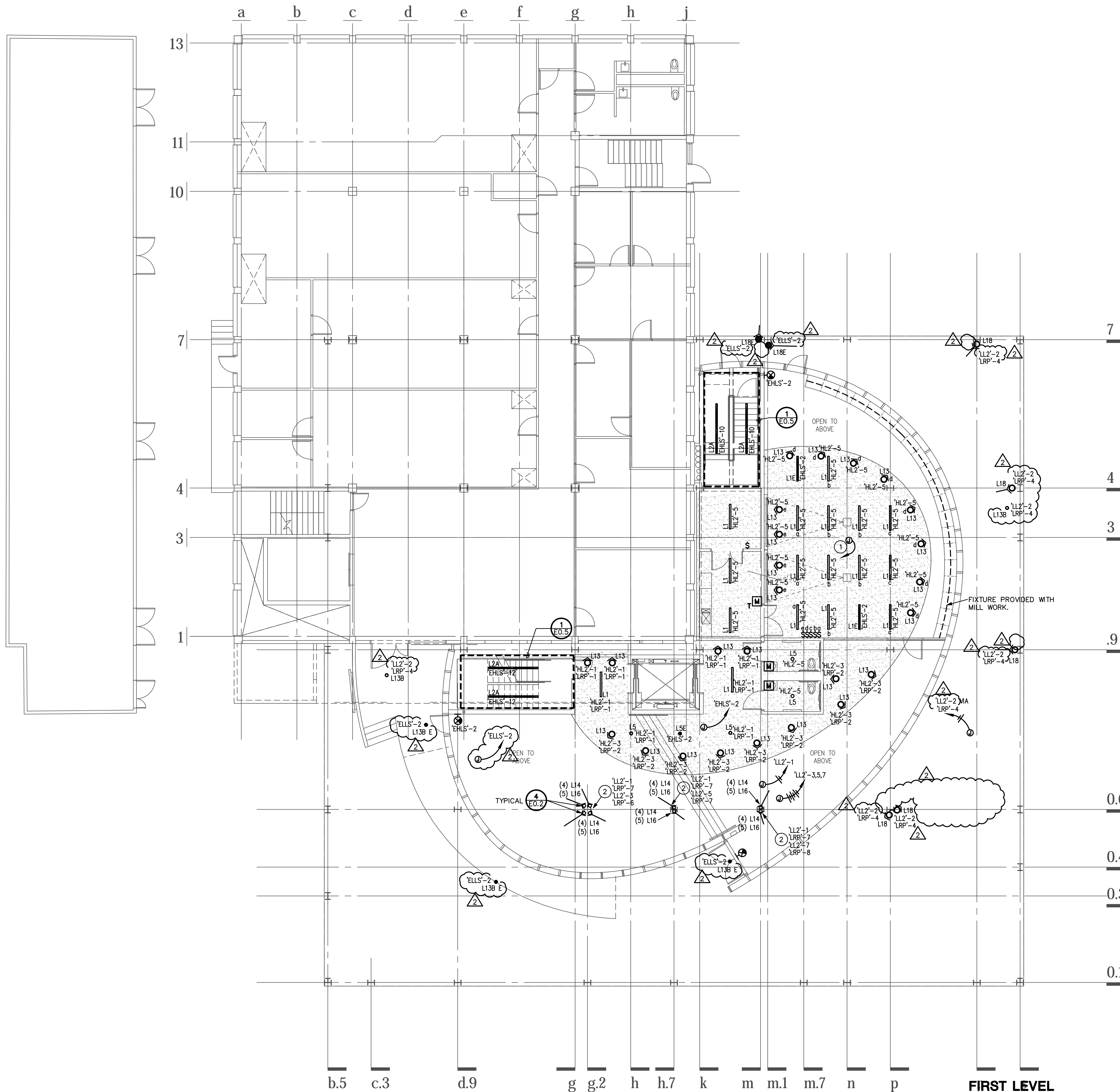
SCALE: 1/4" = 1'-0"

**ENERGY SYSTEMS DESIGN**  
 7135 East Camelback Road  
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 Scottsdale AZ 85251  
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 DESIGN CONTACT  
 RON KORTE

FILE: J:\2008\081093 UofA Tree Ring Laboratory\081093\_100 U of A Tree Ring\UofA Comments Rev 02\E31REV02.dwg

PLOTTED BY: Anthony Miranda

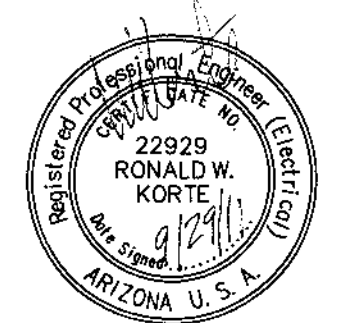
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**FIRST LEVEL ELECTRICAL LIGHTING PLAN**  
SCALE: 1/8" = 1'-0"

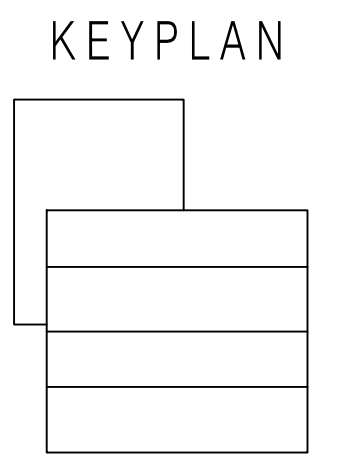
- KEYED NOTES**
- 1 PROVIDE HOMERUN TO LIGHTING BRANCH CIRCUIT(S) AS SHOWN. EXTEND WIRING TO INDIVIDUAL LUMINAIRES PER BRANCH CIRCUIT IDENTIFICATION ADJACENT TO EACH LUMINAIRE. CONTRACTOR SHALL DETERMINE MOST ECONOMICAL ROUTING IN FIELD.
  - 2 TOP (4) L16 LUMINAIRES SHALL BE CIRCUITED TO 'LL2'-1 VIA 'LRP'-7. REMAINING L14 AND L16 LUMINAIRES SHALL BE CIRCUITED TO 'LL2'-3,5,7 VIA 'LRP'-6,7,8 RESPECTIVELY. TYPICAL OF ALL COLUMNS.

ENTIRE LIGHTING DESIGN CHANGED.



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U.A. # 08-8826

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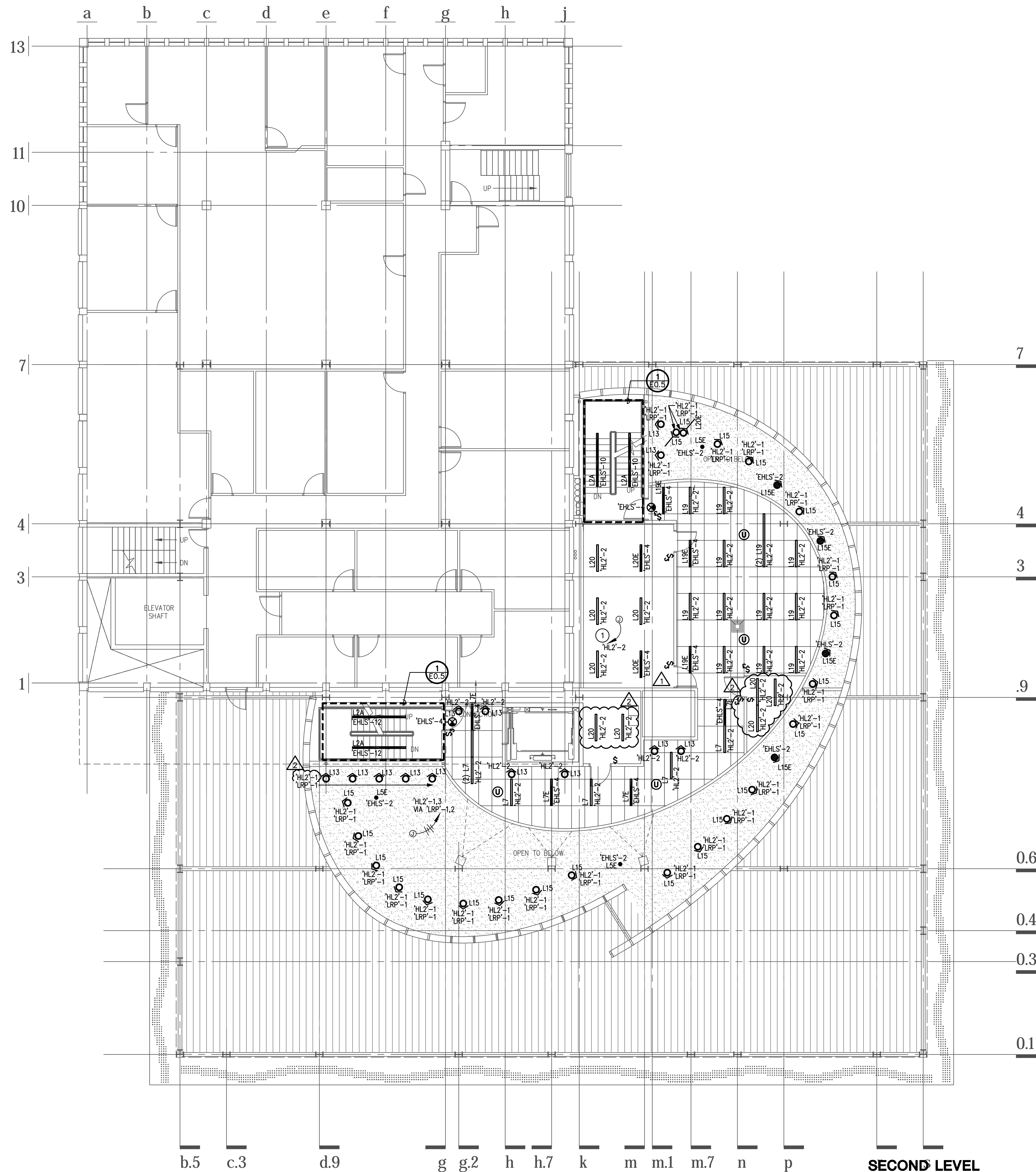




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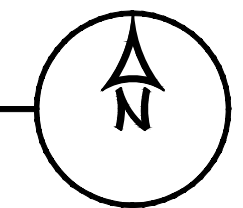
PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:35am



**SECOND LEVEL ELECTRICAL LIGHTING PLAN**

SCALE: 1/8" = 1'-0"



**KEYED NOTES**

- 1 PROVIDE HOMERUN TO LIGHTING BRANCH CIRCUIT(S) AS SHOWN. EXTEND WIRING TO INDIVIDUAL LUMINAIRES PER BRANCH CIRCUIT IDENTIFICATION ADJACENT TO EACH LUMINAIRE. CONTRACTOR SHALL DETERMINE MOST ECONOMICAL ROUTING IN FIELD.

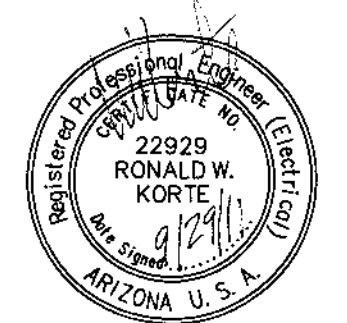
ENTIRE LIGHTING DESIGN CHANGED.

**esd**  
 ENERGY SYSTEMS DESIGN  
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 081093.100  
 DESIGN CONTACT  
 RON KORTE

**SECOND LEVEL LIGHTING PLAN**

**E3.2**  
 AS NOTED

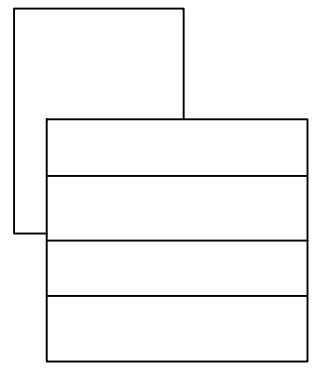
**richard + bauer**  
 1545 W. THOMAS ROAD  
 PHOENIX ARIZONA 85015  
 PHN 602.264.1955  
 FAX 602.264.9234

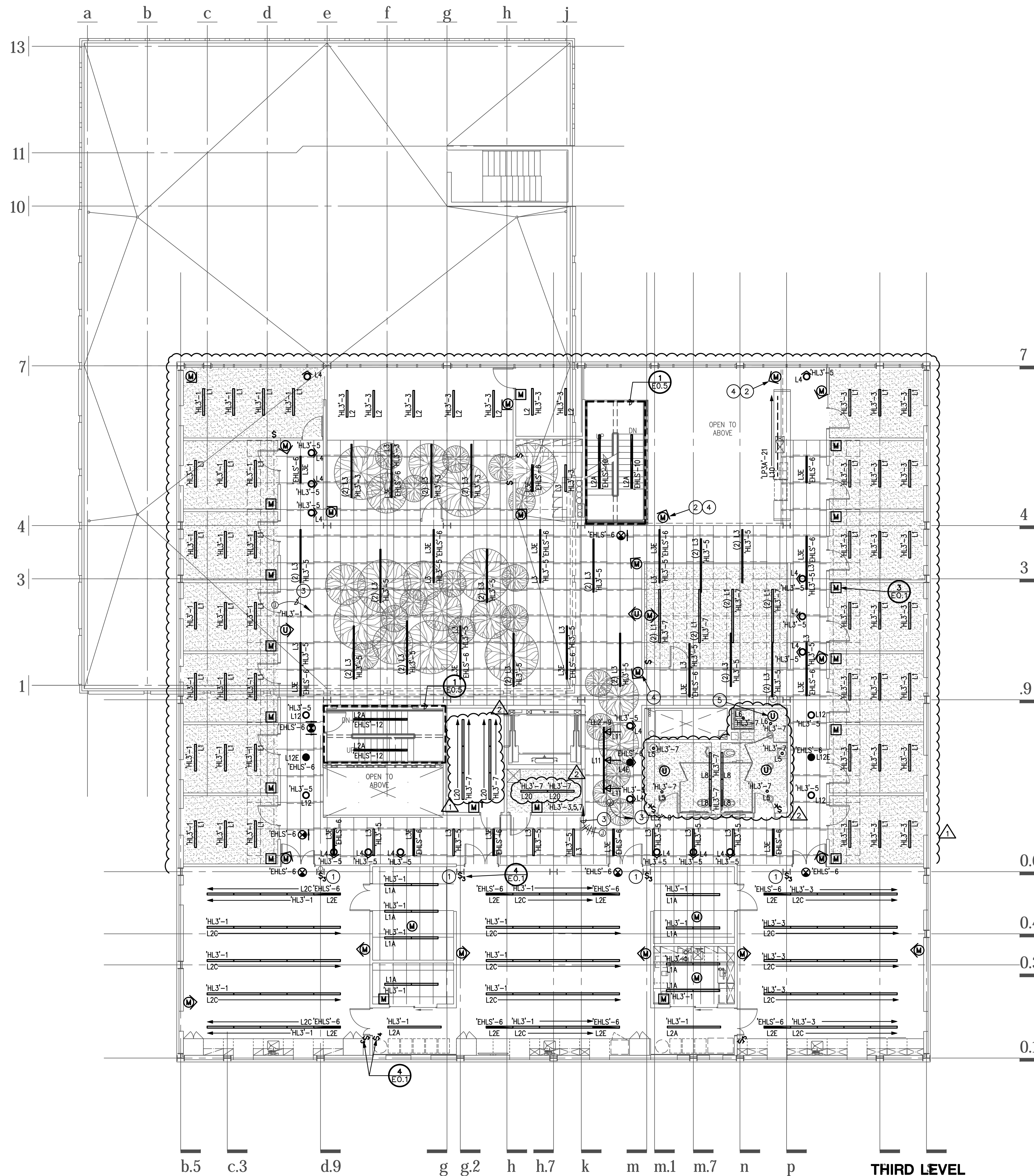


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 OWNER REVIEW  
 07/15/11  
**July 15, 2011**  
**Construction Documents**  
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 U.A. # 08-8826

**LABORATORY OF TREE-RING RESEARCH  
 BRYANT BANNISTER TREE-RING BUILDING**  
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**KEYPLAN**





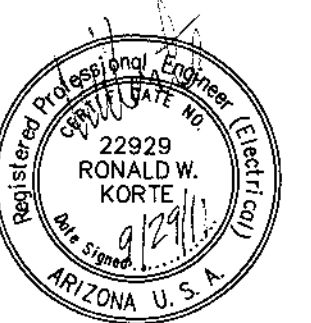
**THIRD LEVEL ELECTRICAL LIGHTING PLAN**  
SCALE: 1/8" = 1'-0"

**SHEET NOTES**

1. AREA ABOVE OFFICES IS OPEN TO VIEW. ALL CONDUITS SHALL BE INSTALLED FLAT ABOVE OFFICE CEILING DECK OR IN DECK. COORDINATE ALL ROUTING WITH ARCHITECT PRIOR TO ROUGH-IN.
2. ALL CONDUIT ABOVE OPEN AREAS SHALL BE INSTALLED AS HIGH AS POSSIBLE. RUNS BACK TO PANELS SHALL BE GROUPED AND RUN TOGETHER. CONDUITS, J-BOXES, SUPPORTS, ETC. SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGH-IN.
3. ALL CONDUIT, J-BOXES, SUPPORTS, ETC. ABOVE CEILINGS SHALL BE PAINTED. COORDINATE WITH GENERAL CONTRACTOR TO ENSURE ALL CONDUITS ARE PAINTED. NO EXCEPTIONS EXCEPT FIRE ALARM CONDUIT.

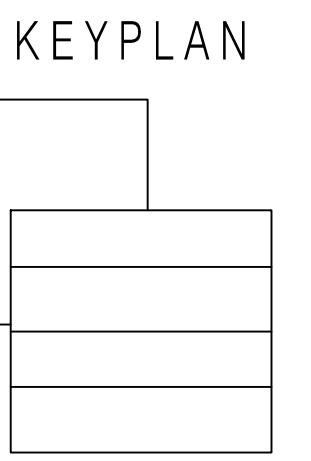
**KEYED NOTES**

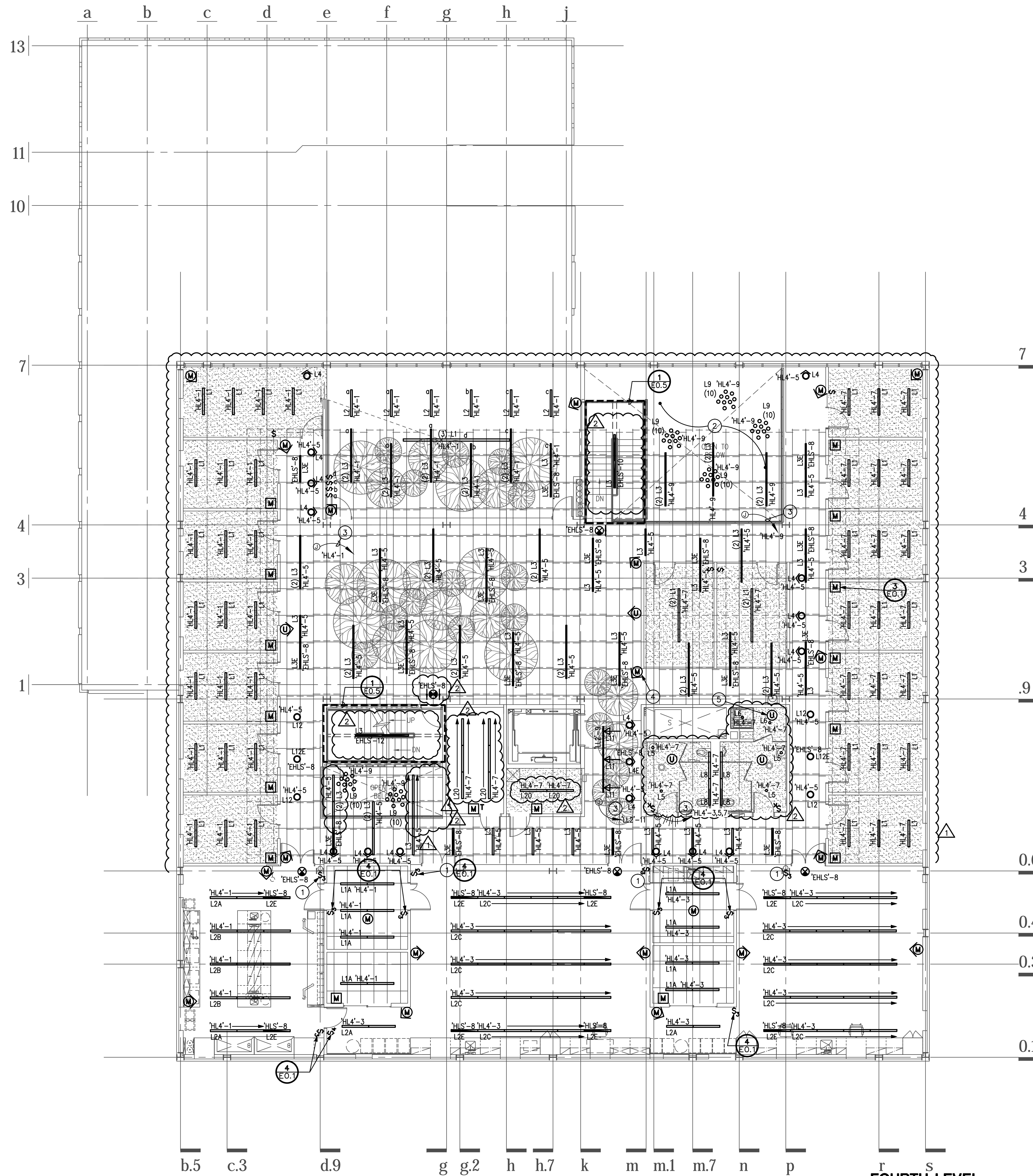
1. SEE ARCHITECTURAL DRAWINGS FOR MOUNTING DETAIL. TYPICAL OF ALL ELECTRICAL DEVICES MOUNTED TO AN EXPOSED BEAM.
2. CONTRACTOR SHALL INSTALL OCCUPANCY SENSOR ON EDGE OF FOURTH LEVEL FLOOR STRUCTURE. COORDINATE MOUNTING WITH ARCHITECT. OCCUPANCY SENSORS SHALL CONTROL THIRD AND FOURTH FLOOR LIGHTING THIS AREA.
3. PROVIDE HOMERUN TO LIGHTING BRANCH CIRCUIT(S) AS SHOWN. EXTEND WIRING TO INDIVIDUAL LUMINAIRES PER BRANCH CIRCUIT IDENTIFICATION ADJACENT TO EACH LUMINAIRE. CONTRACTOR SHALL DETERMINE MOST ECONOMICAL ROUTING IN FIELD.
4. PROVIDE (2) INDIVIDUAL POWER PACKS TO THIS SENSOR TO ALLOW FOR CONTROL OF 277V AND 120V LUMINAIRES.
5. PROVIDE A UL DAMP LOCATION LISTED SENSOR SIMILAR TO CB-100.



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LABORATORY OF TREE-RING RESEARCH  
**BRYANT BANNISTER TREE-RING BUILDING**  
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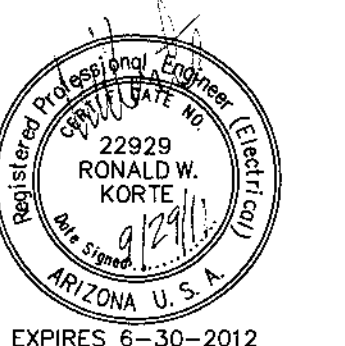
**FOURTH LEVEL ELECTRICAL LIGHTING PLAN**  
SCALE: 1/8" = 1'-0"

**SHEET NOTES**

1. AREA ABOVE OFFICES IS OPEN TO VIEW. ALL CONDUITS SHALL BE INSTALLED FLAT ABOVE OFFICE CEILING DECK OR IN DECK. COORDINATE ALL ROUTING WITH ARCHITECT PRIOR TO ROUGH-IN.
2. ALL CONDUIT ABOVE OPEN AREAS SHALL BE INSTALLED AS HIGH AS POSSIBLE. RUNS BACK TO PANELS SHALL BE GROUPED AND RUN TOGETHER. CONDUITS, J-BOXES, SUPPORTS, ETC. SHALL BE COORDINATED WITH ARCHITECT PRIOR TO ROUGH-IN.
3. ALL CONDUIT, J-BOXES, SUPPORTS, ETC. ABOVE CEILINGS SHALL BE PAINTED. COORDINATE WITH GENERAL CONTRACTOR TO ENSURE ALL CONDUITS ARE PAINTED. NO EXCEPTIONS EXCEPT FIRE ALARM CONDUIT.

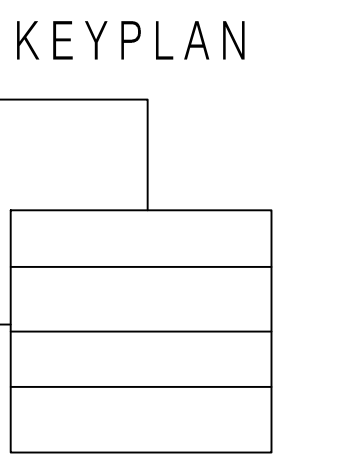
**KEYED NOTES**

- ① SEE ARCHITECTURAL DRAWINGS FOR MOUNTING DETAIL. TYPICAL OF ALL ELECTRICAL DEVICES MOUNTED TO AN EXPOSED BEAM.
- ② THIS AREA LIGHTING SHALL BE CONTROLLED BY OCCUPANCY SENSORS ON LEVEL BELOW. REFER TO THIRD FLOOR LIGHTING PLAN.
- ③ PROVIDE HOMERUN TO LIGHTING BRANCH CIRCUIT(S) AS SHOWN. EXTEND WIRING TO INDIVIDUAL LUMINAIRES PER BRANCH CIRCUIT IDENTIFICATION ADJACENT TO EACH LUMINAIRE. CONTRACTOR SHALL DETERMINE MOST ECONOMICAL ROUTING IN FIELD.
- ④ PROVIDE (2) INDIVIDUAL POWER PACKS TO THIS SENSOR TO ALLOW FOR CONTROL OF 277V AND 120V LUMINAIRES.
- ⑤ PROVIDE A UL DAMP LOCATION LISTED SENSOR SIMILAR TO CB-100.



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**esd** ENERGY SYSTEMS DESIGN  
7135 East Camelback Road  
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P: 480.481.4900  
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PROJECT #  
081093.100  
DESIGN CONTACT  
RON KORTE

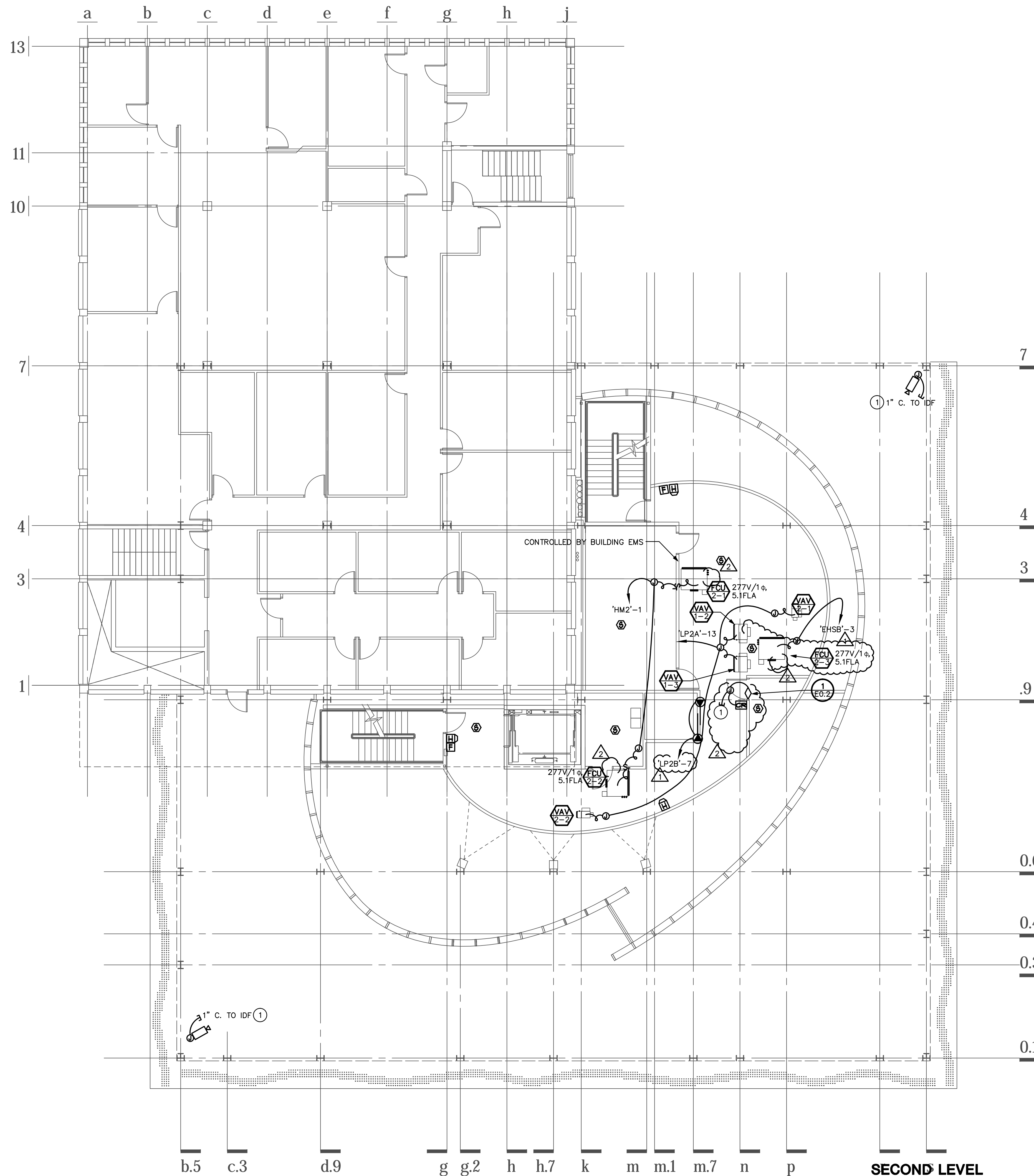
FOURTH FLOOR LIGHTING PLAN  
**E3.4**  
AS NOTED



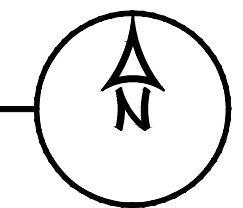
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PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 11:41am



**SECOND LEVEL  
ELECTRICAL HVAC AND SPECIAL SYSTEMS PLAN**  
SCALE: 1/8" = 1'-0"



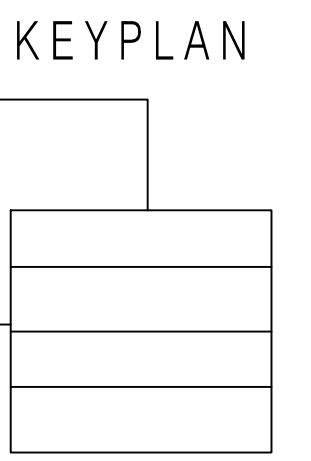
**KEYED NOTES**

- ① INSTALL 1" C. TO SECURITY CONTROLLER. VERIFY NEAREST LOCATION WITH SECURITY CONTRACTOR.



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LABORATORY OF TREE-RING RESEARCH  
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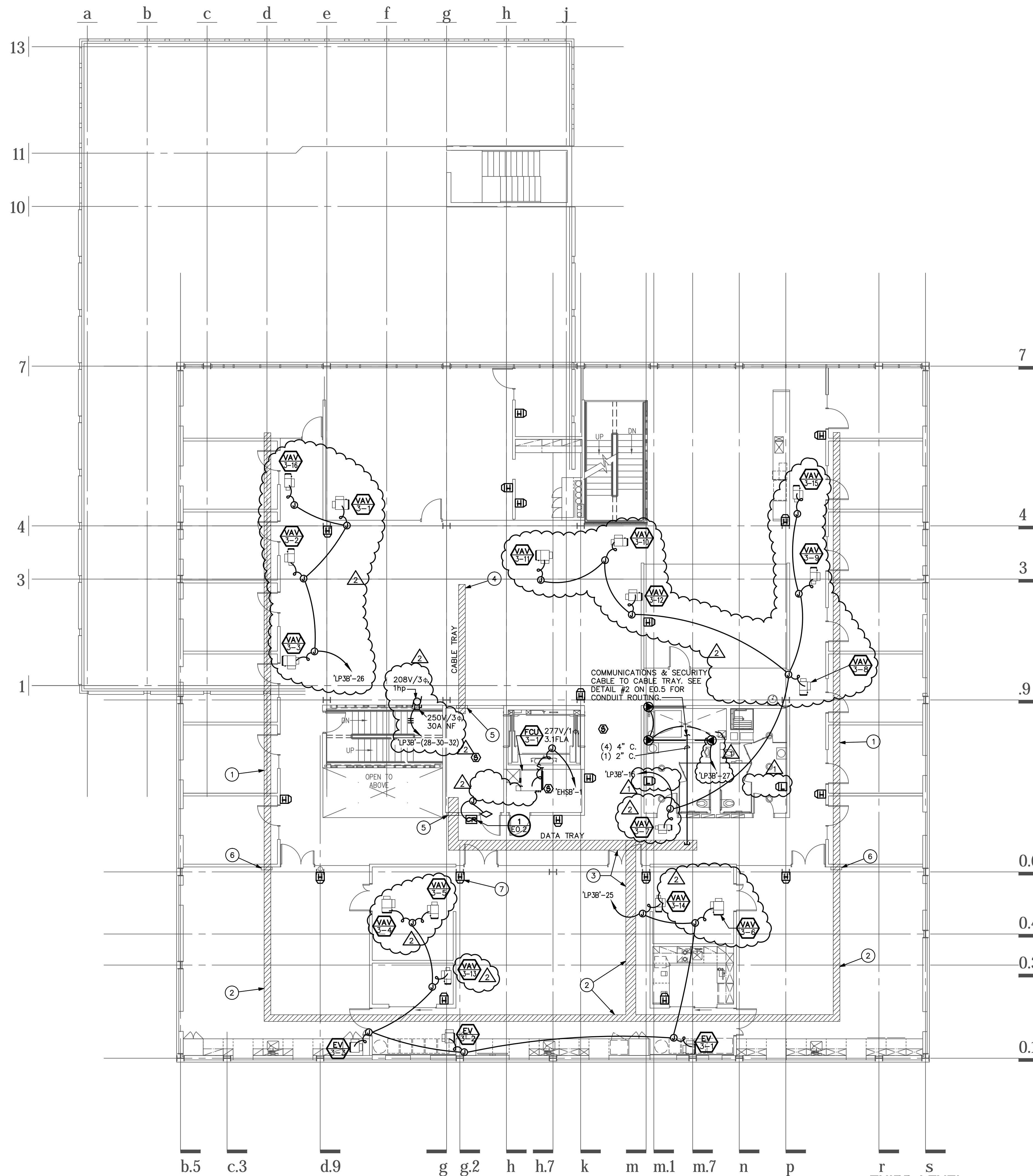
**ENERGY SYSTEMS DESIGN**  
 7135 East Camelback Road  
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 DESIGN CONTACT  
 RON KORTE

SECOND LEVEL  
 HVAC & FA PLAN  
**E4.2**  
 AS NOTED

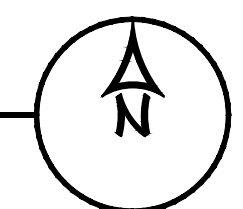
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PLOTTED BY: Anthony Miranda

PLOTTED: 10/11/2011 - 8:03am



**THIRD LEVEL  
ELECTRICAL HVAC AND FIRE ALARM PLAN**  
SCALE: 1/8" = 1'-0"

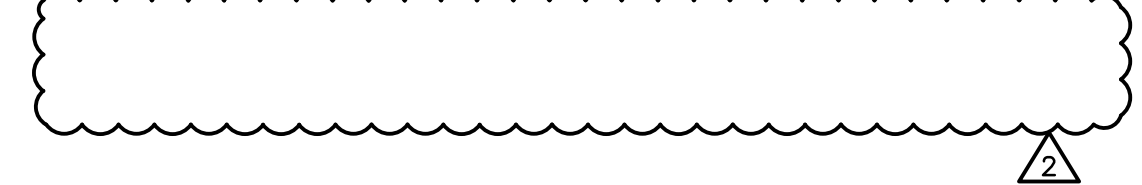


**SHEET NOTES**

1. CENTER HUNG SUPPORTS ARE NOT ALLOWED.
2. CABLE TRAY T'S AND 90° SHALL HAVE WIDE RADIUS JUNCTIONS.
3. PROVIDE 12" MINIMUM HEADROOM ABOVE ALL TRAY RUNS.

**KEYED NOTES**

1. PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 12"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5' O.C. TRAY SHALL BE INSTALLED ABOVE HARD CEILING IN OFFICES AND ACCESSIBLE FROM CORRIDOR. COORDINATE HEIGHT WITH ARCHITECT (AS LOW AS POSSIBLE ON CEILING FRAMING) AND AVOID MECHANICAL SYSTEM INTERFERENCES.
2. PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 12"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5' O.C. CABLE TRAY SHALL BE RUN EXPOSED IN LABS. COORDINATE HEIGHT WITH ARCHITECT AND AVOID CONFLICTS WITH MECHANICAL SYSTEMS.
3. PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 18"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5' O.C. TRAY SHALL BE INSTALLED ABOVE ACCESSIBLE CEILING. COORDINATE HEIGHT WITH ARCHITECT AND AVOID CONFLICTS WITH MECHANICAL SYSTEMS. COORDINATE ROUTING WITH PIPING AND CONDUIT SYSTEMS USING THE SAME SUPPORT SYSTEM. SEE DETAIL 3, EO.2.
4. PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 12"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5' O.C. TRAY SHALL BE INSTALLED ABOVE ACCESSIBLE CEILING. COORDINATE HEIGHT WITH ARCHITECT AND AVOID CONFLICTS WITH MECHANICAL SYSTEMS.
5. SEAL RATED WALL WITH UL APPROVED FIRE-STOPPING SYSTEM.
6. PROVIDE VERTICAL ELEVATION TRANSITION AT THIS LOCATION INSIDE OF LAB ROOM.
7. SEE ARCHITECTURAL DRAWINGS FOR MOUNTING DETAIL. TYPICAL OF ALL ELECTRICAL DEVICES MOUNTED TO AN EXPOSED BEAM.

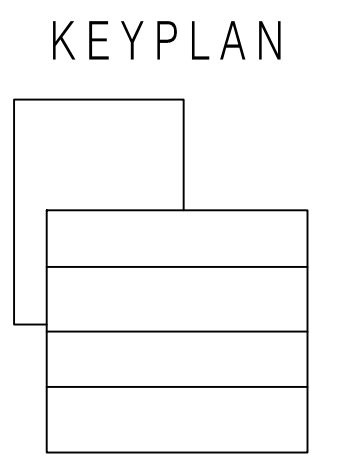


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**richard + bauer**  
1545 W. THOMAS ROAD  
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PHN 602.264.1955  
FAX 602.264.9234

Professional Engineer  
22929 RONALD W. KORTE  
Arizona U.S.A.  
EXPIRES 6-30-2012  
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**BRYANT BANNISTER TREE-RING BUILDING**  
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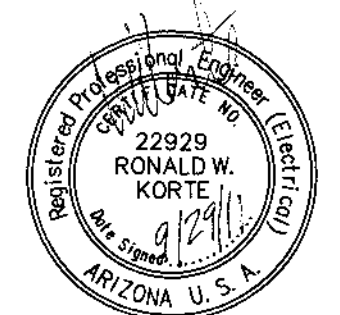


THIRD LEVEL  
HVAC & FA PLAN  
**E4.3**  
AS NOTED

FILE: J:\2008\081093 UofA Tree Ring Laboratory\081093\_100 U of A Tree Ring\UofA Comments Rev 02\E44REV02.dwg

PLOTTED BY: Anthony Miranda

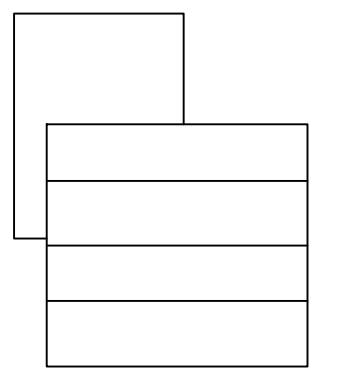
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KEYPLAN

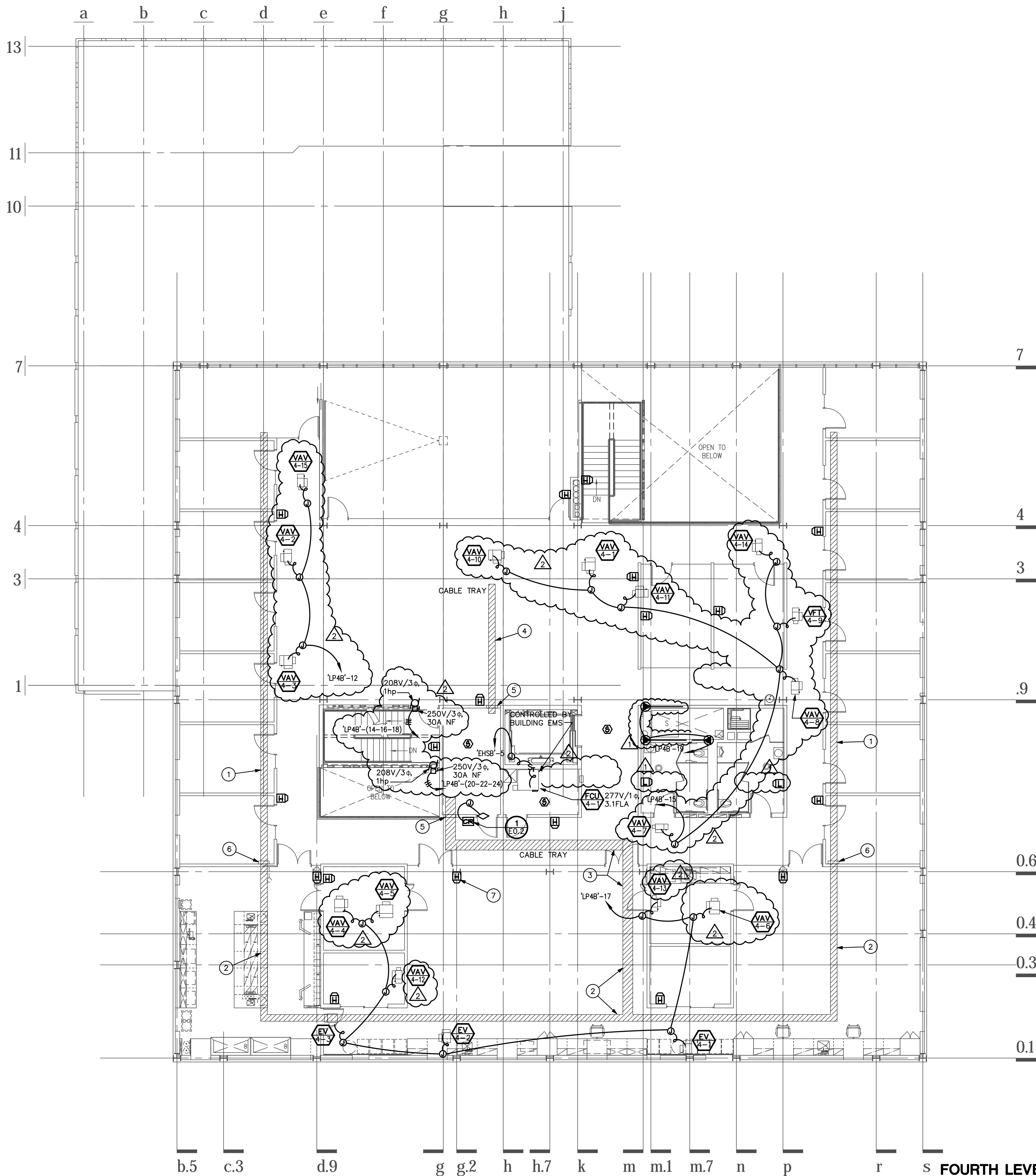


FOURTH LEVEL  
HVAC & FA PLAN



AS NOTED

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**7 SHEET NOTES**

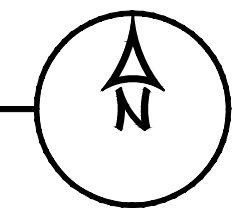
- 1. CENTER HUNG SUPPORTS ARE NOT ALLOWED.
- 2. CABLE TRAY T'S AND 90° SHALL HAVE WIDE RADIUS JUNCTIONS.
- 3. PROVIDE 12" MINIMUM HEADROOM ABOVE ALL TRAY RUNS.

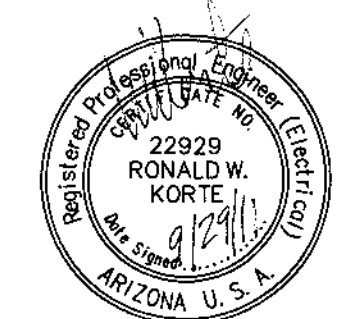
**KEYED NOTES**

- ① PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 12"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5'O.C. TRAY SHALL BE INSTALLED ABOVE HARD CEILINGS IN OFFICES AND ACCESSIBLE FROM CORRIDOR. COORDINATE HEIGHT WITH ARCHITECT (AS LOW AS POSSIBLE ON CEILING FRAMING) AND AVOID MECHANICAL SYSTEM INTERFERENCES.
- ② PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 12"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5'O.C. CABLE TRAY SHALL BE RUN EXPOSED IN LABS. COORDINATE HEIGHT WITH ARCHITECT AND AVOID CONFLICTS WITH MECHANICAL SYSTEMS. COORDINATE HEIGHT WITH ARCHITECT AND AVOID CONFLICTS WITH MECHANICAL SYSTEMS.
- ③ PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 18"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5'O.C. TRAY SHALL BE INSTALLED ABOVE ACCESSIBLE CEILING. COORDINATE HEIGHT WITH ARCHITECT AND AVOID CONFLICTS WITH MECHANICAL SYSTEMS.
- ④ PROVIDE WIRE BASKET CABLE TRAY EQUAL TO CABLOFIL EZTRAY OR GS METAL FLEXTRAY. PROVIDE 12"Wx4"H TRAY AND ALL CONNECTING HARDWARE WITH SUPPORTS MAXIMUM OF 5'O.C. TRAY SHALL BE INSTALLED ABOVE ACCESSIBLE CEILING. COORDINATE HEIGHT WITH ARCHITECT AND AVOID CONFLICTS WITH MECHANICAL SYSTEMS.
- ⑤ SEAL RATED WALL WITH UL APPROVED FIRE-STOPPING SYSTEM.
- ⑥ PROVIDE VERTICAL ELEVATION TRANSITION AT THIS LOCATION INSIDE OF LAB ROOM.
- ⑦ SEE ARCHITECTURAL DRAWINGS FOR MOUNTING DETAIL. TYPICAL OF ALL ELECTRICAL DEVICES MOUNTED TO AN EXPOSED BEAM.

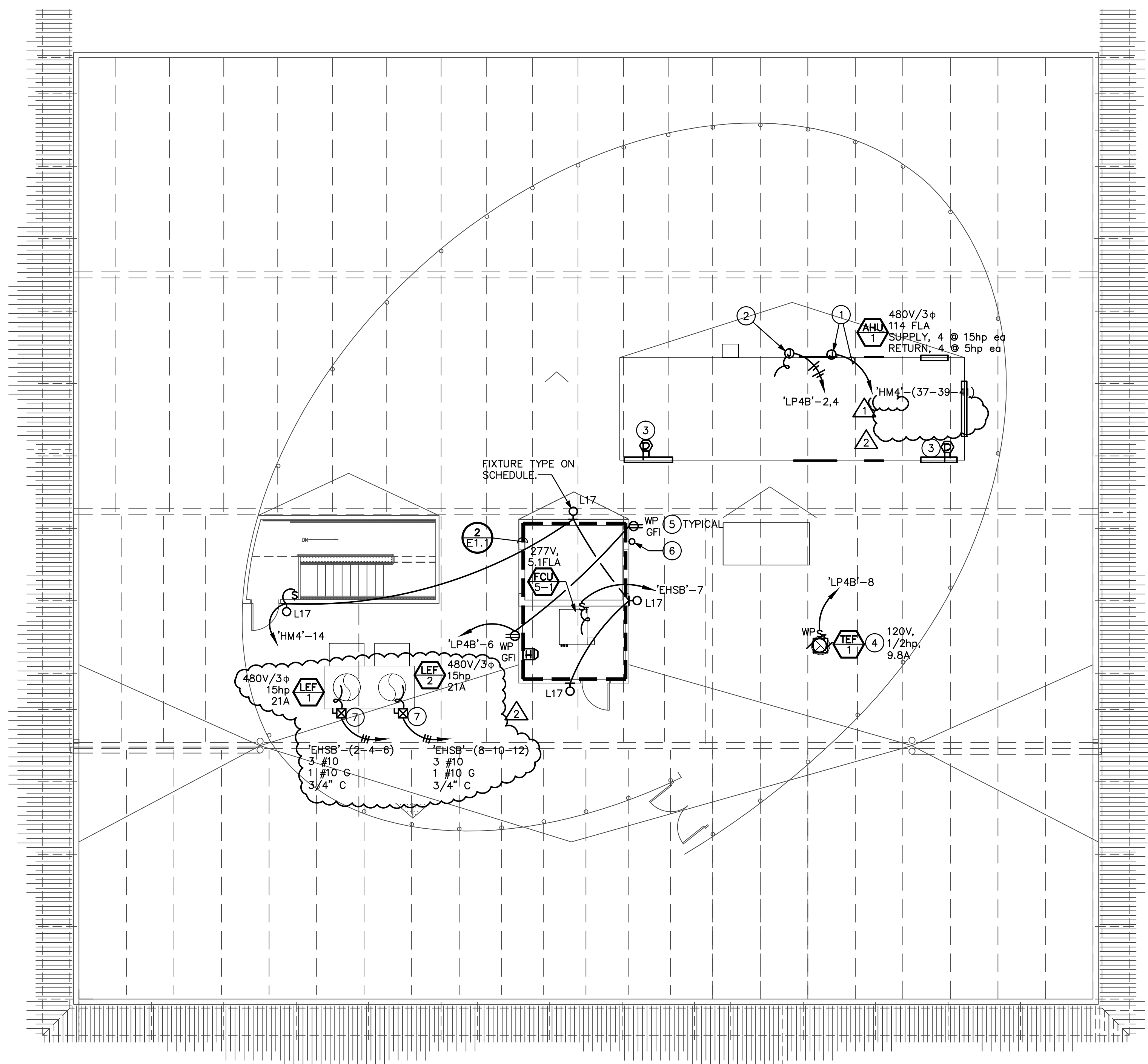
**FOURTH LEVEL  
ELECTRICAL HVAC AND FIRE ALARM PLAN**

SCALE: 1/8" = 1'-0"





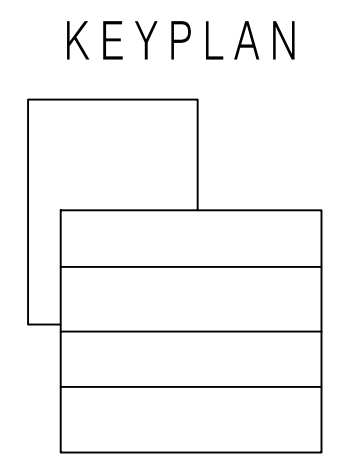
EXPIRES 6-30-2012  
 GMP-ADDENDUM 1  
 05/13/11  
 OWNER REVIEW  
 07/15/11  
**July 15, 2011**  
**Construction Documents**  
 r+b job # 0209  
 U.A. # 08-8826



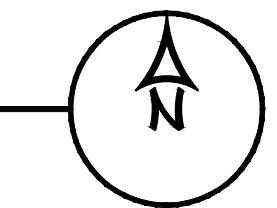
**KEYED NOTES**

- 1 AHU PROVIDED WITH INTEGRAL DISCONNECT AND VFD'S. PROVIDE (3) #2, 1 #6 GROUND IN 2" CONDUIT AND ALL POWER CONNECTIONS.
- 2 PROVIDE 20A, 120V CIRCUIT AND ALL CONNECTIONS FOR INTERNAL LIGHTING/CONVENIENCE RECEPTACLES. PROVIDE 120V CIRCUIT FOR USE BY CONTROLS CONTRACTOR FOR DAMPERS AND OTHER REQUIREMENTS.
- 3 SUPPLY AND RETURN SIDE DUCT DETECTORS PROVIDED AND WIRED BY FIRE ALARM CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. SEE FIRE ALARM RISER.
- 4 CONTROLS PROVIDED BY MECHANICAL CONTRACTOR THROUGH BMS. PROVIDE ALL 120V POWER CONNECTIONS. COORDINATE POWER THROUGH CONTROLLER WITH MECHANICAL CONTRACTOR.
- 5 PROVIDE WEATHERPROOF WHILE-IN-USE COVER.
- 6 2" C. FROM MAIN ELECTRIC ROOM FOR FUTURE PHOTOVOLTAIC SYSTEM. SEE KEYED NOTE Z, DETAILS, SHEET E11.
- 7 FANS ARE REDUNDANT. NEMA 3R COMBINATION STARTER/DISCONNECT FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR. PROVIDE POWER CONNECTIONS.

**LABORATORY OF TREE-RING RESEARCH**  
**BRYANT BANNISTER TREE-RING BUILDING**  
 The University of Arizona - Tucson, Arizona



**ROOF LEVEL**  
**ELECTRICAL HVAC AND FIRE ALARM PLAN**  
 SCALE: 1/8" = 1'-0"

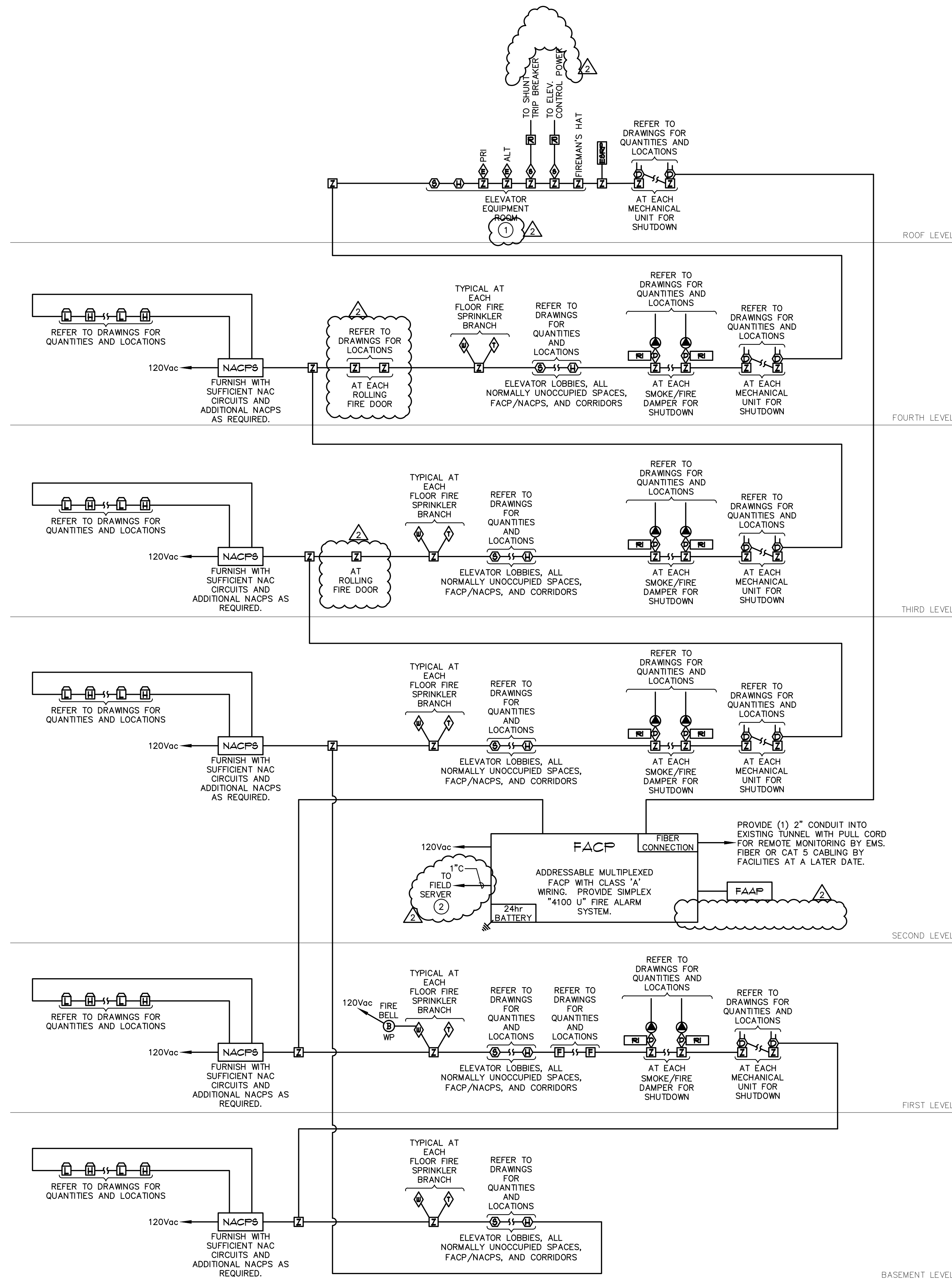


**esd** ENERGY SYSTEMS DESIGN  
 7135 East Camelback Road  
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 PROJECT #  
 081093.100  
 DESIGN CONTACT  
 RON KORTE

ROOF LEVEL  
 HVAC & FA PLAN  
**E4.5**  
 AS NOTED







DESCRIPTION	JACKET COLOR	
	POSITIVE (+)	NEGATIVE (-)
SMOKE DETECTOR & DUCT DETECTORS	RED	BLACK
PULL STATIONS	BLUE	ORANGE
HEAT DETECTORS	VIOLET	SLATE
FLOW SWITCHES	BROWN	YELLOW
TAMPER SWITCHES & PRE-ACTION	-	-
PRESSURE INDICATORS	PINK	WHITE
AUDIO/VIDEO (HORN/STROBE)	RED	BLACK
DOOR HOLDERS	BLUE	YELLOW
FAN SHUT DOWN	PINK	WHITE
PRE-ACTION SPRINKLER & EXIT SIGN INTERFACE	BROWN	ORANGE
CONSTANT 24 VDC (DROP ON RESET)	VIOLET	SLATE

**NOTES:**

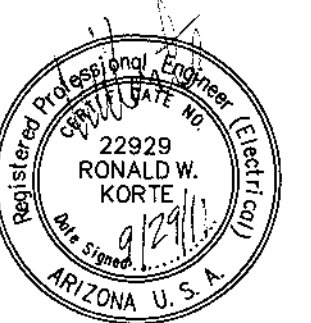
- INITIATING DEVICES WILL USE #18 AWG SOLID COPPER WIRE OR #18 AWG STRANDED COPPER WIRE WITH A MAXIMUM OF STRANDS.
- POWER DEVICES WILL USE #14 AWG STRANDED COPPER WIRE WITH A MAXIMUM OF 19 STRANDS.
- A ROUND WIRE WILL BE USED IN ALL CONDUITS, WIRE MOLD, FLEX, GUTTERS, AND ANY OTHER ELECTRICAL RACEWAYS. THE GROUND WIRE SHALL BE A GREEN #14 STRANDED COPPER WIRE WITH A MAXIMUM OF 19 STRANDS.

**KEYED NOTES**

- REFER TO FIRE ALARM SPECIFICATION 16720 FOR DETAILED ELEVATOR CONTROL AND MONITORING REQUIREMENTS. PROVIDE ALL DEVICES AND WIRING IN ACCORDANCE WITH 16720 AND ELEVATOR FIRE CONTROL DETAIL DIAGRAM D-1.
- PROVIDE WIRING FROM FACP TO FIELD SERVER. REFER TO BAS/FACP INTERFACE SCHEMATIC ON SPECIFICATION 16720, DIAGRAM D-2.

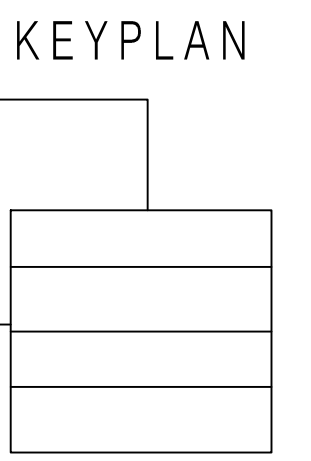
**FIRE ALARM RISER DIAGRAM**  
SCALE: NOT TO SCALE

1  
E.5.1



EXPIRES 6-30-2012  
GMP-ADDENDUM 1  
05/13/11  
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**July 15, 2011**  
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LABORATORY OF TREE-RING RESEARCH  
**BRYANT BANNISTER TREE-RING BUILDING**  
The University of Arizona - Tucson, Arizona



**PANELBOARD SYMBOL SCHEDULE**

- † INDICATES PROVIDE NEW 'LOCK-DOG' ON CIRCUIT BREAKER.
- INDICATES NEW LOAD ADDED TO EXISTING CIRCUIT BREAKER.
- INDICATES NEW LOAD AND NEW CIRCUIT BREAKER ADDED TO EXISTING BUSSED SPACE.
- INDICATES EXISTING LOAD REMOVED AND BREAKER TO BECOME SPARE.
- INDICATES EXISTING LOAD AND BREAKER REMOVED AND REPLACED WITH NEW BREAKER AND POSSIBLY NEW LOAD.
- △ INDICATES EXISTING LOAD & CIRCUIT BREAKER TO REMAIN - NO REVISION. EXISTING LOADS MAY HAVE BEEN ESTIMATED.
- ▲ CIRCUIT THRU LIGHTING CONTACTOR. SEE WIRING DIAGRAM(S).
- C INDICATES CONTINUOUS LOAD.
- N INDICATES NON-CONTINUOUS LOAD.
- SR INDICATES SPARE CIRCUIT BREAKER.
- BSP INDICATES BUSSED SPACE FOR FUTURE CIRCUIT BREAKER.
- M INDICATES MOTOR LOAD.
- R INDICATES GENERAL PURPOSE RECEPTACLE LOAD.

PHASE VOLTS	WIRE MAIN	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE
3	277/480V														
<b>NEW EHLs</b>															
AIC 14000															
200A BUS SURFACE															
NEMA 3R															
--		SPARE			20	1	0			2	20	1		LTG - 1ST LEVEL	C
--		SPARE			20	1	0			2	20	1		LTG - 2ND LEVEL	C
--		SPARE			20	1	0			4	20	1		LTG - 3RD LEVEL	C
--		SPARE			20	1	0			8	20	1		LTG - 4TH LEVEL	C
--		SPARE			20	1	0			10	20	1		LTG - NE STAIRWELL	C
--		SPARE			20	1	0			12	20	1		LTG - SW STAIRWELL	C
--		SPARE			20	1	0			14	20	1		SPARE	--
--		SPARE			20	1	0			16	20	1		SPARE	--
--		SPARE			20	1	0			18	20	1		SPARE	--
--		SPARE			20	1	0			20	20	1		SPARE	--
--		SPARE			20	1	0			22	20	1		SPARE	--
--		SPARE			20	1	0			24	20	1		SPARE	--
--		BUSSED SPACE			20	1	0			26				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			28				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			30				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			32				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			34				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			36				BUSSED SPACE	--
M		ELEVATOR, 50HP			200		37	18013		38		70		ELLS	XFMR
M					39		2224			39				ELLS	XFMR
M					39			18013		40				ELLS	XFMR
M					41			18013		42		3		ELLS	XFMR

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA				
		A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All	
CONTINUOUS	C	3.16	1.52	2.24	6.92	LOAD * 1.25	3.95	1.89	2.80	8.65				
MOTOR	M	18.01	18.01	18.01	54.04	LOAD * 100.00 * Unit 1 * 0.25	22.52	22.52	22.52	67.53				
NONCONTINUOUS	N	1.36	0.20	1.18	2.74	LOAD * 1.00	1.36	0.20	1.18	2.74				

TOTAL CODE LOAD: 78.93 KVA / (1.73 \* 480 V) = 94.94 AMPS

PHASE VOLTS	WIRE MAIN	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE
3	120/208V														
<b>NEW ELLS</b>															
AIC 10000															
100A BUS SURFACE															
NEMA 3R															
N		FACP			20	1	1000			2	20	1		EXTERIOR LIGHTING	C
N		FA BELL			15	1	164			4	20	1		BLUE LIGHT PHONE	N
--		SPARE			20	1	0			6	20	1		SPARE	--
--		SPARE			20	1	0			8	20	1		SPARE	--
--		SPARE			20	1	0			10	20	1		SPARE	--
--		SPARE			20	1	0			12	20	1		SPARE	--
--		BUSSED SPACE			20	1	0			14				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			16				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			18				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			20				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			22				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			24				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			26		60		ELEV	PNL
--		BUSSED SPACE			20	1	0			28				ELEV	PNL
--		BUSSED SPACE			20	1	0			30		3		ELEV	PNL

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA				
		A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All	
CONTINUOUS	C	1.16	0.57	0.00	1.73	LOAD * 1.25	1.46	0.71	0.00	2.17				
NONCONTINUOUS	N	1.36	0.20	1.18	2.74	LOAD * 1.00	1.36	0.20	1.18	2.74				

TOTAL CODE LOAD: 4.90 KVA / (1.73 \* 208 V) = 13.61 AMPS

PHASE VOLTS	WIRE MAIN	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE
3	120/208V														
<b>NEW ELE</b>															
AIC 10000															
60A BUS FLUSH															
NEMA 3R															
C		ELEVATOR CAB LIGHTING			20	1	1000			2	20	1		SPARE	--
C		ELEV RM RECEPT. LTG			20	3	370			4	20	1		SPARE	--
N		ELEVATOR PIT PUMP, SP-1			20	1	0			6	20	1		SPARE	--
N		ELEVATOR PIT RECEPT.			20	1	360			8	20	1		SPARE	--
--		BUSSED SPACE			20	1	0			10	20	1		SPARE	--
--		BUSSED SPACE			20	1	0			12	20	1		SPARE	--
--		BUSSED SPACE			20	1	0			14				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			16				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			18				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			20				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			22				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			24				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			26				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			28				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			30				BUSSED SPACE	--

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA				
		A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All	
CONTINUOUS	C	1.00	0.57	0.00	1.57	LOAD * 1.25	1.25	0.71	0.00	1.96				
NONCONTINUOUS	N	0.36	0.00	1.18	1.54	LOAD * 1.00	0.36	0.00	1.18	1.54				

TOTAL CODE LOAD: 3.50 KVA / (1.73 \* 208 V) = 9.71 AMPS

PHASE VOLTS	WIRE MAIN	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE
3	277/480V														
<b>NEW EHSB</b>															
AIC 14000															
100A BUS SURFACE															
NEMA 3R															
N		FCU 3-1, 3.1FLA			20	1	832			2	20	1		LEF-1, 21A, ON ROOF	M
N		FCU 2-3, 3.1FLA			20	1	1413			4	20	1		LEF-1, 21A, ON ROOF	M
N		FCU 4-1, 3.1FLA			20	1	832			6	20	1		LEF-1, 21A, ON ROOF	M
N		FCU 5-1, 3.1FLA			20	1	1413			8	20	1		LEF-2, 21A, ON ROOF	M
--		SPARE			20	1	0			10	20	1		SPARE	--
--		SPARE			20	1	0			12	20	1		SPARE	--
--		SPARE			20	1	0			14				BUSSED SPACE	--
--		SPARE			20	1	0			16				BUSSED SPACE	--
--		SPARE			20	1	0			18				BUSSED SPACE	--
--		SPARE			20	1	0			20				BUSSED SPACE	--
--		SPARE			20	1	0			22				BUSSED SPACE	--
--		SPARE			20	1	0			24				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			26				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			28				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			30				BUSSED SPACE	--
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--		BUSSED SPACE			20	1	0			34				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			36				BUSSED SPACE	--
--		BUSSED SPACE			20	1	0			38		70		ELSB	XFMR
--		BUSSED SPACE			20	1	0			40				ELSB	XFMR
--		BUSSED SPACE			20	1	0			42		3		ELSB	XFMR

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA				
		A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All	
MOTOR	M	5.82	5.82	5.82	17.46	LOAD * 100.00 * Unit 1 * 0.25	7.28	7.28	7.28	21.83				
RECEPTACLE	R	0.54	0.18	0.00	0.72	0-10000 * 1.00, 10001	0.54	0.18	0.00					

**PANELBOARD SYMBOL SCHEDULE**

- † INDICATES PROVIDE NEW 'LOCK-DOG' ON CIRCUIT BREAKER.
- INDICATES NEW LOAD ADDED TO EXISTING CIRCUIT BREAKER.
- INDICATES NEW LOAD AND NEW CIRCUIT BREAKER ADDED TO EXISTING BUSSED SPACE.
- INDICATES EXISTING LOAD REMOVED AND BREAKER TO BECOME SPARE.
- INDICATES EXISTING LOAD AND BREAKER REMOVED AND REPLACED WITH NEW BREAKER AND POSSIBLY NEW LOAD.
- △ INDICATES EXISTING LOAD & CIRCUIT BREAKER TO REMAIN - NO REVISION. EXISTING LOADS MAY HAVE BEEN ESTIMATED.
- ▲ CIRCUIT THRU LIGHTING CONTACTOR. SEE WIRING DIAGRAM(S).
- N INDICATES CONTINUOUS LOAD.
- C INDICATES NON-CONTINUOUS LOAD.
- SR INDICATES SPARE CIRCUIT BREAKER.
- BSP INDICATES BUSSED SPACE FOR FUTURE CIRCUIT BREAKER.
- M INDICATES MOTOR LOAD.
- R INDICATES GENERAL PURPOSE RECEPTACLE LOAD.

NEW HL2															
PHASE	3			AIC 14000										160A BUS FLUSH	
VOLTS	277/480V													FEED THROUGH LUGS	
WIRE	4													NEMA 3R	
MAIN	LUGS ONLY														
TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE	
C	LTG - EXHIBIT 101, GENERAL	20	1	1	1272				2	30	1		LTG - 2ND FLOOR.	C	
C	LTG - EXHIBIT 101, DISPLAY	20	1	3	912				4	30	1		SPARE	--	
--	SPARE	20	1	5	0				6	30	1		SPARE	--	
--	SPARE	20	1	7	0				8	30	1		SPARE	--	
--	SPARE	20	1	9	0				10	30	1		SPARE	--	
--	SPARE	20	1	11	0				12	30	1		SPARE	--	
--	SPARE	20	1	13	0				14	30	1		SPARE	--	
--	SPARE	20	1	15	0				16	30	1		SPARE	--	
--	SPARE	20	1	17	0				18	30	1		SPARE	--	
--	SPARE	20	1	19	0				20	30	1		SPARE	--	
--	SPARE	20	1	21	0				22	30	1		SPARE	--	
--	SPARE	20	1	23	0				24	30	1		SPARE	--	
--	SPARE	20	1	25	0				26	30	1		SPARE	--	
--	SPARE	20	1	27	0				28	30	1		SPARE	--	
--	SPARE	20	1	29	0				30	30	1		SPARE	--	
--	FEED THRU SHOWN FOR			31	0				32	150			HL3	PNL	
--	LOAD CALCULATION			33	0				34				HL3	PNL	
--	PURPOSES ONLY			35	0				36		3		HL3	PNL	

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA			
CONTINUOUS	C	A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All
		9.99	8.26	8.97	27.01	LOAD * 1.25	12.48	10.32	10.96	33.76			

TOTAL CODE LOAD: 33.76 KVA / (1.73 \* 480 V) = 40.61 AMPS

NEW HL3															
PHASE	3			AIC 14000										160A BUS FLUSH	
VOLTS	277/480V													FEED THROUGH LUGS	
WIRE	4													160A MAIN CB	
MAIN															
TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE	
C	LTG - E. OFFICES, S.E. LABS	20	1	1	3043				2	30	1		SPARE	--	
C	LTG - W. & N. OFFICES, S.W. LAB	20	1	3	2345				4	30	1		SPARE	--	
C	LTG - CORRIDORS, OPEN AREA	20	1	5	0				6	30	1		SPARE	--	
C	LTG - COMP LAB, RR, TELE, JAN	20	1	7	430				8	30	1		SPARE	--	
--	SPARE	20	1	9	0				10	30	1		SPARE	--	
--	SPARE	20	1	11	0				12	30	1		SPARE	--	
--	SPARE	20	1	13	0				14	30	1		SPARE	--	
--	SPARE	20	1	15	0				16	30	1		SPARE	--	
--	SPARE	20	1	17	0				18	30	1		SPARE	--	
--	SPARE	20	1	19	0				20	30	1		SPARE	--	
--	SPARE	20	1	21	0				22	30	1		SPARE	--	
--	SPARE	20	1	23	0				24	30	1		SPARE	--	
--	SPARE	20	1	25	0				26	30	1		SPARE	--	
--	SPARE	20	1	27	0				28	30	1		SPARE	--	
--	SPARE	20	1	29	0				30	30	1		SPARE	--	
--	FEED THRU SHOWN FOR			31	0				32	150			HL4	PNL	
--	LOAD CALCULATION			33	0				34				HL4	PNL	
--	PURPOSES ONLY			35	0				36		3		HL4	PNL	

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA			
CONTINUOUS	C	A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All
		7.30	8.01	7.90	23.40	LOAD * 1.25	9.38	10.01	9.87	29.25			

TOTAL CODE LOAD: 29.25 KVA / (1.73 \* 480 V) = 35.19 AMPS

NEW HL4															
PHASE	3			AIC 14000										160A BUS FLUSH	
VOLTS	277/480V													160A MAIN CB	
WIRE	4														
MAIN															
TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE	
C	LTG - W. OFFICES, S.W. LAB, LIB.	20	1	1	2623				2	30	1		SPARE	--	
C	LTG - S.E. LABS	20	1	3	2240				4	30	1		SPARE	--	
C	LTG - CORRIDORS, OPEN AREA	20	1	5	0				6	30	1		SPARE	--	
C	LTG - CORE, RR, E. OFFICES	20	1	7	1212				8	30	1		SPARE	--	
C	LTG - PENDANTS OPEN TO BELOW	20	1	9	3420				10	30	1		SPARE	--	
--	SPARE	20	1	11	0				12	30	1		SPARE	--	
--	SPARE	20	1	13	0				14	30	1		SPARE	--	
--	SPARE	20	1	15	0				16	30	1		SPARE	--	
--	SPARE	20	1	17	0				18	30	1		SPARE	--	
--	SPARE	20	1	19	0				20	30	1		SPARE	--	
--	SPARE	20	1	21	0				22	30	1		SPARE	--	
--	SPARE	20	1	23	0				24	30	1		SPARE	--	
--	SPARE	20	1	25	0				26	30	1		SPARE	--	
--	SPARE	20	1	27	0				28	30	1		SPARE	--	
--	SPARE	20	1	29	0				30	30	1		SPARE	--	

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA			
CONTINUOUS	C	A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All
		3.84	5.66	3.95	13.45	LOAD * 1.25	4.80	7.08	4.94	16.81			

TOTAL CODE LOAD: 16.81 KVA / (1.73 \* 480 V) = 20.22 AMPS

<http://www.panelschedule.com>

NEW HM2															
PHASE	3			AIC 14000										250A BUS FLUSH	
VOLTS	277/480V													FEED THROUGH LUGS	
WIRE	4													NEMA 3R	
MAIN	LUGS ONLY														
TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE	
M	FCU 2-1, 2-2, 10, 2FLA TOTAL	20	1	1	2825				2	30	1		SPARE	--	
--	SPARE	20	1	3	0				4	30	1		SPARE	--	
--	SPARE	20	1	5	0				6	30	1		SPARE	--	
--	SPARE	20	1	7	0				8	30	1		SPARE	--	
--	SPARE	20	1	9	0				10	30	1		SPARE	--	
--	SPARE	20	1	11	0				12	30	1		SPARE	--	
--	SPARE	20	1	13	0				14	30	1		SPARE	--	
--	SPARE	20	1	15	0				16	30	1		SPARE	--	
--	SPARE	20	1	17	0				18	30	1		SPARE	--	
--	SPARE	20	1	19	0				20	30	1		SPARE	--	
--	SPARE	20	1	21	0				22	30	1		SPARE	--	
--	BUSSED SPACE			23	0				24				BUSSED SPACE	--	
--	BUSSED SPACE			25	0				26				BUSSED SPACE	--	
--	BUSSED SPACE			27	0				28				BUSSED SPACE	--	
--	BUSSED SPACE			29	0				30				BUSSED SPACE	--	
--	BUSSED SPACE			31	0				32				BUSSED SPACE	--	
--	BUSSED SPACE			33	0				34				BUSSED SPACE	--	
--	BUSSED SPACE			35	0				36				BUSSED SPACE	--	
--	BUSSED SPACE			37	0				38				BUSSED SPACE	--	
--	BUSSED SPACE			39	0				40				BUSSED SPACE	--	
--	BUSSED SPACE			41	0				42				BUSSED SPACE	--	
--	UNUSABLE SPACE FOR FEED THRU			43	0				44	250			HM2	PNL	
--	UNUSABLE SPACE FOR FEED THRU			45	0				46				HM2	PNL	
--	UNUSABLE SPACE FOR FEED THRU			47	0				48		3		HM2	PNL	

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA			
CONTINUOUS	C	A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All
		0.38	0.00	0.00	0.38	LOAD * 1.25	0.47	0.00	0.00	0.47			
MOTOR	M	34.42	31.59	31.59	97.60	LOAD * 100.00 + Unm1 * 0.25	42.52	39.49	39.49	121.50			

TOTAL CODE LOAD: 121.77 KVA / (1.73 \* 480 V) = 146.46 AMPS

NEW HM3															
PHASE	3			AIC 14000										250A BUS FLUSH	
VOLTS	277/480V													FEED THROUGH LUGS	
WIRE	4													250A MAIN CB	
MAIN															
TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	A PH	B PH	C PH	CKT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE	
--	SPARE	20	1	1	0				2	30	1		SPARE	--	

**PANELBOARD SYMBOL SCHEDULE**

- ⊥ INDICATES PROVIDE NEW 'LOCK-DOG' ON CIRCUIT BREAKER.
- INDICATES NEW LOAD ADDED TO EXISTING CIRCUIT BREAKER.
- INDICATES NEW LOAD AND NEW CIRCUIT BREAKER ADDED TO EXISTING BUSSED SPACE.
- INDICATES EXISTING LOAD REMOVED AND BREAKER TO BECOME SPARE.
- INDICATES EXISTING LOAD AND BREAKER REMOVED AND REPLACED WITH NEW BREAKER AND POSSIBLY NEW LOAD.
- △ INDICATES EXISTING LOAD & CIRCUIT BREAKER TO REMAIN - NO REVISION. EXISTING LOADS MAY HAVE BEEN ESTIMATED.
- ▲ CIRCUIT THRU LIGHTING CONTACTOR. SEE WIRING DIAGRAM(S).
- C INDICATES CONTINUOUS LOAD.
- N INDICATES NON-CONTINUOUS LOAD.
- SR INDICATES SPARE CIRCUIT BREAKER.
- BSP INDICATES BUSSED SPACE FOR FUTURE CIRCUIT BREAKER.
- M INDICATES MOTOR LOAD.
- R INDICATES GENERAL PURPOSE RECEPTACLE LOAD.

FILE: J:\2008\081093 UofA Tree Ring Laboratory\081093\_00 U of A Tree Ring\UofA Comments Rev 02\E62\_3REV02.dwg

PLOTTED BY: Anthony Miranda

PLOTTED: 09.30.2011 - 12:02pm

2008 BUS FLUSH  
NEMA 3R

**NEW LL2**

PHASE 3  
VOLTS 120/208Y  
WIRE 4  
MAIN LUGS ONLY  
AIC 10000

TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	CONNECTED - KVA			C KT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE
						A PH	B PH	C PH						
C	LTG - EXHIBIT 101, GENERAL	20	1		1	1400			2	20	1		EXTERIOR LIGHTING	C
C	LTG - EXHIBIT 101, DISPLAY	20	1		3	200			4	20	1		SPARE	--
C	LTG - EXHIBIT 101, DISPLAY	20	1		5				6	20	1		SPARE	--
C	LTG - EXHIBIT 101, DISPLAY	20	1		7	300			8	20	1		SPARE	--
C	LTG - 3RD FLOOR 120V	20	1		9	0			10	20	1		SPARE	--
C	LTG - 4TH FLOOR 120V	20	1		11	0			12	20	1		SPARE	--
--	SPARE	20	1		13	0			14	20	1		SPARE	--
--	SPARE	20	1		15	0			16	20	1		SPARE	--
--	SPARE	20	1		17	0			18	20	1		SPARE	--
--	SPARE	20	1		19	0			20	20	1		SPARE	--
--	SPARE	20	1		21	0			22	20	1		SPARE	--
--	SPARE	20	1		23	0			24	20	1		SPARE	--
--	SPARE	20	1		25	0			26	20	1		SPARE	--
--	SPARE	20	1		27	0			28	20	1		SPARE	--
--	SPARE	20	1		29	0			30	20	1		SPARE	--

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION	CALCULATED - KVA			
		A PH	B PH	C PH	All		A PH	B PH	C PH	All
CONTINUOUS	C	2.30	1.55	0.85	4.70	LOAD * 1.25	2.88	1.94	1.06	5.88

TOTAL CODE LOAD: 5.88 KVA / (1.73 \* 208 V) = 16.31 AMP

224A BUS FLUSH  
NEMA 3R

**NEW LP2A**

PHASE 3  
VOLTS 120/208Y  
WIRE 4  
MAIN LUGS ONLY  
AIC 22000

TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	CONNECTED - KVA			C KT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE
						A PH	B PH	C PH						
R	REC - GEN USE, RMS201, 203	20	1		1	900			2	20	1		VAV 1-1, 1-4	N
R	REC - GEN USE, RMS200NE, 204	20	1		3	200			4	20	1		SPARE	--
R	REC - GEN USE, RMS200SW, 200, 202	20	1		5				6	20	1		FLOOR BOX, RM110	R
N	PROJECTOR	20	1		7	600			8	20	1		FLOOR BOX, RM110	R
N	PROJECTOR	20	1		9	360			10	20	1		FLOOR BOX, RM110	R
N	PROJECTOR	20	1		11				12	20	1		FLOOR BOX, RM110	R
N	PROJECTOR	20	1		13	450			14	20	1		FLOOR BOX, RM110	R
R	VAV 1-2, 1-3, 2-1, 2-2	20	1		15	360			16	20	1		FLOOR BOX, RM110	R
R	REC - GEN USE, RMS100, A, 101, 103, 104	20	1		17				18	20	1		FLOOR BOX, RM110	R
R	REC - GEN USE, 102A, 110A, 110A	20	1		19	720			20	20	1		REC - COUNTER, RM110A	R
R	REC - GEN USE, TV, RM110	20	1		21	180			22	20	1		REC - COUNTER, RM110A	R
N	PROJECTOR, RM110	20	1		23				24	20	1		TMB EQUIPMENT, RM201	N
R	FLOOR BOX, RM102	20	1		25	720			26	20	1		SPARE	--
R	FLOOR BOX, RM102	20	1		27	1664			28	20	1		TMB EQUIPMENT, RM201	N
R	FLOOR BOX, RM102	20	1		29				30	20	1		SPARE	--
R	FLOOR BOX, RM101	20	1		31	720			32	30	1		TMB EQUIPMENT, RM201	N
R	FLOOR BOX, RM101	20	1		33	2496			34	20	1		SPARE	--
R	FLOOR BOX, RM101	20	1		35				36	20	1		SPARE	--
R	FLOOR BOX, RM101	20	1		37	720			38	20	1		LEARNING MICRO SCOPES, RM110	N
R	FLOOR BOX, RM101	20	1		39				40	20	1		LEARNING MICRO SCOPES, RM110	N
R	FLOOR BOX, RM101	20	1		41				42	20	1		LEARNING MICRO SCOPES, RM110	N
--	UNUSABLE SPACE FOR FEED THRU				43	0			44				LP2B	PNL
--	UNUSABLE SPACE FOR FEED THRU				45	500			46				LP2B	PNL
--	UNUSABLE SPACE FOR FEED THRU				47				48				LP2B	PNL

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION	CALCULATED - KVA			
		A PH	B PH	C PH	All		A PH	B PH	C PH	All
MOTOR	M	0.40	0.00	0.00	0.40	LOAD * 100.00 * 1.25 * 0.25	0.50	0.00	0.00	0.50
RECEPTACLE	R	4.68	4.86	4.32	13.86	0.10000 * 1.00 10000 * 0.50	4.68	4.86	4.32	13.86
NONCONTINUOUS	N	6.18	6.28	5.45	17.91	LOAD * 1.00	6.18	6.28	5.45	17.91

TOTAL CODE LOAD: 30.34 KVA / (1.73 \* 208 V) = 84.21 AMP

224A BUS FLUSH  
NEMA 3R

**NEW LP2B**

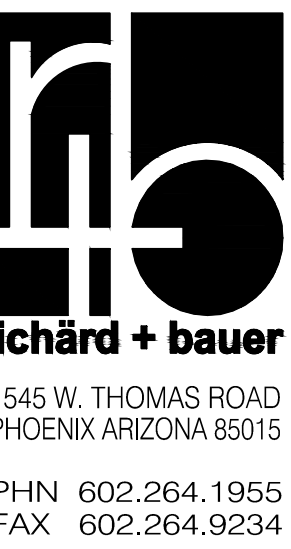
PHASE 3  
VOLTS 120/208Y  
WIRE 4  
MAIN LUGS ONLY  
AIC 22000

TYPE	DESCRIPTION	QTY	QTY TYP	BKR	CKT	CONNECTED - KVA			C KT	BKR	QTY TYP	QTY	DESCRIPTION	TYPE
						A PH	B PH	C PH						
N	SMOKE FIRE DAMPERS, 1ST FLR.	20	1		1	300			2	20	1		SPARE	--
N	AUTO DOOR OPENER, S, ENTRANCE	20	1		3				4	20	1		SPARE	--
N	AUTO DOOR OPENER, N, ENTRANCE	20	1		5				6	20	1		SPARE	--
N	SMOKE FIRE DAMPERS, 2ND FLR.	20	1		7	300			8	20	1		SPARE	--
--	SPARE	20	1		9	0			10	20	1		SPARE	--
--	SPARE	20	1		11	0			12	20	1		SPARE	--
--	SPARE	20	1		13	0			14	20	1		SPARE	--
--	SPARE	20	1		15	0			16	20	1		SPARE	--
--	SPARE	20	1		17	0			18	20	1		SPARE	--
--	SPARE	20	1		19	0			20	20	1		SPARE	--
--	SPARE	20	1		21	0			22	20	1		SPARE	--
--	SPARE	20	1		23	0			24	20	1		SPARE	--
--	BUSSED SPACE				25	0			26				BUSSED SPACE	--
--	BUSSED SPACE				27	0			28				BUSSED SPACE	--
--	BUSSED SPACE				29	0			30				BUSSED SPACE	--
--	BUSSED SPACE				31	0			32				BUSSED SPACE	--
--	BUSSED SPACE				33	0			34				BUSSED SPACE	--
--	BUSSED SPACE				35	0			36				BUSSED SPACE	--
--	BUSSED SPACE				37	0			38				BUSSED SPACE	--
--	BUSSED SPACE				39	0			40				BUSSED SPACE	--
--	BUSSED SPACE				41	0			42				BUSSED SPACE	--

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION	CALCULATED - KVA			
		A PH	B PH	C PH	All		A PH	B PH	C PH	All
NONCONTINUOUS	N	0.50	0.20	0.20	0.90	LOAD * 1.00	0.50	0.20	0.20	0.90

TOTAL CODE LOAD: 0.90 KVA / (1.73 \* 208 V) = 2.50 AMP

<http://www.panelschedule.com>



1545 W. THOMAS ROAD  
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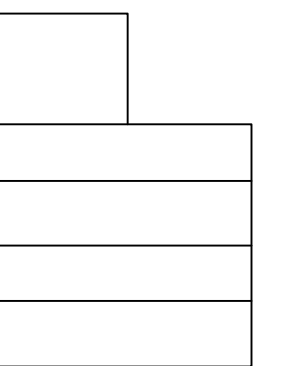


22929  
RONALD W. KORTE  
Professional Engineer  
Arizona U.S.A.  
EXPIRES 6-30-2012  
GMP - ADDENDUM 1  
05/13/11  
OWNER REVIEW  
07/15/11

July 15, 2011  
Construction Documents  
r+b job # 0209  
U.A. # 08-8826

LABORATORY OF TREE-RING RESEARCH  
**BRYANT BANNISTER TREE-RING BUILDING**  
The University of Arizona - Tucson, Arizona

KEYPLAN



**ENERGY SYSTEMS DESIGN**  
7135 East Camelback Road  
Suite 275  
Scottsdale AZ 85251

P: 480.481.4900  
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PROJECT #  
081093.1.00

DESIGN CONTACT  
RON KORTE

ELECTRICAL PANELS



NONE

**PANELBOARD SYMBOL SCHEDULE**

- † INDICATES PROVIDE NEW 'LOCK-DOG' ON CIRCUIT BREAKER.
- INDICATES NEW LOAD ADDED TO EXISTING CIRCUIT BREAKER.
- INDICATES NEW LOAD AND NEW CIRCUIT BREAKER ADDED TO EXISTING BUSSED SPACE.
- INDICATES EXISTING LOAD REMOVED AND BREAKER TO BECOME SPARE.
- INDICATES EXISTING LOAD AND BREAKER REMOVED AND REPLACED WITH NEW BREAKER AND POSSIBLY NEW LOAD.
- △ INDICATES EXISTING LOAD & CIRCUIT BREAKER TO REMAIN - NO REVISION. EXISTING LOADS MAY HAVE BEEN ESTIMATED.
- ▲ CIRCUIT THRU LIGHTING CONTACTOR. SEE WIRING DIAGRAM(S).
- C INDICATES CONTINUOUS LOAD.
- N INDICATES NON-CONTINUOUS LOAD.
- SR INDICATES SPARE CIRCUIT BREAKER.
- BSP INDICATES BUSSED SPACE FOR FUTURE CIRCUIT BREAKER.
- M INDICATES MOTOR LOAD.
- R INDICATES GENERAL PURPOSE RECEPTACLE LOAD.

**NEW LP3D**

PHASE 3  
VOLTS 120/208Y  
WIRE 4  
MAIN 100A MAIN CB

TYPE	DESCRIPTION	QTY	QTY TYP	CONNECTED - KVA					DEMAND CALCULATION					CALCULATED - KVA												
				A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All											
N	WORK STATION, COMP, RM309	20	1	720				2	20	1																
N	WORK STATION, RM309	20	1	360				4	20	1																
N	WORK STATION, COMP, RM309	20	1	360				6	20	1																
N	WORK STATION, COMP, RM309	20	1	360				8	20	1																
N	WORK STATION, RM309	20	1	360				10	20	1																
N	WORK STATION, COMP, RM309	20	1	360				12	20	1																
N	WORK STATION, RM309	20	1	360				14	20	1																
N	WORK STATION, RM309C	20	1	360				16	20	1																
N	WORK STATION, RM309C	20	1	360				18	20	1																
N	WORK STATION, RM309C	20	1	360				20	20	1																
N	WORK STATION, RM309C	20	1	360				22	20	1																
N	WORK STATION, RM309C	20	1	360				24	20	1																
N	WORK STATION, RM309C	20	1	360				26	20	1																
N	WORK STATION, RM309C	20	1	360				28	20	1																
N	WORK STATION, RM309C	20	1	360				30	20	1																

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA				
		A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All	
RECEPTACLE	R	0.36	0.00	0.00	0.36	0-10000*1.00, 10001	0.36	0.00	0.00	0.36				
NONCONTINUOUS	N	3.00	1.98	3.24	8.22	LOAD * 1.00	3.00	1.98	3.24	8.22				

TOTAL CODE LOAD: 8.58 KVA / (1.73 \* 208 V) = 23.82 AMP

**NEW LP3E**

PHASE 3  
VOLTS 120/208Y  
WIRE 4  
MAIN 100A MAIN CB

TYPE	DESCRIPTION	QTY	QTY TYP	CONNECTED - KVA					DEMAND CALCULATION					CALCULATED - KVA												
				A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All											
N	WIREMOLD, RM308	20	1	720				2	20	1																
N	SHOP-VAC, RM308B	20	1	360				4	20	1																
N	WIREMOLD, RM308B	20	1	360				6	20	1																
N	WIREMOLD, RM308B	20	1	360				8	20	1																
N	WIREMOLD, RM308B	20	1	360				10	20	1																
N	WIREMOLD, RM308B	20	1	360				12	20	1																
N	WIREMOLD, RM308B	20	1	360				14	20	1																
N	WIREMOLD, RM308B	20	1	360				16	20	1																
N	WIREMOLD, RM308B	20	1	360				18	20	1																
N	WIREMOLD, RM308B	20	1	360				20	20	1																
N	WIREMOLD, RM308B	20	1	360				22	20	1																
N	WIREMOLD, RM308B	20	1	360				24	20	1																
N	WIREMOLD, RM308B	20	1	360				26	20	1																
N	WIREMOLD, RM308B	20	1	360				28	20	1																
N	WIREMOLD, RM308B	20	1	360				30	20	1																

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA				
		A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All	
RECEPTACLE	R	1.44	1.80	0.90	4.14	LOAD * 1.00	1.44	1.80	0.90	4.14				
NONCONTINUOUS	N	1.44	1.80	0.90	4.14	LOAD * 1.00	1.44	1.80	0.90	4.14				

TOTAL CODE LOAD: 4.14 KVA / (1.73 \* 208 V) = 11.45 AMP

**NEW LP3F**

PHASE 3  
VOLTS 120/208Y  
WIRE 4  
MAIN 100A MAIN CB

TYPE	DESCRIPTION	QTY	QTY TYP	CONNECTED - KVA					DEMAND CALCULATION					CALCULATED - KVA												
				A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All											
N	WORK STATION, COMP, RM308	20	1	720				2	20	1																
N	WORK STATION, RM308	20	1	360				4	20	1																
N	WORK STATION, COMP, RM308	20	1	360				6	20	1																
N	WORK STATION, COMP, RM308	20	1	360				8	20	1																
N	WORK STATION, COMP, RM308	20	1	360				10	20	1																
N	WORK STATION, COMP, RM308	20	1	360				12	20	1																
N	WORK STATION, COMP, RM308	20	1	360				14	20	1																
N	WORK STATION, COMP, RM308	20	1	360				16	20	1																
N	WORK STATION, COMP, RM308	20	1	360				18	20	1																
N	WORK STATION, COMP, RM308	20	1	360				20	20	1																
N	WORK STATION, COMP, RM308	20	1	360				22	20	1																
N	WORK STATION, COMP, RM308	20	1	360				24	20	1																
N	WORK STATION, COMP, RM308	20	1	360				26	20	1																
N	WORK STATION, COMP, RM308	20	1	360				28	20	1																
N	WORK STATION, COMP, RM308	20	1	360				30	20	1																

LOAD TYPE NAME	TYPE	CONNECTED - KVA				DEMAND CALCULATION				CALCULATED - KVA				
		A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All	
RECEPTACLE	R	0.36	0.72	0.00	1.08	0-10000*1.00, 10001	0.36	0.72	0.00	1.08				
NONCONTINUOUS	N	2.52	1.44	1.44	5.40	LOAD * 1.00	2.52	1.44	1.44	5.40				

TOTAL CODE LOAD: 6.48 KVA / (1.73 \* 208 V) = 17.99 AMP

**NEW LP3A**

PHASE 3  
VOLTS 120/208Y  
WIRE 4  
MAIN 100A MAIN CB

TYPE	DESCRIPTION	QTY	QTY TYP	CONNECTED - KVA					DEMAND CALCULATION					CALCULATED - KVA												
				A PH	B PH	C PH	All	A PH	B PH	C PH	All	A PH	B PH	C PH	All											
R	REC-GEN USE, RM300B, 307	20	1	360				2	20	1																
R	REC-GEN USE, RM300B, 306	20	1	360				4	20	1																
R	REC-COMP, RM304, 305, 306	20	1	360				6	20	1																
R	REC-GEN USE, RM301, 304	20	1	360				8	20	1																
R	REC-GEN USE, RM302, 302	20	1	360				10	20	1																
R	REC-COMP, RM301, 302, 303	20	1	360				12	20	1																
R	REC-GEN USE, COFFERS	20	1	360				14	20	1																
R	REC-GEN USE, RM310, 311	20	1	360				16	20	1																
R	SYSTEMS FURN GEN USE, RM300A	20	1	360				18	20	1																

