

**SPECIFIC PLAN NOTES:**

1. EXISTING TRANSFORMER TO BE REMOVED, REMOVE EXISTING CONDUCTORS AND CAP CONDUITS BELOW GRADE.
2. PROVIDE NEW CONDUIT TO NEW SERVER ROOM. SEE PLAN NOTE #7 SHEET E-3.1.
3. EXISTING PARKING LOT LIGHTING TO REMAIN CONNECTED TO EXISTING SWITCHBOARD AND TIME CLOCK MOUNTED TO SIDE OF BOARD.
4. EXISTING UNDERGROUND FEEDERS TO MODULAR "C" TO REMAIN. SEE SINGLE LINE DIAGRAM.

**SITE PLAN GENERAL NOTES:**

1. CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING ON THIS SITE TO AVOID EXISTING DUCTS, PIPING OR CONDUITS, ETC., AND TO PREVENT HAZARDS TO PERSONNEL AND/OR DAMAGE TO EXISTING UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN AND INSTALLED BY ANY OTHER CONTRACTS. THE ENGINEER IS NOT RESPONSIBLE FOR THE LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN OR DETAILED AND INSTALLED BY ANY OTHER CONTRACTS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED. THESE DRAWINGS AND SPECIFICATIONS DO NOT INCLUDE THE NECESSARY ELEMENTS FOR CONSTRUCTION SAFETY.
2. CALL UNDERGROUND SERVICE ALERT (USA) AT 1 (800) 422-4133 OR APPLICABLE STATE AND LOCAL DIG SAFE OR UNDERGROUND ALERT HOTLINES PRIOR TO CONSTRUCTION START.
3. MINIMUM CONDUIT SIZE SHALL BE 3/4" - U.O.N.
4. MINIMUM CONDUCTOR SIZE SHALL BE #10 AWG. - U.O.N.
5. ALL SITE BRANCH CIRCUITS SHALL INCLUDE AN EQUIPMENT GROUND CONDUCTOR THAT, AT MINIMUM, MATCHES THE SIZE OF THE ASSOCIATED BRANCH CIRCUIT CONDUCTOR. WHERE MULTIPLE BRANCH CIRCUITS ARE ROUTED/GROUPED TOGETHER, THE EQUIPMENT GROUNDING CONDUCTOR SHALL MATCH THE SIZE OF THE LARGEST BRANCH CIRCUIT CONDUCTOR IN THE GROUP.
6. ALL ELECTRICAL EQUIPMENT MOUNTED OUTDOORS SHALL BE WEATHERPROOF (NEMA #3R).
7. ALL CONDUIT ONLY SHALL BE PROVIDED WITH A NYLON PULL STRING.
8. SEE ARCHITECTURAL/LANDSCAPE ARCHITECTURAL PLANS FOR EXACT LOCATIONS OF FIXTURES, PULLBOXES, MANHOLES, OTHER ELECTRICAL DEVICES, ETC. COORDINATE ALL UNDERGROUND STRUCTURES AND CONDUIT ROUTING WITH LANDSCAPE ARCHITECT PRIOR TO ROUGH-IN TO ENSURE THAT SUCH ITEMS ARE NOT PLACED IN CRITICAL LANDSCAPE PLANTING/HARDSCAPE AREAS.
9. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

REVISIONS	
DATE/DELTA	REMARKS

**LANCASTER BAPTIST CHURCH**  
NORTH AUDITORIUM "KID CITY"  
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4020 LANCASTER BLVD.  
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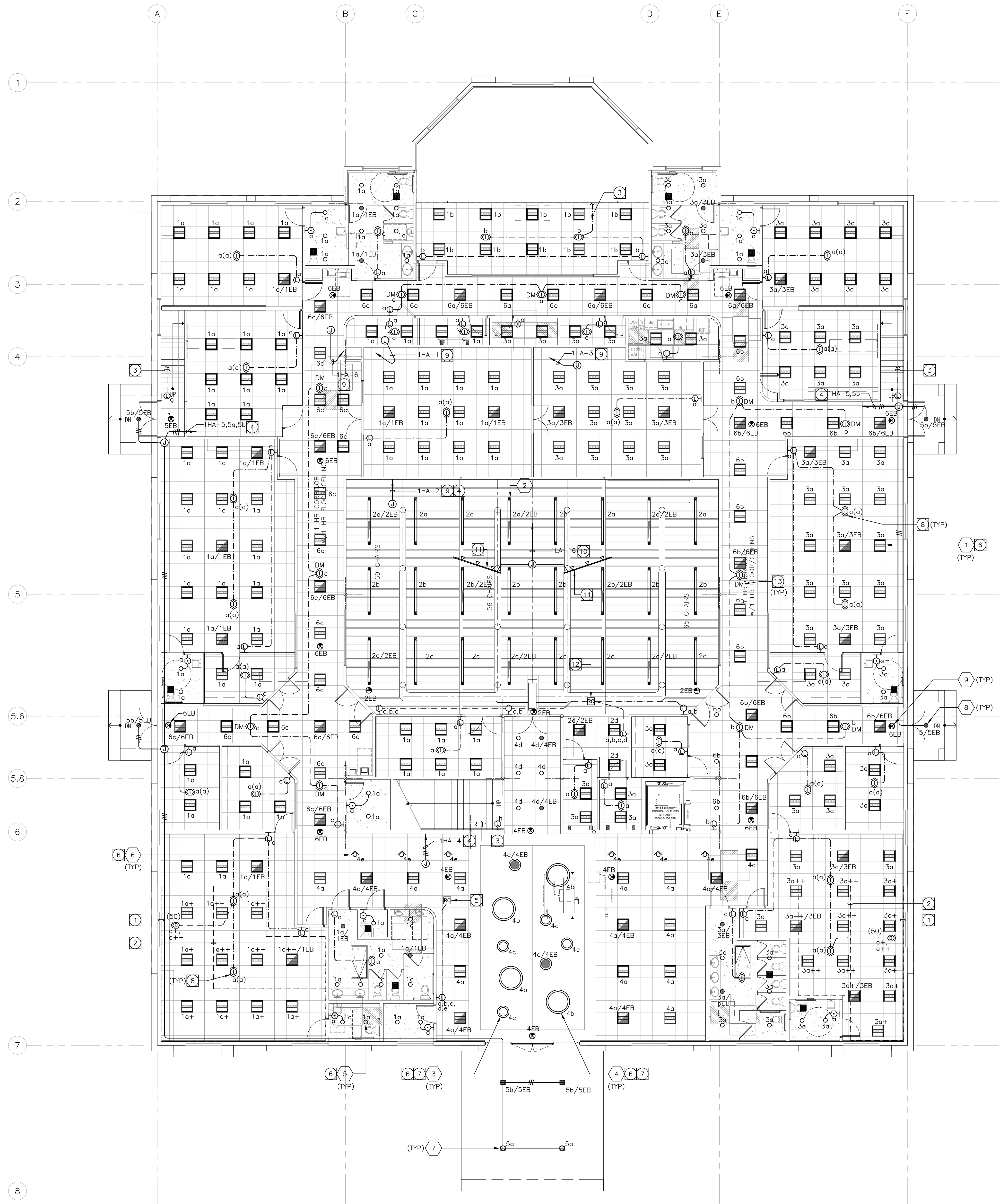
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**SHEET TITLE:**  
**SITE ELECTRICAL PLAN**

**SUB DATE:** 05/08/19  
**BID DATE:** 03/19/19  
**DATE:** 03/19/19  
**DRAWN BY:** JT  
**JOB NO:** 11761  
**CHECKED BY:** SH  
**SHEET NUMBER:** E-1.1





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

1

**PLAN NOTES:**

- 1 PRIMARY DAYLIGHT AREA SHOWN PER TITLE 24 REQUIREMENTS.
- 2 SECONDARY DAYLIGHT AREA SHOWN PER TITLE 24 REQUIREMENTS.
- 3 SEE SHEET E-2.2 FOR CONTINUATION.
- 4 ROUTE HOMERUN VIA LIGHTING CONTROL PANEL. PROVIDE ADDITIONAL HOT CONDUCTOR BY-PASSING CONTROL PANEL FOR EMERGENCY FIXTURES.
- 5 PROVIDE ROOM CONTROLLERS AND LOW VOLTAGE SWITCHES FOR CONTROL/DIMMING OF LOBBY LIGHTS. SEE DISTRIBUTED LIGHTING CONTROLS.
- 6 PROVIDE 0-10V LOW VOLTAGE CONDUCTORS TO EACH 0-10V TYPE DIMMED FIXTURE.
- 7 VERIFY CABLE LENGTH/MOUNTING HEIGHT OF PENDANT FIXTURES WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
- 8 PROVIDE ROOM CONTROLLERS AND NETWORK BRIDGES, ETC. AS REQUIRED TO COMPLY WITH DEMAND RESPONSE REQUIREMENTS. SEE DISTRIBUTED LIGHTING CONTROLS FOR ADDITIONAL INFORMATION.
- 9 EXTEND #10 CONDUCTORS TO FARTHEST FIXTURES IN RUN.
- 10 1/2"Ø-2#10, 1#10 GROUND.
- 11 PROVIDE STAGE LIGHTING BAR/SUPPORT MECHANISM (PROVIDE ADEQUATE STRUCTURAL SUPPORT) AT CEILING PER OWNER'S SPECIFICATIONS. PROVIDE (3) STAGE LIGHTS AT EACH LOCATION. 120V-155W EACH PER OWNER'S SPECIFICATIONS. EXTEND LOW VOLTAGE CABLE (DMX) BACK TO AV BOOTH FOR CONTROL. COORDINATE ALL REQUIREMENTS WITH OWNER AND MAKE ALL FINAL CONNECTIONS.
- 12 PROVIDE ROOM CONTROLLERS AND LOW VOLTAGE SWITCHES FOR CONTROL/DIMMING OF ASSEMBLY ROOM "HOUSE" LIGHTS. SEE DISTRIBUTED LIGHTING CONTROLS.
- 13 PROVIDE DUAL-MODE OCCUPANCY SENSOR. SEE DISTRIBUTED LIGHTING CONTROLS.

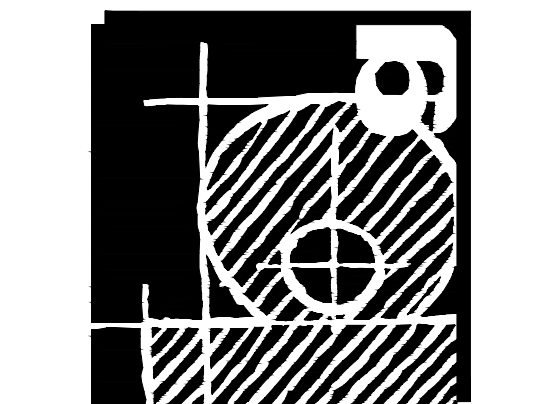
**LIGHTING PLAN GENERAL NOTES:**

1. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND ELEVATION OF ALL LIGHTING FIXTURES AND ALL DEVICES. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
2. VERIFY EXACT CEILING CONSTRUCTION WITH ARCHITECTURAL REFLECTED CEILING PLAN AND PROVIDE LIGHTING FIXTURES WITH ALL NECESSARY MOUNTING HARDWARE.
3. ALL RECESSED FIXTURES SHALL BE PROVIDED WITH ALL REQUIRED STRUCTURAL SUPPORTS AS REQUIRED BY THE CURRENTLY ADOPTED EDITION OF THE IBC, OR CBC WHERE ADOPTED, IN ADDITION TO ANY LOCAL CODES.
4. ALL COVE MOUNTED FIXTURES SHALL EXTEND THE FULL LENGTH OF THE COVE. CONTRACTOR TO FIELD MEASURE COVE LENGTH AND ORDER QUANTITY OF FIXTURES AS REQUIRED.
5. ALL DIMMING BRANCH CIRCUITS SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR FOR EACH ZONE/CHANNEL.
6. ALL FLUORESCENT DIMMING ZONES/CHANNELS SHALL BE PROVIDED WITH 3 LINE VOLTAGE CONDUCTORS (NEUTRAL, DIMMED HOT, SWITCHED HOT) OR 2 LINE VOLTAGE CONDUCTORS/2 CONTROL CONDUCTORS AS REQUIRED BY THE CONTROL/BALLAST TYPE.
7. ALL EMERGENCY BATTERY PACK FIXTURES SHALL BE PROVIDED WITH A CONSTANT HOT CONNECTION TO THE CHARGING LEAD. SEE GENERAL LIGHTING FIXTURE SCHEDULE NOTES FOR MORE INFORMATION.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXIT SIGN CHEVRONS AND NUMBER OF FACES PER EXIT SIGN. ANY DISCREPANCIES BETWEEN EXIT SIGNS SHOWN ON THE ELECTRICAL AND ARCHITECTURAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO ORDERING EXIT SIGNS.
9. WHEN EXPOSED CEILINGS OR OPEN GRID CONDITIONS OCCUR, THE CONTRACTOR WILL NEED TO PROVIDE THE FOLLOWING ITEMS:
  - ALL BRANCH CIRCUITS SHALL BE IN EMT.
  - ALL BRANCH CIRCUITS SHALL BE ROUTED, NEATLY TRAINED, AND IN PARALLEL TO STRUCTURES OR DUCT WORK. THE TERM "TRAINED" MEANS ALL PARALLEL CONDUITS SHALL MAINTAIN THE SAME SPATIAL RELATIONSHIP WITH EACH OTHER FOR ENTIRE RUN TO INCLUDE RADIUS BENDS AND SWEEPS.
10. ALL LED REMOTE INDICATORS FOR DUCT DETECTORS AND FIRE/SMOKE DAMPERS REQUIRED BY THE LOCAL AHJ SHALL BE LOCATED IN CEILINGS IN COORDINATION WITH ARCHITECT PRIOR TO ANY ROUGH-IN.
11. RECESSED FIXTURES LOCATED IN A FIRE-RATED CEILING OR WALL SHALL BE PROVIDED WITH A 5-SIDED RATED ENCLOSURE SO CONSTRUCTED AS TO ALLOW CODE AND MANUFACTURER-REQUIRED CLEARANCES BETWEEN THE FIXTURE AND THE ENCLOSURE.
12. PROVIDE ADDITIONAL J-BOX NEAR PANEL FOR MULTIPLE HOMERUN CIRCUITRY.
13. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.
14. REFER TO GENERAL POWER PLAN NOTES AND COMMUNICATIONS PATHWAYS GENERAL NOTES FOR ADDITIONAL REQUIREMENTS WHEN POWER AND/OR DATA DEVICES ARE SHOWN ON THIS PLAN.

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SHEET TITLE:

**FIRST FLOOR LIGHTING PLAN**

SUB DATE: 05/08/19  
BID DATE:  
DATE: 03/19/19  
DRAWN BY: JT  
JOB NO: 11761  
CHECKED BY: SH

SHEET NUMBER:  
**E-2.1**

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tkisc Job #: 2018-0585







1. CONDUITS SHALL (a) CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 30M (98 FT), (b) CONTAIN NO MORE THAN (2) 90° BENDS OR (1) REVERSE BEND WITHOUT INSTALLING A PULL BOX. SPLIT CONDUITS IN PLACE OF PULL BOXES ARE UNACCEPTABLE.
2. CONDUITS SHALL CONTAIN PLASTIC OR NYLON PULL TAPE RATED AT 200 LBS. WITH A MINIMUM OF 5 FEET OF EXTRA PULL TAPE COILED AT EACH END.
3. CONDUIT BEND RADIUS SHALL BE (a) A MINIMUM OF 6 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS 2-INCHES IN DIAMETER OR LESS, (b) 10 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS MORE THAN 2-INCHES IN DIAMETER.

4. TERMINATE CONDUIT STUBS AND SLEEVES THAT PROTRUDE THROUGH STRUCTURAL FLOORS 2-INCHES TO 3-INCHES ABOVE THE FLOOR SURFACE.
5. INSTALL BUSHINGS OR BELL ENDS AS REQUIRED ON ALL CONDUITS.
6. FLEX CONDUIT IS UNACCEPTABLE FOR USE AS A COMMUNICATIONS CONDUIT EXCEPT AT SEISMIC JOINTS AND/OR IF APPROVED IN WRITING BY THE ENGINEER.
7. ALL UNDER SLAB OR IN-SLAB CONDUITS SHALL BE INSTALLED IN A MANNER THAT PREVENTS WATER INFILTRATION OF THE CONDUIT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROUND WATER, RAIN WATER OR CONSTRUCTION WATER IS PREVENTED FROM ENTERING AND/OR REMOVED FROM THE CONDUITS PRIOR TO PLACEMENT OF CONCRETE. THE CONTRACTOR SHALL SUBMIT DETAILED DRAWINGS, DETAILS AND PLANS FOR ADDITIONAL CONDUIT SEALING REQUIREMENTS.

ALL PULL BOXES SHALL BE SIZED AND INSTALLED PER ANSI-TIA-569-C. PULL BOXES FOR IN/UNDER SLAB CONDUIT RUNS ARE NOT PERMITTED UNLESS OTHERWISE NOTED. PULL BOXES FOR OVERHEAD CONDUIT RUNS SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS WITHIN THE ACCESSIBLE CEILING SPACE AND SUPPORTED INDEPENDENTLY FROM THE STRUCTURE AND CONDUIT SUPPORTS. PULL BOXES FOR ROOF MOUNTED OR EXTERIOR ABOVE GRADE APPLICATION SHALL BE NEMA 3R RATED. PULL BOXES SHALL BE SIZED ACCORDING TO THE FOLLOWING:

CONDUIT SIZE	WIDTH	LENGTH	DEPTH	WIDTH INCREASE PER ADDITIONAL CONDUIT
1"	4"	16"	3"	2"
2"	8"	36"	4"	5"
3"	12"	48"	5"	6"
4"	15"	60"	8"	8"

FOR OTHER CONDUIT SIZES REFER TO ANSI/TIA-569-C TABLE 12. -  
LATEST PUBLISHED EDITION.

9. CONDUIT(S) SHALL EXIT A PULL BOX ON THE WALL OPPOSITE THE WALL ENTERED.
10. PROVIDE LABELING OF EACH CONDUIT PER GENERAL ELECTRICAL SPECIFICATIONS.
11. PROVIDE INTERNAL/EXTERNAL GAS AND WATER TIGHT MECHANICAL SEALING/PLUGGING OF EACH BUILDING ENTRY CONDUIT AS SPECIFIED ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.

- 33 PROVIDE ELECTRO-STATIC DISCHARGE (ESD) FLOOR GROUNDING CONNECTION VIA ELECTRICAL RECEPTACLES AND/OR DEDICATED JUNCTION BOX LOCATIONS AS REQUIRED. COORDINATE FOLLOWS CONSTRUCTION OF FLOORING WITH ESD FLOORING CONTRACTOR PRIOR TO ROUGH-IN. SEE ESD FLOOR GROUNDING DETAIL FOR ADDITIONAL REQUIREMENTS.
- 34 (2") DIA. CONDUIT SLEEVES EXTENDING 6" ABOVE AND BELOW CEILING. VERIFY CONDUIT SIZE AND QUANTITY, AND EXACT LOCATION PRIOR TO ROUGH-IN.
- 35 DATA CABINET/RACK, LADDER TRAY AND RACK-MOUNTED UPS ARE OWNER FURNISHED-CONTRACTOR INSTALLED.

- 1 EXISTING OVERHEAD FEEDERS RUNNING THRU CEILING SPACE TO MODULAR "P" TO REMAIN. LEAVE IN PLACE DURING CONSTRUCTION. SEE SINGLE LINE DIAGRAM.
- 2 ALL RECEPTABLES IN CLASSROOMS, PLAYROOM AND ASSEMBLY ARE TO BE "TAMPER PROOF" TYPE RECEPTABLES.
- 3 PROVIDE DUPLEX RECEPTACLE WITH (2) USB PORTS MOUNTED ABOVE COUNTER. SEE SYMBOL, EGT SHEET E01.
- 4 PROVIDE RECEPTACLE AND TV/HDMI JACK OUTLET FOR WALL MOUNTED LED TV WITH 1" CONDUIT ONLY INTO ACCESSIBLE CEILING SPACE. VERIFY MOUNTING HEIGHT AND ALL REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN.
- 5 CONNECT TO AUTOMATIC SLIDING DOOR.
- 6 EXISTING LANDSCAPE IRRIGATION CONTROLLER TO REMAIN. RECONNECT TO NEW PANEL AS SHOWN.
- 7 EXTEND (1)1/4" CONDUIT ONLY WITH PULL STRING TO EXISTING TELEPHONE COMPANY PULLBOX ADJACENT TO EXISTING MAIN SWITCHGEAR.
- 8 3/4"x3-#8, 1#8 GROUND.
- 9 1/2"x2-#10, 1#10 GROUND.
- 10 3/4"x2-#10, 1#10 GROUND.
- 11 NOT USED.
- 12 NOT USED.

- 13 CONNECT TO WATER HEATER ELECTRONIC IGNITION.
- 14 CONNECT TO CIRC PUMP.
- 15 3/4" C-3#10, 1#10 GROUND.
- 16 PROVIDE A NEMA L5-30R RECEPTACLE FOR UPS.
- 17 PROVIDE (2) 4" CONDUIT ONLY SLEEVES TO 2ND FLOOR SERVER ROOM.
- 18 VERIFY EXACT LOCATION AND MOUNTING HEIGHT FOR ALL RECEPTABLES, OUTLETS AND EQUIPMENT IN THIS ROOM WITH OWNER PRIOR TO ROUGH-IN.
- 19 NOT USED.
- 20 CONNECT TO FIRE RISER.
- 21 PROVIDE (1) 3/4" CONDUIT ONLY DATA DROP FOR RASPBERRY PI DEVICE.
- 22 PROVIDE RECEPTACLE MOUNTED ABOVE CEILING FOR MATV DISTRIBUTION
- 23 EXTEND (2) 2" CONDUIT ONLY FROM WORSHIP CENTER ABOVE CEILING TO SERVER ROOM FOR FIBER OPTIC CABLES. VERIFY BEST ROUTING PATH IN FIELD.
- 24 PROVIDE A 2" CONDUIT ONLY FROM AV BOOTH IN CEILING TO (3) SPEAKER LOCATIONS IN ASSEMBLY CEILING AREA.
- 25 PROVIDE (2) 2" CONDUIT ONLY TO SERVER ROOM FOR SOURCE SIGNALS
- 26 PROVIDE (1) 3" CONDUIT ONLY AND (1) 2" CONDUIT ONLY FOR LOW VOLTAGE SIGNAL FEED TO FLOOR BOX IN PLURIM.
- 27 PROVIDE FLUSH MOUNTED FLOOR BOX WITH PORTS FOR CAT5, SDI AND DMX CABLES. VERIFY FLOOR BOX REQUIREMENTS AND LOCATIONS WITH OWNER PRIOR TO ROUGH-IN.
- 28 MOUNT TRANSFORMER "1TB" ABOVE TRANSFORMER "1TA". SEE DETAIL #6 SHEET E6.1.
- 29 MOUNT SECONDARY FEED DISCONNECT SWITCH ADJACENT TO TRANSFORMER. MAINTAIN ALL CODE REQUIRED CLEARANCES. SEE DETAIL #6 SHEET E6.1.
- 30 NOT USED.
- 31 NOT USED.
- 32 E.C. TO INSTALL ANSI-5-JSD 607A COMPLIANT U.L. LISTED TELECOMMUNICATIONS GROUND BUSBAR (TGB) (CHATS WORTH #40153-020 OR EQUAL (BY HARDER) & TELECOMMUNICATIONS BONDING BACKBONE (TBB) PER ANSI-1-JSD-607-A. PROVIDE 1/8" BRASS TELECOMMUNICATIONS BONDING BACKBONE (TBB) CONSISTING OF (1) 1" C. W/ #3/0 WITH GREEN INSULATION CONNECTING EACH TGB(S). ROUTE TBB TO BUILDING MAIN ELECTRICAL SERVICE GROUND. PROVIDE #6 GROUND CONDUCTOR WITH GREEN INSULATION CONNECTING EXOTHERMICALLY CONNECTED TO NEAREST EFFECTIVELY GROUNDED BUILDING STEEL TO EACH TGB(TGB(S). U.O.N. CONNECTIONS SHALL BE 2-HOLE COMPRESSION CONNECTIONS. LABEL EACH END OF TBB WITH A GROUND WARNING TAG (PANDUIT #PT-BP-RND OR EQUAL). IF THE LENGTH A TBB IS LESS THAN 100 FT PROVIDE A #10/0 WITH GREEN INSULATION IN LEU OF A #3/0. BOND EACH END OF METAL CONDUIT TO TBB W/ #6 WITH GREEN INSULATION. ADDITIONALLY, EC TO EACH TRAY, RACKS/CABINETS, PDUS, UPS, HVAC SYSTEMS ETC TO NEAREST TBB W/ #6 GROUND CONDUCTOR WITH GREEN INSULATION.

1. ALL RECEPTACLES ON COMMON WALLS SHALL BE SEPARATE BOXES AND OFFSET 24-INCHES MINIMUM.
2. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRESTOP SYSTEM EQUAL OR GREATER THAN THE FIRE RATING OF THE WALL.
3. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
4. WHEN EXPOSED CEILINGS OR OPEN GRID CONDITIONS OCCUR, THE CONTRACTOR WILL NEED TO PROVIDE THE FOLLOWING ITEMS:
  - ALL BRANCH CIRCUITS SHALL BE IN ENT.
  - ALL BRANCH CIRCUITS SHALL BE ROUTED NEATLY AND IN PARALLEL TO STRUCTURES OR DUCT WORK.

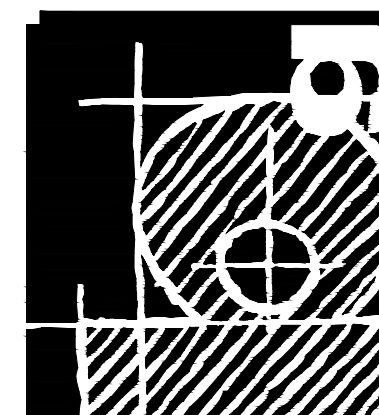
VISUALLY OBJECTIONABLE BRANCH CIRCUITS SHALL BE REROUTED AT THE REQUEST OF THE ARCHITECT AT NO ADDITIONAL COST.

5. EXPOSED CABLE/CONDUCTORS INSTALLED IN A PLENUM SPACE SHALL CONFORM TO NEC, OR CEC WHERE ADOPTED, ARTICLE 300.22(C).
6. PROVIDE G.F.C.I. TYPE RECEPTACLE(S) OR RECEPTACLE(S) PROTECTED BY A GFCI CIRCUIT BREAKER(S) WHEN LOCATED WITHIN 6- FEET OF ANY SINK OR THERAPEUTIC TUB, LAUNDRY AREA, SERVING ANY DRINKING WATER OR VENDING MACHINE, WITHIN ANY KITCHEN SPACE AND/OR LOCATED OUTDOORS. WHERE RECEPTACLES ARE NOT READILY ACCESSIBLE, PROVIDE GFCI CIRCUIT BREAKER(S) TO PROTECT THE RESPECTIVE BRANCH CIRCUIT AND PROVIDE ADDITIONAL NEUTRAL CONDUCTORS IN BRANCH CIRCUITING AS REQUIRED TO ENSURE PROPER GFCI FUNCTION.
7. PROVIDE OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROLLED RECEPTACLE RELAY(S) AS REQUIRED TO SWITCH CONTROLLED RECEPTACLES. CONNECT BRANCH CIRCUITRY AND CONTROL WIRING AS REQUIRED TO ALLOW OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROL TO SWITCH SHANDLONE AND/OR SYSTEMS FURNITURE CONTROLLED RECEPTABLES AS INDICATED ON PLANS. PROVIDE ADDITIONAL CONDUIT, WIRING AND PATHWAYS NECESSARY TO CONNECT GROUNDING CIRCUITRY AND OCCUPANCY RELAYS TO REMOTE RELAYS TO INCLUDE RELAY(S) LOCATED ON ALTERNATE FLOORS, IN ELECTRICAL ROOMS, ETC.
8. PROVIDE ADDITIONAL J-BOX NEAR PANEL FOR MULTIPLE HOMERUN CIRCUITRY.
9. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

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

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

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



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**SHEET TITLE**

## FIRST FLOOR POWER PLAN

SUB DATE	05/08/1
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<b>BID DATE</b>	
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DATE: 03/19/11

DRAWN BY: J  
JOB NO: 1176

CHECKED BY: \_\_\_\_\_ S

**SHEET NUMBER:** \_\_\_\_\_

### F-3.1

### E-3.1



COMMUNICATIONS PATHWAYS  
GENERAL NOTES:

- CONDUITS SHALL (a) CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 30M (98 FT.), AND (b) CONTAIN NO MORE THAN (2) 90° BENDS OR (1) REVERSE BEND WITHOUT INSTALLING A PULL BOX. SPLIT CONDUITS IN PLACE OF PULL BOXES ARE UNACCEPTABLE.
- CONDUITS SHALL CONTAIN PLASTIC OR NYLON PULL TAPE RATED AT 200 LBS. WITH A MINIMUM OF 5 FEET OF EXTRA PULL TAPE COILED AT EACH END.
- CONDUIT BEND RADIUS SHALL BE (a) A MINIMUM OF 8 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS 2-INCHES IN DIAMETER OR LESS, AND (b) 10 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS MORE THAN 2-INCHES IN DIAMETER.
- TERMINATE CONDUIT STUBS AND SLEEVES THAT PROTRUDE THROUGH STRUCTURAL FLOORS 2-INCHES TO 3-INCHES ABOVE THE FLOOR SURFACE.
- INSTALL BUSHINGS OR BELL ENDS AS REQUIRED ON ALL CONDUITS.
- FLEX CONDUIT IS UNACCEPTABLE FOR USE AS A COMMUNICATIONS CONDUIT EXCEPT AT SEISMIC JOINTS AND/OR IF APPROVED IN WRITING BY THE ENGINEER.
- ALL UNDER SLAB OR IN-SLAB CONDUITS SHALL BE INSTALLED IN A MANNER THAT PREVENTS WATER INFILTRATION OF THE CONDUIT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROUND WATER, RAIN WATER OR CONSTRUCTION WATER IS PREVENTED FROM ENTERING AND/OR REMOVED FROM THE CONDUITS PRIOR TO PLACEMENT OF COMMUNICATIONS CABLES. SEE ELECTRICAL SPECIFICATIONS, DETAILS AND PLANS FOR ADDITIONAL CONDUIT SEALING REQUIREMENTS.
- ALL PULL BOXES SHALL BE SIZED AND INSTALLED PER ANSI-TIA-569-C. PULL BOXES FOR IN/UNDER SLAB CONDUIT RUNS ARE NOT PERMITTED UNLESS OTHERWISE NOTED. PULL BOXES FOR OVERHEAD CONDUIT RUNS SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS WITHIN THE ACCESSIBLE CEILING SPACE AND SUPPORTED INDEPENDENTLY FROM THE STRUCTURE AND CONDUIT SUPPORTS. PULL BOXES FOR ROOF MOUNTED OR EXTERIOR ABOVE GRADE APPLICATIONS SHALL BE NEMA 3R RATED. PULL BOXES SHALL BE SIZED ACCORDING TO THE FOLLOWING:

CONDUIT SIZE	WIDTH	LENGTH	DEPTH	WIDTH INCREASE PER ADDITIONAL CONDUIT
1"	4"	16"	3"	2"
2"	8"	36"	4"	5"
3"	12"	48"	5"	6"
4"	15"	60"	6"	8"

- FOR OTHER CONDUIT SIZES REFER TO ANSI/TIA-569-C TABLE 12. - LATEST PUBLISHED EDITION.
- CONDUIT(S) SHALL EXIT A PULL BOX ON THE WALL OPPOSITE THE WALL ENTERED.
  - PROVIDE LABELING OF EACH CONDUIT PER GENERAL ELECTRICAL SPECIFICATIONS.
  - PROVIDE INTERNAL/EXTERNAL GAS AND WATER TIGHT MECHANICAL SEALING/PLUGGING OF EACH BUILDING ENTRY CONDUIT AS SPECIFIED ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.

PLAN NOTES:

- CONNECT TO WATER HEATER ELECTRONIC IGNITION.
- ALL RECEPTACLES IN CLASSROOMS, PLAYROOM AND ASSEMBLY ARE TO BE TAMPER PROOF TYPE RECEPTACLES.
- PROVIDE DUPLEX RECEPTACLE WITH (2) USB PORTS MOUNTED ABOVE COUNTER. SEE SYMBOL LIST SHEET E0.1.
- PROVIDE RECEPTACLE AND T.V./HDMI JACK OUTLET FOR WALL MOUNTED LED T.V. WITH 1" CONDUIT ONLY INTO ACCESSIBLE CEILING SPACE. VERIFY MOUNTING HEIGHT AND ALL REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN.
- 3/4"C-3#10, 1#10 GROUND.
- NOT USED.
- NOT USED.
- 3/4"C-2#10, 1#10 GROUND.
- PROVIDE A NEMA L5-30R RECEPTACLE FOR UPS.
- PROVIDE 8'HIGH PLYWOOD BACKBOARD WALL TO WALL.
- VERIFY EXACT LOCATION AND MOUNTING HEIGHT FOR ALL RECEPTACLES, OUTLETS AND EQUIPMENT IN THIS ROOM WITH OWNER PRIOR TO ROUGH-IN.
- NOT USED.
- PROVIDE (1)3/4" CONDUIT ONLY DATA DROP FOR RASPBERRY PI DEVICE.
- PROVIDE RECEPTACLE MOUNTED ABOVE CEILING FOR MATV DISTRIBUTION AMP.
- E.C. TO INSTALL ANSI-J-STD 607A COMPLIANT U.L. LISTED TELECOMMUNICATIONS GROUND BUSBAR (TGB) (CHATSWORTH #40153-020 OR EQUAL BY HARGER) & TELECOMMUNICATIONS BONDING BACKBONE (TBB) PER ANSI-J-STD-607-A. PROVIDE 1/8" BRASS ENGRAVED NAMEPLATE WITH ABBREVIATION "T.G.B." OF 2" WHERE QUESTION MARKS INDICATE FLOOR AND IDF IDENTIFIER RESPECTIVELY. ATTACH NAMEPLATE TAG TO EACH BUS BAR. PROVIDE TELECOMMUNICATIONS BONDING BACKBONE (TBB) CONSISTING OF (1) 1" C.W. #3/0 WITH GREEN INSULATION CONNECTING EACH TGB(S). ROUTE TBB TO BUILDING MAIN ELECTRICAL SERVICE GROUND. PROVIDE 1/2"C. #6 GROUND CONDUCTOR WITH GREEN INSULATION EXOTHERMICALLY CONNECTED TO NEAREST EFFECTIVELY GROUNDED BUILDING STEEL TO EACH TGB/TGB(S). U.O.N. CONNECTIONS SHALL BE MADE WITH 2-HOLE COMPRESSION CONNECTORS. LABEL EACH END OF TBB WITH A GROUND WARNING TAG (PANDUIT #GT-BORND OR EQUAL). IF THE LENGTH A TBB IS LESS THAN 100 FT PROVIDE A #1/0 WITH GREEN INSULATION IN LIEU OF A #3/0. BOND EACH END OF METAL CONDUIT TO TBB W/ASULON INSULATION. ADDITIONALLY, EC BOND ALL TRAY, RACKS/CABINETS, PDUS, UPS, HVAC SYSTEMS ETC TO NEAREST TGB WITH 1#6 GROUND CONDUCTOR WITH GREEN INSULATION.
- PROVIDE ELECTRO-STATIC DISCHARGE (ESD) FLOOR GROUNDING CONNECTION VIA ELECTRICAL RECEPTACLES AND/OR DEDICATED JUNCTION BOX LOCATIONS AS REQUIRED. COORDINATE FOIL CONNECTION LOCATION LOCATIONS WITH ESD FLOORING CONTRACTOR PRIOR TO ROUGH-IN. SEE ESD FLOOR GROUNDING DETAIL FOR ADDITIONAL REQUIREMENTS.
- (2)4" DIA. CONDUIT SLEEVES EXTENDING 6" ABOVE AND BELOW CEILING. VERIFY CONDUIT SIZE AND QUANTITY, AND EXACT LOCATION PRIOR TO ROUGH-IN.
- DATA CABINET/RACK, LADDER TRAY AND RACK-MOUNTED UPS ARE OWNER FURNISHED-CONTRACTOR INSTALLED.
- PROVIDE 120V CIRCUIT CONNECTION FOR HVAC CONTROL PANEL. VERIFY EXACT LOCATION WITH MC PRIOR TO ROUGH-IN.

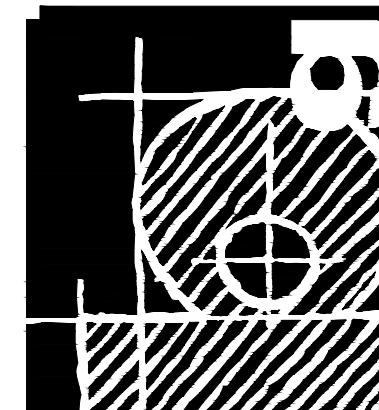
POWER PLAN GENERAL NOTES:

- ALL RECEPTACLES ON COMMON WALLS SHALL BE SEPARATE BOXES AND OFFSET 24-INCHES MINIMUM.
- ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRESTOP SYSTEM EQUAL OR GREATER THAN THE FIRE RATING OF THE WALL.
- ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
  - ALL BRANCH CIRCUITS SHALL BE IN ENT.
  - ALL BRANCH CIRCUITS SHALL BE ROUTED NEATLY AND IN PARALLEL TO STRUCTURES OR DUCT WORK.
- VISUALLY OBJECTIONABLE BRANCH CIRCUITS SHALL BE REROUTED AT THE REQUEST OF THE ARCHITECT AT NO ADDITIONAL COST.
- EXPOSED CABLE/CONDUCTORS INSTALLED IN A PLENUM SPACE SHALL CONFORM TO NEC, OR CEC WHERE ADOPTED, ARTICLE 300.22(C).
- PROVIDE G.F.C.I. TYPE RECEPTACLE(S) OR RECEPTACLE(S) PROTECTED BY A GFCI CIRCUIT BREAKER(S) WHEN LOCATED WITHIN 6- FEET OF ANY SINK OR THERAPEUTIC TUB, LAUNDRY AREA, SERVING ANY DRINKING FOUNTAIN OR VENDING MACHINE, WITHIN ANY KITCHEN SPACE AND/OR LOCATED OUTDOORS. WHERE RECEPTACLES ARE NOT READILY ACCESSIBLE, PROVIDE GFCI CIRCUIT BREAKER(S) TO PROTECT THE RESPECTIVE BRANCH CIRCUIT AND PROVIDE ADDITIONAL NEUTRAL CONDUCTORS IN THE BRANCH CIRCUITING AS REQUIRED TO ENSURE PROPER GFCI FUNCTION.
- PROVIDE OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROLLED RECEPTACLE RELAY(S) AS REQUIRED TO SWITCH CONTROLLED RECEPTACLES. CONNECT BRANCH CIRCUITRY AND CONTROL WIRING AS REQUIRED TO ALLOW OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM RELAY TO SWITCH STANDALONE AND/OR SYSTEMS FURNITURE CONTROLLED RECEPTACLES AS INDICATED ON PLANS. PROVIDE ADDITIONAL CONDUIT, WIRING AND PATHWAYS NECESSARY TO CONNECT BRANCH CIRCUITRY AND CONTROL WIRING TO REMOTE RELAYS TO INCLUDE RELAY(S) LOCATED ON ALTERNATE FLOORS, IN ELECTRICAL ROOMS, ETC.
- PROVIDE ADDITIONAL J-BOX NEAR PANEL FOR MULTIPLE HOMERUN CIRCUITRY.
- UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

REVISIONS	DATE/DELTA	REMARKS

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SHEET TITLE:

**SECOND FLOOR  
POWER PLAN**

SUB DATE 05/08/19

BID DATE

DATE 03/19/19

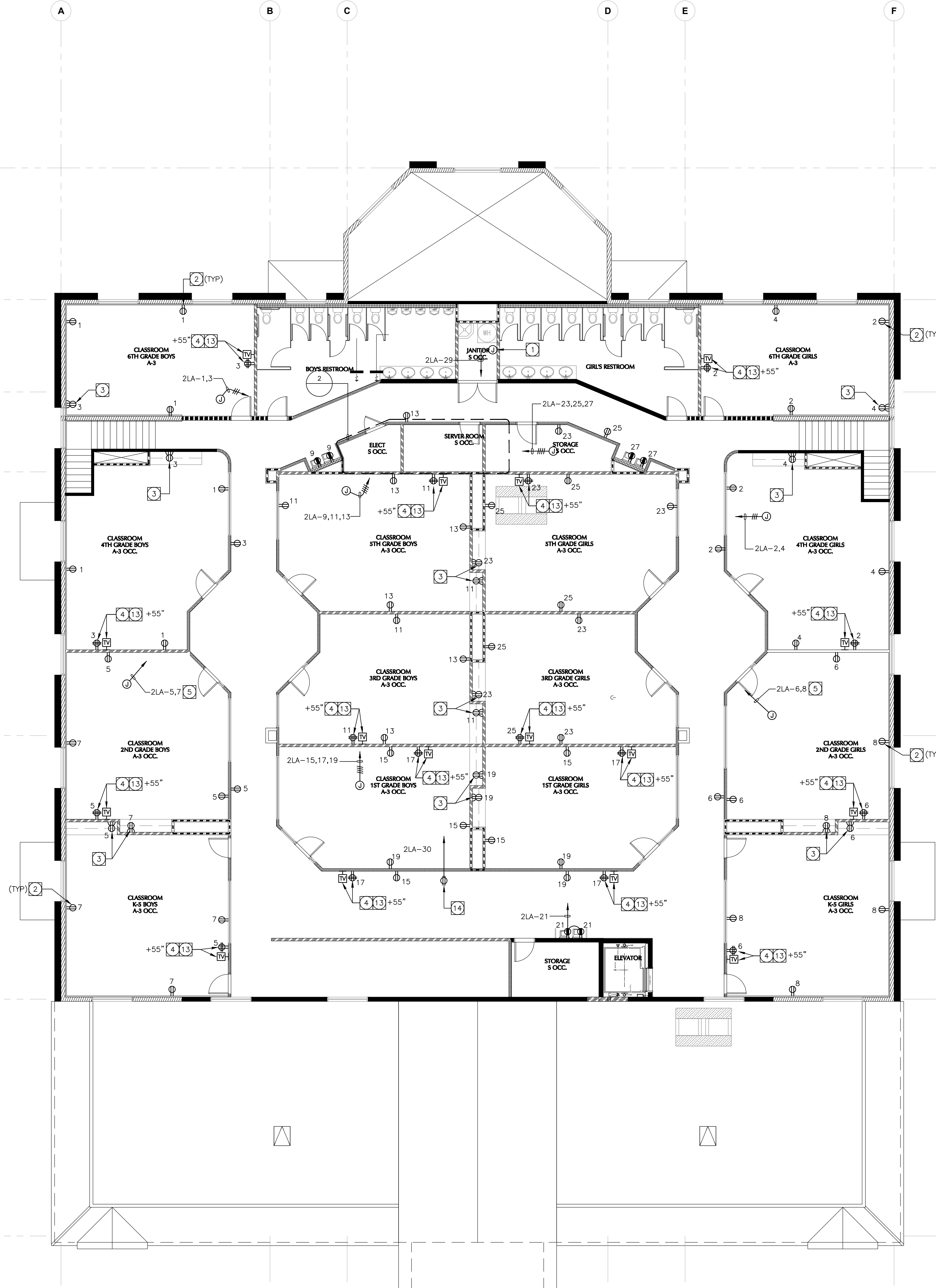
DRAWN BY: JT

JOB NO: 11761

CHECKED BY: SH

SHEET NUMBER:

E-3.2



SECOND FLOOR ENLARGED ELECTRICAL AND SERVER ROOM

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

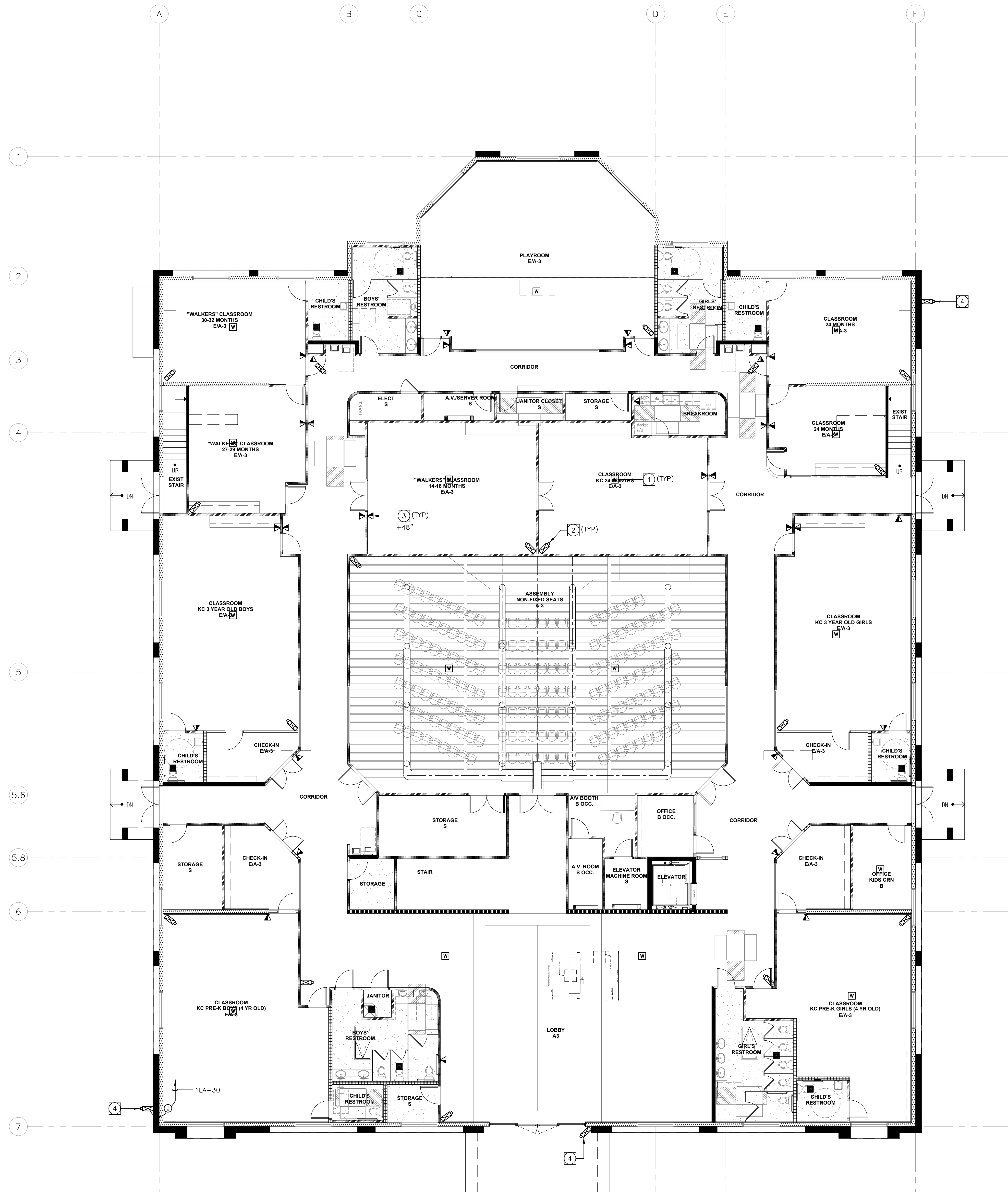
SECOND FLOOR POWER PLAN

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

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Project Leader - Steve Hayman  
Electrical Lead - Steve Hayman  
tkisc Job #: 2018-0585





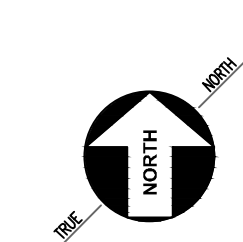
**PLAN NOTES:**

- 1 PROVIDE J-BOX FOR WIRELESS ACCESS POINT MOUNTED ABOVE CEILING. COORDINATE EXACT LOCATION AND MOUNTING ARRANGEMENTS WITH OWNER AND L.V. SYSTEM VENDOR.
- 2 PROVIDE J-BOX FOR CEILING MOUNTED CAMERA. COORDINATE EXACT LOCATION AND MOUNTING ARRANGEMENT WITH OWNER AND CAMERA/SECURITY SYSTEM VENDOR.
- 3 PROVIDE J-BOX WITH 1" CONDUIT ONLY TO ACCESSIBLE CEILING SPACE FOR PHONE AND SIGNAGE. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH OWNER AND L.V. SYSTEM VENDOR.
- 4 PROVIDE J-BOX AND 3/4" CONDUIT ONLY TO ACCESSIBLE CEILING SPACE FOR EXTERIOR WALL MOUNTED CAMERA. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH OWNER AND CAMERA/SECURITY SYSTEM VENDOR.

**FIRST FLOOR LOW VOLTAGE PLAN**

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

1



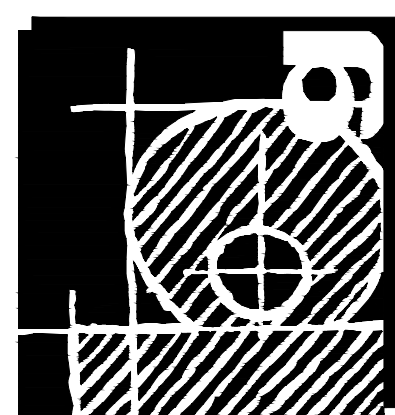
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SHEET TITLE:

**FIRST FLOOR LOW  
VOLTAGE PLAN**

SUB DATE 05/08/19

BID DATE

DATE 03/19/19

DRAWN BY: JT

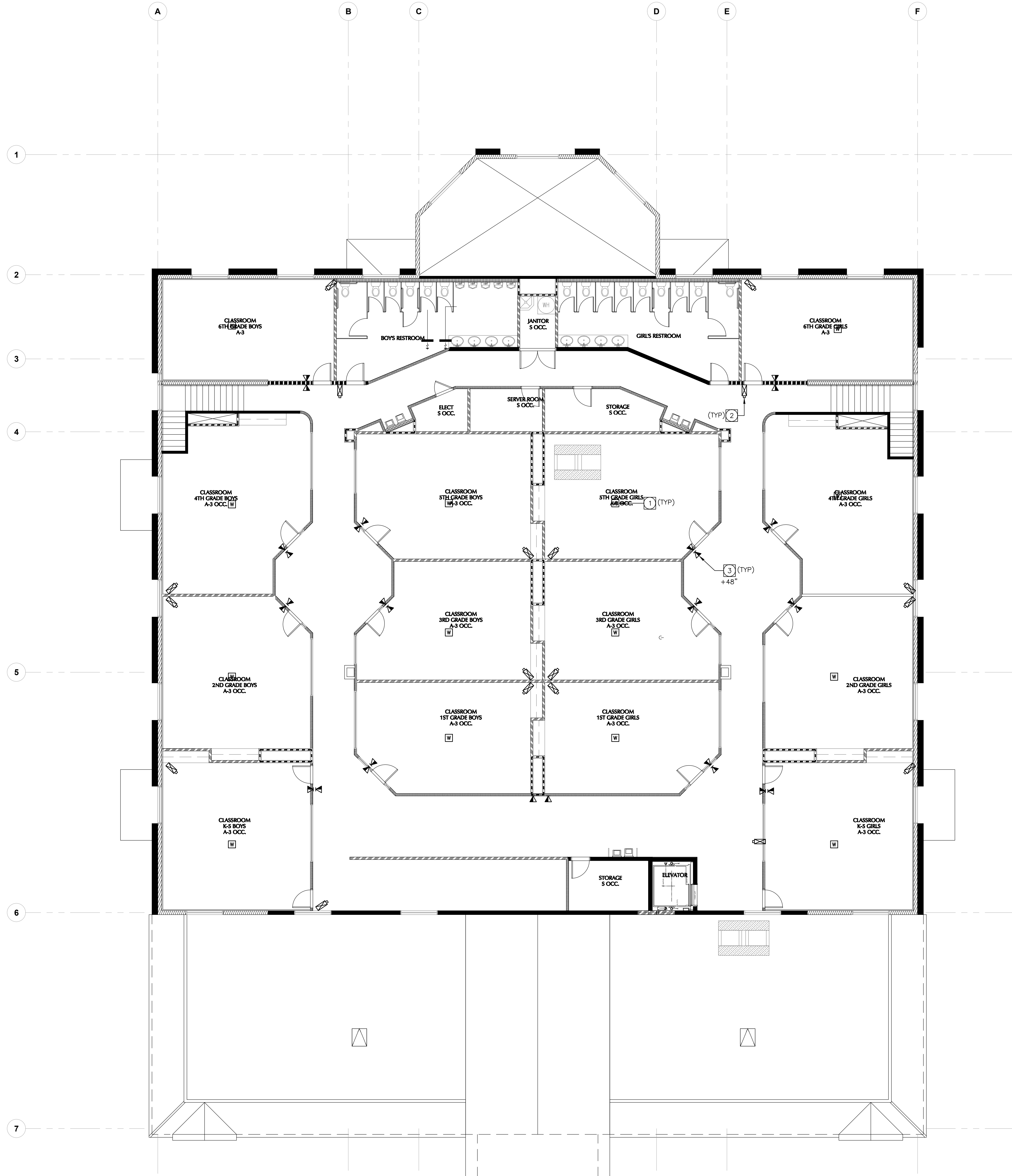
JOB NO: 11761

CHECKED BY: SH

SHEET NUMBER:

**E-3.3**





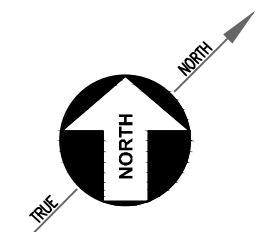
**PLAN NOTES:**

- 1 PROVIDE J-BOX FOR WIRELESS ACCESS POINT MOUNTED ABOVE CEILING. COORDINATE EXACT LOCATION AND MOUNTING ARRANGEMENTS WITH OWNER AND L.V. SYSTEM VENDOR.
- 2 PROVIDE J-BOX FOR CEILING MOUNTED CAMERA. COORDINATE EXACT LOCATION AND MOUNTING ARRANGEMENT WITH OWNER AND CAMERA/SECURITY SYSTEM VENDOR.
- 3 PROVIDE J-BOX WITH 1" CONDUIT ONLY TO ACCESSIBLE CEILING SPACE FOR PHONE AND SIGNAGE. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH OWNER AND L.V. SYSTEM VENDOR.

**SECOND FLOOR LOW VOLTAGE PLAN**

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

1



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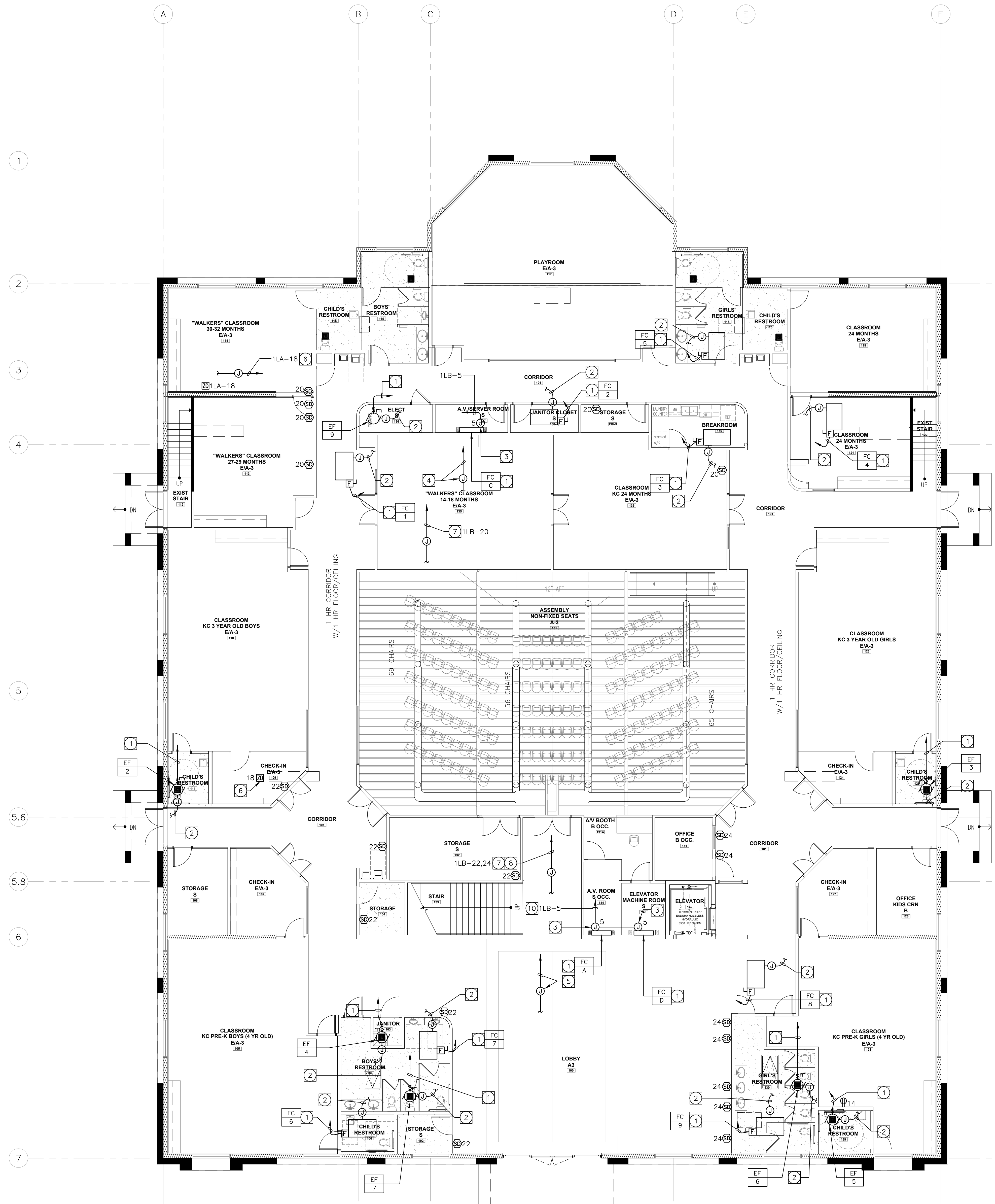
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SHEET TITLE:  
**SECOND FLOOR  
LOW VOLTAGE PLAN**

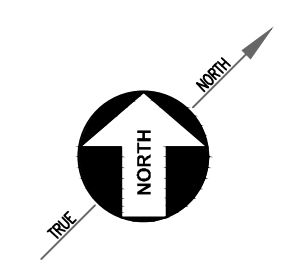
SUB DATE	05/08/19
BID DATE	
DATE:	03/19/19
DRAWN BY:	JT
JOB NO:	11761
CHECKED BY:	SH
SHEET NUMBER:	E-3.4





**FIRST FLOOR HVAC POWER PLAN**  
SCALE: 1/8" = 1'-0"

1



**PLAN NOTES:**

- 1 REFER TO MOTORIZED EQUIPMENT SCHEDULE ON SHEET E3.7 FOR MOTOR FEEDER/ BRANCH CIRCUIT INFORMATION.
- 2 PROVIDE 3/4" C.O.(S) TO RESPECTIVE CONTROL DEVICE(S) FOR CONTROL WIRING. REFER TO THE EQUIPMENT CONTROL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION.
- 3 CONNECT TO CONDENSATE PUMP. SEE MECHANICAL PLANS.
- 4 PROVIDE 3/4" C TO DUCT DETECTORS FOR FAN COILS FC-1 THRU FC-5 AND EXTEND TO FACP.
- 5 PROVIDE 3/4" C TO DUCT DETECTORS FOR FAN COILS FC-6 THRU FC-9 AND EXTEND TO FACP.
- 6 PROVIDE COMPLETE CONNECTION TO ZONE DAMPERS. VERIFY EXACT LOCATION AND QUANTITIES OF ZONE DAMPERS WITH MECHANICAL PLANS PRIOR TO ROUGH IN.
- 7 CONTRACTOR TO PROVIDE COMPLETE CONNECTIONS TO SMOKE DAMPERS AS REQUIRED. SEE MECHANICAL PLANS FOR QUANTITY AND APPROXIMATE LOCATION(S). VERIFY EXACT LOCATION OF SMOKE DETECTORS WITH M.C. PRIOR TO ROUGH-IN.
- 8 3/4"C+3#10+1#12GRD.

**COMMUNICATIONS PATHWAYS  
GENERAL NOTES:**

1. CONDUITS SHALL (a) CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 30M (98 FT.), AND (b) CONTAIN NO MORE THAN (2) 90° BENDS OR (1) REVERSE BEND WITHOUT INSTALLING A PULL BOX. SPLIT CONDUITS IN PLACE OF PULL BOXES ARE UNACCEPTABLE.
2. CONDUITS SHALL CONTAIN PLASTIC OR NYLON PULL TAPE RATED AT 200 LBS. WITH A MINIMUM OF 5 FEET OF EXTRA PULL TAPE COILED AT EACH END.
3. CONDUIT BEND RADIUS SHALL BE (a) A MINIMUM OF 6 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS 2-INCHES IN DIAMETER OR LESS, AND (b) 10 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS MORE THAN 2-INCHES IN DIAMETER.
4. TERMINATE CONDUIT STUBS AND SLEEVES THAT PROTRUDE THROUGH STRUCTURAL FLOORS 2-INCHES TO 3-INCHES ABOVE THE FLOOR SURFACE.
5. INSTALL BUSHINGS OR BELL ENDS AS REQUIRED ON ALL CONDUITS.
6. FLEX CONDUIT IS UNACCEPTABLE FOR USE AS A COMMUNICATIONS CONDUIT EXCEPT AT SEISMIC JOINTS AND/OR IF APPROVED IN WRITING BY THE ENGINEER.
7. ALL UNDER SLAB OR IN-SLAB CONDUITS SHALL BE INSTALLED IN A MANNER THAT PREVENTS WATER INFILTRATION OF THE CONDUIT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROUND WATER, RAIN WATER OR CONSTRUCTION WATER IS PREVENTED FROM ENTERING AND/OR REMOVED FROM THE CONDUITS PRIOR TO PLACEMENT OF COMMUNICATIONS CABLES. SEE ELECTRICAL SPECIFICATIONS, DETAILS AND PLANS FOR ADDITIONAL CONDUIT SEALING REQUIREMENTS.
8. ALL PULL BOXES SHALL BE SIZED AND INSTALLED PER ANSI-TIA-569-C. PULL BOXES FOR IN/UNDER SLAB CONDUIT RUNS ARE NOT PERMITTED UNLESS OTHERWISE NOTED. PULL BOXES FOR OVERHEAD CONDUIT RUNS SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS WITHIN THE ACCESSIBLE CEILING SPACE AND SUPPORTED INDEPENDENTLY FROM THE STRUCTURE AND CONDUIT SUPPORTS. PULL BOXES FOR ROOF MOUNTED OR EXTERIOR ABOVE GRADE APPLICATIONS SHALL BE NEMA 3R RATED. PULL BOXES SHALL BE SIZED ACCORDING TO THE FOLLOWING:

CONDUIT SIZE	WIDTH	LENGTH	DEPTH	WIDTH INCREASE PER ADDITIONAL CONDUIT
1"	4"	16"	3"	2"
2"	8"	36"	4"	5"
3"	12"	48"	5"	6"
4"	15"	60"	6"	8"

FOR OTHER CONDUIT SIZES REFER TO ANSI/TIA-569-C TABLE 12. - LATEST PUBLISHED EDITION.

9. CONDUIT(S) SHALL EXIT A PULL BOX ON THE WALL OPPOSITE THE WALL ENTERED.
10. PROVIDE LABELING OF EACH CONDUIT PER GENERAL ELECTRICAL SPECIFICATIONS.
11. PROVIDE INTERNAL/EXTERNAL GAS AND WATER TIGHT MECHANICAL SEALING/PLUGGING OF EACH BUILDING ENTRY CONDUIT AS SPECIFIED ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.

**POWER PLAN GENERAL NOTES:**

1. ALL RECEPTACLES ON COMMON WALLS SHALL BE SEPARATE BOXES AND OFFSET 24-INCHES MINIMUM.
2. ALL PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED FROM THE SPREAD OF FIRE WITH AN APPROVED FIRESTOP SYSTEM EQUAL OR GREATER THAN THE FIRE RATING OF THE WALL.
3. ALL WALL-MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
4. WHEN EXPOSED CEILINGS OR OPEN GRID CONDITIONS OCCUR, THE CONTRACTOR WILL NEED TO PROVIDE THE FOLLOWING ITEMS:
  - ALL BRANCH CIRCUITS SHALL BE IN EMT.
  - ALL BRANCH CIRCUITS SHALL BE ROUTED NEATLY AND IN PARALLEL TO STRUCTURES OR DUCT WORK.
5. EXPOSED CABLE/CONDUCTORS INSTALLED IN A PLENUM SPACE SHALL CONFORM TO NEC, OR CEC WHERE ADOPTED, ARTICLE 300.22(C).

VISUALLY OBJECTIONABLE BRANCH CIRCUITS SHALL BE REROUTED AT THE REQUEST OF THE ARCHITECT AT NO ADDITIONAL COST.
6. PROVIDE G.F.C.I. TYPE RECEPTACLE(S) OR RECEPTACLE(S) PROTECTED BY A GFCI CIRCUIT BREAKER(S) WHEN LOCATED WITHIN 6'-FEET OF ANY SINK OR THERAPEUTIC TUB, LAUNDRY AREA, SERVING ANY DRINKING FOUNTAIN OR VENDING MACHINE, WITHIN ANY KITCHEN SPACE AND/OR LOCATED OUTDOORS. WHERE RECEPTACLES ARE NOT READILY ACCESSIBLE, PROVIDE GFCI CIRCUIT BREAKER(S) TO PROTECT THE RESPECTIVE BRANCH CIRCUIT AND PROVIDE ADDITIONAL NEUTRA CONDUCTORS IN THE BRANCH CIRCUITING AS REQUIRED TO ENSURE PROPER GFCI FUNCTION.
7. PROVIDE OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM CONTROLLED RECEPTACLE RELAY(S) AS REQUIRED TO SWITCH CONTROLLED RECEPTACLES. CONNECT BRANCH CIRCUITRY AND CONTROL WIRING AS REQUIRED TO ALLOW OCCUPANCY SENSOR/LIGHTING CONTROL SYSTEM RELAY TO SWITCH STANDALONE AND/OR SYSTEMS FURNITURE CONTROLLED RECEPTACLES AS INDICATED ON PLANS. PROVIDE ADDITIONAL CONDUIT, WIRING AND PATHWAYS NECESSARY TO CONNECT BRANCH CIRCUITRY AND CONTROL WIRING TO REMOTE RELAYS TO INCLUDE RELAY(S) LOCATED ON ALTERNATE FLOORS, IN ELECTRICAL ROOMS, ETC.
8. PROVIDE ADDITIONAL J-BOX NEAR PANEL FOR MULTIPLE HOMERUN CIRCUITRY.
9. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

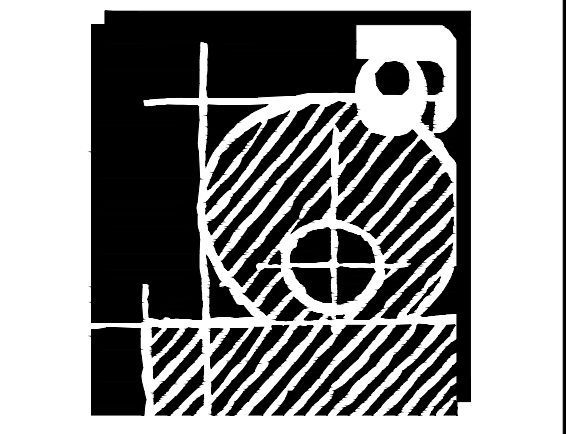
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SHEET TITLE:

**FIRST FLOOR HVAC  
POWER PLAN**

SUB DATE: 05/08/19  
BID DATE:  
DATE: 03/19/19  
DRAWN BY: JT  
JOB NO: 11761  
CHECKED BY: SH  
SHEET NUMBER:  
**E-3.5**



COMMUNICATIONS PATHWAYS  
GENERAL NOTES:

1. CONDUITS SHALL (a) CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 30M (98 FT.), AND (b) CONTAIN NO MORE THAN (2) 90° BENDS OR (1) REVERSE BEND WITHOUT INSTALLING A PULL BOX. SPLIT CONDUITS IN PLACE OF PULL BOXES ARE UNACCEPTABLE.
2. CONDUITS SHALL CONTAIN PLASTIC OR NYLON PULL TAPE RATED AT 200 LBS. WITH A MINIMUM OF 5 FEET OF EXTRA PULL TAPE COILED AT EACH END.
3. CONDUIT BEND RADIUS SHALL BE (a) A MINIMUM OF 6 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS 2-INCHES IN DIAMETER OR LESS, AND (b) 10 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS MORE THAN 2-INCHES IN DIAMETER.
4. TERMINATE CONDUIT STUBS AND SLEEVES THAT PROTRUDE THROUGH STRUCTURAL FLOORS 2-INCHES TO 3-INCHES ABOVE THE FLOOR SURFACE.
5. INSTALL BUSHINGS OR BELL ENDS AS REQUIRED ON ALL CONDUITS.
6. FLEX CONDUIT IS UNACCEPTABLE FOR USE AS A COMMUNICATIONS CONDUIT EXCEPT AT SEISMIC JOINTS AND/OR IF APPROVED IN WRITING BY THE ENGINEER.
7. ALL UNDER SLAB OR IN-SLAB CONDUITS SHALL BE INSTALLED IN A MANNER THAT PREVENTS WATER INFILTRATION OF THE CONDUIT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROUND WATER, RAIN WATER OR CONSTRUCTION WATER IS PREVENTED FROM ENTERING AND/OR REMOVED FROM THE CONDUITS PRIOR TO PLACEMENT OF COMMUNICATIONS CABLES. SEE ELECTRICAL SPECIFICATIONS, DETAILS AND PLANS FOR ADDITIONAL CONDUIT SEALING REQUIREMENTS.
8. ALL PULL BOXES SHALL BE SIZED AND INSTALLED PER ANSI-TIA-569-C. PULL BOXES FOR IN/UNDER SLAB CONDUIT RUNS ARE NOT PERMITTED UNLESS OTHERWISE NOTED. PULL BOXES FOR OVERHEAD CONDUIT RUNS SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS WITHIN THE ACCESSIBLE CEILING SPACE AND SUPPORTED INDEPENDENTLY FROM THE STRUCTURE AND CONDUIT SUPPORTS. PULL BOXES FOR ROOF MOUNTED OR EXTERIOR ABOVE GRADE APPLICATIONS SHALL BE NEMA 3R RATED. PULL BOXES SHALL BE SIZED ACCORDING TO THE FOLLOWING:

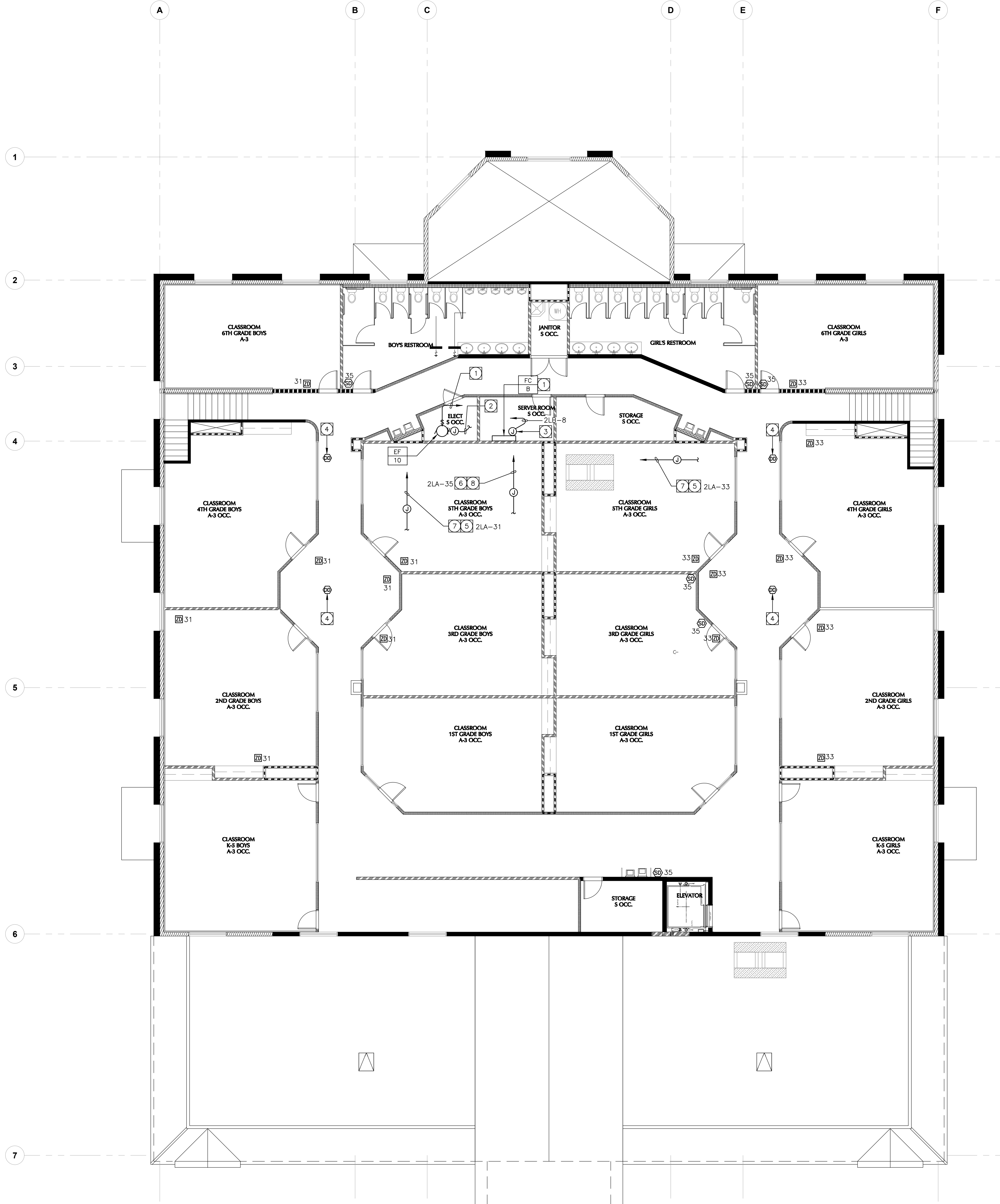
CONDUIT SIZE	WIDTH	LENGTH	DEPTH	WIDTH INCREASE PER ADDITIONAL CONDUIT
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3"	12"	48"	5"	6"
4"	15"	60"	8"	8"

FOR OTHER CONDUIT SIZES REFER TO ANSI/TIA-569-C TABLE 12. - LATEST PUBLISHED EDITION.

9. CONDUIT(S) SHALL EXIT A PULL BOX ON THE WALL OPPOSITE THE WALL ENTERED.
10. PROVIDE LABELING OF EACH CONDUIT PER GENERAL ELECTRICAL SPECIFICATIONS.
11. PROVIDE INTERNAL/EXTERNAL GAS AND WATER TIGHT MECHANICAL SEALING/PLUGGING OF EACH BUILDING ENTRY CONDUIT AS SPECIFIED ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.

PLAN NOTES:

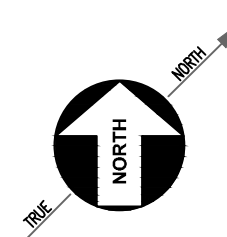
- 1 REFER TO MOTORIZED EQUIPMENT SCHEDULE ON SHEET E3.7 FOR MOTOR FEEDER/ BRANCH CIRCUIT INFORMATION.
- 2 PROVIDE 3/4" C.O.(S) TO RESPECTIVE CONTROL DEVICE(S) FOR CONTROL WIRING. REFER TO THE EQUIPMENT CONTROL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION.
- 3 CONNECT TO CONDENSATE PUMP. SEE MECHANICAL PLANS.
- 4 PROVIDE 3/4"C TO DUCT DETECTORS FOR HVAC UNITS AND EXTEND TO FACP.
- 5 PROVIDE COMPLETE CONNECTION TO ZONE DAMPERS (15). VERIFY EXACT LOCATION AND QUANTITIES OF ZONE DAMPERS WITH MECHANICAL PLANS PRIOR TO ROUGH IN.
- 6 CONTRACTOR TO PROVIDE COMPLETE CONNECTIONS TO SMOKE DAMPERS AS REQUIRED. SEE MECHANICAL PLANS FOR QUANTITY AND APPROXIMATE LOCATION(S). VERIFY EXACT LOCATION OF SMOKE DETECTORS WITH M.C. PRIOR TO ROUGH-IN.
- 7 3/4"C+2#10+1#12GRD.



SECOND FLOOR HVAC POWER PLAN

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

1



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DATE/DELTA REMARKS

LANCASTER BAPTIST CHURCH

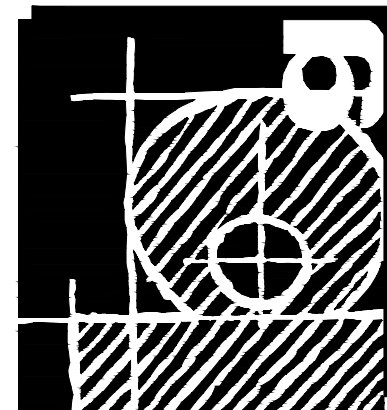
NORTH AUDITORIUM "KID CITY"

IMPROVEMENTS

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LANCASTER, CALIFORNIA

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SHEET TITLE:

SECOND FLOOR  
POWER PLAN

SUB DATE 05/08/19

BID DATE

DATE: 03/19/19

DRAWN BY: JT

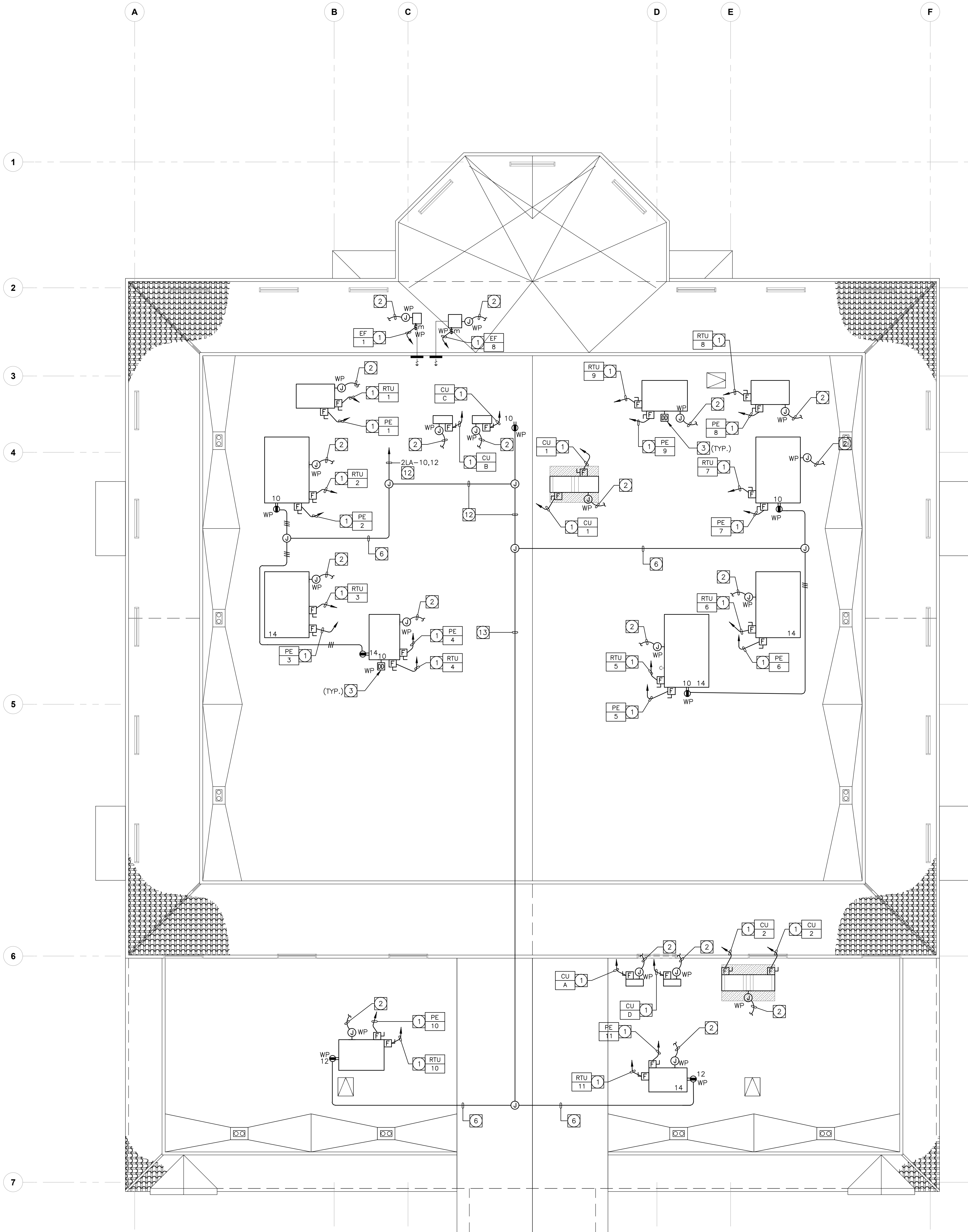
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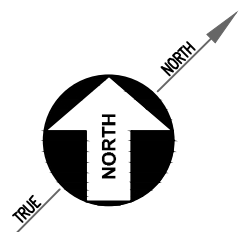
E-3.6





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

1



MOTORIZED EQUIPMENT SCHEDULE												
ITEM	DESCRIPTION	EQUIPMENT RATING				DISC. SW. SIZE			CIRCUIT DATA		SPECIFIC NOTES	
		VOLTS	PH.	HP	FLA	MCA	MOCR	SCCR	STARTER SIZE	CONDUIT — WIRE		
CU 1	CONDENSING UNIT	460	3	—	—	23	30	4,251	30A/3P	2HC-25,28,30 3/4" C-3#12 +1#10 GRD	A,B	
CU 1	CONDENSING UNIT	460	3	—	—	12.9	20	2,910	30A/3P	2HC-25,28,30 3/4" C-3#12 +1#12 GRD	A,B	
CU 2	CONDENSING UNIT	460	3	—	—	23	30	2,371	30A/3P	2HC-25,28,30 3/4" C-3#8 +1#10 GRD	A,B	
CU 2	CONDENSING UNIT	460	3	—	—	23	30	2,371	30A/3P	2HB-13,15,17 3/4" C-3#8 +1#10 GRD	A,B	
CU A	CONDENSING UNIT	208	1	—	—	18	25	914	30A/2P	2HB-13,15,17 3/4" C-2#12 +1#10 GRD	A,B	
CU B	CONDENSING UNIT	208	1	—	—	20	30	2,083	30A/2P	2LB-5-7 3/4" C-2#12 +1#10 GRD	A,B	
CU C	CONDENSING UNIT	208	1	—	—	20	30	2,083	30A/2P	2LB-9,11 3/4" C-2#12 +1#10 GRD	A,B	
CU D	CONDENSING UNIT	208	1	—	—	18	25	914	30A/2P	2LB-13 3/4" C-2#12 +1#10 GRD	A,B	
EF 1	EXHAUST FAN	120	1	1/4	5.8	—	15	—	—	2LB-2 3/4" C-2#12 +1#12 GRD	D	
EF 2	EXHAUST FAN	120	1	—	12W	—	15	—	—	1LB-54 3/4" C-2#12 +1#12 GRD	D	
EF 3	EXHAUST FAN	120	1	—	12W	—	15	—	—	1LB-56 3/4" C-2#12 +1#12 GRD	D	
EF 4	EXHAUST FAN	120	1	—	12W	—	15	—	—	1LB-58 3/4" C-2#12 +1#12 GRD	D	
EF 5	EXHAUST FAN	120	1	—	12W	—	15	—	—	1LB-60 3/4" C-2#12 +1#12 GRD	D	
EF 6	EXHAUST FAN	120	1	—	240W	—	15	—	—	1LB-62 3/4" C-2#12 +1#12 GRD	D	
EF 7	EXHAUST FAN	120	1	—	240W	—	15	—	—	1LB-64 3/4" C-2#12 +1#12 GRD	D	
EF 8	EXHAUST FAN	120	1	3/4	13.8	—	15	—	—	3/4" C-2#12 +1#12 GRD	D	
EF 9	EXHAUST FAN	120	1	—	155W	—	15	—	—	3/4" C-2#12 +1#12 GRD	E	
EF 10	EXHAUST FAN	120	1	—	81W	—	15	—	—	3/4" C-2#12 +1#12 GRD	E	
FC 1	FAN COIL (CU-1)	208	1	—	—	5.7	15	<5K	30A/2P	1LB-37-39 3/4" C-2#12 +1#12 GRD	A,B	
FC 2	FAN COIL (CU-1)	208	1	—	—	2.3	15	<5K	30A/2P	1LB-41-43 3/4" C-2#12 +1#12 GRD	A,B	
FC 3	FAN COIL (CU-1)	208	1	—	—	2.3	15	<5K	30A/2P	1LB-45-47 3/4" C-2#12 +1#12 GRD	A,B	
FC 4	FAN COIL (CU-1)	208	1	—	—	1.8	15	<5K	30A/2P	1LB-49-51 3/4" C-2#12 +1#12 GRD	A,B	
FC 5	FAN COIL (CU-1)	208	1	—	—	2.8	15	<5K	30A/2P	1LB-53-55 3/4" C-2#12 +1#12 GRD	A,B	
FC 6	FAN COIL (CU-2)	208	1	—	—	5.7	15	<5K	30A/2P	1LB-58-60 3/4" C-2#12 +1#10 GRD	A,B	
FC 7	FAN COIL (CU-2)	208	1	—	—	5.7	15	<5K	30A/2P	1LB-62-64 3/4" C-2#12 +1#10 GRD	A,B	
FC 8	FAN COIL (CU-2)	208	1	—	—	5.7	15	<5K	30A/2P	1LB-66-68 3/4" C-2#12 +1#10 GRD	A,B	
FC 9	FAN COIL (CU-2)	208	1	—	—	5.7	15	<5K	30A/2P	1LB-70-72 3/4" C-2#12 +1#10 GRD	A,B	
FC A	POWERED BY CU-A	—	—	—	—	—	—	—	—	—	A,B	
FC B	POWERED BY CU-B	—	—	—	—	—	—	—	—	—	A,B	
FC C	POWERED BY CU-C	—	—	—	—	—	—	—	—	—	A,B	
FC D	POWERED BY CU-D	—	—	—	—	—	—	—	—	—	A,B	
RTU 1	ROOF TOP UNIT	460	3	—	—	13	20	3,968	30A/3P	2HB-13,15,17 3/4" C-3#12 +1#10 GRD	A,C	
PE 1	POWER EXHAUST	460	3	1	—	2.5	3.1	15	3,968	2HB-7,9,11 3/4" C-3#12 +1#12 GRD	A	
RTU 2	ROOF TOP UNIT	460	3	—	—	42.2	50	8,748	60A/3P	2HB-13,15,17 3/4" C-3#6 +1#10 GRD	A,C	
PE 2	POWER EXHAUST	460	3	2	—	4.0	5.0	15	3,221	2HB-19,21,23 3/4" C-3#12 +1#12 GRD	A	
RTU 3	ROOF TOP UNIT	460	3	—	—	40.7	50	7,323	60A/3P	2HB-25,27,29 3/4" C-3#6 +1#10 GRD	A,C	
PE 3	POWER EXHAUST	460	3	2	—	4.0	5.0	15	2,512	2HB-31,33,35 3/4" C-3#12 +1#12 GRD	A	
RTU 4	ROOF TOP UNIT	460	3	—	—	24	30	3,731	30A/3P	2HB-2,4,6 3/4" C-3#10 +1#10 GRD	A,C	
PE 4	POWER EXHAUST	460	3	2	—	4.0	6.0	15	2,512	2HB-8,10,12 3/4" C-3#12 +1#12 GRD	A	
RTU 5	ROOF TOP UNIT	460	3	—	—	50.2	60	5,102	60A/3P	2HB-14,16,18 3/4" C-3#6 +1#10 GRD	A,C	
PE 5	POWER EXHAUST	460	3	4	—	6.6	10.8	30	2,410	2HB-20,22,24 3/4" C-3#10 +1#10 GRD	A	
RTU 6	ROOF TOP UNIT	460	3	—	—	40.7	50	4,475	60A/3P	2HB-26,28,30 3/4" C-3#6 +1#10 GRD	A,C	
PE 6	POWER EXHAUST	460	3	2	—	4.0	5.0	15	1,449	2HB-32,34,36 3/4" C-3#12 +1#12 GRD	A	
RTU 7	ROOF TOP UNIT	460	3	—	—	42.2	50	5,630	60A/3P	2HC-1,3,5 3/4" C-3#6 +1#10 GRD	A,C	
PE 7	POWER EXHAUST	460	3	2	—	4.0	5.0	15	1,825	2HC-7,9,11 3/4" C-3#12 +1#12 GRD	A	
RTU 8	ROOF TOP UNIT	460	3	—	—	20	25	2,895	30A/3P	2HC-13,15,17 3/4" C-3#10 +1#10 GRD	A,C	
PE 8	POWER EXHAUST	460	3	1	—	2.6	3.1	15	1,927	2HC-19,21,23 3/4" C-3#12 +1#12 GRD	A	
RTU 9	ROOF TOP UNIT	460	3	—	—	31	40	4,952	60A/3P	2HC-25,27,29 3/4" C-3#6 +1#10 GRD	A,C	
PE 9	POWER EXHAUST	460	3	3	—	6.4	6.8	20	2,319	2HC-31,33,35 3/4" C-3#12 +1#12 GRD	A	
RTU 10	ROOF TOP UNIT	460	3	—	—	20	25	1,958	30A/3P	2HC-2,4,6 3/4" C-3#10 +1#10 GRD	A,C	
PE 10	POWER EXHAUST	460	3	1	—	2.6	3.1	15	1,279	2HC-8,10,12 3/4" C-3#12 +1#12 GRD	A	
RTU 11	ROOF TOP UNIT	460	3	—	—	13	20	1,564	30A/3P	2HC-14,16,18 3/4" C-3#10 +1#10 GRD	A,C	
PE 11	POWER EXHAUST	460	3	1	—	2.5	3.1	15	1,014	2HC-20,22,24 3/4" C-3#12 +1#12 GRD	A	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	

ROOF PLAN SPECIFIC NOTES:

- REFER TO MOTORIZED EQUIPMENT SCHEDULE FOR MOTOR FEEDER/ BRANCH CIRCUIT INFORMATION.
- PROVIDE 3/4" C.O.(S) TO RESPECTIVE CONTROL DEVICE(S) FOR CONTROL WIRING. REFER TO THE EQUIPMENT CONTROL WIRING DIAGRAMS FOR ADDITIONAL INFORMATION.
- PROVIDE 3/4" C. TO FACP FOR COMPLETE CONNECTION TO DUCT DETECTOR. REFER TO MECHANICAL M2.3 FOR MORE INFORMATION.
- STUB-DOWN 3/4" CONDUIT ONLY INTO ACCESSIBLE CEILING SPACE FOR FUTURE CONNECTION TO TENANT PANEL.
- PROVIDE SWITCH AND CONNECT TO TENANT SIGNAGE. VERIFY EXACT LOCATION WITH ARCHITECT.
- 1/2" C-3#10, 1#10 GROUND.
- 1/2" C-2#10, 1#10 GROUND.
- ROUTE HOMERUN VIA LIGHTING CONTROL PANEL.
- THIS SPACE HAS BEEN IDENTIFIED A LOCATION FOR FUTURE PV SYSTEM INVERTER(S). THIS LOCATION ALSO PROVIDES AN ACCESSIBLE PATHWAY FOR FUTURE PV CONDUITS ROUTED TO THE MAIN ELECTRICAL SERVICE IN COMPLIANCE WITH CALIFORNIA TITLE 24 110.10(C).
- ACCESSIBLE PATHWAY FOR FUTURE PV CONDUITS ROUTED TO THE MAIN ELECTRICAL SERVICE IN COMPLIANCE WITH CALIFORNIA TITLE 24 110.10(C).
- STUB-DOWN 1" CONDUIT ONLY INTO ACCESSIBLE CEILING SPACE FOR FUTURE CONNECTION TO TENANT PANEL. REFER TO MOTORIZED EQUIPMENT SCHEDULE FOR MOTOR FEEDER/BRANCH CIRCUIT INFORMATION.
- 1" C-4#8, 1#8 GROUND.
- 3/4" C-3#8, 1#8 GROUND.

ROOF PLAN GENERAL NOTES:

- ELECTRICAL CONTRACTOR SHALL REFER TO MECHANICAL/PLUMBING AND ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND CHARACTERISTICS OF ALL EQUIPMENT LISTED IN SCHEDULE. ANY MODIFICATIONS AND/OR ADDITIONAL WORK NECESSARY SHALL BE INCLUDED IN THE BASE BID.
- ALL TEMPERATURE CONTROL AND INTERLOCK CONDUIT AND WIRING SHALL BE BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED. SEE MECHANICAL/PLUMBING DRAWINGS FOR ALL INFORMATION.
- ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL CONNECTION POINTS WITH THE EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
- ELECTRICAL CONTRACTOR SHALL PROVIDE LOCAL REMOTE DISCONNECTING MEANS FOR ALL ELECTRIC HEATING EQUIPMENT IF REQUIRED BY THE LOCAL ELECTRICAL CODE.
- ELECTRICAL CONTRACTOR SHALL COORDINATE THE ROUTING OF CONDUIT/WIRING TO ROOF-MOUNTED EQUIPMENT WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN. WHERE ROOF-MOUNTED EQUIPMENT IS MANUFACTURED TO BE FED FROM WITHIN MECHANICAL CURB ASSEMBLY — SEPARATE ROOF PENETRATIONS FOR WIRING CONNECTIONS SHALL NOT BE PERMITTED. ALL WIRING SHALL BE BELOW THE ROOF IN AN ACCESSIBLE CEILING SPACE LOCATION.
- ALL ROOF MOUNTED EQUIPMENT SHALL BE NEMA 3R RATED.
- UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW.

MOTORIZED EQUIPMENT SCHEDULE SPECIFIC NOTES:

- FUSED AS RECOMMENDED BY MANUFACTURER.
- PROVIDE 3/4" CONDUIT WITH QUANTITY/SIZE OF CONDUCTORS PER MECHANICAL CONTROL DIAGRAM BETWEEN CONDENSING UNIT AND RESPECTIVE FAN COIL UNIT.
- PROVIDE CONNECTION TO DUCT DETECTOR AT SUPPLY PLENUM. SEE ROOF PLAN.
- PROVIDE 120V TIME CLOCK ADJACENT TO PANEL FOR CONTROL.
- PROVIDE CONDUIT/CONDUCTORS TO LINE VOLTAGE T-STAT FOR CONTROL.

MOTORIZED EQUIPMENT SCHEDULE GENERAL NOTES:

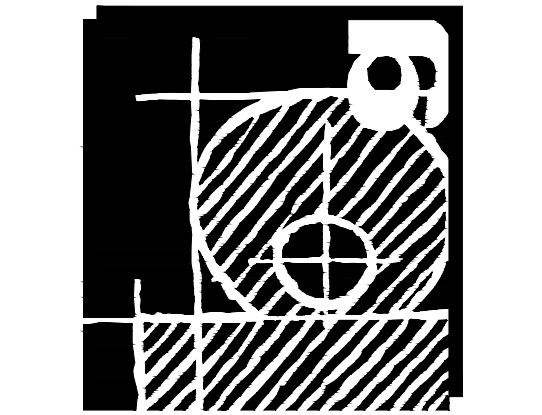
- ALL BRANCH CIRCUIT DATA IS BASED UPON METALLIC CONDUITS. IF THE CONTRACTOR ELECTS TO USE NONMETALLIC CONDUITS, AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED PER NEC, OR CEC WHERE ADOPTED, TABLE 250.122 AND THE CONDUIT SIZE SHALL BE INCREASED ACCORDINGLY.
- ELECTRICAL CONTRACTOR SHALL REFER TO ALL DOCUMENTS RELATED TO THE EQUIPMENT (I.E. SHOP DRAWINGS, CONSTRUCTION DOCUMENTS, ETC.) IN REGARDS TO ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT LISTED IN THE SCHEDULE. ANY MODIFICATION AND/OR ADDITIONAL WORK NECESSARY SHALL BE INCLUDED IN THE BASE BID.
- ELECTRICAL CONTRACTOR SHALL CHECK THE ROTATION OF ALL THREE PHASE MOTORS AND CORRECT THE ROTATION IF REVERSED.
- ELECTRICAL CONTRACTOR SHALL PROVIDE FUSES SIZED PER THE EQUIPMENT NAMEPLATE INFORMATION.
- DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE, EXTERNALLY OPERATED, QUICK MAKE QUICK BREAK AND SHALL BE FUSIBLE OR NON FUSIBLE AS INDICATED. A MAXIMUM VOLTAGE, CURRENT AND HORSEPOWER SHALL BE CLEARLY MARKED ON SWITCH ENCLOSURE. SWITCHES HAVING DUAL RATINGS (HIGHER RATINGS WHEN USED WITH DUAL ELEMENT FUSES) SHALL HAVE RATINGS INDICATED ON METAL PLATES RIVETED OR OTHERWISE PERMANENTLY ATTACHED TO THE ENCLOSURE. WHEN INDICATED, TOGGLE SWITCHES SHALL BE MOTOR RATED FOR THE APPLICATION.
- STARTERS SHALL BE FULL VOLTAGE, REDUCED VOLTAGE OR COMBINATION DISCONNECT AND STARTER, WITH CONTROL VOLTAGE AS REQUIRED, AS INDICATED ON THE DOCUMENTS RELATED TO THE EQUIPMENT, SUCH AS SHOP DRAWINGS, CONSTRUCTION DOCUMENTS, ETC. STARTERS SHALL INCLUDE MOTOR OVERLOAD PROTECTION, PHASE LOSS AND PHASE UNBALANCE PROTECTION AS REQUIRED.
- ALL TERMINATIONS AND ENCLOSURES SHALL BE RATED FOR USE WITH 75 DEGREE C CONDUCTORS.
- COMPLETE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF NEC (OR CEC WHERE ADOPTED) ARTICLES 430 AND 440.

REVISIONS

DATE/DELTA REMARKS

LANCASTER BAPTIST CHURCH  
NORTH AUDITORIUM "KID CITY"  
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DATE: 12/31/2019  
DRAWN BY: JT  
JOB NO: 11761  
CHECKED BY: SH

SHEET TITLE:

ROOF PLAN

SUB DATE: 05/08/19

BID DATE:

DATE: 03/19/19

DRAWN BY: JT

JOB NO: 11761

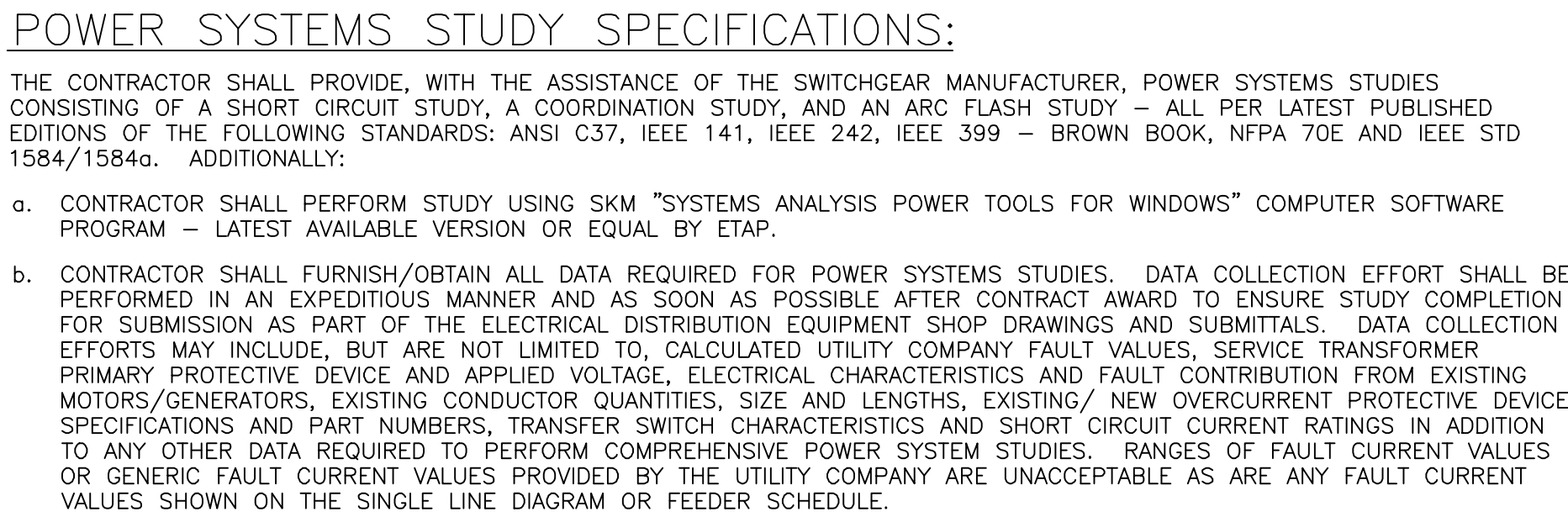
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E-3.7

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SCALE: N.T.S.

## FEEDER SCHEDULE

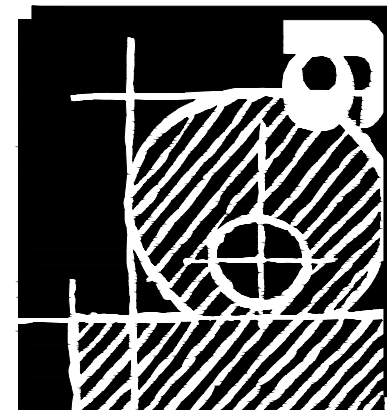
1. ALL FEEDERS SHOWN, UNLESS SPECIFICALLY NOTED OTHERWISE, ARE PRESUMED TO BE ROUTED IN METAL RACEWAYS. IF P.V.C. CONDUITS ARE UTILIZED, THE CONTRACTOR SHALL PROVIDE AN EQUIPMENT GROUND PER NEC ARTICLE 250.10. IF ADOPTED, TABLE 250.10, PROVIDE A MAIN BONDING JUMPER PER TABLE 250.66 AND INCREASE THE CONDUIT SIZE ACCORDINGLY.
2. LOADS INDICATED WITH " ( ) " REPRESENT WORST CASE LOAD IN AMPS.
3. DISTANCE SHOWN IS FOR DESIGN PURPOSES ONLY. IT IS NOT A MATERIAL TAKEOFF.
4. VOLTAGE DROP VALUE INDICATED IS AT THE END OF THE FEEDER.
5. AVAILABLE FAULT CURRENT VALUE AT THE END OF THE FEEDER INDICATED. CALCULATIONS ARE BASED ON INITIAL FAULTS OCCURRING FROM THE SERVING BUS, THE LENGTH AND IMPEDANCE OF THE FEEDER, THE SHORT CIRCUIT CURRENT RATING, EQUIPMENT BUS BRACING, AND/OR AMP INTERRUPTING CAPABILITY OF EQUIPMENT CONNECTED ON THE LOAD SIDE OF THE FEEDER SHALL BE GREATER THAN THE AVAILABLE FAULT CURRENT.

- 1 PROVIDE GROUNDING PER NEC, OR CEC WHERE ADOPTED, 250.30. SEE TRANSFORMER SCHEDULE FOR GEC/BJ SIZING INFORMATION. SEE SEPARATELY DERIVED SYSTEM GROUNDING DETAIL FOR MORE INFORMATION.
- 2 REMOVE EXISTING CIRCUIT BREAKERS CURRENTLY FEEDING EXISTING AC UNITS TO BE DEMO'D. RETURN BREAKERS TO OWNER AND PROVIDE DEAD-FRONT PANELS AS REQUIRED.
- 3 100A-3P-208V FUSED DISCONNECT SWITCH. SEE DETAIL #6 SHEET E6.1.

1. ALL SWITCHGEAR SHALL BE SQUARE D.
2. ALL ITEMS DEPICTED ON THE SINGLE LINE DRAWINGS SHALL BE ASSUMED AS NEW U.O.N.
3. ALL OVERCURRENT DEVICES IN AN INDIVIDUAL PIECE OF EQUIPMENT SHALL HAVE AN ARC RATING EQUAL TO THE OVERALL RATING OF THE EQUIPMENT—SERIES RATING OF DEVICES WITHIN A PIECE OF EQUIPMENT IS NOT ALLOWED. SEE SPECIFICATIONS FOR MORE INFORMATION.
4. SERIES RATED DEVICES SHALL HAVE BEEN INVESTIGATED BY U.L. IN COMBINATION WITH THE END USE EQUIPMENT AND IN THE EQUIPMENT IN WHICH THESE DEVICES ARE USED AND SHALL BE MARKED WITH A SERIES RATING. EQUIPMENT SHALL BE MARKED IN ACCORDANCE WITH NEC OR CEC—WHERE ADOPTED REQUIREMENTS. SEE SPECIFICATIONS FOR MORE INFORMATION. WHERE SERIES RATINGS ARE ALLOWED, THE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD TO INDICATE A SERIES COMBINATION RATING WHICH IS THE RESULT OF THE SERIES AND THE END USE EQUIPMENT.
5. CAUTION — SERIES COMBINATION SYSTEM RATED AT ????. AMPERES, USE ONLY IDENTIFIED REPLACEMENT COMPONENTS IN THIS SYSTEM.
6. WHERE ????. REPRESENTS AVAILABLE FAULT CURRENT. SEE SPECIFICATIONS FOR PLACARD REQUIREMENTS.
7. ALL TERMINATIONS AND ENCLOSURES SHALL BE RATED FOR USE WITH 75 DEGREE CELSIUS CONDUCTORS.
8. ALL SERVICE ENTRANCE EQUIPMENT RATED AT 400A OR GREATER SHALL BE PROVIDED WITH A BACKED-RATED, SOLID STATE MAIN OVERCURRENT DEVICE WITH BUSSING RATED AT 100% OF CURRENT (1000A/400A), FOR THE FOLLOWING: NO HEAT, NO ARC, NO BUSSING ALLOWED. NON-SERVICE ENTRANCE SWITCHBOARDS AND DISTRIBUTION BOARDS LARGER THAN 600A SHALL BE PROVIDED WITH BUSSING RATED FOR 100% OPERATION. SEE SPECIFICATION FOR CIRCUIT BREAKER REQUIREMENTS.
9. ALL NON-SERVICE ENTRANCE SWITCHBOARDS AND DISTRIBUTION BOARD MAIN OVERCURRENT DEVICES SHALL BE BACKFEEED-RATED. BACKFEEED RATINGS SHALL COMPLY WITH NEC, OR CEC WHERE ADOPTED, 690.10 (E) AND 705.12(D)(4). SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS REGARDING CIRCUIT BREAKERS.
10. PROVIDE CIRCUIT BREAKER ARC ENERGY REDUCTION MAINTENANCE SWITCHING PER NEC, OR CEC WHERE ADOPTED, 240.87(B)(3) FOR ANY CIRCUIT BREAKER, 1200A FRAME AND LARGER. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
11. ALL SWITCHBOARDS AND DISTRIBUTION BOARDS SHALL HAVE:
  - a. TIN-PLATED ALUMINUM BUSSING WITH RECTANGULAR CROSS SECTION. HORIZONTAL AND VERTICAL BUSSING SHALL BE FULL LENGTH. THERE SHALL BE NO PROVISIONS FOR FUTURE EXTENSIONS. ALL HORIZONTAL BUSSING SHALL HAVE A 1/2" STANDSTAND DISTANCE TO THE AVAILABLE PART OF CURRENT INDICATED. ALL VERTICAL AND HORIZONTAL BUSSING SHALL BE RATED AT FULL CAPACITY IN ALL SWITCHBOARD AND DISTRIBUTION BOARD SECTIONS. PROVIDE 100% NEUTRAL BUSSING MINIMUM UNLESS OTHERWISE NOTED. PROVIDE FULL LENGTH GROUND BUS AND, WHERE INDICATED ON PLANS, ISOLATED GROUND BUSSING. PROVIDE RAR WIRE WAY IN ALL SWITCHBOARD SECTIONS.
  - b. LUGS SUITABLE FOR USE WITH COPPER OR ALUMINUM CONDUCTORS LISTED FOR USE WITH 75 DEGREE CELSIUS AMPACITY CONDUCTORS.
  - c. PERMANENT PLACARD(S) MARKED PER THE SPECIFICATIONS AND PER NEC (OR CEC—WHERE ADOPTED) SECTIONS 225.37, 230.2(E), 690.56, 692.56, 700.7, 701.7, 702.7, 702.7, AND 705.10 DENOTING THE PRESENCE OF ADDITIONAL SERVICES, PHOTOVOLTAIC SYSTEMS, FUEL CELLS, EMERGENCY OR STAND-BY POWER SOURCES AS APPLICABLE.

9. CONTRACTOR SHALL SUBMIT SWITCHBOARD SHOP DRAWINGS TO THE SERVING UTILITY FOR APPROVAL PRIOR TO FABRICATION. CONTRACTOR SHALL SECURE CONFIRMATION THAT THE PROPOSED SWITCHBOARD COMPLIES WITH THE UTILITY COMPANY'S REGULATION.
10. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PER THE SPECIFICATIONS FOR SWITCHBOARDS, DISTRIBUTION BOARDS, TRANSFORMERS, PANEL BOARDS, AND ALL OTHER DEVICES SHOWN ON THE SINGLE LINE, PRIOR TO FABRICATION.
11. ALLOWABLE DIMENSIONS IN MAIN ELECTRICAL ROOM ARE A CRITICAL COORDINATION ITEM. CONTRACTOR SHALL PROVIDE 1/4" = 1'-0" SCALE DRAWINGS WITH SWITCHGEAR SUBMITTALS SHOWING THAT ALL PROPOSED EQUIPMENT WILL FIT IN THE SPACE PROVIDED. SUBMITTALS WITHOUT THIS DRAWING SHALL BE REJECTED AS INCOMPLETE.
12. UNLESS SPECIFICALLY SHOWN AS (E), (R), (ER), (D), EXISTING OR NON-BOLD, ALL ELECTRICAL DEVICES SHOWN ARE NEW
13. WHERE REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION OR WHERE A NEW GROUND FAULT PROTECTIVE DEVICE IS REQUIRED TO BE INSTALLED, A GROUND FAULT SYSTEM TEST SHALL BE PERFORMED BY AN INDEPENDENT TESTING AGENCY PER NEC (OR CEC-WHERE ADOPTED) 230.95(C). THE GROUND FAULT SYSTEM TEST SHALL BE PERFORMED IN THE PRESENCE OF THE LOCAL AUTHORITY HAVING JURISDICTION. VERIFICATION OF THE POWER SYSTEMS STUDY SPECIFICATION SHALL BE PERFORMED BY THE SAME INDEPENDENT TESTING AGENCY. THE GROUND FAULT TEST RESULTS SHALL BE DELIVERED TO THE ENGINEER OF RECORD.
14. SEE POWER SYSTEMS STUDY SPECIFICATION FOR ADDITIONAL REQUIREMENTS. ALL REQUIRED POWER SYSTEMS STUDIES MUST BE COMPLETED AND SUBMITTED WITH ELECTRICAL POWER DISTRIBUTION EQUIPMENT SUBMITTAL. FAILURE TO DO SO WILL PREVENT THE ENGINEER FROM EFFECTIVELY EVALUATING THE SUBMITTAL. THIS MAY RESULT IN REJECTION OF THE ELECTRICAL POWER DISTRIBUTION EQUIPMENT SUBMITTAL AS INCOMPLETE.

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**SHEET TITLE:**

SUB DATE	05/08/19
BID DATE	
DATE:	03/19/19
DRAWN BY:	JL
JOB NO:	1176
CHECKED BY:	SH
SHEET NUMBER:	
E4.1	



PANEL 1HA (NEW)																																					
MOUNTING		SURFACE		DOUBLE LUG		NO		VOLTS		277/480V		MAIN		M.L.O.																							
NEMA 3R		NO		200% NEUTRAL		NO		PHASE		3		BUS		225A																							
FEED THRU		NO		I/G BUS		NO		WIRE		4		A.I.C.		22,000																							
NOTES	LOCATION		A		B		C		L T G		C O I N T V		K I E I C S P C		B K R		C I R C		C I R C		B K R		M I E I C S P C		K I E I C S P C		L T G		A		B		C		LOCATION		NOTES
	INTERIOR LIGHTING		3080						127						20/1		1				2		20/1				27		1770						ASSEMBLY LIGHTING		
	INTERIOR LIGHTING				2394				94				20/1		3				4		20/1				39				988						LOBBY LIGHTING		
	EXTERIOR LIGHTING						128		B				20/1		5				6		20/1				47						1181				CORRIDOR LIGHTING		
	SPARE												20/1		7				8		20/1														SPARE		
	SPARE												20/1		9				10		20/1														SPARE		
	SPARE												20/1		11				12		20/1														SPARE		
	SPACE														13				14																SPACE		
	SPACE														15				16																SPACE		
	SPACE														17				18																SPACE		
SPACE														19				20																SPACE			
SPACE														21				22																SPACE			
SPACE														23				24																SPACE			
TRANSF. 1TA		18250										1 100/3		25				26																SPACE			
(SUB-FEED)				18983										---		27		28		20/1		1						3000						INSTA-HOT			
---						18739								---		29		30		20/1		1								3000				INSTA-HOT			
A= 23100 VA					B= 25365 VA					C= 23048 VA																											
PHASE A LCL= 1213 VA					PHASE B LCL= 846 VA					PHASE C LCL= 327 VA																											
PHASE A W/LCL= 24313 VA					PHASE B W/LCL= 26210 VA					PHASE C W/LCL= 23375 VA																											
TOTAL VA= 71512					TOTAL LCL= 2385					TOTAL VA W/LCL= 73898																											
					AMPS= 89					HIGH PHASE AMPS= 95																											

PANEL 2HA (NEW)																																		
MOUNTING		SURFACE		DOUBLE LUG		200% NEUTRAL		NO		VOLTS		277/480V		MAIN		M.L.O.																		
NEMA 3R		NO				I/G BUS		NO		PHASE		3		BUS		225A																		
FEED THRU		NO						NO		WIRE		4		A.I.C.		22,000																		
NOTES	LOCATION	A			B			C			L T G	C O I N T V	K I E I C S P C	B K R	C I R C	C I R C	B K R	M I E I C S P C	K I E I C S P C	L T G	A			B			C			LOCATION	NOTES			
		A	B	C	A	B	C	A	B	C																								
	INTERIOR LIGHTING	2422						95			20/1	1				2	20/1														SPARE			
	INTERIOR LIGHTING				2394						20/1	3				4	20/1														SPARE			
	CORRIDOR/STAIR LTS						1522	58			20/1	5				6	20/1														SPARE			
	SPACE										20/1	7				8																SPACE		
	SPACE											9				10																	SPACE	
	SPACE											11				12																	SPACE	
	SPACE											13				14																	SPACE	
	SPACE											15				16																	SPACE	
	SPACE											17				18																	SPACE	
	SPACE											19				20																	SPACE	
	SPACE											21				22																	SPACE	
	SPACE											23				24																	SPACE	
	TRANSF. 2TA	16258								1	100/3	25				25																	SPACE	
	---				15758						---	27				28																	SPACE	
	---						13190				---	29				30																	SPACE	
A= 18680 VA					B= 18152 VA					C= 14712 VA																								
PHASE A LCL= 606 VA					PHASE B LCL= 599 VA					PHASE C LCL= 381 VA																								
PHASE A W/LCL= 19285 VA					PHASE B W/LCL= 18750 VA					PHASE C W/LCL= 15093 VA																								
TOTAL VA= 51543					TOTAL LCL= 1565					TOTAL VA W/LCL= 53128																								
					AMPS= 64					HIGH PHASE AMPS= 70																								

PANEL 1LA (NEW)																								
MOUNTING		SURFACE		DOUBLE LUG		200% NEUTRAL		NO		VOLTS		120/208		MAIN		200A								
NEMA 3R		NO				I/G BUS		NO		PHASE		3		BUS		225A								
FEED THRU		NO						NO		WIRE		4		A.I.C.		10,000								
NOTES	LOCATION				L T G	C O I N T V	K I E I C S P C	B K R	C I R C	C I R C	B K R	M I E I C S P C	K I E I C S P C	L T G				LOCATION	NOTES					
		A	B	C											A	B	C							
	CONV RECEPTS.	720					4	20/1	1		2	20/1		6	1080			CONV RECEPTS.						
	CONV RECEPTS.		900				5	20/1	3		4	20/1		6		1080		CONV RECEPTS.						
	DRINKING FOUNTAIN			750			2	20/1	5		6	20/1	2				750	DRINKING FOUNTAIN						
	CONV RECEPTS.	1080					6	20/1	7		8	20/1		5	900			CONV RECEPTS.						
	CONV RECEPTS.		1080				6	20/1	9		10	20/1		5		900		CONV RECEPTS.						
	CONV RECEPTS.			1080			6	20/1	11		12	20/1		6		1080		CONV RECEPTS.						
	CONV RECEPTS.	900					5	20/1	13		14	20/1		5	900			CONV RECEPTS.						
	CONV RECEPTS.		900				5	20/1	15		16	20/1		2		900		CONV RECEPTS.						
	CONV RECEPTS.			900			5	20/1	17		18	20/1	2				200	1ST FLOOR DAMPERS						
	CONV RECEPTS.	900					5	20/1	19		20	20/1	6		600			1ST FLOOR DAMPERS						
	CONV RECEPTS.		900				5	20/1	21		22	20/1	7			700		2ND FLOOR DAMPERS						
	DRINKING FOUNTAIN			750			2	20/1	23		24	20/1	6			600		3rd FLOOR DAMPERS						
	CONV RECEPTS.	1080					6	20/1	25		26	20/1	4		720			MATVIST AMP						
	COPER		1500				1	20/1	27		28	20/1	1			100		FACP						
	WASHER			1200			1	20/1	29		30	20/1	1				100	CAMERA						
	IRRIG. CONTROL	500					1	20/1	31		32	20/1	3		900			SERVER ROOM						
	ELEV RM CONV REC		180				1	20/1	33		34	20/1	2			800		UPS						
	ELEV RM LIGHTING			100			1	20/1	35		36	30/1	1			2700		PANEL 1LB						
	ELEV CABLING	100					1	20/1	37		38	100/3	1		7845									
	ELEV SHANT LIGHTING		100				1	20/1	39		40	---			6655									
	ELEV SHANT RECEPT			180			1	20/1	41		42	---				8324								
		A= 18225 VA						B= 18725 VA						C= 18714 VA										
		PHASE A L LCL= 25 VA						PHASE B L LCL= 258 VA						PHASE C L LCL= 25 VA										
		PHASE A W/LCL= 18250 VA						PHASE B W/LCL= 18983 VA						PHASE C W/LCL= 18739 VA										
		TOTAL VA= 55664						TOTAL LCL= 308						TOTAL VA W/LCL= 56971										
								AMPS= 155						HIGH PHASE AMPS= 158										



PANEL AV (NEW)																					
MOUNTING NEMA 3R FEED THRU		SURFACE		DOUBLE LUG 200% NEUTRAL IG BUS				NO NO		VOLTS PHASE WIRE		120/208 3 4		MAIN BUS AIC		100A 100A 10,000					
N O T E S	LOCATION	A	B	C	L C T O N V	K E I C P	M I E S C	B K R	C I R C	C I R C	B K R	M I E S C	K E I C P	L C T O N V	A	B	C	LOCATION	N O T E S		
	ASSEMBLY LED SCREEN	1500							1	20/1	1				2	20/1	2		600		LOBBYTVS
	ASSEMBLY LED SCREEN		1500						1	20/1	3				4	20/1			900		LOBBY RECEPTS.
	ASSEMBLY LED SCREEN			1500					1	20/1	5				6	20/1	2		600		LOBBYTVS
	ASSEMBLY LED SCREEN	1500							1	20/1	7				8	20/1			720		LOBBY RECEPTS.
	ASSEMBLY LED SCREEN		1500						1	20/1	9				10	20/1	1		1500		AUTOMATIC DOOR
	ASSEMBLY LED SCREEN			1500					1	20/1	11				12	20/1			1080		ASSEMBLY CONVREC
	A/BOOTH	900							2	20/1	13				14						SPACE
	A/BOOTH		900						2	20/1	15				16						SPACE
	A/BOOTH			900					2	20/1	17				18						SPACE
	A/ROOM	900							1	20/1	19				20						SPACE
	A/ROOM		900						1	20/1	21				22						SPACE
	A/ROOM			900					1	20/1	23				24						SPACE
	A/ROOM	900							1	20/1	25				26						SPACE
	A/ROOM		900						1	20/1	27				28						SPACE
	SPACE									29	30										SPACE
	SPACE									31	32										SPACE
	SPACE									33	34										SPACE
	SPACE									35	36										SPACE
	SPACE									37	38										SPACE
	SPACE									39	40										SPACE
	SPACE									41	42										SPACE
A= 7020 VA		B= 8100 VA				C= 6480 VA															
PHASE A LCL= 0 VA		PHASE B LCL= 0 VA				PHASE C LCL= 0 VA															
PHASE A W/LCL= 7020 VA		PHASE B W/LCL= 8100 VA				PHASE C W/LCL= 6480 VA															
TOTAL VA= 21600		TOTAL LCL= 0				TOTAL VA W/LCL= 21600															
AMPS= 60		HIGH PHASE AMPS= 68																			

COORDINATE WITH APPLICABLE TRADE TO INSURE RECESSED MOUNTED PANELBOARDS WILL SEAT FLUSH IN THE WALLS PROVIDED PANELS ARE SUPPLIED WITH THE CORRECT SIZES AND FASTENERS WITH FLUSH TYPE COMBINATION LOCK AND CATCH, TWO MILLED TYPE KEYS SUPPLIED WITH EACH PANEL. ALL LOCKS SHALL BE PROVIDED WITH A TYPE IDENTIFICATION CARD OR PLASTIC COVERED DIRECTORY FRAME WITH A TYPED IDENTIFICATION CARD OF ALL CIRCUIT AND PANEL NUMBERS FOR BRANCH CIRCUIT PANELBOARDS.

14. UPON PROJECT COMPLETION, CONTRACTOR SHALL INSTALL TYPED AS-BUILT PANEL DIRECTORIES IN EACH PANEL WITHIN THE MFG-PROVIDED DIRECTORY HOLDER. THE DIRECTORY SHALL CLEARLY SHOW THE LOCATION OF EACH PANEL, THE CIRCUIT AND SPECIFIC PURPOSE OR USE. EACH CIRCUIT IDENTITY SHALL INCLUDE SUFFICIENT DETAIL TO ALLOW EACH CIRCUIT TO BE DISTINGUISHED FROM ALL OTHERS BY NAME OR CEC NUMBER. ADOPTED, ART 408.1 AND 408.4. HANDWRITTEN DIRECTORIES ARE UNACCEPTABLE. COPIES OF AS-BUILT PANEL SCHEDULES SHALL BE PROVIDED TO EACH PANEL OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LARGER-THAN-STANDARD CUSTOM PANEL DIRECTORY HOLDERS TO ACCOMMODATE COPIES OF AS-BUILT PANEL SCHEDULES.

15. PANELBOARDS SHALL BE MANUFACTURED BY G.E., CUTLER-HAMMER, SIEMENS, OR SQUARE "D". FUSED PANEL BOARDS SHALL BE BY COOPER BUSSMANN.

16. PROVIDE SHOP DRAWING SUBMITTAL PER THE ELECTRICAL SPECIFICATION SUBMITTAL REQUIREMENTS FOR EACH PANEL DEPENDENT CONFORMANCE TO THE ELECTRICAL SCHEDULES.

13. COORDINATE WITH APPLICABLE TRADE TO INSURE RECESSED MOUNTED PANELBOARDS WILL SEAT FLUSH IN THE WALLS PROVIDED THE PANEL TRIMMER IS CONCEALED DOWNSIDE AND FASTENERS WITH FLUSH TYPE COMBINATION LOCK AND CATCH, TWO MILLED TYPE KEYS SUPPLIED WITH EACH PANEL. ALL LOCKS SHALL BE KEYPED ALIKE AND EACH DOOR SHALL HAVE A PLASTIC COVER OVER THE IDENTIFICATION FRAME WITH A TYPED IDENTIFICATION CARD OF ALL CIRCUIT AND PANEL NUMBERS FOR BRANCH CIRCUIT PANELBOARDS.
  14. UPON PROJECT COMPLETION, CONTRACTOR SHALL INSTALL TYPED AS-BUILT PANEL DIRECTORIES IN EACH PANEL WITHIN THE INFORMATION PROVIDED BY THE SUBMITTER. THE DIRECTORY SHALL CLEARLY IDENTIFY EACH CIRCUIT TO ITS CLEAR, EVENT, AND SPECIFIC PURPOSE OR USE. EACH CIRCUIT DIRECTORY SHALL INCLUDE THE IDENTIFICATION NUMBER OF EACH CIRCUIT TO BE DISTINGUISHED FROM ALL OTHERS PER NEC, OR CEC WHERE ADOPTED, ART 408.1 AND 408.4. HANDWRITTEN DIRECTORIES ARE UNACCEPTABLE. COPIES OF AS-BUILT PANEL SCHEDULES SHALL BE PROVIDED TO THE SUBMITTER. E.C. TO INCLUDE ALL COST REQUIRED FOR LARGER-THAN-STANDARD CUSTOM PANEL DIRECTORY HOLDERS TO ACCOMMODATE COPIES OF AS-BUILT PANEL SCHEDULES.
  15. PANELBOARDS SHALL BE MANUFACTURED BY C.E., CUTLER-HAMMER, SIEMENS, OR SQUARE "D". FUSED PANEL BOARDS SHALL BE BY COOPER BUSSMANN.
  16. PROVIDE SHOP DRAWING SUBMITTAL PER THE ELECTRICAL SPECIFICATION SUBMITTAL REQUIREMENTS FOR EACH PANEL DEPICTING CONFORMANCE WITH THE ABOVE NOTES AND SCHEDULES.
- SPECIFIC PANEL SCHEDULE NOTES:**
- "A" PROVIDE LOCK-ON DEVICE.
  - "B" PROVIDE LOCK-OFF DEVICE.
  - "C" PROVIDE SHUNT TRIP DEVICE.
  - "D" PROVIDE GFCI TYPE DEVICE.
  - "E" PROVIDE A RED CIRCUIT BREAKER.
  - "F" PROVIDE A NEW BREAKER TO MATCH THE EXISTING IN PANEL.
  - "G" EXISTING BREAKER WITH NEW LOAD.
  - "H" PROVIDE AFCI TYPE DEVICE COMPLYING WITH NEC, OR CEC WHERE ADOPTED, 210.12(A) & (B).

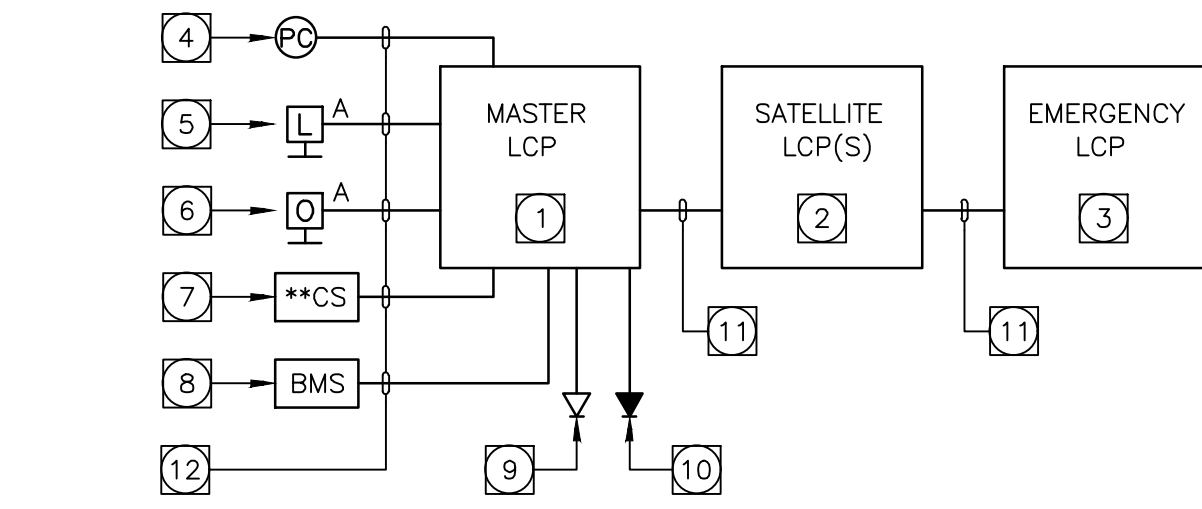
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Electrical Lead - Steve Hayman  
tk1sc Job #: 2018-0585



LIGHTING CONTROL SYSTEM SCHEMATIC:



LIGHTING CONTROL SYSTEM SCHEMATIC PLAN NOTES:

1. MASTER LIGHTING CONTROL PANEL. SEE PLANS FOR EXACT LOCATION. REFER TO MASTER LIGHTING CONTROL PANEL SCHEDULE FOR MORE INFORMATION. PROVIDE 120V POWER AS REQUIRED. DO NOT USE LIGHTING BRANCH CIRCUIT FOR CONTROL PANEL POWER.
2. SATELLITE LIGHTING CONTROL PANEL(S). SEE PLANS FOR EXACT LOCATION AND QUANTITY. REFER TO SATELLITE LIGHTING CONTROL PANEL SCHEDULE(S) FOR MORE INFORMATION. DO NOT USE LIGHTING BRANCH CIRCUIT FOR CONTROL PANEL POWER.
3. EMERGENCY LIGHTING CONTROL PANEL(S). PROVIDE 120V OR 277V UNSWITCHED NORMAL AND/OR EMERGENCY CIRCUIT. CONNECT CIRCUIT(S) AS REQUIRED SUCH THAT THE EMERGENCY LCP(S) FUNCTION(S) IN A POWER OUTAGE BY TURNING ALL LIGHTING CIRCUITS CONTROLLED BY RESPECTIVE EMERGENCY LCP(S). SEE PLANS FOR EXACT LOCATION. REFER TO EMERGENCY LIGHTING CONTROL PANEL SCHEDULE FOR MORE INFORMATION.
4. EXTERIOR PHOTOCELL MOUNTED AT EXTERIOR ROOFTOP LOCATION FACING NORTH. SEE LIGHTING CONTROL PANEL SCHEDULE(S) AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
5. LOCAL SWITCH(ES) UNDER A COMMON FACEPLATE. SEE LIGHTING CONTROL PANEL SCHEDULE(S) FOR EXACT QUANTITY AND SEE PLANS FOR EXACT LOCATION(S) AND LIGHTING CONTROL SWITCH FACEPLATE CONFIGURATION(S) FOR ADDITIONAL REQUIREMENTS.
6. OVERRIDE SWITCH(ES) UNDER A COMMON FACEPLATE. SEE LIGHTING CONTROL PANEL SCHEDULE(S) FOR EXACT QUANTITY AND SEE PLANS FOR EXACT LOCATION(S) AND CONFIGURATION(S).
7. WHEN "IDCS/DPCS" OPTION IS INDICATED IN LIGHTING CONTROL PANEL SCHEDULE PROVIDE 3/4" C. WITH REQUIRED CONDUCTORS TO EACH IDCS AND/OR DPCS PANEL OR INTERFACE DEVICES PER THEIR RESPECTIVE SCHEDULES, IF PROVIDED ON PROJECT. SEE LIGHTING CONTROL SCHEDULE AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
8. WHEN "BMS" OPTION IS INDICATED IN LIGHTING CONTROL PANEL SCHEDULE, PROVIDE 3/4" C. WITH REQUIRED CONDUCTORS TO NEAREST BMS GATEWAY/INTERFACE DEVICE. COORDINATE LOCATION, CONDUCTOR QUANTITIES/TYPES, AND TERMINATION LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE 120V POWER/RECEPTACLE AS REQUIRED. SEE LIGHTING CONTROL PANEL SCHEDULE(S) AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
9. WHEN "MODEM" OPTION IS INDICATED IN LIGHTING CONTROL PANEL SCHEDULE, PROVIDE 3/4" C. WITH CATEGORY 5 ANALOG FAX/MODEM LINE FROM LCP TELEPHONE MODEM TO NEAREST TELEPHONE BACKBOARD. TERMINATE CABLE AS REQUIRED TO OBTAIN CONNECTION SERVICE PROVIDER DIAL TONE. TEST CONNECTION WITH LCP MANUFACTURER TO ENSURE MANUFACTURER CAN PROVIDE REMOTE TROUBLESHOOTING SUPPORT, ETC. PROVIDE 120V POWER/RECEPTACLE AS REQUIRED.
10. WHEN "SNMP" OPTION IS INDICATED IN LIGHTING CONTROL PANEL SCHEDULE, PROVIDE 3/4" C. WITH CATEGORY 6 DATA CABLE FROM LCP SNMP INTERFACE DEVICE TO NEAREST IDF CLOSET TO ALLOW COMMUNICATIONS PER THE LIGHTING CONTROL SYSTEM SCHEDULE AND SPECIFICATIONS. COIL 30' OF EXTRA CABLE WITHIN IDF CLOSET. COILED CABLE SHALL BE TAGGED NOTING FAR-END TERMINATION LOCATION AND "LIGHTING CONTROL SYSTEM LAN INTERFACE CABLE". ALL CONDUIT/PULL BOXES SHALL BE INSTALLED PER GENERAL COMMUNICATIONS PATHWAY NOTES. PROVIDE 120V POWER/RECEPTACLE AS REQUIRED.
11. PROVIDE 3/4" CONDUIT MINIMUM, OR LARGER AS REQUIRED, WITH QUANTITY AND TYPE OF CONDUCTORS, PER MANUFACTURER'S RECOMMENDATIONS, FOR INTERCONNECTION MASTER AND SLAVE PANELS. REFER TO MASTER RELAY SCHEDULE FOR NETWORKING TYPE.
12. PROVIDE 3/4" CONDUIT MINIMUM, OR LARGER AS REQUIRED, WITH QUANTITY AND TYPE OF CONDUCTORS PER MANUFACTURER'S RECOMMENDATIONS.

LIGHTING CONTROL SYSTEM REQUIREMENTS:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FURNISHING OF ALL MATERIAL, LABOR, EQUIPMENT, AND SERVICES, IN CONNECTION WITH THE INSTALLATION OF A COMPLETE AND FULLY FUNCTIONING AND CODE COMPLIANT INSTALLATION.
2. IT IS THE INTENT OF THE CONTRACT DOCUMENTS, WHICH ARE PRESENTED IN A DIAGRAMMATIC FORMAT, TO PROVIDE CONTRACTOR INFORMATION THAT SUPPLEMENTS AND ENHANCES THE GENERALLY ACCEPTED CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES EMPLOYED IN CONNECTION WITH INSTALLATION OF THIS TYPE OF PRODUCT/SYSTEM.
3. THE CONTRACTOR SHALL ALSO INCORPORATE THE REQUIREMENTS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS/WARRANTY REQUIREMENTS AS PART OF THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS. IN THE EVENT OF A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND THE MANUFACTURER'S INSTALLATION REQUIREMENTS, THE MORE STRINGENT REQUIREMENTS SHALL APPLY UNLESS THE MORE STRINGENT REQUIREMENT VIOLATES APPLICABLE LAWS OR VIOLATES THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION. ANY SUCH CONFLICT SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING THROUGH THE FORMAL RFI PROCESS.
4. REFER TO THE ASSOCIATED SCHEDULES, SCHEMATICS, DRAWINGS, AND SPECIFICATIONS FOR DETAILED INFORMATION/REQUIREMENTS ON THIS PRODUCT/SYSTEM.

LIGHTING CONTROL SYSTEM SPECIFICATIONS:

1. ALL EQUIPMENT SHALL BE NEW, OF CURRENT DESIGN, AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF IEEE, NEMA, UL, ANSI AS WELL AS LOCAL JURISDICTION REQUIREMENTS. ALL EQUIPMENT SHALL BE FACTORY ASSEMBLED AND TESTED. THE LATEST PUBLISHED EDITION OF THE FOLLOWING DOCUMENTS SHALL APPLY TO THE MANUFACTURING AND INSTALLATION OF THE LIGHTING CONTROL SYSTEM:
  - UL 916
  - UL 924
  - ASHRAE 90.1-2004
  - CALIFORNIA TITLE 24- WHERE ADOPTED
  - ALL OTHER APPLICABLE STATE AND LOCAL ENERGY CODES
  - NEC, OR CEC WHERE ADOPTED, ART. 409
  - NEC, OR CEC WHERE ADOPTED, ART. 725
  - NEC, OR CEC WHERE ADOPTED, ART. 700.10(b)
2. ALL COMPONENTS OF THE LIGHTING CONTROL SYSTEM SHALL BE MANUFACTURED BY A SINGLE MANUFACTURER. THE ENTIRE SYSTEM SHALL BE COVERED BY A TWO YEAR WARRANTY. TELEPHONE FACTORY SUPPORT SHALL BE AVAILABLE AT NO ADDITIONAL COST TO THE CONTRACTOR OR OWNER BOTH DURING AND AFTER THE WARRANTY PERIOD.
3. THE LIGHTING CONTROL PANELS SHALL BE FACTORY PRE-ASSEMBLED AND UL LISTED. PROVIDE COMPLETE WITH ALL REQUIRED CONTROL TRANSFORMERS AND REQUIRED VOLTAGE BARRIERS. WHEN DESIGNATED AS SURFACE MOUNTING, PROVIDE A SCREW-ON COVER. WHEN DESIGNATED AS FLUSH MOUNTING, PROVIDE A HINGED DOOR ASSEMBLY.
4. LIGHTING CONTROL RELAYS SHALL HAVE THE FOLLOWING CHARACTERISTICS:
  - RATED FOR FULL CIRCUIT LOAD AND SUITABLE FOR ALL TYPES OF LAMP LOADS TO A MINIMUM OF 20 AMPERES AT 347 VAC (SINGLE POLE) AND 600 VAC (DOUBLE POLE).
  - CONTAINED IN A MOLDED CASE CONTAINING BOTH HIGH AND LOW VOLTAGE TERMINALS AND SHALL HAVE A BUILT-IN OPERATING LEVER MARKED ON/OFF FOR MANUAL SWITCHING AT THE RELAY PANEL.
  - RELAY LOAD CONTACTS SHALL BE ABLE TO SUSTAIN AVAILABLE FAULT CURRENTS AT THE LOCATION OF THE RELAY WITHIN THE ELECTRICAL SYSTEM AS INDICATED IN THE LIGHTING CONTROL SCHEDULE(S). ALL RELAYS SHALL BE CONSPICUOUSLY MARKED WITH THEIR RESPECTIVE SHORT CIRCUIT CURRENT RATING (SCCR). IN NO CASE SHALL A RELAY HAVE AN SCCR LESS THAN 14,000 AMPS.
  - SHOULD A RELAY(S) INTERRUPTING CAPACITY BE INADEQUATE BASED ON AVAILABLE SYSTEM FAULT CURRENT, THE CONTRACTOR SHALL MAKE ONE OR MORE OF THE FOLLOWING MODIFICATIONS:
    - a. EXTEND THE LENGTH OF THE BRANCH CIRCUIT WIRING TO REDUCE THE AVAILABLE FAULT CURRENT TO A LEVEL THAT IS BELOW THE SCCR RATING OF THE RELAY(S).
    - b. RELOCATE LCP(S) IN ORDER TO EXTEND BRANCH CIRCUIT CONDUCTORS TO REDUCE THE AVAILABLE FAULT CURRENT TO A LEVEL THAT IS BELOW THE SCCR RATING OF THE RELAY(S).
    - c. UTILIZE A MECHANICALLY-HELD LATCHING LIGHTING CONTACTOR(S) WITH SUFFICIENT SCCR-RATING(S). MINIMUM SCCR SHALL BE 14,000A. CONTACTOR(S) SHALL BE OF THE TYPE THAT AUTOMATICALLY CLOSSES UPON LOSS OF CONTROL POWER. CONTACTOR(S) SHALL CARRY CIRCUIT CURRENT WHICH, IN TURN, SHALL BE CONTROLLED BY THE LCP RELAY. NUMBER OF CONTACTOR POLES SHALL EQUAL NUMBER OF RELAY POLES SHOWN IN THE LIGHTING CONTROL PANEL SCHEDULE(S) FOR THAT PARTICULAR LOAD (EXAMPLE A 2-POLE RELAY REQUIRES USE OF A 2-POLE LIGHTING CONTACTOR). USING MULTI-POLE CONTACTORS TO COMBINE OUTPUTS/SWITCH LEGS OF DIFFERENT RELAYS IS EXPRESSLY PROHIBITED. EACH CONTACTOR SHALL BE LABELED WITH THE CONTROLLING RELAY LCP NAME AND CONTROLLING RELAY ID #. SEE LABELING REQUIREMENTS WITHIN THE GENERAL ELECTRICAL SPECIFICATION. CONTACTORS SHALL BE LOCATED IN A NEMA ENCLOSURE ABOVE OR ADJACENT TO THEIR SERVING LIGHTING CONTROL PANEL. CONTRACTOR SHALL INCLUDE CONTACTOR CABINET LOCATION ON 1/4" SCALE ELECTRICAL ROOM SHOP DRAWING SUBMITTAL(S).

LIGHTING CONTROL SYSTEM SPECIFICATIONS - CONT'D:

5. OVERRIDE AND LOCAL SWITCHES SHALL HAVE THE FOLLOWING CHARACTERISTICS:
  - INTEGRAL LED'S INDICATING BOTH LOCATION (GREEN LIGHT ALWAYS ON), ON (RED LIGHT ON), AND OFF POSITIONS (RED LIGHT OFF).
  - IDENTIFIED/LABELLED WITH A DESCRIPTION OF THE AREA CONTROLLED PER THE CONTROL PANEL SCHEDULE. SEE LCP FACE PLATE DETAILS FOR MORE INFORMATION.
  - EACH SWITCH BUTTON SHALL BE 100% FIELD PROGRAMMABLE VIA LIGHTING CONTROL PANEL OR REMOTELY VIA LIGHTING CONTROL SOFTWARE TO CONTROL ANY RELAY(S) IN ANY LIGHTING CONTROL PANEL(S).
  - EACH BUTTON SHALL BE CAPABLE OF BEING PROGRAMMED FOR ON ONLY, OFF ONLY, ON/OFF (TOGGLE), RAISE (DIM UP) AND LOWER (DIM DOWN). SWITCHES REQUIRING LOW VOLTAGE CONTROL WIRES TO BE MOVED FROM ONE INPUT TERMINAL TO ANOTHER TO ACCOMPLISH THESE FUNCTIONS ARE NOT ACCEPTABLE.
  - IN ADDITION SWITCHES LOCATED IN HIGH ABUSE AREAS OR IDENTIFIED ON PLANS AS HIGH-ABUSE SWITCHES (GYMNASIUMS, MECHANICAL EQUIPMENT ROOMS, MACHINE ROOMS, EXTERIOR SPORT COURTS, KITCHENS, ETC.) SHALL BE VANDAL RESISTANT, CONTAIN NO MOVING PARTS, AND BE TOUCH SENSITIVE AND AVAILABLE WITH UP TO TWO BUTTONS IN A SINGLE GANG. MULTI GANG VERSIONS SHALL ALSO BE AVAILABLE. HIGH ABUSE SWITCHES SHALL BE STAINLESS STEEL AND CAPABLE OF HANDLING BOTH HIGH ABUSE AND WASH DOWN LOCATIONS. EACH HIGH ABUSE SWITCH SHALL BE ABLE TO BE PROGRAMMED FOR ON, OFF, TOGGLE OR MAINTAIN OPERATION. SWITCHES MUST BE CAPABLE OF HANDLING ELECTROSTATIC DISCHARGES OF AT LEAST 30,000 VOLTS (1CMSPARK) WITHOUT ANY INTERRUPTION OR FAILURE IN OPERATION.
  - KEYSWITCHES, IF REQUIRED ON PLANS, SHALL BE PROGRAMMABLE WITH PILOT LIGHT, AVAILABLE AS MOMENTARY "ON/OFF" OR AS CAPTIVE AS REQUIRED BY CALIFORNIA TITLE 24.
6. THE LIGHTING CONTROL SYSTEM CONTROLLER(S) SHALL BE LOCATED IN EACH MASTER AND EACH EMERGENCY LIGHTING CONTROL PANEL AND HAVE THE FOLLOWING CHARACTERISTICS:
  - CONTAIN 1 OR MORE DIGITAL TIME CLOCK(S) (DTC) THAT CONTROL AND PROGRAM THE ENTIRE LIGHTING CONTROL SYSTEM AND SUPPLY ALL TIME FUNCTIONS AND ACCEPT INTERFACE INPUTS AS DEFINED IN THE MASTER LIGHTING CONTROL SCHEDULE.
  - LOCAL PROGRAMMING SHALL BE USER-FRIENDLY VIA BUTTONS ON AN LED OR LCD DISPLAY WITH ALL NECESSARY INSTRUCTIONS PRINTED ON THE "CONTROLLER" LABEL. NO AUXILIARY INSTRUCTION MANUALS SHALL BE REQUIRED.
  - DIGITAL TIMECLOCK(S) FEATURES INCLUDE SEVEN DAY / HOLIDAY CONTROL, MINIMUM OF 32 DISCRETE SCHEDULES, EACH OF WHICH HAS ONE SET OF "ON" AND "OFF" TIMES PER DAY FOR EACH DAY OF THE WEEK AND FOR EACH OF TWO HOLIDAY LISTS, 15 YEAR NON-VOLATILE MEMORY TO MAINTAIN PROGRAMMING AND CLOCK TIME UPON LOSS OF POWER.
  - ALLOW FOR AUXILIARY INPUT OF A MAINTAINED OR A MOMENTARY PULSE FROM OTHER BUILDING SYSTEMS (SECURITY, HVAC, BMS, CCTV, ETC)
  - PROVIDE A FLICK WARN OPTION FOR ALL OF THE VARIOUS CONTROL ZONES. A LOCAL SWITCH SHALL BE CAPABLE OF OVERRIDING AN OFF SWEEP WITHIN ITS RESPECTIVE LIGHTING CONTROL ZONE(S) DURING THE 5 MINUTE WARNING PERIOD. FLICK-WARN OPTION SHALL NOT BE ENABLED ON CIRCUITS SUPPORTING HID LAMP TYPES.
  - SHALL CONTAIN PRE LOADED SOFTWARE CONFIGURED TO PRESENT A VISUAL REPRESENTATION OF EACH DEVICE ON THE SYSTEM, SHOW REAL TIME STATUS AND THE ABILITY TO CHANGE THE STATUS OF ANY INDIVIDUAL DEVICE, RELAY OR ZONE. THE SYSTEM SHALL BE CAPABLE OF RUNNING AN UPGRADED VECTOR-BASED GRAPHICS LIGHTING CONTROL SOFTWARE. THE SOFTWARE SHALL BE ACCESSIBLE TO A PC VIA MODEM AND/OR LOCAL AREA NETWORK CONNECTION.
7. THE PHOTOMETRIC SENSOR SHALL BE:
  - CAPABLE OF SENSING LIGHT LEVEL CHANGES AS FOLLOWS: 1 TO 10, 1 TO 100, 1 TO 1000, AND 1 TO 10,000 FOOTCANDLES.
  - UNITS USED FOR EXTERIOR LIGHT CONTROL SHALL PROVIDE MULTIPLE TRIPS POINT FROM 1 ROOF MOUNTED UNIT. ALL TRIPS POINTS SHALL BE ABLE TO BE CHANGED LOCALLY AT THE NEAREST LIGHTING CONTROL PANEL CONTROLLER OR REMOTELY VIA LAN OR MODEM.
8. WHEN THE MASTER LIGHTING CONTROL PANEL SCHEDULE(S) INDICATES COPPER COMMUNICATIONS MEDIA, PROVIDE MULTICONDUCTOR #18 COPPER WIRE OR LARGER AS RECOMMENDED BY THE MANUFACTURER AS NECESSARY TO CONNECT ALL ELEMENTS OF THE LIGHTING CONTROL SYSTEM. WHEN THE MASTER LIGHTING CONTROL PANEL SCHEDULE INDICATES FIBER COMMUNICATIONS MEDIA, PROVIDE FIBER OPTIC TRANSCEIVERS AS REQUIRED TO CONNECT VARIOUS MASTER AND/OR SATELLITE LIGHTING CONTROL PANELS TOGETHER VIA FIBER OPTIC CABLING. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING/EXAMINING TERMINATION POINTS, ROUTING AND GRADE OF FIBER OPTIC CABLING ALLOCATED FOR USE BY THE LIGHTING CONTROL SYSTEM AND ACCOMMODATE SUCH IN THE DESIGN OF THE LIGHTING CONTROL SYSTEM. SHOULD ANY ASPECT OF THE NEW OR EXISTING FIBER OPTIC CABLING SYSTEM BE UNCLEAR, THE CONTRACTOR SHALL ISSUE PRE-BID RFIS AS NECESSARY TO GAIN A COMPLETE UNDERSTANDING OF THE SYSTEM IN ORDER TO MAKE A COMPLETE LIGHTING CONTROL SYSTEM BID.
9. WHEN THE LIGHTING CONTROL PANEL SCHEDULE(S) INDICATES "IDCS/DPCS" INTERFACE, PROVIDE A DIGITAL INTERFACE OR CONTACT CLOSURE OUTPUT(S) FOR "FLICK-WARN" SWEEP-OFF AND SWEEP-ON OPERATION OF ANY DPCS UNIT(S) AND/OR IDCS UNIT(S) AS INDICATED IN IDCS OR DPCS SCHEDULES.
10. WHEN THE LIGHTING CONTROL PANEL SCHEDULE(S) INDICATES A "BMS" OPTION, PROVIDE ONE OR MORE OF DIRECT DIGITAL INTERFACES TO BUILDING AUTOMATION SYSTEMS:
  - "BACNET", "METASYS (N2)", "LON WORKS" AND "MODBUS" INTERFACE OPTIONS SHALL ALLOW THE LCP SYSTEM TO ACCEPT ON/OFF COMMANDS, TIME SCHEDULES AND REPORT STATUS OF ALL RELAYS IN ALL PANELS IN REAL TIME VIA THE RESPECTIVE COMMUNICATIONS PROTOCOL(S). INTERFACE CARDS SHALL SELF POPULATE EACH INDIVIDUAL RELAY AND EACH GROUP TO THE BMS.
  - "DMX512A" INTERFACES SHALL ALLOW THE LCP SYSTEM TO ACCEPT 14 GLOBAL DMX512A COMMANDS, EACH OF WHICH CAN BE MODIFIED LOCALLY OR REMOTELY USING LIGHTING CONTROLS MANUFACTURER SUPPLIED SOFTWARE. DMX INTERFACE CARD SHALL BE CONNECTED TO THE LIGHTING CONTROL SYSTEM IN SUCH A WAY AS TO PROVIDE REAL TIME RESPONSE FROM THE LIGHTING CONTROL SYSTEM TO DMX COMMANDS.
  - "CONTACT" INTERFACES SHALL CONSIST OF DRY CONTACT INPUT INTERFACE CARD(S) THAT PROVIDES 14 PROGRAMMABLE DRY CONTACT CLOSURE INPUTS PER CARD. USE SHIELDED CABLE TO CONNECT INPUT DEVICES TO INTERFACE CARD(S). CONTACT CLOSURE INTERFACE CARDS SHALL ALLOW THE LCP SYSTEM TO ACCEPT ON/OFF COMMANDS FOR INDIVIDUAL RELAYS OR GROUPS OF RELAYS BASED ON BMS TIME SCHEDULES.
- CONTRACTOR SHALL PROVIDE PROTOCOL POINT ID/REGISTERS/BITMAPS FOR USE BY OTHERS TO ENABLE REPORTING/MONITORING/CONTROLLING/ADJUSTING OF THE LIGHTING CONTROL SYSTEM EQUIPMENT OPERATING PARAMETERS TO BUILDING MANAGEMENT SYSTEM (BMS) VIA BMS GATEWAY INTERFACE DEVICE AND OTHER REQUIRED ACCESSORIES. SEE BMS DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- THE E.C. SHALL INCLUDE ALL COSTS IN THE BASE BID TO INTEGRATE THE LIGHTING CONTROL SYSTEM WITH THE SPECIFIED BMS SYSTEM AND SYSTEM PROTOCOL WHICH INCLUDES, BUT IS NOT LIMITED TO, COMMUNICATIONS INTERFACE MODULES, ALONG WITH POINT ID LISTS/REGISTERS, BITMAPS AND/OR CAD FILES OF EACH PIECE OF ELECTRICAL EQUIPMENT (PLAN VIEW AND ELEVATION VIEW), AND MAN-HOURS AS NECESSARY TO ASSIST THE BMS CONTRACTOR IN COMMISSIONING THE BMS SYSTEM AS IT RELATES TO THE LIGHTING CONTROL SYSTEM WITH WHICH IT COMMUNICATES.
11. WHEN THE LIGHTING CONTROL PANEL SCHEDULE(S) INDICATES A "NETWORK INTERFACE" OPTION, PROVIDE ONE OR MORE OF THE FOLLOWING:
  - "SNMP" INTERFACE OPTION SHALL ALLOW THE LCP SYSTEM, VIA PRE INSTALLED LIGHTING CONTROL SYSTEM SOFTWARE, TO COMMUNICATE OVER THE LOCAL AREA NETWORK (LAN) TO ANY PC ON THE LAN USING LCP MANUFACTURER-FURNISHED CLIENT PC-COMPATIBLE SOFTWARE. CONTRACTOR SHALL INCLUDE ALL COSTS TO RETURN TO THE PROJECT SITE AFTER PROJECT COMPLETION TO INSTALL AND CONFIGURE 1 COPY OF SOFTWARE ON OWNER-FURNISHED PC OR SERVER AND MAKE FULLY FUNCTIONAL IN ALL ASPECTS.
  - "WEB" INTERFACE OPTION SHALL ALLOW THE LCP SYSTEM, VIA PRE INSTALLED LIGHTING CONTROL SYSTEM HTML WEB SERVER SOFTWARE, TO COMMUNICATE OVER THE LOCAL AREA NETWORK (LAN) TO ANY PC ON THE LAN USING ANY WEB BROWSER. CONTRACTOR SHALL INCLUDE ALL COSTS TO RETURN TO THE PROJECT SITE AFTER PROJECT COMPLETION TO CONFIGURE SOFTWARE TO OPERATE ON OWNER-FURNISHED LOCAL AREA NETWORK AND MAKE FULLY FUNCTIONAL IN ALL ASPECTS.
12. WHEN THE LIGHTING CONTROL PANEL SCHEDULE(S) INDICATES "MODEM" COMMUNICATIONS ARE REQUIRED, PROVIDE A PROGRAMMABLE FAX MODEM TO REMOTELY COMMUNICATE WITH THE LIGHTING CONTROL SYSTEM AND ITS PRE-LOADED SOFTWARE DESCRIBED ELSEWHERE IN THIS SPECIFICATION. CONTRACTOR SHALL INCLUDE ALL COSTS TO PROVIDE AN ANALOG LINE/PHONE JACK AS REQUIRED FOR THIS CONNECTION. CONTRACTOR SHALL INCLUDE ALL COSTS TO RETURN TO THE PROJECT SITE AFTER PROJECT COMPLETION TO CONFIGURE SOFTWARE TO OPERATE ON INSTALL ONE COPY OF SOFTWARE ON OWNER-FURNISHED COMPUTER AND MAKE SYSTEM SOFTWARE FULLY FUNCTIONAL IN ALL ASPECTS.
13. THE LOW VOLTAGE LIGHTING CONTROL SYSTEM SHALL BE PROGRAMMED / APPROVED BY A MANUFACTURER'S REPRESENTATIVE. CONTRACTOR TO INCLUDE THREE (3) HOURS OF INSTRUCTION PER MASTER PANEL. INSTRUCTIONS SHALL BE BY THE MANUFACTURER'S REPRESENTATIVE IN THE PRESENCE OF THE OWNER. SET-UP, COMMISSIONING OF THE LIGHTING CONTROL SYSTEM, AND OWNER INSTRUCTION INCLUDES:
  - CONFIRMATION OF ENTIRE SYSTEM OPERATION AND COMMUNICATION TO EACH DEVICE.
  - CONFIRMATION OF OPERATION OF INDIVIDUAL RELAYS, SWITCHES, OCCUPANCY SENSORS AND DAYLIGHT SENSORS.
  - CONFIRMATION OF SYSTEM PROGRAMMING, PHOTOCELL SETTINGS, OVERRIDE SETTINGS, ETC.
  - PROVIDE TRAINING TO COVER INSTALLATION, MAINTENANCE, TROUBLESHOOTING, PROGRAMMING, AND REPAIR AND OPERATION OF THE LIGHTING CONTROL SYSTEM.
14. COMPLY WITH APPLICABLE ENERGY CODE LIGHTING CONTROL SYSTEM ACCEPTANCE REQUIREMENTS TO INCLUDE VERIFICATION THAT LIGHTING CONTROLS WERE INSTALLED AND CALIBRATED CORRECTLY. THESE TESTS MAY REQUIRE THAT A RESPONSIBLE PARTY CERTIFY THAT CONTROLS ARE INSTALLED AND CALIBRATED PROPERLY. THIS SHALL BE THE INSTALLING CONTRACTOR'S RESPONSIBILITY.
15. SHOP DRAWINGS SHALL BE SUBMITTED PER THE GENERAL SPECIFICATION REQUIREMENTS SHOWING ALL COMPONENTS, WIRING CONFIGURATIONS AND PROGRAMMING SCHEDULES. SUBMITTALS SHALL BE MADE SPECIFIC TO THE PROJECT - GENERIC SUBMITTALS SHALL BE REJECTED.
16. THE LOW VOLTAGE LIGHTING CONTROL SYSTEM SHALL BE MANUFACTURED BY LCO&D OR EQUAL SYSTEM BY LUTRON OR WATTSOPPER.

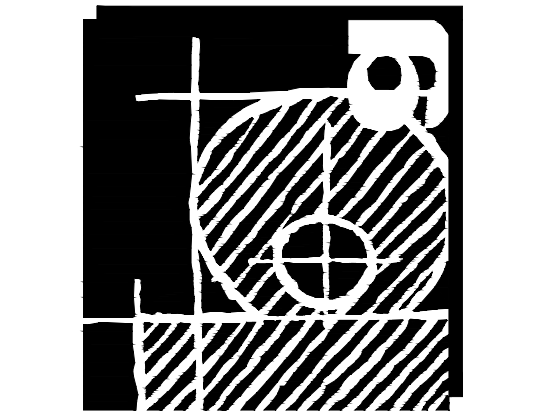
LIGHTING CONTROL PANEL SCHEDULE - LCP									
MOUNTING	EXTERIOR PHOTO CELL	COMM. MEDIA	DPCS / IDCS INTERFACE	BMS INTERFACE	NETWORK INTERFACE	MODEM	AVAILABLE FAULT CURRENT	REMARKS	
SURFACE	YES	-	-	-	YES	-	-	-	
PANEL#	CKT#	RELAY	DESCRIPTION			LOCAL SWITCH	OVERRIDE SWITCH	ZONE NUMBER	MISCELLANEOUS
1HA	2	1	ASSEMBLY ROOM LIGHTING			-	-	2	-
1HA	4	2	LOBBY LIGHTING			-	-	2	-
1HA	5a	3	EXTERIOR LIGHTING			-	-	2	-
1HA	5b	4	EXTERIOR LIGHTING			-	-	1	-
-	-	5	SPARE			-	-	-	-
-	-	6	SPARE			-	-	-	-
-	-	7	SPARE			-	-	-	-
-	-	8	SPARE			-	-	-	-
-	-	9	SPARE			-	-	-	-
-	-	10	SPARE			-	-	-	-
-	-	11	SPARE			-	-	-	-
-	-	12	SPARE			-	-	-	-
-	-	13	SPARE			-	-	-	-
-	-	14	SPARE			-	-	-	-
-	-	15	SPARE			-	-	-	-
-	-	16	SPARE			-	-	-	-
ZONE NUMBER	TIME	PHOTO	DESCRIPTION			ZONE NUMBER	TIME	PHOTO	DESCRIPTION
1	-	-	X	X	SECURITY LIGHTING	5	-	-	-
2	0600	2100	-	-	NORMAL BUSINESS HOURS	6	-	-	-
3	-	2200	X	-	SITE SIGNAGE	7	-	-	-
4	-	-	-	-	-	8	-	-	-

\* PROVIDE PANEL WITH NETWORK/DATA CONNECTION CARD.

REVISIONS	
DATE/DELTA	REMARKS

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SHEET TITLE:

LIGHTING CONTROL PANEL

SUB DATE	05/08/19
BID DATE	
DATE	03/19/19
DRAWN BY:	JT
JOB NO:	11761
CHECKED BY:	SH
SHEET NUMBER:	

E-4.4

tkisc  
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Project Leader - Steve Hayman  
Electrical Lead - Steve Hayman  
K1sc Job #: 2018-0585



WATTSTOPPER:

WALL BOX SENSORS:	STANDALONE SINGLE RELAY = #DW-100 STANDALONE 0-10V DIMMING WITH SINGLE RELAY = #PW-311 STANDALONE DUAL RELAY = #DW-200 SYSTEM-BASED DIMMING CONTROL = #LMDW-102
CEILING SENSORS:	ONE-WAY DIRECTIONAL = #LWDC-100 WITH MASKING AS REQUIRED. 360 DEGREE COVERAGE = #LWDC-100
DAYLIGHT SENSORS:	OPEN LOOP SENSOR = #LMLS-500 (1-3 ZONE) OR CLOSED LOOP SENSOR = #LMLS-400 (1 ZONE ONLY) REMOTE CONTROL = #LMCT-100 (HAND TO OWNER AT COMPLETION OF PROJECT.)
CONTROL UNITS:	SWITCHED = #LMRC-10? (NUMBER OF RELAYS AS REQUIRED). CONTINUOUS DIMMING (0-10V) = #LMRC-21? (NUMBER OF RELAYS AS REQUIRED). CONTINUOUS DIMMING (UNIVERSAL) = #LMRC-22? (NUMBER OF RELAYS AS REQUIRED). RECEPTACLE CONTROL = #LMPL-101 OR LMPL-201 WHERE MORE THAN 4 RECEPTACLE CONTROL UNITS ARE TIED TOGETHER. HVAC CONTROL = #LMRL-100 AV SYSTEM SERIAL INTERFACE = #LMDI-100 (SCREENS / AV SYSTEM INTEGRATION) MOVEABLE PARTITION INTERFACE & SENSOR = #LMIO-102 PARTITION INTERFACE, #LMPS-104 PARTITION SWITCH/STATUS INDICATOR, #BZ-50 POWER PACK (SENSOR POWER) & PARTITION SENSOR #ENTERTAINMENT NETWORKS SENSOR W/BOTTOM COVER (www.entertainmentnetworks.com). DUAL MODE CORRIDOR/STAIRWAY/AISLEWAY CONTROL INPUT = #LMCZ-301, UNLESS OTHERWISE NOTED.
WALL CONTROLS:	DIMMING = #LWSW-101/102/103/104/108 (# OF SWITCHES AS REQUIRED 4/YOKE MAX). KEYED SWITCH = #LMIO-101 INPUT INTERFACE W/ LEVITON #1221-2L-? KEYED SWITCH
NETWORK COMPONENTS:	ZONE SEGMENT MANAGER = #LMSM-3E/#LMSM-6E W/LMSM-ENC1 ENCLOSURE NETWORK BRIDGE / ROUTER / SWITCH = #LMBC-300/#NB-ROUTER/#NB-SWITCH NETWORK WIRING = #LM-WSP. NETWORK RELAY PANELS = LMCPB, 24 OR 48
INTERCONNECT COMPONENTS:	NETWORK BRIDGE / ROUTER / SWITCH = #LMBC-300/#NB-ROUTER/#NB-SWITCH PROVIDE TEMPORARY NB ROUTER AND LAPTOP TO DEMONSTRATE DEMAND RESPONSE CAPABILITY DURING ACCEPTANCE TESTING.
EMERGENCY POWER INTERFACE:	SWITCHING / STEP DIMMING = #ELCU-200 BYPASS DEVICE. CONTINUOUS DIMMING = #ELCU-200 BYPASS DEVICE.
LOAD INTERFACE DEVICE:	CONTROL COMPONENTS = LUTRON #BCI-0-10. REVERSE/FORWARD PHASE DIMMING COMPONENTS = LUTRON #PHPM-PA-DV-WH.

nLIGHT:

WALL BOX SENSORS:	STANDALONE SINGLE RELAY = #WSX-PDT STANDALONE DUAL RELAY = #WSX-PDT-2P SYSTEM-BASED DIMMING CONTROL = #nWSX-PDT-LV-DX
CEILING SENSORS:	ONE-WAY DIRECTIONAL = #NRM-PDT-9 W/MASKING AS REQUIRED. 360 DEGREE COVERAGE = #NRM-PDT-9 STANDARD RANGE, #NRM-PDT-10 EXTENDED RANGE/CORRIDOR
DAYLIGHT SENSORS:	CLOSED LOOP SENSOR = #NES-ADCX / #NRM-ADCX (ONLY IF REQUIRED BY CLG. TYPE). REMOTE CONTROL = N/A
CONTROL UNITS:	SWITCH / STEPPED DIMMING = #NPP-16/#NSP-16 (NUMBER OF RELAYS AS REQUIRED). CONTINUOUS DIMMING (0-10V) = #NPP16-D (NUMBER OF RELAYS AS REQUIRED). CONTINUOUS DIMMING (UNIVERSAL) = #NSPS-PCD (NUMBER OF RELAYS AS REQUIRED). AUXILIARY INPUT / OUTPUT CONTROL = #NAR-40 RECEPTACLE CONTROL = #NRP20 PL HVAC CONTROL = #NAR-40 AV SYSTEM SERIAL INTERFACE = #NIO X (SCREENS / AV SYSTEM INTEGRATION) MOVEABLE PARTITION INTERFACE & SENSOR = #NRP16-D (NUMBER OF RELAYS AS REQUIRED). #NIO-1S POWER PACK (SENSOR POWER) & PARTITION SENSOR #ENTERTAINMENT NETWORKS SENSOR W/BOTTOM COVER (www.entertainmentnetworks.com). DUAL MODE CORRIDOR/STAIRWAY/AISLEWAY CONTROL INPUT = LC&D BLUE BOX, UNLESS OTHERWISE NOTED.
WALL CONTROLS:	DIMMING = #NPD0M-DX SERIES (# OF DIMMERS AS REQUIRED - 4 / YOKE MAX) KEYED SWITCH = #NIO INPUT INTERFACE W/LEVITON #1221-2L-? KEYED SWITCH
NETWORK COMPONENTS:	GATEWAY = #NECY-120, NGWY2-GFX, 13.9" H x 10" W x 4.5" D ENCLOSURE TO BE PROVIDED BY CONTRACTOR BRIDGE = #NBRG-B-KIT NETWORK WIRING = ARP INTERCXX NLT XFGR MVOLT, QTY AS REQUIRED, TO INCLUDE SPARE RELAYS SHOWN IN SCHEDULES.
INTERCONNECT COMPONENTS:	GATEWAY = #NECY-120, NGWY2-GFX, 13.9" H x 10" W x 4.5" D ENCLOSURE TO BE PROVIDED BY CONTRACTOR BRIDGE = #NBRG-B-KIT STANDARDS BASED RCP RECEIVER = NADR PROVIDE END USER CLIENT WITH (1) WIRELESS PROGRAMMING DEVICE (NIO-BT) FOR MAINTENANCE AND PROGRAMMING
EMERGENCY POWER INTERFACE:	SWITCHING / STEP DIMMING = #NPP16-ER CONTINUOUS DIMMING = #NPP16-D-ER
LOAD INTERFACE DEVICE:	LUTRON COMPONENTS = LUTRON #BCI-0-10. REVERSE PHASE DIMMING COMPONENTS = #NSPS-PCD-ELV120/LUTRON #PHPM-PA-DV-WH. FORWARD PHASE DIMMING COMPONENTS = #NSPS-PCD-ELV120/LUTRON #PHPM-PA-DV-WH. 2 & 3 WIRE DIMMING COMPONENTS = #NSPS-PCD-2W/3W OR LUTRON #PHPM-PA-DV-WH.

COOPER CONTROLS (GREENGATE):

WALL BOX SENSORS:	STANDALONE SINGLE RELAY = #ONW-D-1001-MV-N SERIES STANDALONE DUAL RELAY = #ONW-D-1001-DMV-N SERIES SYSTEM-BASED DIMMING CONTROL = NOT AVAILABLE
CEILING SENSORS:	ONE-WAY DIRECTIONAL = #OAC-DT-501 (500 S.F. MAXIMUM) 360 DEGREE COVERAGE = #OAC-DT-1000 (1,000 S.F. MAXIMUM) 360 DEGREE COVERAGE = #OAC-DT-2000
DAYLIGHT SENSORS:	OPEN LOOP SENSOR = #DSRC-FMOIR REMOTE CONTROL = #HHRC-RC
CONTROL UNITS:	SWITCH / STEPPED DIMMING = #RC3D-PL PLENUM RATED SERIES (NUMBER OF RELAYS AS REQUIRED). CONTINUOUS DIMMING (0-10V) = #RC3D PLENUM RATED SERIES (NUMBER OF RELAYS AS REQUIRED). CONTINUOUS DIMMING (UNIVERSAL) = USE WITH LOAD INTERFACE DEVICE RECEPTACLE CONTROL = #RCC-RU45 RECEPTACLE CONTROL = #SPRC-R-20-120 HVAC CONTROL = #R-OPTION ON OCCUPANCY SENSOR OR CONTACT CLOSURE VIA TERMINAL #5 ON RC CONTROL UNIT. AV SYSTEM SERIAL INTERFACE: REQUIRES NETWORKING TO PROVIDE SERIAL CONNECTION. MOVEABLE PARTITION INTERFACE & SENSOR = #NRP16-D (NUMBER OF RELAYS AS REQUIRED). #NIO-1S POWER PACK (SENSOR POWER) & PARTITION SENSOR #ENTERTAINMENT NETWORKS SENSOR W/BOTTOM COVER (www.entertainmentnetworks.com). DUAL MODE CORRIDOR/STAIRWAY/AISLEWAY CONTROL INPUT = RC3 SERIES, UNLESS OTHERWISE NOTED.PROVIDE QTY OF CONTROLLERS AND SEPARATE DEMAND RESPONSE/INTERCONNECT CABLEING AS REQUIRED.
WALL CONTROLS:	DIMMING = #RC SERIES DIMMERS (# OF DIMMERS AS REQUIRED - 4 / YOKE MAX) KEYED SWITCH = #RCC-RU45 INPUT INTERFACE W/LEVITON #1221-2L-? KEYED SWITCH
NETWORK COMPONENTS:	NETWORK ADAPTER = RC3D-PL-N OR RC3D-PL-M
INTERCONNECT COMPONENTS:	DEMAND RESPONSE INCLUDED STANDARD IN CONTROL UNITS. PROVIDE QTY OF CONTROLLERS AND SEPARATE DEMAND RESPONSE/INTERCONNECT CABLEING AS REQUIRED.
EMERGENCY POWER INTERFACE:	SWITCHING / STEP DIMMING = PROVIDE THE #RC3E OPTION ON CONTROLLER. CONTINUOUS DIMMING = PROVIDE THE #RC3DE OPTION ON CONTROLLER.
LOAD INTERFACE DEVICE:	LUTRON COMPONENTS = LUTRON #BCI-0-10. REVERSE PHASE DIMMING COMPONENTS = LDCM-PL 2-WIRE DIMMING (FORWARD PHASE-ONLY) = GREENGATE #PD216 SERIES INTERFACE.
NETWORK INTERFACE:	NOT AVAILABLE

DISTRIBUTED LIGHTING CONTROLS SYSTEM SPECIFICATIONS (OCCUPANCY / VACANCY SENSORS AND DAYLIGHTING CONTROLS):

- SEE LIGHTING PLAN DRAWINGS FOR DISTRIBUTED LIGHTING CONTROL SYSTEM (DCLS) SPECIFICS, SPACE SPECIFIC CONFIGURATIONS/REQUIREMENTS, AS WELL AS FIXTURE BALLAST/DRIVER CONFIGURATIONS.
  - ALL PRODUCTS SHALL BE BACKED BY A FIVE YEAR MANUFACTURER'S WARRANTY.
  - ALL PRODUCTS LISTED IN THIS SPECIFICATION ARE BASED UPON PRODUCTS LISTED ON THIS SHEET. THE FEATURES AND CHARACTERISTICS OF THE PRODUCT LITERATURE AND SPECIFICATION SHEETS AVAILABLE ON THE VARIOUS MANUFACTURER'S WEB-SITES ARE INCLUDED IN THE REQUIREMENT OF THESE SPECIFICATIONS. ALL DCLS NETWORKED/INTERCONNECTED/NON-NETWORKED SYSTEM-BASED AND STANDALONE COMPONENTS SHALL BE PROVIDED BY A SINGLE MANUFACTURER.
  - DCLS COMPONENTS SHALL BE COMPLIANT WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL ENERGY CODES AND BE PROVIDED AS FOLLOWS:
    - STANDALONE: WALL MOUNTED OCCUPANCY SENSORS SHALL BE UL LISTED AND HAVE A MINIMUM LOAD CAPACITY OF 800 WATTS AT 120 VOLTS AND 1200 WATTS AT 277 VOLTS. WALL SENSORS SHALL ALSO BE DECORATOR STYLE, WITH A LOW-PROFILE APPEARANCE AND A HARD LENS FOR DURABILITY. SENSOR SHALL UTILIZE PASSIVE INFRARED TECHNOLOGY (PIR) AND ULTRASONIC/MICROPHONIC TECHNOLOGY. UNIT SHALL BE RATED FOR 120/277 VOLT WITH NO MINIMUM LOAD, COMPATIBLE WITH ALL THE SPECIFIED BALLASTS, PROVIDED WITH A NEUTRAL CONNECTION (NO LEAKAGE TO GROUND) AND NO LEAKAGE TO LOAD IN THE "OFF" MODE. SENSOR SHALL BE UTILIZED IN SPACES NOT EXCEEDING 150 SQ.FT. SINGLE RELAY SENSORS SHALL BE CONFIGURED WITH THE RELAY IN A "MANUAL ON/ AUTO OFF" SETTING. DUAL RELAY SENSORS SHALL BE CONFIGURED WITH THE FIRST RELAY IN A "AUTOMATIC ON/ AUTOMATIC OFF" SETTING AND THE SECOND RELAY IN A "MANUAL ON/ AUTOMATIC OFF" SETTING. FACTORY STANDARD COLOR TO BE APPROVED BY ARCHITECT.  
SYSTEM-BASED: WHEN INDICATED WITH A DOT SYMBOL, "1" , OR "N" IN THE OCCUPANCY SENSOR SYMBOL, A LOW VOLTAGE, WALL MOUNTED OCCUPANCY SENSOR SHALL BE PROVIDED AND CONNECTED TO A CONTROL UNIT. WHEN INDICATED WITH A LOW-PROFILE APPEARANCE, HAVE ON/OFF/RAISE/LOWER BUTTONS, AND A HARD LENS FOR DURABILITY. SENSOR SHALL UTILIZE PASSIVE INFRARED TECHNOLOGY (PIR) AND ULTRASONIC/MICROPHONIC TECHNOLOGY. FACTORY STANDARD COLOR TO BE APPROVED BY ARCHITECT.
    - SYSTEM-BASED CEILING MOUNTED OCCUPANCY SENSORS INDICATED WITH A DOT SYMBOL, "1" , OR "N" IN THE OCCUPANCY SENSOR SYMBOL SHALL HAVE A LOW-PROFILE APPEARANCE AND SHALL BE CONFIGURED IN ONE OF THE FOLLOWING WAYS AS INDICATED ON THE DRAWINGS:
      - AUTO ON: a/b
      - SWITCHED: AUTO ON a / MANUAL ON b
      - CONTINUOUS DIMMED: AUTO ON 50% a / MANUAL ON 100% aSENSOR(S) SHALL UTILIZE DUAL TECHNOLOGY (PIR AND ULTRASONIC/MICROPHONIC TECHNOLOGY) WITH 360 DEGREE COVERAGE. IN SPACES WITH DESKTOP ACTIVITIES, THE COVERAGE SHALL BE "HAND MOTION" AND SHALL NOT EXCEED 500 SQ. FT. AT A MAXIMUM CEILING HEIGHT OF 10 FT. IN CORRIDORS, STORAGE ROOMS AND OTHER SPACES WITH NON-DESKTOP ACTIVITIES, COVERAGE SHALL BE "HALF-STEP, WALKING MOTION" AND SHALL NOT EXCEED 1200 SQ. FT. AT A MAXIMUM CEILING HEIGHT OF 10 FT.
    - "H" AT THE OCCUPANCY SENSOR INDICATES CONNECTION TO AUXILIARY OUTPUT CONTROL DEVICE FOR CONTROL OF A THIRD PARTY DEVICE VIA LOW-VOLTAGE CONTACT CLOSURES - 1 AMP @ 24V AC/DC. NO/NO RELAYS SHALL BE CONNECTED TO A CONTROLLER TO PERFORM THE AUXILIARY CONTROL REQUIREMENTS INDICATED BY THE DRAWINGS.
    - "DM" PREFIX AT THE OCCUPANCY SENSOR INDICATES A DUAL MODE CORRIDOR/STAIRWAY/WAREHOUSE AISLE CONTROL FUNCTIONALITY TO BE IMPLEMENTED AS FOLLOWS:
      - BUSINESS HOUR MODE
        - UNOCCUPIED CORRIDOR/STAIRWAY/AISLE LIGHTING SHALL AUTOMATICALLY DIM TO ACHIEVE 50% LIGHTING POWER LEVEL.
        - UPON OCCUPANCY, LIGHTING SHALL AUTOMATICALLY BE BROUGHT TO 100% LIGHTING POWER LEVEL.
      - AFTER BUSINESS HOUR MODE
        - UNOCCUPIED CORRIDOR/STAIRWAY/AISLE LIGHTING SHALL AUTOMATICALLY TURN OFF BASED ON CEC-LISTED TIME CLOCK OUTPUT CONTACT POSITION/TIME CLOCK PROGRAMMING.
        - UPON OCCUPANCY, LIGHTING SHALL BE BROUGHT TO 100% LIGHTING POWER LEVEL.
      - ONCE OCCUPANCY IS DETECTED IN A CORRIDOR, STAIRWAY, OR AISLE, THAT RESPECTIVE AREA SHALL OPERATE IN BUSINESS HOUR MODE UNTIL THE NEXT AFTER BUSINESS HOUR MODE OCCURS.
      - UNOCCUPIED CORRIDOR/STAIRWAY/AISLEWAY LIGHTING SHALL AUTOMATICALLY REVERT TO BUSINESS HOUR MODE OPERATION BASED ON CEC-LISTED TIME CLOCK CONTACT POSITION/TIME CLOCK PROGRAMMING.
- E.C. SHALL BE RESPONSIBLE FOR PROVIDING ALL DEVICES AND WIRING REQUIRED FOR DUAL MODE OPERATIONS AND ANY PROGRAMMING/CONFIGURATION OF TIME-BASED OPERATING PARAMETERS TO INCLUDE OUTPUT CONTACT CLOSURES FROM TIME CLOCKS OR NETWORK GATEWAYS. COORDINATE WITH OWNER TO DETERMINE BUSINESS HOUR/AFTER BUSINESS HOUR MODES. WHERE DUAL MODE CONTROL IS ACCOMPLISHED THROUGH NON-NETWORK TIME CLOCK DEVICES, LOCATE EACH OF THESE DEVICES ADJACENT TO THE CLOSEST STAIRWAY/CORRIDOR/AISLEWAY CONTROL UNIT. IF THE PLANS IDENTIFY A NEW OR EXISTING CEC LIGHTING CONTROL PANEL AS THE SOURCE OF DUAL MODE TIMING, E.C. SHALL INCLUDE ALL COSTS TO INSTALL ANY NECESSARY I/O TERMINALS, CARDS, ETC. TO MAKE THE SYSTEM FULLY FUNCTIONAL.
- WHEN INDICATED WITH AN "N" IN THE OCCUPANCY SENSOR SYMBOL, A NETWORKED SYSTEM SHALL BE PROVIDED AND INSTALLED. THIS NETWORK-BASED SYSTEM SHALL PROVIDE/RESULT IN "LADDERLESS COMMISSIONING" OF DAYLIGHT CONTROLS. AT A MINIMUM, NETWORK ACQUIRED DATA SHALL PROVIDE CT-BASED LIGHTING POWER (WATTS) MEASUREMENTS PER THE COMMISSIONING PORTION OF THESE REQUIREMENTS. PROVIDE NETWORKED CONTROL UNITS/POWER PACKS/INTERFACES AND MISCELLANEOUS EQUIPMENT AS FOLLOWS:
  - NETWORK SEGMENT MANAGER WITH NATIVE BACKUP IP - QUANTITY AS REQUIRED BASED UPON A MAXIMUM OF 100 LOCAL ROOM NETWORKS PER SEGMENT AND A MINIMUM OF ONE SEGMENT MANAGER PER FLOOR. THIS EQUIPMENT SHALL BE LOCATED IN THE TYPICAL FLOOR ELECTRICAL ROOM.
  - NETWORK BRIDGE CONNECTING THE SEGMENT MANAGER TO THE CONTROLLER SUB/LOCAL NETWORK.
  - SEGMENT NETWORK WIRING FROM NETWORK SEGMENT MANAGER TO FIRST NETWORK CONTROLLER DEVICE AS WELL AS ALL OTHER NETWORK CONTROLLER CONNECTIONS (VIA LINEAR TOPOLOGY) AS REQUIRED.
  - ALL CORRIDORS AND STAIRWELLS SHALL BE PROVIDED WITH DUAL MODE CORRIDOR/STAIRWAY CONTROLS TO INCLUDE CEC-LISTED TIME CLOCKS OR SYSTEM GATEWAYS, INTERPOSING RELAYS (WHEN INTERFACING WITH EXISTING CEC-LISTED RELAY PANELS), WIRING, 120V POWER, PROGRAMMING, ETC. NECESSARY FOR A COMPLETE AND FUNCTIONING CONTROL SYSTEM.
  - INCLUDE ALL COSTS IN BASE BID TO PROVIDE 120V CIRCUIT(S) AND RECEPTACLE(S) NECESSARY TO POWER ALL DEMAND RESPONSE EQUIPMENT.
  - PROVIDE DATA OUTLET/PATHWAY, DATA CABLEING (IF REQUIRED ELSEWHERE BY PROJECT DOCUMENTS), AND CONNECTION TO THE PROJECT'S LOCAL AREA NETWORK.
  - INCLUDE ALL COSTS IN BASE BID TO PROVIDE 120V CIRCUIT(S) AND RECEPTACLE(S) NECESSARY TO POWER ALL NETWORK SEGMENT MANAGERS, SWITCHES AND ROUTERS.
  - DEMONSTRATE DCLS RESPONSE TO A SIMULATED DEMAND RESPONSE REQUEST AS PART OF THE LIGHTING COMMISSIONING PROCESS. WHERE MORE THAN ONE WIRING TOPOLOGY AND/OR ZONE IS REQUIRED TO ACCOMPLISH DEMAND RESPONSE - ALL WIRING TOPOLOGIES AND ZONES SHALL BE TESTED ACCORDINGLY.

- WHEN INDICATED WITH AN "I" IN THE OCCUPANCY SENSOR SYMBOL, A INTERCONNECTED CONTROL SYSTEM SHALL BE PROVIDED AND INSTALLED. THIS INTERCONNECTED CONTROL SYSTEM SHALL PROVIDE/RESULT IN "DRIY CONTACT CLOSURE DEMAND RESPONSE LOAD SHEET CONTROL FUNCTIONALITY. AT A MINIMUM, A CONTACT CLOSURE SHALL REDUCE THE LIGHTING POWER LOAD BY AT LEAST 15%. WHERE AN INTERCONNECTED CONTROL SYSTEM IS SERVING CORRIDORS AND/OR STAIRWAYS, THE SYSTEM SHALL ALSO PROVIDE DUAL MODE CORRIDOR/STAIRWAY CONTROL. PROVIDE CONTROL UNITS/POWER PACKS/INPUT INTERFACES/TIME CLOCK AND MISCELLANEOUS EQUIPMENT AS FOLLOWS:
  - INPUT CONTROL UNIT INTERFACE DEVICE CAPABLE OF RECEIVING SEPARATE DRY CONTACT INPUTS ACTIVATING A DIMMED SCENE WITH AT LEAST A 15% LOAD REDUCTION AND, WHEN SERVING CORRIDORS AND/OR STAIRWELL CORRIDOR/STAIRWAY CONTROL. PROVIDE CONTROL UNITS/POWER PACKS/INPUT INTERFACES/TIME CLOCK AND MISCELLANEOUS EQUIPMENT AS FOLLOWS:
    - INPUT CONTROL UNIT INTERFACE DEVICE CAPABLE OF RECEIVING SEPARATE DRY CONTACT INPUTS ACTIVATING A DIMMED SCENE WITH AT LEAST A 15% LOAD REDUCTION AND, WHEN SERVING CORRIDORS AND/OR STAIRWELL CORRIDOR/STAIRWAY CONTROL. PROVIDE CONTROL UNITS/POWER PACKS/INPUT INTERFACES/TIME CLOCK AND MISCELLANEOUS EQUIPMENT AS FOLLOWS:
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STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

Project Name: Children's Ministry Lancaster Baptist Church

Report Page: Page 6 of 7

Project Address: 4020 Lancaster Blvd.

Date Prepared: 5/2/2019

T. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at <http://www.energy.ca.gov/2015publications/CEC-400-2015-033/supplements/forms/NRCC>

| YES                              | NO                               | Form/Title  | Field Inspector          |                          |
|----------------------------------|----------------------------------|---|--------------------------|--------------------------|
|                                  |                                  |   | Pass                     | Fail                     |
| <input checked="" type="radio"/> | <input type="radio"/>            | NRCC-LTI-01-E - Must be submitted for all buildings   | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="radio"/> | <input type="radio"/>            | NRCC-LTI-02-E - Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.  | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="radio"/>            | <input checked="" type="radio"/> | NRCC-LTI-03-E - Must be submitted for a line-voltage track lighting integral current limiter, or for a supplementary overcurrent protection panel used to energize only line-voltage track lighting, to be recognized for compliance. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="radio"/> | <input type="radio"/>            | NRCC-LTI-04-E - Must be submitted for two interlocked systems serving an auditorium, a convention center, a conference room, a multipurpose room, or a theater to be recognized for compliance.                                       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="radio"/>            | <input checked="" type="radio"/> | NRCC-LTI-05-E - Must be submitted for a Power Adjustment Factor (PAF) to be recognized for compliance.  | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="radio"/>            | <input checked="" type="radio"/> | NRCC-LTI-06-E - Must be submitted for additional wattage installed in a video conferencing studio to be recognized for compliance.  | <input type="checkbox"/> | <input type="checkbox"/> |

U. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: <http://www.energy.ca.gov/title24/outc/providers.html>

| YES                              | NO                               | Form/Title  | Field Inspector          |                          |
|----------------------------------|----------------------------------|---|--------------------------|--------------------------|
|                                  |                                  |   | Pass                     | Fail                     |
| <input checked="" type="radio"/> | <input type="radio"/>            | NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls. | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="radio"/> | <input type="radio"/>            | NRCA-LTI-03-A - Must be submitted for automatic daylight controls.                          | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="radio"/> | <input type="radio"/>            | NRCA-LTI-04-A - Must be submitted for demand responsive lighting controls.                  | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="radio"/>            | <input checked="" type="radio"/> | NRCA-LTI-05-A - Must be submitted for institutional tuning power adjustment factor (PAF).   | <input type="checkbox"/> | <input type="checkbox"/> |

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

Project Name: Children's Ministry Lancaster Baptist Church

Report Page: Page 6 of 7

Project Address: 4020 Lancaster Blvd.

Date Prepared: 5/2/2019

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

Table Instructions: Please include lighting controls for conditioned and unconditioned spaces in this table. When an option having a \* is selected, the notes section of this table must be completed. The lighting controls section of the Compliance Summary Table on the first page will show "DOES NOT COMPLY" if the notes are left blank.

Area Level Controls

| 04                                | 05   | 06                       | 07                              | 08                           | 09                                    | 10                               | 11                                  | 12                       |                          |
|-----------------------------------|--|--------------------------|---------------------------------|------------------------------|---------------------------------------|----------------------------------|-------------------------------------|--------------------------|--------------------------|
| Area Description                  | Complete Building or Area Category Primary Function Area | Area Controls \$130.1(a) | Multi-Level Controls \$130.1(b) | Shut-Off Controls \$130.1(c) | Primary/Skylit Daylighting \$130.1(d) | Secondary Daylighting \$140.6(a) | Interlocked Systems \$140.6(a)(1)   | Field Inspector          |                          |
|                                   |  | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | Pass                     | Fail                     |
| 1st Fir. Breakroom                | Lounge, Recreation                                       | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. All Cor./ Restrm/Support | Corridor/Restroom/Support                                | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. All Offices              | Office <= 250 sqft                                       | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. Lobby                    | Lobby, Main Entry  | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. All Classroom            | Classroom, Lecture, Training                             | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. Electrical Room          | Electrical, Mechanical Room                              | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. Assembly                 | Auditorium   | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. Playroom                 | Sports Arena, Indoor Playing Area                        | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | Included                              | Included                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. Electrical Room          | Electrical, Mechanical Room                              | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1st Fir. AV Server Room           | Computer Room  | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2nd Fir. All Classroom            | Classroom, Lecture, Training                             | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2nd Fir. All Cor./ Restrm/Support | Corridor/Restroom/Support                                | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2nd Fir. Electrical Room          | Electrical, Mechanical Room                              | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2nd Fir. Server Room              | Computer Room  | Manual ON/OFF            | Dimmer                          | Occ Sensor                   | N/A                                   | N/A                              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

\*NOTES: Controls with a \* require a note in the space below explaining how compliance is achieved.  
EX: Conference 1: Primary/Skylight Daylighting: Exempt because less than 120 watts of general lighting; EXCEPTION 1 to §130.1(d)(2)  
Table Continued

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

Project Name: Children's Ministry Lancaster Baptist Church

Report Page: Page 6 of 7

Project Address: 4020 Lancaster Blvd.

Date Prepared: 5/2/2019

A. GENERAL INFORMATION

Table Instructions: Include any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.6 or §141.0(b)(2) for alterations. WARNING: Changing the Calculation Method in this table will result in the deletion of data previously input. If you need to change the calculation method, please open a new form or use "Save As".

| 01  | 02   | 03                                   | 04  | 05                              | 06  | 07 | 08 | 09 |
|---|--|--------------------------------------|---|---------------------------------|---|----|----|----|
| Project Location (city)                                 | Lancaster                                      | Total Conditioned Floor Area (ft²)   | 32,352  | 01                              | 02  | 03 | 04 | 05 |
| Climate Zone  | 14   | Total Unconditioned Floor Area (ft²) | 0   | 01                              | 02  | 03 | 04 | 05 |
| Occupancy Types Within Project (select all that apply): | 06   | # of Stories (Habitable Above Grade) | 2   | 01                              | 02  | 03 | 04 | 05 |
| <input checked="" type="checkbox"/> Office              | <input type="checkbox"/> Retail                | <input type="checkbox"/> Warehouse   | <input type="checkbox"/> Hotel/Motel                  | <input type="checkbox"/> School | <input checked="" type="checkbox"/> Support Areas |    |    |    |
| <input type="checkbox"/> Parking Garage                 | <input type="checkbox"/> High-Rise Residential | <input type="checkbox"/> Relocatable | <input checked="" type="checkbox"/> Other (write in): |                                 |   |    |    |    |

B. PROJECT SCOPE

Table Instructions: Include any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.6 or §141.0(b)(2) for alterations. WARNING: Changing the Calculation Method in this table will result in the deletion of data previously input. If you need to change the calculation method, please open a new form or use "Save As".

| 01  | 02                 | 03         | 04                 | 05         |
|---|--------------------|------------|--------------------|------------|
| My Project Consists of (check all that apply):          | Calculation Method | Area (ft²) | Calculation Method | Area (ft²) |
| <input checked="" type="checkbox"/> New Lighting System | Area Category      | 32,352     | Area Category      | 0          |
| <input type="checkbox"/> Altered Lighting System        |                    |            |                    |            |
| Total Area of Work (ft²)                                |                    | 32,352     | 0                  |            |

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

| Lighting in conditioned and unconditioned spaces must not be combined for compliance per §140.6(b)(1). | 01                          | 02                                       | 03                     | 04                    | 05                     | 06   | 07                                | 08                   | 09                    | 10                      |
|--|-----------------------------|--|------------------------|-----------------------|------------------------|--|-----------------------------------|----------------------|-----------------------|-------------------------|
| Complete Building \$140.6(c)(1)  | Area Category \$140.6(c)(2) | Area Category Footnotes \$140.6(c)(2)(+) | Tailored \$140.6(c)(3) | Total Allowed (Watts) | Total Designed (Watts) | Portable Lighting \$140.6(a) \$140.6(a)(2) | PAF Control Credits \$140.6(a)(2) | Total Actual (Watts) | *Includes Adjustments | 05 Must be ≥ 09 \$140.6 |
| (See Table I)  | (See Table I)               | (See Table K)                            | (See Table L)          | = 32,154.2            | ≥ 15,221               | (See Table F)                              | (See Table J)                     | (See Table R)        | = 15,221              | COMPLIES                |
| Conditioned:   | 32,154.2                    |  |                        | = 32,154.2            | ≥ 15,221               |  |                                   |                      | = 15,221              | COMPLIES                |
| Unconditioned:   |                             |  |                        | = 2                   |                        |  |                                   |                      | =                     | COMPLIES                |
| Controls Compliance (See Table H for Details)  |                             |  |                        |                       |                        |  |                                   |                      |                       | COMPLIES                |
| Rated Power Reduction Compliance (See Table S for Details)   |                             |  |                        |                       |                        |  |                                   |                      |                       | Not Applicable          |

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

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CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

Project Name: Children's Ministry Lancaster Baptist Church

Report Page: Page 2 of 7

Project Address: 4020 Lancaster Blvd.

Date Prepared: 5/2/2019

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

No exceptional conditions apply to this project.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. INDOOR LIGHTING FIXTURE SCHEDULE

Table Instructions: Include all permanent designed lighting and all portable lighting in offices.

| 01                                       | 02                             | 03   | 04                   | 05                        | 06                      | 07                       | 08           | 09                       |
|--|--------------------------------|--|----------------------|---------------------------|-------------------------|--------------------------|--------------|--------------------------|
| Name or Item Tag                         | Complete Luminaire Description | Specialized Luminaire Types Track Portable | Watts per luminaire¹ | How Wattage is determined | Total number luminaires | Exempt per §140.6(a)(3)  | Design Watts | Field Inspector          |
| 1  | 1 - 2x2' Led Recessed Troffer  | <input type="checkbox"/>                   | 28                   | Mfr. Spec¹                | 480                     | <input type="checkbox"/> | 13,440       | <input type="checkbox"/> |
| 2  | 2 - 2x2' Led Recessed Troffer  | <input type="checkbox"/>                   | 32                   | Mfr. Spec¹                | 16                      | <input type="checkbox"/> | 512          | <input type="checkbox"/> |
| 3  | 3 - 24" Led Decorative Pendant | <input type="checkbox"/>                   | 24                   | Mfr. Spec¹                | 6                       | <input type="checkbox"/> | 144          | <input type="checkbox"/> |
| 4  | 4 - 36" Led Decorative Penda   | <input type="checkbox"/>                   | 42                   | Mfr. Spec¹                | 4                       | <input type="checkbox"/> | 168          | <input type="checkbox"/> |
| 5  | 5 - 4" Led Downlight           | <input type="checkbox"/>                   | 11                   | Mfr. Spec¹                | 81                      | <input type="checkbox"/> | 891          | <input type="checkbox"/> |
| 6  | 6 - 4" Led Wall Washer         | <input type="checkbox"/>                   | 11                   | Mfr. Spec¹                | 6                       | <input type="checkbox"/> | 66           | <input type="checkbox"/> |
| Total Designed Watts CONDITIONED SPACES: |                                |  |                      |                           |                         |                          |              | 15,221                   |

\*NOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per §130.0(c). Wattage used must be the maximum rated for the luminaire, not the lamp.

G. TRACK LIGHTING

This Section Does Not Apply

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

Project Name: Children's Ministry Lancaster Baptist Church

Report Page: Page 5 of 7

Project Address: 4020 Lancaster Blvd.

Date Prepared: 5/2/2019

L. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE

This Section Does Not Apply

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED SPECIAL FUNCTION AREAS

This Section Does Not Apply

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY

This Section Does Not Apply

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING

This Section Does Not Apply

P. ADDITIONAL LIGHTING ALLOWANCE: TAILORED ORNAMENTAL/SPECIAL EFFECTS

This Section Does Not Apply

Q. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE

This Section Does Not Apply

R. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (PAF)

This Section Does Not Apply

S. RATED POWER REDUCTION COMPLIANCE BY SPACE

This Section Does Not Apply

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

Project Name: Children's Ministry Lancaster Baptist Church

Report Page: Page 5 of 7

Project Address: 4020 Lancaster Blvd.

Date Prepared: 5/2/2019

TITLE 24 GENERAL NOTE

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK ASSOCIATED WITH FINAL INSPECTION AND APPLICABLE ACCEPTANCE REQUIREMENT PROCEDURES. INCLUDE ALL COSTS IN THE BASE BID. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO CONSTRUCTION INSPECTION, MEASUREMENTS, MONITORING, FUNCTIONAL TESTING, CALIBRATING, ETC. CONTRACTOR SHALL ASSUME THE ROLE OF "FIELD TECHNICIAN" AND "RESPONSIBLE PERSON" AS DEFINED IN STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS NONRESIDENTIAL COMPLIANCE MANUAL SECTION 13.2.2.

SEE STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS SECTIONS 10-103(a)(3)A AND 10-103(a)(3)B AND SECTION 130.4 FOR MORE INFORMATION.

SEE STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS NONRESIDENTIAL COMPLIANCE MANUAL CHAPTER 13 FOR MORE DETAILED REQUIREMENTS / INFORMATION.

SEE STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS RESIDENTIAL COMPLIANCE MANUAL CHAPTER 2 FOR MORE DETAILED REQUIREMENTS / INFORMATION.

PROVIDE COMPLETED INSTALLATION CERTIFICATE(S) AND CERTIFICATE(S) OF ACCEPTANCE AS REQUIRED TO THE SATISFACTION OF THE ENFORCEMENT AGENCY.

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

Project Name: Children's Ministry Lancaster Baptist Church

Report Page: Page 5 of 7

Project Address: 4020 Lancaster Blvd.

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

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CALIFORNIA ENERGY COMMISSION

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STATE OF CALIFORNIA

Indoor Lighting

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Report Page: Page 5 of 7

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July 2018

STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 7/18)

CALIFORNIA ENERGY COMMISSION

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CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: [http](http://www.energy.ca.gov/title24/2016standards)



STATE OF CALIFORNIA

Outdoor Lighting

NRCC-LTO-E (Created 9/17)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

NRCC-LTO-E

Page 5 of 6

Project Name: Children's Ministry Lancaster Baptist Church

Report Page:

Project Address: 4020 Lancaster Blvd.

Date Prepared: 6/11/2019

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: <http://www.energy.ca.gov/title24/attcp/providers.html>

| YES                              | NO                    | Form/Title   | Field Inspector          |                          |
|----------------------------------|-----------------------|--|--------------------------|--------------------------|
|                                  |                       |  | Pass                     | Fail                     |
| <input checked="" type="radio"/> | <input type="radio"/> | NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls area added to ≤ 20 luminaires. | <input type="checkbox"/> | <input type="checkbox"/> |

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

September 2017

STATE OF CALIFORNIA

Outdoor Lighting

NRCC-LTO-E (Created 9/17)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

NRCC-LTO-E

Page 6 of 6

Project Name: Children's Ministry Lancaster Baptist Church


Report Page:

Project Address: 4020 Lancaster Blvd.

Date Prepared: 6/11/2019

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

Documentation Author Name: Raymond Swartz

Documentation Author Signature: 

Company: tk1sc

Signature Date: 6/11/2019

Address: 15231 Laguna Canyon Rd. Suite 100

CEA/HERS Certification Identification (if applicable): E15610

City/State/Zip: Irvine, CA 92618

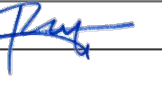
Phone: (949) 751-5800

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Compliance is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
- The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
- The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
- I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Ray Swartz

Responsible Designer Signature: 

Company: TK1SC

Date Signed: 6/11/2019

Address: 15231 Laguna Canyon Road Suite 100

License: E15610

City/State/Zip: Irvine, CA 92618

Phone: 949-751-5800

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

September 2017

STATE OF CALIFORNIA

Outdoor Lighting

NRCC-LTO-E (Created 9/17)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

NRCC-LTO-E

Page 3 of 6

Project Name: Children's Ministry Lancaster Baptist Church

Report Page:

Project Address: 4020 Lancaster Blvd.

Date Prepared: 6/11/2019

Table Instructions: Complete this table demonstrating compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application. When an option having a \* is selected, the notes section of this table must be completed. The lighting controls section of the Compliance Summary Table on the first page will show "DOES NOT COMPLY" if the notes are left blank. For each requirement in columns 02 through 07, do not leave the field blank, instead select NA or Exempt\* from the dropdown list to indicate not applicable or an exemption.

Mandatory Controls

| 01               | 02  | 03                  | 04                       | 05                       | 06                        | 07  | 08                       |
|------------------|---|---------------------|--------------------------|--------------------------|---------------------------|---|--------------------------|
| Area Description | Motion Sensor: Incandescent-100W §130.2(c)1 | Shut-Off §130.2(c)1 | Auto-Schedule §130.2(c)2 | Motion Sensor §130.2(c)3 | Sales Frontage §130.2(c)4 | Facade, Ornament, Outdoor Dining §130.2(c)5 | Field Inspector          |
| Main Entrance    | NA: No Incand-100W                          | Astronomical Time   | Yes                      | NA: Walls30W             | NA: No Sales Front Ltg    | NA: No Sales Front Ltg                      | <input type="checkbox"/> |
| Side Entrance    | NA: No Incand-100W                          | Astronomical Time   | Yes                      | NA: Walls30W             | NA: No Sales Front Ltg    | NA: No Sales Front Ltg                      | <input type="checkbox"/> |

\*NOTES: Controls with a \* require a note in the space below explaining how compliance is achieved. EX: Not permitted by health & safety to be turned off. EXCEPTION 1 to §130.2(c).

I. LIGHTING POWER ALLOWANCE (per §140.7)

Table Instructions: Please complete this table for areas using the allowance calculations per §140.7. General Hardscape Allowance is per Table 140.7(a) while "Use it or lose it" Allowances are per Table 140.7(b). Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance.

Calculated General Hardscape Lighting Power Allowance per Table 140.7-A

| 02               | 03                           | 04                             | 05                              | 06                    | 07                     | 08                       | 09   |
|------------------|------------------------------|--------------------------------|---------------------------------|-----------------------|------------------------|--------------------------|------|
| Area Description | Area Wattage Allowance (AWA) | Linear Wattage Allowance (LWA) | Total General AWA + LWA (Watts) |                       |                        |                          |      |
|                  | Illuminated Area (ft²)       | Allowed Density (W/ft²)        | Area Allowance (Watts)          | Perimeter Length (ft) | Allowed Density (W/ft) | Linear Allowance (Watts) |      |
| Main Entrance    | 620                          | 0.04                           | 24.8                            | 100                   | 0.35                   | 35                       | 59.8 |
| Side Entrance    | 800                          | 0.04                           | 32                              | 240                   | 0.35                   | 84                       | 116  |

Initial Wattage Allowance for Entire Site (Watts): 520

Total General Hardscape Allowance (Watts): 695.8

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

September 2017

STATE OF CALIFORNIA

Outdoor Lighting

NRCC-LTO-E (Created 9/17)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

NRCC-LTO-E

Page 2 of 6

Project Name: Children's Ministry Lancaster Baptist Church

Report Page:

Project Address: 4020 Lancaster Blvd.

Date Prepared: 6/11/2019

A. GENERAL INFORMATION

|  |   |   |       |
|--|---|---|-------|
| 01 Project Location (city)   | Lancaster   | 04 Total Illuminated Hardscape Area (ft²)   | 1,420 |
| 02 Climate Zone  | 14  |   |       |
| 03 Outdoor Lighting Zone per Title 24, Part 1 §10-114 or as designated by Authority Having Jurisdiction (AHJ): |   |   |       |
| <input type="checkbox"/> LZ-0: Very Low - Undeveloped Parkland   | <input type="checkbox"/> LZ-2: Moderate - Rural Areas                   | <input type="checkbox"/> LZ-4: High - Must be reviewed by CA Energy Commission for Approval |       |
| <input type="checkbox"/> LZ-1: Low - Developed Parkland  | <input checked="" type="checkbox"/> LZ-3: Moderately High - Urban Areas |   |       |

B. PROJECT SCOPE

Table Instructions: Include any outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.7 or §141.0(b)(2) for alterations.

My project consists of:

|   |  |
|---|--|
| 01  | 02   |
| <input checked="" type="checkbox"/> New Lighting System | Must Comply with Allowances from §140.7.   |
| <input type="checkbox"/> Altered Lighting System        | Is your alteration increasing the connected lighting load (Watts)? <input type="radio"/> Yes <input checked="" type="radio"/> No |

\*FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D, for guidance.

Calculation of Total Allowed Lighting Power (Watts) §140.7 or §141.0(b)(2)

| 01   | 02   | 03  | 04                                    | 05   | 06   | 07                      | 08                                   | 09              |
|--|--|---|---------------------------------------|--|--|-------------------------|--------------------------------------|-----------------|
| General Hardscape Allowance §140.7(d)1 (See Table I) | + Per Application §140.7(d)2 (See Table J) | + Sales Frontage §140.7(d)2 (See Table K) | + Ornamental §140.7(d)2 (See Table L) | + Per Specific Area §140.7(d)2 (See Table M) | OR Existing Power §141.0(b)(2) (See Table N) | = Total Allowed (Watts) | ≥ Total Actual (Watts) (See Table F) | 07 Must be ≥ 08 |
| 695.8  | +  | +   | +                                     | +  | OR   | = 695.8                 | ≥ 128                                | COMPLIES        |

Cutoff Compliance (See Table G for Details)

Not Applicable

Controls Compliance (See Table H for Details)

COMPLIES

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

September 2017

STATE OF CALIFORNIA

Outdoor Lighting

NRCC-LTO-E (Created 9/17)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE

NRCC-LTO-E

Page 4 of 6

Project Name: Children's Ministry Lancaster Baptist Church

Report Page:

Project Address: 4020 Lancaster Blvd.

Date Prepared: 6/11/2019

J. LIGHTING ALLOWANCE: PER APPLICATION

This Section Does Not Apply

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This Section Does Not Apply

L. LIGHTING ALLOWANCE: ORNAMENTAL

This Section Does Not Apply

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This Section Does Not Apply

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This Section Does Not Apply

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at <http://www.energy.ca.gov/2015publications/CEC-400-2015-033/appendices/forms/NRCC>

| YES                              | NO                    | Form/Title   | Field Inspector          |                          |
|----------------------------------|-----------------------|--|--------------------------|--------------------------|
|                                  |                       |  | Pass                     | Fail                     |
| <input checked="" type="radio"/> | <input type="radio"/> | NRCL-LTO-01-E - Must be submitted for all buildings.   | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="radio"/> | <input type="radio"/> | NRCL-LTO-02-E - Must be submitted for a lighting control system; or for an Energy Management Control System (EMCS), to be recognized for compliance. | <input type="checkbox"/> | <input type="checkbox"/> |

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

September 2017

STATE OF CALIFORNIA

Outdoor Lighting

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NRCC-LTO-E

Page 2 of 6

Project Name: Children's Ministry Lancaster Baptist Church

Report Page:

Project Address: 4020 Lancaster Blvd.

Date Prepared: 6/11/2019

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

No exceptional conditions apply to this project.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. OUTDOOR LIGHTING FIXTURE SCHEDULE

Table Instructions: For new or altered lighting systems demonstrating compliance with §140.7 (ie Table I has expanded for input), include all luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application in the Table below. For altered lighting systems using the Existing Power method per §141.0(b)(2) (ie Table N has expanded for input), include only new luminaires being installed and replacement luminaires being installed as part of the project scope (ie, do not include existing luminaires remaining or existing luminaires being moved).

Designed Wattage:

| 01                        | 02                             | 03                   | 04                        | 05                      | 06                | 07                       | 08           | 09                            | 10                       |
|---------------------------|--------------------------------|----------------------|---------------------------|-------------------------|-------------------|--------------------------|--------------|-------------------------------|--------------------------|
| Name or Item Tag          | Complete Luminaire Description | Watts per luminaire¹ | How Wattage is determined | Total number luminaires | Luminaire Status² | Excluded per §140.7(a)³  | Design Watts | Cutoff Req. > 150W §130.2(b)⁴ | Field Inspector          |
| 7                         | 7 - 6" Led Downlight           | 21                   | Mfr. Spec²                | 4                       | New               | <input type="checkbox"/> | 84           |                               | <input type="checkbox"/> |
| 8                         | 8 - 6" Led Downlight           | 11                   | Mfr. Spec²                | 4                       | New               | <input type="checkbox"/> | 44           |                               | <input type="checkbox"/> |
| Total Designed Watts: 128 |                                |                      |                           |                         |                   |                          |              |                               |                          |

\* NOTES: Selections with a \* require a note in the space below explaining how compliance is achieved. EX: Luminaire is lighting a statue; EXCEPTION 2 to §130.2(b).

G. CUTOFF REQUIREMENTS (BUG)

This Section Does Not Apply

H. OUTDOOR LIGHTING CONTROLS

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2016standards>

September 2017

## TITLE 24 GENERAL NOTE

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK ASSOCIATED WITH FINAL INSPECTION AND APPLICABLE ACCEPTANCE REQUIREMENT PROCEDURES. INCLUDE ALL COSTS IN THE BASE BID. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO CONSTRUCTION INSPECTION, MEASUREMENTS, MONITORING, FUNCTIONAL TESTING, CALIBRATING, ETC. CONTRACTOR SHALL ASSUME THE ROLE OF "FIELD TECHNICIAN" AND "RESPONSIBLE PERSON" AS DEFINED IN STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS NONRESIDENTIAL COMPLIANCE MANUAL SECTION 13.2.2.

SEE STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS SECTIONS 10–103(a)3A AND 10–103(a)3B AND SECTION 130.4 FOR MORE INFORMATION.

SEE STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS NONRESIDENTIAL COMPLIANCE MANUAL CHAPTER 13 FOR MORE DETAILED REQUIREMENTS / INFORMATION.

SEE STATE OF CALIFORNIA 2016 BUILDING ENERGY EFFICIENCY STANDARDS RESIDENTIAL COMPLIANCE MANUAL CHAPTER 2 FOR MORE DETAILED REQUIREMENTS / INFORMATION.

PROVIDE COMPLETED INSTALLATION CERTIFICATE(S) AND CERTIFICATE(S) OF ACCEPTANCE AS REQUIRED TO THE SATISFACTION OF THE ENFORCEMENT AGENCY.

**tk1sc**  
COLLABORATIVE

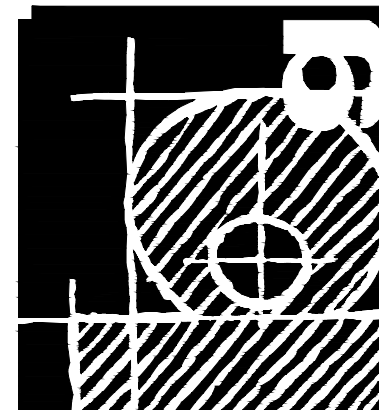
15231 Laguna Canyon Road, Suite 100  
Irvine, California 92618  
949.751.5800 www.tk1sc.com  
Project Leader - Steve Hayman  
Electrical Lead - Steve Hayman  
TK1sc Job #: 2018-0585

REVISIONS

| DATE/DELTA | REMARKS |
|------------|---------|
|            |         |
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**LANCASTER BAPTIST CHURCH**  
NORTH AUDITORIUM "KID CITY"  
IMPROVEMENTS  
4020 LANCASTER BLVD.  
LANCASTER, CALIFORNIA

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SHEET TITLE:

**TITLE 24  
(EXTERIOR)**

SUB DATE 05/08/19

BID DATE

DATE 03/19/19

DRAWN BY: JT

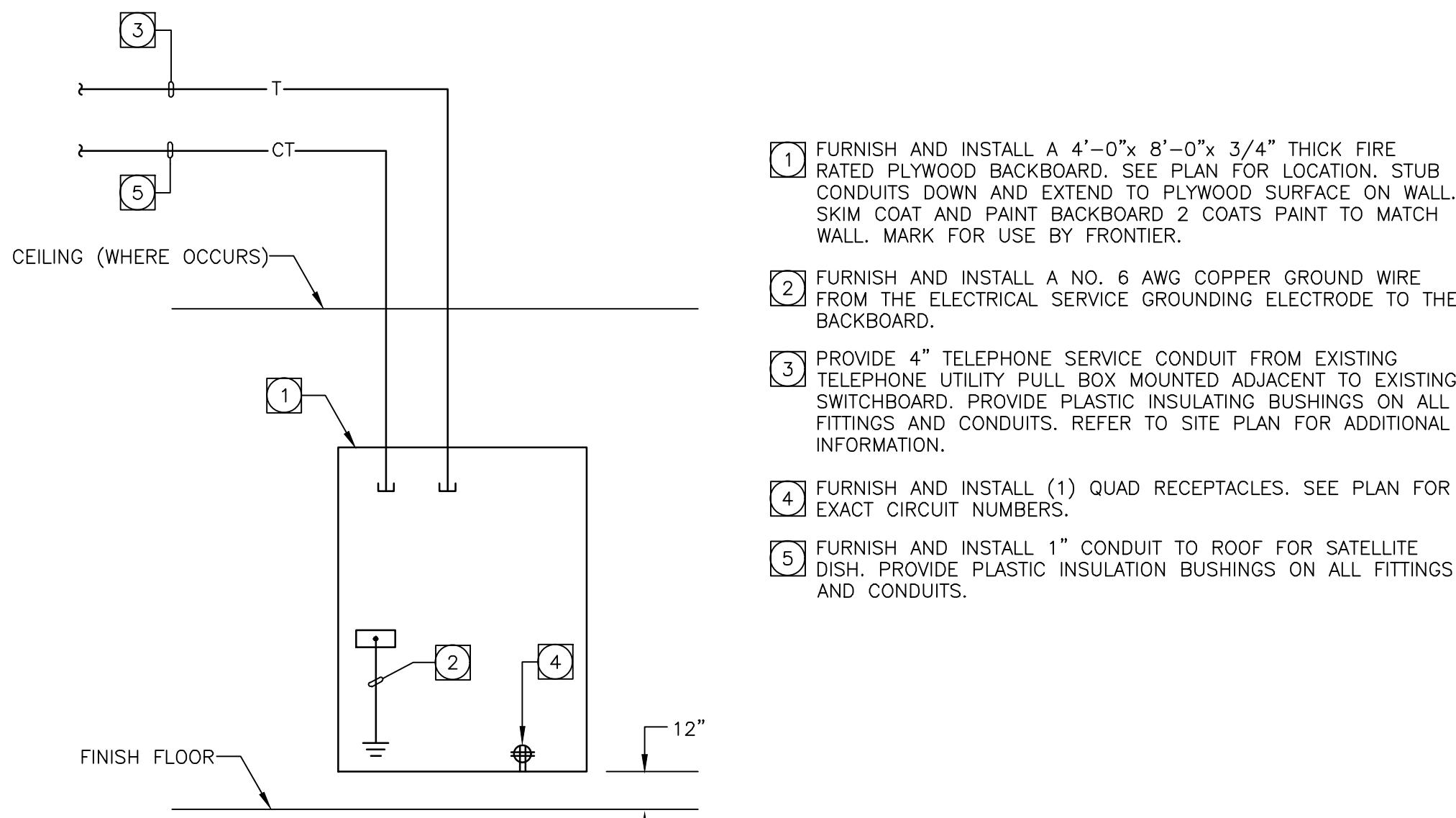
JOB NO: 11761

CHECKED BY: SH

SHEET NUMBER:

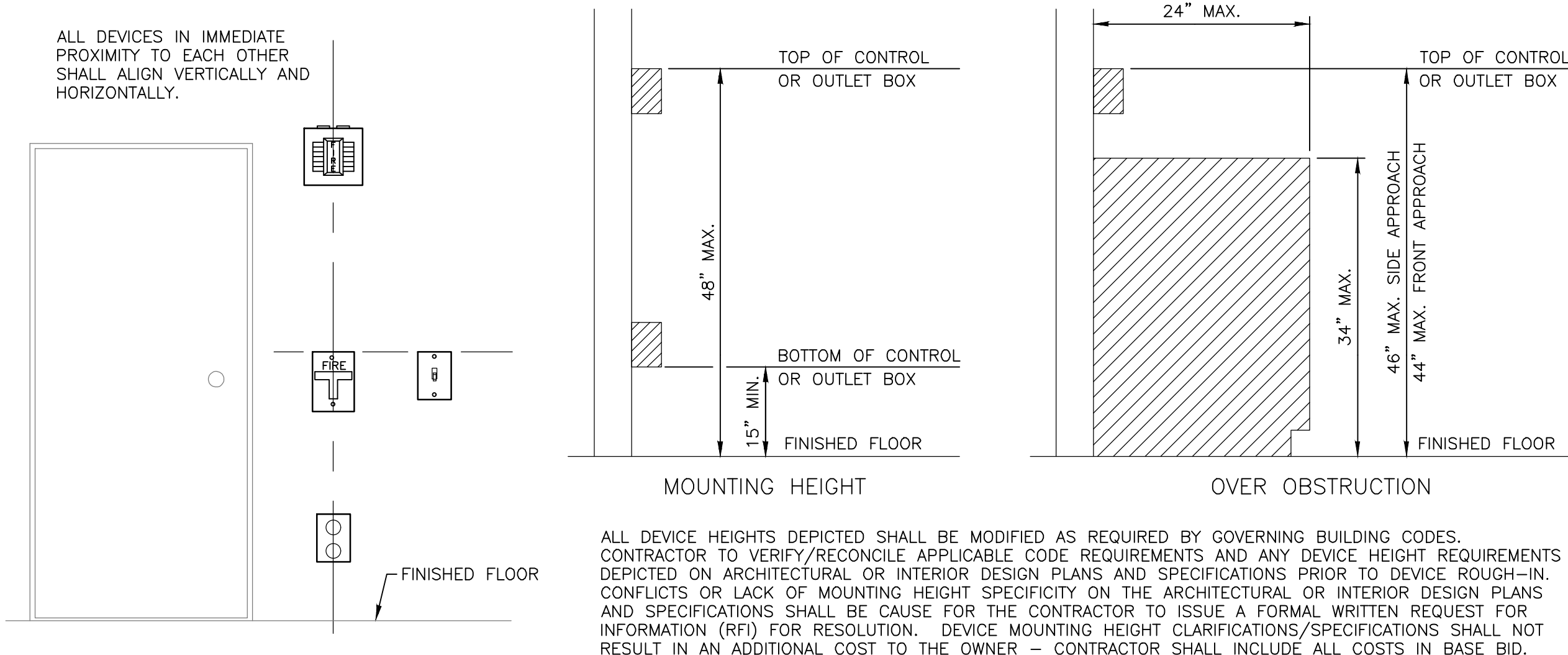
**E-5.3**





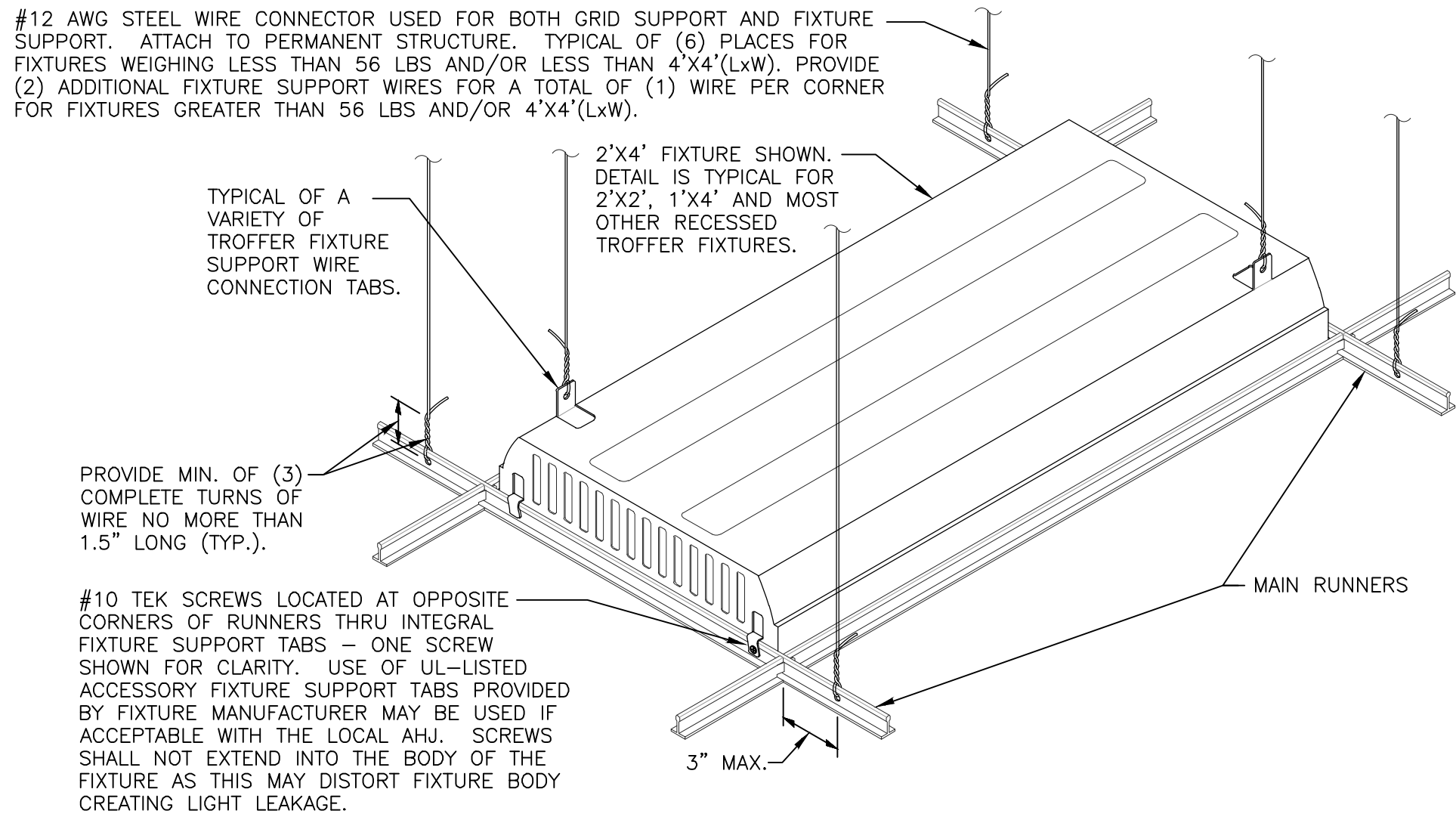
TELEPHONE BACKBOARD DETAIL  
SCALE: NTS

2



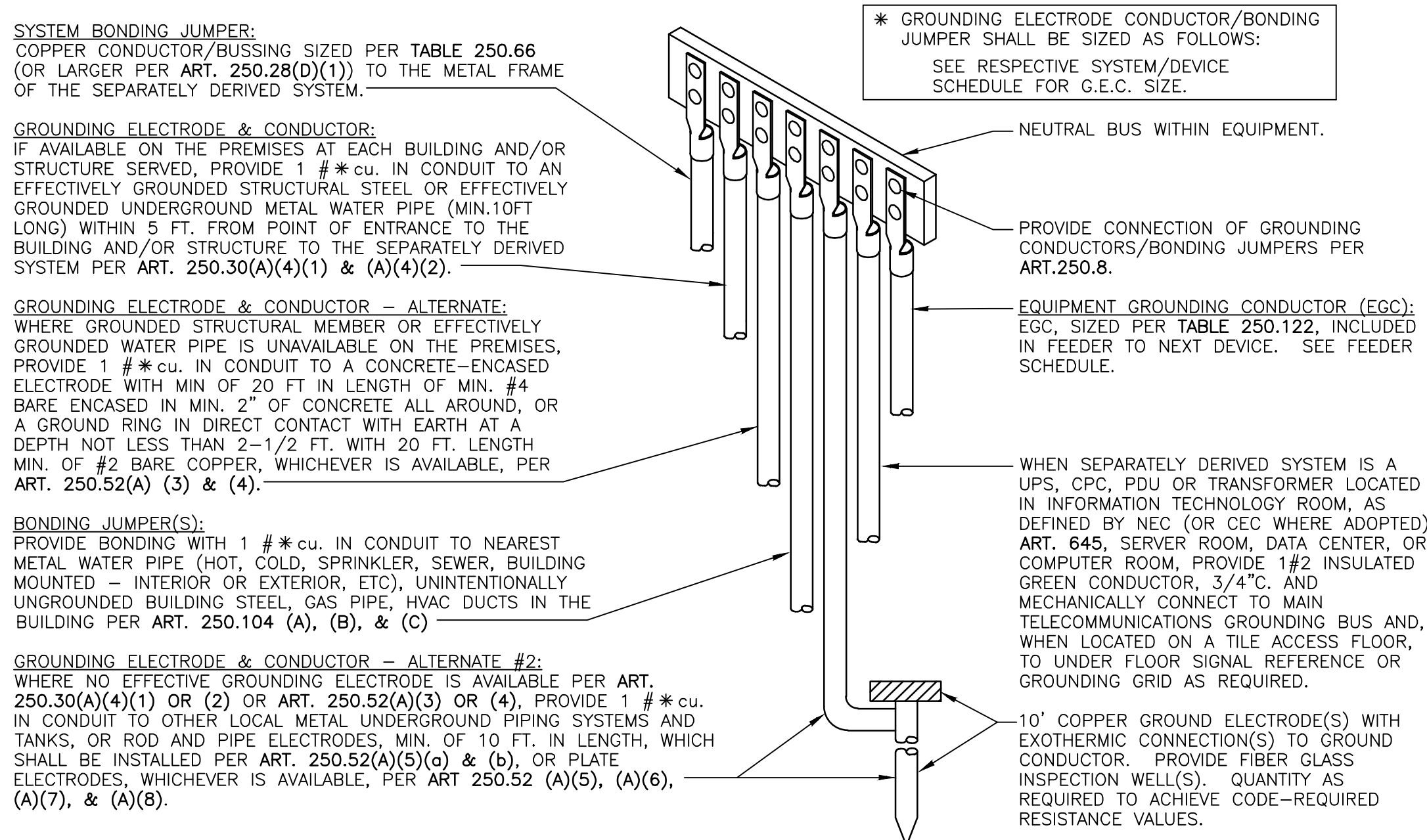
DEVICE ALIGNMENT & MOUNTING HEIGHT DETAILS  
SCALE: NTS

1



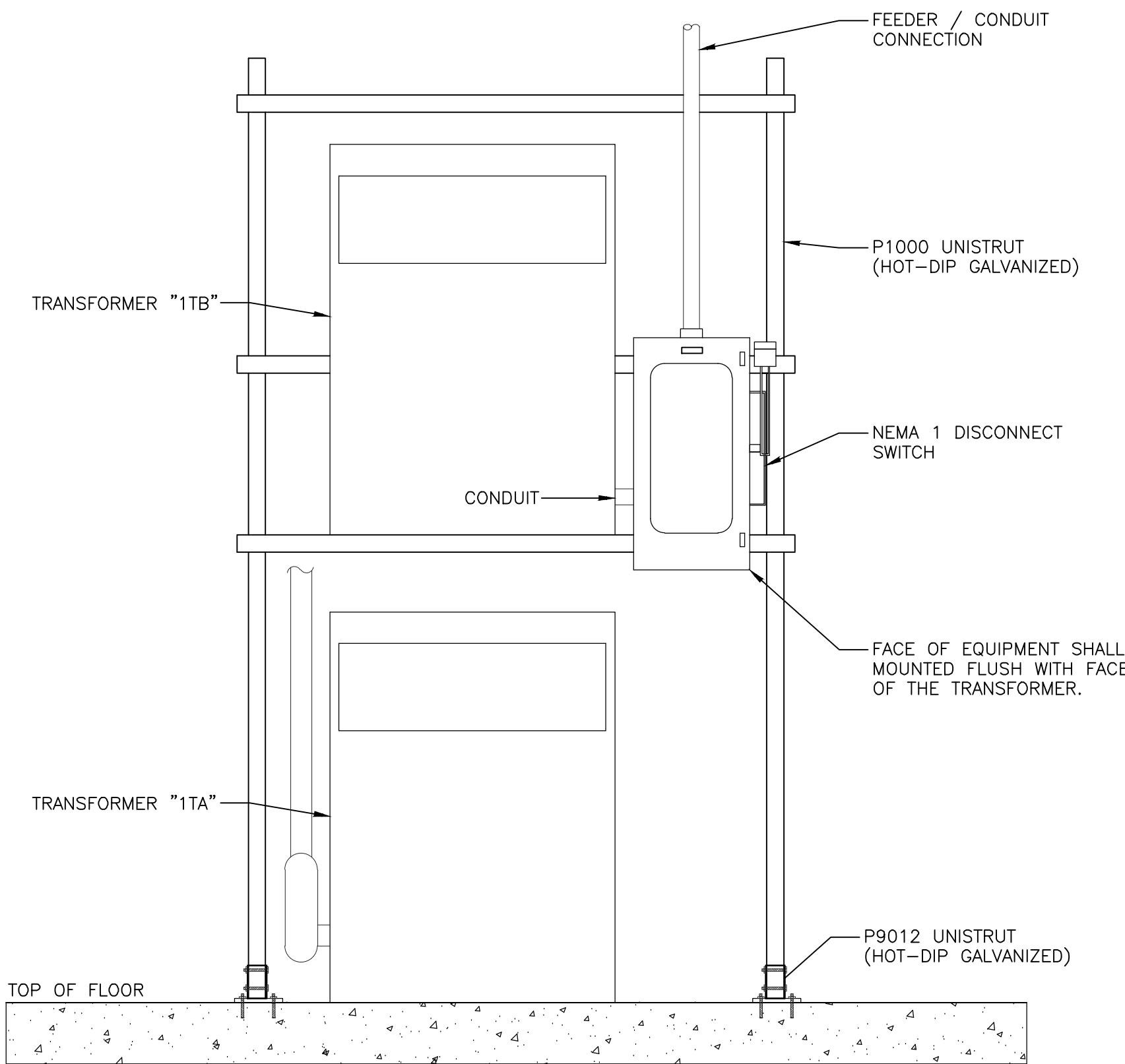
FIXTURE SUPPORT DETAIL  
SCALE: NTS

4



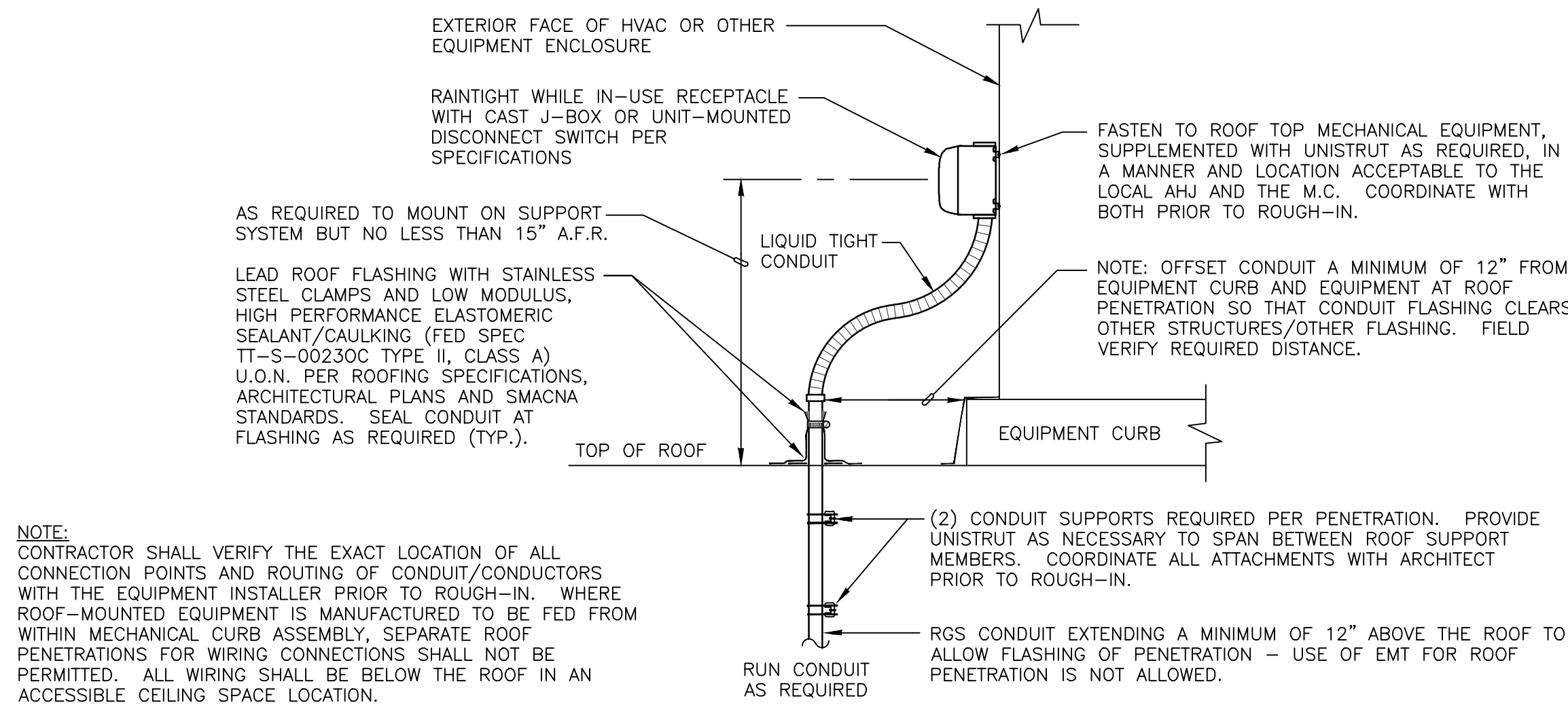
SEPARATELY DERIVED SYSTEM (SDS) GROUNDING DETAIL  
SCALE: NTS

3



TRANSFORMER UNISTRUT MOUNTING DETAIL  
SCALE: NTS

6



EQUIPMENT MOUNTED SWITCH/RECEPTACLE MOUNTING DETAIL  
SCALE: NTS

5

REVISIONS

| DATE/DELTA | REMARKS |
|------------|---------|
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SHEET TITLE:

MISCELLANEOUS DETAILS

|               |          |
|---------------|----------|
| SUB DATE      | 05/08/19 |
| BID DATE      |          |
| DATE          | 03/19/19 |
| DRAWN BY:     | JT       |
| JOB NO:       | 11761    |
| CHECKED BY:   | SH       |
| SHEET NUMBER: | E-6.1    |





1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FURNISHING OF ALL MATERIAL, LABOR, EQUIPMENT, AND SERVICES, IN CONNECTION WITH THE INSTALLATION OF A COMPLETE AND FULLY FUNCTIONING AND CODE COMPLIANT INSTALLATION.
2. IT IS THE INTENT OF THE CONTRACT DOCUMENTS, WHICH ARE PRESENTED IN A DIAGRAMMATIC FORMAT, TO PROVIDE CONTRACTOR INFORMATION THAT SUPPLEMENTS AND ENHANCES THE GENERALLY ACCEPTED CONSTRUCTION METHODS, MATERIALS, AND PROCEDURES EMPLOYED IN CONNECTION WITH INSTALLATION OF THIS TYPE OF PRODUCT / SYSTEM.
3. THE CONTRACTOR SHALL ALSO INCORPORATE THE REQUIREMENTS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS / WARRANTY REQUIREMENTS AS PART OF THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS. IN THE EVENT OF A CONFLICT BETWEEN THE CONTRACT DOCUMENT REQUIREMENTS AND THE MANUFACTURER'S INSTALLATION REQUIREMENTS, THE MORE STRINGENT REQUIREMENTS SHALL APPLY – UNLESS THE MORE STRINGENT REQUIREMENT VIOLATES APPLICABLE WARRANTIES OR VIOLATES THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION. ANY SUCH CONFLICT SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING THROUGH THE FORMAL RFI PROCESS.
4. REFER TO THE ASSOCIATED SCHEDULES, SCHEMATICS, DRAWINGS, AND SPECIFICATIONS FOR DETAILED INFORMATION / REQUIREMENTS ON THIS PRODUCT / SYSTEM.
5. THE CONTRACTOR SHALL COORDINATE AND VERIFY EXIST REQUIREMENTS WITH ELEVATOR DRAWINGS, SPECIFICATIONS AND THE ELEVATOR CONTRACTOR PRIOR TO ANY ROUGH IN.



| NAME | KVA | WINDING MATERIAL | INPUT |   |   | OUTPUT  |   |   | MIN. %Z | A.I.C. VALUE | K. VAL | GEC./BJ. SIZE | REDUCED SOUND LEVEL | NEMA- /MNTG. | DIMENSIONS |    |    | WGT. | REMARKS |
|------|-----|------------------|-------|---|---|---------|---|---|---------|--------------|--------|---------------|---------------------|--------------|------------|----|----|------|---------|
|      |     |                  | V     | P | W | V       | P | W |         |              |        |               |                     |              | H          | W  | D  |      |         |
| 1TA  | 75  | ALUMINUM         | 480   | 3 | 3 | 120/208 | 3 | 4 | 2.6     | 8,010        | N/A    | 1/2" C, #2    | YES                 | 1/FLR        | 43         | 35 | 27 | 710  | -       |
| 1TB  | 30  | ALUMINUM         | 480   | 3 | 3 | 120/208 | 3 | 4 | 2.3     | 3,619        | N/A    | 1/2" C, #6    | YES                 | 1/WALL       | 37         | 27 | 24 | 409  | -       |
| 2TA  | 75  | ALUMINUM         | 480   | 3 | 3 | 120/208 | 3 | 4 | 2.6     | 8,010        | N/A    | 1/2" C, #2    | YES                 | 1/FLR        | 43         | 35 | 27 | 710  | -       |

TYP. OF 4

FLOOR MOUNTED      WALL MOUNTED

- ② TRANSFORMER PER SPECIFICATIONS AND TRANSFORMER SCHEDULE.
- ③ PRIMARY FEEDER – SEE SINGLE LINE DIAGRAM.
- ④ SECONDARY FEEDER(S) – SEE SINGLE LINE DIAGRAM.
- ⑤ VIBRATION DAMPERS – SEE SPECIFICATIONS.
- ⑥ SEE SEPARATELY DERIVED SYSTEM GROUNDING DETAIL.
- ⑦ TRANSFORMER IDENTIFICATION NAMEPLATE IDENTIFYING REMOTE DISCONNECTING MEANS, LOCATION, AS REQUIRED, PER NEC, OR CEC WHERE ADOPTED, ARTICLE 450.14. SEE LABELING SECTION OF THE GENERAL ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ⑧ PROVIDE A TRANSFORMER DISCONNECTING MEANS CAPABLE OF BEING LOCK-OFF, AS REQUIRED, PER NEC, OR CEC WHERE ADOPTED, ARTICLE 450.14.

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FURNISHING OF ALL MATERIAL, LABOR, EQUIPMENT, AND SERVICES, IN CONNECTION WITH THE INSTALLATION OF A COMPLETE AND FULLY FUNCTIONING AND CODE COMPLIANT SYSTEM.
2. IT IS THE INTENT OF THE CONTRACT DOCUMENTS, WHICH ARE PRESENTED IN A DIAGRAMMATIC FORMAT, TO PROVIDE CONTRACTOR INFORMATION THAT SUPPLEMENTS AND ENHANCES THE GENERALLY ACCEPTED CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES EMPLOYED IN CONNECTION WITH THE INSTALLATION OF THE SYSTEM.
3. THE CONTRACTOR SHALL ALSO INCORPORATE THE REQUIREMENTS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS / WARRANTY REQUIREMENTS AS PART OF THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS. IN THE EVENT OF A CONFLICT BETWEEN THE CONTRACT DOCUMENT REQUIREMENTS AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS / WARRANTY REQUIREMENTS, THE CONTRACTOR SHALL FOLLOW THE MORE STRINGENT REQUIREMENT VOIDS APPLICABLE WARRANTIES OR VIOLATES THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION. ANY SUCH CONFLICT SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ARCHITECT THROUGH THE AIA FORMS FOR DISCUSSION.
4. REFER TO THE ASSOCIATED SCHEDULES, SCHEMATICS, DRAWINGS, AND SPECIFICATIONS FOR DETAILED INFORMATION / REQUIREMENTS ON THIS PRODUCT / SYSTEM.

3. W.P. SWITCH AND 4 FT LONG, SURFACE-MOUNTED, WET-LOCATION LISTED, 300V NOMINAL LUMEN LED FIXTURE WITH MOLDED ACRYLIC LENS AND FIBER OPTIC REINFORCED POLYESTER BODY IN PIT PER CODE REQUIREMENTS. QUANTITY AS REQUIRED TO MEET CODE MINIMUM LIGHTING LEVELS. LOCATE SWITCH ADJACENT TO ACCESS LADDER. FOR MACHINE-ROOMLESS (MRL) ELEVATORS PROVIDE SAME LUMEN TYPE AT TOP OF SHAFT. QUANTITY AS REQUIRED TO MEET CODE MINIMUM LIGHTING LEVELS.

4. W.P. G.F.C.I. OUTLET IN PIT. LOCATE PER CODE AND MANUFACTURER REQUIREMENTS.

5. W.P. G.F.C.I. OUTLET 1/2 WAY UP SHAFT ONLY IF REQUIRED BY CODE OR MANUFACTURER REQUIREMENTS. FOR MACHINE-ROOMLESS (MRL) ELEVATORS, PROVIDE A G.F.C.I. RECEPTACLE AT TOP OF SHAFT.

6. W.P. G.F.C.I. OUTLET IN MACHINE ROOM. LOCATE PER CODE AND MANUFACTURER'S REQUIREMENTS.

7. TELEPHONE OUTLET WITH 3/4" C.O. TO THE MAIN TELEPHONE BACKBOARD. VERIFY EXACT LOCATION WITH MANUFACTURER IF REQUIRED IN THE SHAFT AND/OR IN THE MACHINE ROOM.

8. CONNECT TO ELEVATOR MOTOR CONTROLLER(S). LOCATE AND LABEL DISCONNECT SWITCH PER REQUIREMENTS. SEE LINE DIAGRAM AND MOTORIZED EQUIPMENT SCHEDULE FOR MORE INFORMATION/REQUIREMENTS.

9. CONTRACTOR TO PROVIDE JUNCTION BOXES FOR ELEVATOR CALL BUTTON AND ELEVATOR FLOOR LIGHT PER ARCHITECTURAL ELEVATIONS. TYPICAL AT EACH LOBBY/FLOOR.

10. W.P. SMOKE DETECTOR(S) (AREA) AT EACH ELEVATOR LOBBY/FLOOR FOR ELEVATOR CAPTOR/RECALL. CONNECT TO ELEVATOR CONTROLLER(S) AS REQUIRED. PROVIDE A W.P. FIRE ALARM DEVICE(S). AT EXTERIOR INSTALLATIONS, PROVIDE A W.P. HEAT DETECTOR.

11. CONNECT TO ELEVATOR CAB LIGHTING, CAB RECEPTACLE, CAB VENTILATION, AND/OR CAB AIR CONDITIONING/HEATING UNIT(S). PROVIDE A MINIMUM OF (1) 2 POLE, 30A LOCKABLE FUSED DISCONNECT WITH 20A FUSES FOR DEDICATED CAB LIGHTING AND CAB RECEPTACLE/VENTILATION CIRCUITS IN COMPLIANCE WITH NEC (SEE WHERE ADOPTED) ART 620.22 AND 620-53.

12. SMOKE AND HEAT DETECTORS LOCATED IN ELEVATOR HOISTWAY ACCESSIBLE FROM OUTSIDE ELEVATOR SHAFT. SEE ELEVATOR SHUTDOWN WIRING DETAIL AND ELEVATOR SHAFT FIRE ALARM DEVICE DETAIL. CONTRACTOR TO PROVIDE EXACT REQUIREMENTS WITH THE ARCHITECT AND THE FIRE ALARM DESIGN-BUILD CONTRACTOR PRIOR TO ROUGH-IN. SET HEAT DETECTORS TO DEGREES LESS THAN SPRINKLER HEAD. INSTALLATION SHALL COMPLY WITH SECTION 914 OF ASME A17.0 (CURRENT EDITION) AND ELEVATOR INSPECTOR REQUIREMENTS.

13. SMOKE AND HEAT DETECTORS LOCATED IN ELEVATOR MACHINE ROOM. SEE ELEVATOR SHUTDOWN WIRING DETAIL.

14. L.V. FIRE ALARM CONTROL DEVICE(S) FOR ELEVATOR CAPTOR/RECALL. CONNECT TO ELEVATOR CONTROLLER(S) AS REQUIRED.

15. PROVIDE LOCKABLE 20A FUSED SWITCH AND EXTEND CIRCUIT TO ELEVATOR GROUND FLOOR CONTROLLER(S), IF REQUIRED. COORDINATE LOCATION WITH ELEVATOR CONTRACTOR PRIOR TO ROUGH-IN.

16. PROVIDE 1/2" C.C. WITH REQUIRED CONDUCTORS FROM DISCONNECT SWITCH AUXILIARY CONTACTS TO ELEVATOR CONTROLLER. COORDINATE REQUIREMENTS WITH ELEVATOR CONTRACTOR AND G.C. PRIOR TO ROUGH-IN.

17. PROVIDE CONNECTION TO PUMP MAN, AS REQUIRED.

18. ROOM LIGHT SWITCH TO BE WITHIN 18" OF DOOR. SEE LIGHTING PLANS FOR MORE INFORMATION.

WHERE REQUIRED BY INTERNATIONAL FIRE CODE, INTERNATIONAL BUILDING CODE AND/OR STATE/LOCAL SUPPLEMENTAL CODES, PROVIDE THE FOLLOWING:

19. L.V. FIRE ALARM CONTROL DEVICE(S) FOR ELEVATOR BATTERY LOWERING DEVICE SHUNT MECHANISM.

20. FIRE ALARM CONTRACTOR TO PROVIDE SPEAKER AND FIREMAN'S PHONE JACK FOR EACH ELEVATOR TO BE INSTALLED BY ELEVATOR CONTRACTOR. SPEAKER AND JACK TO BE CUSTOM COLOR AND MATERIAL PER ARCHITECT.

21. PROVIDE CONDUITS FROM THE HOISTWAY/MACHINE ROOM TO FIRE CONTROL ROOM. PROVIDE AUTOMATIC SWITCHES AND CONDUIT SIZE PER ARCHITECT. SIZE ROUTING AND QUANTITY WITH G.C. AND ELEVATOR CONTRACTOR PRIOR TO BID.

22. FIRE ALARM CONTRACTOR TO PROVIDE FIREMAN'S PHONE JACK AT EACH LOBBY. JACK AND FACELATE TO BE PER ARCHITECTURAL DETAIL.

23. CONNECT TO EMERGENCY CIRCUIT.

24. L.V. FIRE ALARM CONTROL DEVICE FOR ALTERNATE FLOOR CAPTOR/RECALL FUNCTION.

25. PROVIDE EMERGENCY OR STANDBY 120V POWER, IF AVAILABLE ON PROJECT. PROVIDE SMOKE AND/OR FIRE DETECTOR CONNECTION AS REQUIRED. PROVIDE ADDITIONAL WALL SWITCH J-BOX WITH CONDUIT/CONDUCTORS TO CONTROL PANELS REQUIRED FOR SMOKE AND/OR FIRE DOOR RESET SWITCH. PROVIDE L.V. FIRE ALARM CONTROL AND MONITORING DEVICE(S) FOR SMOKE AND/OR FIRE DOOR. CONNECT TO ELEVATOR CONTROLLER(S) AS REQUIRED. SEE ARCHITECTURAL PLANS FOR LOCATIONS AND QUANTITIES. COORDINATE EXACT LOCATION WITH ROOM SUPPLIER FOR SMOKE AND/OR FIRE DOOR SUPPLIER AND ARCHITECT PRIOR TO ROUGH-IN.

26. L.V. FIRE ALARM CONTROL DEVICE FOR ELEVATOR LIGHT FUNCTION. (ELEVATOR LOBBY DETECTORS ACTIVATED).

27. L.V. FIRE ALARM CONTROL DEVICE FOR ELEVATOR LIGHT FUNCTION. (ELEVATOR HOISTWAY DETECTORS ACTIVATED).

28. L.V. FIRE ALARM MONITOR DEVICE TO NOTIFY WHEN PHASE 1 ELEVATOR RECALL IS COMPLETED.

29. L.V. FIRE ALARM MONITOR DEVICE TO NOTIFY ELEVATOR SHUNT TRIP IS DISABLED.

WHERE REQUIRED BY INTERNATIONAL FIRE CODE, INTERNATIONAL BUILDING CODE AND/OR STATE/LOCAL SUPPLEMENTAL CODES, PROVIDE THE FOLLOWING:

TRANSFORMERS SHALL BE DRY TYPE, INTEGRAL, SELF-COOLED, ENCLOSED DISTRIBUTION, TWO-WINDING TYPE PER UL 506. TRANSFORMERS SHALL BE PROVIDED WITH WINDINGS AS SHOWN ON THE DRAWING. EACH TRANSFORMER MUST UNDERGO VIBRATION TESTING, RESISTANCE, IMPEDANCE AND RATIO TESTING, THE RESULTS OF WHICH SHALL BE PROVIDED AS PART OF THE TRANSFORMER SUBMITTAL PACKAGE.

2. TRANSFORMERS SHALL BE EQUIPPED WITH TWO (2) 2 1/2" FCAN AND TWO (2) 2 1/2" FCBN TAPS. TAP LEADS SHALL BE TERMINATED ON AN INTERNAL BLOCK WITH LUGS FOR CONNECTION OF THE TERMINAL. EACH TRANSFORMER MUST UNDERGO VIBRATION TESTING BELOW THE LEVEL OF THE TRANSFORMER WINDINGS. PROVIDE ACCESS TO TERMINALS FROM THE FRONT FOR WALL AND FLOOR MOUNTED TRANSFORMERS, AND FROM THE FRONT AND BACK FOR FLOOR MOUNTED TRANSFORMERS.

3. VENTILATION OPENINGS SHALL BE LOCATED TO PERMIT PLACING THE TRANSFORMER IN A CORNER WITHIN 6" OF THE TWO ADJACENT WALLS. ENCLOSURE SHALL BE CONSTRUCTED OF HEAVY GAUGE STEEL, COATED INSIDE AND OUT WITH ZINC CHROMATE OR IRON OXIDE Rust INHIBITING PRIMER. ENCLOSURE SHALL THEN BE FINISHED IN GRAY ENAMEL. EACH TRANSFORMER SHALL BE FURNISHED WITH A MANUFACTURER'S NAMEPLATE LOCATED ON THE FRONT OF THE UNIT. THE NAMEPLATE SHALL BE ANODIZED ALUMINUM STENCILED WITH VOLTAGE, KVA RATING, K-RATING, PHASE, TAP ADJUSTMENTS AND WIRING DIAGRAMS.

4. SEISMICALLY-RATED VIBRATION ISOLATORS (KORFUND COMPANY, MASON INDUSTRIES, CALDYN OR EQUAL) SHALL BE LOCATED AT EACH CORNER OF THE TRANSFORMER. ELASTOMER ISOLATORS SHALL BE USED FOR TRANSFORMERS 1) WEIGHING LESS THAN 1000 LBS AND 2) THAT ARE NOT SPECIFIED WITH REDUCED SOUND LEVELS PER THE TRANSFORMER SCHEDULE. ELASTOMER PADS SHALL BE EQUIPPED WITH SHOULDERED PUSHING SURFACES TO PREVENT SLIDING. TRANSFORMERS 1000 LBS AND GREATER AND THE TRANSFORMER, NEOPRENE ISOLATORS SHALL BE USED FOR TRANSFORMERS WEIGHING 1000 LBS OR MORE OR ANY TRANSFORMER SPECIFIED WITH REDUCED SOUND LEVEL. TRANSFORMERS SHALL BE PROVIDED WITH SEISMIC BRACING AND ANCHORAGE. SEISMIC STEEL OR DUCTILE IRON HOUSINGS AS REQUIRED BY SEISMIC CONDITIONS AND WEIGHT OF THE TRANSFORMER. NEOPRENE ELEMENTS SHALL BE ARRANGED IN OPPOSITION TO PROVIDE POSITIVE MECHANICAL RESTRAINT IN ALL DIRECTIONS. NEOPRENE ISOLATORS SHALL BE SELECTED TO PROVIDE NOMINAL 0.2" OF NOMINAL STATIC DEFLECTION IN COMPRESSION (0.15" MINIMUM DEFLECTION) AND LESS THAN 70 DIURETHER (BASED ON 1000 LBS) AT A 1000 LBS LOAD. TRANSFORMERS SHALL BE PROVIDED WITH SEISMIC SOUND/VIBRATION TRANSMISSION TO THE STRUCTURE – SUBMIT ISOLATOR DEFLECTION CALCULATIONS FOR SELECTED ISOLATORS WITH TRANSFORMER SUBMITTAL. TRANSFORMER SHALL BE MOUNTED TO VIBRATION ISOLATORS, TO THE FLOOR, HOUSEKEEPING PAD, CEILING OR WALL MOUNTING BRACKETS AT ALL FOUR CORNERS. WHEN SHOWN AS WALL-MOUNTED, PROVIDE EITHER MANUFACTURER'S STANDARD TRANSFORMER WALL MOUNTING BRACKETS OR FIELD-ENGINEERED WALL MOUNTING BRACKETS. TRANSFORMER INSTALLATIONS SHALL, AT MINIMUM, MEET THE SEISMIC BRACING AND ANCHORAGE REQUIREMENTS MANDATED BY GOVERNING BUILDING CODES. SEE GENERAL ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

5. STANDARD TRANSFORMERS SHALL HAVE CLASS 220 INSULATION, HAVING A 150 DEGREE KELVIN RATING. TRANSFORMERS SHALL BE PROVIDED WITH 105 DEGREE CELSIUS MAXIMUM, WHEN OPERATING AT FULL LOAD – WITHOUT A LOSS OF LIFE. STANDARD TRANSFORMERS SHALL COMPLY WITH NEMA ENERGY EFFICIENCY STANDARD "TP-1", WHERE THE MAXIMUM PERMITTED SOUND LEVEL IS 65 DBA. TRANSFORMERS SHALL COMPLY WITH 2016 DEPARTMENT OF ENERGY (DOE) TRANSFORMER EFFICIENCY STANDARD-COMPLIANT TRANSFORMERS.

6. K RATED TRANSFORMERS SHALL HAVE CLASS 220 INSULATION, HAVING A 115 DEGREE CELSIUS TEMPERATURE RISE ABOVE 30 DEGREE CELSIUS AVERAGE AND 40 DEGREE CELSIUS MAXIMUM. WHEN OPERATING AT FULL LOAD – WITHOUT A LOSS OF LIFE. STANDARD TRANSFORMERS SHALL COMPLY WITH NEMA ENERGY EFFICIENCY STANDARD "TP-1", WHERE THE MAXIMUM PERMITTED SOUND LEVEL IS 65 DBA. TRANSFORMERS SHALL COMPLY WITH 2016 DEPARTMENT OF ENERGY (DOE) TRANSFORMER EFFICIENCY STANDARD-COMPLIANT TRANSFORMERS.

7. USE FLEXIBLE CONDUIT FOR PRIMARY AND SECONDARY CONNECTIONS WITH A SEPARATE EQUIPMENT GROUND CONDUCTOR.

8. THE "MIN. 32" COLUMN INDICATES THE MINIMUM ALLOWED TRANSFORMER IMPEDANCE.

9. THE "A.I.C. VOLTAGE" COLUMN INDICATES THE INTERRUPTING CURRENT AT THE SECONDARY TERMINALS BASED UPON AN INTERRUPTING CURRENT OF INFINITY AT THE PRIMARY TERMINALS.

10. THE "K VALUE" COLUMN INDICATES THE MINIMUM UL K RATING. K RATED TRANSFORMERS SHALL BE PROVIDED WITH DOUBLE SIZE NEUTRAL TERMINALS, ADDITIONAL CAPACITY, AN ELECTROSTATIC SHIELD, AND SHALL BE U.L. LISTED FOR NON-LINEAR LOADS.

11. THE "GEC/BCE" COLUMN INDICATES THE MINIMUM CONDUIT AND COPPER GROUNDING ELECTRODE CONDUCTOR AND BONDING JUMPER SIZES. THE G.E.C. AND CONDUIT SIZE SHALL BE INCREASED PER NEC OR CEC WHERE ADAPTED, TABLE 250.66 BY THE CONTRACTOR BASED ON EQUIVALENT SIZE OF THE TRANSFORMER SECONDARY CONDUCTORS.

12. WHEN THE TRANSFORMER SCHEDULE INDICATES A "REDUCED SOUND LEVEL" TRANSFORMER, PROVIDE TRANSFORMER THAT PRODUCES 3 DECIBELS LESS SOUND AS COMPARED TO NEMA STANDARD SOUND LEVELS. (WHEN REDUCED SOUND LEVEL TRANSFORMER IS NOT INDICATED, PROVIDE A TRANSFORMER THAT MEETS NEMA STANDARD SOUND LEVELS, WHICH ARE:

|             |              |
|-------------|--------------|
| 10-50 KVA   | 45 DECIBELS. |
| 51-150 KVA  | 50 DECIBELS. |
| 151-300 KVA | 55 DECIBELS. |
| 301-500 KVA | 60 DECIBELS. |

13. THE "NEMA/INTC" COLUMN INDICATES THE NEMA RATED ENCLOSURE TYPE AS WELL AS THE MOUNTING METHOD:

"1" – INDICATES AN INDOOR TYPE.

"2" – INDICATES A TRANSFORMER WITH 3R, OUTDOOR TYPE WITH VENTILATED OPENINGS AND RODENT/TAMPER SCREENS.

"3" – INDICATES FLOOR MOUNTED.

"4" – INDICATES WALL MOUNTED.

"RF" – INDICATES RAISED FLOOR MOUNTING WHICH REQUIRES A CUSTOM MOUNTING FRAME SUCH THAT THE RAISED FLOOR DOES NOT SUPPORT THE TRANSFORMER(S). SUGGESTED SOURCE: MASON WEST INC. ([www.masonwest.com](http://www.masonwest.com))

14. THE "DIMENSIONS" COLUMN INDICATES "H" HEIGHT, "W" WIDTH, AND "D" DEPTH. ALL DIMENSIONS AND WEIGHTS ARE BASED UPON SQUARE D PRODUCTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COST IMPACTS OF LARGER DIMENSIONS FROM AN ALTERNATE MANUFACTURER.

15. TRANSFORMERS SHALL BE GROUNDED TO A CODE APPROVED GROUND SOURCE PER NEC, OR CEC WITHIN 5 FEET OF THE TRANSFORMER.

16. IF THE SINGLE LINE DIAGRAM INDICATES TWO (2) 0.220" FEEDERS THE TRANSFORMER SHALL BE PROVIDED WITH A DOUBLE BUSBARS UNIT.

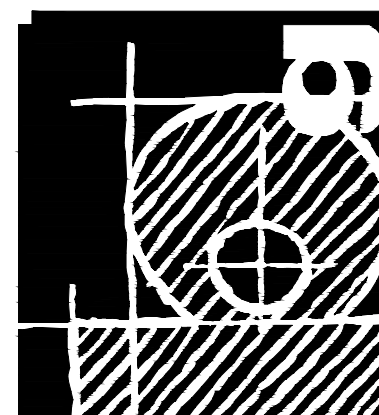
SHOP DRAWINGS SHALL BE SUBMITTED PER THE ELECTRICAL SUBMITTAL REQUIREMENTS

17. SHOWING CONFORMANCE TO THESE SPECIFICATIONS.

TRANSFORMERS SHALL BE MANUFACTURED BY GE, CUTLER-HAMMER, SIEMENS, SQUARE D, MCM, HAMMOND POWER SOLUTIONS, OR OLSEN.

**LANCASTER BAPTIST CHURCH**  
**ORTH AUDITORIUM "KID CITY"**  
**IMPROVEMENTS**  
**4020 LANCASTER BLVD.**  
**LANCASTER, CALIFORNIA**

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**SHEET TITLE**

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E-6.2







