FIRE ALARM NOTES

1. INSTALLATION OF THE FIRE ALARM SYSTEM SHALL NOT BE STARTED UNTIL SHOP DRAWINGS ARE SUBMITTED AND APPROVED BY THE LOCAL AUTHORITIES HAVING JURISDICTION.
2. PROVIDE ALL DRAWINGS, ENGINEERING CALCULATIONS, EQUIPMENT SPECIFICATIONS, ETC. AS NECESSARY TO OBTAIN APPROVAL.
3. FIRE ALARM SHALL BE MONITORED BY A U.L. CERTIFICATED CENTRAL STATION MONITORING COMPANY.
4. FIRE ALARM SHALL BE AN EXTENSION OF EXISTING SYSTEM. PROVIDE ADDITIONAL PANELS, POWER SUPPLIES, ETC. FOR A COMPLETE AND OPERABLE FIRE ALARM SYSTEM.
5. THE FIRE ALARM SYSTEM SHALL BE INSTALLED IN COMPLIANCE TO UFC 1007 AND NFPA 72.
6. PROVIDE AUDIO AND VISUAL DEVICES IN COMPLIANCE TO NFPA 72G.
7. DEVICES ARE NOT SHOWN ON DRAWINGS. PROVIDE THE QUANTITY OF DEVICES REQUIRED FOR A COMPLETE AND OPERABLE FIRE ALARM SYSTEM TO MEET THE CITY OF LOS ANGELES FIRE DEPARTMENT AND STATE FIRE MARSHAL REQUIREMENTS.

DEMOLITION GENERAL NOTES

1. REFER TO E2-11 AND ARCHITECTURAL DEMOLITION DRAWINGS FOR DEMOLITION AREAS, AND EXISTING WALLS TO REMAIN. THE SCOPE OF THE DEMOLITION WORK SHALL INCLUDE ALL LABOR, MATERIALS, SERVICES AND EQUIPMENT REQUIRED FOR THE REMOVAL OF ALL EXISTING ELECTRICAL REQUIRED TO CLEAR WALLS AND CEILINGS TO BE REMOVED. THIS WORK INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:
   - A. ALL EXISTING WIRE SHALL BE REMOVED FROM CONDUIT.
   - B. ALL EXISTING CONDUIT, THAT INTERFERES WITH ANY NEW CONSTRUCTION SHALL BE CUT BACK AS REQUIRED TO CLEAR NEW CONSTRUCTION.
   - C. REMOVE ALL EXISTING EXPOSED CONDUIT, SURFACE RACEWAYS AND CONDUIT CONCEALED IN EXISTING CONSTRUCTION THAT IS TO BE REMOVED. RECONNECT OUTLETS AND LIGHTING FIXTURES WHICH ARE NOW FED THROUGH THE OUTLETS TO BE REMOVED.
   - D. REMOVE ALL EXPOSED CONDUIT, WIRE, OUTLETS, DISCONNECT SWITCHES AND ELECTRICAL MOUNTING HARDWARE FOR MECHANICAL EQUIPMENT BEING REMOVED. PROVIDE WEATHERPROOF CAPS ON ALL CONDUIT PENETRATING ROOF AND ABANDON CONDUIT. REPAIR ROOFING DAMAGED BY REMOVAL OF EXISTING ELECTRICAL.
   - E. REMOVE FROM WALLS ALL EXISTING RECEPTACLE, AUDIO/VISUAL & TELE/DATA DEVICES IN AREA OF DEMOLITION.
   - F. REMOVE FROM CEILING & WALLS ALL EXISTING LIGHTING FIXTURES & LIGHTING CONTROL DEVICES IN AREA OF DEMOLITION.
   - G. REMOVE FROM CEILING & WALLS ALL FIRE ALARM DEVICES IN AREA OF DEMOLITION. EXISTING FIRE ALARM SYSTEM CIRCUITS SHALL BE REUSED/EXTENDED TO NEW DEVICES AS REQUIRED.
   - H. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IN THE OPINION OF THE ARCHITECT ARE SALVAGEABLE, SHALL REMAIN THE PROPERTY OF OWNER. DELIVER SUCH SALVAGED MATERIALS AND EQUIPMENT ON PREMISES AS DIRECTED, AND NEATLY PILE OR STORE THEM AND PROTECT FROM DAMAGE.
   - I. DO NOT REUSE SALVAGED MATERIALS AND EQUIPMENT, UNLESS SPECIFICALLY INDICATED ON PLANS OR SPECIFIED. REMOVE FROM PREMISES AND DISPOSE OF ALL MATERIALS CONSIDERED BY ARCHITECT TO BE SCRAP.
2. CONTRACTOR SHALL INCLUDE ALL WORK NECESSARY TO KEEP EXISTING ELECTRICAL AND COMMUNICATIONS SYSTEMS IN ALL AREAS ADJACENT TO DEMOLITION/RECONSTRUCTION AREAS IN SERVICE CONTINUOUSLY UNTIL WORK IN THAT AREA IS COMPLETE. THIS WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, INSTALLATION OF TEMPORARY ELECTRICAL CIRCUITS OR TEMPORARY RELOCATIONS OF EXISTING ELECTRICAL CIRCUITS, TEMPORARY EXTENSION AND RECONNECTION OF FEEDERS AND BRANCH CIRCUITS, TEMPORARY RELOCATION OF COMMUNICATIONS AND FIRE ALARM CIRCUITS AND EQUIPMENT AND EXTENSION AND RECONNECTION OF TELEPHONE CABLES, ETC. AS REQUIRED TO MAINTAIN ALL ELECTRICAL, FIRE ALARM AND COMMUNICATION FUNCTIONS. PRIOR TO DISCONNECTING ANY ELECTRICAL, FIRE ALARM OR COMMUNICATION EQUIPMENT OR DEVICES LOCATED IN AREAS REQUIRED TO BE IN SERVICE, ALL EQUIPMENT, CONDUIT, WIRE, ETC. (TEMPORARY OR OTHERWISE) SHALL BE IN PLACE AND READY AS MUCH AS PRACTICABLE FOR IMMEDIATE RECONNECTION SO AS TO MINIMIZE DOWNTIME. CONTRACTOR SHALL SUBMIT A LETTER TO OWNER TWO (2) WEEKS PRIOR TO ANY PLANNED DISCONNECTION OF ELECTRICAL, FIRE ALARM AND COMMUNICATIONS FUNCTIONS INDICATING DESIRED DOWNTIME SCHEDULE AND SHALL NOT PROCEED WITH THIS WORK UNTIL SCHEDULE IS APPROVED.
3. ELECTRICAL DEMOLITION DRAWINGS DO NOT SHOW ALL ELECTRICAL WORK THAT IS TO BE REMOVED. REFER TO ALL DEMOLITION DRAWINGS OF OTHER TRADES/DISCIPLINES FOR WORK THAT AFFECTS ELECTRICAL DEMOLITION WORK.
4. DISPOSAL OF HAZARDOUS MATERIALS SUCH AS LAMPS SHALL BE DISPOSED OF IN ACCORDANCE TO ALL STATE AND FEDERAL REQUIREMENTS.

GENERAL NOTES

1. THESE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO COVER A COMPLETE INSTALLATION OF SYSTEMS. THE OMISSION OR EXPRESSED REFERENCE TO ANY ITEM OF LABOR OR MATERIALS REQUIRED FOR THE PROPER EXECUTION OF THE WORK IN ACCORDANCE WITH PRESENT PRACTICE OF THE TRADE SHALL NOT RELIEVE THE CONTRACTOR FROM PROVIDING SUCH ADDITIONAL LABOR AND MATERIALS.
2. THIS PROJECT IS A REMODEL OF AN EXISTING BUILDING. REFER TO THE ARCHITECTURAL DRAWINGS FOR NOTES AND OTHER ELECTRICAL REQUIREMENTS NOT SHOWN ON THE ELECTRICAL DRAWINGS AND TO DETERMINE EXISTING CONSTRUCTION TO REMAIN AS WELL AS NEW CONSTRUCTION. IF THERE ARE OMISSIONS OR CONFLICTS BETWEEN THE ELECTRICAL DOCUMENTS AND THE DOCUMENTS OF OTHER TRADES, CLARIFY THESE POINTS WITH THE ARCHITECT BEFORE SUBMITTING A BID. NO EXTRA PAYMENT WILL BE ALLOWED FOR FAILURE TO OBTAIN THIS INFORMATION.
3. THESE PLANS, SPECIFICATIONS, AND ALL MATERIALS SHALL BE IN FULL ACCORDANCE WITH ALL LEGAL AND INDUSTRY REQUIREMENTS, AND STANDARDS INCLUDING WITHOUT LIMITATION TO THE FOLLOWING:
   - a. CALIFORNIA CODE OF REGULATIONS TITLE 24, PARTS 1 AND 2 (CALIFORNIA BUILDING CODE), 2016 EDITION.
   - b. CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 3 (CALIFORNIA ELECTRICAL CODE), 2016 EDITION.
   - c. CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 6 (CALIFORNIA ENERGY CODE), 2016 EDITION.
   - d. CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 9 (CALIFORNIA FIRE CODE), 2016 EDITION.
   - e. OTHER REGULATING AGENCIES WHICH MAY HAVE AUTHORITY OVER ANY PORTION OF THE WORK, INCLUDING THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY, AND THOSE CODES AND STANDARDS LISTED IN THESE NOTES AND SPECIFICATIONS.
   - f. THE ELECTRICAL SYSTEMS FUNCTIONALITY STANDARDS SET FORTH IN TITLE 7 OF THE CALIFORNIA CIVIL CODE (THE 'RIGHT TO REPAIR ACT').
   - g. THE MANUFACTURER'S REQUIREMENTS OR RECOMMEND-ATIONS FOR ANY INCORPORATED PRODUCTS.
   - h. THE MOST CURRENT APPROVED ISSUES OF ANY NOTED SPECIFICATIONS, CODES AND STANDARDS, INCLUDING SUPPLEMENTS, UNLESS NOTED OTHERWISE.
4. THE PLANS REPRESENT ONLY THE FINISHED ELECTRICAL, FIRE ALARM, AND LOW VOLTAGE SYSTEMS, AND THEY ARE NOT INTENDED TO INDICATE OR REQUIRE ANY CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES.
5. IN USING THE PLANS FOR BIDDING OR CONSTRUCTION PURPOSES, THE CONTRACTOR IS REQUIRED TO REVIEW ALL OF THE PROJECT'S CONSTRUCTION DOCUMENTS AS A WHOLE IN ORDER TO IDENTIFY ALL REQUIREMENTS THAT DIRECTLY OR INDIRECTLY AFFECT ITS PORTION OF THE ELECTRICAL WORK, EVEN REQUIREMENTS LOCATED IN SECTIONS DESIGNATED AS APPLICABLE TO OTHER TRADES. IN CASE OF CONFLICTS, THE CONTRACTOR SHALL EITHER OBTAIN DIRECTION FROM AN APPROPRIATE OWNER REPRESENTATIVE OR OTHERWISE APPLY THE MORE STRINGENT REQUIREMENT.
6. IN INTERPRETATING THE PLANS, THE FOLLOWING GENERAL RULES APPLY:
   - a. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DRAWINGS.
   - b. SCALED DIMENSIONS AND GRAPHICALLY SHOWN LOCATIONS ARE TO BE CONSIDERED ONLY APPROXIMATE. FIELD VERIFY DIMENSIONS PRIOR TO BID.
   - c. BECAUSE THE PLANS ARE INTENDED TO SET FORTH THE REQUIREMENTS FOR CONSTRUCTION IN ONLY AN INDUSTRY-STANDARD LEVEL OF QUALITY AND DETAIL, AND THEREFORE ARE INTENDED TO BE SUPPLEMENTED BY APPROPRIATE REQUESTS FOR CLARIFICATION AND INFORMATION, ERRORS AND OMISSIONS ARE TO BE EXPECTED AND ANTICIPATED; AND THE CONT-RACTOR IS REQUIRED TO CAREFULLY REVIEW THE PLANS FOR ERRORS AND OMISSIONS AND TO BRING THESE ERRORS AND OMISSIONS TO THE ATTENTION OF AN APPROPRIATE OWNER REPRESENTATIVE IN A TIMELY MANNER AN ASSUMES THE RISK OF THE CONSEQUENCES OF FAILING TO DO SO BEFORE BIDDING OR OTHERWISE PROCEEDING.
   - d. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION, AND NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCRE-PANCIES OR INCONSISTENCIES..
7. SUBMITTALS WILL BE REVIEWED BY THE ELECTRICAL ENGINEER, IF AT ALL, ONLY PURSUANT TO THE INDUSTRY-STANDARD PROTOCOL SET FORTH IN AIA DOCUMENT A201, AND IN NO EVENT WILL THE SUBMITTAL REVIEW PROCESS RELIEVE OR LESSEN THE SUBMITTING CONTRACTOR'S RESPONSIBILITY FOR AN INAPPROPRIATE SUBMITTAL.
8. IN NO EVENT WILL ANY SITE VISITS BY THE ELECTRICAL ENGINEER CONCERN CONSTRUCTION MEANS AND METHODS OR CONSTRUCTION SAFETY, AND ALL SUCH MATTERS SHALL REMAIN THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
9. ELECTRICAL PLANS DO NOT SHOW ELECTRICAL REQUIREMENTS FOR MECHANICAL AND PLUMBING EQUIPMENT CONTROL. REFER TO MECHANICAL AND PLUMBING PLANS AND SPECIFICATIONS. WHERE EQUIPMENT IS INDICATED TO BE BY ELECTRICAL CONTRACTOR PROVIDE ALL CONDUIT, WIRE, J-BOX, OUTLET BOXES, RELAY SWITCHES, TIME SWITCHES, CONTROL CIRCUITS, ETC. REQUIRED FOR A COMPLETE AND OPERABLE MECHANICAL AND PLUMBING INSTALLATION. ALL WIRE SHALL BE INSTALLED IN CODE SIZED CONDUIT.
10. REFER TO THE DRAWINGS AND SHOP DRAWINGS OF OTHER TRADES FOR ADDITIONAL DETAILS WHICH AFFECT THE PROPER INSTALLATION OF THIS WORK.
11. BEFORE SUBMITTING A BID, THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH ALL FEATURES OF THE EXISTING BUILDING, AND ALL BUILDING DRAWINGS WHICH MAY AFFECT THE EXECUTION OF THE WORK. NO EXTRA PAYMENT WILL BE ALLOWED FOR FAILURE TO OBTAIN THIS INFORMATION.
12. PROTECT ALL WORK, MATERIALS AND EQUIPMENT FROM DAMAGE FROM ANY CAUSE WHAT SO EVER AND PROVIDE ADEQUATE AND PROPER STORAGE FACILITIES DURING THE PROGRESS OF THE WORK. PROVIDE FOR THE SAFETY AND GOOD CONDITION OF ALL THE WORK UNTIL FINAL ACCEPTANCE OF THE WORK BY THE OWNER AND REPLACE ALL DAMAGED OR DEFECTIVE WORK, MATERIALS AND EQUIPMENT BEFORE REQUESTING FINAL ACCEPTANCE.
13. THE DRAWINGS INDICATE IN A DIAGRAMMATIC MANNER, THE DESIRED LOCATIONS OF ARRANGEMENT OF THE COMPONENTS OF ELECTRICAL WORK. DETERMINE EXACT CONDUIT ROUTING, CONDUIT BENDS, AUXILIARY JUNCTION BOXES, SUPPORTS, AND UNDEFINED CONSTRUCTION DETAILS AS A JOB CONDITION TO BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE CODE REQUIREMENTS. PROPER JUDGEMENT MUST BE EXERCISED IN EXECUTING THE WORK SO AS TO SECURE THE BEST POSSIBLE INSTALLATION IN THE AVAILABLE SPACE, AND TO OVERCOME LOCAL DIFFICULTIES DUE TO SPACE LIMITATIONS OR INTERFERENCE OF CONDITIONS ENCOUNTERED.
14. IN THE EVENT CHANGES IN THE INDICATED LOCATIONS OR ARRANGEMENTS ARE NECESSARY, DUE TO DEVELOPED CONDITIONS IN THE BUILDING CONSTRUCTION OR REARRANGEMENT OF EQUIPMENT, SUCH CHANGES SHALL BE MADE WITHOUT COST PROVIDING THE CHANGE IS ORDERED BEFORE THE CONDUIT RUNS, ETC., AND WORK DIRECTLY CONNECTED TO SAME IS INSTALLED AND NO EXTRA MATERIALS ARE REQUIRED.
15. THE DRAWINGS INDICATE APPROXIMATE LOCATIONS OF EXISTING CONDUITS. THE EXACT ROUTING SHALL BE VERIFIED IN FIELD AND LENGTH OF CONDUCTORS SHALL BE ADJUSTED TO THE LENGTH REQUIRED.
16. PERFORM CUTTING AND PATCHING ON THE CONSTRUCTION WORK WHICH MAY BE REQUIRED FOR THE PROPER INSTALLATION OF THE ELECTRICAL WORK. PATCHING SHALL BE OF THE SAME MATERIAL, WORKMANSHIP AND FINISH AS SPECIFIED AND ACCURATELY MATCH SURROUNDING WORK TO SATISFACTION OF THE ARCHITECT.
17. PROVIDE UL LISTED FIRE STOP FOR ALL PENETRATIONS THROUGH FIRE RATED FLOORS, WALLS AND CEILINGS TO MAINTAIN ALL FIRE RATINGS. THE FIRE STOP MATERIALS SHALL BE RE-ENTERABLE AND REUSABLE.
18. PROVIDE COORDINATED SHOP DRAWINGS. INDICATING DIMENSIONED LOCATIONS AND SIZES OF ALL CORE DRILLS FOR REVIEW AND APPROVAL. ALL CORE DRILL LOCATIONS SHALL BE VERIFIED AND APPROVED WITH OWNERS REPRESENTATIVE, STRUCTURAL AND ARCHITECT PRIOR TO CORE DRILL. UTILIZE X-RAY EQUIPMENT TO LOCATE AND VERIFY EXISTING STRUCTURAL ELEMENTS WITHIN SLAB.
19. WHERE EXISTING CIRCUITS ARE SHOWN ON PLANS, THE INFORMATION WAS OBTAINED FROM RECORD DRAWINGS. WHERE NEW CIRCUITS ARE SHOWN IN EXISTING PANELBOARD(S), THE CONTRACTOR SHALL VERIFY THAT THE INDICATED CIRCUITS ARE AVAILABLE IN THE EXISTING PANELBOARD(S), THE CONTRACTOR SHALL RELOCATE SUCH CIRCUITS TO AN AVAILABLE SPACE IN THE EXISTING PANELBOARD(S), AND 'AS BUILT' PLANS. IF NO CIRCUIT SPACE IS AVAILABLE IN THE EXISTING PANELBOARD(S), THE CONTRACTOR SHALL REPORT THE DISCREPANCY TO THE ARCHITECT.
20. GROUNDING SHALL BE EXECUTED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS, BOTH OF THE STATE OF CALIFORNIA AND LOCAL AUTHORITIES HAVING JURISDICTION.
21. PANELBOARDS ARE EXISTING UNLESS NOTED OTHERWISE. NEW CIRCUIT BREAKERS SHALL BE THE SAME TYPE AND INTERRUPTING RATING AS EXISTING BREAKERS IN PANEL.
22. WHERE CIRCUIT CHANGES OR ADDITIONS OCCUR IN PANELBOARDS UPDATE PANEL DIRECTORY CARDS WITH NEW TYPEWRITTEN CARDS INDICATING DESCRIPTION OF ALL CIRCUITS.
23. PROVIDE HANDLE TIES AT CIRCUIT BREAKERS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS OF MULTI-WIRE BRANCH CIRCUITS WITH A SHARED NEUTRAL.
24. UNLESS NOTED OTHERWISE ALL 120 VOLT HOMERUNS OVER 100 FEET SHALL BE #10 AWG MINIMUM. ADJUST CONDUIT SIZE ACCORDINGLY.
25. CONDUIT FOR TELEPHONE/DATA CABLING SHALL COMPLY WITH THE FOLLOWING ADDITIONAL REQUIREMENTS:
   - a. INSIDE BEND RADIUS SHALL BE AT LEAST 10 TIMES ITS INTERNAL DIAMETER.
   - b. PROVIDE PULL BOXES WHENEVER CONDUIT LENGTH EXCEEDS 150 FEET AND WHEN COMBINED BENDS ARE GREATER THAN 180 DEGREES.
   - c. ALL CONDUIT SHALL BE PROVIDED WITH INSULATED BUSHINGS.
   - d. MAINTAIN A MINIMUM CLEARANCE OF 4 FEET FROM MOTORS AND TRANSFORMERS.
   - e. MAINTAIN A MINIMUM CLEARANCE OF 12 INCHES FROM POWER CIRCUITS.
   - f. MAINTAIN A MINIMUM CLEARANCE OF 12 INCHES FROM FLUORESCENT LIGHT FIXTURES.
26. COORDINATE MOUNTING HEIGHTS OF RECEPTACLES, SWITCHES, A/V DEVICES, SECURITY DEVICES, ETC. MOUNTED ON COMMON WALLS SO THAT ALL OUTLETS ARE MOUNTED TO ALIGN HORIZONTALLY.

SYMBOL LIST

(ALL SYMBOLS NOT NECESSARILY USED ON THESE DRAWINGS)
ALL SYMBOL DESCRIPTIONS ARE SUBJECT TO MODIFICATION AS NOTED ON THE DRAWINGS. VERIFY EXACT LOCATIONS AND HEIGHTS OF OUTLETS WITH ARCHITECTURAL INTERIOR ELEVATIONS PRIOR TO ROUGH-IN.

- FLUORESCENT STRIP OR INDUSTRIAL LIGHTING FIXTURE, SURFACE, CHAIN OR PENDANT MOUNTED ON FLUSH MOUNTED OUTLET BOX.
- LIGHTING FIXTURE, PENDANT MOUNTED, ON FLUSH CEILING MOUNTED OUTLET BOX..
- LIGHTING FIXTURE, RECESS MOUNTED, WITH OUTLET BOX.
- LIGHTING FIXTURE, SURFACE OR FLUSH MOUNTED AS INDICATED ON FIXTURE SCHEDULE, ON WALL MOUNTED OUTLET BOX, +90". STEM INDICATES WALL MOUNTED OUTLET BOX, TYPICAL.
- OUTLET ON EMERGENCY LIGHTING CIRCUIT.
- LIGHTING FIXTURE WITH LAMPS ON NORMAL AND EMERGENCY LIGHTING CIRCUITS, PROVIDE SEPARATE LAMP BALLASTS AS REQUIRED.
- LIGHTING FIXTURE RECESSED MOUNTED WITH OUTLET BOX AND REMOTE MOUNTED JUNCTION BOX CONCEALED ABOVE ACCESSIBLE CEILING. PROVIDE FLEXIBLE CONDUIT CONNECTION 6 FT. MAXIMUM LENGTH, 1/2" DIAMETER MINIMUM, FROM JUNCTION BOX TO FIXTURE OUTLET. PROVIDE CONDUCTORS IN CONDUIT, QUANTITY AS REQUIRED FOR INDICATED CIRCUITS AND SWITCHING CONTROLS, #12 (AWG) MINIMUM.
- WALL WASH LIGHTING FIXTURE, RECESS MOUNTED, WITH OUTLET BOX.
- EXIT SIGN SINGLE FACE, ON FLUSH CEILING MOUNTED OUTLET BOX. ARROW INDICATES DIRECTIONAL ARROW ON EXIT SIGN FACE.
- EXIT SIGN DOUBLE FACE, ON FLUSH CEILING MOUNTED OUTLET BOX.
- EXIT SIGN, ON FLUSH WALL MOUNTED OUTLET BOX, +90".
- 2 / 100 — LIGHT FIXTURE SCHEDULE DESIGNATION: '2' INDICATES FIXTURE TYPE, '100' INDICATES FIXTURE TOTAL WATTAGE.
- S 2, P / a, b — SINGLE POLE TOGGLE SWITCH, ON FLUSH WALL MOUNTED OUTLET BOX, +45". INSTALL MULTIPLE SWITCHES UNDER COMMON COVER PLATE. SUBSCRIPT OR SUPERSCRIPT AT SWITCH SYMBOL INDICATES THE FOLLOWING:
  - 2 - DOUBLE POLE; 4 - FOUR WAY; M - MANUAL MOTOR STARTERS
  - 3 - THREE WAY; P - PILOT LIGHT; K - KEY OPERATED
  - R - SPDT MOMENTARY CONTACT RELAY SWITCH; V - VAPOR PROOF
  - a, b, c, d, ETC. - MULTIPLE SWITCHES WITH IDENTIFICATION OF OUTLET CONTROLLED.
- $ — SWITCH FOR CONTROL OF LOW VOLTAGE LIGHTING RELAY(S), ON FLUSH WALL MOUNTED OUTLET BOX, +45". INSTALL MULTIPLE SWITCHES UNDER COMMON COVER PLATE.
- OS — OCCUPANCY MOTION SENSOR ON FLUSH CEILING MOUNTED OUTLET BOX.
- OCCUPANCY MOTION SENSOR SWITCH, ON FLUSH WALL MOUNTED OUTLET BOX, +45".
- DUPLEX CONVENIENCE RECEPTACLE VERTICAL ON FLUSH WALL MOUNTED OUTLET BOX, +18". STEM INDICATES WALL MOUNTED OUTLET BOX, TYPICAL.
- DUPLEX CONVENIENCE RECEPTACLE VERTICAL ON FLUSH WALL MOUNTED OUTLET BOX, +6" ABOVE COUNTER SPLASH.
- DUPLEX CONVENIENCE RECEPTACLE SPLIT WIRED, ON FLUSH WALL MOUNTED OUTLET BOX, +18".
- DOUBLE DUPLEX (FOUR-PLEX) CONVENIENCE RECEPTACLE VERTICAL ON ONE FLUSH WALL MOUNTED OUTLET BOX +18".
- DOUBLE DUPLEX (FOUR-PLEX) CONVENIENCE RECEPTACLE VERTICAL ON ONE FLUSH WALL MOUNTED OUTLET BOX +6" ABOVE COUNTER SPLASH.
- SINGLE RECEPTACLE, NEMA CONFIGURATION PER EQUIPMENT MANUFACTURER REQUIREMENTS, ON FLUSH WALL MOUNTED OUTLET BOX, +18".
- DUPLEX CONVENIENCE RECEPTACLE WITH INTERNAL GROUND FAULT INTERRUPTER, VERTICAL ON FLUSH WALL MOUNTED OUTLET BOX +18".
- DUPLEX CONVENIENCE RECEPTACLE WITH INTERNAL GROUND FAULT INTERRUPTER, VERTICAL ON FLUSH WALL MOUNTED OUTLET BOX, +6" ABOVE COUNTER SPLASH.
- DOUBLE DUPLEX (FOUR-PLEX) CONVENIENCE RECEPTACLE WITH INTERNAL GROUND FAULT INTERUPTER, VERTICAL ON ONE FLUSH WALL MOUNTED OUTLET BOX +6" ABOVE COUNTER SPLASH
- WP — PROVIDE UL LISTED WEATHERPROOF 'WHILE-IN-USE' TYPE COVERPLATE RECEPTACLE WITH INTERNAL GROUND FAULT INTERRUPTER ON FLUSH WALL MOUNTED OUTLET BOX IN ACCORDANCE WITH NEC 406.8(B)
- DUPLEX CONVENIENCE RECEPTACLE ON FLUSH, FLOOR MOUNTED OUTLET BOX.
- DOUBLE DUPLEX CONVENIENCE RECEPTACLES, BACK TO BACK, PEDESTAL TYPE ON FLUSH FLOOR MOUNTED OUTLET BOX.
- DUPLEX CONVENIENCE RECEPTACLE, ON FLUSH CEILING MOUNTED OUTLET BOX.
- 'POKE-THRU' COMBINATION FLUSH DOUBLE DUPLEX CONVIENCE RECEPTACLE WITH SLIDE COVER FOR FOUR TELECOMMUNICATIONS JACKS, WITH 1" CONDUIT TO ACCESSIBLE CEILING SPACE.
- FLUSH IN FLOOR 2 SERVICE FLOOR BOX WITH ONE DUPLEX RECEPTACLE AND ONE TELECOMMUNICATION OUTLET, WITH 1" CONDUIT TO ACCESSIBLE CEILING SPACE.
- FLUSH IN FLOOR 3 SERVICE FLOOR BOX WITH TWO DUPLEX RECEPTACLE AND ONE TELECOMMUNICATION OUTLET, WITH 1" CONDUIT TO ACCESSIBLE CEILING SPACE.
- TV — TELEVISION OUTLET. PROVIDE 3/4"C.O. TO ACCESSIBLE CEILING SPACE U.N.O.
- J — JUNCTION BOX, FLUSH WALL MOUNTED, +18".
- J — JUNCTION BOX CONCEALED ABOVE ACCESSIBLE CEILING.
- J — INDICATES CONNECTION TO EQUIPMENT AS REQUIRED, TYPICAL.
- JUNCTION BOX, FLUSH IN FLOOR.
- P — AUTOMATED DOOR CONTROLLER/SWITCH.
- A / E-1 — PANELBOARD, ADJACENT LINE INDICATES PANEL FRONT. ADJACENT BALLOON INDICATES PANEL DESIGNATION 'A'.
- A / E-1 — FLOOR STANDING SWITCHGEAR ADJACENT BALLOON INDICATES EQUIPMENT DESIGNATION 'DBA'.
- CIRCUIT BREAKER STATIONARY (NON-DRAWOUT), SECONDARY VOLTAGE.
- FUSIBLE SWITCH AND FUSE DEVICE. STATIONARY SWITCH (NON- DRAWOUT) REMOVABLE FUSES, SECONDARY VOLTAGE.
- TRANSFORMER; KVA, LINE AND LOAD VOLTAGE RATINGS AS INDICATED.
- FUSED SAFETY SWITCH (DISCONNECT), HORSE POWER RATED. MOUNT ON WALL +45". PROVIDE SWITCH AND FUSES SIZED PER EQUIPMENT MANUFACTURER REQUIREMENTS.
- MOTOR CONNECTION. PROVIDE FUSED SAFETY SWITCH (DISCONNECT), HORSE POWER RATED, WALL MOUNTED, +45" OR EQUIPMENT MOUNTED, +36". PROVIDE SWITCH AND FUSES SIZED PER EQUIPMENT MANUFACTURER REQUIREMENTS.
- (3) — MAGNETIC MOTOR STARTER: NUMBER INDICATES 'NEMA' SIZE '3'.
- (3) — COMBINATION MAGNETIC MOTOR STARTER: NUMBER INDICATES 'NEMA' SIZE '3'.
- CONDUIT, INSTALLED CONCEALED IN WALL OR IN CEILING SPACE.
  - 1/2" C - 2 #12; 3/4" C - 6 #12
  - 1/2" C - 3 #12; 1" C - 7 #12
  - 3/4" C - 4 #12; 1" C - 8 #12
  - 3/4" C - 5 #12; 1 1/4" C - 9 #12
- CONDUIT, INSTALLED CONCEALED IN OR UNDER FLOOR OR BELOW GRADE, 3/4" CONDUIT MINIMUM. SAW CUT EXISTING SLAB, PATCH ACCORDINGLY.
- CONDUIT, INSTALLED EXPOSED.
- B-5, 7, 9 — HOMERUN TO PANEL "B" FOR CIRCUITS 5, 7, 9 WITH COMMON NEUTRAL.
- UNDERGROUND CONDUIT STUBOUT, STUB 5'-0" FROM BUILDING OR WALKWAY, CAP, MARK AND RECORD.
- E — EXISTING RACEWAY.
- CONNECTED TO SOLID GROUND REFERENCE POINT
- TERMINAL CABINET OR EQUIPMENT CABINET. ADJACENT LINE INDICATES CABINET FRONT.
- TELEPHONE OUTLET, ON FLUSH WALL MOUNTED OUTLET BOX, +18" WITH 3/4"C.O. TO SIGNAL SYSTEM BACKBOARD. SUBSCRIPT OR SUPERSCRIPT AT SIGNAL SYMBOLS INDICATES THE FOLLOWING:
  - W - OUTLET ON FLUSH WALL MOUNTED OUTLET BOX, +45".
- COMBINATION TELEPHONE/DATA OUTLET ON FLUSH WALL MOUNTED OUTLET, +18". PROVIDE 3/4" C.O. TO TELEPHONE ROOM L38 BACKBOARD.
  - C - OUTLET VERTICAL IN FLUSH WALL MOUNTED OUTLET BOX, +6" ABOVE COUNTER SPLASH.
- C / E-2 — DETAIL CALLOUT, "C" INDICATES DETAIL, "E-2" INDICATES DRAWING WHERE DETAIL OCCURS.
- EF / 1 — MECHANICAL EQUIPMENT CALLOUT. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATIONS AND REQUIREMENTS OF MECHANICAL EQUIPMENT.
- 1 — PLAN NOTE CALLOUT. REFER TO CORRESPONDING NOTE ON DRAWING WHERE CALLOUT OCCURS.
- R — REMOVE INDICATED EXISTING EQUIPMENT. WHERE EXISTING WIRE AND/OR CONDUIT IS REFERENCED, REMOVE WIRE AND REMOVE CONDUIT IF CONDUIT IS EXPOSED, ABANDON CONDUIT AND REMOVE WIRE WHERE THE CONDUIT IS UNDERGROUND OR OTHERWISE CONCEALED FROM VIEW. WHERE SPECIFICALLY NOTED, EXISTING CONDUIT TO REMAIN IN PLACE FOR REUSE.

+45"	MOUNTING HEIGHT TO CENTER LINE OF DEVICE FROM FINISH FLOOR OR EXTERIOR GRADE
A.F.F.	ABOVE FINISH FLOOR
A.F.G.	ABOVE FINISH GRADE
AWG	AMERICAN WIRE GAUGE
AMP, A	AMPERE
A.I.C.	AMPERES INTERRUPTING CAPACITY (SYMMETRICAL)
C	CONDUIT
C.O.	CONDUIT ONLY.
CLCB	CURRENT LIMITING CIRCUIT BREAKER
EMT	ELECTRICAL METALLIC TUBING
E	EXISTING EQUIPMENT TO BE REUSED
FLA	FULL LOAD AMPS
GFI	GROUND FAULT INTERRUPTER.
GRD	GROUND
IG	ISOLATED GROUND
J-BOX	JUNCTION BOX
KVA	KILOVOLT AMPERES
KW	KILOWATT
LCL	LONG CONTINUOUS LOAD
LTG, LTS	LIGHTING
MCM	THOUSAND CIRCULAR MILS
NL	24/7 NIGHT LIGHT
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED.
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
PH. or Φ	PHASE
PROVIDE	FURNISH, INSTALL AND CONNECT.
RGS	RIGID GALVANIZED STEEL
TYP	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
V	VOLTS
VA	VOLT AMPERES
WP	WEATHERPROOF
W	WIRE

Sheet List Table

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E2-21	SECOND FLOOR POWER PLANS
E2-23	ROOF POWER PLANS
E2-31	KITCHEN ELECTRICAL PLAN
E2-32	ENLARGED ELECTRICAL PLANS
E2-51	SPECIFICATIONS
E2-41	ELECTRICAL DETAILS

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KTGY Project No: 171180

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LAKESIDE COMMONS DINING

1950 SILVERLEAF CIRCLE
CARLSBAD, CA 92009

REGISTERED PROFESSIONAL ENGINEER STEPHEN R. ... No. E 10372 Exp. 09-30-20 ELECTRICAL STATE OF CALIFORNIA

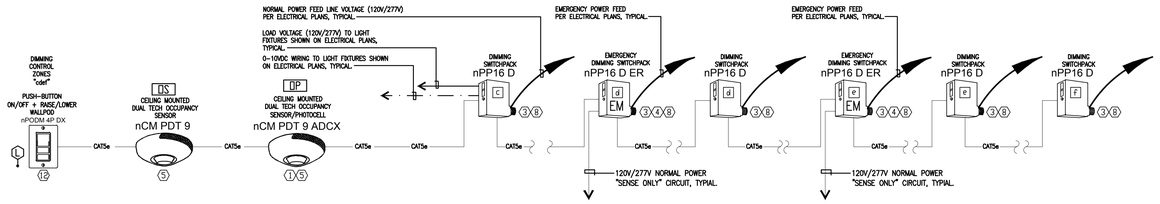
Sheet Issue & Revision Log

	Date	Description
	2019-03-01	INITIAL SUBMITTAL
1	04/03/20	RFI #1
2	04/14/20	HD RESUBMITTAL
A	4/17/20	2ND PC SUBMITTAL

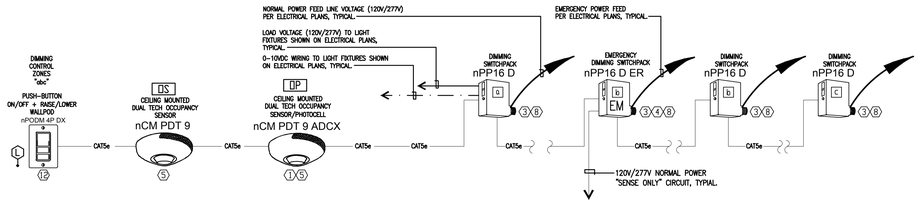
FBA Engineering
Consulting Electrical Engineers
150 Paularino Avenue Suite A120
Costa Mesa, CA 92626
949.852.9995 • 949.852.1657 (fax)
fbaengr.com
FBA Job Number: 232023

SYMBOL LIST & GENERAL NOTES

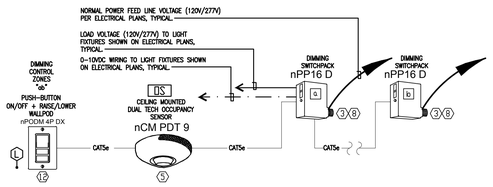
E2-01



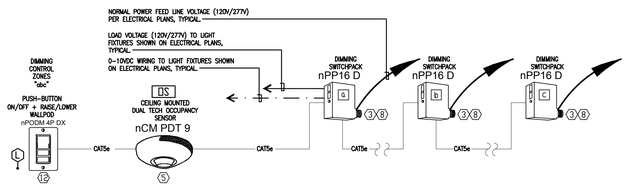
1 – NEW LOUNGE DISTRIBUTED DIMMING SYSTEM



2 – NEW PRIVATE DINING DISTRIBUTED DIMMING SYSTEM



3 – NEW BAR FOOD & SERVICE DISTRIBUTED DIMMING SYSTEM



4 – NEW GRAB-&-GO DISTRIBUTED DIMMING SYSTEM

LAKESIDE COMMONS FIXTURE SCHEDULE
DATE: 2020-0417

FBA #232023

Fixture Type	Fixture Description	System Watts	Lamp Source	Color Temp	CRI	Total Lumens	Lumens Per Watt
AR1	LED Accent Downlight	15.4	LED	2700	90+	1700	110.4
AR1-R	LED Accent Downlight Retrofit	15.4	(1) B1	2700	90+	1700	110.4
DP1	Decorative Pendant - Private Dining	48	(3) A1	2700	90+	2560	53.3
DP2	Decorative Pendant - Bistro	60	(3) A1	2700	90+	1400	23.3
DP3	Decorative Pendant - Elevator	120	(1) B1	2700	90+	2560	21.3
RD1	Recessed LED Downlight 4"	13.5	LED	2700	90+	1700	125.9
RD1-R	Recessed LED Downlight Retrofit 4"	13.5	(1) B1	2700	90+	1700	125.9
RD2	Recessed LED Downlight 2"	15	(3) A1	2700	90+	1200	80.0
RD3	Recessed LED Downlight 4"	8	(3) A1	2700	90+	800	100.0
RD4	Recessed LED 2x2	28.5	(1) B1	2700	90+	2444	85.8
RW1	Recessed LED wallwash Downlight	12	(1) B1	2700	90+	1300	108.3
RW1-R	Recessed LED wallwash Downlight Retrofit	12	(3) A1	2700	90+	1300	108.3
WD1	Wall Sconce	15	(1) B1	2700	90+	1200	80.0
WD2	Wall Sconce	15	LED	2700	90+	1200	80.0

FIXTURE NOTES

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ACTUAL CEILING CONSTRUCTION TYPE AS DEFINED ON THE ARCHITECTURAL DRAWINGS AND FURNISH ALL LIGHTING FIXTURES WITH THE CORRECT MOUNTING DEVICES WHETHER OR NOT SUCH VARIATIONS ARE INDICATED BY THE FIXTURE CATALOG NUMBER. THE CONTRACTOR SHALL VERIFY DEPTH OF ALL RECESSED LIGHTING FIXTURES WITH ARCHITECTURAL DRAWINGS PRIOR TO ORDERING FIXTURES. ANY DISCREPANCIES THAT WOULD CAUSE RECESSED FIXTURES NOT TO FIT INTO CEILING SHALL BE REPORTED TO THE ARCHITECT PRIOR TO ORDERING FIXTURES.
2. VERIFY MOUNTING HEIGHT OF ALL WALL MOUNTED FIXTURES WITH ARCHITECT.
3. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHT FIXTURES.
4. COORDINATE LOCATION FOR REMOTE BALLASTS WITH ARCHITECT. REMOTE BALLASTS SHALL BE LOCATED IN AN ACCESSIBLE LOCATION.
5. COORDINATE TYPE OF LED POWER SUPPLY AND DRIVERS WITH THE DIMMING SYSTEM SO THAT ALL EQUIPMENT SUPPLIED IS COMPATIBLE AND FIXTURES WILL DIM PROPERLY WITHOUT FLICKER.

LIGHTING CONTROLS GENERAL NOTES

PROVIDE EVIDENCE THAT THE LIGHTING CONTROL DEVICES AND EQUIPMENT ARE CERTIFIED BY THE CALIFORNIA ENERGY COMMISSION.

1. THE TYPICAL CONTROL DIAGRAM IS AN EXAMPLE ONLY AND DEPICTS ONLY THE INTENT OF THE LIGHTING CONTROLS. LIGHTING CONTROL SYSTEM BASIS OF DESIGN IS AN nLIGHT SYSTEM BY ACUITY CONTROLS.
2. PROVIDE MANUFACTURER SPECIFIC INSTALLATION SHOP DRAWINGS. SHOP DRAWINGS SHALL INCLUDE 1/8 SCALE FLOOR PLANS INDICATING ALL REQUIRED CONTROL DEVICE LOCATIONS AND POINT-TO-POINT WIRING. SHOP DRAWINGS SHALL INCLUDE PRODUCT DATA CUT SHEETS AND SINGLE LINE SCHEMATIC DIAGRAM.
3. WHETHER OR NOT DETAILED ON ELECTRICAL DRAWINGS, PROVIDE ALL CONTROL DEVICES AS REQUIRED FOR A COMPLETE, FULLY OPERABLE AND CODE COMPLIANT SYSTEM.
4. PROVIDE UL924 DEVICES IN ANY AREA THAT REQUIRES EMERGENCY EGRESS LIGHTING WHETHER OR NOT SPECIFICALLY HEREIN DETAILED. REFER TO LIGHTING PLANS FOR ALL EMERGENCY EGRESS "EM" LIGHTING FIXTURES.
5. PROVIDE CONTROL DEVICES AS REQUIRED FOR LIGHTING ZONES AS SHOWN ON LIGHTING PLANS. SCHEMATIC DIAGRAM EXAMPLES SHOWN HEREIN ARE NOT SPECIFIC FOR EACH LIGHTING CONTROL CONDITION DEPICTED ON LIGHTING PLANS.
6. ALL 0-10VDC DIMMING CONDUCTORS SHALL BE INSTALLED IN CONDUIT.
7. VERIFY CORRECT LIGHTING CONTROL CONFIGURATIONS AND OPERATION IN EACH ROOM. REFER TO LIGHTING PLANS.
8. SIMULATE NORMAL SOURCE POWER FAILURE BY 'OPENING' (TURN OFF) BUILDING MAIN SERVICE DISCONNECT AND VERIFY CONNECTIONS AND OPERATION OF UL 924 DEVICES FOR EMERGENCY LIGHTING FIXTURES.
9. SETUP, PROGRAM, AND FUNCTION TEST LIGHTING CONTROL SYSTEMS TO PERFORM EACH OF THE INDICATED CONTROL FUNCTIONS.

CONTROL DIAGRAM NOTES

1. PROVIDE WHERE DAYLIGHT (PHOTOCELL) CONTROLS ARE INDICATED ON ELECTRICAL PLANS.
2. (BLANK)
3. LOCATE IN ACCESSIBLE CEILING SPACE, WHERE POSSIBLE. WHERE NO ACCESSIBLE CEILING, LOCATE SWITCHPACK DEVICE AT CENTRAL LOCATION WITH OTHER SWITCHPACK DEVICES AND PROVIDE ACCESS PANEL IN CEILING. COORDINATE ACCESS PANEL LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
4. PROVIDE WHERE EMERGENCY LIGHTING ('EM') IS SHOWN ON PLANS. PROVIDE NON-SWITCHED HOT CONNECTION FROM NORMAL POWER LIGHTING CIRCUIT FOR 'SENSE' CONNECTION.
5. PROVIDE QUANTITY AS REQUIRED FOR COMPLETE OCCUPANCY AND/OR DAYLIT ZONE COVERAGE, BUT IN NO CASE LESS THAN SHOWN ON PLANS.
6. COORDINATE DIMMING REQUIREMENTS WITH DECORATIVE AND/OR CUSTOM FIXTURE SPECIFICATIONS AND LAMPING TO ENSURE PROPER DIMMING FUNCTION.
7. PROVIDE WHERE CONTROLLED RECEPTACLES ARE SHOWN ON POWER PLANS.
8. PROVIDE QUANTITY OF POWER RELAY PACK DEVICES AS NEEDED TO SUPPORT SWITCHLEGS (LIGHTING ZONES) AS INDICATED ON ELECTRICAL PLANS FOR A PARTICULAR SPACE.
9. PROVIDE WITH INTEGRAL TIMECLOCK FUNCTION WITH AUTO OFF.
10. COORDINATE EXACT LOCATION WITH AUDIO/VISUAL CONSULTANT.
11. COORDINATE EXACT LOCATION WITH ARCHITECT.
12. PROVIDE QUANTITY OF CONTROL DEVICES AS REQUIRED, BUT IN NO CASE LESS THAN SHOWN ON ELECTRICAL PLANS.
13. PROVIDE WHERE AUDIO/VISUAL (AV) INTERFACE IS INDICATED ON ELECTRICAL PLANS. LOCATE IN ACCESSIBLE CEILING SPACE, WHERE POSSIBLE. WHERE NO ACCESSIBLE CEILING, PROVIDE ACCESS PANEL IN CEILING. COORDINATE ACCESS PANEL LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.

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150 Paularino Avenue Suite A120
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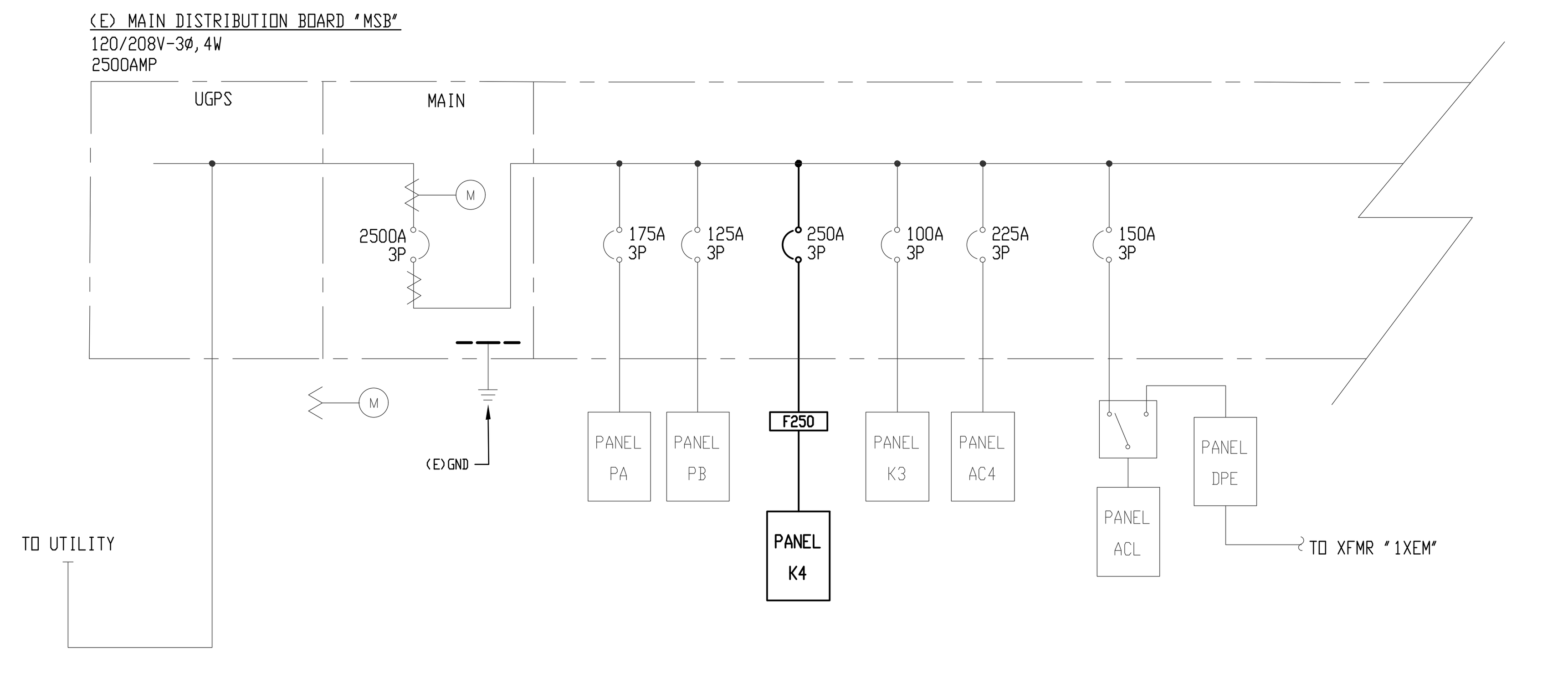
fbaengr.com
FBA Job Number: 232023

FIXTURE SCHEDULE & LIGHTING CONTROLS

E2-02



PARTIAL SINGLE LINE DIAGRAM
NTS
1 E2-03

FEEDER SCHEDULE

FEEDER TYPE	COPPER CONDUCTORS THW 600V (AWG) – CONDUIT SIZE AND QUANTITY – QUAN.	SIZE	CONDUCTORS IN EACH CONDUIT – PHASE/NEUTRAL – QUAN.	SIZE	EQUIPMENT GROUND WIRE SIZE	ALUMINUM CONDUCTORS THW 600V (AWG) – CONDUIT SIZE AND QUANTITY – QUAN.	SIZE	CONDUCTORS IN EACH CONDUIT – PHASE/NEUTRAL – QUAN.	SIZE	EQUIPMENT GROUND WIRE SIZE
F20	1	3/4"	4	12	12	-	-	-	-	-
F30	1	3/4"	4	10	10	-	-	-	-	-
F40	1	1"	4	8	10	-	-	-	-	-
F50	1	1 1/4"	4	6	10	-	-	-	-	-
F60	1	1 1/2"	4	4	10	-	-	-	-	-
F70	1	1 1/2"	4	4	8	-	-	-	-	-
F80	1	2"	4	2	8	-	-	-	-	-
F90	1	2"	4	2	8	-	-	-	-	-
F100	1	2"	4	1	8	1	2"	4	2/0	4
F110	1	2"	4	1	6	1	2"	4	2/0	4
F125	1	2"	4	1/0	6	1	2"	4	2/0	4
F150	1	2"	4	1/0	6	1	2 1/2"	4	4/0	2
F175	1	2"	4	2/0	6	1	2 1/2"	4	4/0	2
F200	1	2 1/2"	4	3/0	6	1	4"	4	350MCM	2
F225	1	3"	4	4/0	4	1	4"	4	350MCM	1
F250	1	3"	4	250MCM	4	1	4"	4	500MCM	1
F275	1	4"	4	350MCM	4	2	4"	4	350MCM	1
F300	1	4"	4	350MCM	4	2	4"	4	350MCM	1/0
F350	1	4"	4	500MCM	2	2	4"	4	350MCM	1/0
F400	2	2 1/2"	4	3/0	2	2	4"	4	350MCM	2/0
F500	2	3"	4	250MCM	2	2	4"	4	500MCM	3/0
F600	2	4"	4	350MCM	1	2	5"	4	750MCM	4/0
F700	2	4"	4	500MCM	1/0	2	5"	4	750MCM	4/0
F800	3	4"	4	350MCM	1/0	3	5"	4	750MCM	250MCM
F900	3	4"	4	350MCM	2/0	3	5"	4	750MCM	350MCM
F1000	3	4"	4	500MCM	2/0	3	5"	4	750MCM	350MCM
F1200	4	4"	4	350MCM	3/0	4	5"	4	750MCM	500MCM
F1600	5	4"	4	500MCM	4/0	5	5"	4	750MCM	500MCM
F2000	6	4"	4	500MCM	250MCM	6	5"	4	750MCM	750MCM
F2500	7	4"	4	500MCM	350MCM	7	5"	4	750MCM	750MCM
F3000	8	4"	4	500MCM	500MCM	8	5"	4	750MCM	750MCM
F4000	11	4"	4	500MCM	500MCM	11	5"	4	750MCM	500MCM(CU)

LAKESIDE COMMONS DINING — PANELBOARD (E)PA

PROJECT NO. 232-023
VOLTS 120/208 · PHASE 3PH, 4W · MTG SURFACE
LOCATION ELECT. ROOM L33
MAIN L.O. · BUS 225A

CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION	PH	CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION
1	736	-----	-----	L	20/1	E	LIGHTING CORRIDOR	A	2	73	-----	-----	L	20/1	E	EXTERIOR LIGHTING
3	-----	526	-----	L	20/1	E	LIGHTING RESTROOM	B	4	-----	94	-----	L	20/2	E	EXTERIOR LIGHTING/TRASH
5	-----	-----	1158	L	20/1	E	LIGHTING OFFICE	C	6	-----	-----	280	L	--	E	----
7	900	-----	-----	L	20/1	R	LIGHTING DINING L01	A	8	570	-----	-----	L	2-/2	E	EXTERIOR LIGHTING
9	-----	148	-----	L	20/1	R	LIGHTING DINING L01	B	10	-----	570	-----	L	--	E	----
11	-----	-----	908	L	20/1	R	LIGHTING DINING L01	C	12	-----	-----	50	L	20/1	E	EXIT LIGHTING
13	954	-----	-----	L	20/1	R	LIGHTING DINING L01/SERV	A	14		-----	-----		20/1	E	SPARE
15	-----	732	-----	L	20/1	R	LIGHTING LOUNGE LA3	B	16	-----	700	-----	L	20/2	E	EXTERIOR LIGHTING
17	-----	-----	373	L	20/1	R	LIGHTING LOUNGE LA3/BAR	C	18	-----	-----	700	L	--	E	----
19	556	-----	-----	L	20/1	E	LIGHTING KITCHEN	A	20	500	-----	-----	G	20/1	E	RESTROOM FLUSH
21	-----	531	-----	L	20/1	E	LIGHTING KITCHEN	B	22	-----	180	-----	R	20/1	E	SITE RECEPTACLE
23	-----	-----	845	L	20/1	E	LIGHTING KITCHEN	C	24	-----	-----	180	R	20/1	E	SITE RECEPTACLE
25	88	-----	-----	L	20/1	R	LIGHTING DINING L01	A	26	180	-----	-----	R	20/1	E	SITE RECEPTACLE
27	-----	376	-----	L	20/1	R	LIGHTING DINING L01	B	28	-----	200	-----	G	20/1	E	CATV
29	-----	-----	1654	N	20/1	E	FOUNTAIN	C	30	-----	-----	1080	G	20/1	E	WATER TREATMENT
31	942	-----	-----	G	20/1	R	LOBBY/CORRIDOR	A	32	3734	-----	-----	M	60/3	E	TRASH COMPACTOR
33	-----	723	-----	L	20/1	R	LIGHTING KITCHEN/DINING	B	34	-----	3734	-----	M	--	E	----
35	-----	-----	35	L	20/1	E	EXIT SIGN	C	36	-----	-----	3734	M	--	E	----
37	190	-----	-----	L	20/1	R	LIGHTING CORRIDOR/DINING	A	38	1270	-----	-----	M	20/3	E	ROLL UP DOOR
39	-----		-----	K	20/1	E	COFFEE MAKER 1ST FL	B	40	-----	1270	-----	M	--	E	----
41	-----	-----			20/1	E	SPARE	C	42	-----	-----	1270	M	--	E	----

CONNECTED:

	VA	AMPS
PHASE A =	10693	89
PHASE B =	9784	82
PHASE C =	12267	102
TOTAL =	32744	91

L.C.L. @ 125% = 16020
RECEPT. ( ) 10 kVA @ 50%) = 540
KITCHEN @ 65% =
OTHER LOAD @ 100% = 19388
TOTAL VA = 35948
TOTAL AMPS = 100

LOAD TYPE:
G - GENERAL (100%) · M - MOTOR (100%)
L - L.C.L. (125%) · M1 - MOTOR (125%)
R - RECEPTACLE (50%) (10 kVA @ 100%) · X - X-RAY (100%)
K - KITCHEN (65%) · X1 - X-RAY (50%)

'N' DENOTES NEW BREAKER, NEW LOAD
'E' DENOTES EXISTING BREAKER, EXISTING LOAD
'R' DENOTES EXISTING BREAKER, NEW LOAD

LAKESIDE COMMONS DINING — PANELBOARD (E)PB

PROJECT NO. 232-023
VOLTS 120/208 · PHASE 3PH, 4W · MTG SURFACE
LOCATION ELECT. ROOM L33
MAIN L.O. · BUS 225A

CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION	PH	CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION
1	720	-----	-----	R	20/1	4 E	RECEPTACLE LOUNGE	A	2	540	-----	-----	R	20/1	3 R	RECEPTACLE SPEAKEASY, TP-1
3	-----	360	-----	R	20/1	2 E	RECEPTACLE LOUNGE	B	4	-----	540	-----	R	20/1	3 E	RECEPTACLE LOUNGE
5	-----	-----	540	R	20/1	3 E	RECEPTACLE LOUNGE	C	6	-----	-----	900	R	20/1	5 E	RECEPTACLE LOUNGE
7	720	-----	-----	R	20/1	4 E	RECEPTACLE LOUNGE	A	8	180	-----	-----	R	20/1	1 E	RECEPTACLE LOUNGE
9	-----	720	-----	R	20/1	4 R	RECEPTACLE BISTRO, TV	B	10	-----	180	-----	R	20/1	1 E	RECEPTACLE LOUNGE
11	-----	-----	720	R	20/1	4 E	RECEPTACLE LOUNGE	C	12	-----	-----	540	R	20/1	3 R	RECEPTACLE BISTRO, TP-1
13	900	-----	-----	R	20/1	5 R	RECEPTACLE DINING, FOYER	A	14	540	-----	-----	R	20/1	3 E	RECEPTACLE LOUNGE
15	-----	720	-----	R	20/1	4 R	RECEPTACLE BISTRO, TV	B	16	-----	360	-----	R	20/1	2 E	RECEPTACLE LOUNGE
17	-----	-----	720	R	20/1	4 R	RECEPTACLE LOUNGE	C	18	-----	-----	540	R	20/1	3 E	RECEPTACLE LOUNGE
19	720	-----	-----	R	20/1	4 R	RECEPTACLE DINING	A	20	960	-----	-----	M1	20/1	E	MOTOR SHADE
21	-----	720	-----	R	20/1	4 R	RECEPTACLE DINING, TP-1	B	22	-----	960	-----	M	20/1	E	MOTOR SHADE
23	-----	-----	600		20/1	E	FIREPLACE	C	24	-----	-----	960	M	20/1	E	MOTOR SHADE
25	500	-----	-----		20/1	R	AUTOMATIC DOOR VESTIBULE 111	A	26		-----	-----		20/1	E	A/C MODULE
27	-----	540	-----	R	20/1	3 E	RECEPTACLE LOUNGE	B	28	-----	1731	-----		30/2	E	STEAM TABLE
29	-----	-----	720	R	20/1	4 E	RECEPTACLE LOUNGE	C	30	-----	-----	1731		---	E	-----
31	720	-----	-----	R	20/1	4 E	RECEPTACLE LOUNGE	A	32	360	-----	-----	R	20/1	2 E	RECEPTACLE ELEVATOR SHAFT
33	-----	720	-----	R	20/1	4 E	RECEPTACLE LOUNGE	B	34	-----	200	-----		20/1	E	EXISTING LOAD
35	-----	-----	720	R	20/1	4 E	RECEPTACLE LOUNGE	C	36	-----	-----	500		20/1	E	ELECTRIC DOOR
37	1200	-----	-----		20/1	E	DRINKING FOUNTAIN	A	38	1200	-----	-----	R	20/1	E	TRASH ROOM RECEPTACLE
39	-----	1200	-----		20/1	E	DRINKING FOUNTAIN	B	40	-----	1200	-----		20/1	E	LOUNGE MICROWAVE
41	-----	-----	1200		20/1	E	TIMECARD READERS	C	42	-----	-----	360	R	20/1	2 E	EXTERIOR RECEPTACLE

CONNECTED:

	VA	AMPS
PHASE A =	9260	77
PHASE B =	10151	85
PHASE C =	10751	90
TOTAL =	30162	84

L.C.L. @ 125% = 1200
RECEPT. ( ) 10 kVA @ 50%) = 13610
KITCHEN @ 65% =
OTHER LOAD @ 100% = 11982
TOTAL VA = 26792
TOTAL AMPS = 74

LOAD TYPE:
G - GENERAL (100%) · M - MOTOR (100%)
L - L.C.L. (125%) · M1 - MOTOR (125%)
R - RECEPTACLE (50%) (10 kVA @ 100%) · X - X-RAY (100%)
K - KITCHEN (65%) · X1 - X-RAY (50%)

'N' DENOTES NEW BREAKER, NEW LOAD
'E' DENOTES EXISTING BREAKER, EXISTING LOAD
'R' DENOTES EXISTING BREAKER, NEW LOAD

LA COSTA GLEN LAKESIDE COMMONS — PANELBOARD (E)AC4

PROJECT NO. 232023
VOLTS 120/208 · PHASE 3PH, 4W · MTG SURFACE
LOCATION STORAGE RM 204
MAIN MLO · BUS 225A

CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION	PH	CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION
1	3867	-----	-----	M1	60/3	E	EF-3	A	2	2000	-----	-----	M	30/3	E	MAU-1
3	-----	3867	-----	M1	---	E	-----	B	4	-----	2000	-----	M	---	E	-----
5	-----	-----	3867	M1	---	E	-----	C	6	-----	-----	2000	M	---	E	-----
7	416	-----	-----	M	20/2	E	EF-2	A	8	288	-----	-----	M	20/3	E	EF-1
9	-----	416	-----	M	---	E	-----	B	10	-----	288	-----	M	---	E	-----
11	-----	-----	700	M	20/1	E	EF-4	C	12	-----	-----	288	M	---	E	-----
13	288	-----	-----	M	20/3	E	EF-5	A	14	874	-----	-----	M	20/2	E	HP-28
15	-----	288	-----	M	---	E	-----	B	16	-----	874	-----	M	---	E	-----
17	-----	-----	288	M	---	E	-----	C	18	-----	-----	300	M	20/3	N	KEF-1
19	288	-----	-----	M	20/3	E	OAF-1	A	20	300	-----	-----	M	---	N	-----
21	-----	288	-----	M	---	E	-----	B	22	-----	300	-----	M	---	N	-----
23	-----	-----	288	M	---	E	-----	C	24	-----	-----	500	M	20/3	N	MAU-1
25	700	-----	-----	M	20/3	E	OAF-2	A	26	500	-----	-----	M	---	N	-----
27	-----	700	-----	M	---	E	-----	B	28	-----	500	-----	M	---	N	-----
29	-----	-----	700	M	---	E	-----	C	30	-----	-----	960		20/2	N	RA
31	700	-----	-----	M	20/3	E	OAF-3	A	32	960	-----	-----		---	N	-----
33	-----	700	-----	M	---	E	-----	B	34	-----		-----				SPACE
35	-----	-----	700	M	---	E	-----	C	36	-----	-----					SPACE
37		-----	-----				SPACE	A	38		-----	-----				SPACE
39	-----		-----				SPACE	B	40	-----		-----				SPACE
41	-----	-----						C	42	-----	-----					SPACE

CONNECTED:

	VA	AMPS
PHASE A =	11181	93
PHASE B =	10221	85
PHASE C =	10591	88
TOTAL =	31993	89

L.C.L. @ 125% = 14501
RECEPT. ( ) 10 kVA @ 50%) =
KITCHEN @ 65% =
OTHER LOAD @ 100% = 20392
TOTAL VA = 34893
TOTAL AMPS = 97

LOAD TYPE:
G - GENERAL (100%) · M - MOTOR (100%)
L - L.C.L. (125%) · M1 - MOTOR (125%)
R - RECEPTACLE (50%) (10 kVA @ 100%) · X - X-RAY (100%)
K - KITCHEN (65%) · X1 - X-RAY (50%)

'N' DENOTES NEW BREAKER, NEW LOAD
'E' DENOTES EXISTING BREAKER, EXISTING LOAD
'R' DENOTES EXISTING BREAKER, NEW LOAD

LA COSTA GLEN LAKESIDE COMMONS — PANELBOARD (N)K4

PROJECT NO. 232023
VOLTS 120/208 · PHASE 3PH, 4W · MTG RECESSED
LOCATION SERVICE CORRIDOR 107
MAIN MLO · BUS 250A

CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION	PH	CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION
1	1560	-----	-----	K	20/1		BLENDER 108	A	2	4804	-----	-----	K	60/3		OVEN/MICROWAVE 106A
3	-----	1080	-----	K	20/1		CABINET WARMING/HOLDING 108	B	4	-----	4804	-----	K	---		-----
5	-----	-----	1524	K	20/1		COFFEE MAKER, AIRPOT 108	C	6	-----	-----	4804	K	---		-----
7	900	-----	-----	K	20/1		U/C REFRIGERATOR 108	A	8	4804	-----	-----	K	60/3		OVEN/MICROWAVE 106A
9	-----	960	-----	K	20/1		WORK TABLE 106A	B	10	-----	4804	-----	K	---		-----
11	-----	-----	900	K	20/1		COMPACT U/C FRIDGE 106A	C	12	-----	-----	4804	K	---		-----
13	1176	-----	-----	K	20/1		PIZZA PREP FRIDGE 106A	A	14		-----	-----		20/1		SPARE
15	-----	1200	-----	K	20/1		WORK TABLE, OVEN 106A	B	16	-----		-----		20/1		SPARE
17	-----	-----	900	K	20/1		COMPACT U/C FRIDGE 106A	C	18	-----	-----			20/1		SPARE
19	504	-----	-----	K	20/1		HEAT LAMP, DECORATIVE 106A	A	20	180	-----	-----	K	20/1		BACK BAR COOLER 106A
21	-----	2256	-----	K	30/1		CABINET WARMING/HOLDING 106A	B	22	-----	2882	-----		40/3		ESPRESSO MACHINE 108
23	-----	-----	1608	K	20/1		DROP-IN, HOT/COLD SHELF 106A	C	24	-----	-----	2882		---		-----
25	1200	-----	-----	K	20/1		POS SYSTEM 106A	A	26	2882	-----	-----		---		-----
27	-----	1200	-----	K	20/1		POS SYSTEM 106A	B	28	-----	4804	-----		60/3		OVEN/MICROWAVE 108
29	-----	-----	1320	K	20/1		BACK BAR EQUIP, HEAT LAMP 106A	C	30	-----	-----	4804		---		-----
31	1608	-----	-----	K	20/1		WAREWASHER UNDERCOUNTER 106A	A	32	4804	-----	-----		---		-----
33	-----		-----		20/1		SPARE	B	34	-----		-----		20/1		SPARE
35	-----	-----					SPACE	C	36	-----	-----					SPACE
37		-----	-----				SPACE	A	38		-----	-----				SPACE
39	-----		-----				SPACE	B	40	-----		-----				SPACE
41	-----	-----					SPACE	C	42	-----	-----					SPACE

CONNECTED:

	VA	AMPS
PHASE A =	24422	204
PHASE B =	23990	200
PHASE C =	23546	196
TOTAL =	71958	200

L.C.L. @ 125% =
RECEPT. ( ) 10 kVA @ 50%) =
KITCHEN @ 65% = 31785
OTHER LOAD @ 100% = 23058
TOTAL VA = 54843
TOTAL AMPS = 152

LOAD TYPE:
G - GENERAL (100%) · M - MOTOR (100%)
L - L.C.L. (125%) · M1 - MOTOR (125%)
R - RECEPTACLE (50%) (10 kVA @ 100%) · X - X-RAY (100%)
K - KITCHEN (65%) · X1 - X-RAY (50%)

LA COSTA GLEN LAKESIDE COMMONS — PANELBOARD (E)K3

PROJECT NO. 232023
VOLTS 120/208 · PHASE 3PH, 4W · MTG RECESSED
LOCATION KITCHEN
MAIN MLO · BUS 225A

CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION	PH	CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION
1	1524	-----	-----	K	20/1	R	COFFEE MAKER, AIRPOT 102	A	2	400	-----	-----	K	20/1	E	SMOKE FIRE DAMPERS
3	-----	2016	-----	R	20/1	E	ICE MACHINE 199	B	4	-----	1680	-----	K	20/1	E	ROTISSERIE 90
5	-----	-----	1440	K	20/1	R	ICED TEA BREWER 102	C	6	-----	-----	960	K	20/1	E	RANGE 82
7	1200	-----	-----	K	20/1	R	JUICE DISPENSER 102	A	8	2352	-----	-----	M	30/3	E	HP-29
9	-----	900	-----	K	20/1	R	WARMER, DRAWER 102	B	10	-----	2352	-----	M	---	E	-----
11	-----	-----	500		20/1	E	EXISTING LOAD	C	12	-----	-----	2352	M	---	E	-----
13	1644	-----	-----	K	20/1	R	WARMER, FOOD 102	A	14	1920	-----	-----	K	20/1	E	CABINETS 192
15	-----	960	-----	K	20/1	R	BUSSING CABINET 102	B	16	-----	1920	-----	K	20/1	E	CABINETS 192
17	-----	-----	1512	K	20/1	R	CABINET, WARMING/HOLDING 102	C	18	-----	-----	600	K	20/1	E	HOOD 74
19	876	-----	-----	K	20/1	R	DISPLAY CASE, REFRIGERATED 102	A	20	500	-----	-----		20/1	E	EXISTING LOAD
21	-----	696	-----	K	20/1	R	REFRIGERATOR, REACH-IN 108	B	22	-----	900	-----	K	30/2	E	FOOD WARMER
23	-----	-----	660	K	20/1	R	REFRIG SELF SERV, JUICER 108	C	24	-----	-----	900	K	---	E	-----
25	864	-----	-----	K	20/1	R	PREP REFRIGERATOR 108	A	26		-----	-----		30/2	R	SPARE
27	-----	1200	-----	K	20/1	R	POS SYSTEM 108	B	28	-----		-----		---	R	SPARE
29	-----	-----	360	K	20/1	R	ICE DISPENSER, UC REFRIG. 108	C	30	-----	-----			20/1	R	SPARE
31	540	-----	-----	K	20/1	E	JUICE DISPENSER 187	A	32		-----	-----		30/2	R	SPARE
33	-----	500	-----	K	20/1	E	EXISTING LOAD	B	34	-----		-----		---	R	SPARE
35	-----	-----	500	K	20/1	E	JUICE DISPENSER 176	C	36	-----	-----			20/1	R	SPARE
37	500	-----	-----	K	20/1	E	SYLVER CABINET 180	A	38	1000	-----	-----	K	30/2	E	COFFEE MAKER 185
39	-----	500	-----	K	20/1	E	POS SYSTEM 157	B	40	-----	1000	-----	K	---	E	-----
41	-----	-----	500		20/1	E	EXISTING LOAD	C	42	-----	-----	500		20/1	E	EXISTING LOAD

CONNECTED:

	VA	AMPS
PHASE A =	13320	111
PHASE B =	14624	122
PHASE C =	10784	90
TOTAL =	38728	108

L.C.L. @ 125% =
RECEPT. ( ) 10 kVA @ 50%) = 2016
KITCHEN @ 65% = 17976
OTHER LOAD @ 100% = 9056
TOTAL VA = 29048
TOTAL AMPS = 81

LOAD TYPE:
G - GENERAL (100%) · M - MOTOR (100%)
L - L.C.L. (125%) · M1 - MOTOR (125%)
R - RECEPTACLE (50%) (10 kVA @ 100%) · X - X-RAY (100%)
K - KITCHEN (65%) · X1 - X-RAY (50%)

'N' DENOTES NEW BREAKER, NEW LOAD
'E' DENOTES EXISTING BREAKER, EXISTING LOAD
'R' DENOTES EXISTING BREAKER, NEW LOAD

LAKESIDE COMMONS DINING — PANELBOARD (E)ECL

PROJECT NO. 232-023
VOLTS 120/208 · PHASE 3PH, 4W · MTG SURFACE
LOCATION ELECT. ROOM L33
MAIN 150A · BUS 225A

CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION	PH	CKT	A	B	C	LOAD TYPE	BKR	OUTLET QUAN	DESCRIPTION
1	319	-----	-----	L	20/1	E	LTG ELEC/TEL/OFFICE NL	A	2	100	-----	-----	L	20/1	E	EXIT LIGHTING CONTROL
3	-----	210	-----	L	20/1	R	LTG ELEC/TEL/OFFICE NL	B	4	-----	200	-----	L	20/1	E	EXIT LIGHTING
5	-----	-----	746	L	20/1	E	LTG ELEC/TEL/OFFICE NL	C	6	-----	-----	200	L	20/1	E	EXIT LIGHTING
7	672	-----	-----	L	20/1	E	LTG ELEC/TEL/OFFICE NL	A	8	300	-----	-----	L	20/1	E	EXTERIOR LIGHTING
9	-----	706	-----	L	20/1	E	LTG ELEC/TEL/OFFICE NL	B	10	-----	400	-----	L	20/1	E	EXTERIOR LIGHTING
11	-----	-----	140	L	20/1	E	LTG CORRIDOR NL	C	12	-----	-----	100	L	20/1	E	ELEVATOR CAB
13	395	-----	-----	L	20/1	E	LTG CORRIDOR NL	A	14	100	-----	-----	L	20/1	E	PATIO PORCH A
15	-----	618	-----	L	20/1	E	LT STAIRS NL	B	16	-----	500	-----	L	20/1	E	PATIO PORCH A
17	-----	-----					SPACE	C	18	-----	-----	500	L	20/1	E	PATIO PORCH A
19		-----	-----				SPACE	A	20	500	-----	-----	L	20/1	E	PATIO L50 TO BLDG 'B'
21	-----		-----				SPACE	B	22	-----	500	-----	L	20/1	E	TRASH CORRIDOR
23	-----	-----					SPACE	C	24	-----	-----					SPACE
25		-----	-----				SPACE	A	26		-----	-----				SPACE
27	-----		-----				SPACE	B	28	-----		-----				SPACE
29	-----	-----					SPACE	C	30	-----	-----					SPACE
31		-----	-----				SPACE	A	32		-----	-----				SPACE
33	-----		-----				SPACE	B	34	-----		-----				SPACE
35	-----	-----					SPACE	C	36	-----	-----					SPACE
37		-----	-----				SPACE	A	38		-----	-----				SPACE
39	-----		-----				SPACE	B	40	-----		-----				SPACE
41	-----	-----					SPACE	C	42	-----	-----					SPACE

CONNECTED:

	VA	AMPS
PHASE A =	2386	20
PHASE B =	3134	26
PHASE C =	1686	14
TOTAL =	7206	20

L.C.L. @ 125% = 9008
RECEPT. ( ) 10 kVA @ 50%) =
KITCHEN @ 65% =
OTHER LOAD @ 100% =
TOTAL VA = 9008
TOTAL AMPS = 25

LOAD TYPE:
G - GENERAL (100%) · M - MOTOR (100%)
L - L.C.L. (125%) · M1 - MOTOR (125%)
R - RECEPTACLE (50%) (10 kVA @ 100%) · X - X-RAY (100%)
K - KITCHEN (65%) · X1 - X-RAY (50%)

'N' DENOTES NEW BREAKER, NEW LOAD
'E' DENOTES EXISTING BREAKER, EXISTING LOAD
'R' DENOTES EXISTING BREAKER, NEW LOAD

SHORT CIRCUIT AND VOLTAGE DROP CALCULATIONS

FEEDERS

DESIGNATION	FEEDER LENGTH (ft)	PHASE ϕ	CONDUCTORS – Cu	CONDUCTORS – SIZE	CONDUCTORS – PARALLEL RUNS	CONDUIT MAG=1 NON=2	L-L VOLTAGE	L-N VOLTAGE	STARTING Isc	CONNECTED LOAD AMPACITY	BUS AVAILABLE Isc 3 ϕ	VOLTAGE DROP %
MSB TO K4	150	3	Cu	250 KCMIL	1	1	208	120	65,000	250	10,969	2.22

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Project Designer: STAN BRADEN

Developer

La Costa Glen CARLSBAD

LA COSTA GLEN
1970 LEVANTE STREET

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LAKESIDE COMMONS DINING
1950 SILVERLEAF CIRCLE
CARLSBAD, CA 92009

REGISTERED PROFESSIONAL ENGINEER · STEPHEN R. ...ICEK · No. E 10372 · Exp. 09-30-20 · ELECTRICAL · STATE OF CALIFORNIA

Sheet Issue & Revision Log

	DATE	DESCRIPTION
	2019-03-01	INITIAL SUBMITTAL
1	04/03/20	RFI #1
2	04/14/20	HD RESUBMITTAL
A	4/17/20	2ND PC SUBMITTAL

FBA Engineering
Consulting Electrical Engineers
150 Paularino Avenue Suite A120
Costa Mesa, CA 92626
949.852.9995 • 949.852.1657 (fax)
fbaengr.com
FBA Job Number: 232023

SINGLE LINE DIAGRAM & PANEL SCHEDULES

E2-03

FBA Engineering / Plot Date: 4/17/2020 11:29 AM / Plotted by: Christopher L. Pham / Drawing Location: \232\2023\E2-03_232023.dwg

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 7 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE
This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY
This section does not apply to this project.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING
This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED ORNAMENTAL/SPECIAL EFFECTS
This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE
This section does not apply to this project.

P.POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))
This section does not apply to this project.

Q. RATED POWER REDUCTION COMPLIANCE FOR ALTERATIONS
This section does not apply to this project.

R. 80% LIGHTING POWER FOR ALLALTERATIONS - CONTROLS EXCEPTIONS
This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)
This section does not apply to this project.

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 4 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

H. INDOOR LIGHTING CONTROLS (Not including PAFs)
*This table includes lighting controls for conditioned and unconditioned spaces. When a control having a * is shown, the notes section of this table provides more detail on how compliance is achieved. The lighting controls section of the Compliance Summary Table on the first page will show "DOES NOT COMPLY" if the notes are left blank.*

Building Level Controls

01	02	03	
		Field Inspector	
Mandatory Demand Response §110.12(c)	Shut-off controls §130.1(c)	Pass	Fail
Required > 10,000 SF	Whole Building Auto Time Switch	☐	☐

Area Level Controls

04	05	06	07	08	09	10	11	12	
								Field Inspector	
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(d)	Interlocked Systems §140.6(a)1	Pass	Fail
*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*							13		
							Plan Sheet Showing Daylit Zones:		

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS
Each area complying using the Complete Building or Area Category Methods per §140.6(b) are included in this table. Column 06 indicates if additional lighting power allowances per §140.6(c) or adjustments per §140.6(a) are being used .

Conditioned Spaces

01	02	03	04	05	06	
					Additional Allowance / Adjustment	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Area Category	PAF
Dining Area	Cafeteria/Fastfood	0.4	4,970	1,988	Yes	No
Corridor	Corridor Area	0.6	618	370.8	No	No
Kitchen	Kitchen/ Food Preparation Area	0.95	656	623.2	No	No
Main Entry	Main Entry Lobby	0.85	1,089	925.65	Yes	No

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 1 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

This document is used to demonstrate compliance with requirements in §110.9, §110.12(c), §130.0, §130.1, §140.6 and §141.0(b)2 for indoor lighting scopes using the prescriptive path.

A. GENERAL INFORMATION

01	Project Location (city)	Carlsbad	04	Total Conditioned Floor Area (ft²)	7,333
02	Climate Zone	7	05	Total Unconditioned Floor Area (ft²)	0
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	1

☐ Office ☐ Retail ☐ Warehouse ☐ Hotel/Motel ☐ School ☒ Support Areas
☐ Parking Garage ☐ High-Rise Residential ☐ Relocatable ☐ Healthcare ☒ Other (Write in) See Table I

B. PROJECT SCOPE
This table includes 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.

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☐ New Lighting System				
☐ New Lighting System - Parking Garage				
☒ Altered Lighting System	Area Category Method	7333	Area Category Method	0
Total Area of Work (ft²)	7333		0	

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 8 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

T. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Yes	No	Form/Title	Field Inspector Pass	Field Inspector Fail
●	○	NRCI-LTI-01-E - Must be submitted for all buildings	☐	☐
○	●	NRCI-LTI-02-E- Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.	☐	☐
○	●	NRCI-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.	☐	☐
○	●	NRCI-LTI-05-E- Must be submitted for a Power Adjustment Factor (PAF) to be recognized for compliance.	☐	☐
○	●	NRCI-LTI-06-E- Must be submitted for additional wattage installed in a video conferencing studio to be recognized for compliance.	☐	☐

U. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE
Selections have been made based on information provided in this document. If any selection have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name 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	Field Inspector Fail
●	○	NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	☐	☐
○	●	NRCA-LTI-03-A - Must be submitted for automatic daylight controls.	☐	☐
●	○	NRCA-LTI-04-A - Must be submitted for demand responsive lighting controls.	☐	☐
○	●	NRCA-LTI-05-A. - Must be submitted for institutional tuning power adjustment factor (PAF)	☐	☐

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 5 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

TOTALS:	7,333	3,907.65	See Tables J, or P for detail

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 2 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

C. COMPLIANCE RESULTS
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	Allowed Lighting Power per §140.6(b) (Watts) 01 Complete Building §140.6(c)1 (See Table J)	02 Area Category §140.6(c)2 (See Table J)	03 Area Category Additional §140.6(c)2G (+) (See Table J)	04 Tailored §140.6(c)3 (+) (See Table K)	=	05 Total Allowed (Watts)	≥	Adjusted Lighting Power per §140.6(a) (Watts) 06 Total Designed (Watts) (See Table R)	07 Adjustments PAF Lighting Control Credits §140.6(a)2 (-) (See Table R)	=	08 Total Adjusted (Watts) *Includes Adjustments	Compliance Results 09 05 must be >= 08 §140.6
⚠ Conditioned		3,907.65	1,758.9		=	5,666.55	≥	4,600.9	0	=	4600.9	COMPLIES
Unconditioned												
											Controls Compliance (See Table H for Details)	COMPLIES
											Rated Power Reduction Compliance (See Table Q for Details)	

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

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

F. INDOOR LIGHTING FIXTURE SCHEDULE
This table includes all permanent designed lighting and all portable lighting in offices.
Designed Wattage: Conditioned Spaces

01 Name or Item Tag	02 Complete Luminaire Description	03 Modular (Track) Fixture	04 Small Aperture & Color Change[1]	05 Watts per luminaire[2]	06 How is Wattage determined	07 Total Number of Luminaires	08 Excluded per §140.6(a)3	09 Design Watts	10 Field Inspector Pass	10 Field Inspector Fail
AR1	AR1 Accent Light 15.4	No	No	15.4	Mfr. Spec	33	No	508.2	☐	☐
AR1-R	AR1 Accent Light 15.4	No	No	15.4	Mfr. Spec	3	No	46.2	☐	☐

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 3 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Steve R. Zajicek	Documentation Author Signature:
Company:	Signature Date:
Address: 150 Paularino Avenue Suite A120	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Costa Mesa California 92626	Phone: 9498529995

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. 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)
3. 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.
4. 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.
5. 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: Steve R. Zajicek	Responsible Designer Signature:
Company: FBA Engineering	Date Signed: 2020-04-17
Address: 150 Paularino Avenue Suite A120	License: E 10372
City/State/Zip: Costa Mesa California 92626	Phone: 9498529995

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 6 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM
All areas indicated in Table I as using an additional allowance using the Area Category Method have been included in this table to calculate the additional allowance per Table 140.6-C.

Conditioned Spaces

01 Area Description	02 Primary Function Area	03 Applicable Qualifying Lighting System from Table 140.6-C	04 Allowed Density (W/ft² or W/lf or W/unit)	05 Ltg Area, Length or ATM/Mirror (ft², lf or #)	06 Extra Allowance (Watts)	07 Luminaire Name or Item Tag	08 Watts per Luminaire	09 Number of Luminaires	10 Total Design Watts
Dining Area	Cafeteria/Fastfood	OrnamentalLighting	0.30	4970	1491.00	DP1	48	3	144
						AR1	15.4	18	277.2
						AR1	15.4	6	92.4
						AR1	15.4	9	138.6
						WD1	60	3	180
						M200	200	1	200
						W51	51	2	102
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
1134.2	1491.00	1134.2							
Main Entry	Main Entry Lobby	OrnamentalLighting	0.30	1089	326.70	WD1	60	3	180
						WD2	30	10	300
Total Design Watts	Calculated Allowance (Watts):	Total Additional Allowance for this area:							
480	326.70	326.70							
	11								
Total Additional Allowance (Watts) CONDITIONED SPACES		1460.90							

Unconditioned Spaces
This section does not apply to this project.

STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE			NRCC-LTI-E
Project Name:	Lakeside Commons	Report Page:	(Page 3 of 9)
Project Address:	1950 Silverleaf Circle	Date Prepared:	4/17/2020

F. INDOOR LIGHTING FIXTURE SCHEDULE

DP1	DP1 Decorative Pendant 48W	No	No	48	Mfr. Spec	3	No	144	☐ ☐
DP2	DP2 Decorative Pendant 18W	No	No	60	Mfr. Spec	2	No	120	☐ ☐
DP3	DP3 Decorative Pendant 18W	No	No	120	Mfr. Spec	1	No	120	☐ ☐
J30	Existing Cove Light	No	No	32	Mfr. Spec	16	No	512	☐ ☐
M200	Existing Pendant	No	No	200	Mfr. Spec	1	No	200	☐ ☐
RD1	RD1 Recessed Downlight 13.5	No	No	13.5	Mfr. Spec	81	No	1,093.5	☐ ☐
RD1-R	RD1 Recessed Downlight 13.5	No	No	13.5	Mfr. Spec	36	No	486	☐ ☐
RD2	RD2 Recessed Downlight 15W	No	No	15	Mfr. Spec	9	No	135	☐ ☐
RD3	RD3 Recessed Downlight 8W	No	No	8	Mfr. Spec	4	No	32	☐ ☐
RD4	RD4 28.5W	No	No	28.5	Mfr. Spec	4	No	114	☐ ☐
RDW-R	RDW-R	No	No	15	Mfr. Spec	4	No	60	☐ ☐
RW1	RW1 12W	No	No	12	Mfr. Spec	5	No	60	☐ ☐
W51	Existing Pendant	No	No	51	Mfr. Spec	2	No	102	☐ ☐
WD1	WD1 60W	No	No	60	Mfr. Spec	6	No	360	☐ ☐
WD2	WD2 30W	No	No	30	Mfr. Spec	10	No	300	☐ ☐
							Total Designed Watts: CONDITIONED SPACES	4,600.9	

[1]*FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per §140.6(a)4B is adjusted to be 75% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.*

[2]*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. MODULAR LIGHTING SYSTEMS
This section does not apply to this project.

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KTGY Project No: 171180

Project Contact: DORINA SZALMA
Email: dszalma@ktgy.com
Principal: SIMON PERKOWITZ
Project Designer: STAN BRADEN

Developer
La Costa Glen CARLSBAD
LA COSTA GLEN
1970 LEVANTE STREET
CARLSBAD, CA 92009
PHONE NO. 800-852-4384
FAX NO. ----

LAKESIDE COMMONS DINING
1950 SILVERLEAF CIRCLE
CARLSBAD, CA 92009

REGISTERED PROFESSIONAL ENGINEER — No. 10372 — Exp. 09-30-20 — ELECTRICAL — STATE OF CALIFORNIA

Sheet Issue & Revision Log

	2019-03-01	INITIAL SUBMITTAL
1	04/03/20	RFI #1
2	04/14/20	HD RESUBMITTAL
A	4/17/20	2ND PC SUBMITTAL

It is the clients responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or clients subcontractors proceeding with the work. The client will be responsible for any defects in construction if these procedures are not followed.

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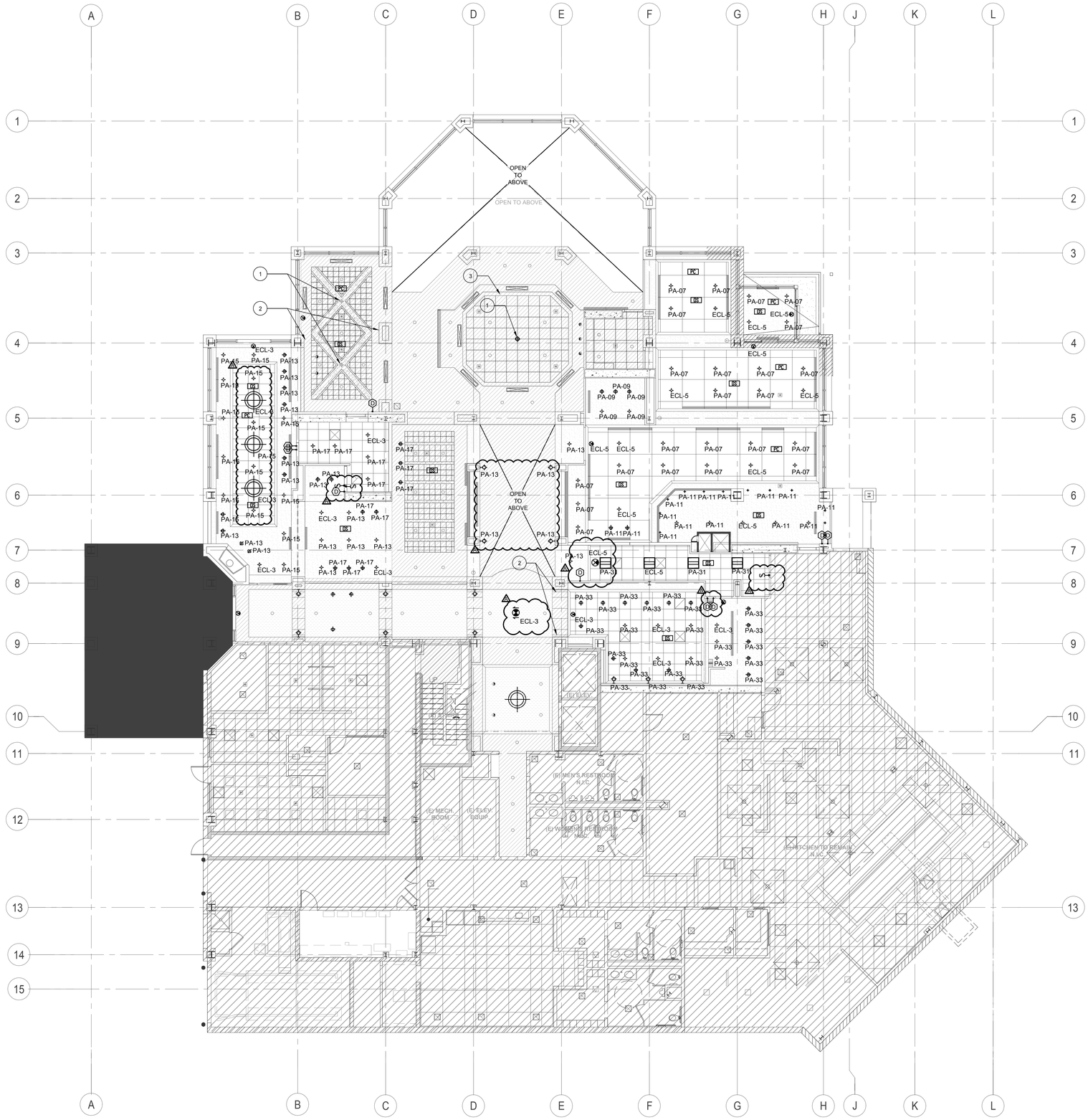
FBA Job Number: 232023

TITLE 24

E2-04



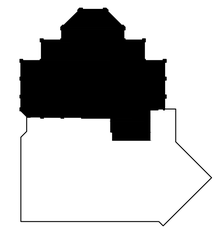
GENERAL NOTES:

1. FOR RETROFIT FIXTURES, CONNECT RETROFIT FIXTURES TO EXISTING CIRCUIT.
2. FOR NEW FIXTURES, CONNECT NEW LIGHTS TO CIRCUITS AS THEY ARE CALLED OUT.
3. REFER TO SHEET LD2-12 FOR FIXTURE TYPE CALL OUT.

KEYNOTES:

1. EXISTING PENDANTS TO REMAIN.
2. EXISTING SCONCES TO BE REMOVED.
3. EXISTING COVE LIGHTS TO REMAIN.

KEY PLAN



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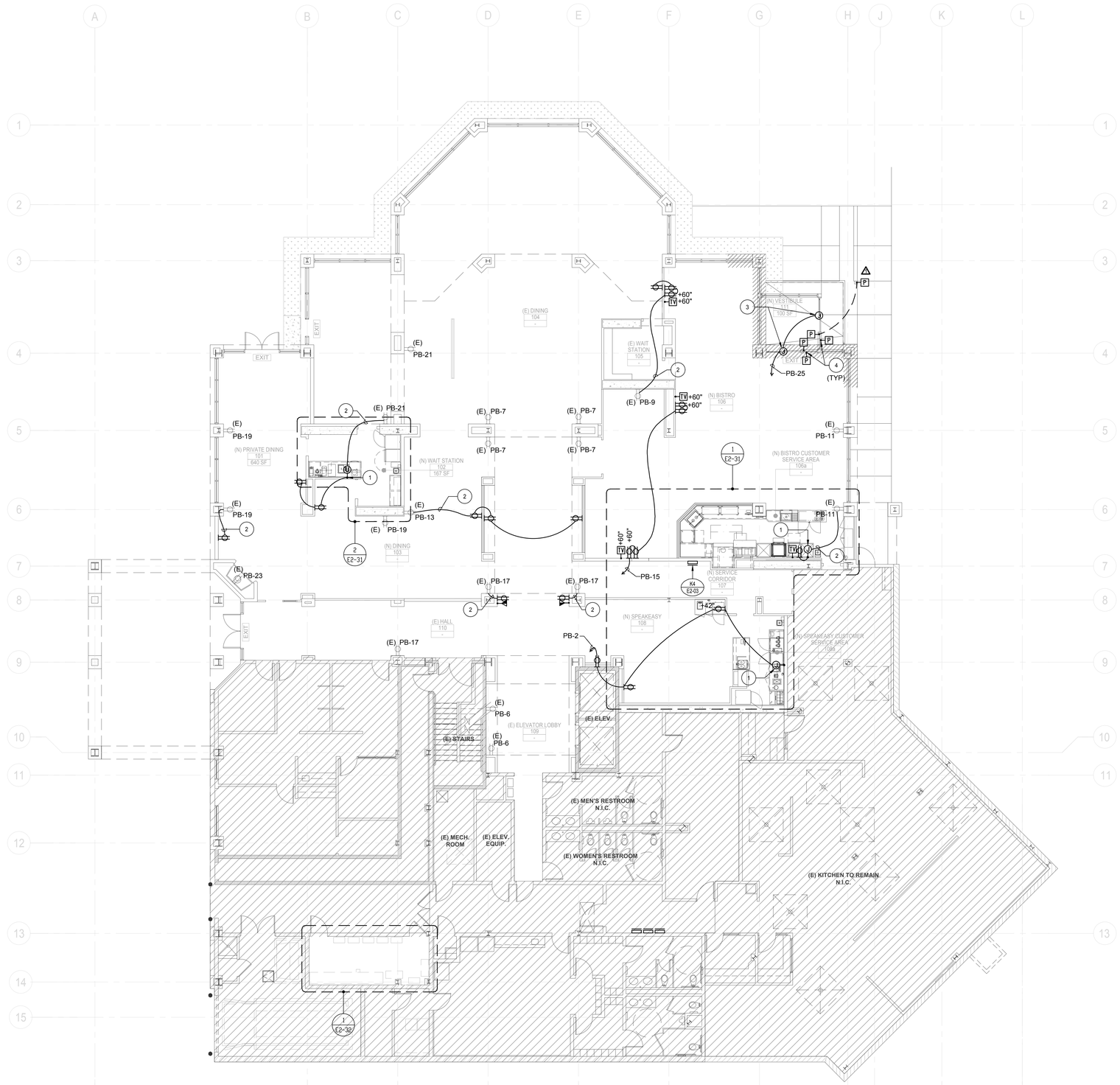
LOWER LEVEL LIGHTING PLAN

E2-10

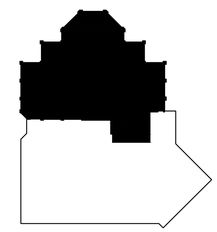
FBA Engineering / Plot Date: 4/22/2020 11:08 AM / Plotted by: Christopher L. Pham / Drawing Location: I:\232\023\E2-10_232023.dwg

KEY NOTES

1. ELECTRICAL CONNECTION FOR TRAP PRIMER. SEE PLUMBING DRAWINGS FOR EXACT LOCATION.
2. INTERCEPT AND EXTEND CIRCUIT TO NEW ELECTRICAL CONNECTIONS.
3. AUTOMATIC SLIDING DOOR SYSTEM, SEE DETAIL 1/E2-41.
4. CONNECT TO AUTOMATIC SLIDING DOOR OPERATOR. COORDINATE ALL REQUIREMENTS WITH SLIDING DOOR INSTALLER. PROVIDE ALL CONDUIT, BOXES, AND WIRING AS REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.



KEY PLAN



POWER & SIGNAL PLAN | SCALE: 1/8"=1'-0" | 1

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Project Designer: STAN BRADEN

Developer

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LAKESIDE COMMONS DINING

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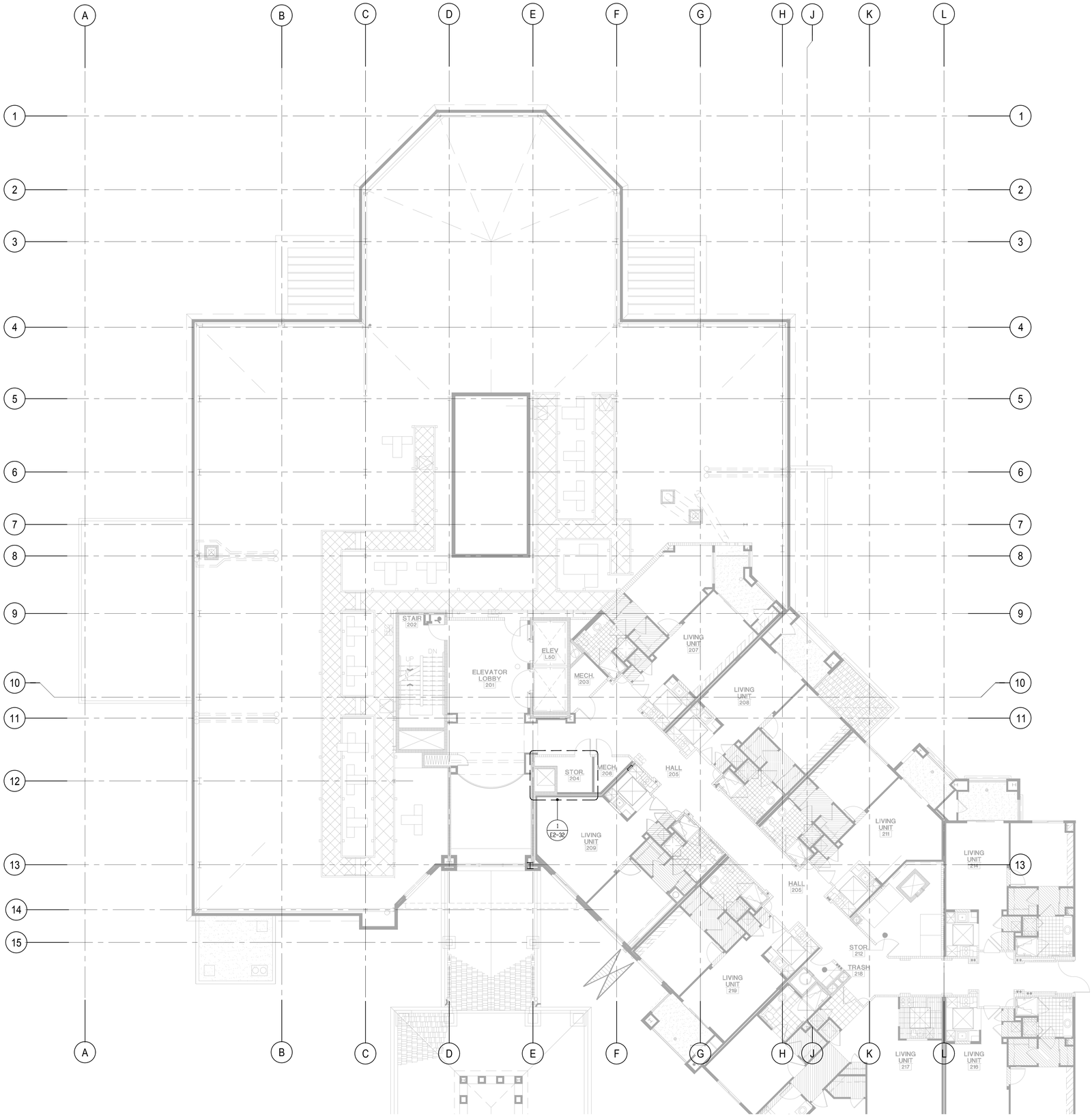
fbaeng.com
FBA Job Number: 232023

LOWER LEVEL
POWER PLANS

E2-20

FBA Engineering / Plot Date: 4/17/2020 11:29 AM / Plotted by: Christopher L. Pham / Drawing Location: I:\232\023\E2 20_232023.dwg



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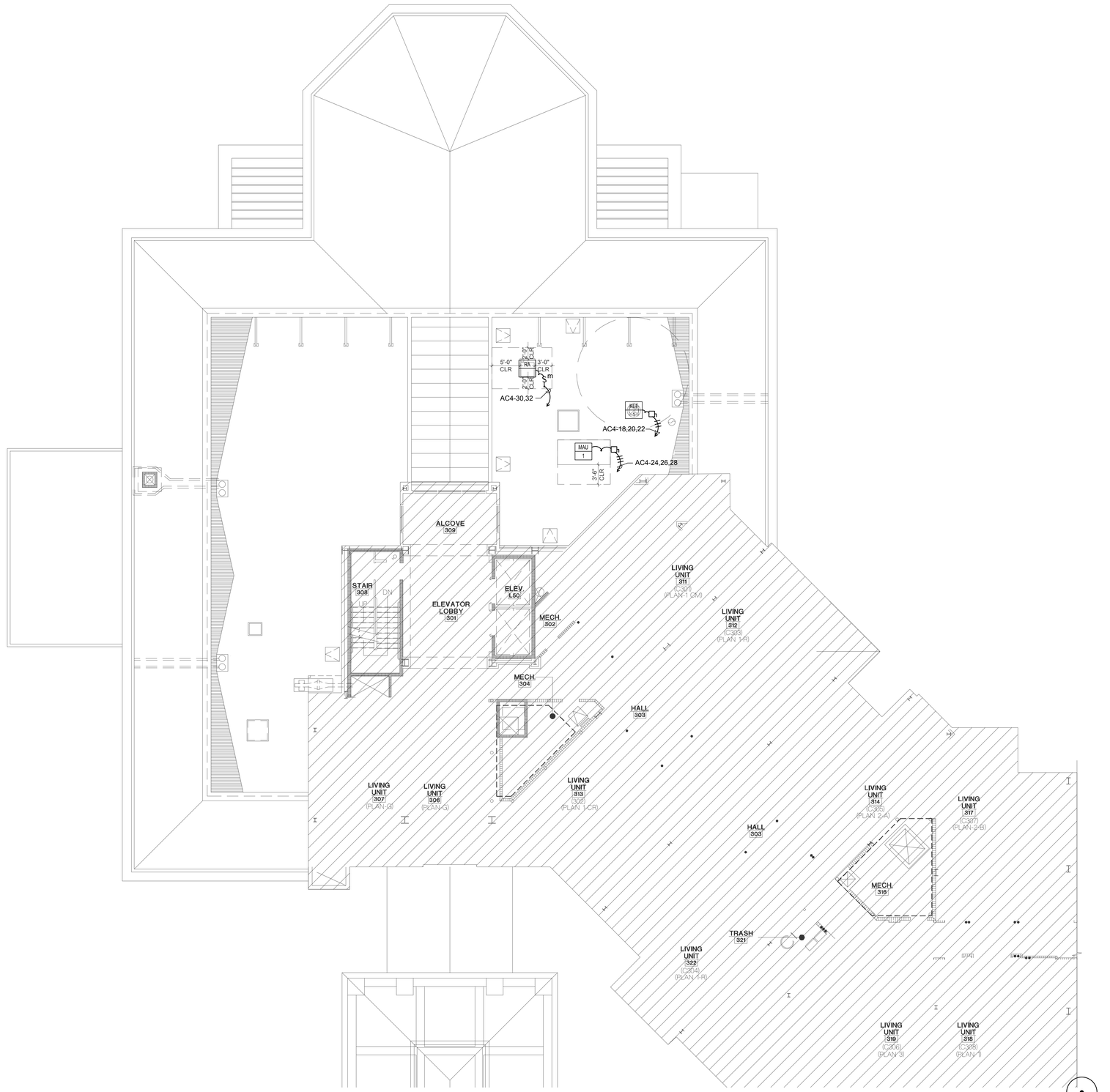
SECOND FLOOR POWER PLANS

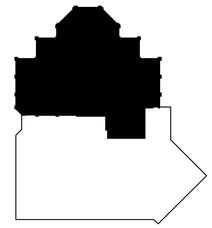
E2-21

FBA Engineering / Plot Date: 4/17/2020 11:29 AM / Plotted by: Christopher L. Pham / Drawing Location: I:\232\023\E2 21_232023.dwg



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

KEY PLAN



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Sheet Issue & Revision Log

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ROOF POWER PLANS

E2-23

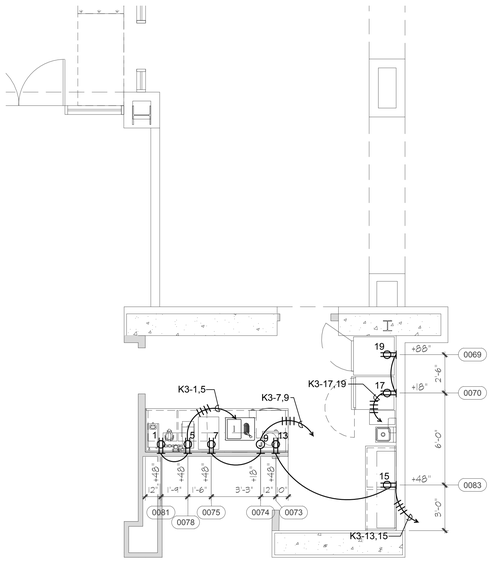
FBA Engineering / Plot Date: 4/17/2020 11:29 AM / Plotted by: Christopher L. Pham / Drawing Location: I:\232\023\E2-23_232023.dwg

ELECTRICAL NOTES

1. ALL ELECTRICAL OUTLETS AND CONNECTIONS SHOWN ON THIS PLAN ARE FOR FIXTURES AND EQUIPMENT SHOWN ON ROBERTCLARK EQUIPMENT PLAN ONLY. FOR ADDITIONAL BUILDING ELECTRICAL REQUIREMENTS, SEE ARCHITECT, GENERAL CONTRACTOR, OR OWNER.
2. ALL DIMENSIONS ARE GIVEN FROM FINISHED WALL AND/OR CENTER LINE OF COLUMNS TO CENTER LINE OF OUTLET OR FROM CENTER LINE OF OUTLET TO CENTER LINE OF OUTLET, UNLESS OTHERWISE NOTED. ALL OUTLETS NOTED +12", +24", ETC., TO STUB OUT OF WALL AT HEIGHT GIVEN. HEIGHT OF OUTLET IS GIVEN FROM FINISHED FLOOR (NOT TOP OF FINISHED CURB) TO CENTER LINE OF OUTLET. OUTLETS NOTED "STUB UP" OR "STUB OUT" OF FINISHED FLOOR AT LOCATION SHOWN ARE TO STUB UP A MAXIMUM OF 4" ABOVE FINISHED FLOOR OR TOP OF CURB, UNLESS OTHERWISE NOTED. CONTRACTOR TO VERIFY ALL DIMENSIONS AT JOB SITE.
3. ELECTRICAL CONTRACTOR TO PROVIDE CAPS AND CORDS FOR ALL ITEMS WHERE THEY ARE NOT STANDARD WITH MANUFACTURER AND SHORTEN ANY CORDS IF REQUESTED, I.E., FRYERS, TOASTER, ETC.
4. ELECTRICAL CONTRACTOR TO CONNECT ALL ELECTRICAL EQUIPMENT AND FIXTURES AND DO ANY INTERNAL WIRING IN FIXTURES.
5. FIXTURE FABRICATOR WILL CUT ACCESS HOLES TO CONVENIENCE RECEPTACLES IN BACK SPLASHES, ETC., BUT ELECTRICAL CONTRACTOR TO PROVIDE EXTENSION SHIELD, IF REQUIRED.
6. ELECTRICAL CONTRACTOR TO PROVIDE POWER AT COMPRESSOR AREAS FOR COMPRESSORS AS LISTED ON ELECTRICAL ROUGH IN AND/OR REFRIGERATION/P.V.C. PLAN. WHERE AUTOMATIC DEFROST SYSTEMS ARE USED FOR FREEZERS, PROVIDE 4 WIRE COLOR-CODED SERVICE FROM COMPRESSOR TO COIL. FOR EXACT LOCATION OF COMPRESSOR RACK, VERIFY WITH ARCHITECT OR OWNER.
7. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL REFRIGERATION CONDUIT LINES FROM COMPRESSOR AREA TO PULLBOXES OR STUB UPS AS INDICATED ON ELECTRICAL ROUGH IN AND/OR REFRIGERATION/P.V.C. PLAN. CONDUIT TO BE ROUND TRANSITE OR P.V.C. DIAMETER AS INDICATED, WITH MINIMUM BENDING RADIUS 24" AND NO FACTORY "L'S" PERMITTED .
8. ELECTRICAL CONTRACTOR TO CONNECT ALL COMPRESSORS COMPLETE WITH DISCONNECT SWITCHES AND MAGNETIC STARTERS AS PER LOCAL CODES .
9. ELECTRICAL CONTRACTOR TO CONNECT VAPOR PROOF LIGHTS AND INSTALL SWITCHES FOR EXHAUST CANOPY.
10. ELECTRICAL CONTRACTOR TO CONNECT VAPOR PROOF LIGHTS, DOOR HEATER AND DRAIN HEATER IN WALK-IN COOLER/FREEZER.
11. THE SYMBOLS ON THE ELECTRICAL PLAN ARE TO INDICATE LOCATION AND TYPE OF CONNECTION ONLY. ELECTRICAL CONTRACTOR TO PROVIDE CIRCUITS AND CONDUIT RUNS REQUIRED.
12. ROBERTCLARK PLANS ARE PROVIDED FOR THE SOLE PURPOSE OF INDICATING THE LOCATION OF OUTLETS, TYPES OF CONNECTION FOR EQUIPMENT AND ELECTRICAL LOAD. SUBCONTRACTORS MUST COMPLY WITH ALL CODES RELATED TO THE INSTALLATION, WIRING AND HOOKUP OF EQUIPMENT.
13. ELECTRICAL CONTRACTOR TO PROVIDE POWER ON ROOF AND CONNECT EXHAUST FANS AND MAKE UP AIR FANS.
14. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL GENERAL PURPOSE LIGHTING AND SPECIALTY LIGHTING. HE SHALL ALSO PROVIDE POWER FOR DECORATIVE FIXTURES BY OTHERS, AS PER ELECTRICAL ROUGH IN AND REFLECTED CEILING PLANS.
15. ELECTRICIAN TO MAKE ALL FINAL CONNECTIONS.
16. ELECTRICIAN TO SUPPLY ALL LAMPS, WIRING, SWITCHES AND DISCONNECTS AS PER LOCAL CODES.
17. ELECTRICIAN TO MAKE ALL CONNECTIONS BETWEEN FIXTURE MOUNTED COMPONENTS AND REMOTE SWITCHES.
18. ELECTRICIAN TO SUPPLY AND INSTALL ALL FIXTURE MOUNTED BOXES FROM STUB AS NOTED.
19. ALL COVER PLATES IN KITCHEN AND SERVICE AREAS TO BE STAINLESS STEEL UNLESS OTHERWISE NOTED.
20. ALL DUPLEX AND SINGLE CONVENIENCE RECEPTACLES IN KITCHEN AND SERVICE AREAS ABOVE 36" TO BE MOUNTED HORIZONTALLY AND GROUNDED UNLESS OTHERWISE NOTED.
21. ELECTRICIAN TO SUPPLY AND INSTALL PLUG MOLD WHERE INDICATED BY JOB SITE SUPERVISOR OR ROBERTCLARK PLANS.
22. ELECTRICIAN TO HANG OR INSTALL DECORATIVE LIGHTING SUPPLIED BY OTHERS AND SUPPLY LIGHT BULBS AS REQUIRED.

FOOD SERVICE GENERAL NOTES

1. REFER TO KITCHEN EQUIPMENT CONSULTANT DRAWINGS FOR ADDITIONAL ELECTRICAL WORK NOT SHOWN ON POWER PLAN, BUT INCLUDED IN THE ELECTRICAL CONTRACT SUCH AS:
   A. CONDUIT, WIRE, JUNCTION BOXES AND RECEPTACLES LOCATED IN SERVICE AND COOLING AREA COUNTERS, CONNECTION TO K.E.C. FURNISHED LIGHTS, SWITCHES, BALLASTS, JUNCTION BOXES, ETC. AS REFERENCED ON K.E.C. DRAWINGS.
   B. CORDS, CAPS AND RECEPTACLES FOR MISCELLANEOUS KITCHEN EQUIPMENT, SEE K.E.C. ELECTRICAL ROUGH-IN SCHEDULE.
   C. REFRIGERATED BASE WIRING. REFER TO K.E.C. DRAWINGS FOR EXTENT OF WORK AND ELECTRICAL ROUGH-IN SCHEDULE TO DETERMINE WHERE REFRIGERATED BASES OCCUR.
   D. READ ALL NOTES RELATED TO ELECTRICAL.
2. REFER TO K.E.C. DRAWINGS AND PROVIDE PVC CONDUITS, PVC SLEEVES AND PULLBOXES FOR REFRIGERATION AND DRINK DISPENSING LINES. ELECTRICAL CONTRACTOR SHALL COMPLY WITH ALL DETAILS AND INSTALLATION INSTRUCTIONS.
3. DEVICE PLATES IN KITCHEN SHALL BE STAINLESS STEEL. ENGRAVE PLATES WHERE INDICATED. ENGRAVING SHALL BE 1/8" HIGH BACK FILLED AND SHALL BE DONE BY PLATE AS REQUIRED BY K.E.C.
4. PROVIDE MISCELLANEOUS 20A, 125V, 3W GROUNDING RECEPTACLES WHERE INDICATED ON K.E.C. DRAWINGS AND 125V. 3W GROUNDING PLUGS WITH 3/C #12 "SO" CORD IN LENGTH AS REQUIRED BY K.E.C.
5. PROVIDE RECEPTACLES AND SWITCHES IN OUTLET BOXES FURNISHED IN STAINLESS STEEL KITCHEN AND BAR COUNTERS.
6. REFER TO K.E.C. ELECTRICAL FOR ROUGH-IN LOCATIONS OF ITEMS DENOTED WITH FOOD SERVICE EQUIPMENT ROUGH-IN CALLOUT.
7. VERIFY RECEPTACLE TYPES AND CONNECTION REQUIREMENTS WITH SELECTED KITCHEN EQUIPMENT.
8. PROVIDE CONDUIT SEALS AT ALL CONDUITS ENTERING OR LEAVING REFRIGERATORS AND FREEZERS IN ACCORDANCE TO N.E.C. 300-7.
9. ALL RECEPTACLES IN KITCHEN SHALL BE GFCI TYPE.



2 / E2-21 **SERVICE ELECTRICAL PLAN**
SCALE: 1/4"=1'-0"

1 / E2-21 **BAR / GRAB - & - GO ELECTRICAL PLAN**
SCALE: 1/4"=1'-0"

SYMBOL LIST

⊖	SINGLE RECEPTACLE	$	SWITCH
⊖⊖	DUPLEX RECEPTACLE	◀	TELEPHONE OUTLET
⊕	FOURPLEX RECEPTACLE	◁	DATA OUTLET
○	FIXTURE MOUNTED RECEPT.	— · —	INTERCONNECTING WIRING
⊖J	JUNCTION BOX W/ DEVICE RING	◉	ELECTRICAL STUB-UP
⊖	ELECTRICAL PIGTAIL-6'-0"	ⓞ	ELECTRICAL STUB-DOWN
⊖V	VAPOR PROOF LIGHT	∿∿∿	DOOR HEATER
⊖T	THERMOSTAT	⬡P	FIRE PULL

ELECTRICAL KEY NOTES

1. PROVIDE 1"C. - 4#8, 1#10G
2. PROVIDE 1 1/2"C. - 4#4, 1#10G

WALK-IN COOLER/FREEZER NOTE

NOTE TO ELECTRICIAN: WALK-IN COOLER/FREEZER MAY REQUIRE THE FOLLOWING CONNECTIONS.

COOLER:		FREEZER:	
COIL	120V, AMPS VARIES	COIL	120V, AMPS VARIES
LIGHTS	120V, .75 AMP EA.	LIGHTS	120V, .75 AMP EA.
DIGITAL THERMO	120V, .125 AMP	DIGITAL THERMO	120V, .125 AMP
		VENT	120V, 1.5 AMP
		DOOR & JAMB HEATERS	120V, 2.6 AMP

Architecture + Planning
17911 Von Karman Ave.
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KTGY Project No: 171180

Project Contact: DORINA SZALMA
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Project Designer: STAN BRADEN

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La Costa Glen
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LAKESIDE COMMONS DINING

1950 SILVERLEAF CIRCLE
CARLSBAD, CA 92009

REGISTERED PROFESSIONAL ENGINEER — ELECTRICAL — STATE OF CALIFORNIA — No. 09-30-20

Sheet Issue & Revision Log

	2019-03-01	INITIAL SUBMITTAL
1	04/03/20	RFI #1
2	04/14/20	HD RESUBMITTAL
A	4/17/20	2ND PC SUBMITTAL

It is the clients responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or clients subcontractors proceeding with the work. The client will be responsible for any defects in construction if these procedures are not followed.

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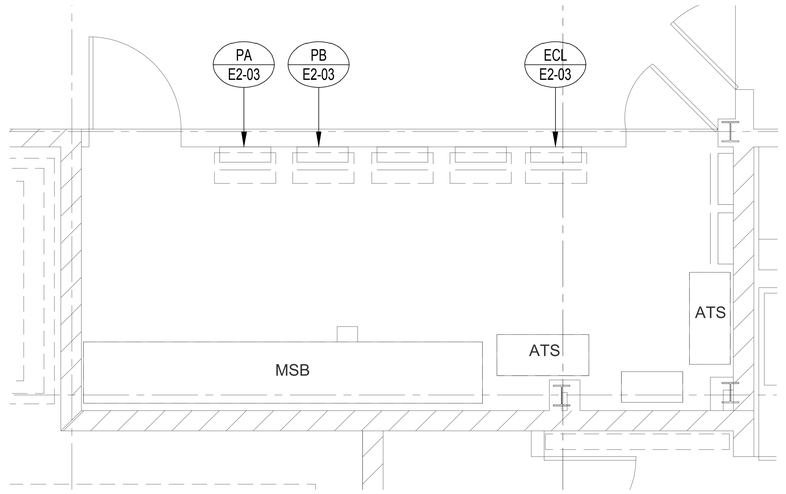
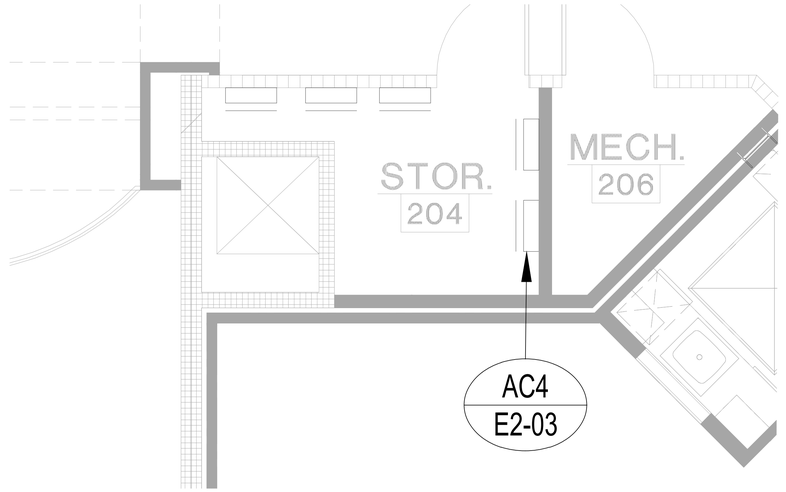
FBA Job Number: 232023

KITCHEN
ELECTRICAL PLAN

E2-31



ENLARGED ELECTRICAL ROOM L33 | SCALE: 1/2" = 1' 0" | 1



ENLARGED STORAGE ROOM 204 | SCALE: 1/2" = 1' 0" | 2

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LAKESIDE COMMONS DINING

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REGISTERED PROFESSIONAL ENGINEER
No. 10372
Exp. 09-30-20
ELECTRICAL
STATE OF CALIFORNIA

Sheet Issue & Revision Log

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1	04/03/20	RFI #1
2	04/14/20	HD RESUBMITTAL
A	4/17/20	2ND PC SUBMITTAL

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fbaengr.com
FBA Job Number: 232023

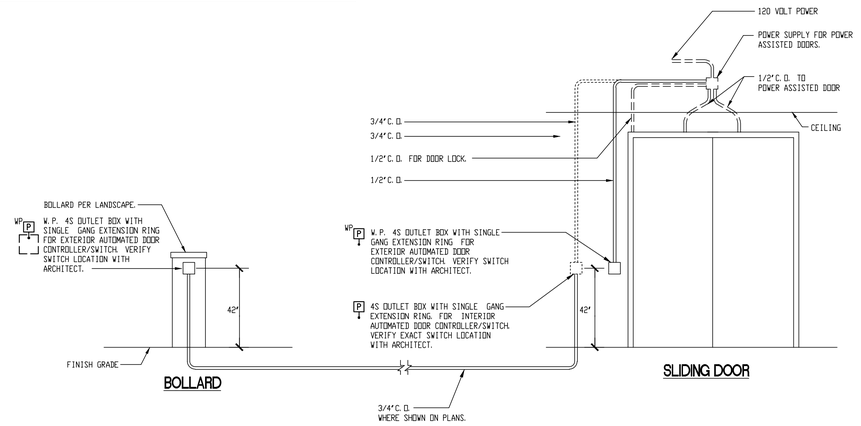
ENLARGED ELECTRICAL PLANS

E2-32

FBA Engineering / Plot Date: 4/17/2020 11:29 AM / Plotted by: Christopher L. Pham / Drawing Location: I:\232\023\E2.32_232023.dwg

GENERAL NOTES:

1. COORDINATE LOCATION OF POWER SUPPLY AND CONDUITS FOR PADDLE SWITCH, DOOR LOCK, AND POWER ASSIST WITH LOW VOLTAGE SYSTEMS INSTALLER.
2. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF PADDLE SWITCHES AND DETAILS OF BOLLARDS.
3. 120V POWER FOR DOOR SYSTEMS SHALL COME FROM RECEPTACLE BRANCH CIRCUIT IN NEAREST IDF/COMMUNICATIONS CLOSET WHEN POWER SUPPLY IS LOCATED IN THIS ROOM. IF LOCATED IN AN AREA OTHER THAN IDF/COMMUNICATIONS CLOSET, 120V POWER SHALL COME FROM CORRIDOR RECEPTACLE BRANCH CIRCUIT.



TYPICAL POWER ASSISTED DOOR DETAIL | SCALE: NONE | 1

ktgy

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fbaengr.com
FBA Job Number: 232023

ELECTRICAL DETAILS

E2-41

FBA Engineering / Plot Date: 4/17/2020 11:29 AM / Plotted by: Christopher L. Pham / Drawing Location: I:\232\023\E2-41_232023.dwg

PART 1.00 GENERAL

1.01 RELATED DOCUMENTS

A. The requirements of the General Conditions, Supplementary General Conditions and pertinent provisions of Sections in Division One of these Specifications apply to the work specified in this Section.

1.02 SCOPE

A. Work Included: All labor, materials, appliance, tools, equipment, facilities, transportation and service necessary for, and incidental to, performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the Drawings and/or specified herein.

1.03 GENERAL SUMMARY OF ELECTRICAL WORK

A. The Specifications and Drawings are intended to cover a complete installation of systems. The omission of expressed reference to any item of labor or materials for the proper execution of the work in accordance with present practice of trade shall not relieve the Contractor from providing such additional labor and materials.

B. Refer to the Drawings and Shop Drawings of other trades for additional details which affect the proper installation of this work.

C. The Electrical Drawings are diagrammatic in many respects. It is not within the scope of these Drawings to show all necessary bends, offsets, or pullboxes required. Sizes and locations of equipment and wiring may be distorted for clarity on the Drawings. Exact locations of all lighting fixtures, outlets, exit signs, wiring devices, and the like, shall be shown on Architectural Drawings, as dimensioned on Plans, or as approved by Architect.

D. Before submitting a bid, the Contractor shall familiarize himself with all features of the existing building, and all Building Drawings and Site Drawings which may affect the execution of the work. No extra payment will be allowed for failure to obtain this information.

E. This project is a partial remodel of an existing building. Refer to the Architectural Drawings for notes and other electrical requirements not shown on the Electrical Drawings and to determine existing construction to remain as well as new construction. If there are omissions or conflicts between the Electrical Documents and the documents of other trades or between the Electrical Drawings and Specifications, clarify these points with the Architect before submitting a bid. No extra payment will be allowed for failure to obtain this information.

F. Provide all line voltage electrical work, materials and control equipment required for proper operation of the air conditioning, heating, ventilating and plumbing equipment, as specified by the respective trade. This work may or may not be included on the Electrical Drawings.

1.04 LOCATIONS OF EQUIPMENT

A. The Drawings indicate diagrammatically the desired locations of arrangements of conduit runs, outlets, equipment, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work so as to secure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural conditions encountered.

B. In the event changes in the indicated locations or arrangements are necessary, due to developed conditions in the building construction or rearrangement of equipment, such changes shall be made without cost providing the change is ordered before the conduit runs, etc., and work directly connected to same is installed and no extra materials are required.

C. The Drawings indicate approximate locations of existing conduits. The exact routing shall be verified in field and length of conductors shall be adjusted to the length required.

D. Coordinate and cooperate in every way with other trades in order to avoid interference and assure a satisfactory job.

1.05 QUALITY ASSURANCE, STANDARDS AND SYMBOLS

A. Work and materials in full accordance with the latest rules and regulations of the California Code of Regulations, Title 24,Title "8 Division of Industrial Safety", the City of Gardena, California Electrical Code, the National Life Safety Code, pertinent N.F.P.A. Publications and other Federal State or other City Agencies Having Jurisdiction.

B. Keep a copy of all applicable Codes available at the job site at all times while performing work under this section. Nothing in Plans or Specifications shall be construed to permit work not conforming to the most stringent of Codes.

C. Should any changes be necessary in the Drawings or Specifications to make the work comply with these requirements, the Contractor shall notify the Architect at once in writing and cease work in parts of the Contract which are affected.

1.06 SUBMITTALS

A. Material Lists and Shop Drawings

1. Submit Shop Drawings for approval. The materials list of installation materials shall indicate proposed Equipment Manufacturers. Submittals shall be organized in completed groups for materials (i.e., all lighting fixtures or all switchgear, etc.). Departure from the above procedure will result in resubmittals and delays. The Contractor shall verify dimensions of equipment and be satisfied as to fit and that they comply with all Code Requirements relating to clear working space about electrical equipment prior to submitting Shop Drawings for approval. Where current limiting fuse devices are specified, submit technical data to indicate fuses adequately protect equipment and that the fuses are selective to the circuit breakers that it protects.

2. Submit Shop Drawings for all electrical items except installation materials such as conduit, conduit fittings, outlet boxes, 600-volt conductors, wiring devices, etc.

3. Submittals which are intended to be reviewed as a substitution or departure from the Contract Documents must be specifically noted as such or the requirements of the Contract Documents will prevail, regardless of the acceptance of the submittal.

4. Shop Drawings shall include Dimensioned Plans, elevations, details, wiring diagrams and descriptive literature of component parts where applicable. Structural calculations and mounting details, signed by Structural Engineer registered by the State of California, shall be submitted for all equipment weighing over 400lbs and shall be in compliance with Title 21 of the California Administrative Code.

5. Shop Drawings shall include the Manufacturer's projected days for shipment from the factory of completed equipment, after the equipment is released for production by the Contractor. It shall be the responsibility of the Contractor to ensure that all material and equipment is ordered in time to provide an orderly progression of the work. The Contractor shall notify the Architect of any changes in delivery which would affect the project completion date.

B. Maintenance and Operation Manuals

1. Contractor shall furnish three copies of typewritten maintenance and operating manuals for all electrical equipment to the Owner and instruct Owner's personnel in correct operation of all equipment at completion of project.

2. Maintenance and operating manuals shall be bound in three-ring, hard-cover, plastic binders and shall be delivered to the Owner with letter of transmittal, carbon copy to the Architect.

C. Portable or Detachable Parts: The Contractor shall retain in his possession and be responsible for all portable and detachable parts or portions of the installation such as fuses, keys, locks adapters, locking clips, and inserts until final completion of his work. These parts shall then be delivered to the Owner or his authorized Representative and an itemized receipt obtained, with copies of receipt sent to the Architect.

1.07 RECORD DRAWINGS

A. Provide and maintain in good order a complete set of Electrical Contract prints. Changes to the contract to be clearly recorded on this set of prints. At the end of the project, the Contractor shall transfer all changes to one set reproducible Drawings to be delivered unfolded to the Architect.

B. The Contractor shall keep the "as-built" prints up to date current with all work performed.

1.08 CLEANING EQUIPMENT, MATERIALS, PREMISES

A. All parts of the equipment shall be thoroughly cleaned of dirt, rust, cement, plaster, etc., and all cracks and corners scraped out clean. Surfaces to be painted shall be carefully cleaned of grease and oil spots and left smooth, clean and in proper condition to receive paint finish.

1.09 JOB CONDITIONS - PROTECTION

A. Protect all work, materials and equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the work. Provide for the safety and good condition of all the work until final acceptance of the work by the Owner and replace all damaged or defective work, materials and equipment before requesting final acceptance.

B. Provide UL listed fire stop for all penetration through fire rated floor, wall, ceiling and roof assemblies to maintain all fire ratings. The fire stop materials shall be re-enterable and reusable, as manufactured by Nelson, type "FSP", or equal by 3M Company.

1.10 CUTTING AND PATCHING

A. Perform cutting and patching on the construction work which may be required for the proper installation of the electrical work. Patching shall be of the same material, workmanship and finish as specified and accurately match surrounding work to satisfaction of the Architect.

1.11 IDENTIFICATION

A. Panelboards, terminal cabinets, circuit breakers, disconnect switches, starters, relays, time switches, contactors, pushbutton control stations, and other apparatus used for operation of controls of feeders, circuits, appliances, or equipment shall be properly identified by means of descriptive nameplates or tags permanently attached to the apparatus and wiring.

B. Nameplates shall be engraved laminated phenolic. Shop Drawings with dimensions and format shall be submitted to the Architect before installation. Attachment to equipment shall be with escutcheon pins, rivets, self-tapping screws or machine screws. Self-adhering or adhesive backed nameplates shall not be used.

C. Provide black-on-white laminated plastic nameplate engraved in minimum 1/4" high letters to correspond with the designations on the Drawings. Provide other additional information on nameplates where indicated.

D. For equipment containing or operating on circuits of more than 240 volts nominal, provide red-on-white laminated warning signs engraved in 1/2" high letters to read "CAUTION - 480 (or as applicable) VOLTS".

E. Tags shall be attached to feeder wiring in conduits at every point where runs are broken or terminated and shall include pull wires in empty conduits. Circuit, phase, and function shall be indicated. Branch circuit shall be tagged on panelboards. Tags may be made of pressure sensitive plastic or embossed, self-attached, stainless steel or brass ribbon.

F. Cardholders and cards shall be provided for circuit identification in panelboards. Cardholders shall consist of a metal frame retaining a clear plastic cover permanently attached to the inside of panel door. List of circuits shall be typewritten on card. Circuit description shall include name or number of circuit, area, and connected load.

G. Junction and pullboxes shall have covers stenciled with box number when shown on the Drawings, or circuit numbers according to panel schedule. Data shall be lettered in an inconspicuous manner with a color contrasting to finish.

1.12 TIME/CURRENT COORDINATION, SHORT CIRCUIT, ARC-FLASH AND SERIES RATED EQUIPMENT

A. Short Circuit, Coordination and ARC-Flash

1. Perform engineering analysis and submit engineered settings for each equipment location, fuse device and circuit breaker device, showing the correct time and current settings to provide the selective coordination within the limits of the specified equipment. Shall comply with the latest application standards of IEEE and ANSI. Provide electrical system short circuit worst case bolted-fault analysis, both 1-phase line-to-line and 1-phase line-to-ground calculations as part of the coordination analysis recommendations. Provide Electric ARC-FLASH calculations as part of the coordination analysis recommendations.

2. The information shall be submitted in format with an engineering narrative. Written narrative describing data, assumptions, analysis of results and prioritized recommendations.

3. The goal is to minimize an unexpected but necessary electrical system outage and personnel exposure to the smallest extent possible within the fault occurrence location, using the specified contract equipment. Shall comply with, but not limited to:

a. IEEE-242, Recommended Practices for Protection and Coordination of Industrial and Commercial Distribution.
b. IEEE-399, Recommended Practices for Industrial and Commercial Power System Analysis.
c. IEEE-1584, Guide to Performing ARC-FLASH Hazard Study.
d. CEC/NEC

4. Provide permanent warning labels on each equipment location. The labels shall describe ARC-FLASH, Short-Circuit and Time/Current Coordination, including safety precautions and protective clothing. Also described actions to be taken if any circuit changes or equipment modifications occur.

5. Completed engineered documentation shall be submitted with the Shop Drawing submittals for the respective equipment.

B. Equipment, equipment bus, circuit protection devices and circuit breakers short circuit fault current withstand and interrupt ratings shall not be less than the values calculated in the CONTRACTOR's required short circuit analysis and report; plus a 25% additional short circuit fault current safety factor.

1.13 ELECTRICAL WORK CLOSEOUT

A. Prepare the following items and submit to the Architect before final acceptance.

1. Two copies of all test results as required under this section.

2. Two copies of Local and/or State Code Enforcing Authorities final inspection certificates.

3. Copies of As-built Record Drawings as required under the General Conditions, pertinent Division One Section and Electrical General Provisions.

4. Two copies of all receipts transferring portable or detachable parts to the Owner when requested.

5. Notify the Architect in writing when installation is complete and that a final inspection of this work can be performed. In the event defects or deficiencies are found during this final inspection, they shall be corrected to the satisfaction of the Architect before final acceptance can be issued.

6. Three copies of operating and maintenance instruction books covering all electrical equipment and systems.

1.14 EQUIPMENT SEISMIC REQUIREMENTS

A. Equipment supports and anchorage's provided as part of the contract shall be designed, constructed and installed in accordance with the earthquake regulations of the California Building Code, Title 24, Section 1632A, and the Uniform Building Code, (UBC).

B. For equipment weighing over four hundred pounds provide equipment anchorage details, coordinated with the equipment mounting provision, prepared, signed and "stamped" with PE registration by a Civil or Structural Engineer licensed as a Professional Engineer (PE) in the State of California.

C. Mounting recommendations shall be provided by the Manufacturer based upon approved shake table tests used to verify the seismic design of that type of equipment.

D. The seismic requirements are typical for each equipment item exceeding 100 pounds.

PART 2 - PRODUCTS

2.01 CONDUIT

A. Rigid metal conduit: Steel, hot-dip galvanized, sherardized or zinc coated.

B. Intermediate Steel Conduit (IMC): Steel, hot-dip galvanized, sherardized or zinc coated. Couplings and connectors shall be threaded and rated "liquid tight".

C. Electrical metallic tubing: Steel, galvanized or sherardized. Couplings and connectors, seamless steel construction and of the set screw or watertight compression type equal to Thomas & Betts Co. #5123 or #5031 Series, complete with insulated throats.

D. Flexible Conduit: Steel, galvanized. Connector shall be equal to Thomas & Betts Co. #3312 and/or #3332 Series, complete with insulated throat.

E. Liquid-tight flexible conduit: Sealtite Type U.A. with Appleton Series "ST" connectors.

F. Rigid Non Metallic Conduit (RNMC):

1. Polyvinyl Chloride (PVC)-RNMC

a. PVC-schedule 40 heavy wall construction.
b. PVC-schedule 80 extra heavy wall construction.
c. PVC-type EB.

2. RNMC fittings connecting to metallic raceways shall be provided with a ground/bond jumper connection.

2.02 WIRE AND CABLE

A. Copper conductors: #12 AWG minimum unless specifically noted otherwise on the Drawings. Conductors #10 AWG and smaller shall be solid and #8 AWG and larger shall be stranded. Type of wire as noted on Drawings or as follows:

1. Type THWN/THHN insulation used for all conductors unless otherwise noted.

2. Type THHN insulation used for circuit conductors installed in fluorescent lighting fixture raceways, for conductors connected to the secondary of fluorescent or mercury vapor fixture ballast or other hot locations.

3. Type XHHW or THWN insulation shall be used where conductors are installed in conduit exposed to the weather.

4. The following color code for 120/208 volt branch circuits: Neutral - White (Tape feeder neutrals with white tape near connections); Ground - Green; Isolated Ground - Green with yellow stripe; Phase A - Black; Phase B - Red; Phase C - Blue.

5. The following color code for 277/480 volt branch circuits: Neutral - Grey - Tape feeder neutrals with Grey tape near connections); Ground - Green; Phase A - Brown; Phase B - Orange; Phase C - Yellow.

6. When individual neutral conductors are required for each branch circuit, the color code for the neutral conductors shall be as follows: Phase A - White with Black stripe; Phase B - White with Red Stripe; Phase C - White with Blue stripe. All common neutral conductors, when required, shall be White without any stripes.

7. Feeders identified as to phase or leg in each panelboard with printed identifying tape.

8. Color coding for mechanical and plumbing control wiring shall be an agreed upon color code between the Mechanical/Plumbing Contractor and the Electrical Contractor.

2.03 MC CABLE

A. General

1. Metal clad electrical cable type "MC", UL listed and labeled; low smoke per IEEE-FT4 1212 procedure and UL-1685 and 1569. Fire stop penetration rated. Rated for installation in environmental air plenums.

2. The cable assembly shall be rated for continuous full load operation in ambient temperatures as follows:

a. Dry locations 90 degrees centigrade.
b. Wet locations 75 degrees centigrade.

3. The type of MC cable, MC fittings and supports shall be suitable for the conditions of use and the conditions of location of installation, based on the Manufacturer's recommendations and based on applicable Codes.

2.04 OUTLET BOXES

A. Outlet boxes and covers to be pressed steel, knockout type or cast iron with drilled, tapped and plugged holes, hot-dipped galvanized or sherardized. Boxes of proper Code size for the number of wires or conduits passing through or terminating therein, but in no case shall box be less than 4" square, unless specifically noted as smaller on the Drawings or boxes at end of a run and containing a single device may be of the "Handy Box" type. Covers for flush outlets finish flush with plaster or other finished surface.

B. All boxes for data, telephone and combination outlets shall be 4-11/16" square by 2-1/2" deep minimum, with extension ring as required to accommodate the outlet assembly to be installed.

2.05 SWITCHES

A. Switches shall be totally enclosed, Specification grade, toggle switch type, color white with 277 volt A.C. rating for full capacity of contacts with incandescent or fluorescent lamp loads. Switch ratings shall be 20 amp only. Hubbell #CS1221 or equal by P&S or Leviton. Color as selected by Architect.

B. Where switches are mounted in multiple gang assembly and are operating at 277 volts and/or 277 volts and 120 volts mounted in same outlet boxes, there shall be a barrier installed between each switch.

C. Color of switches shall be as selected by Architect.

2.06 RECEPTACLES

A. All receptacles in flush type outlet boxes shall be installed with a bonding jumper for ground between the grounded outlet box and the receptacle ground terminal. Grounding through the receptacle mounting straps is not acceptable. The bonding jumper shall be sized in accordance with the branch circuit protective device as tabulated herein under "grounding". Bonding jumper shall be attached at each outlet to the back of the box using drilled and tapped holes and washer head screws 6-32 or larger. For receptacles in surface mounted outlet boxes direct metal-to-metal contact between receptacle mounting strap (if it is connect to the ground contacts) and outlet boxes may be used.

B. Duplex convenience receptacles shall be specification grade, color white, 120 volt, 15 ampere, NEMA 5-15R grounding type with grounding contact which is internally connected to the frame. Outlet shall accommodate standard parallel blade cap and shall be back and side wired. Hubbell #CR5252 or equal by P&S or Leviton.

C. Where duplex receptacle is supplied by separate 20-ampere, circuit, receptacle shall be NEMA 5 -2OR. Hubbell #CR5352 or equal by P&S or Leviton.

D. Ground fault type duplex receptacle shall be 15 ampere outlet with 20 ampere feed through, NEMA 5-15R. Hubbell #GFR5252 or equal by P&S or Leviton.

E. Isolated Ground receptacles shall be identified with an orange triangle on an orange receptacle body. Hubbell #CR5252IG or equal by P&S or Leviton.

F. Weatherproof Receptacle: Ground fault type duplex receptacle. On exposed conduit runs, weatherproof ground fault type receptacles as hereinbefore specified, installed in "FS" condulet. Covers shall be one of the following door type covers: Hubbell #WP26M or equal by P&S.

G. Special outlets as indicated on Drawings.

H. Color of receptacles shall be as selected by Architect.

2.07 PLATES

A. Provide plates for every switch, receptacle, telephone outlet, data outlet. All plates shall be thermoplastic or nylon on all outlets, unless specifically noted otherwise. Color as selected by Architect.

2.08 LIGHTING FIXTURES

A. Lighting fixtures shall have all parts and fittings necessary to complete and properly install the fixture. All fixtures shall be wired from outlet to socket with #14 AWG Underwriters' Type "AF" or "CF" fixture wire. All fixtures shall be equipped with lamps of size and type specified.

B. Lighting fixtures recessed in ceiling or wall which have a fire resistive rating of 1 hour or more shall be fully enclosed in a box which has a fire rating equal to that of the ceiling or wall. The space from the fixture to the enclosure to be a minimum of 3 inches.

C. It is the Contractor's responsibility to verify actual ceiling construction type as defined on the Architectural Drawings and furnish all lighting fixture with the correct mounting devices and proper operating voltage whether or not such variations are indicated by fixture catalog number. The Contractor shall verify depth of all recessed lighting fixture with Architectural Drawings prior to ordering fixtures. Any discrepancies that would cause recessed fixtures not to fit into ceiling shall be reported to the Architect prior to ordering of the fixtures.

2.09 STRUCTURAL AND MISCELLANEOUS STEEL

A. Structural and miscellaneous steel used in connection with electrical work and located out-of-doors or in damp locations, to be hot-dip galvanized unless otherwise specified. Included are underground pullbox covers and similar electrical items. Galvanizing average 2.0 ounce per square foot and conform to ASTM A123.

2.10 CIRCUIT BREAKER

A. Where two or three pole breakers occur in the panels, they shall be common trip units. Single pole breakers with tie-bar between handles will not be accepted.

B. Circuit Breakers shall be arranged in the panels so that the breakers on the proper trip settings and numbers correspond to the numbering in the panel schedules on the Drawings. Circuit numbers of breakers shall be black-on-white micarta tabs or other previously approved method. Circuit number tabs which can readily be changed from front of panel will not be accepted. Circuit number tabs which can shall not be attached to or be a part of the breaker.

C. Circuit Breakers shall be bolt on type.

2.11 DISCONNECTS

A. Disconnect switches shall be 250 volt or 600 volt A.C., NEMA Type HD, quick-made, quick-break, h.p. rated, fusible or non-fusible Class "R", in NEMA Type I enclosure, lockable, with number of poles and amperage as indicated on the Drawings. Where enclosure is indicated W.P. (weatherproof) switches shall be in rain-tight NEMA Type 3R enclosure, lockable. Maximum voltage, current and horsepower rating clearly marked on the switch enclosure and switches having dual element fuses shall have rating indicated on the metal plate. Manufactured by GE, Square-D or approved equal.

2.12 SWITCHBOARDS

A. Switchboards shall be floor mounted, dead-front, dead-rear type, front and rear aligned, self-supporting, consisting of one or more vertical sections with group mounted circuit protective devices, instrumentation and control wiring as indicated on the drawings and as specified herein. Switchboards shall comply with U.L. Standard #UL-891.

B. Switchboards shall include but not be limited to the following:

1. Underground pullsection.

2. Metering facilities as required by the serving utility company

3. Main disconnect (where indicated on drawings).

4. Feeder protective devices.

5. Bussing.

C. Switchboard sections shall of the universal frame type using dieformed, 12 gauge steel members bolted and welded together. Provide removable side and rear plates with formed edges all around. Provide ventilation openings required to maintain minimum operating temperature. Provide removable steel cover plates for all usable device spaces. Provide lifting means and provisions for moving by means of rollers or skids to installation location. Bolt individual sections together to form a single rigid switchboard assembly. Provide full height, hinged, vertical wireway metal covers, on each vertical wireway, of each distribution section of the switchboard, containing group mounted feeder protective devices.

D. Horizontal and vertical busses shall be full length in each equipment section. Buses shall have a minimum withstand rating as indicated on Drawings.

E. Provide interconnected full capacity neutral bus in each section with the same ratings and construction as the phase busses.

F. Provide interconnected ground bus in each section.

G. Provide space and all hardware and mounting attachments for future devices as indicated on the Drawings.

H. Main horizontal bussing shall be full capacity in all switchboard sections.

I. Vertical buss may be tapered, to not less than one third the ampacity rating of the main horizontal buss; but in no case shall be vertical buss be of less capacity than the sum of the frame size ampacities of overcurrent devices mounted in the respective sections including any indicated spares and spaces.

J. The switchboard bussing shall be of sufficient cross-sectional area to meet UL Standard 891 on temperature rise. Bus shall be copper with silver plated bus joints or extruded aluminum with tin plated bus joints. The through bus shall have provisions for the addition of future sections. The through bus supports, connections and joints are to be bolted with grade 5 hex head bolts and Belleville washers to minimize Maintenance Requirements.

K. Performance Requirements for circuit breakers conforming to one or more of the following applications:

600 ampere or larger frame size.
Larger than 400 ampere trip.
Services entrance in main switchboard.
Noted as main circuit breakers on the drawings.

1. Circuit breaker shall employ current sensors and static electronic automatic trip system. Three phase, or single-phase operation as noted on the drawings. Current carrying components shall be completely isolated from the static trip units. The trip unit shall be independent of external power sources. Circuit breaker shall be U.L. listed for reverse connection.

2. Breaker solid state trip control functions shall provide the following field adjustable features:

a. Adjustable ampere setting to vary the continuous current carrying capacity, minimum range of 80% thru 100% of full load trip rating.
b. Adjustable long-time delay setting to vary the time the breaker will trip under sustained overload conditions. Minimum of three settings, "minimum - intermediate - maximum".
c. Adjustable short-time pickup to vary the level of high current the breaker can carry for short periods of time, minimum range of 2 times thru 8 times of ampere setting.
d. Adjustable short time delay to vary the time of the short - time pickup. Minimum of three settings "minimum - intermediate - maximum".
e. Short time "I2t" switch to allow a current -square multiplied by time ramp function in the short-time system. Two position setting "in-out".
f. Adjustable instantaneous pickup to vary the breaker ampere setting for immediate (instantaneous) interruption of severe overloads (short circuits). Adjustable minimum range of 2.0 times thru 9 times of circuit breaker ampere sensor rating. (note where the coordination study requires a higher instantaneous setting, change the specified adjustable instantaneous trip to fixed instantaneous trip at 15 times the breaker ampere sensor setting).
g. Individual fault trip indicators shall provide local indication on the breaker for overload and short circuit (and ground fault where applicable) conditions.
h. Provide one Manufacturers standard test set for solid state trip circuit breakers.

L. Performance Requirements for circuit breakers conforming to one or more of the following applications:

Smaller than 600 ampere frame size.
400 ampere and smaller trip.
225 ampere and larger frame size.
Larger than 100 ampere trip.

1. Circuit breaker shall be molded case thermal-magnetic or solid-state trip. Thermal-magnetic circuit breakers shall be furnished with field adjustable, instantaneous magnetic trip element.

2. Solid state trip breaker shall conform to the requirements described for solid state breakers larger than 400 ampere trip except, only following field adjustments are required.

a. Ampere setting adjustable minimum range of 80% thru 100% of full load trip rating.
b. Short time pickup adjustable minimum range of 2 times thru 8 times of the ampere setting.
c. Fixed or field adjustable instantaneous trip.

M. Performance Requirements for circuit breakers conforming to the following applications:

100 ampere frame size and smaller.
100 ampere and smaller trip.

1. Circuit breaker shall be molded case thermal-magnetic trip.

N. Equipment components/devices, switchboards, and/or switchgear shall be manufactured by: General Electric AV-Line, Cutler Hammer, Square D, or Siemens.

2.13 PANELBOARDS

A. Panelboards shall be flush or surface mounting as indicated with circuit breakers as shown on panel schedule, hinged lockable doors, index card holders and proper bussing.

B. Where indicated on the Drawings, panelboards shall be furnished with subfeed breakers and/ or lugs, split bussing, contactors, time switches, relays, etc., as required.

C. All panelboards shall be keyed alike.

D. All panelboards shall be finished with one coat of zinc chromate and coat of primer sealer after a thorough cleaning where exposed to public view (e.g., corridors, covered passages, offices, etc.) and gray in switchboard, janitor's heater and storage rooms. Prime coated panelboard shall be painted to match surroundings after installation. Panelboards shall be fabricated of sheet steel of the following minimum gauges; Door and trim #12; enclosure - code gauge steel.

E. Furnish all panelboards and terminal cabinets with Manufacturer flush locks and keys except where indicated otherwise herein. Fasten the trim to panelboards and terminal cabinets by means of concealed, bolted or screwed fasteners accessible only when the door is open.

F. Panelboard 120/208 volt, 3-phase, 4 wire, S/N.

Panelboard types as manufactured by:

1. Cutler-Hammer....... Type Pow-R-Line 1
2. General Electric.......Type AQ
3. Square D.................Type NQD
4. Siemens...................Type S series

G. Panelboards shown on the Drawings with relays, time clocks or other control devices shall have a separate metal barriered compartment mounted above panel with separate hinged locking door to match panelboard. Provide mounting subbase in cabinet for control devices and wiring terminal strips.

H. Panelboard shall have a circuit index card holder removable type, with clear plastic cover. Index card shall have numbers imprinted to match circuit breaker numbers.

I. Bussing shall be rectangular cross section copper, or silver or tin-plated aluminum. Bussing shall be full length of the enclosure.

PART 3 - EXECUTION

3.01 GROUNDING

A. Grounding shall be executed in accordance with all applicable Codes and Regulations and local authorities having jurisdiction.

B. Provide ground conductor in all branch circuit conduits serving receptacle loads.

C. Ground conductors for branch circuit wiring shall be attached at each outlet to the back of the box using drilled and tapped holes and washer head screws, 6-32 or larger.

D. Each panelboard, switchboard, pullbox or any other enclosure in which several ground wires are terminated shall be equipped with a ground bus secured to the interior of the enclosure. The bus shall have a separate lug for each ground conductor. No more than one conductor shall be installed per lug.

3.02 CONDUIT

A. The sizes of the conduits for the various circuits as indicated on the Drawings and as required by Code for the size and number of conductors to be pulled therein. Open ends capped with approved manufactured conduit seals as soon as installed and kept capped until ready to pull in conductors. Where running thread unions are necessary, only approved manufactured conduit unions used. No bends or offsets will be permitted unless absolutely necessary. Conduits to be concealed except as noted otherwise.

B. Rigid steel conduit or intermediate metal conduit shall be used where placed underground in concrete, in brick or masonry walls or exposed on roofs. Rigid steel conduit shall not be installed in direct contact with the earth or sand. Conduits installed in a wet, or exposed location in concrete have threads filled with red lead. For short runs of conduits installed in the ground and with Architect's approval, conduits may be "half" lapped with polyvinyl chloride tape equal to Scotch Wrap. Joints to be "double" wrapped. Tape shall be 10 mil. thick.

C. Electrical metallic tubing up to and including 4 inch may be installed as permitted by Codes reference within Specification.

D. Flexible conduit may be installed as permitted by Codes referenced within Specifications. Sealtite, flexible conduit used for final connections to motors and in wet, damp or outdoor areas where Drawings indicate the use of flexible conduit.

E. Conduits throughout the work shall be securely and rigidly supported. Supports placed not more than 10' apart and with a support provided not more than 3' from any outlet or bend.

F. RNMC Installation Locations

RNMC conduit and RNMC fittings shall be installed in the following locations containing only "non-hazardous material":

1. Underground, concealed below earth grade, unless specifically noted or specified otherwise.

2. Exposed on utility service poles, for pole risers at 9 feet or higher above finish grade, schedule 80 PVC only.

3. RNMC type "EB" conduit(s) shall be concrete encased along the entire length of the conduits for all installation locations.

G. Conduit over metal channel, lath and plaster ceilings securely tied to the furring channels with #16 gauge galvanized wire ties space not over 4' apart.

H. Conduit placed against concrete above ground fastened to the concrete with pipe straps or one-screw conduit clamps attached to the concrete by means of expansion screw anchors and screws.

I. Conduits which are installed at this time and left empty for future shall have polyvinyl rope left in place for future use.

J. Conduit stub ups shall be provided with insulated throat bushings

K. Conduit exposed shall be run at right angles or parallel to the walls or structures. All changes in direction, either horizontally or vertically shall be made with conduit outlet bodies as manufactured by Crouse Hinds or equal. Conduits run on exposed beams or trellis work shall be painted to match surrounding surfaces. Conduits run exposed on roofs shall be rigid steel or intermediate metal conduit and shall be installed on 4 x 4 redwood sleepers, maximum 5 foot on centers. Sleepers shall be set on non-hardening mastic.

L. Re-route conduit where necessary to clear structural and mechanical obstructions.

M. Provide expansion and deflection fittings, with bonding jumper at all building expansion or seismic joint crossings.

3.03 CONDUIT CONCRETE ENCASEMENT

A. Conduits which are run underground exterior to building slab shall be continuously concrete encased except, 15 and 20 ampere power branch circuit conduits underground do not require concrete encasement.

B. PVC rigid-non-metallic-type EB conduit, of any size and any location shall be continuously concrete encased the full length of the conduit installation, including under building slab.

C. Concrete for encasement of underground conduits shall be 2000 PSI 28 days cure strength with a maximum of ¾-inch gravel. Concrete encasement of conduits shall be continuous without voids. The encasement shall extend 3-inches past the edges of all conduits on all sides of the circuit. Provide a continuous yellow 12 inch wide flat plastic tracer tape, located 12 inches above the conduits in the trench. The tracer tape shall be imprinted with "Warning-Electrical Circuits" a minimum of 24 inches on center.

D. Conduits located below or adjacent to structural foundations shall be separated from the foundation by a minimum of 12 inches. Conduits located below structural foundations shall be fully and continuously concrete back-filled and encased between the bottom of the foundation to the bottom of the conduits. The concrete shall be 4000 PSI 28 day cures strength instead of 2000-PSI concrete.

E. Underground Conduits

1. Three or more underground conduits larger than 1-inch in size and occupying the same trench shall be separated and supported on factory fabricated, non-metallic, duct/conduit support spacers. The spacers shall be modular, keyed interlocking type, "built-up" to accommodate quantity, size orientation and spacing of installed conduits. The spacers shall maintain a constant distance between adjacent conduit supports and hold conduits in place during trench backfill operations. Minimum support spacer installation interval along with length of the conduits shall be as follows:

a. Concrete encased conduits, not less than 8 feet on center.
b. Non-concrete encased conduits, not less than 5 feet on center.

2. Provide trenching, excavation, shoring and Back-filling required for the proper installation of underground conduits. Tops of backfill shall match finish grade.

3. Bottoms of trenches shall be cut parallel to "finish grade" elevation. Make trenches 12 inches wider than the greatest diameter of the conduit.

4. Back-filling Trenches for Conduits without Concrete Encasement Requirements

a. Conduits which are not required by the Contract Documents to be concrete encased shall be set on a 3 inch bed of damp clean sand. Conduit trenches shall be back-filled to within 12 inches of finished grade with damp sand after installation of conduit is completed. Remainder of backfill shall be native soil.
b. Provide a continuous yellow 12 inch wide flat plastic tracer tape, located 12 inches above the conduits in the trench. The tracer tape shall be imprinted with "Warning-Electric Circuits" a minimum of 24 inches on center.

F. Back-filling Trenches for Conduits with Concrete Encasement Requirements by the Contract Documents.

1. Trenches with all conduits concrete encased shall be back-filled with clean damp sand or native soil.

G. Backfill Material

1. Sand and native soil backfill of trenches shall be machine vibrated in 6-inch lifts to provide not less than 90% compaction of backfill.

2. Concrete and slurry mix shall be machine vibrated during installation to remove "air-voids".

3. Soil shall have no stones, organic matter of aggregate greater than 3 inches.

4. The slurry mix shall consist of concrete, clean sand and clean water mixture. Maximum shrinking of slurry mix shall not exceed 5% wet to dry.

H. Do not backfill until Owner's Representative has approved installation and As-Built Drawings are up to date. Promptly install conduits after excavation has been done, so as to keep the excavations open as short a time as possible. Excess soil from trenching shall be removed from the site.

I. Install underground conduit, except under buildings, not less than 24-inches below finished grade in non-traffic areas and 30-inches below finished grade in traffic areas, including roads and parking areas. Not less than 48-inches below finished grade under public/private transit system right of way and railroad right of way. Dimensions shall be measured to the top of the conduit.

J. Conduit crossing existing underground utilities shall cross below the bottom depth of the existing utilities. If the top portion of the existing utility depth below finish grade exceeds 72 inches and the specified separation and depths are maintained when crossing over the top of the existing underground utility, the conduit may cross above the existing underground utility.

K. Provide long radius horizontal bends (minimum radius of 36 times the conduit diameter) in underground conduits where the conduit is in excess of 100 feet long.

L. Conduits installed below grade and on grade below buildings, shall not be smaller than 0.75 inches. Conduits for circuits exceeding 600 volts shall not be smaller than 5.0 inches.

M. Underground conduits entering a building shall be sloped. The conduit direction of slope shall be away from the building, and shall prevent water in the conduit from "gravity draining" towards the building. The conduit slope "high point" shall originate from the building, out to the first exterior pullbox, manhole etc. exterior conduit termination "low point". The minimum slope angle shall be a constant 8 inches (or greater) of fall for each 100 feet of conduit length.

N. Dewatering

1. Provide pumping to remove, maintain and dispose of all water entering the excavation during the time the excavation is being prepared, for the conduit laying, during the laying of the conduit, and until the backfill at the conduit zone has been completed. These provisions shall apply on a continuous basis. Water shall be disposed of in a manner to prevent damage to adjacent property. Trench water shall not be drained through the construction. Groundwater shall not be allowed to rise around the pipe until joining compound has firmly set.

2. The Owner's Representative shall be notified 48 hours prior to commencement of dewatering.

3.04 OUTLET JUNCTION BOXES

A. Flush mounted boxes shall be attached to two studs or structural members by means of metal supports.

B. Boxes located above suspended ceiling shall be attached to structural members. Where boxes are suspended, they shall be supported independently of the conduit system by means of hanger rods and/or preformed steel channels. Boxes shall be supported independent of all piping, duct work, equipment ceiling hanger wires and suspended ceiling grid systems.

C. Boxes installed in common party separation walls, in corridor walls and service walls shall be acoustically sealed on the exterior back and sides of the box, including wall openings around the box, with a 1/8" minimum thickness resilient sound absorbing sealant, as manufactured by Lowry and Assoc., Inc.

3.05 WIRE AND CABLE

A. Branch circuit and fixture joints for #10 AWG and smaller wire shall be made with UL-approved connectors listed for 600 volts, approved for use with copper and/or aluminum wire. Connector to consist of a cone-shaped, expandable coil spring insert, insulated with a nylon shall and 2 wings placed opposite each other to serve as a built-in wrench or shall be molded one-piece as manufactured by "Scotchlok".

B. Branch circuit joints #8 and larger screw pressure lugs made of high strength structural aluminum alloy and UL-approved for use with both copper and/or aluminum wire as manufactured by Thomas & Betts.

C. Splices insulated with plastic splicing tape, half-lapped and at least the thickness of the wire insulation. Tape shall be fresh and quality equal to Scotch.

D. Correspond each circuit to the branch number indicated on the panel schedule shown on the Drawings except where departures are approved by the Architect or the Owner's Inspectors.

E. All wiring, including low voltage, shall be installed in conduit, unless otherwise noted. Conduit may be omitted for low voltage interconnect wiring between ceiling mounted occupancy sensors where plenum rated wiring is installed above accessible ceilings.

F. Control wiring to conform to the wiring diagrams shown on the Mechanical Drawings and the Manufacturer's wiring diagrams. Control the equipment in the manner specified under the "Mechanical" Section of the Specifications. Control wire to be color-coded for each in making final connections. Tag all spare conductors.

G. Wiring within panel enclosures to be neatly grouped and laced with Thomas & Betts "Ty-rap" spaced 3" apart and fanned out to the terminals. Tag all spare conductors.

3.06 MC CABLE INSTALLATION

A. General

1. MC cable shall not be "spliced" or coupled directly to any other conduit type under any circumstance.

2. MC cable shall not be installed exposed. Where exposed installation occurs, provide a conduit to completely enclose and protect the MC Cable. The inside diameter of the conduit shall be sized 1.6 times the outside diameter of the MC cable. The conduit type and installation methods shall comply with the Contractor Documents.

3. MC cable shall be continuous length between end point terminations, without intermediate splices or junctions.

4. MC cable shall be supported and attached. MC cable supports and attachments shall be the same as contract document requirements for conduit, with the following exceptions:

a. Support at not more than 3ft. intervals along the entire length of the MC cable.
b. Support within 12 inches of each bend or change of direction.
c. Support within 12 inches of each termination entrance.

5. The minimum installed bending radius shall not be less than 8 times the outside diameter of cable assembly, as measured at the inside radius cable jacket surface.

6. Cable lengths of less than 6 feet shall not be permitted.

7. MC cable shall be installed and terminated to comply with Manufacturer's recommendations.

B. Permitted Applications

1. MC cable may be provided only for electric power circuits and where complying with all of the following conditions:

a. Circuits operating on line to ground 60HZ-AC circuit voltages, exceeding 100 volts and less than 500 volts.
b. The full load ampere rating and circuit conductor quantities of the proposed MC cable shall be equal to or greater than the full load ampere rating for the conduit and wire conductors shown on the Contract Drawings.
c. The electrical circuit voltage drop of the proposed MC cable shall be equal to or less than for the conduit and wire conductor sizes shown on the Contract Drawings.
d. The conductor sizes in MC cable shall not be smaller than the conductor sizes described for conduit and wire installations.
e. MC cable shall not be permitted on circuits with more than one phase conductor per phase.
f. MC cable shall not be used for homerun conduits or throughout a single circuit homerun and branch circuit.

2. MC type cable may only be installed in the following locations in areas that do not contain classified hazardous materials (MC cables without PVC jacket):

a. Concealed in hollow non-masonry metal stud frame and wood stud frame fully enclosed walls.
b. Concealed above fully enclosed ceiling spaces.

3.07 SWITCHBOARD MOUNTING

A. Install switchboards in accordance with Manufacturer's written instructions and applicable portions of NECA's "Standards of Installations" for switchboards and motor control centers.

B. Bolt switchboards to floor and wall where wall exists. Where units are free standing provide preformed steel channel or angle iron bracing to nearest wall or building structural member. Switchboard anchoring shall be designed for a 1.0 gravity lateral acceleration of the equipment. Submit structural calculations and details.

3.08 SWITCHBOARD TESTING (ADDITIONAL REQUIREMENTS)

A. Adjustable settings shall be set and tested after the equipment installation is complete, for proper operation at set pickup and/or drop-out points, by an independent test laboratory. Testing shall comply with the Equipment Manufacturer recommendations. Submit three copies of all test results to OWNER's Representative. Correct any deficiencies and retest.

3.09 PANELBOARD MOUNTING

A. Flush mounted panelboards and terminal cabinets shall be securely fastened to at least two studs or structural members. Trim shall be flush with finished surface.

B. Surface mounted panelboards and terminal cabinets shall be secured to walls by means of preformed steel channels securely fastened to at least two studs or structural members.

C. Panelboards shall be installed to insure the top circuit protective device (including top compartment control devices) are not more than 6'-6' above finish floor in front of the panel and the bottom device is a minimum of 12" above the floor. Manufacturer shall specifically indicate on Shop Drawing submittals each panel where these conditions can not be met.

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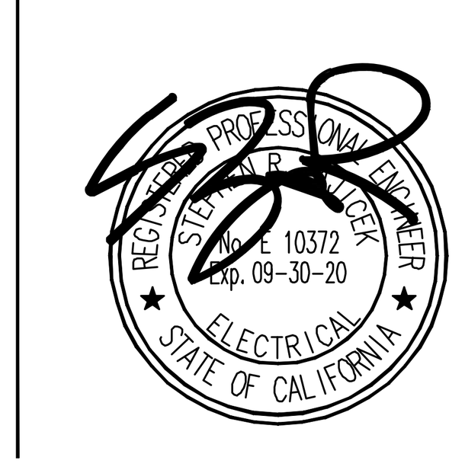

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2	04/14/20	HD RESUBMITTAL
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SPECIFICATIONS

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