ELECTRICAL NOTES

1. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS THAT A COMPLETE AND WORKABLE ELECTRICAL INSTALLATION BE PROVIDED FOR THE EQUIPMENT DESCRIBED OR SHOWN AS BEING IN THIS CONTRACT. PROVIDE LABOR AND TOOLS NECESSARY AND INSTALL APPARATUS, MATERIALS, AND EQUIPMENT IN A FASHION COMPLYING WITH ALL APPLICABLE CODES, INCLUDING ITEMS REQUIRED BUT NOT NECESSARILY SHOWN, SUCH AS LAMPS, COUPLINGS, HANGERS, BRACKETS, CLAMPS, BOXES, CONNECTORS, AND HARDWARE.

2. EXAMINE ALL CONTRACT DOCUMENTS AND VERIFY ALL DIMENSIONS AND CONDITIONS, SUCH AS CABINETS, BEAMS, FURRING, DOOR SWINGS, DUCTS, PIPES, CEILINGS AND BRING ANY DISCREPANCIES TO THE ATTENTION OF THE GENERAL CONTRACTOR PRIOR TO COMMENCING ANY WORK. SWITCHES, CONTROLS, ACCESS DOORS ON ELECTRICAL EQUIPMENT, SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING AND REPAIRING.

3. REFER TO MECHANICAL DRAWING AND OTHER MANUFACTURERS INFORMATION WIRING DIAGRAMS FOR ITEMS AND DEVICES TO BE FURNISHED, INSTALLED AND/OR CONNECTED BY ELECTRICAL CONTRACTOR FOR A COMPLETE AND OPERABLE HEATING, VENTILATING AND AIR CONDITIONING SYSTEM AND OTHER EQUIPMENT. VERIFY EXACT LOCATION OF EQUIPMENT AND CONDUIT TERMINATION AT EQUIPMENT WITH MECHANICAL, PLUMBING AND MANUFACTURES SUB–CONTRACTOR. PROVIDE CONDUITS AND JUNCTION BOXES FOR CONTROL WIRING AND THERMOSTATS AND OTHER CONTROL DEVICES. THE CONTRACTOR SHALL EXTEND WIRING FROM LOCAL DISCONNECT SWITCHES TO ALL MOTORS.

4. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND INDICATE THE LOCATION OF OUTLETS AND EQUIPMENT AND THE CIRCUIT ARRANGEMENT OF THE REQUIRED WIRING, AND THOUGH NOT NECESSARILY INDICATING THE ACTUAL ROUTES OF CONDUITS, THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS PROPER COORDINATION WITH THE WORK OF OTHER TRADES AND SPACE WILL PERMIT. SIMPLIFY INSTALLATION WHEREVER POSSIBLE BUT SUBJECT TO APPROVAL OF THE ENGINEER FOR VISUAL AND STRUCTURAL REASONS. IT IS NOT WITHIN THE SCOPE OF THE DRAWINGS TO SHOW NECESSARY OFFSETS, BENDS, PULL BOXES AND OBSTRUCTIONS. THE DRAWINGS ARE NOT INTENDED TO BE SCALED AND THE ELECTRICAL CONTRACTOR SHALL REFER TO THE ARCHITECTURAL CONSTRUCTION DRAWINGS FOR DIMENSIONS.

5. THE ELECTRICAL WORK SHALL BE INSTALLED IN STRICT COMPLIANCE WITH NEC 2005, CEC 2007, LAEC 2008, T–24 REGULATION AND ORDINANCES, AND AUTHORITIES HAVING JURISDICTION.

6. ERECT AND MAINTAIN SUITABLE BARRIERS, PROTECTIVE DEVICES, LIGHTS AND WARNING SIGNS WHERE REQUIRED FOR THE PROTECTION OF THE PUBLIC AND EMPLOYEES ABOUT THE BUILDING.

7. WHEN CONCRETE WORK IS INCLUDED IN THE SCOPE OF WORK, THE MATERIALS, PROPORTIONING, MIXING, CONVEYING, PLACING, CURING AND PROTECTION OF THE CONCRETE WORK SHALL BE IN ACCORDANCE TO "ACI" STANDARD 301.

8. UNLESS OTHERWISE SHOWN OR SPECIFIED, CONDUIT SHALL BE CONCEALED IN WALLS OR ABOVE FINISHED CEILING.

   A) CONCEALED CONDUIT SHALL BE RUN IN AS DIRECT A LINE AS POSSIBLE. BENDS SHALL BE OF LONG SWEEP TYPE.

   B) EXPOSED CONDUIT SHALL BE RUN PARALLEL TO, OR AT RIGHT ANGLES WITH THE LINES OF THE BUILDING. BEND SHALL BE FREE FROM DENTS OR FLATTENING. CONDUIT SHALL BE SUPPORTED AND SECURELY FASTENED.

   C) CONDUIT SHALL BE INSTALLED AS A COMPLETE SYSTEM BEFORE WIRE OR CONDUCTORS ARE PULLED IN.

   D) CONDUIT SHALL BE INSTALLED ENTIRELY FREE FROM OTHER PIPING, VALVES OR OTHER MECHANICAL EQUIPMENT, AND SHALL NOT BE INSTALLED WITHIN 6 INCHES OF HOT WATER OR STEAM PIPING OR HEATING FLUES.

   E) POCKETS OR TRAPS IN ALL CONDUIT RUNS WHERE MOISTURE MAY COLLECT SHALL BE AVOIDED. WHERE DIPS ARE UNAVOIDABLE, A PULL BOX SHALL BE LOCATED AT EACH LOW POINT IN ORDER TO PROVIDE A MEANS OF DRAINAGE.

   F) THE CONDUIT SYSTEM AND CONDUCTING WIRE ENCLOSURES SHALL BE SECURELY BONDED TOGETHER SO THAT FOR EVERY CONDUCTING COMPONENT IS PROVIDED WITH A LOW RESISTANCE PATH TO GROUND.

   G) DOUBLE LOCKNUTS SHALL BE USED FOR SECURING CONDUIT AT A BOX OR CABINET UNLESS A THREADED HUB IS PROVIDED AS PART OF THE BOX OR CABINET.

   H) RUNNING THREADS SHALL NOT BE USED ON CONDUIT FOR CONNECTION AT COUPLINGS. WHERE 2 LENGTHS OF CONDUIT MUST BE COUPLED TOGETHER, AND IT IS IMPOSSIBLE TO SCREW BOTH LENGTHS INTO AN ORDINARY COUPLING, THEN THE "ERICKSON" TYPE OF COUPLING MUST BE USED IN ORDER TO PROVIDE A RIGID JOINT THAT WILL BE BOTH MECHANICALLY AND ELECTRICALLY EFFECTIVE.

   I) PROTECT CONDUIT FROM DAMAGE AND THE ENTRANCE OF WATER AND FOREIGN MATTER DURING THE CONSTRUCTION PERIOD. WATERTIGHT STOPPERS OR CAPS SHALL BE INSTALLED IMMEDIATELY AFTER THE CONDUIT IS INSTALLED, REMOVED ONLY WHEN WIRE IS TO BE INSTALLED.

   J) THOROUGHLY CLEAN THE INSIDE OF CONDUITS TO ASCERTAIN FOREIGN MATERIALS ARE REMOVED BEFORE PULLING WIRE OR CABLE.

   K) COUPLING AND CONNECTORS USED ON ELECTRIC METALLIC TUBING SHALL BE SET SCREW TYPE, COMPRESSION FOR 2" AND LARGER.

   L) CONDUIT SHALL BE TERMINATED WITH SUITABLE BUSHINGS OR EQUIVALENT DEVICES WHICH SHALL PROTECT THE ENCLOSED WIRES FROM ABRASION AT THE ENDS. INSULATED BUSHINGS SHALL BE USED ON CONDUIT 1–1/4" SIZE AND LARGER.

   M) CONDUIT SIZES SHALL BE MINIMUM OF 3/4" AND IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS OF THE "CEC".

   N) IN EACH CONDUIT WITHOUT CONDUCTORS, PROVIDE ONE #12 TW PULL STRING WITH A TAG IDENTIFYING LOCATION OF OPPOSITE END.

   O) PROVIDE SLEEVES, NIPPLES, AND COUPLINGS REQUIRED FOR THE INSTALLATION OF CONDUIT. SLEEVES SHALL PROJECT 2" ABOVE FLOOR.

   P) FLEXIBLE CONDUIT SHALL BE PROVIDED TO CONNECT MOTORS ON SLIDING BASES, TO CONTROLS, AND TO VIBRATING EQUIPMENT.

9. PROVIDE HANGERS SUPPORT AND FASTENERS AS REQUIRED.

   A) INSTALLATION OF HANGERS AND SUPPORTS SHALL BE MADE TO THE STRUCTURAL STEEL, MASONRY AND POURED CONCRETE. HANGERS AND SUPPORTS SHALL NOT BE INSTALLED TO PRE–CAST CONCRETE, METAL DECKS, STEEL BRACING OR BRIDGING, PIPING OR OTHER CONDUIT.

   B) FASTENERS FOR SUPPORTS AND HANGERS SHALL BE MADE WITH BEAM CLAMPS, U–BOLTS, STUD WELDING OR OTHER APPROVED DEVICES. FASTENERS FOR SUPPORTS AND HANGERS TO CONCRETE SHALL BE MADE WITH ONE PIECE MALLEABLE IRON OR WROUGHT STEEL INSERTS WITH LONG RADIUS NECKS AND KEYHOLE SLOTS FOR ATTACHMENT IN FORMS, WITH SELF DRILLING TYPE EXPANSION SHIELDS WITH INSIDE THREADS AND EXPANSION PLUGS, OR WITH OTHER APPROVED TYPE DEVICES.

   C) INSTALLATION SHALL BE SUCH SO AS TO SUPPORT CONDUIT WITHOUT SAGGING AND SHALL BE CLEAR OF THE WORK OF OTHER TRADES. PROVISION FOR EXPANSION AND CONTRACTION SHALL BE MADE.

   D) SPACING OF SUPPORTS FOR EXPOSED HORIZONTAL CONDUIT RUNS SHALL BE AS FOLLOWS.

SIZE OF CONDUIT (INCHES)	NUMBER OF CONDUITS IN RUN	LOCATION	MAXIMUM SUPPORT SPACING (FEET)
3/4	1 OR 2	ON A FLAT CEILING/WALL	5
3/4	1 OR 2	WHERE IT IS DIFFICULT TO PROVIDE SUPPORTS EXCEPT AT INTERVALS FIXED BY BUILDING CONSTRUCTION	7
3/4	3 OR MORE	ANY LOCATION	7
1 & LARGER	1 OR 2	ON A FLAT CEILING/WALL	6
1 & LARGER	1 OR 2	WHERE IT IS DIFFICULT TO PROVIDE SUPPORTS EXCEPT AT INTERVALS FIXED BY BUILDING CONSTRUCTION	10
1 & LARGER	3 OR MORE	ANY LOCATION	10

   E) SPACING OF SUPPORTS FOR EXPOSED VERTICAL CONDUIT RUNS SHALL BE AS FOLLOWS.

SIZE OF CONDUIT (INCHES)	MAXIMUM SUPPORT SPACING (FEET)
3/4	7
1 AND 1–1/4	8
1–1/2 AND LARGER	10

   F) ELECTRICAL ENCLOSURES SHALL BE FURRED FROM OUTSIDE WALLS OF WET AREAS.

10. EXACT LOCATION OF EQUIPMENT AND OUTLETS SHALL BE VERIFIED IN FIELD. COORDINATE INSTALLATION OF ELECTRICAL SYSTEM WITH THAT OF ALL OTHER TRADES. PRIOR TO COMPLETION OF AFFECTED WORK, ELECTRICAL CONTRACTOR SHALL INSTRUCT THE OWNER ON THE USE AND MAINTENANCE OF THE ELECTRICAL SYSTEM. CONTRACTOR SHALL INCLUDE ALL THE ELECTRICAL EQUIPMENT, LIGHT LUMINAIRES TO BE RELOCATED WITHIN 20 FEET RADIUS BOTH HORIZONTAL AND VERTICAL FROM WHERE THE DEVICES ARE SHOWN ON THE DRAWINGS.

11. PROVIDE A CODE APPROVED DISCONNECT SWITCH OR BREAKER WITHIN SIGHT OF EVERY MOTOR. FOR MOTORS NOT EQUIPPED WITH "BUILT IN" PROTECTION, PROVIDE MAGNETIC OR MANUAL MOTOR STARTER WITH OVERLOAD HEATERS, SIZED TO COMPLY WITH MOTOR MANUFACTURERS RECOMMENDATIONS AND APPLICABLE CODES. VERIFY FUSE SIZE WITH MANUFACTURER RECOMMENDATIONS.

12. SIZE OUTLET BOXES IN CONFORMITY WITH CODE FOR NUMBER AND GAUGE OF CONDUCTORS THEREIN. EXCEPT WHERE NOTED TO BE LARGER, MINIMUM BOX SIZE SHALL BE 4" SQUARE BY 1–1/4" DEEP. JUNCTION BOXES SHALL BE LABELED WITH RESPECTIVE CIRCUIT NUMBERS.

13. OUTLET BOXES SHALL BE FLUSH WITH THE FINISHED SURFACE OF WALLS AND CEILINGS OF COMBUSTIBLE MATERIALS.

14. OPENINGS IN BOXES, CONDUIT BODIES AND FITTINGS SHALL BE ADEQUATELY CLOSED.

15. SURFACE MOUNTED BOXES AND CABINETS MOUNTED IN WET AND DAMP LOCATIONS SHALL BE WEATHERPROOF AND SHALL HAVE AT LEAST 1/4 INCH AIR SPACE BETWEEN THE BOX AND MOUNTING SURFACE.

16. ENTRANCE TO ROOMS AND OTHER GUARDED LOCATIONS THAT CONTAIN LIVE PARTS SHALL BE MARKED WITH A CONSPICUOUS WARNING SIGN FORBIDDING UNQUALIFIED PERSONS TO ENTER.

17. CUT FLOORS, CEILINGS AND WALLS AS REQUIRED FOR INSTALLATION OF ELECTRICAL WORK. APPROVED PENETRATION THROUGH CONCRETE WALLS OR CEILINGS SHALL BE PROVIDED BY MEANS OF SLEEVES OR CORE DRILLING, CONTRACTOR SHALL COORDINATE WITH OTHER TRADES, INCLUDING THE STRUCTURAL ENGINEER, REGARDING CONDUITS PENETRATING STRUCTURAL SLAB AND WALL, WORK SHALL BE PATCHED AND REPAIRED AS DIRECTED BY OWNER.

18. BEFORE ORDERING THE LIGHTING FIXTURES, VERIFY WITH THE ARCHITECT, OR AT THE JOB SITE, THE EXACT CEILING BEING FURNISHED, AND PROVIDE THE NECESSARY HARDWARE FOR A COMPLETE INSTALLATION.

19. INSTALL LIGHTING FIXTURES SO AS TO CLEAR PIPING, DUCTS, AIR DIFFUSERS, GRILLES, ACCESS PANELS & OTHER DEVICES, PROVIDE HANGERS TO SUPPORT FIXTURES WITHOUT CAUSING SAGGING OR DISTORTION TO THE FIXTURES, INSTALL FIXTURES SYMMETRICAL TO CEILING TILES AND OR DIMENSIONS SHOWN, PROVIDE FIRE RATED ENCLOSURE OVER LIGHT FIXTURES RECESSED IN FIRE RATED WALLS OR CEILINGS. REPLACE ALL DAMAGED OR DEFECTIVE FIXTURES INCLUDING GLASSWARE, PLASTICS OR DIFFUSERS UP TO THE TIME OF FINAL INSPECTION AND ACCEPTANCE BY THE OWNER.

20. USE THHN/THWN COPPER WIRES FOR ALL BRANCH CIRCUIT WIRING WITH A SEPARATE GREEN GROUNDING CONDUCTOR. SIZE PER CEC 250–122.

21. TELEPHONE WIRE AND CABLE INSTALLATION, SPLICING, TERMINATING, AND EQUIPMENT SHALL BE IN CONFORMITY WITH THE REQUIREMENTS AND SUBJECT TO APPROVAL OF THE DISTRICT'S COMMUNICATION PERSONAL.

   A) SIZE TELEPHONE CABINETS TO HOUSE CABLING, SPLICING, AND WIRING.

   B) PROVIDE TELEPHONE CONDUIT SYSTEM SEPARATE AND INDEPENDENT FROM OTHER SYSTEMS.

22. THE NON–CURRENT CARRYING METALLIC PARTS OF ALL ELECTRICAL EQUIPMENT AND ENCLOSURES, INCLUDING CONDUITS, SUPPORTS, CABINETS, MOTOR FRAMES, SWITCHBOARD ENCLOSURES, CONTROL PANELS AND ASSOCIATED EQUIPMENT, WHICH ARE INSTALLED OR CONNECTED UNDER THIS CONTRACT, SHALL BE PROPERLY GROUNDED BY CONNECTION TO THE GROUNDING SYSTEM, REGARDLESS OF WHETHER OR NOT THESE CONNECTIONS ARE SHOWN ON THE DRAWINGS.

   A) THE GROUNDING INSTALLATION SHALL HAVE PROVISIONS FOR BOTH SYSTEM AND EQUIPMENT GROUNDS AS DEFINED BY THE "CEC" THESE GROUNDING SYSTEMS ARE TO BE EFFECTIVELY INSULATED FROM EACH OTHER EXCEPT AT THE SERVICE CONNECTION.

   B) GROUNDING SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF "CEC" AND THE "NEC". LOCAL REQUIREMENTS OF THE INSPECTION AUTHORITY HAVING JURISDICTION SHALL GOVERN IN ALL MATTERS OF INTERPRETATION.

   C) IF WATER SERVICE IS USED FOR GROUNDING POINT, IT SHALL BE ASCERTAINED THAT THE WATER PIPING IS ELECTRICALLY CONTINUOUS AT JOINTS WITHIN 5FT OF BUILDING AND IS OF CONDUCTING MATERIAL. WATER PIPING WITH SWEATED JOINTS IN ELECTRICAL PATH SHALL HAVE SUCH JOINTS BONDED.

   D) WHERE GROUND CABLES ENTER AND LEAVE FERROUS CONDUITS, THEY SHALL BE MECHANICALLY CONNECTED TO THE END OF THE RACEWAY. WHERE GROUND CABLE PASSES THROUGH FERROUS FLOORING OR FRAMING, CONNECTION SHALL BE MADE TO SUCH METAL.

23. THE CONTRACTOR SHALL KEEP ALL PARTS OF THE BUILDING AND SITE FREE FROM ANY ACCUMULATIONS OF RUBBISH OR WASTE MATERIALS CAUSED BY HIS WORKMEN, AND SHALL REMOVE SUCH ACCUMULATIONS FROM THE BUILDING, SITE AND PROPERTY. JOB SITE SHALL BE CLEANED AT THE END OF EACH WORKING DAY.

24. THOROUGHLY CLEAN ALL PARTS OF THE EQUIPMENT AND MATERIAL INSTALLED UNDER THIS SECTION. SURFACES OF EXPOSED CONDUIT SHALL BE CLEANED OF CEMENT, PLASTER, DIRT, RUST, GREASE, AND OTHER FOREIGN MATTER, AND BE LEFT IN CONDITION SUITABLE TO THE CONTRACTOR AND ACCEPTABLE FOR PAINTING.

   A) EQUIPMENT FURNISHED WITHOUT SHOP APPLIED FINISH SHALL BE FIELD PAINTED.

   B) CONCEALED SURFACES OF METAL RACKS, FRAMES, AND BOXES SHALL BE PAINTED BEFORE MOUNTING.

   C) AFTER TESTS HAVE BEEN COMPLETED, CLEAN ALL LIGHTING FIXTURES AND EQUIPMENT WITH SOAP AND WATER, LEAVING EVERYTHING IN WORKING ORDER AT THE COMPLETION OF THE ELECTRICAL WORK.

NOTE: IF CONFLICTS OCCUR BETWEEN DRAWING SPECIFICATION AND BOOK SPECIFICATION, THE MORE STRINGENT OF THE TWO SHALL BE USED.

25. WIRING AND CONNECTIONS SHALL BE TESTED FOR CONTINUITY, GROUNDS, SHORT CIRCUITS, AND OTHER DEFECTS BEFORE ANY EQUIPMENT OR FIXTURES ARE CONNECTED THERETO. CABLES SHALL BE CHECKED FOR CONTINUITY, SHORTS, INSULATION RESISTANCE, AND PROPER PHASING. CONTRACTOR SHALL TERMINATE ALL CABLES & WIRES WITH TERMINAL LUGS (SUPPLIED BY CONTRACTOR).

26. INSULATION SHALL BE TESTED BEFORE AND AFTER INSTALLATION, AND BEFORE ENERGIZING.

   A) RUBBER INSULATION SHALL BE TESTED FOR ACCEPTANCE BY APPLYING DIRECT CURRENT POTENTIAL NOT OVER 3 TIMES THE RATIO OF DIRECT CURRENT TO 60% OF EQUIVALENT "RMS" ALTERNATING CURRENT FACTORY TEST VOLTAGE FOR 5 MINUTES.

   B) VARNISHED CAMBRIC, PAPER, AND OTHER INSULATION SHALL BE TESTED IN THE MANNER DIRECTED BY AND UP TO THE LIMITS RECOMMENDED BY THE MANUFACTURER.

   C) INSULATION RESISTANCE SHALL BE TESTED BY MEGGER OF NOT LESS THAN 600 VOLTS OUTPUT FOR CIRCUITS 480 VOLTS AND LESS. ANY CIRCUIT SHOWING AN INSULATION RESISTANCE OF LESS THAN 1 MOHM SHALL BE INVESTIGATED AND THE WEEK POINT CORRECTED. CORRECT OR REPLACE ANY CIRCUIT DEFECTIVE OR GROUNDED AND MAKE WIRE–BY–WIRE TEST.

27. THE ENTIRE SYSTEM SHALL BE PLACED IN PROPER OPERATING CONDITION.

   A) OVERLOAD DEVICES SHALL BE ADJUSTED AND SET TO SUIT THE LOADS WHICH THEY CONTROL.

   B) LOADS ON ALL PARTS OF SYSTEMS SHALL BE BALANCED, INSOFAR AS IS PRACTICAL.

   C) ALL CHANGES SHALL BE MADE THAT ARE NECESSARY FOR ADJUSTING, SETTING AND BALANCING.

   D) PHASE ROTATION AT ALL BUSES, PANELS, SWITCHBOARD ETC., SHALL BE CHECKED TO SEE IF IT CONFORMS WITH RECOGNIZED STANDARDS.

   E) GROUND TESTS SHALL BE MADE WITH THE 3 ELECTRODE "AC" OR "DC" VOLTAGE DROP METHOD TO ESTABLISH INITIAL READINGS FOR RECORDS, AND TO ASCERTAIN THAT THEY MEET DESIGN AND CODE REQUIREMENTS.

   F) CONTROL CIRCUITS SHALL BE CHECKED OUT FOR PROPER FUNCTIONING AND FAIL–SAFE QUALITIES.

   G) RECEPTACLES SHALL BE CHECKED OUT FOR CORRECT AND CONSTANT PHASE POSITION, AND GROUNDED RECEPTACLES SHALL BE TESTED FOR LOCATION AND EFFECTIVENESS OF GROUNDED PIN.

   H) LIGHTING SWITCHING SHALL BE TESTED FOR CORRECT OPERATIONS ESPECIALLY WHERE 3 AND 4 WAY OPERATION IS DESIGNATED.

   I) CONTROL DEVICES SUCH AS LIMIT SWITCHES, LEVEL CONTROLS, PRESSURE CONTROLS, THERMOSTATS, SHALL BE SET FOR OPERATING CONDITIONS. COORDINATE WITH MECHANICAL CONTRACTOR.

   J) RUNNING LOADS OF MOTORS SHALL BE CHECKED AGAINST NAMEPLATE DATA. OVERLOADS SHALL BE REPORTED.

28. NO PIPING DUCT OR EQUIPMENT FOREIGN TO ELECTRICAL SHALL BE PERMITTED TO BE LOCATED WITH THE DEDICATED SPACE ABOVE THE ELECTRICAL EQUIPMENT.

29. ALL NEW ELECTRICAL EQUIPMENT SHALL BE LISTED BY A CITY OF LOS ANGELES RECOGNIZED ELECTRICAL TESTING LABORATORY OR APPROVED BY THE DEPARTMENT.

FIRE ALARM

1. INSTALLATION OF THIS SYSTEM SHALL COMPLY WITH ALL APPLICABLE GOVERNING THIS TYPE OF SYSTEM AS ENFORCED BY THE LOCAL "AUTHORITY HAVING JURISDICTION". SYSTEM SHALL ABIDE BY ALL REQUIREMENTS IMPOSED BY LOCAL JURISDICTION HAVING AUTHORITY.

2. ALL MATERIALS AND METHODS USED IN THIS INSTALLATION SHALL CONFORM WITH THE APPLICABLE SECTIONS.

3. OF CALIFORNIA BUILDING, FIRE AND ELECTRICAL CODE. ARTICLE 760.

4. PRIOR TO REQUEST FOR FINAL APPROVAL/ACCEPTANCE, PROVIDE STATEMENT OF COMPLIANCE AS NOTED IN CFC 901.2.1 & NFPA 72 CHAP. 4. THEN, A TEST SHALL BE CONDUCTED IN THE PRESENCE OF THE ENFORCING AGENCY AND SHALL BE PASSED TO THEIR SATISFACTION.

5. INSTALLER SHALL PROVIDE OWNER "RECORD DRAWING" (AS–BUILTS) PER CFC 901.6.2; NFPA 72 CHAP. 4.9.10 UPON COMPLETION AND PRIOR TO ACCEPTANCE.

6. ALL DEVICES AND WIRING IN THIS SYSTEM ARE REQUIRED TO BE SUPERVISED FOR FAULT AND FAILURE. INSTALLER IS TO BE THOROUGHLY COMPETENT IN THE METHOD OF WIRING FOR SUPERVISION AS COVERED BY N.F.P.A ARTICLE 72. AS WELL AS CALIFORNIA ELECTRICAL CODE. ARTICLE 760. ALL WIRING MUST BE TESTED PRIOR TO CONNECTION TO CONTROL EQUIPMENT. TEST FOR: GROUND FAULT, OPEN CIRCUIT AND SHORT CIRCUIT.

7. ANY PENETRATION TO FIRE RATED ASSEMBLY BY WIRING FOR THIS SYSTEM, IT IS TO BE FIRE STOPPED USING U.L. APPROVED METHOD. IF WIRING IS TO PENETRATE RATED PARTITIONS AND DETAILS OF THROUGH PENETRATIONS IS NOT INCLUDED WITHIN THIS SET, CONTACT ENGINEERING DEPARTMENT FOR APPLICABLE INFORMATION.

8. DO NOT RUN WIRING EXPOSED SO AS TO BE DAMAGED BY OCCUPANTS. USE METALLIC RACEWAY WHEN INSTALLING BELOW 8'–0". WHEN USING METALLIC RACEWAYS FOR WIRING, ENSURE THAT THE WIRE FILL DOES NOT EXCEED THE LISTED CAPACITY AS LISTED IN C.E.C. CONDUIT NOT APPROVED AS PATH TO GROUND. USE #12 GA. TO WATER PIPE OR OTHER RECOGNIZED METHOD.

9. WHERE PERMITTED, "OPEN WIRE" MAY BE EMPLOYED. ENSURE THAT THE JACKETED CABLE IS LISTED FOR THE INTENDED APPLICATION. WHEN SUSPENDING JACKETED CABLE, USE CABLE FASTENERS AND SUSPENSION SYSTEMS AS REQUIRED BY CODE.

10. DEVICES USED IN THIS SYSTEM MAY HAVE STRICT REQUIREMENTS THAT GOVERN THEIR MOUNTING HEIGHTS AND LOCATION. INSTALLER IS TO BE THOROUGHLY COMPETENT IN THE INSTALLATION OF THE DEVICES THAT ARE COVERED BY THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AS THEY PERTAIN TO THE SYSTEM DESCRIBED ON THESE DRAWINGS.

11. NOTIFICATION APPLIANCES SHALL PROVIDE MINIMUM AUDIBILITY OF 15DB ABOVE AMBIENT LEVELS. CONTRACTOR TO FURNISH SOUND LEVEL METER AT THE TIME OF INSPECTION IF REQUIRED BY THE TESTING AGENCY. NOTIFICATION APPLIANCES SHALL BE SYNCHRONIZED IF MORE THAN TWO DEVICES ARE EITHER SEEN OR HEARD FROM ONE LOCATION.

12. CIRCUIT DISCONNECTION MEANS SHALL HAVE RED MARKING, SHALL BE ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL, AND SHALL BE IDENTIFIED AS "FIRE ALARM CIRCUIT." THE LOCATION OF THE CIRCUIT DISCONNECTING MEANS SHALL BE PERMANENTLY IDENTIFIED AT THE FIRE ALARM CONTROL UNIT (NFPA 72–2007, 4.4.1.4.2)

13. IT IS UNLAWFUL TO OCCUPY ANY PORTION OF BLDG/STRUCTURE UNTIL REQUIRED FIRE ALARM SYSTEM HAS BEEN TESTED AND APPROVED, PER CBC 901.5; 3312; CFC 901.5.1; 14

14. RECORDS OF ALL INITIAL INSPECTIONS, TESTS, MAINTENANCE REQUIRED BY REGULATION/STANDARD AND INSTALLING CONTRACTOR, TYPE OF COMPONENTS INSTALLED, MANUFACTURER OF COMPONENTS, LOCATIONS NUMBER PER FLOOR SHALL BE MAINTAINED ON PREMISES FOR A MINIMUM OF 3 YEARS. (CFC 901.6.2, NFPA 72 CHAP. 4.10)

15. REACCEPTANCE TESTING OF EXISTING SYSTEM SHALL BE PERFORMED IN ADHERANCE WITH NFPA 72 CHAPTER 10; CFC 901.4.1; 90720

16. SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION REGARDING SCOPE OF WORK.

1

ELECTRICAL LEGEND

NOT ALL SYMBOLS, ABBREV., ETC. ARE NECESSARILY USED ON THIS PROJECT

POWER DEVICES

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE – WALL MOUNTED AT 18" AFF U.O.N. 20 AMP, 120 VOLT, COVER PLATE PER ARCHITECT INSTRUCTION
	DUPLEX RECEPTACLE – CEILING MOUNTED, 20 AMP, 120 VOLT, COVER PLATE PER ARCHITECT INSTRUCTION
	DOUBLE DUPLEX RECEPTACLE – WALL MOUNTED AT 18" AFF U.O.N. 20 AMP, 120 VOLT, COVER PLATE PER ARCHITECT INSTRUCTION.
	DOUBLE DUPLEX RECEPTACLE – CEILING MOUNTED, 20 AMP, 120 VOLT, COVER PLATE PER ARCHITECT INSTRUCTION.
	SPECIAL PURPOSE RECEPTACLE –WALL MOUNTED AT 18" AFF U.O.N. NEMA CONFIGURATION AS NOTED ON DRAWINGS.
L5–15R	SPECIAL PURPOSE RECEPTACLE –CEILING MOUNTED. NEMA CONFIGURATION AS NOTED ON DRAWINGS.
AB "ON ALT."	RECEPTACLE TYPE SHOWN –WALL –ABOVE COUNTER BACKSPLASH. SEE ARCHITECTURAL DRAWINGS. SHADED RECEPTACLES NOTED "ON ALT." ABOVE ARE CONNECTED TO ALTERNATE POWER SOURCE (EMERG., STANDBY, UPS, ETC.) PER CIRCUITING INDICATED
	DUPLEX RECEPTACLE – WALL – WITH INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER
WP	RECEPT. TYPE SHOWN W/ WEATHERPROOF COVER AND INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER
+42"	RECEPT. TYPE SHOWN AT SPECIAL HEIGHT AS INDICATED ON DRAWINGS.
IG	ISOLATED GROUND RECEPTACLE RECEPTACLE SYMBOL TO MATCH DESCRIPTION ABOVE.
PDU	UNDER FLOOR POWER DISTRIBUTION UNIT. HAWORTH OR EQUAL.
	RAISED FLOOR OUTLET BOX, TYPE AS SHOWN ABOVE. OUTLET BOX TO BE COMPATIBLE WITH PDU & HAVE JUMPERED CONNECTIONS.

SWITCHING CONTROLS

SYMBOL	DESCRIPTION
S^a	SWITCH, FLUSH IN WALL, TOGGLE, SINGLE–POLE, SINGLE THROW +42"AFF U.O.N. (SUBSCRIPT DENOTES UNIT CONTROLLED)
S_2	SWITCH, FLUSH IN WALL, TOGGLE, TWO–POLE SINGLE THROW +42"AFF U.O.N.
S_3	SWITCH, FLUSH IN WALL, THREE WAY +42"AFF U.O.N. (CONNECT TO MATCHING SWITCH FOR 3–WAY USE)
S_4	SWITCH, FLUSH IN WALL, FOUR WAY +42"AFF U.O.N. (CONNECT TO MATCHING SWITCH FOR 3–4 WAY USE)
S_K	SWITCH, FLUSH IN WALL, KEY OPERATED +42"AFF U.O.N.
	FLUORESCENT DIMMER SWITCH, FLUSH IN WALL, TOGGLE +42"AFF U.O.N., SINGLE–POLE, SINGLE–THROW. SUBSCRIPT DENOTES UNIT CONTROLLED.)
S^1	LOW VOLTAGE MOMENTARY CONTACT SWITCH +42"AFF U.O.N. SUPERSCRIPT DENOTES RELAY NUMBER. SEE LIGHTING CONTROLS SCHEDULES FOR MORE DETAILS.
S_{WP}	WEATHERPROOF SWITCH
S_T	MOTOR–RATED THERMAL OVERLOAD SWITCH (POLES NOTED, HORSEPOWER RATED)
PC	PHOTOCELL
TC	TIME CLOCK
OS	WALL MOUNTED DUAL–TECHNOLOGY OCCUPANCY SENSOR WITH INTEGRAL POWER UNITS
OS	CEILING MOUNTED DUAL–TECHNOLOGY OCCUPANCY SENSOR WITH INTEGRAL POWER UNITS
LCP 2	LIGHTING CONTROL PANEL AND ASSOCIATED COMPONENTS. PROVIDE 120V OR 277V CONTROL POWER AS REQUIRED OR AS INDICATED.
TX	REMOTE MOUNTED LINE TO LOW–VOLTAGE FUSED TRANSFORMER. CONCEAL FROM VIEW.

DISTRIBUTION & EQUIPMENT

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT PANELBOARDS, SURFACE AND RECESS MOUNTED, SOLID= 120/280V, HATCHED= 277/480V, DASHED EQUIP. = FUTURE
	MOTOR CONTROL CENTER W/ CODE CLEARANCES SHOWN, DASHED EQUIP. = FUTURE
	TRANSFORMER WITH CODE CLEARANCES SHOWN
	SERVICE AND/OR DISTRIBUTION EQUIPMENT WITH CODE CLEARANCES SHOWN
	CONNECTION TO MOTOR PROVIDED BY OTHERS
VFD	CONNECTION TO DIV. 15 FURNISHED VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT DIV. 16 TO INSTALL VFD EQUIPMENT
30A	DISCONNECT SWITCH, SIZE AS NOTED OR IF NOT SHOWN SIZE PER CONNECTED MOTOR SIZE AND MOTOR DISCONNECT SCHEDULE
F 30A	FUSED DISCONNECT SWITCH, SIZE AS NOTED. SIZE FUSE PER MANUFACTURER'S RECOMMENDATIONS
C 60AT	ENCLOSED CIRCUIT BREAKER DISCONNECT SWITCH, TRIP SIZE AS NOTED.
	DISCONNECT W/ MAGNETIC MOTOR STARTER (CONTROLLER) OR CONTACTOR. SIZE PER LOAD SERVED. NEMA SIZE #1 MINIMUM.
	MAGNETIC MOTOR STARTER (CONTROLLER) OR CONTACTOR. SIZE PER LOAD SERVED. NEMA SIZE #1 MINIMUM.
	DIV. 16 CONNECTION TO EQUIPMENT PROVIDED BY OTHERS. SHADED = ON ALT. POWER SOURCE NOTED
	DIV. 16 CONNECTION TO EQUIPMENT WITH INTEGRAL DISCONNECT THAT IS PROVIDED BY OTHERS. SHADED = ON ALT. POWER SOURCE NOTED
	EQUIPMENT OR TERMINAL ENCLOSURE AS NOTED, SURFACE AND RECESS MOUNTED

FIRE ALARM

SYMBOL	DESCRIPTION
	FIRE ALARM SYSTEM TO BE DONE DESIGN–BUILD BY CONTRACTOR.

1

WIRING

SYMBOL	DESCRIPTION
	WIRING CONCEALED IN CEILING OR WALL LINE WEIGHT TOP TO BOTTOM = NEW, EXITING TO REMAIN, FUTURE. CONTRACTOR MAY RUN WIRING IN WALLS, UNDERGROUND, OR IN RAISED FLOOR MARK AS–BUIL