

# ELECTRICAL SPECIFICATIONS

## PART I - GENERAL

### A. CONDITIONS

- FURNISH AND INSTALL A COMPLETELY WIRED AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO, THE MAJOR ITEMS:
  - LIGHTING FIXTURES AS INDICATED AND SPECIFIED ON THE PLANS.
  - ELECTRICAL PANELS, SERVICE, CONDUIT, WIRING, ETC., FOR ALL OUTLETS AND EQUIPMENT.
  - TELEPHONE OUTLETS AND CONDUIT AS INDICATED.

### B. RELATED WORK BY OTHERS

- THE ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, TRENCH AND BACKFILL FOR ELECTRICAL SERVICE ENTRANCE FROM THE MAIN SERVICE TO UTILITY POINT OF ELECTRICAL SERVICE. ELECTRICAL CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE ELECTRICAL SERVICE ENTRANCE WITH SERVING UTILITY COMPANY.

### C. CODES, REGULATIONS, AND STANDARDS

- THE INSTALLATION SHALL COMPLY WITH APPLICABLE LOCAL AND STATE CODES AND ORDINANCES, WITH THE REGULATIONS AND CURRENTLY ACCEPTED EDITIONS OF THE NATIONAL ELECTRICAL CODE AND WITH THE REQUIREMENTS OF THE POWER, TELEPHONE, AND CATV COMPANIES FURNISHING SERVICES TO THIS INSTALLATION.

### D. INSPECTION OF SITE

- PRIOR TO SUBMITTING A BID FOR ELECTRICAL WORK, THE CONTRACTOR SHALL VISIT THE SITE OF THE PROPOSED CONSTRUCTION AND SHALL THOROUGHLY ACQUAINT HIMSELF WITH EXISTING UTILITIES, AND WORKING CONDITIONS TO BE ENCOUNTERED, ETC. ALLOWANCE WILL NOT BE MADE FOR NONCOMPLIANCE WITH THIS CONDITION AFTER BIDDING.
- ELECTRICAL INSTALLATION SHALL MEET THE EXISTING CONDITIONS.

### E. STORAGE AND HANDLING OF MATERIAL

- DELIVER MATERIALS AND EQUIPMENT TO THE PROJECT IN THE MANUFACTURER'S ORIGINAL, UNOPENED, LABELED CONTAINERS. PROTECT AGAINST MOISTURE, TAMPERING, OR DAMAGE FROM IMPROPER HANDLING OR STORAGE. CONTRACTOR SHALL PROTECT AND BE RESPONSIBLE FOR ANY DAMAGE TO WORK OR MATERIALS UNTIL FINAL ACCEPTANCE BY THE OWNER, AND SHALL MAKE GOOD WITHOUT COST TO THE OWNER, ANY DAMAGE OR LOSS THAT MAY OCCUR DURING THIS PERIOD.
- ARRANGE FOR TIMELY DELIVERY OF MATERIALS AND EQUIPMENT TO THE JOB SITE IN ORDER TO MINIMIZE THE LENGTH OF TIME BETWEEN DELIVERY AND INSTALLATION.

- COVER AND PROTECT ANY MATERIAL WHICH MAY BE AFFECTED BY THE WEATHER WHILE IN TRANSIT OR STORED AT THE PROJECT SITE. ANY MATERIAL FOUND DEFECTIVE OR NOT INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS MAY BE REJECTED BY THE ENGINEER.

### F. CLEANUP

- KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIALS, OR RUBBISH CAUSED BY EMPLOYEES OR WORK UNDER THIS DIVISION OF THE SPECIFICATIONS. AT THE COMPLETION OF THE WORK REMOVE ALL SURPLUS MATERIALS, TOOLS, ETC., AND LEAVE THE PREMISES BROOM-CLEAN.

### G. DRAWINGS

- THE DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND LOCATIONS OF THE ELECTRICAL WORK DATA PRESENTED ON THESE DRAWINGS ARE AS ACCURATE AS PLANNING CAN DETERMINE, BUT FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DRAWINGS AND ADJUST ALL WORK TO MEET THE REQUIREMENTS OF CONDITIONS SHOWN IN THE ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER ALL OTHER DRAWINGS. DISCREPANCIES BETWEEN DRAWINGS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, OR REGULATIONS AND CODES GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING BEFORE THE DATE OF BID OPENING. IF DISCREPANCIES ARE NOT REPORTED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR GREATER QUANTITY OR BETTER QUALITY, AND APPROPRIATE ADJUSTMENTS WILL BE MADE AFTER CONTRACT AWARD. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD MEASURE AND CONFIRM MOUNTING HEIGHTS AND LOCATION OF ELECTRICAL EQUIPMENT WITH RESPECT TO COUNTERTOPS, RADIATION, ETC. DO NOT SCALE DISTANCES OFF THE ELECTRICAL DRAWINGS, USE ACTUAL BUILDING DIMENSIONS.

### H. EXCAVATION, CUTTING, AND FITTING

- PERFORM THE EXCAVATION, CUTTING, FITTING, REPAIRING, AND FINISHING OF THE WORK NECESSARY FOR THE INSTALLATION OF THE EQUIPMENT OF THIS SECTION; HOWEVER, NO CUTTING OF THE WORK OF OTHER TRADES OR OF ANY STRUCTURAL MEMBERS SHALL BE DONE WITHOUT THE CONSENT OF THE ARCHITECT.

### I. COOPERATION WITH OTHER CONTRACTORS

- COOPERATE WITH THE OTHER TRADES SO THAT THE INSTALLATION OF THE ELECTRICAL OUTLETS AND EQUIPMENT WILL BE PROPERLY COORDINATED. CONDUIT, LIGHTING FIXTURES, AND OTHER EQUIPMENT LOCATIONS SHALL BE CHECKED WITH OTHER TRADES TO AVOID CONFLICT WITH THE PIPING, DUCTWORK, STEEL BEAMS, OR OTHER OBSTRUCTIONS.
- COORDINATE THE LOCATION OF THE TRENCHES AND CONDUITS FOR ELECTRICAL AND TELEPHONE UTILITY SERVICES WITH THE GENERAL CONTRACTOR.
- COORDINATE HVAC EQUIPMENT CONNECTION REQUIREMENTS WITH HVAC CONTRACTOR.
- CAREFULLY CHECK THE LOCATIONS OF THE OUTLET BOXES AND DETERMINE THAT THEY HAVE NOT BEEN DISTURBED DURING THE INSTALLATION OF MATERIALS OR OTHER TRADES.

## PART II - PRODUCTS AND EXECUTION

### A. MATERIALS

- ALL MATERIALS SHALL BE NEW AND OF QUALITY AS SPECIFIED ON THE PLANS OR SPECIFICATIONS AND MUST CARRY THE UNDERWRITER'S LABORATORIES APPROVAL COVERING THE PURPOSE FOR WHICH THEY ARE USED, IN ADDITION TO MEETING ALL REQUIREMENTS OF THE CURRENT APPLICABLE CODES AND REGULATIONS.

### B. CONDUIT

- ALL WIRING SHALL BE INSTALLED IN LISTED METALLIC CONDUIT EXCEPT AS PERMITTED BELOW. RIGS, WITH A 20 MIL PVC COATING WILL BE USED WHEN IN CONTACT WITH EARTH. IMC MAY BE USED IN INDOOR LOCATIONS NOT IN CONTACT WITH THE EARTH. EMT MAY BE USED IN INDOOR LOCATIONS NOT IN CONTACT WITH EARTH, NOT IN CONCRETE SLABS OR WALLS AND NOT SUBJECT TO DAMAGE. PVC MAY BE USED IN OR BELOW CONCRETE AND DIRECT BURIED IN EARTH. FLEXIBLE STEEL CONDUIT SHALL BE USED FOR INDOOR FINAL CONNECTIONS TO EQUIPMENT IN LENGTHS NOT TO EXCEED 72". LIQUID-TIGHT FLEXIBLE STEEL CONDUIT SHALL BE USED FOR OUTDOOR FINAL CONNECTIONS TO EQUIPMENT NOT TO EXCEED 30'.
- WHERE CONDUIT ENTERS OUTLET BOXES, FIXTURES OR CABINETS, FIRMLY FASTEN WITH STEEL SET SCREW, COMPRESSION CONNECTORS OR DOUBLE CONDUITS FOR GFCI. ALL CONNECTIONS SHALL HAVE BUSHINGS OR INSULATED THROAT CONNECTORS. FIRMLY FASTEN CONDUIT TO THE BUILDING CONSTRUCTION, RUN EXPOSED CONDUIT PARALLEL TO THE BUILDING LINES, SUPPORTED BY APPROPRIATE HANGERS (INSTRUT, T & B OR APPLETON OR EQUAL).
- COVER METALLIC CONDUIT IN CONTACT WITH EARTH WITH POLYETHYLENE TAPED SPIRAL, WRAPPED, 12 LAPPED TO PROVIDE 20 MIL THICKNESS. TAPE SHALL BE SCOTCH NO. 50 TAPE. CONDUIT AND DUCTS NOT UNDER BUILDINGS AND FEEDER DUCTS SHALL BE INSTALLED PER N.E.C. 300-6. MAKE JOINTS WITH COMPOUND TO BE WATER-TIGHT.
- FITTINGS AND CONDUIT BODIES SHALL BE STEEL, NO DIECAST FITTINGS.
- CONDUIT SIZES SHALL BE AS REQUIRED BY CODE AND AS INDICATED OR SPECIFIED.
- ALL EMPTY CONDUIT SYSTEMS SHALL HAVE A NYLON PULL STRING TO FACILITATE INSTALLATION OF FUTURE WIRE.
- SCHEDULE 40 PVC CONDUIT SHALL BE PERMITTED UNDERGROUND WITH PROPER FITTINGS. ALL UL APPROVED AND CEMENTED JOINTS. PENETRATIONS THROUGH FLOOR SLABS AND BENDS GREATER THAN 22" SHALL BE WRAPPED RIGID GALVANIZED STEEL ELBOWS.
- CONDUITS AND OUTLETS SHALL BE CONCEALED WITH THE BUILDING STRUCTURE, EXCEPT THAT CERTAIN MOTOR AND LIGHTING FEEDER CONDUITS MAY BE RUN EXPOSED IN CERTAIN AREAS AS INDICATED ON THE DRAWINGS. CONDUIT SHOWN TO BE INSTALLED IN CABINETS, COUNTERS, AND CASEWORK SHALL BE RUN AS DIRECTED BY THE ARCHITECT.
- ALL CONDUIT SYSTEMS SHALL HAVE A CODE SIZED COPPER GROUND CONDUCTOR INCREASE CONDUIT SIZE AS REQUIRED.
- CONDUITS SHALL BE ROUTED SURFACE ON THE STRUCTURE, PARALLEL AND PERPENDICULAR TO THE STRUCTURE.

### C. OUTLET, PULL, AND JUNCTION BOXES

- EACH SWITCH, LIGHT, RECEPTACLE OR OTHER OUTLET SHALL BE PROVIDED WITH A CODE GAUGE, GALVANIZED STEEL, OUTLET BOX, JUNCTION BOX AND PULL BOXES SHALL BE CODE GAUGE, GALVANIZED STEEL. OUTLET BOXES SHALL BE OF THE ONE PIECE, KNOCKOUT TYPE, IN GENERAL, 4" SQUARE WITH PLASTER RING. PLASTER RINGS SHALL BE SET TO PROVIDE NOT MORE THAN 1/8" FROM WALL SURFACE TO RING. IN NO CASE SHALL PLASTER RING PROJECT BEYOND SURFACE OF WALL. SINGLE GANG RINGS SIMILAR TO STEEL CITY 52050 SHALL BE USED FOR 4" BOXES UNFINISHED BRICK NUMBER 180 BOXES MAY BE USED FOR UNFINISHED MASONRY FLUSH WALL OUTLETS. CENTER ALL OUTLET BOXES IN BLOCK COURSE.
- BOXES INSTALLED IN POURED CEMENT FLOORS SHALL BE FLUSH TYPE CAST IRON OR STEEL WITH WATER-TIGHT GASKETED COVERS. WHERE BOXES ARE INSTALLED IN FLOORS WITH TILE OR CARPET FLOOR COVERING, COVERS SHALL BE OF THE RECESSED TYPE TO ACCOMMODATE THE FLOOR COVERING.

### D. WIRE

- CONDUCTOR SIZES SHOWN ON THE DRAWINGS ARE BASED ON COPPER WIRE, UNLESS OTHERWISE SPECIFIED. ALL WIRE SHALL BE TYPE XHHW FOR FEEDERS OR BRANCH CIRCUITS LARGER THAN 4 AWG. TYPE THHN/THWN INSULATION FOR FEEDERS AND BRANCH CIRCUITS 4 AWG AND SMALLER. ALL BRANCH CIRCUIT WIRING SHALL BE COPPER. SERVICE AND PANEL FEEDERS #10 AND LARGER MAY BE ALUMINUM, PROVIDED THE CONDUCTOR SIZES ARE INCREASED FOR EQUAL OR GREATER AMPACITY AND EQUAL OR LESS EQUIVALENT VOLTAGE DROP. INCREASE CONDUIT SIZE AS REQUIRED. THE WIRES SHALL BE MARKED WITH COLOR TO SIMPLIFY CIRCUIT IDENTIFICATION, UNLESS OTHERWISE REQUIRED BY LOCAL ORDINANCES. GREEN WIRES SHALL BE GREEN, NEUTRAL WIRES SHALL BE 120V-WHITE, 277V-GRAY AND LIVE WIRES 208Y/120V AND 120/240 SHALL BE BLACK (PHASE A), RED (PHASE B), AND BLUE (PHASE C). FOR 480Y/277V CIRCUITS, THE COLOR CODE SHALL BE BROWN (PHASE A), ORANGE (PHASE B), AND YELLOW (PHASE C). THE WIRE SHALL BE 12 AWG UNLESS OTHERWISE INDICATED. CIRCUIT SHALL BE LABELED IN EACH J-BOX.
- WHERE COPPER WIRE IS USED, COPPER CONDUCTOR MATERIAL SHALL COMPLY WITH N.E.C. 310-14 AND ALL CONNECTIONS AND TERMINATIONS SHALL BE MACHINE COMPRESSION TYPE EQUAL TO BURNDY "H" PLUGS OR "MACADAPT", NO EXCEPTIONS.
- NO WIRE SHALL BE INSTALLED IN THE CONDUIT SYSTEM UNTIL THE CONDUIT SYSTEM IS COMPLETE. USE MINERAL OIL #100 OR EQUIVALENT AS A LUBRICANT TO FACILITATE THE INSTALLATION OF THE CONDUITS IN THE CONDUIT SYSTEM.
- SPLICES IN EXTERIOR PULL BOXES AND MANHOLES SHALL BE WEATHER-PROOF USING "SCOTCHCAST" SPLICE KIT OR APPROVED EQUAL. SEAL ENDS OF CONDUITS AND DUCTS WITH "DUCTSEAL" OR APPROVED EQUAL.
- PROVIDE SOLID CONDUCTOR FOR 12 AWG AND SMALLER.

### H. GUARANTEE

- GUARANTEE ALL MATERIAL FURNISHED AND ALL WORKMANSHIP PERFORMED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF WORK. ANY DEFECTS DEVELOPING WITHIN THIS PERIOD, TRACIBLE TO MATERIAL FURNISHED AS A PART OF THIS SECTION OR WORKMANSHIP PERFORMED HEREUNDER, SHALL BE MADE GOOD AT NO EXPENSE TO THE OWNER.

### I. SHOP DRAWINGS AND APPROVALS

- THE ITEMS SPECIFIED HEREIN AND ON DRAWINGS ARE USED AS A STANDARD OF QUALITY. ANY MATERIALS OF EQUAL QUALITY AND AESTHETIC VALUE WILL BE GIVEN CONSIDERATION AS A SUBSTITUTE FOR THE MATERIALS SPECIFIED. NO APPROVAL WILL BE GIVEN TO A SPECIFIC CATALOG NUMBER, MODEL, OR TYPE OF EQUIPMENT, PRIOR TO BIDDING. AFTER BIDDING, THE DECISION OF THE ARCHITECT AND/OR LEGO AND ENGINEER DETERMINING EQUAL MATERIALS WILL BE FINAL.
- THE CONTRACTOR SHALL SUBMIT SEVEN (7) IDENTICAL BOUND SETS OF SHOP DRAWINGS ON THE FOLLOWING ITEMS:
  - LIGHTING FIXTURE CUTS AND PERFORMANCE DATA.
  - OUTLINE DRAWINGS AND DATA SHEETS OF EACH PANELBOARD AND SWITCHBOARD.
  - OUTLINE DRAWINGS OF ALL SWITCHGEAR.
- SUBMIT ITEMS AT ONE TIME IN A NEAT AND ORDERLY MANNER WITHIN 15 DAYS OF AWARD OF CONTRACT. PARTIAL SUBMITTALS WILL NOT BE ACCEPTABLE.

### J. RECORD AND AS-BUILT DRAWINGS

- THE ELECTRICAL CONTRACTOR SHALL MAINTAIN A SET OF DRAWINGS AT THE JOB SITE FOR THE EXCLUSIVE PURPOSE OF MAINTAINING A RECORD OF ALL WORK INSTALLED AND TO SHOW ANY DEVIATIONS FROM THE WORK INDICATED ON THE DRAWINGS.
- AT THE COMPLETION OF THE PROJECT, ONE SET OF REPRODUCIBLE DRAWINGS, SHOWING ALL AS-BUILT CONDITIONS, SHALL BE DELIVERED TO THE OWNER FOR ACCEPTANCE PRIOR TO FINAL PAYMENT.

# GENERAL ELECTRICAL NOTES

### NOTES

- ALL SYMBOLS ARE NOT NECESSARILY USED IN THIS PROJECT.
- IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY. THE ENGINEER RESERVES THE RIGHT TO ALLOW OTHER METHODS AND MATERIALS NOT REJECTED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO REQUEST THE ENGINEER WAVE THE STANDARDS TO ALLOW ALTERNATE MEANS AND METHODS PRIOR TO BEGINNING THE PROJECT. CONTRACT DOCUMENT REVISIONS TO ACCOMMODATE INSTALLED CONDITIONS, WITHOUT PRIOR APPROVAL, WILL RESULT IN ADDITIONAL DESIGN CHARGES TO THE CONTRACTOR.
- ELECTRICAL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE NECA INSTALLATION STANDARDS TO THE SATISFACTION OF THE ARCHITECT, ENGINEER AND LEGO.
- ALL WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE CURRENTLY ACCEPTED EDITION OF ALL APPLICABLE NATIONAL, STATE AND CITY CODES AND ORDINANCES.
- ALL ELECTRICAL SYSTEM COMPONENTS SHALL BE LISTED OR LABELED BY UL, OR OTHER RECOGNIZED TESTING FACILITY AS ALLOWED BY AUTHORITY HAVING JURISDICTION.
- WHERE AN APPARENT DISCREPANCY EXISTS BETWEEN THE REQUIREMENTS OF THE GENERAL NOTES AND INFORMATION PORTAYED IN THE ELECTRICAL DRAWINGS, THE CONTRACTOR SHALL INCLUDE IN HIS BID THE COST OF THE GREATER QUALITY OR QUANTITY.
- CONTRACTOR SHALL VISIT JOB SITE PRIOR TO BID AND VERIFY EXISTING CONDITIONS. CONTRACTOR SHALL INCLUDE IN BASE BID ALL COSTS REQUIRED FOR PERMITS AND INSPECTIONS.
- CONTRACTOR SHALL VERIFY, WITH OWNER'S REPRESENTATIVE PRIOR TO SUBMITTING BID, ALL ALLOWABLE WORKING HEIGHTS, EXISTING PARALLEL STORAGE REQUIREMENTS, DEMOLITION AND REMOVAL OF CONSTRUCTION DEBRIS, AS WELL AS DAILY CLEAN UP REQUIREMENTS. INCLUDE ALL COSTS IN BID FOR DUST BARRIERS, DUMPSTERS, ETC. AS REQUIRED AND FOR THE DURATION OF THE PROJECT. PERFORM ALL WORK AS DIRECTED BY OWNER'S REPRESENTATIVE AND ARCHITECT.
- ALL ELECTRICAL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION, IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE ALL NECESSARY CORRECTIONS AT NO ADDITIONAL COST TO OWNER.
- CONTRACTOR SHALL GUARANTEE ALL WORK AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE. ALL DEFECTS SHALL BE PROMPTLY CORRECTED BY CONTRACTOR WITHOUT ADDITIONAL CHARGE TO OWNER.
- PROVIDE AS-BUILT DRAWINGS TO ARCHITECT. DRAWINGS SHALL INCLUDE ACCURATE CONDUIT AND DEVICE LOCATIONS DIMENSIONED FROM PERMANENT LANDMARKS SUCH AS BUILDING WALLS.
- DO NOT SCALE ELECTRICAL DRAWINGS. VERIFY EXACT LOCATION OF ALL DEVICES, JUNCTION BOXES, LIGHTING FIXTURES, ETC. WITH ARCHITECTURAL AND INTERIOR DESIGN DRAWINGS PRIOR TO INSTALLATION. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL MECHANICAL EQUIPMENT AND OTHER EQUIPMENT REQUIRED ELECTRICAL CONNECTION PRIOR TO RUSHING. EVERY OUTLET HEIGHT SHALL BE VERIFIED ON EACH WALL WITH THE INTERIOR PLANNING AND DESIGN DRAWINGS. COORDINATE WITH CABINET SHOP DRAWINGS TO ENSURE PROPER HEIGHT AND LOCATION WITH RESPECT TO MILLWORK, EQUIPMENT, ETC.
- THESE DRAWINGS INDICATE THE FINISHED REQUIREMENTS FOR THE ELECTRICAL SYSTEMS, EQUIPMENT, LIGHTING FIXTURES, OUTLETS AND DEVICES. DUE TO STRUCTURAL CONDITIONS, MECHANICAL DUCT, PIPING CONFLICTS, OR OTHER LEGITIMATE REASONS, THE CONTRACTOR MAY DESIRE TO INSTALL THE WORK INDICATED IN A MANNER DIFFERENT FROM THAT SHOWN. SUCH CHANGES SHALL BE PRESENTED TO THE OWNER'S REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO PROCEEDING. UPON APPROVAL, THE WORK SHALL BE PERFORMED AND THE AS-BUILT DRAWINGS SHALL BE REVISED TO ACCURATELY REFLECT THE WORK AS ACTUALLY INSTALLED.
- RACEWAY SYSTEMS ARE SHOWN DIAGRAMMATICALLY. ACTUAL LOCATION AND ROUTING OF ALL, SHALL BE DETERMINED BY CONTRACTOR TO SUIT FIELD CONDITIONS.
- PROVIDE DEDICATED NEUTRAL FOR EACH NEW CIRCUIT. HOME RUN CONDUCTORS MAY BE COMBINED INTO ONE CONDUIT. NO RACEWAY OR CABLE SHALL CONTAIN MORE THAN NINE (9) CURRENT CARRYING CONDUCTORS, WHERE MULTIPLE CONDUCTORS IN EXCESS OF THREE (3) ARE INDICATED ON THESE DRAWINGS. THEY HAVE BEEN DERATED AS REQUIRED BY NEC ARTICLE 310 SURROUNDINGS.
- RACEWAYS SHALL BE INSTALLED CONCEALED (IN CMU OR OTHER WALL) WHENEVER POSSIBLE. RACEWAYS INSTALLED EXPOSED SHALL BE ROUTED OUT OF PUBLIC VIEW AS MUCH AS POSSIBLE. RACEWAYS SHALL BE RUN PARALLEL WITH, OR AT RIGHT ANGLE TO WALLS.
- PROVIDE APPROVED EXPANSION FITTINGS WHERE RACEWAYS CROSS BUILDING EXPANSION JOINTS. PROVIDE BONDING JUMBERS SIZED PER CODE WHERE REQUIRED. PROVIDE ALL FITTINGS REQUIRED FOR A COMPLETE INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR EXPANSION JOINT LOCATIONS).
- MINIMUM RACEWAY SIZE SHALL BE 12". MINIMUM HOMERUN SIZE SHALL BE 3/4". MINIMUM CONDUIT SIZE SHALL BE #12 AWG UNLESS OTHERWISE NOTED. ALL POWER RELATED CONDUITS SHALL HAVE A CODE SIZED GROUND WIRE INSTALLED IN EACH RUN.
- CONTRACTOR SHALL PROVIDE PULL CORDS IN ALL EMPTY CONDUITS WHERE MORE THAN ONE CONDUIT TERMINATES IN A JUNCTION BOX. THE CONTRACTOR SHALL IDENTIFY EACH CONDUIT AND JUNCTION BOX IN A MANNER ALLOWING IDENTIFICATION AFTER ALL WALL FINISHES HAVE BEEN APPLIED.
- CONTRACTOR SHALL PROVIDE ALL RACEWAY SYSTEMS INDICATED ON THE DRAWING PER NEC REQUIREMENTS AND GENERAL NOTES. ANY DEVIATION FROM THE WIRING METHODS INDICATED SHALL BE ALLOWED ONLY BY SPECIFIC WRITTEN APPROVAL FROM EITHER THE ARCHITECT, ENGINEER OR OWNER. CONTRACTORS BID SHALL INCLUDE ALL COSTS FOR RACEWAY SYSTEMS AS SPECIFIED UNLESS SPECIFIC WRITTEN APPROVAL FOR AN ALTERNATE WIRING METHOD IS OBTAINED FROM EITHER THE ARCHITECT, ENGINEER OR OWNER AND IS SUBMITTED AS PART OF CONTRACTORS FORMAL BID PROPOSAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECT SIZE AND INSTALLATION OF ALL OUTLET, PULL AND JUNCTION BOXES IN ACCORDANCE WITH NEC 314-16. ALL BOXES SHALL BE MINIMUM 4" SQUARE BY 1-1/2" DEEP OR AS INDICATED ON THE DRAWINGS. ALL BOXES SHALL BE RECESSED WITH COVER PLATE TO SUIT THE INTENDED APPLICATION.
- PRIOR TO INSTALLATION, CONTRACTOR SHALL REVIEW THE COMPLETE SET OF CONSTRUCTION DOCUMENTS FOR CONFLICTS WITH OTHER TRADES. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL WORK WITH OTHER TRADES TO AVOID CONFLICT DURING INSTALLATION. CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS IN EQUIPMENT LOCATION AND ROUTING AS NECESSARY AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL BE RESPONSIBLE TO PROPERLY CUT AND PATCH EXISTING CONSTRUCTION AS REQUIRED TO INSTALL NEW ELECTRICAL WORK. ALL PATCHING SHALL BE OF THE SAME MATERIALS, WORKMANSHIP AND FINISH AS THE EXISTING WORK AND SHALL ACCURATELY MATCH ALL SURROUNDING WORK TO THE SATISFACTION OF THE ARCHITECT.
- ALL ELECTRICAL EQUIPMENT SHALL HAVE SUFFICIENT GUTTER SPACE AND LUGS TO ACCOMMODATE QUANTITY AND SIZE OF CONDUCTORS REQUIRED. CONTRACTORS SHALL PROVIDE EQUIPMENT WITH OVERSIZED ENCLOSURES WHERE REQUIRED.
- ALL PENETRATIONS OF FIRE RESISTIVE FLOORS OR WALLS SHALL BE PROTECTED BY MATERIALS AND INSTALLATION DIAGRAMS THAT CONFORM TO UL LISTING FOR "THROUGH-PENETRATION FIRE STOP SYSTEMS".
- ALL UNDERGROUND SERVICE CONDUITS SHALL BE SEALED PER NEC ARTICLE 230-8.
- PROVIDE 10 AWG CONDUCTORS FOR 20 AMPERE, 120V BRANCH CIRCUITS LONGER THAN 75' AND 8 AWG CONDUCTORS FOR 20 AMPERE, 120V BRANCH CIRCUITS LONGER THAN 120'. PROVIDE 10 AWG CONDUCTORS FOR 20 AMPERE, 277V BRANCH CIRCUITS LONGER THAN 200'.

# STANDARD ABBREVIATIONS

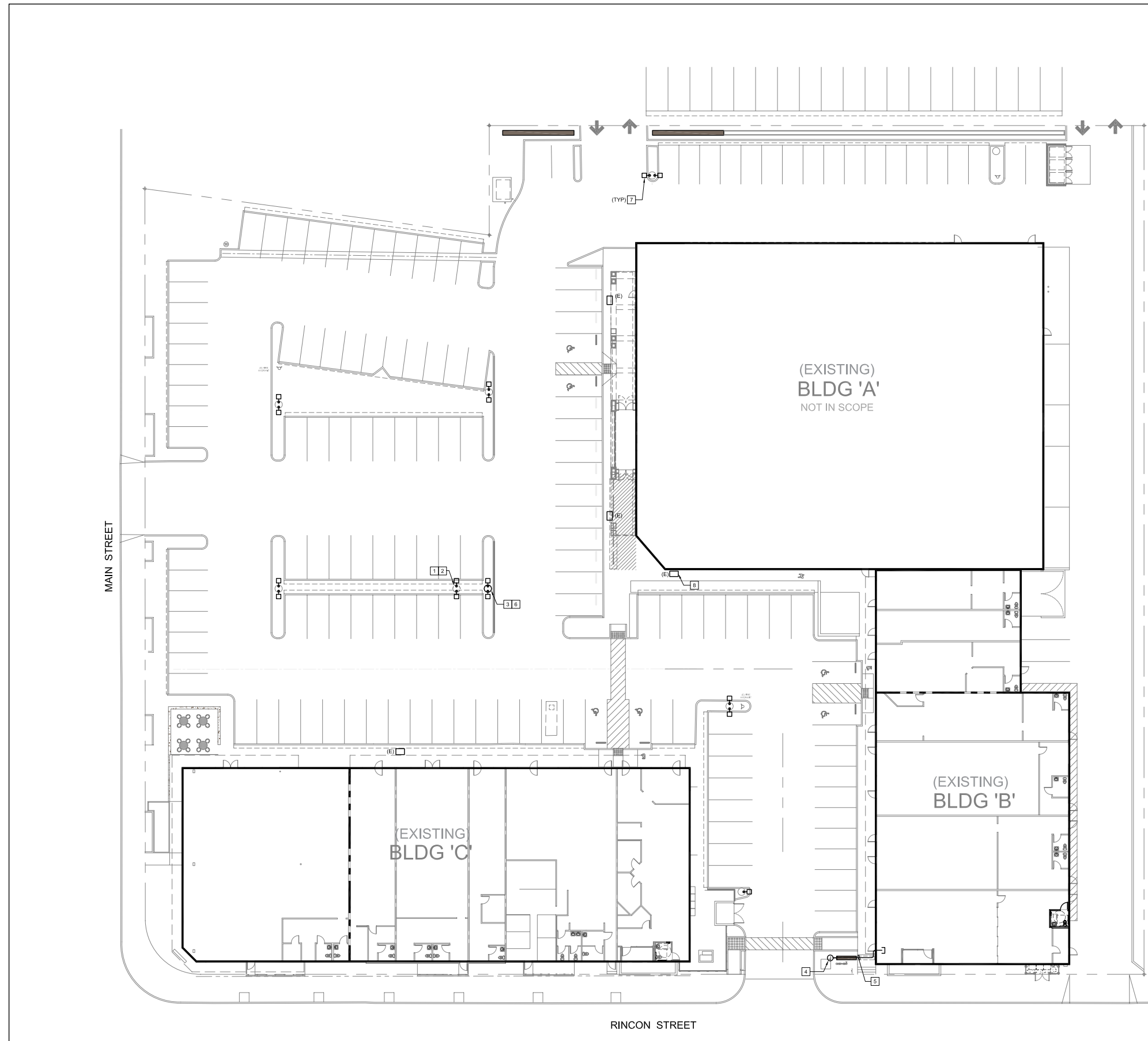
A	AMPERE
AFF	ABOVE FINISHED FLOOR
AF	ARC FAULT, AMP FUSE
AFG	ABOVE FINISHED GRADE
AD	AMPERES INTERRUPTING CAPACITY
AL	ALUMINUM
ARCH/PL	ARCHITECTURAL
AS	AMP SWITCH
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
BUILD G	BUILDING
C	CONDUIT
CABINETS	CABINETS
CAT/LOG/CATEGORY	CATALOG/CATEGORY
CB	CIRCUIT BREAKER
CBT	CIRCUIT BREAKER
CELING	CEILING
CO, EC	CONDUIT ONLY
COMM	COMMUNICATION
COU	COPPER
DEMOLITION/DEMOLISH	DEMOLITION/DEMOLISH
DISC.	DISCONNECT
DOWN	DOWN
DWG	DRAWING
EACH	EACH
ELECT.	ELECTRICAL
ELEV	ELEVATOR
EMERGENCY	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EQUIP	EQUIPMENT
EX/EXIST	EXISTING
FF	FINISHED FLOOR
FFIT	FIXTURE
FLEX	FLEXIBLE METALLIC CONDUIT (STEEL)
FLOOR	FLOOREST
FEET OR	FEET OR
GFA	GROUND FAULT ALARM
GFCI (GFI)	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HP	HORSEPOWER
HVAC	HEATING, VENTILATING & AIR CONDITIONING
IBC	INTERNATIONAL BUILDING CODE
IMC	INTERMEDIATE METAL CONDUIT (INCHES)
IN	INTERNATIONAL RESIDENTIAL CODE
ISC	SHORT CIRCUIT AMPERES
JB, J-BOX	JUNCTION BOX
KCMIL, MCM	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERE
KW	KILOWATT
LG	LIGHTING
MAX.	MAXIMUM
MECH	METALLIC CONDUIT BREAKER
MECH.	MECHANICAL
MIN	MINIMUM
MIL	MINIMUM LUGS ONLY MOUNTED
MTD	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NECA	NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NFC	NATIONAL FIRE CODE
NF	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NPCO	NEVADA POWER COMPANY
NTS	NOT TO SCALE
OCP	OVERCURRENT PROTECTION
PH	PHASE
PNL	PANEL
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
PWR	POWER
QTY	QUANTITY
RECEPT	RECEPTACLE
REQ'D	REQUIRED
RIGID	RIGID STEEL CONDUIT
SCHED	SCHEDULE
SECT	SECTION
SP	SINGLE POLE
SN	SOLID NEUTRAL
SPEC	SPECIFICATION
SW	SWITCHBOARD
SWBD	SWITCHGEAR SYSTEM
SWGR	TEMPORARY
TEMP	TEMPERATURE
TELE	TELEPHONE
TERMO	THERMOSTAT
TIB	TELEPHONE TERMINAL BACKBOARD
TTG	TELEPHONE TERMINAL CABINET
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UL	UNDERWRITERS LABORATORY
U.N.O.	UNLESS NOTED OTHERWISE
VA	VOLT OR VOLTAGE
VOL T	VOLT AMPERE
VAPOR	VAPOR DROP
WALT	WALT, WIRE
WCR	WITHSTAND CURRENT RATING
WF	UL LISTED WEATHERPROOF, NEMA 3R
XFMR	TRANSFORMER
(E)	EXISTING TO REMAIN
(R)	REMOVE

# ELECTRICAL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
<b>LIGHTING</b>		<b>SIGNAL</b>	
	LINEAR FLUORESCENT FIXTURE		THERMOSTAT OUTLET AT +54" (HVAC UNIT DESIGNATION)
	LINEAR FLUORESCENT FIXTURE		ENCLOSED CIRCUIT BREAKER
	SUSPENDED LINEAR FLUORESCENT FIXTURE		RELAY
	FLUORESCENT WALL MOUNT FIXTURE		TIME SWITCH
	LINEAR FLUORESCENT STRIP FIXTURE		CONTACTOR
	LIGHT FIXTURE - RECESSED OR SURFACE		TRANSFORMER
	FENDANT FIXTURE		AUTOMATIC TRANSFER SWITCH
	WALL MOUNTED LIGHT FIXTURE		TELEPHONE OUTLET AT +18"
	WALL SCONCE		DATA OUTLET AT +18"
	WALL WASHER		COMBINATION TELECOMPUTER OUTLET AT +18"
	LETTER REFERS TO FIXTURE TYPE		TELEPHONE OUTLET ABOVE COUNTER
	MONO-POINT LIGHT FIXTURE		TELEDATA OUTLET ABOVE COUNTER
	TRACK LIGHT FIXTURE		DATA OUTLET ABOVE COUNTER
	PARKING LOT POLE MOUNTED LIGHT FIXTURE		FLUSH FLOOR BOX WITH COMBINATION TELEDATA OUTLET
	BOLLARD LIGHT FIXTURE		TELEVISION OUTLET
	EXIT SIGN - CEILING MOUNTED		TELEVISION CAMERA (CCTV)
	EXIT SIGN - WALL MOUNTED		FIRE ALARM HORN/STROBE
	EXIT SIGN - WARROWS INDICATE DIRECTION		CARD READER
	EMERGENCY BATTERY UNIT WITH HEADS		FLOW SWITCH
	FIXTURE W/ EMERGENCY BATTERY OR GENERATOR		TAMPER SWITCH
	SINGLE POLE SWITCH, 20A, 120/277V		SMOKE DETECTOR
	TWO POLE SWITCH, 20A, 120/277V		FIRE SMOKE DAMPER
	THREE-WAY SWITCH, 20A, 120/277V		CARBON MONOXIDE DETECTOR (SPECIFIED BY MECHANICAL ENGINEER)
	FOUR-WAY SWITCH, 20A, 120/277V		
	DIMMER SWITCH, MIN. 200W, 120/277V		
	HP RATED MOTOR SWITCH WITH THERMAL OVERLOAD PROTECTION		
	LOWER CASE LETTER DENOTES FIXTURES TO BE CONTROLLED		
	KEY SWITCH, 20A, 120/277V		
	PUSH BUTTON CONTROL STATION		

## POWER

	SINGLE RECEPTACLE, NEMA 5-20R, 20A, 125V
	DUPLEX RECEPTACLE, NEMA 5-20R, 20A, 125V
	GFCI DUPLEX RECEPTACLE, NEMA 5-20R, 20A, 125V
	DOUBLE DUPLEX RECEPTACLE, NEMA 5-20R, 20A, 125V
	DUPLEX RECEPTACLE 1/2" HALF-SWITCHED
	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - VERIFY MOUNTING HEIGHT
	SPECIAL PURPOSE OUTLET (TYPE AS NOTED)
	CLOCK OUTLET NEMA 5-20R, 20A, 125V w/ RECESSED COVER PLATE AT +90°, ULN.O.
	FLOOR OUTLET w/ DEVICE AS INDICATED
	COMBINATION FLOOR OUTLET w/ DEVICES AS INDICATED
	JUNCTION BOX
	JUNCTION BOX - WALL MOUNT
	JUNCTION BOX - FLUSH FLOOR MOUNT
	MULTI-OUTLET SURFACE RACEWAY w/ NEMA

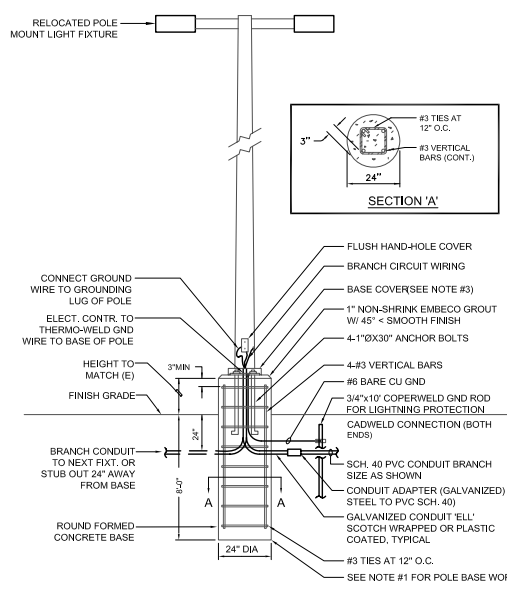


**GENERAL NOTES**

1. CONTRACTOR SHALL VISIT SITE PRIOR TO BID.
2. ALL NEW EQUIPMENT/MATERIALS SHALL BE UL LISTED.

**SINGLE LINE KEYNOTES**

- 1 REMOVE AND RELOCATE EXISTING LIGHT POLE. SEE 3 NOTE FOR NEW LOCATION.
- 2 INTERCEPT EXISTING CIRCUIT AND EXTEND UP TO RELOCATED LIGHT POLE NEW LOCATION. MATCH EXISTING CONDUCTORS IN 1" CONDUIT. SEE POLE MOUNT DETAIL ON THIS SHEET.
- 3 RELOCATED LIGHT POLE IN NEW LOCATION.
- 4 PROVIDE WEATHER PROOF JUNCTION BOX FOR FUTURE SIGNAGE.
- 5 PROVIDE 3/4" C WITH BUSHING AND PULL ROPE FOR FUTURE CONNECTION TO NEAREST EXISTING 120V PANEL.
- 6 PROVIDE NEW POLE BASE. SEE DETAIL AVE-2.00 ON THIS SHEET.
- 7 EXISTING LIGHT POLE TO REMAIN.
- 8 EXISTING WALL PACK TO REMAIN.



- NOTES:
1. BASE SHALL BE 3000 PSI CONC. STONED & SACKED EXPOSED PORTION.
  2. STANDARDS TO WITHSTAND PER TITLE 24 EXPOSURE (C) 70MPH

**IRA REALTY CAPITAL**  
1900 Main Street, Suite 375  
Irvine, California 92614

PROJECT NAME

**SHOPS at MAIN STREET - Exterior Building Improvements**

511-581 North Main Street  
Corona, California 92880

ENGINEER/ARCHITECT

**IDS GROUP**  
1 PETERS CANYON ROAD, SUITE 130  
IRVINE, CA 92606  
TEL: 949-387-8500, FAX: 949-387-0800



REV.	DESCRIPTION	DATE
	PLAN CHECK SUBMITTAL	05.31.16
	PLAN CHECK RE-SUBMITTAL	07.06.16
	PLAN CHECK RE-SUBMITTAL	08.31.16

PROJECT NO.	15X047.00
PRINT DATE	8/31/2016
DRAWN BY	
CHECKED BY	MB, HB

**DETAILS AND SECTIONS**

SHEET NUMBER

**E1.01**

PLAN CHECK RE-SUBMITTAL SET - 08/30/16

PROJECT