

ELECTRICAL ABBREVIATIONS			
ABBREVIATION/DEFINITION		ABBREVIATION/DEFINITION	
A	AMPERE, AMMETER	LV	LOW VOLTAGE
AFF	ABOVE FINISHED FLOOR	MB	MAIN BREAKER
AIC	AMPERE, AMMETER	MCC	MOTOR CONTROL CENTER
C	CONDUIT	MLO	MAIN LUGS ONLY
CU	COPPER	NIC	NOT IN CONTRACT
E	EXISTING	NTS	NOT TO SCALE
EMER	EMERGENCY	OC	OVER COUNTER
G,GND	GROUND	P	POLE, PHASE
GFI	GROUND FAULT INTERRUPTER	P,PNL	PANELBOARD
HP	HORSEPOWER	R	RELOCATE
HZ	HERTZ	TYP	TYPICAL
IG	ISOLATED GROUND	UG	UNDERGROUND
J	JUNCTION BOX	UNO	UNLESS NOTED OTHERWISE
KVA	KILOVOLT-AMPERES	V	VOLT
KW	KILOWATTS	WP	WEATHERPROOF
LC	LIGHTING CONTACTOR	XFMR	TRANSFORMER
LTG	LIGHTING		

NOTE: THESE ARE STANDARD ABBREVIATIONS, ALL ABBREVIATIONS SHOWN ABOVE MAY NOT APPEAR ON DRAWINGS.

ELECTRICAL LEGEND			
<div><div><div>A-1,3,5</div><div></div></div><div><div>A-1,3,5, ADJACENT TO ARROW INDICATED HOMERUN OF CIRCUITS 1,3,5 TO PANEL A. MARKS ACROSS RACEWAY RUNS INDICATE THE NUMBER OF #12 CONDUCTORS. UNLESS NOTED, NO MARKS INDICATE TWO #12 CONDUCTORS. NUMERAL AND LOWER CASE LETTER INDICATES CIRCUIT CONNECTION AND SWITCH LEG DESIGN RESPECTIVELY. UPPER CASE LETTER INDICATES FIXTURE TYPE.</div></div></div>			
INFORMATION NOTES: 1. ALL DIMENSIONS INDICATED IN LEGEND ARE TO BOTTOM OF OUTLET OR EQUIPMENT AND SHALL BE THE DIMENSIONS USED UNLESS SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS. 2. ALL SYMBOLS INDICATED IN THIS LEGEND MAY NOT BE USED ON THE PLANS. 3. DEVICE PLATES FOR RECEPTACLES AND SWITCHES SHALL BE SELECTED BY ARCHITECT. 4. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF LIGHTING FIXTURES. 5. MOUNTING HEIGHTS FOR LIGHT SWITCHES, RECEPTACLES, FIRE ALARM BREAK-GLASS STATIONS, ETC., AND AUDIO-VISUAL ALARM DEVICES COMPLY WITH A.D.A. DO NOT VARY THESE DIMENSIONS.			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
S	SINGLE POLE TOGGLE SWITCH 48" AFF		CEILING OR WALL OUTLET AND FIXTURE
S ₃	THREE-WAY TOGGLE SWITCH 48" AFF		WITH EMERGENCY BATTERY BALLAST
S ₀	SINGLE POLE DIMMER SWITCH 48" AFF		WALL MOUNTED EMERGENCY FIXTURE
S _w	MOTOR RATED SWITCH W/ OVERLOAD PROTECTION		OUTLET AND FLUORESCENT FIXTURE
S _{oc}	WALL MOUNTED OCCUPANCY SWITCH 48"AFF WATTSTOPPER DW-103		CEILING OUTLET AND FLUORESCENT FIXTURE
	CEILING MOUNTED OCCUPANCY SWITCH WATTSTOPPER WS-250		WITH EMERGENCY BATTERY BALLAST
	DUPLEX RECEPTACLE 18"AFF (NEMA-5-20R)		CEILING OR WALL MOUNTED EXIT SIGN (ARROWS DENOTE DIRECTION OF EGRESS)
	DOUBLE DUPLEX RECEPTACLE 18" AFF		CEILING OR WALL MOUNTED JUNCTION BOX
xx"	DUPLEX 20A RECEPTALCE - xx" AFF AS NOTED ON PLANS. "OC" DESIGNATES OUTLETS TO BE INSTALLED ABOVE COUNTER TOPS. INSTALL SUCH DEVICES HORIZONTALLY 4" ABOVE COUNTER TOP TO CENTER OF OUTLET BOX, OR AS INDICATED ON ARCHITECTURAL DRAWINGS.		SPECIAL RECEPTACLE AS NOTED 18" AFF
	RECESSED/FLUSH FLOOR BOX WITH DUPLEX REC. (HINGED COVER, BLACK NONMETALIC)		VOICE/DATA OUTLET 18" AFF (*)
	FIRE ALARM SYSTEM PULL STATION 48" AFF		TELEPHONE OUTLET 18" AFF (*)
	FIRE ALARM SYSTEM STROBE-ONLY SIGNAL (**)		TELEVISION OUTLET 18" AFF (*)
	FIRE ALARM SYSTEM HORN/STROBE SIGNAL (**)		FIRE ALARM CONTROL PANEL
	PANELBOARD (FLUSH OR SURFACE MOUNTED)		FIRE ALARM ANNUNCIATOR PANEL
	FLEXIBLE METALLIC RACEWAY (6' MAXIMUM LENGTH)		WALL/CEILING MOUNTED SMOKE DETECTOR (***)
	RACEWAY INSTALLED CONCEALED IN WALLS AND/OR ABOVE CEILING		DUCT MOUNTED SMOKE DETECTOR- COORDINATE WITH MECHANICAL ENGINEER (***)
	TERMINATE CONDUIT ABOVE CEILING (PROVIDE INSULATED THROAT BUSHING)		WALL/CEILING MOUNTED HEAT DETECTOR (***)
			NON-FUSED DISCONNECT SWITCH (RATING/POLES/ENCLOSURE AS INDICATED)
			MOTOR
* PROVIDE 4"x4" BOX, PLASTER RING, AND CONDUIT FROM OUTLET ABOVE CEILING AREA WITH PULLSTRING WIRE FOR CABLING BY OWNER'S VENDOR. ** 80" AFF OR 6" BELOW FINISHED CEILING. ALIGN WITH WALL SWITCH WHERE APPLICABLE. *** TIE INTO FIRE ALARM PANEL.			

ELECTRICAL SPECIFICATIONS:

1. THE PLANS ACCOMPANYING THESE SPECIFICATIONS ARE GENERALLY DIAGRAMMATIC AND DO NOT SHOW ALL DETAILS REQUIRED FOR THE COMPLETE WORK. ESTABLISH DETAILS OF THE WORK AS NECESSARY TO PROVIDE FOR THE COMPLETE INSTALLATION OF SYSTEMS AND MATERIALS. ARRANGE THE WORK SO AS TO AVOID INTERFERENCE WITH OTHER BUILDING COMPONENTS OR SYSTEMS AS ACTUALLY INSTALLED. LAY OUT THE WORK AND BE RESPONSIBLE FOR LOCATIONS, LEVELS, GRADES, AND ARCHITECTURAL OR STRUCTURAL FEATURES SUCH AS BEAMS, FIRE BARRIERS, CEILING TYPES AND HEIGHTS, SLAB OR WALL THICKNESS, CABINET HEIGHTS, OR DOOR SWINGS. DO NOT SCALE THE PLANS FOR ANY DIMENSION. VERIFY DIMENSIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCY OR INTERFERENCE TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION.

2. PROVIDE A LICENSED MASTER ELECTRICIAN TO DEVELOP DETAILS OF THE WORK FOR EACH SYSTEM, AND IF REQUIRED TO CERTIFY SAID WORK TO BUILDING OFFICIALS. PERFORM WORK ON A SCHEDULE AS NECESSARY TO INTERFACE WITH OTHER TRADES.

3. WORK SHALL BE FURNISHED AND INSTALLED AS A MINIMUM IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS AND RECOMMENDATIONS OF THE LATEST LOCALLY ADOPTED EDITION OF THE FOLLOWING CODES AND STANDARDS:

- NATIONAL ELECTRICAL CODE (NEC), NFPA-70.
- OTHER NFPA STANDARDS APPLICABLE TO THIS PROJECT
- NEMA, IEEE, AND ANSI STANDARDS APPLICABLE TO THIS PROJECT.
- U.L. STANDARDS AND LISTING REQUIREMENTS.
- FEDERAL, STATE, AND LOCAL LAWS, ORDINANCES, CODES, AND RULINGS OF BUILDING OFFICIALS HAVING JURISDICTION, INCLUDING BUT NOT LIMITED TO THE STATE BUILDING CODE.

9. MATERIALS FURNISHED SHALL BE NEW. MATERIALS SHALL BE MANUFACTURER'S STANDARD ESTABLISHED PRODUCT LINE, AND SHALL BE LISTED AND LABELED FOR THE APPLICATION BY UNDERWRITER'S LABORATORIES (UL), OR SHALL BE CERTIFIED BY OTHER APPROVED LABORATORY OR BY THE BUILDING OFFICIAL HAVING JURISDICTION.

10. CONDUCTORS FOR BRANCH CIRCUITS SHALL BE COPPER WITH 600V TYPE THWN INSULATION. CONDUCTORS SHALL BE STRANDED FOR SIZES #8 AND LARGER; SOLID FOR SIZES #10 AND SMALLER. BRANCH CIRCUIT CONDUCTORS SHALL BE #12 MINIMUM SIZE. CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE REQUIREMENTS. LIGHTING AND POWER WIRING FOR CIRCUITS LESS THAN 100 FEET SHALL BE #12 AWG, UNLESS NOTED, WIRE SIZES SHALL BE #10 FOR CIRCUITS GREATER THAN 100 FEET. NOT MORE THAN (3) LIGHTING OR CONVENIENCE OUTLET CIRCUITS IN ONE CONDUIT UNLESS OTHERWISE NOTED.

ELECTRICAL SYSTEMS, EQUIPMENT, AND SUPPORTING STRUCTURES SHALL BE EFFECTIVELY GROUNDED. BONDING JUMPERS SHALL BE PROVIDED WHERE NECESSARY. METAL ELECTRICAL RACEWAYS AND FITTINGS, JOINTS AND CONNECTIONS AT EQUIPMENT SHALL BE MECHANICALLY AND ELECTRICALLY SECURED TO PROVIDE AN APPROVED EQUIPMENT OR ENCLOSURE GROUNDING MEANS, EVEN WHEN NO OTHER SEPARATE GROUNDING MEANS ARE ALSO PROVIDED EITHER INHERENTLY OR BY BONDING. PROVIDE INSULATED GROUNDING CONDUCTORS IN ALL CONDUITS. GROUND WIRE TO BE SIZED IN ACCORDANCE WITH N.E.C. ARTICLE 250.122.

11. WHERE REQUIRED, CONDUITS SHALL BE ELECTRICAL METALLIC TUBING (EMT) EXCEPT FOR THE FOLLOWING CONDITIONS:
a. CONDUITS WHICH PENETRATE THE BUILDING ROOF OR EXTERIOR SHALL BE GALVANIZED RIGID STEEL (GRS) OR INTERMEDIATE METAL CONDUIT (IMC).
b. CONDUITS INSTALLED WITHIN CONCRETE SLABS SHALL BE GRS, IMC, OR SCHEDULE 40 HEAVY WALL PVC. WHERE TRANSITION IS MADE FROM RACEWAY IN SLAB TO ANY TYPE OF RACEWAY OUT OF SLAB, MAKE TRANSITION WITH A RIGID GALVANIZED ELBOW.
c. CONDUITS INSTALLED IN DIRECT CONTACT WITH EARTH SHALL BE SCHEDULE 40 PVC.
d. TYPE MC CABLE SHALL BE ALLOWED WITHIN WALLS TO RECEPTACLES AND NOT BE USED ABOVE CEILING FOR ANY BRANCH CIRCUIT WORK EXCEPT FOR FINAL CONNECTIONS TO LIGHT FIXTURES IN LENGTHS OF 6' OR LESS. MAINTAIN GROUND CONTINUITY THROUGH FLEXIBLE CONDUIT WITH A GREEN EQUIPMENT GROUNDING CONDUCTOR. LIQUID-TIGHT FLEXIBLE CONDUIT SHALL BE USED IN EXTERIOR INSTALLATIONS, AND IN KITCHEN AND LAUNDRY AREAS.

12. EMT CONDUIT COUPLINGS AND CONNECTORS SHALL BE STEEL RAINLIGHT TYPE. ALL EMT CONNECTORS SHALL BE INSULATED THROAT TYPE. GRS AND IMC FITTINGS SHALL BE STANDARD THREADED COUPLINGS, LOCKNUTS, BUSHINGS, AND ELBOWS. ALL GRS AND IMC FITTINGS SHALL BE STEEL OR MALLEABLE IRON; SET SCREW OR NON-THREADED FITTINGS ARE NOT PERMITTED. NON-METALLIC CONDUIT FITTINGS SHALL BE OF THE SAME MATERIAL AS THE CONDUIT FURNISHED AND SHALL BE THE PRODUCT OF THE SAME MANUFACTURER.

13. FOR GENERAL WIRING IN ORDINARY LOCATIONS FOR POWER AND LIGHTING CIRCUITS, CONDUCTORS SHALL BE RATED 60 HERTZ, 600 VOLTS, WITH 75°C OR 90°C INSULATION AS FOLLOWS:

- WET LOCATIONS: THW, THWN, OR XHHW.
- DRY LOCATIONS: THW, THWN, XHHW, OR THHN.
- CONDUCTORS FOR CIRCUITS REQUIRING 90°C OR HIGHER RATING, SHALL BE OF THHN OR XHHW AS APPLICABLE, OR OTHER APPROVED TYPE.

13. INSULATION RATED FOR 90°C SHALL BE USED WHERE NECESSARY DUE TO THE TEMPERATURE RATING OF CONNECTED EQUIPMENT, THE AMBIENT SPACE, THE GROUPING OF CONDUCTORS, OR OTHER REASON. JOINTS ON CONDUCTORS RATED ABOVE 75°C SHALL BE TAPED OR MADE-UP WITH MATERIALS HAVING A SUITABLE HIGH TEMPERATURE RATING.

14. RACEWAYS AND CABLE SHALL BE INSTALLED CONCEALED, EXCEPT THAT RACEWAYS DESIGNED ONLY FOR SURFACE MOUNTING.

15. JUNCTION OR PULL BOXES SHALL BE PROVIDED WHERE INDICATED OR WHERE NECESSARY TO AVOID EXCESSIVE RUNS OR TOO MANY BENDS BETWEEN OUTLETS.

16. EXPOSED RACEWAYS SHALL BE PARALLEL OR PERPENDICULAR TO STRUCTURAL MEMBERS OR ARCHITECTURAL FEATURES. CONCEALED CONDUIT RACEWAYS SHALL BE RUN IN A DIRECT MANNER WITH AS FEW BENDS AS FEASIBLE, AND SHALL BE COORDINATED WITH STRUCTURAL, MECHANICAL AND ARCHITECTURAL REQUIREMENTS.

17. RACEWAY OR CABLE, ETC. THAT PENETRATES A FIRE BARRIER, SUCH AS FIRE OR SMOKE RATED SLAB, WALL, CEILING, OR OTHER ELEMENT, SHALL BE INSTALLED WITH MATERIALS AND METHODS APPROVED FOR THE APPLICATION BY LOCAL BUILDING OFFICIALS. BE RESPONSIBLE FOR IDENTIFYING EACH FIRE BARRIER FROM THE ARCHITECTURAL PLANS, AND FOR SECURING APPROVAL OF MATERIALS AND METHODS TO BE USED FOR EACH TYPE PENETRATION.

18. ELECTRICAL SYSTEMS, EQUIPMENT, AND SUPPORTING STRUCTURES SHALL BE EFFECTIVELY GROUNDED. BONDING JUMPERS SHALL BE PROVIDED WHERE NECESSARY. PROVIDE INSULATED GROUNDING CONDUCTORS IN ALL CONDUITS.

19. DISTRIBUTION EQUIPMENT SHALL BE GENERAL ELECTRIC, SIEMENS, SQUARE-D, CUTLER-HAMMER/WESTINGHOUSE. THE ACTUAL AVAILABLE FAULT CURRENT SHALL BE VERIFIED WITH THE SERVING UTILITY COMPANY AND CIRCUIT BREAKERS WITH INTERRUPTING CAPACITIES (RMS SYMMETRICAL) WHICH MEET OR EXCEED THE AVAILABLE FAULT CURRENT SHALL BE PROVIDED. SERIES-RATED DEVICES (PER U.L. TESTING PROCEDURES) ARE ACCEPTABLE.

20. LIGHTING FIXTURES SHALL BE AS INDICATED, COMPLETE WITH BALLASTS AND LAMPS. VERIFY CEILING CONSTRUCTION BEFORE ORDERING FIXTURES AND PROVIDE MOUNTING ACCESSORIES WITHOUT ADDITIONAL COST. VERIFY ALL DOOR SWINGS BEFORE INSTALLING LIGHT SWITCHES.

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REVISIONS:

ISSUED: 03/10/2017

Legend and
Specifications

E001

Project: 17-130