ELECTRICAL SPECIFICATIONS

SCOPE OF WORK:
THE CONTRACTOR SHALL PROVIDE EQUIPMENT AND MATERIALS, ELECTRICAL AND APPURTENANT WORK NECESSARY FOR A COMPLETE AND OPERABLE ELECTRICAL SYSTEM. PROVIDE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING ITEMS.

1. COORDINATE WITH THE ELECTRIC, TELEPHONE AND CABLE TV UTILITIES AND PROVIDE ALL THE NECESSARY LABOR AND MATERIALS AND ITS REQUIREMENTS ASSOCIATED WITH THIS PROJECT (ESPECIALLY NOT PROVIDED BY THE UTILITIES). SEE DRAWINGS.

CODES, REGULATIONS AND STANDARDS:
THE FOLLOWING INDUSTRY STANDARDS, SPECIFICATIONS AND CODES ARE MINIMUM REQUIREMENTS.

1. THE LATEST NATIONAL ELECTRICAL CODE (NEC), ADOPTED BY JURISDICTION WITH AUTHORITY, SOUTHERN NEVADA AMENDMENTS TO THE NEC.
2. THE NATIONAL ELECTRICAL MANUFACTURER ASSOCIATION STANDARDS (NEMA).
3. UNDERWRITER LABORATORIES INCORPORATED STANDARD (UL).
4. AMERICAN STANDARDS ASSOCIATION.
5. BUILDING CODE PER JURISDICTION, ADOPTED BY JURISDICTION WITH AUTHORITY

ALL EQUIPMENT AND MATERIALS SHALL BE LISTED BY AND SHALL BEAR THE LABEL OF THE UNDERWRITERS' LABORATORIES INCORPORATED (UL) OR OF AN INDEPENDENT TESTING LABORATORY ACCEPTABLE TO THE LOCAL CODE-ENFORCEMENT AGENCY HAVING JURISDICTION.

THE CONSTRUCTION AND INSTALLATION OF THE ELECTRICAL EQUIPMENT AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE OSHA SAFETY AND HEALTH STANDARDS (29CFR1910 AND 29CFR1926, AS APPLICABLE), STATE BUILDING STANDARDS, AND APPLICABLE CODES AND REGULATIONS.

STORAGE AND HANDLING:
DELIVER MATERIALS AND EQUIPMENT TO THE PROJECT IN THE MANUFACTURER'S ORIGINAL, UNOPENED, LABELED CONTAINERS, PROTECT AGAINST MOISTURE, TAMPERING, OR DAMAGE FROM IMPROPER HANDLING ETC.

ARRANGE FOR TIMELY DELIVERY OF MATERIALS AND EQUIPMENT TO THE JOB SITE IN ORDER TO MINIMIZE THE LENGTH OF THE TIME BETWEEN DELIVERY AND INSTALLATION.

COVER AND PROTECT ANY MATERIALS, WHICH MAY BE AFFECTED BY THE WEATHER WHILE IN TRANSIT OR STORED AT THE PROJECT SITE. ANY
MATERIAL FOUND DEFECTIVE OR NOT FUNCTIONAL OR NOT INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS MAY BE REJECTED BY THE ENGINEER, CONSTRUCTION MANAGER OR AUTHORITY HAVING JURISDICTION.

CONTRACTOR SHALL PROTECT MATERIALS AND EQUIPMENT AND BE RESPONSIBLE IN FOR ANY DAMAGE. ANY DAMAGE OR LOSS THAT MAY OCCUR DURING THIS PERIOD OR IF IT IS DEEMED AS CONTRACTORS FAULT, CONTRACTOR SHALL REPAIR OR REPLACE TO ITS ORIGINAL CONDITION WITHOUT ADDITIONAL COST TO THE OWNER.

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 CLEAN (I.E., BROOM CLEAN).

DRAWINGS:
THE DRAWINGS INDICATE GENERAL LAYOUT OR ARRANGEMENT AND LOCATIONS OF THE ELECTRICAL WORK ONLY. DATA PRESENTED ON THESE DRAWINGS ARE AS ACCURATE AS THE ENGINEER CAN DETERMINE. FIELD VERIFICATION IS REQUIRED OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC. TO SUIT FIELD CONDITIONS. REVIEW ALL ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND OTHER TRADES' DRAWINGS AND ADJUST ALL WORK TO MEET THE REQUIREMENTS OF THE CONDITIONS SHOWN. IF DISCREPANCIES ARE NOT REPORTED, THE CONTRACTOR SHALL BID THE GREATER QUANTITY OR BETTER QUALITY, AND APPROPRIATE ADJUSTMENTS WILL BE MADE AFTER CONTRACT AWARD. CONTRACTOR SHALL RE RESPONSIBLE TO FIELD MEASURE AND CONFIRM MOUNTING HEIGHTS AND LOCATIONS OF ELECTRICAL EQUIPMENT WITH RESPECT TO COUNTERS, RADIATION, ETC. DO NOT SCALE DISTANCE OFF THE ELECTRICAL DRAWINGS, USE ACTUAL BUILDING DIMENSIONS.

IN ALL CASES SWITCHES CONTROLLING LIGHTING ARE TO BE LOCATED ON THE STRIKE SIDE OF THE DOORS (WHERE OR AS APPLICABLE). LOCATIONS INDICATED FOR SWITCHES AND OUTLETS ARE APPROPRIATE. OWNER MAY MAKE MINOR RELOCATION'S AT NO ADDITIONAL CHARGE.

EXCAVATION, CUTTING AND FITTING:
PERFORM THE 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 ANY STRUCTURAL MEMBER SHALL BE DONE WITHOUT THE CONSENT OF THE ARCHITECT OR TO THE AUTHORITY HAVING JURISDICTION.

COORDINATION AND COOPERATION WITH OTHER CONTRACTORS:
COORDINATE AND COOPERATE WITH THE OTHER CONTRACTORS OR TRADES SO THAT THE INSTALLATIONS OF THE ELECTRICAL OUTLETS AND EQUIPMENT WILL BE PROPERLY INSTALLED. CONDUIT, FIXTURES, AND OTHER EQUIPMENT LOCATIONS SHALL BE CHECKED WITH OTHER TRADES TO AVOID CONFLICT WITH THE PIPING, DUCTWORK, STEEL, BEAMS, OR OTHER OBSTRUCTIONS.

CAREFULLY CHECK THE LOCATIONS OF THE OUTLET BOXES AND DETERMINE THAT THEY HAVE NOT BEEN DISTURBED DURING THE INSTALLATION OF MATERIALS OF OTHER TRADES.

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

WIRES:
UNLESS OTHERWISE SPECIFIED, ALL WIRES SHALL BE 600 VOLT, 75 DEGREE C, TYPE THW, THWN, THHN, OR XHHN. ALL WIRING SHALL BE COPPER. THE WIRES SHALL BE MARKED WITH COLOR INSULATION TO SIMPLIFY CIRCUIT IDENTIFICATION. MINIMUM WIRE SIZE SHALL BE #14 AWG FOR RESIDENTIAL LIGHTING ONLY, PROTECTED BY A 15 AMP CIRCUIT BREAKER. MINIMUM WIRE SIZE FOR ALL OTHER APPLICATIONS SHALL BE #12 AWG. MINIMUM WIRE SIZE FOR BRANCH CIRCUITS WHOSE LENGTH FROM PANEL TO CENTER OF CIRCUIT LOAD EXCEEDS 100 FEET, SHALL BE #10 AWG. ALL CONDUCTORS LARGER THAN #10 AWG SHALL BE STRANDED.

FEEDERS FROM MAIN INCOMING POINT OF CONNECTION (ELECTRICAL) TO SUB PANELS MAY BE ALUMINUM, TYPE SER. ALUMINUM CONDUCTORS SHALL BE SIZED PER NEC TABLE 310.16 OR PER NEC TABLE 310.15(B)(6) FOR SINGLE-PHASE DWELLING SERVICES.

NO WIRE SHALL BE INSTALLED IN THE CONDUIT SYSTEM UNTIL THE CONDUIT SYSTEM IS COMPLETE. USE MINERALAC #600 OR EQUIVALENT AS
LUBRICANT TO FACILITATE THE INSTALLATION OF THE WIRES IN THE CONDUIT SYSTEM. CONTRACTOR MAY USE MC CABLE OR NON-METALLIC CABLE PROVIDED THAT MATERIALS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH ALL THE APPLICABLE CODES.

OUTLET, PULL, AND JUNCTION BOXES:
WHERE REQUIRED. EACH SWITCH, LIGHT, RECEPTACLE OR OTHER OUTLET SHALL BE PROVIDED WITH CODE GAGE GALVANIZED STEEL OUTLET BOX OR SHALL BE U.L. LISTED FOR APPLICATION. OUTLET BOXES SHALL BE OF THE ONE PIECE, KNOCKOUT TYPE.

LIGHTING FIXTURES:
WHERE APPLICABLE ALL NEW LIGHTING FIXTURES, WIRED AND CONNECTED AS INDICATED. THE DRAWINGS INDICATE THE FIXTURES FOR EACH LOCATION. PROVIDE LAMPS FOR ALL FIXTURES. THE LAMPS SHALL BE THE SAME MANUFACTURER. VERIFY CEILING CONSTRUCTION BEFORE ORDERING RECESSED UNITS. PROVIDE PLASTER FRAMES AND HANGERS AS REQUIRED.

MECHANICAL AND ELECTRICAL COORDINATION:
1. ANY DEVICE WHICH CARRIES THE FULL LOAD CURRENT OF THE ELECTRICALLY DRIVEN MACHINERY, AS OPPOSED TO THE CONTROL OF INSTRUMENTATION CURRENT IN THE HOLDING COIL, IS DEFINED AS A POWER CIRCUIT AND IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. CONTROL AND INSTRUMENTATION CIRCUITS CONNECTING HOLDING COILS TO THE AUTOMATIC TEMPERATURE CONTROL SYSTEM ARE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
2. THE POWER CIRCUIT IS DEFINED AS ALL DEVICES NECESSARY TO OPERATE THE UNIT, AND AS ALL DEVICES REQUIRED BY CODE TO PROTECT AND SERVICE THE UNIT, INCLUDING BRANCH CIRCUIT PROTECTIVE DEVICES, FUSED AND UNFUSED DISCONNECTS, MAGNETIC MOTOR STARTERS WITH RUNNING OVERLOAD AND SINGLE PHASING PROTECTION, AND MAGNETIC CONTACTORS.
3. THE CONTROL AND INSTRUMENTATION CIRCUIT IS DEFINED AS ALL DEVICES NECESSARY TO INTERFACE THE ELECTRICAL POWER CIRCUIT WITH THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, INCLUDING CONDUIT, BOXES, CONDUIT FITTINGS, CONDUCTORS, ELECTRIC PNEUMATIC SWITCHES, PNEUMATIC ELECTRIC SWITCHES, ELECTRIC AND PNEUMATIC RELAYS, AND PNEUMATIC TUBING.
4. WHERE AN AIR CONDITIONER IS LISTED BY A QUALIFIED ELECTRICAL TESTING LABORATORY WITH A NAMEPLATE THAT READS 'MAXIMUM FUSE SIZE,' LISTING RESTRICTS THE USE OF THIS UNIT TO FUSE PROTECTION ONLY AND DOES NOT COVER ITS USE WITH CIRCUIT BREAKERS. IF THE AIR CONDITIONER HAS BEEN EVALUATED FOR BOTH FUSES AND ORDINARY CIRCUIT BREAKERS, OR BOTH FUSES AND HACR-TYPE CIRCUIT BREAKERS, IT MAY BE SO MARKED. UL-LISTED CIRCUIT BREAKERS THAT HAVE BEEN FOUND SUITABLE FOR USE WITH HEATING, AIR-CONDITIONING, AND REFRIGERATION EQUIPMENT COMPRISING MULTIMOTOR OR COMBINATION LOADS ARE MARKED 'LISTED HACR TYPE.' THE MANUFACTURER'S INSTALLATION SPECIFICATIONS SHALL BE CLOSELY FOLLOWED AND THAT ANY RESTRICTION OF THE LISTING BE APPLIED TO THE INSTALLATION OF THE EQUIPMENT, IN ORDER TO COMPLY WITH THE NEC.

SAFETY SWITCHES (DISCONNECT):
SAFETY SWITCHES: UNLESS OTHERWISE INDICATED ON THE DRAWINGS, SHALL BE HEAVY DUTY TYPE, 600 OR 250-VOLT, OF THE NUMBER OF POLES REQUIRED. SAFETY SWITCHES FOR AIR CONDITIONING USE SHALL BE RECOMMENDED BY EQUIPMENT MANUFACTURER. THE SWITCH SHALL BE AS REQUIRED BY CODE AND AS INDICATED ON THE DRAWINGS. WHEN OUTSIDE THE BUILDING, THE SWITCHES SHALL BE RAIN TIGHT NEMA 3R. ALL SWITCHES SHALL BE LOCKABLE.

ELECTRICAL FLOOR PLAN NOTES

1. ALL SMOKE DETECTORS AND COMBINATION SMOKE/ CARBON MONOXIDE DETECTORS SHALL BE HARDWIRED ON SAME CIRCUIT AND HAVE A BATTERY BACKUP SYSTEM.
2. WHEN MORE THAN EITHER ONE (1) SMOKE ALARM OR MORE THAN ONE (1) CARBON MONOXIDE ALARM IS REQUIRED TO BE INSTALLED WITHIN AN INDIVIDUAL DWELLING UNIT, ALL ALARM DEVICES SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTUATION OF ONE ALARM WILL ACTIVATED ALL OF THE ALARMS IN THE INDIVIDUAL UNIT. SMOKE AND CARBON MONOXIDE ALARMS SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS: (IRC SECTION R314.3 AS AMENDED)
   a. SMOKE ALARMS IN EACH SLEEPING ROOM.
   b. SMOKE ALARMS OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS.
   c. SMOKE ALARMS ON EACH ADDITIONAL STORY OF THE DWELLING, INCLUDING BASEMENTS BUT NOT INCLUDING CRAWL SPACE AND
      UNINHABITABLE ATTICS. IN DWELLINGS OR DWELLING UNITS WITH SPLIT LEVELS AND WITHOUT AN INTERVENING DOOR BETWEEN THE ADJACENT LEVELS, A SMOKE ALARM INSTALLED ON THE UPPER LEVEL SHALL SUFFICE FOR THE ADJACENT LOWER LEVEL PROVIDED
      THAT THE LOWER LEVEL IS LESS THAN ONE FULL STORY BELOW THE UPPER LEVEL.
   d. CARBON MONOXIDE ALARMS OUTSIDE OF SLEEPING AREAS IN THE IMMEDIATE VICINITY OF THE BEDROOMS IN DWELLING UNITS WITHIN
      WHICH FUEL-FIRED APPLIANCES ARE INSTALLED AND IN DWELLING UNITS THAT HAVE ATTACHED GARAGES.
   e. CARBON MONOXIDE ALARMS WITHIN EACH BEDROOM WHICH CONTAINS A FUEL-FIRED APPLIANCES.
3. ALL BRANCH CIRCUITS THAT SUPPLY 125-VOLT, SINGLE PHASE, 15 AND 20 AMP OUTLETS INSTALLED IN DWELLING UNIT BEDROOMS, FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY AN ARC-FAULT CIRCUIT INTERRUPTER LISTED TO PROVIDE PROTECTION OF ENTIRE BRANCH CIRCUIT. NEC ARTICLE 210.12 (A). SMOKE DETECTORS SHALL BE INCLUDED IN THE ARC-FAULT CIRCUIT INTERRUPTER PROTECTION OF DWELLING UNIT BEDROOM BRANCH CIRCUITS.
4. ALL ATTIC ACCESSES SHALL BE PROVIDED WITH A SWITCHED LIGHT AND 120 VOLT OUTLET AT OR NEAR THE FORCED AIR UNIT.
5. CIRCUITS PROVIDED FOR HVAC AND PLUMBING EQUIPMENT SHALL BE LOCATED PER MECHANICAL DRAWINGS.
6. FEEDERS TO AIR CONDITIONING EQUIPMENT SHALL BE RATED FOR FULL LOAD CURRENT. UNLESS NOTED OTHERWISE, NON-FUSED DISCONNECTS SHALL BE INSTALLED AT AIR CONDITIONING EQUIPMENT LOCATIONS. HACR CIRCUIT BREAKERS/FUSES SHALL BE SIZED IN ACCORDANCE WITH THE HVAC EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. AS INDICATED ON THE PLANS, 120 VAC WEATHERPROOF GFCI RECEPTACLES SHALL BE INSTALLED SO THAT NO HVAC EQUIPMENT IS MORE THAN 25 FEET FROM A RECEPTACLE.
7. WHERE A OUTLET BOXES OR OUTLET BOX SYSTEM USED AS THE SOLE SUPPORT OF A CEILING-SUSPENDED (PADDLE) FAN SHALL BE LISTED, SHALL BE MARKED BY THEIR MANUFACTURER AS SUITABLE FOR THIS PURPOSE, AND SHALL NOT SUPPORT CEILING SUSPENDED (PADDLE) FANS THAT WEIGH MORE THAN 70LB. FOR OUTLET BOXES OR OUTLET BOX SYSTEMS DESIGNED TO SUPPORT CEILING-SUSPENDED (PADDLE) FANS THAT WEIGH MORE THAN 35LB, THE REQUIRED MARKING SHALL INCLUDE THE MAXIMUM WIGHT TO BE SUPPORTED. (NEC ART. 314.27(D)).
8. ALL CEILING LIGHT/FAN FIXTURES TO BE CENTERED IN ROOM UNLESS OTHERWISE NOTED.
9. LIGHTING FIXTURES SHOWN ON THESE PLANS INDICATE THE DESIGN INTENT. FINAL APPROVAL OF ALL LUMINAIRES SHALL BE BY THE OWNER.
10. SECURITY ALARM SYSTEM DESIGN SHALL BE PROVIDED BY OTHERS.
11. THE ELECTRICAL CONTRACTOR SHALL FOLLOW DRAWINGS FROM RESPECTIVE UTILITY COMPANY (POWER, TELEPHONE AND CABLE TV) FOR DRY UTILITY DESIGN.
12. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ELECTRICAL COMPONENTS AND HARDWARE AS REQUIRED BY THE NATIONAL ELECTRICAL CODE, LATEST EDITION, AND SHALL COMPLY WITH THE REQUIREMENTS OF THE INSPECTING AUTHORITY HAVING JURISDICTION.
13. IN EVERY KITCHEN, FAMILY ROOM, DINING ROOM, LIVING ROOM, PARLOR, LIBRARY, DEN, SUN ROOM, BEDROOM, RECREATION ROOM, OR SIMILAR ROOM OR AREA OF DWELLING UNITS, RECEPTACLE OUTLETS SHALL BE INSTALLED IN ACCORDANCE WITH THE GENERAL PROVISIONS SPECIFIED IN THE FOLLOWING ARTICLES: SPACING - 210.52(A)(1), WALL SPACE - 210.52(A)(2,) FLOOR RECEPTACLES - 210.52(A)(3).
14. AT COUNTERTOPS IN KITCHEN AND DINING ROOMS OF DUELLING UNITS, RECEPTACLE OUTLETS FOR COUNTER SPACES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING ARTICLES: WALL COUNTER SPACE - NEC ARTICLE 210.52(C)(1), ISLAND COUNTER SPACE - NEC ARTICLE 210.52(C)(2), PENINSULAR COUNTER SPACE - NEC ARTICLE 210.52(C)(3), SEPARATE SPACES - NEC ARTICLE 210.52(C)(4), RECEPTACLE OUTLET LOCATIONS NEC ARTICLE 210.52(C)(5). (NEC ARTICLE 210.52).
15. AT LEAST ONE RECEPTACLE OUTLET SHALL BE INSTALLED AT EACH ISLAND COUNTER SPACE WITH A LONG DIMENSION OF 24 INCHES OR GREATER AND A SHORT DIMENSION OF 12 INCHES OR GREATER. THIS OUTLET SHALL SERVE UP TO THE FIRST 4 FEET OF COUNTER SPACE MEASURED HORIZONTALLY IN THE LONG DIMENSION. AN ADDITIONAL OUTLET SHALL BE REQUIRED TO SERVE EACH ADDITIONAL 4 FEET OR FRACTION THEREOF.
16. ALL LUMINAIRES (LIGHTING FIXTURES) PERMITTED TO BE INSTALLED WITHIN A ZONE MEASURED 3 FEET HORIZONTALLY AND 8 FEET VERTICALLY FROM THE TOP OF THE BATHTUB RIM OR SHOWER STALL THRESHOLD SHALL BE GFCI PROTECTED (NEC ARTICLE 410.4(D).
17. THE FOLLOWING FASTENED-IN-PLACE APPLIANCES ARE REQUIRED TO HAVE A SEPARATE MINIMUM 20-AMPERE CIRCUIT: DISHWASHER, TRASH COMPACTOR, MICROWAVE OVEN, RANGE HOOD, CLOTHES WASHER, AND HYDRO-MASSAGE BATHTUB. THE CLOTHES WASHER CIRCUIT MAY SERVE ONE (1) ADDITIONAL OUTLET IN THE LAUNDRY AREA. (NEC ARTICLE 210.23(E)(4) AS AMENDED).
18. NO MORE THAN 5 DUPLEX RECEPTACLE OUTLETS SERVING THE REQUIRED COUNTERTOP RECEPTACLES SHALL BE INSTALLED ON ANY SMALL APPLIANCE BRANCH CIRCUIT. (NEC ARTICLE 210.23(E)(3) AS AMENDED).
19. THE MAXIMUM NUMBER OF OUTLETS ON A 20-AMPERE, 125-VOLT CIRCUIT USED EITHER EXCLUSIVELY FOR LIGHTING FIXTURES OR FOR ANY COMBINATION OF RECEPTACLES AND LIGHTING FIXTURES SHALL BE 12. (SEE EXCEPTIONS) (NEC ART. 210.23(E)(2) &(A.).
20. RECEPTACLE OUTLETS SHALL NOT BE INSTALLED IN A FACE-UP POSITION IN THE WORK SURFACES OR COUNTERTOPS. (NEC ART. 406.4(E)).
21. RECEPTACLES INSTALLED IN A KITCHEN TO SERVE COUNTERTOP SURFACES SHALL BE LIMITED TO FIVE (5) DUPLEX RECEPTACLES ON A CIRCUIT. (NEC 210.52(B)(3) AS AMENDED.
22. ALL INTERIOR AND EXTERIOR STAIRWAYS SHALL BE PROVIDED WITH A MEANS TO ILLUMINATE THE STAIRS, INCLUDING THE LANDINGS AND TREADS. INTERIOR STAIRWAYS SHALL BE PROVIDED WITH AN ARTIFICIAL LIGHT SOURCE LOCATED IN THE IMMEDIATE VICINITY OF EACH LANDING OF THE STAIRWAY. FOR INTERIOR STAIRS THE ARTIFICIAL LIGHT SOURCES SHALL BE CAPABLE OF ILLUMINATING TREADS AND LANDINGS TO LEVELS NOT LESS THAN 1 FOOT-CANDLE MEASURED AT THE CENTER OF TREADS AND LANDINGS. (IRC SECTION R303.6.).
23. LUMINAIRES IN CLOTHES CLOSETS SHALL BE INSTALLED IN ACCORDANCE WITH NEC ART. 410.16.
24. SMOKE AND CARBON MONOXIDE ALARMS SHALL BE LISTED, SHALL RECEIVE THEIR PRIMARY POWER FROM THE BUILDING WIRING WHEN SUCH WIRING IS SERVED FROM A COMMERCIAL SOURCE, AND WHEN PRIMARY POWER IS INTERRUPTED, SHALL RECEIVE POWER FROM A BATTERY. (IRC R314.1, R314.2.1, R314.4 AS AMENDED.).
25. IN ALL AREAS SPECIFIED IN 210.52, ALL 125 VOLT, 15 AND 20 AMPERE RECEPTACLES SHALL BE LISTED TAMPER-RESISTANT RECEPTACLES. (NEC 406.11)
26. ALL 125-VOLT, SINGLE PHASE, 15 AND 20 AMPERE RECEPTACLES SHALL HAVE GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION FOR PERSONNEL, INCLUDING: BATHROOMS, GARAGES, OUTDOORS, KITCHEN COUNTERTOPS, LAUNDRY, UTILITY AND WET BAR SINKS - WITHIN 6 FEET OF THE OUTSIDE EDGE OF THE SINK.
27. IN THE KITCHEN, PANTRY, BREAKFAST ROOM, DINING ROOM, OR SIMILAR AREA OF A DUELLING UNIT, THE TWO OR MORE 20-AMPERE SMALL-APPLIANCE BRANCH CIRCUITS REQUIRED BY 210.11(C)(1) SHALL SERVE ALL WALL AND FLOOR RECEPTACLE OUTLETS COVERED BY 210.52(A), ALL COUNTERTOP OUTLETS COVERED BY 210.52(C), AND RECEPTACLE OUTLETS FOR REFRIGERATION EQUIPMENT. (NEC ARTICLE 210.52(B.)(1)).
28. THE MAXIMUM NUMBER OF OUTLETS ON A 15-AMPERE, 125-VOLT LIGHTING FIXTURE CIRCUIT SHALL BE TWELVE (12) AND SHALL NOT CONTAIN GENERAL PURPOSE OUTLETS. (SEE EXCEPTIONS) (NEC ARTICLE 210.23(E)(1) AS AMENDED.).
29. ALL LUMINAIRES (FIXTURES) INSTALLED IN DAMP LOCATIONS SHALL BE MARKED, 'SUITABLE FOR WET LOCATIONS' OR 'SUITABLE FOR DAMP LOCATIONS.' (NEC ARTICLE 410.10(A.)).
30. EACH PANELBOARD OR LOAD CENTER INSTALLED IN A DWELLING SHALL HAVE A CAPACITY FOR A MINIMUM OF TWO (2) ADDITIONAL FULL-SIZE POLE OR OVERCURRENT DEVICES ON ADJACENT OPPOSITE POLES FOR EXPANSION. ALL AVAILABLE OVERCURRENT DEVICE SPACES SHALL COMPLY WITH ARTICLE 404.8(A). NEC ARTICLE 408.54 AS AMENDED.
31. ALL 125-VOLT, SINGLE-PHASE, 15- AND 20-AMPERE RECEPTACLES SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL, INCLUDING
   A. BATHROOMS,
   B. GARAGES,
   C. OUTDOORS,
   D. KITCHEN COUNTERTOPS,
   E. LAUNDRY, UTILITY AND WET BAR SINKS –WITHIN 6-FEET OF THE OUTSIDE EDGE OF THE SINK. (NEC 210.8).
32. ALL 120-VOLT, SINGLE PHASE, 15, - AND 20-AMPERE BRANCH CIRCUITS SUPPLYING OUTLETS INSTALLED IN DUELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER (AF) COMBINATION TYPE, INSTALLED TO PROVIDE PROTECTION OF BRANCH CIRCUIT PER NEC ARTICLE 210.12(B).
33. A MINIMUM OF 75% OF PERMANENTLY INSTALLED LIGHTING FIXTURES SHALL BE HIGH-EFFICACY LAMPS (2012 IECC R404.1)
34. A 'MAIN ELECTRICAL DISCONNECT' PLACARD SHALL BE PLACED ON THE MAIN ELECTRICAL SERVICE EQUIPMENT AND EXTERIOR OF THE DOOR TO ELECTRICAL ROOM AS PER 2011 NEC (230.70). EACH SERVICE DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED WITH 1 INCH (25.3 MM) HIGH X 1/4 INCH (6.35 MM) STROKE LETTERS AND OR NUMBERS INDICATING THE ADDRESS OR UNIT IT SERVES AND BE IDENTIFIED AS THE DISCONNECTING MEANS.
35. EMERGENCY LIGHTING IN THE FIRE RISER ROOM PER IFC 2012 (916.6) LIGHTING. PERMANETLY INSTALLED ARTIFICIAL LIGHTING WITH BACK-UP POWER SHALL BE PROVIDED FOR THE RISER ROOM.

SYMBOL LIST
(NOT ALL SYMBOLS ARE USED)

- FLUORESCENT FIXTURE
- RECESSED DOWNLIGHT FIXTURE
- WALL MOUNTED FIXTURE
- CEILING SURFACE MOUNTED FIXTURE
- FLOODLIGHT FIXTURE
- WALL WASHER
- TRACK LIGHT - NUMBER OF HEADS AS SHOWN
- SUSPENDED PENDANT FIXTURE
- CHANDELIER LIGHT FIXTURE
- RECESSED ACCENT FIXTURE
- SCONCE
- VANITY FIXTURE - NUMBER OF HEADS AS SHOWN
- IN-GRADE LED LIGHT FIXTURE
- WALL MOUNTED PATH LIGHT FIXTURE
- S — SINGLE POLE SWITCH @ +48" UNLESS NOTED
- S_{abcc} — SWITCH BANK @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- S_3 — 3-WAY SWITCH @ +48" UNLESS NOTED
- S_4 — 4-WAY SWITCH @ +48" UNLESS NOTED
- S_D — DIMMER SWITCH - SIZE AS REQUIRED @ +48" UNLESS NOTED
- S_S — SWITCH SENSOR @ +48" UNLESS NOTED
- S_M — MOTOR RATED DISCONNECT SWITCH
- SINGLE RECEPTACLE @ +18" UNLESS NOTED
- DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- DOUBLE DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- GFI DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- GFI DOUBLE DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- FLUSH FLOOR (OR PEDESTAL) DUPLEX RECEPTACLE
- DUPLEX RECEPTACLE - CEILING MOUNTED
- SPECIAL RECEPTACLE @ +18" UNLESS NOTED
- 1/2 SWITCHED RECEPTACLE @ +18" UNLESS NOTED
- THERMOSTAT (BY MECHANICAL)
- PHOTOCELL
- SMOKE DETECTOR
- SMOKE/CARBON DETECTOR
- CEILING FAN AND LIGHT, PRE-WIRED ONLY
- TELEPHONE OUTLET@ +18" UNLESS NOTED
- DATA OUTLET @ +18" UNLESS NOTED
- COMBO TELEPHONE/DATA OUTLET @ +18" UNO
- TV — TELEVISION OUTLET @ +18" UNLESS NOTED
- CHIME
- ELECTRIC PANEL
- JUNCTION BOX
- T — TRANSFORMER
- TS — TIME SWITCH
- OR — EXHAUST FAN
- NON-FUSED DISCONNECT SWITCH.- SIZE AS INDICATED
- PUSH BUTTON
- EF — MECHANICAL EQUIPMENT CONNECTION, SEE SCHEDULE ON MECHANICAL PLAN
- CONDUIT RUN CONCEALED IN WALL OR ABOVE CLG
- CONDUIT RUN BELOW FLOOR OR GRADE
- CONDUIT RISER
- A-1.3 — HOMERUN: TO PANEL A, CKTS 1,3
- A-1.3 — HOMERUN BELOW FLOOR OR GRADE: TO PANEL A, CKTS 1,3
- EXISTING HOMERUN TO REMAIN
- EXISTING HOMERUN TO BE REMOVED
- 1/2" - 2 #12 THWN/THHN UNLESS NOTED. DOES NOT INCLUDE WIRE. IF REQUIRED ADD CODE SIZE GROUND
- 1/2" - 3 #12 THWN/THHN UNLESS NOTED. DOES NOT INCLUDE WIRE. IF REQUIRED ADD CODE SIZE GROUND

SHEET INDEX

PRIOR TO COMMENCING WORK

1. OBTAIN AND REVIEW ALL OTHER DRAWINGS INCLUDING REFLECTED CEILING PLAN, INTERIOR AND EXTERIOR ELEVATIONS, FURNITURE PLANS AND ALL MILL WORK DRAWINGS. COORDINATE INSTALLATION OF ALL ELECTRICAL DEVICES AND EQUIPMENT PRIOR TO ROUGH-IN.
2. COORDINATE INSTALLATION OF HVAC CONTROLS WITH MECHANICAL. VERIFY ALL REQUIREMENTS WITH EQUIPMENT SUPPLIED.
3. OBTAIN SUBMITTAL AND SHOP DRAWINGS FROM ALL OTHER TRADES AND COORDINATE YOUR INSTALLATION ACCORDINGLY.
4. INSTALLATION SHALL COMPLY WITH ALL CURRENT APPLICABLE CODES AND GOVERNING AGENCIES HAVING JURISDICTION.
5. THOROUGHLY READ AND REVIEW ALL NOTES, SPECIFICATIONS, SYMBOL LISTS, SCHEDULES, ETC.
6. YOU ARE RESPONSIBLE FOR A COMPLETE INSTALLATION IN ACCORDANCE WITH ALL DOCUMENTS. CONTACT YOUR PRIME CONTRACTOR FOR A COMPLETE SET OF DOCUMENTS.

REVISIONS			
NO.	DATE	DESCRIPTION	BY
3	1-30-19	BLDG DPT COMMENT	

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ENGINEERING A SUSTAINABLE FUTURE
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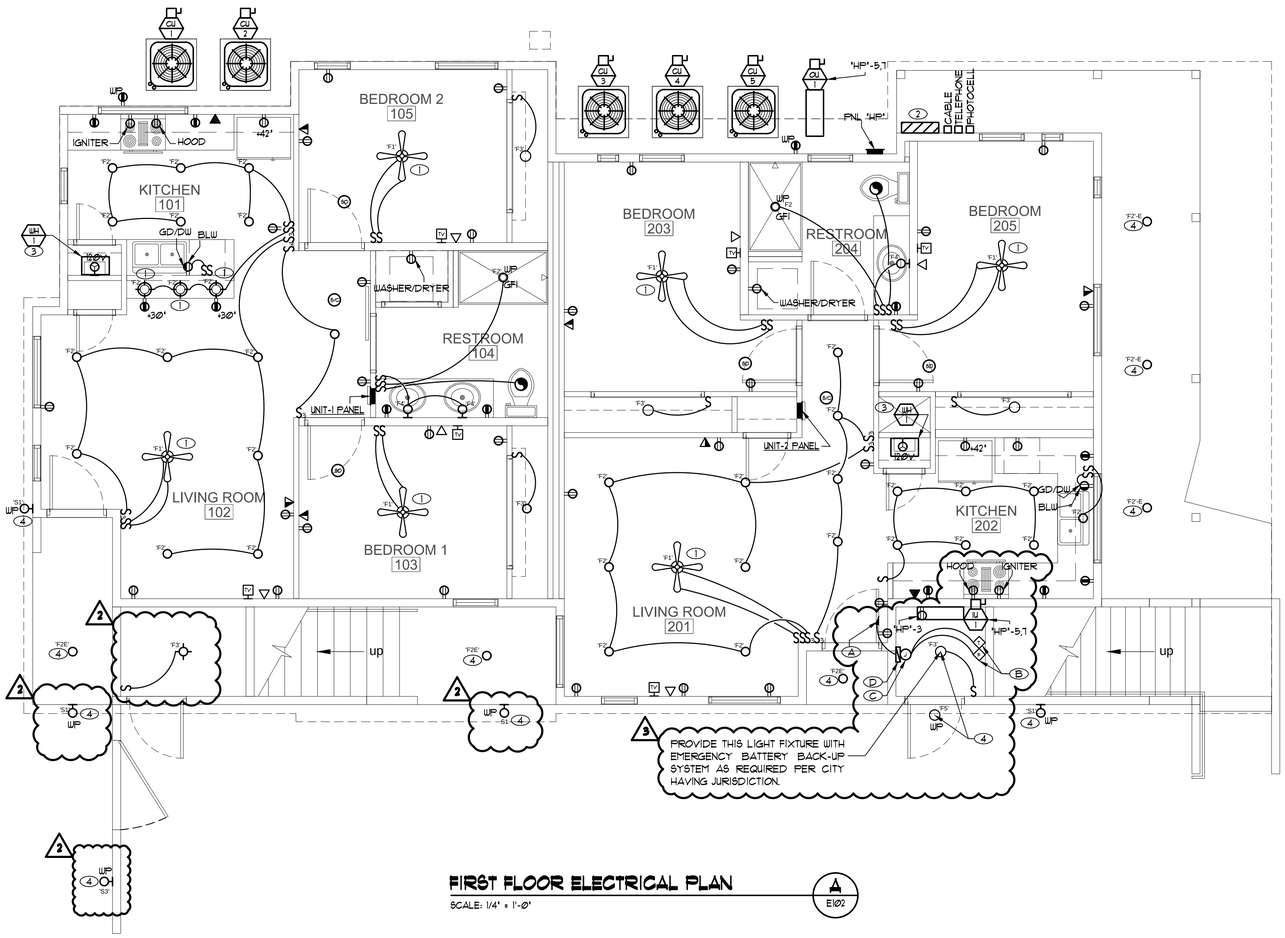
Phone: office 702.360.0020, cell 702.321.5700
Website: marianoeng.com

150 COPPER ST.
HENDERSON, NEVADA
SPECIFICATIONS, PLAN NOTES, ABBRS, SHEET INDEX, SYMBOL LIST & PRIOR TO COMMENCING WORK

JOB NO.:	201724-C
PHASE:	CD
DRAWN:	SO, LE
CHECKED:	SO
DATE:	10/22/2018

E101



FIRST FLOOR ELECTRICAL PLAN

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

E102

GENERAL PLAN NOTES

1. ALL LIGHT FIXTURES TO BE SPECIFIED BY OWNER/DEVELOPER, FURNISHED AND INSTALLED BY CONTRACTOR.
2. REFER TO SHEET E-1 FOR ELECTRICAL FLOOR PLAN NOTES AND LEGEND
3. PROVIDE DISCONNECT SWITCH AND 240V POWER FOR MECHANICAL FORCE AIR UNITS.
4. ALL ATTIC ACCESSES SHALL BE PROVIDED WITH A SWITCH, LIGHT AND 120V GFI OUTLET AT OR NEAR THE FORCED AIR UNIT. LOCATE SWITCH NEAR ATTIC ACCESS PANEL.
5. SWITCHES SHALL BE MOUNTED AT A MAXIMUM OF 48" ABOVE FINISHED FLOOR. GENERAL RECEPTACLES, TV AND TELE/COMPUTER OUTLETS SHALL BE MOUNTED AT A MINIMUM OF 18" ABOVE FINISHED FLOOR. INSTALL RECEPTACLE IN KITCHEN AND BATHROOMS 6" ABOVE COUNTER HORIZONTALLY UNLESS NOTED OTHERWISE.
6. COORDINATE AND VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF WALL MOUNTED LIGHT FIXTURES WITH OWNER PRIOR TO INSTALLATION.
7. ALL LIGHTING FIXTURE LUMINAIRE INSTALLED INSIDE THE SHOWER ROOM SHALL NOT EXCEED 40 WATTS.
8. PROVIDE MINIMUM 4" THICK WALL FOR MOUNTING ELECTRICAL SUBPANELS.
9. ALL BRANCH CIRCUITS THAT SUPPLY 125-VOLT, SINGLE PHASE, 15 AND 20 AMP OUTLETS INSTALLED IN DWELLING UNIT BEDROOMS, FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY AN ARC-FAULT CIRCUIT INTERRUPTER LISTED TO PROVIDE PROTECTION OF ENTIRE BRANCH CIRCUIT. NEC ARTICLE 210.12 (A). SMOKE DETECTORS SHALL BE INCLUDED IN THE ARC-FAULT CIRCUIT INTERRUPTER PROTECTION OF DWELLING UNIT BEDROOM BRANCH CIRCUITS.
10. ALL ELECTRICAL PENETRATIONS THROUGH A FIRE RATED BARRIER (I.E., WALLS, CEILINGS AND/OR FLOORS) SHALL BE PROVIDED WITH A FIRE RATED ESCUTCHEON OR EQUAL. THE FIRE ESCUTCHEON AND ITS INSTALLATION SHALL BE FIRE RATED EQUAL OR BETTER THAN THE BARRIER.

KEYED PLAN NOTES

(1) WHERE A BOX IS USED AS THE SOLE SUPPORT OF A LIGHT FIXTURE, THE BOX SHALL BE LISTED FOR THE APPLICATION AND FOR THE WEIGHT OF THE FIXTURE SUPPORTED. NEC ART. 314.27(A)(B). CONSULT OWNER FOR FIXTURE TYPE AND FINISH.

(2) REFER TO SINGLE LINE DIAGRAM FOR DETAILS. MAIN ELECTRICAL SERVICE LOCATION TO COMPLY WITH LOCAL POWER UTILITY REQUIREMENTS.

(3) PROVIDE 120V SPECIAL RECEPTACLE FOR ELECTRICAL WATER HEATER. COORDINATE & VERIFY ALL ELECTRICAL REQUIREMENTS WITH MANUFACTURER.

(4) SEE SITE ELECTRICAL PLAN FOR CIRCUITING.

FIRE RISER ROOM KEYED NOTES

(A) FIRE ALARM CONTROL WIRING AS REQUIRED TO TELEPHONE BOX/BACKBOARD. COORDINATE WITH FIRE ALARM CONTRACTOR FOR REQUIREMENTS.

(B) PROVIDE CONNECTION OF FLOW SWITCH AND TAMPER SWITCHES TO FIRE MONITORING PANEL. VERIFY LOCATIONS, SWITCHES PROVIDED BY FIRE PROTECTION CONTRACTOR.

(C) PROVIDE WP JUNCTION BOX FOR CONNECTION TO COMBINATION FIRE ALARM HORN/STROBE. VERIFY LOCATION, PROVIDE AS PER LOCAL FIRE DEPARTMENT REQUIREMENTS.

(D) FIRE MONITORING PANEL WITH BATTERY BACK-UP. PROVIDED BY FIRE PROTECTION CONTRACTOR. VERIFY LOCATION.

REVISIONS

NO.	DATE	DESCRIPTION	BY
1	11-28-18	BLDG DPT COMMENT	
2	1-30-19	BLDG DPT COMMENT	
3	1-30-19	BLDG DPT COMMENT	

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FIRST FLOOR ELECTRICAL PLAN

JOB NO.:	201724-C
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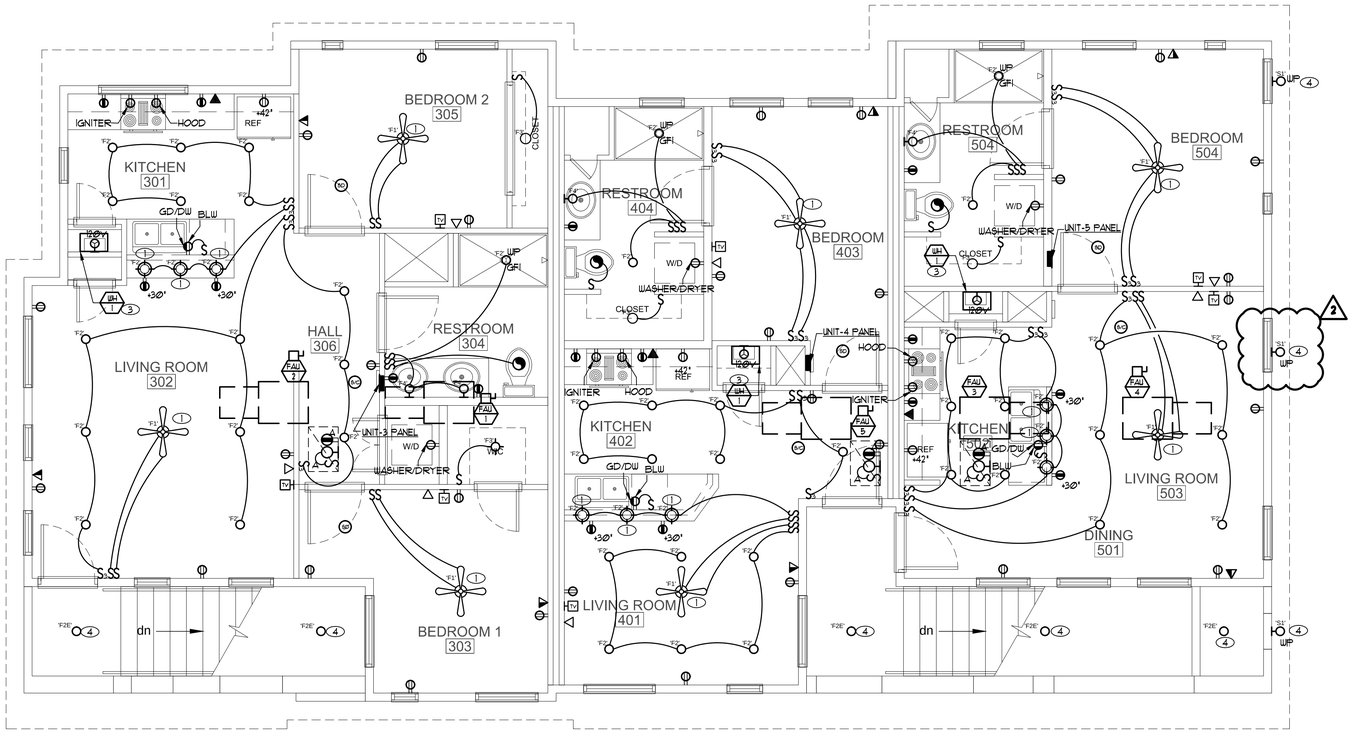
E102



SECOND FLOOR ELECTRICAL PLAN

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

E103

GENERAL PLAN NOTES

1. ALL LIGHT FIXTURES TO BE SPECIFIED BY OWNER/DEVELOPER, FURNISHED AND INSTALLED BY CONTRACTOR.
2. REFER TO SHEET E-1 FOR ELECTRICAL FLOOR PLAN NOTES AND LEGEND
3. PROVIDE DISCONNECT SWITCH AND 240V POWER FOR MECHANICAL FORCE AIR UNITS.
4. ALL ATTIC ACCESSES SHALL BE PROVIDED WITH A SWITCH, LIGHT AND 120V GFI OUTLET AT OR NEAR THE FORCED AIR UNIT. LOCATE SWITCH NEAR ATTIC ACCESS PANEL.
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6. COORDINATE AND VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF WALL MOUNTED LIGHT FIXTURES WITH OWNER PRIOR TO INSTALLATION.
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8. PROVIDE MINIMUM 4" THICK WALL FOR MOUNTING ELECTRICAL SUBPANELS.
9. ALL BRANCH CIRCUITS THAT SUPPLY 125-VOLT, SINGLE PHASE, 15 AND 20 AMP OUTLETS INSTALLED IN DWELLING UNIT BEDROOMS, FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY AN ARC-FAULT CIRCUIT INTERRUPTER LISTED TO PROVIDE PROTECTION OF ENTIRE BRANCH CIRCUIT. NEC ARTICLE 210.12 (A). SMOKE DETECTORS SHALL BE INCLUDED IN THE ARC-FAULT CIRCUIT INTERRUPTER PROTECTION OF DWELLING UNIT BEDROOM BRANCH CIRCUITS.
10. ALL ELECTRICAL PENETRATIONS THROUGH A FIRE RATED BARRIER (I.E., WALLS, CEILINGS AND/OR FLOORS) SHALL BE PROVIDED WITH A FIRE RATED ESCUTCHEON OR EQUAL. THE FIRE ESCUTCHEON AND ITS INSTALLATION SHALL BE FIRE RATED EQUAL OR BETTER THAN THE BARRIER.

KEYED PLAN NOTES

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2. REFER TO SINGLE LINE DIAGRAM FOR DETAILS. MAIN ELECTRICAL SERVICE LOCATION TO COMPLY WITH LOCAL POWER UTILITY REQUIREMENTS.
3. PROVIDE 120V SPECIAL RECEPTACLE FOR ELECTRICAL WATER HEATER. COORDINATE & VERIFY ALL ELECTRICAL REQUIREMENTS WITH MANUFACTURER.
4. SEE SITE ELECTRICAL PLAN FOR CIRCUITING.

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SECOND FLOOR ELECTRICAL PLAN

JOB NO.:	201724-C
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DATE:	10/22/2018

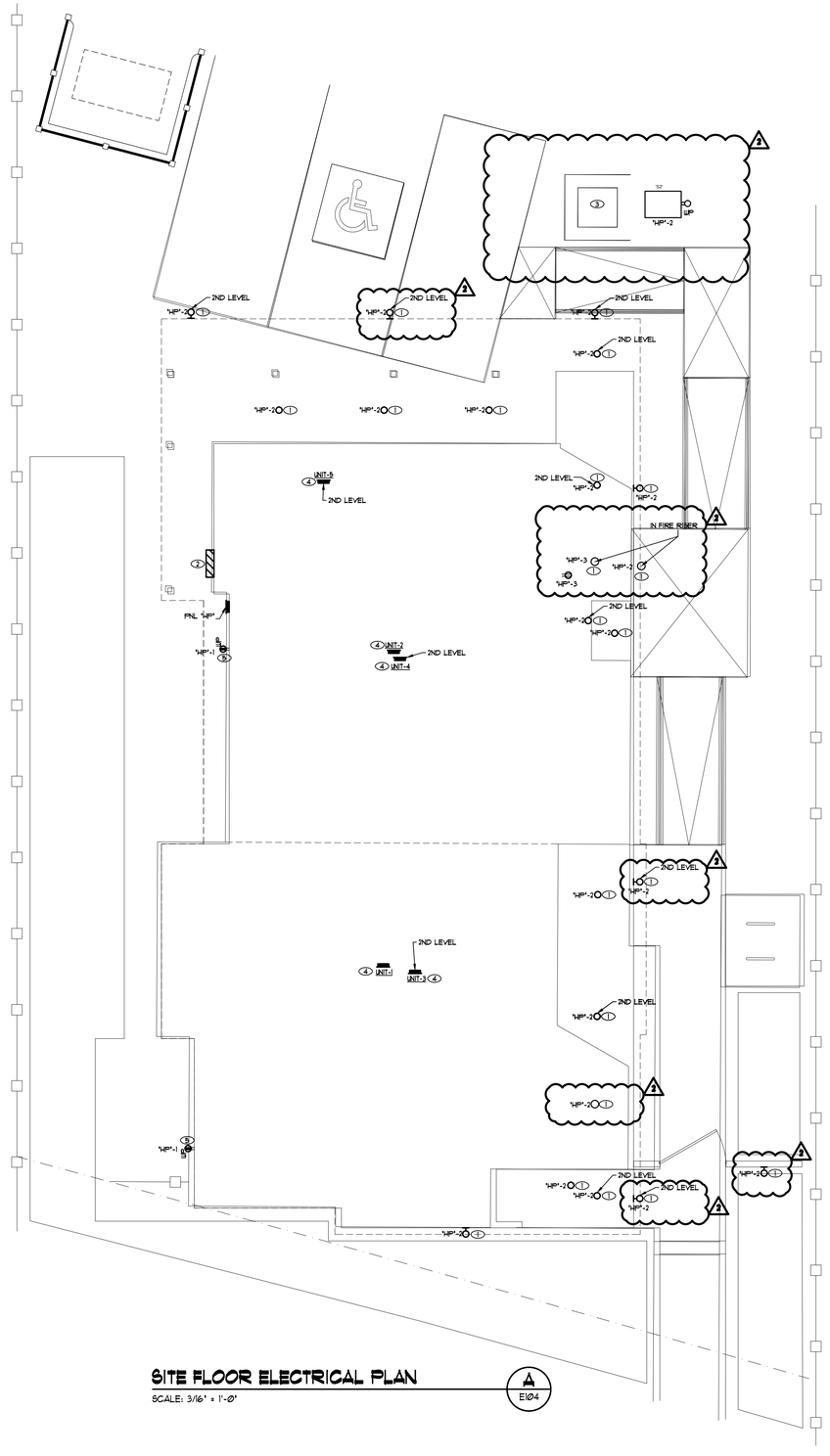
E103

GENERAL PLAN NOTES

1. ALL LIGHT FIXTURES TO BE SPECIFIED BY OWNER/DEVELOPER, FURNISHED AND INSTALLED BY CONTRACTOR.
2. REFER TO SHEET E-1 FOR ELECTRICAL FLOOR PLAN NOTES AND LEGEND.
3. PROVIDE DISCONNECT SWITCH AND 240V POWER FOR MECHANICAL FORCE AIR UNITS.
4. COORDINATE AND VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF WALL MOUNTED LIGHT FIXTURES WITH OWNER PRIOR TO INSTALLATION. CONNECT TO LIGHTING CONTROL PANEL.
5. PROVIDE MINIMUM 4" THICK WALL FOR MOUNTING ELECTRICAL SUBPANELS.

KEYED PLAN NOTES

1. SEE ELECTRICAL FLOOR PLAN FOR TYPE OF FIXTURES AND REQUIREMENTS. VERIFY WITH ARCHITECT EXACT LOCATIONS.
2. REFER TO SINGLE LINE DIAGRAM FOR DETAILS. MAIN ELECTRICAL SERVICE LOCATION TO COMPLY WITH LOCAL POWER UTILITY REQUIREMENTS.
3. NVENERGY TRANSFORMER. THIS SITE MAY BE FED THRU AN OVERHEAD SERVICE DROP. CONTRACTOR SHALL PROPERLY VERIFY AND COORDINATE WITH NVENERGY FOR CORRECT SERVICE AND PROVIDE ALL THE REQUIREMENTS PER THE UTILITY STANDARDS AS REQUIRED.
4. UNIT PANEL APPROXIMATE LOCATION. SEE ELECTRICAL FLOOR PLAN AND PANEL LOAD CALCULATIONS FOR MORE DETAILS.
5. MAINTENANCE RECEPTACLES, SEE FLOOR PLAN.



SITE FLOOR ELECTRICAL PLAN

SCALE: 3/16" = 1'-0"

E104

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HENDERSON, NEVADA

SITE ELECTRICAL PLAN

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E104

KEYED PLAN NOTES

(X) X-DENOTES NUMBER OF FEEDER, POINT WHERE AVAILABLE FAULT, & %VOLTAGE DROP; SEE SCHEDULE ON THIS SHEET. PROVIDE APPROPRIATE PANEL/EQUIPMENT SHORT CIRCUIT (KAIC) BRACING AS REQUIRED.

(1) PROVDE NEW NVENERGY SERVICE PER NVENRGY REQUIREMENTS, COMPLETE INCLUDING TRENCHING, DIGGING, BACKFILL, AND OR RESTORING ORIGINAL SURFACE AS REQUIRED, AND OR ALL LABOR AND MATERIALS NOT PROVIDED BY NVENERGY FOR A COMPLETE OPERATIONAL SYSTEM.

THIS SITE MAY BE FED THRU AN OVERHEAD SERVICE DROP, CONTRACTOR SHALL PROPERLY VERIFY AND COORDINATE WITH NVENERGY FOR CORRECT SERVICE AND PROVIDE ALL THE REQUIREMENTS PER THE UTILITY STANDARDS AS REQUIRED.

(2) PROVIDE NEW MAIN/METER SWITCHGEAR AS REQUIRED, SEE SINGLE LINE DIAGRAM FOR DETAILS.

(3) PROVIDE NEW BONDING AND GROUNDING AS REQUIRED BY NEC 250, SEE SINGLE LINE FOR DETAILS.

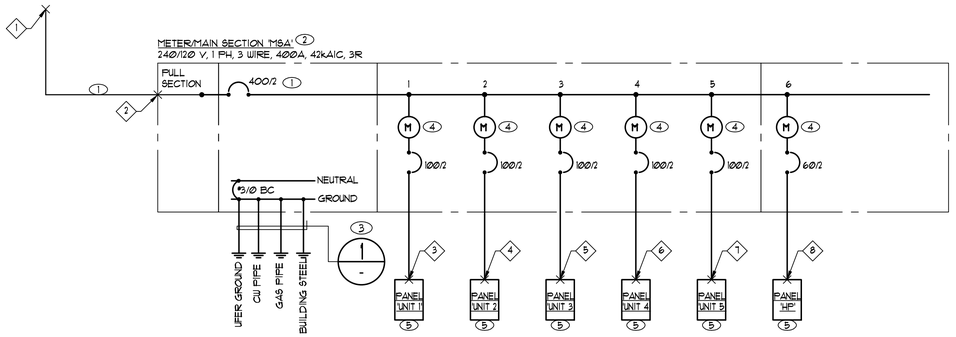
(4) PROVIDE NEW CIRCUIT BREAKER & METER SETS AS REQUIRED, SIZE AS INDICATED IN SINGLE LINE DIAGRAM.

(5) PROVIDE PANEL, SEE PANEL LOAD SCHEDULE & CALCULATIONS FOR DETAILS.

THE DESIGN PROFESSIONAL HAS PERFORMED ALL THE REQUIRED VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND FEEDERS PER NEC.

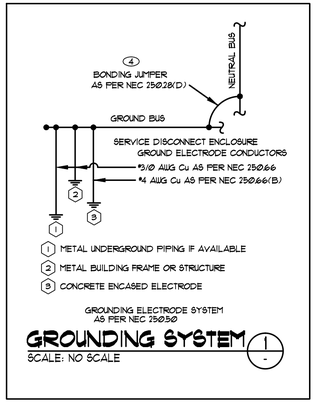
THE DESIGN PROFESSIONAL HAS PERFORMED ALL THE REQUIRED SHORT CIRCUIT CALCULATIONS BASED ON ASSUMED 1000KVA TRANSFORMER AND 4SETS OF #3/0 COPPER WIRES AT 40FEET AWAY SERVIDE LATERAL AND THE AIC RATING INDICATED FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

SINGLE LINE IS DIAGRAMMATICAL ONLY. PRIOR TO BIDDING AND OR ORDERING EQUIPMENT THE CONTRACTOR SHALL VERIFY AVAILABLE TYPE OF SWITCHGEAR/METER OR ELECTRICAL EQUIPMENT THAT WILL FIT IN THE ELECTRICAL ROOM OR WALL PER CODE, UTILITY, AND/OR CITY HAVING JURISDICTION INCLUDING CONDUIT PLACEMENT OR LAYOUT. ADVISE OWNER OR ARCHITECT IF ADDITIONAL ROOM IS NEEDED. OTHERWISE CONTRACTOR SHALL ADD IN HIS/HER BID ALL THE ADDITIONAL LABOR AND MATERIALS TO HAVE INSTALLATION IN COMPLIANCE WITH THE APPROVAL AND SATISFACTION OF OWNER AND OR UTILITY AND/OR CITY HAVING JURISDICTION.



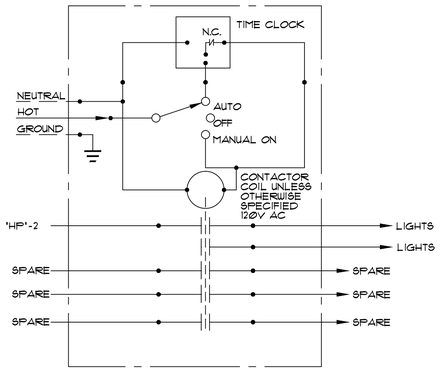
SINGLE LINE DIAGRAM

NOT TO SCALE



GROUNDING SYSTEM

SCALE: NO SCALE



PROVIDE LIGHTING CONTACTOR NEMA 3R ENCLOSURE PER IECC AND PROVIDE NUMBER OF CONTACTS AS REQUIRED (LOCATE PER OWNER)

LIGHTING CONTROL DETAIL "LCP"

NOT TO SCALE

LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER/ CATALOG NUMBER	VOLTAGE	NO. LAMPS	WATTS FIXT.	LAMP TYPE	REMARKS	PROVIDE LAMPS AS REQUIRED
"F1"	CEILING FAN WITH INTEGRAL LED LIGHT	LUMENCIA LL52SKY3SSN-ES-LED SERIES	120	INCL		LED	OR APPROVED BY OWNER/ ARCHITECT	INSTALL WITHOUT 6 INCH DOWN ROD FAN HEIGHT APPROX. 12 INCHES VERIFY CEILING CLEARANCE
"F2"	4 INCH LED DOWNLIGHT BAFFLE / RECESSED	ELCO E414C-08-30-W HOUSING: E4LC-08-ICA-D	UNV	INCL	8.76	LED	OR APPROVED BY OWNER/ ARCHITECT	PROVIDE COMPLETE KIT INCLUDING SPECIAL MOUNTING BRACKET, ETC. AS REQUIRED
"F2E"	EMERGENCY 4 INCH LED DOWNLIGHT BAFFLE / RECESSED	ELCO E414C-08-30-W HOUSING: E4LC-08-ICA-D-EM1	UNV	INCL	8.76	LED	OR APPROVED BY OWNER/ ARCHITECT	EM BATTERY BACK UP 700 LUMENS FOR 90 MINUTES
"F3"	CLOSET LIGHT	FEIT 71801	120V	INCL	17.5	LED	OR APPROVED BY OWNER/ ARCHITECT	
"F4"	BATHROOM VANITY FIXTURE	BROWNLEE 5172-25-BN-H16LED-30K	120V	INCL	16	LED	OR APPROVED BY OWNER/ ARCHITECT	
"F5"	LED VAPOR TIGHT WALL MOUNT	CREE C-VTT-A-SMWL-9-40K-GR	120V	INCL	14	LED	OR APPROVED BY OWNER/ ARCHITECT	
"S1"	WALL PACK WITH EM BACK-UP AND PHOTOCELL	MOBERN MILGCOWPK-LED-36-MV-50-PC120 EM	120V	INCL	35	LED	OR APPROVED BY OWNER/ ARCHITECT	PHOTOCELL MUST BE SPECIFIED FOR LINE VOLTAGE
"S2"	AREA LIGHT PARKING SPACES 16 FOOT POLE	NLS VUE VUE1-T3-32L-1-50K-UNV-DPS6-BRZ-PC…..POLE SSSP-16-4S-11G98C-SGL-BRZ-3430	UNV	INCL	106	LED	OR APPROVED BY OWNER/ ARCHITECT	

NOTES:
1. WHEN REQUIRED, UNIVERSAL OR ADVANCED BALLAST ONLY: ELECTRONIC, PARALLEL > 0.90 POWER FACTOR, REDUCED HARMONICS <0.10
2. UL LISTED AND APPROVED FOR WET OR DAMP LOCATION, DEPENDING ON CONDITIONS
3. COORDINATE BLDG PENETRATION WITH EXTERIOR BLDG SURFACE MATERIALS. PROVIDE MANUFACTURERS LISTED PENETRATION SEALS. ALL PENETRATIONS SHALL BE MADE WATER PROOF. COORDINATE WITH OTHER TRADES REQUIREMENTS. WHERE APPLICABLE
4. WHEN FIXTURE IS DENOTED WITH AN "E" EXAMPLE - F1E, PROVIDE 90 MINUTE EMERGENCY OPERATION WITH ACCESSIBLE TEST SWITCH. 1100 LUMEN BATTERY PACK MANUFACTURED BY BODINE WITH 5 YEAR WARRANTY. TEST SWITCH SHALL BE FIXTURE MOUNTED, EXTERIOR FIXTURE TEST SWITCHES SI-WEATHERPROOF. ALL LIGHTING FIXTURE WITH BATTERY PACKS REQUIRE A SEPARATE NON-SWITCH, HOT CONDUCTOR FOR OPERATION. DISCONNECT POWER TO BATTERY PACKS WILL CAUSE THEM TO DISCHARGE. (OR PER OWNER'S APPROVED)
5. PROVIDE WITH FIXTURE MOUNTED PHOTOCELL.
6. **ALL SWITCHING AND MOUNTING SHOWN IN DRAWINGS ARE GENERIC IN NATURE. BEFORE ORDERING FIXTURES YOU SHALL VERIFY WITH ARCHITECT/ACHITECTURAL'S SWITCHING AND MOUNTING REQUIREMENTS AND PROVIDE THE APPROPRIATE BALLASTS, FIXTURES OR MOUNTINGS MATERIALS AS NEEDED.**
7. **YOU SHALL ADHERE TO THE NOTES IN THE "PRIOR TO COMMENCING WORK" AS STATED IN COVER SHEET OR ELSEWHERE ON DRAWINGS.**

MAIN PANEL

"MSA"

150 COPPER STREET, HENDERSON, NV 89015

General Load			
	Sq. ft.	VA per Sq. ft.	VA
General Lighting (SF at 3VA/SF)	**3830**	3	11490
	# of Units		
20A Small appliance load circuits at 1500VA, 2 each min.	**10**	1500	15000
Laundry (Washing Machine) 1500VA 1 min.	**5**	1500	7500
		Subtotal (1)	**33990**
First 10,000VA of general load at 100%			10000
Remainder of subtotal (1) at 45%	ST	23990	10795.5
If over 120,000VA VA use 25%	ST	0	0
		Subtotal (2)	**20795.5**

Electrical (Cooking) Appliances (Use NEC TabLE)			
	# of Units	VA	**DF%**
Range (from table 220-55 rating, Owner's Alternative) Gas		0	
Double Electric Oven (Owner Option)		0	
Clothes dryer 100%, table 220-54 (Owner's Alternative) Gas		0	
		Subtotal (3)	**0**

Heating, A/C: Name and List each Equip components VA @ 100%				
	# of Units	Amps	Watts	VA
CU-1	**1**	19.1	230	4393
CU-2	**1**	20.6	230	4738
CU-3	**1**	19.1	230	4393
CU-4	**1**	19.1	230	4393
CU-5	**1**	19.1	230	4393
CU-6	**1**	19.1	230	4393
FAU-1	1	7.7	115	886
FAU-2	1	7.7	115	886
FAU-3	1	7.7	115	886
FAU-4	1	7.7	115	886
FAU-5	1	7.7	115	886
FAU-6	1	7.7	115	886
Exhaust Fan 1	**2**	1.4	120	336
Exhaust Fan 2	**0**	1.8	120	0
Space Heating (Gas)	**0**		**8000**	0
			Subtotal (4)	**32352**

Fixed Appliances - use 100%. If four or more, a demand of 75% is allowed			
	# of Units	VA	VA
Garbage Disposal	**10**	**800**	8000
Microwave	**10**	**1000**	10000
Water Heater (Gas)	**0**	**4500**	0
Dishwasher	**10**	**800**	8000
	0.75		**19500**
		Subtotal (5)	

Miscellaneous Motor Loads			
	# of Units	VA	VA
Future Pool Equip	**0**	**10000**	0
Jacuzzi Allowance	**0**	**5000**	0
25% Large Motor including A/C comp.	0.25	**4738**	1184.5
		Subtotal (6)	**1185**
ADD 4800VA at New House per Ordinance		**Subtotal (7)**	**0**
Grand Total of subtotals (2) + (3) + (4) + (5) + (6) + (7) =			73832
Add House Panel "HP" VA =			5518
Grand Total VA = 79350 divided by 240V=			331 Amperes
Use Minimum Panel Size = 400 Amperes			

PANEL NAME "HP"	LINE-LINE VOLTS	PHASE VOLTS	SYSTEM PHASE
	240	120	1
NO OF WIRE SYSTEM	3		
MAIN BREAKER OR FUSE SIZE	60		
MAIN LUG BUSS SIZE	60		

LOCATION: SEE PLAN

FEED: TOP
ENCL: NEMA-3R
AVAIL SHRT CKT 16.67 KAIC
SHRT CKT BRACE 22 KAIC
%VDROP = 0.11%

POLE #	DESCRIPTION	PHASE A	PHASE B	POLE	C.B.	C.B.	POLE	PHASE	PHASE	DESCRIPTION	POLE #
1	MAINTENACE RECEPTACLES	900		1	20	20	1	1486		BLDG LIGHTS + POLE LIGHT	2
3	FIRE RISER RECEPTACLE & LIGHT		360	1	20	30				HVAC	4
5	OU-UNIT & IU-UNIT	1200		2	15						6
7	-		1200								8
9											10
11											12
	SUB-TOTAL =	2100	1560					1486	0	= SUB-TOTAL	
	TOTAL CONNECTED VA/PHASE =	3686	1560					30	13	= TOTAL CONNECTED AMPS/PHASE	
	TOTAL CONNECTED VA =	5146									

TOTAL DEMAND	Load	DF	DEMAND
LIGHTING IN VA	1486	25%	371.6
RECEPTACLES > 10K IN VA		50%	0
LARGEST MOTOR IN VA		25%	0
THIS PANEL LOAD IN VA	5146	100%	5146
TOTAL PANEL IN VA			5517.5
		TOTAL AMPERES =	23

NOTES:
PROVIDE 3/4"C WITH 3#6 & 1#10 GND (Copper)
PROVIDE APPROPRIATE WIRE SIZES PER NEC

FEEDER, AVAILABLE FAULT, & %VD SCHEDULE

DATE PERFORMED: 01/31/19

CONTRACTOR SHALL MARK IN THE FIELD THE MAXIMUM AVAILABLE CURRENT ON THE SERVICE EQUIPMENT PER NEC 110.24 (A) OR AS REQUIRED BY CITY HAVING JURISDICTION

	FROM UTILITY XFMR
1	AVAIL FAULT = 55766 %VDROP = 0%
2	PANEL NAME = **"MSA"** FEEDER SIZE = 2SETS OF 2"C WITH 3#3/0 & 1#3 GND (Copper) ABOVE FEEDER SIZE IS USED FOR CALCULATION ONLY, PROVIDE PER UTILITY REQUIREMENTS AS REQUIRED. AVAIL FAULT (AIC)= 23352 %VDrop = 0.00%
3	PANEL NAME = **"UNIT-1"** FEEDER SIZE = 1"C WITH 3#4 & 1#8 GND (Copper) wire types to be per NEC table 310.15(B)(7) AVAIL FAULT (AIC)= 7222 %VDrop = 1.49%
4	PANEL NAME = **"UNIT-2"** FEEDER SIZE = 1"C WITH 3#4 & 1#8 GND (Copper) wire types to be per NEC table 310.15(B)(7) AVAIL FAULT (AIC)= 9846 %VDrop = 0.95%
5	PANEL NAME = **"UNIT-3"** FEEDER SIZE = 1-1/2"C WITH 3#4 & 1#8 GND (Copper) wire types to be per NEC table 310.15(B)(7) AVAIL FAULT (AIC)= 6245 %VDrop = 1.86%
6	PANEL NAME = **"UNIT-4"** FEEDER SIZE = 1"C WITH 3#4 & 1#8 GND (Copper) wire types to be per NEC table 310.15(B)(7) AVAIL FAULT (AIC)= 7835 %VDrop = 1.26%
7	PANEL NAME = **"UNIT-5"** FEEDER SIZE = 1"C WITH 3#4 & 1#8 GND (Copper) wire types to be per NEC table 310.15(B)(7) AVAIL FAULT (AIC)= 8407 %VDrop = 1.15%
8	PANEL NAME = **"HP"** FEEDER SIZE = 3/4"C WITH 3#6 & 1#10 GND (Copper) AVAIL FAULT (AIC)= 16669 %VDrop = 0.11%

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