# GENERAL ELECTRICAL SPECIFICATIONS

1. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK.
2. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE. INSTALL CONDUIT RUNS AS SPECIFIED WITH SCHEMATIC REPRESENTATION INDICATED ON THE DRAWINGS AND AS SPECIFIED.
3. WHERE CONDUITS ARE SHOWN AS "HOME RUNS" ON THE CONTRACT DRAWINGS, OR STATED TO BE FURNISHED, BUT NOT EXPLICITLY SHOWN AS PART OF THE SCOPE OF WORK, THE CONTRACTOR SHALL PROVIDE ALL CONDUITS, FITTINGS, BOXES, WIRING, CONDUIT SEALS, ETC., AS REQUIRED FOR COMPLETION OF THE RACEWAY SYSTEM IN COMPLIANCE WITH THE NEC AND THE CONTRACT DOCUMENTS.
4. MODIFY CONDUIT RUNS TO SUIT FIELD CONDITIONS, AS ACCEPTED BY THE OWNER'S REPRESENTATIVE.
5. FINAL CONNECTIONS & ROUGH-IN REQUIREMENTS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
6. CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL, MECHANICAL AND OTHER DRAWINGS PRIOR TO BID.
7. CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED. CONTRACTOR SHALL REPORT DISCREPANCIES TO THE ARCHITECT AND INCLUDE IN ITS BID ALL COSTS REQUIRED TO MAKE HIS WORK MEET EXISTING CONDITIONS.
8. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
9. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES AND ORDINANCES.
10. ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.
11. PROVIDE PERMITS AND INSPECTIONS REQUIRED.
12. GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USAGE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO THE OWNER.
13. PROVIDE RECORD DRAWINGS TO THE OWNER'S REPRESENTATIVE. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.
14. VERIFY EXACT LOCATION AND ELECTRICAL CHARACTERISTICS OF EQUIPMENT TO BE FURNISHED BY OTHER DISCIPLINES PRIOR TO ROUGH-IN.
15. SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO COST TO OWNER.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
17. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS OR EQUIPMENT.
18. SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION. LIGHTS, SWITCHES, RECEPTACLES, MOTORS, ETC., SHALL BE CONNECTED AND OPERABLE.
19. PRESENT SUBMITTAL DATA AT ONE TIME BOUND IN PDF FORMAT OR PER THE OWNER'S REQUIREMENTS. SUBMITTALS SHALL BE INDEXED IN A NEAT AND ORDERLY MANNER. PARTIAL SUBMITTALS WILL NOT BE ACCEPTED. SUBMITTALS SHALL INCLUDE ALL EQUIPMENT SPECIFIED UNDER THIS PROJECT. SHOULD CONTRACTOR FAIL TO PROVIDE SUBMITTALS, CONTRACTOR PROCEEDS AT ITS OWN RISK AND ANY COST FOR CORRECTIVE WORK WILL BE BORNE BY THE CONTRACTOR.
20. PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. FIRESTOP ALL PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE.
21. PROTRUDING OBJECTS SHALL COMPLY WITH ADAAG 307. WALL MOUNTED FIXTURES OR SIMILAR WALL MOUNTED DEVICES SHALL NOT PROTRUDE MORE THAN 4" HORIZONTALLY INTO THE CIRCULATION PATH, OR OTHERWISE SHALL BE INSTALLED 80" MINIMUM TO THE BOTTOM OF THE FIXTURE.

# DISTRIBUTION EQUIPMENT

1. SWITCHBOARDS, DISTRIBUTION BOARDS, PANELBOARDS, DISCONNECT SWITCHES, MOTOR CONTROL CENTERS, ETC. SHALL BE MANUFACTURED BY GENERAL ELECTRIC, SIEMENS, SQUARE 'D' OR CUTLER-HAMMER. BOLT FREE STANDING EQUIPMENT TO 4" HIGH CONCRETE HOUSEKEEPING PADS. PROVIDE FUSED DISCONNECT SWITCHES WHEN FED FROM PANELBOARDS OR DISTRIBUTION BOARDS RATED OVER 10kAIC.
2. PROVIDE ARC FLASH WARNING LABELS ON ALL ELECTRICAL EQUIPMENT SUCH AS SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOCKET ENCLOSURES, AND MOTOR CONTROL CENTERS THAT ARE LIKELY TO REQUIRE EXAMINATION, ADJUSTMENT, SERVICING OR MAINTENANCE WHILE ENERGIZED PER NEC 2008 110.16 TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS.
3. ALL EQUIPMENT SUCH AS SWITCHBOARDS, DISTRIBUTION BOARDS, DISCONNECT SWITCHES, TRANSFORMERS AND PANELBOARDS SHALL BE BY THE SAME MANUFACTURER. ALL FUSES PROVIDED SHALL BE OF THE SAME MANUFACTURER.
4. WHERE PANELS ARE INSTALLED FLUSH WITH WALLS, EMPTY CONDUITS SHALL BE EXTENDED FROM THE PANEL TO AN ACCESSIBLE SPACE ABOVE OR BELOW. A MINIMUM OF ONE 3/4"C SHALL BE INSTALLED FOR EVERY THREE SINGLE POLE SPARE CIRCUIT BREAKERS OR SPACES, OR FRACTION THEREOF, BUT NOT LESS THAN TWO CONDUITS.
5. PROVIDE ENGRAVED NAMEPLATES ON SWITCHBOARDS, PANELBOARDS, DISCONNECT SWITCHES, MOTOR CONTROL CENTERS, TRANSFORMERS, ETC., INDICATING EQUIPMENT DESIGNATION (OR DESIGNATION OF EQUIPMENT SERVED) AND VOLTAGE.
6. PANEL DIRECTORIES SHALL BE REMOVABLE. SUBMIT PROPOSED SCHEDULE OF DIRECTORIES TO OWNER FOR APPROVAL. ROOM NAMES AND NUMBERS SHALL BE AS DIRECTED BY OWNER. DIRECTORIES SHALL BE TYPED AND INSTALLED UNDER CLEAR PLASTIC COVERS.
7. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE. FUSIBLE SWITCHES SHALL ACCEPT CLASS 'R' FUSES ONLY AND REJECT ALL OTHERS. INSTALL DISCONNECT SWITCH ON TWO 24" LONG UNISTRUT CHANNELS DRILLED AND BOLTED TO HVAC UNIT FRAME WHERE POSSIBLE (COORDINATE LOCATION W/ HVAC MANUFACTURER TO AVOID WARRANTY INFRACTIONS). SILICONE SEAL ALL HOLES IN UNIT.

# ELECTRICAL SYMBOLS

(D) or

ELECTRICAL DEMOLITION. REMOVE EQUIPMENT AND APPURTENANCES IN THEIR ENTIRETY U.N.O. COORDINATE WORK RESTRICTIONS PRIOR TO DEMOLITION.

HOMERUN CONDUIT – STROKES INDICATE QUANTITY OF CONDUCTORS

CONDUIT/WIRE CONCEALED IN WALL OR ABOVE CEILING EXCEPT IN EXPOSED STRUCTURE AREAS 1/2"-2 #12 & 1 #12 GND THWN U.N.O.

CONDUIT AND/OR WIRE BELOW FLOOR OR GRADE 3/4"-2 #12 & 1 #12 GND THWN UNLESS NOTED

EXISTING CONDUIT AND/OR CONDUCTORS TO REMAIN (SHOWN LIGHT)

SINGLE POLE SWITCH @ +48" TO TOP UNLESS NOTED
a = DEVICE SWITCH IDENTIFICATION (LOWERCASE)

IF b:

| | | | |
|---|---|---|---|
| F | = 3 SPEED SWITCH | D | = DIMMER SWITCH |
| 2 | = 2 POLE SWITCH | K | = KEY OPERATED SWITCH |
| 3 | = 3-WAY SWITCH | M | = MOTION SENSOR SWITCH |
| 4 | = 4-WAY SWITCH | T | = THERMAL OVERLOAD SWITCH |
| L | = BACKLIT SWITCH | TM | = SWITCH WITH DIGITAL TIMER |

WALL MOUNTED DUPLEX RECEPTACLE @ +18" TO CENTER U.N.O.
= RECEPTACLE PROTECTED BY GFCI BREAKER, OR GFCI TYPE RECEPTACLE INSTALLED PER NEC 210.8.
= DOUBLE DUPLEX RECEPTACLE
= 1/2 SWITCHED (BOTTOM HALF) DUPLEX RECEPTACLE

IF a:
AV = AV RECEPTACLE
C = RECEPTACLE INSTALLED ABOVE COUNTER
H = RECEPTACLE INSTALLED HORIZONTALLY
T = TIMECLOCK RECEPTACLE
IG = ISOLATED GROUND TYPE (ORANGE) RECEPTACLE
IF b:
MOUNTING HEIGHT IN INCHES TO TOP OF RECEPTACLE

FLOOR MOUNT RECEPTACLE

CEILING MOUNT RECEPTACLE

SPECIAL RECEPTACLE @ +18" TO CENTER UNLESS NOTED

PC PHOTOCELL (INSTALL ON ROOF FACING NORTH)

HD HEAT DETECTOR

SMOKE DETECTOR

LUMINAIRE IDENTIFICATION
A = LUMINAIRE DESIGNATION (UPPERCASE)
a = SWITCH DESIGNATION (LOWERCASE)

SURFACE MOUNT TROFFER

DOWNLIGHT LUMINAIRE

WALL MOUNTED LUMINAIRE

SURFACE MOUNTED PANELBOARD

FLUSH MOUNTED PANELBOARD

MAIN SWITCHBOARD, MOTOR CONTROL CENTER OR DISTRIBUTION BOARD

METER

N NON-FUSED DISCONNECT SWITCH

F FUSED DISCONNECT SWITCH

J JUNCTION BOX, IF a:
FS = FIRE/SMOKE DAMPER CONNECTION
V = VARIABLE AIR VOLUME BOX CONNECTION
CF = CEILING FAN
S = SIGNAGE
WH = WATER HEATER

COMBINATION METER/MAIN

M SINGLE METER WITH CT,

CIRCUIT BREAKER

HP MOTOR LOAD

GROUND BUS & GROUND ELECTRODES

GROUNDING BUSBAR

TV TELEVISION OUTLET
(1) SERIES 6 COAX CABLE FROM TV TAP TO TV OUTLET

x TELEPHONE/DATA OUTLET
(X) 4-PAIR CAT-6 CABLES (TYPE 'H')
PROVIDE CORRESPONDING FACEPLATE WITH QTY OF PORTS AS REQUIRED, WHERE "X" INDICATED NUMBER OF PORTS.

# WIRING DEVICES

1. WIRING DEVICES SHALL BE SPECIFICATION GRADE AND RATED AT 20 AMPERES. THE DEVICE PLATES SHALL BE LEXAN OR NYLON (IN KITCHENS WITH STAINLESS STEEL COUNTERS DEVICE PLATES SHALL BE STAINLESS STEEL). THE COLOR OF THE DEVICES AND COVER PLATES SHALL BE AS DIRECTED BY ARCHITECT.
2. RECEPTACLES WHICH ARE SHOWN WALL MOUNTED ON THE ELECTRICAL DRAWINGS ON WALLS WHICH, ON THE ARCHITECTURAL DRAWINGS AND ELEVATIONS ARE SHOWN AS GLASS OR PARTITIONS, SHALL BE FLUSH FLOOR DUPLEX RECEPTACLES MOUNTED ADJACENT TO BASE OR WALLS. COORDINATE MOUNTING HEIGHTS & LOCATIONS OF ALL OUTLETS & DEVICES WITH ARCHITECTURAL CABINET DRAWINGS & INTERIOR ELEVATIONS.
3. FLUSH FLOOR RECEPTACLE OUTLETS SHALL BE HUBBELL #B-2527 WITH BRASS COVER #S-3925. PROVIDE CARPET OR TILE FLANGE TO MATCH
4. FLOOR FINISH. FLUSH FLOOR TELEPHONE OUTLETS SHALL BE HUBBELL #B-2527 WITH BRASS COVER #S-2725. PROVIDE CARPET OR TILE FLANGE TO MATCH FLOOR FINISH.
5. BOXES SHALL BE MINIMUM 4" SQUARE WITH REQUIRED EXTENSIONS & PLASTER OR TILE RINGS.
6. DEVICES INSTALLED IN FIRE RATED WALLS SHALL HAVE HEVI-DUTY NELSON FSP PUTTY, PADS INSTALLED TO MAINTAIN FIRE INTEGRITY-ONE PAD PER HOUR OF RATING. APPLY UL LISTED FIRESTOP SEALANT TO ELECTRICAL AND TELECOMMUNICATIONS PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO RESTORE ORIGINAL FIRE-RESISTANCE RATING OF ASSEMBLY, INSTALLED PER MANUFACTURER'S UL LISTED ASSEMBLY DETAILS. VERIFY LOCATIONS OF FIRE RATED FLOOR AND WALL ASSEMBLIES WITH ARCHITECTURAL DRAWINGS.
7. RECEPTACLES INSTALLED OUTSIDE, ON THE BUILDING EXTERIOR OR ROOF, IN KITCHENS OR WITHIN 6 FEET HORIZONTALLY FROM A SINK OR DRINKING FOUNTAIN UNLESS LOCATED BELOW A COUNTER OR OTHERWISE PROTECTED SHALL BE GFCI TYPE OR PROTECTED BY GFI CIRCUIT BREAKER.
8. WIRING DEVICES IN DWELLING UNITS AND GUESTROOMS SHALL BE PROVIDED IN SUFFICIENT QUANTITY TO MEET THE REQUIREMENTS OF NEC 210. DEVICE LOCATIONS SHALL ALSO COMPLY WITH NEC 210.
9. COORDINATE THE LOCATION OF ALL WALL MOUNTED EQUIPMENT WITH THE ARCHITECTURAL INTERIOR AND EXTERIOR ELEVATIONS. UNLESS OTHERWISE VERIFIED IN WRITING THE ARCHITECTURAL DRAWINGS SHALL GOVERN.

# MECHANICAL SYSTEMS

1. CONTRACTOR SHALL PROVIDE CONTROLS, INTERLOCKS, ACCESSORIES, ETC., AS REQUIRED BY THE TEMPERATURE CONTROL CONTRACTOR. STARTERS SHALL CONTAIN 120V CONTROL TRANSFORMER, PILOT LIGHT, AND PUSHBUTTONS OR SELECTOR SWITCH AS REQUIRED, IN ADDITION TO OTHER ITEMS (AUXILIARY CONTACTS, DOOR SWITCHES, RELAYS, ETC.) REQUIRED. REFER TO DIV. 15 DRAWINGS AND TEMPERATURE CONTROL DIAGRAMS FOR ADDITIONAL CONDUIT, WIRE, RELAYS, TRANSFORMERS, CONNECTIONS, ETC. REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.
2. WHERE MECHANICAL EQUIPMENT IS INSTALLED ABOVE A GYPBOARD CEILING REQUIRING ACCESS THROUGH AN ACCESS PANEL, PROVIDE A RECEPTACLE, SWITCH AND LIGHT IN THE CEILING SPACE AT THE ACCESS LOCATION.
3. PROVIDE MAINTENANCE RECEPTACLE WITHIN 25'-0" OF ALL MECHANICAL OR MOTORIZED EQUIPMENT. INSTALL PER NEC 210.63.
4. SEE DIVISION 15 DRAWINGS FOR LOCATION OF MECHANICAL EQUIPMENT. PROVIDE SERVICE TO AND CONNECT EQUIPMENT AS REQUIRED. PROVIDE FUSES OR HACR-TYPE CIRCUIT BREAKERS FOR ALL AIR CONDITIONING EQUIPMENT SIZED IN ACCORDANCE WITH MANUFACTURER'S NAMEPLATE.

NFPA 70 CODE VERSION: 2017

# ELECTRICAL ABBREVIATIONS

| | |
|---|---|
| +18" | INDICATES MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE AFF OR AFG |
| AF | AMP FUSE (FOR FUSES), AMP FRAME (FOR CIRCUIT BREAKERS) |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| C | CONDUIT |
| CONT | CONTINUATION |
| CU | COPPER |
| AFCI | INDICATES ARC FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL |
| GND | GROUND |
| HELCO | ELECTRICAL UTILITY COMPANY |
| IWP | IN-USE WEATHER-PROOF (NEMA 3R) |
| LO | LUGS ONLY (SEE ALSO MLO) |
| MCB | MAIN CIRCUIT BREAKER |
| MLO | MAIN LUGS ONLY |
| NEC | NATIONAL ELECTRICAL CODE, AS ADOPTED BY THE AHJ |
| P | POLE |
| PH | PHASE |
| PNL | INDICATES PANEL |
| S/N | SOLID NEUTRAL |
| TYP | TYPICAL |
| WP | WEATHER-PROOF (NEMA 3R) |
| (N) | NEW |

HAWAII COUNTY ENERGY CODE

2018 IECC, HAWAII REVISED STATUTES HRS 107-24 TO 28 & HAWAII ADMINISTRATIVE RULES HAR 3-181.1

**RESIDENTIAL BUILDING ENERGY EFFICIENCY STANDARDS**

I CERTIFY THAT THE DESIGN IS IN CONFORMANCE WITH THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE RESIDENTIAL PROVISIONS OF THE 2018 IECC WITH AMENDMENTS PER HAR CHAPTER 3-181.1:

| | | |
|---|---|---|
| COMPLIANCE METHOD | | |
| | TROPICAL ZONE. R401.2.1 | |
| | POINTS OPTION. R407 | |
| X | PRESCRIPTIVE. R402 | |
| | POINTS OPTION. R407 | |
| | SIMULATED PERFORMANCE ALTERNATIVE. R405 | |
| | ENERGY RATING INDEX COMPLIANCE ALTERNATIVE. R406 | |
| INFORMATION IN CONSTRUCTION DOCUMENTS | | YES |
| ENVELOPE | | |
| | ROOF INSULATION R-VALUE | |
| | ROOF INSULATION TYPE AND LOCATION | |
| | ROOF MEMBRANE SOLAR REFLECTANCE AND THERMAL EMITTANCE | |
| | WALL INSULATION R-VALUE | |
| | WALL INSULATION TYPE AND LOCATION | |
| | WINDOW AND SKYLIGHT SHGC | |
| | AIR LEAKAGE TESTING REQUIREMENT | |
| AIR CONDITIONING | | |
| | AIR CONDITIONING EQUIPMENT CAPACITY AND EFFICIENCY | |
| | PROGRAMMABLE THERMOSTAT | |
| | DUCT INSULATION R-VALUE | |
| | DUCT LEAKAGE TESTING REQUIREMENT | |
| ELECTRICAL | | |
| | LIGHTING FIXTURE LOCATIONS | X |
| | LAMP TYPE | X |
| | CEILING FANS | X |
| | WHOLE-HOUSE FAN | |

NOTES:

SIGNATURE:
DATE: 06/08/2022
NAME: ELI B. WALTZ
TITLE: ELECTRICAL ENGINEER
LICENSE NO.:18572-E

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/24
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

GENERAL CONTRACTOR:

| REVISIONS NO. | DESCRIPTION | DATE |
|---|---|---|
| | | |

**SINGLE FAMILY RESIDENCE**
**LOT 22 NOHEA, PHASE 1**
**TMK: 3-6-8-043:022**
NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD, STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
PH: 503-522-9000
monaghan.craig@gmail.com

DATE: 05/13/22

SCALE: As indicated

SHEET TITLE:
**ELECTRICAL SYMBOLS, IECC & ABBREVIATIONS**

SHEET NUMBER:
E1.0

# RESIDENTIAL OUTLETS

1. APPLIANCE RECEPTACLE OUTLETS INSTALLED IN A DWELLING UNIT FOR SPECIFIC APPLIANCES SUCH AS LAUNDRY EQUIPMENT, SHALL BE INSTALLED WITHIN 6' OF THE INTENDED LOCATION OF THE APPLIANCE.

2. IN EVERY KITCHEN, FAMILY ROOM, DINING ROOM, LIVING ROOM, PARLOR, LIBRARY, DEN, SUNROOM, BEDROOM, RECREATION ROOM, OR SIMILAR ROOM OR AREA OF DWELLING UNITS, RECEPTACLE OUTLETS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING GENERAL PROVISIONS:

   a. RECEPTACLES SHALL BE INSTALLED SUCH THAT NO POINT MEASURED HORIZONTALLY ALONG THE FLOOR LINE IN ANY WALL SPACE IS MORE THAN 6' FROM A RECEPTACLE OUTLET.

   b. WALL SPACE SHALL BE DEFINED AS:

      - AND SPACE 2' OR MORE IN WIDTH (INCLUDING SPACE MEASURED AROUND CORNERS) AND UNBROKEN ALONG THE FLOOR LINE BY DOORWAYS, FIREPLACES, AND SIMILAR OPENINGS
      - THE SPACE OCCUPIED BY FIXED PANELS IN EXTERIOR WALLS, EXCLUDING SLIDING PANELS
      - THE SPACE AFFORDED BY FIXED ROOM DIVIDERS SUCH AS FREE STANDING BAR-TYPE COUNTERS OR RAILING.

   c. RECEPTACLE OUTLETS IN FLOORS SHALL NOT BE COUNTED AS PART OF THE REQUIRED NUMBER OF RECEPTACLE OUTLETS UNLESS LOCATED WITHIN 18" OF THE WALL.

3. TWO OR MORE SMALL-APPLIANCE BRANCH CIRCUITS SHALL BE REQUIRED IN THE KITCHEN, PANTRY, BREAKFAST ROOM, DINING ROOM, OR SIMILAR AREA OF A DWELLING UNIT. NO OTHER OUTLETS SHALL BE CONNECTED TO THESE SMALL-APPLIANCE BRANCH CIRCUITS. NO SMALL-APPLIANCE BRANCH CIRCUIT SHALL SERVE MORE THAN ONE KITCHEN

4. IN KITCHENS, PANTRIES, BREAKFAST ROOMS, DINING ROOMS, AND SIMILAR AREAS OF DWELLING UNITS, RECEPTACLE OUTLETS FOR COUNTERTOP SPACES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING:

   a. A RECEPTACLE OUTLET SHALL BE INSTALLED AT EACH WALL COUNTERTOP SPACE THAT IS 12" OR WIDER. RECEPTACLE OUTLETS SHALL BE INSTALLED SO THAT NO POINT ALONG THE WALL LINE IS MORE THAN 24".

   b. AT LEAST ONE RECEPTACLE SHALL BE INSTALLED AT EACH ISLAND COUNTERTOP SPACE WITH A LONG DIMENSION OF 24" OR GREATER AND A SHORT DIMENSION OF 12" OR GREATER.

   c. AT LEAST ONE RECEPTACLE OUTLET SHALL BE INSTALLED AT EACH PENINSULAR COUNTERTOP SPACE WITH A LONG DIMENSION OF 24" OR GREATER AND A SHORT DIMENSION OF 12" OR GREATER. A PENINSULAR COUNTERTOP IS MEASURED FROM THE CONNECTING EDGE.

   d. COUNTERTOP SPACES SEPARATED BY RANGETOPS, REFRIGERATORS, OR SINKS SHALL BE CONSIDERED AS SEPARATE COUNTERTOP SPACES.

   e. RECEPTACLE OUTLETS SHALL BE LOCATED ABOVE, BUT NOT MORE THAN 20" ABOVE, THE COUNTERTOP. RECEPTACLE OUTLETS RENDERED NOT READILY ACCESSIBLE BY APPLIANCES FASTENED IN PLACE, APPLIANCE GARAGES, SINKS, OR RANGETOPS ETC. ARE EXEMPT FROM THIS REQUIREMENT. APPLIANCES OCCUPYING DEDICATED SPACE SHALL NOT BE CONSIDERED AS THESE REQUIRED OUTLETS.

5. IN DWELLING UNITS, AT LEAST ONE RECEPTACLE OUTLET SHALL BE INSTALLED IN BATHROOMS WITHIN 3' OF THE OUTSIDE EDGE OF EACH BASIN. THE RECEPTACLE OUTLET SHALL BE LOCATED ON A WALL OR PARTITION THAT IS ADJACENT TO THE BASIN OR BASIN COUNTERTOP, OR INSTALLED ON THE SIDE OR FACE OF THE BASIN CABINET NOT MORE THAN 12" BELOW THE COUNTERTOP.

6. OUTDOOR OUTLETS SHALL BE INSTALLED IN ACCORDANCE TO THE FOLLOWING:

   a. FOR A ONE FAMILY DWELLING AND EACH UNIT OF A TWO-FAMILY DWELLING THAT IS AT GRADE LEVEL, AT LEAST ONE RECEPTACLE OUTLET ACCESSIBLE WHILE STANDING AT GRADE LEVEL AND LOCATED NOT MORE THAN 6.5' ABOVE GRADE SHALL BE INSTALLED AT THE FRONT AND BACK OF THE DWELLING.

   b. FOR EACH DWELLING UNIT OF A MULTIFAMILY DWELLING WHERE THE DWELLING UNIT IS LOCATED AT GRADE LEVEL AND PROVIDED WITH INDIVIDUAL EXTERIOR ENTRANCE/EGRESS, AT LEAST ONE RECEPTACLE OUTLET ACCESSIBLE FROM GRADE LEVEL AND NOT MORE THAN 6.5' ABOVE GRADE SHALL BE INSTALLED.

   c. BALCONIES, DECKS, AND PORCHES THAT ARE ACCESSIBLE FROM INSIDE THE DWELLING UNIT SHALL HAVE AT LEAST ONE RECEPTACLE OUTLET INSTALLED WITHIN THE PERIMETER OF THE BALCONY, DECK, OR PORCH. THE RECEPTACLE SHALL NOT BE LOCATED MORE THAN 6.5' ABOVE THE BALCONY, DECK, OR PORCH SURFACE.

7. IN DWELLING UNITS, AT LEAST ONE RECEPTACLE OUTLET SHALL BE INSTALLED FOR THE LAUNDRY.

8. FOR A ONE-FAMILY DWELLING THE FOLLOWING PROVISIONS SHALL APPLY:

   a. AT LEAST ONE RECEPTACLE OUTLET, IN ADDITION TO THOSE FOR SPECIFIC EQUIPMENT, SHALL BE INSTALLED IN EACH BASEMENT, IN EACH ATTACHED GARAGE, AND IN EACH DETACHED GARAGE WITH ELECTRIC POWER.

   b. WHERE A PORTION OF THE BASEMENT IS FINISHED INTO ONE OR MORE HABITABLE ROOMS, EACH SEPARATE UNFINISHED PORTION SHALL HAVE A RECEPTACLE OUTLET INSTALLED IN ACCORDANCE WITH THIS SECTION.

9. IN DWELLING UNITS, HALLWAYS OF 10' OR MORE IN LENGTH SHALL HAVE AT LEAST ONE RECEPTACLE OUTLET. THE HALL LENGTH SHALL BE CONSIDERED THE LENGTH ALONG THE CENTERLINE OF THE HALL WITHOUT PASSING THROUGH A DOORWAY.

# SMOKE DETECTOR GENERAL NOTES

1. SMOKE DETECTORS SHALL BE MARKED WITH THEIR NOMINAL PRODUCTION SENSITIVITY AND TOLERANCE (PERCENT PER FOOT OBSCURATION, AS REQUIRED BY THE LISTING.

2. SPOT-TYPE SMOKE DETECTORS SHALL BE LOCATED ON THE CEILING OR, IF ON A SIDEWALL BETWEEN THE CEILING AND 12 IN. DOWN FROM THE CEILING TO THE TOP OF THE DETECTOR.

3. SMOKE AND HEAT ALARMS SHALL BE INSTALLED IN ALL OCCUPANCIES WHERE REQUIRED BY OTHER GOVERNING LAWS, CODES, OR STANDARDS.

4. WHERE REQUIRED BY OTHER GOVERNING LAWS, CODES, OR STANDARDS FOR SPECIFIC TYPE OF OCCUPANCY, APPROVED SINGLE- AND MULTIPLE-STATION SMOKE ALARMS SHALL BE INSTALLED AS FOLLOWS:

   a. IN ALL SLEEPING ROOMS AND GUEST ROOMS
   b. OUTSIDE OF EACH SEPARATE DWELLING UNIT SLEEPING AREA, WITHIN 21 FT OF ANY DOOR TO A SLEEPING ROOM, WITH DISTANCE MEASURED ALONG A PATH OF TRAVEL.
   c. ON EVER LEVEL OF A DWELLING UNIT, INCLUDING BASEMENTS.
   d. ON EVERY LEVEL OF A RESIDENTIAL BOARD AND CARE OCCUPANCY (SMALL FACILITY), INCLUDED BASEMENTS AND EXCLUDING CRAWL SPACES AND UNFINISHED ATTICS
   e. IN LIVING AREAS OF A GUEST SUITE
   f. IN THE LIVING AREA(S) OF A RESIDENTIAL BOARD AND CARE OCCUPANCY (SMALL FACILITY).

5. ALL POINTS ON THE CEILING SHALL HAVE A SMOKE ALARM WITHIN A DISTANCE OF 30 FT TRAVEL DISTANCE OR SHALL HAVE AND EQUIVALENT OF ONE SMOKE ALARM PER 500 $FT^2$ OF FLOOR AREA. ONE SMOKE ALARM PER 500 $FT^2$ IS EVALUATED BY DIVIDING THE TOTAL INTERIOR SQUARE FOOTAGE OF FLOOR AREA PER LEVEL BY 500 $FT^2$.

6. UNLESS OTHERWISE PERMITTED BY THE AUTHORITY HAVING JURISDICTION, AUDIBLE FIRE ALARM SIGNALS SHALL SOUND ONLY IN AN INDIVIDUAL DWELLING UNIT, SUITE OF ROOMS, OR SIMILAR AREA AND SHALL NOT BE ARRANGED TO OPERATE FIRE-WARNING EQUIPMENT OR FIRE ALARM SYSTEMS OUTSIDE THESE LOCATIONS. REMOTE ANNUNCIATION SHALL BE PERMITTED.

7. SMOKE ALARMS SHALL BE POWERED BY ONE OF THE FOLLOWING MEANS:

   a. A COMMERCIAL LIGHT AND POWER SOURCE ALONG WITH A SECONDARY POWER SOURCE THAT IS CAPABLE OF OPERATING THE DEVICE FOR AT LEAST 24 HOURS IN THE NORMAL CONDITIONS, FOLLOWED BY 4 MINUTES OF ALARM
   b. IF A COMMERCIAL LIGHT AND POWER SOURCE IS NOT NORMALLY AVAILABLE, A NONCOMMERCIAL AC POWER SOURCE ALONG WITH A SECONDARY POWER SOURCE THAT IS CAPABLE OF OPERATING THE DEVICE FOR AT LEAST 7 DAYS IN THE NORMAL CONDITION, FOLLOWED BY 4 MINUTES OF ALARM.
   c. A NONRECHARGEABLE, NONREPLACEABLE PRIMARY BATTER THAT IS CAPABLE OF OPERATING THE DEVICE FOR AT LEAST 10 YEARS IN THE NORMAL CONDITION, FOLLOWED BY 4 MINUTES OF ALARM, FOLLOWED BY 7 DAYS OF TROUBLE.
   d. IF A BATTERY PRIMARY POWER SUPPLY IS SPECIFICALLY PERMITTED, A BATTERY MEETING THE REQUIREMENTS OF NFPA 72 29.6.6 (NONRECHARGEABLE PRIMARY BATTERY) OR THE REQUIREMENTS OF 2010 NFPA 72 29.6.7 (RECHARGEABLE PRIMARY BATTERY) SHALL BE USED.

8. SMOKE ALARMS, SMOKE DETECTORS, DEVICES, COMBINATION DEVICES, AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S LISTING AND PUBLISHED INSTRUCTIONS, AND, UNLESS SPECIFICALLY LISTED FOR THE APPLICATION, SHALL COMPLY WITH REQUIREMENTS IN 2010 NFPA 72 29.8.3.1 THROUGH 29.8.3.4

9. SMOKE ALARMS, SMOKE DETECTORS, DEVICES, COMBINATION DEVICES, AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S LISTING AND PUBLISHED INSTRUCTIONS, AND, UNLESS SPECIFICALLY LISTED FOR THE APPLICATION, SHALL COMPLY WITH REQUIREMENTS IN 2010 NFPA 72 29.8.3.1 THROUGH 29.8.3.4. THIS INCLUDES, BUT IS NOT LIMITED TO NOT BEING INSTALLED WITHIN 36 IN. OF:

   e. HORIZONTAL PATH FROM THE TIP OF THE BLADE OF A CEILING SUSPENDED (PADDLE) FAN.
   f. HORIZONTAL PATH FROM SUPPLY REGISTERS OF A FORCED AIR HEATING OR COOLING SYSTEM AND SHALL BE INSTALLED OUTSIDE OF THE DIRECT AIRFLOW FROM THOSE REGISTERS.
   g. HORIZONTAL PATH FROM A DOOR TO A BATHROOM CONTAINING A SHOWER OR TUB.

10. SMOKE ALARMS OR SMOKE DETECTORS MOUNTED ON A SLOPED CEILING HAVING A RISE GREATER THAN 1' IN 8' HORIZONTALLY SHALL BE LOCATED WITHIN 36" OF THE HIGH SIDE OF THE CEILING, BUT NOT CLOSER THAN 4" FROM THE ADJOINING WALL SURFACE.

11. FOR TRAY-SHAPED CEILINGS THAT ARE LEVEL AT THE TOP, SMOKE ALARMS MUST BE MOUNTED ON THE HIGH CEILING OR ON THE SLOPED RISE BETWEEN LEVELS WITHIN 12" VERTICALLY FROM THE ADJOINING HIGH CEILING.

12. SMOKE ALARMS PLACED BETWEEN 10' AND 20' OF A STATIONARY OR FIXED COOKING APPLIANCE SHALL HAVE A SILENCING MEANS OR BE THE PHOTOELECTRIC TYPE.

# UTILITY COORDINATION

A. ELECTRICAL SERVICE:
   1. COORDINATE WITH THE UTILITY COMPANIES TO PROVIDE SERVICE.
   2. FURNISH MATERIALS IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE UTILITIES AND THESE SPECIFICATIONS.
   3. IT IS THE CONTRACTOR'S RESPONSIBILITY FOR SCHEDULING AND COORDINATING THE WORK OF SUBCONTRACTORS, SUPPLIERS, AND OTHER INDIVIDUALS OR ENTITIES PERFORMING OR FURNISHING ANY OF CONTRACTOR'S WORK.
   4. PROVIDE ALL WORK AND MATERIALS AND BEAR ALL COSTS FOR PROVIDING TEMPORARY CONSTRUCTION POWER AND THE PERMANENT ELECTRICAL SERVICE, INCLUDING BUT NOT LIMITED TO:
      a. ALL WORK AND MATERIALS NOT PROVIDED BY THE ELECTRIC UTILITY.
      b. ALL PERMITS AND FEES REQUIRED BY THE ELECTRIC UTILITY.
   5. PROVIDE ELECTRICAL DUCTS, RACEWAYS, CONDUCTORS AND CONNECTIONS INDICATED ON THE DRAWINGS, AND ALL OTHER WORK AND MATERIALS REQUIRED FOR A COMPLETE ELECTRICAL SERVICE, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
      a. ELECTRICAL SERVICE CONDUITS AND CONDUCTORS FROM THE POINT OF ELECTRIC UTILITY CONNECTION TO THE SERVICE ENTRANCE EQUIPMENT.
      b. METERING CONDUITS FROM THE INSTRUMENT TRANSFORMERS TO THE METER.

B. TELEPHONE/CATV SERVICE:
   1. PROVIDE ALL WORK AND MATERIALS AND BEAR ALL COSTS FOR THE TELEPHONE/CATV SERVICE DURING CONSTRUCTION.
   2. PROVIDE THE TELEPHONE/CATV ENTRANCE CONDUIT(S) FROM THE TERMINAL POLE TO THE TELEPHONE BOARD, AND ALL OTHER WORK AND MATERIALS REQUIRED FOR A COMPLETE TELEPHONE/CATV SERVICE.
   3. COORDINATE AND OBTAIN INSPECTIONS AND FINAL INSTALLATION APPROVAL FROM SERVING UTILITIES AND OTHER AUTHORITIES HAVING JURISDICTION.
   4. BEFORE COMMENCING WORK, COORDINATE COMPLETE TELEPHONE/CATV SERVICE:
      a. VERIFY COMPLIANCE WITH TELEPHONE/CATV UTILITY REQUIREMENTS.
      b. VERIFY EXACT LOCATION OF EACH SERVICE POINT AND TYPE OF SERVICE.
      c. PAY ANY CHARGES REQUIRED BY THE TELEPHONE/CATV UTILITY FOR CONNECTION AND TURN-ON.
   5. COORDINATE COMPLETE TELEPHONE/CATV LINE CONNECTIONS AT LOCATIONS INDICATED ON THE DRAWINGS WITH THE LOCAL TELEPHONE UTILITY.

C. CERTIFICATION:
   1. PRIOR TO EQUIPMENT PROCUREMENT, SUBMIT CERTIFICATION THAT THE INTENDED INSTALLATION HAS BEEN COORDINATED WITH THE UTILITY COMPANIES AND MEETS ALL UTILITY REQUIREMENTS.
   2. BEFORE START OF SITE WORK, MAKE ARRANGEMENTS FOR TEMPORARY TELEPHONE AND ELECTRICAL SERVICE AS REQUIRED.
   3. BEFORE BIDDING, THE ELECTRICAL CONTRACTOR SHALL CONTACT THE UTILITIES TO DETERMINE THE WORK AND MATERIALS THAT WILL BE REQUIRED FROM THE CONTRACTOR, AND ALL FEES AND PERMITS THAT WILL BE REQUIRED, SO THAT ALL UTILITY SYSTEMS FURNISHED BY THE CONTRACTOR WILL BE INCLUDED IN THE BID.
   4. COORDINATE WORK WITH ENGINEER TO MINIMIZE DOWNTIME OF EXISTING OPERATING EQUIPMENT AND ELECTRICAL DISTRIBUTION SYSTEMS AND TO PRECLUDE UNSAFE OPERATION:
      a. NOTIFY OWNER 10 DAYS BEFORE POWER INTERRUPTIONS.
      b. COORDINATE DOWNTIME WITH OWNER AND LOCAL ELECTRIC UTILITY.
   5. BEFORE COMMENCING WORK, COORDINATE ELECTRIC SERVICE ENTRANCE REQUIREMENTS WITH LOCAL ELECTRIC UTILITY TO ASSURE THAT THE INSTALLATION WILL BE COMPLETE IN ACCORDANCE WITH THESE SPECIFICATIONS AND UTILITY COMPANY REQUIREMENTS:
      a. ENSURE POWER TRANSFORMER SIZE, ELECTRICAL CHARACTERISTICS, AND LOCATION ARE CONSISTENT WITH THE DESIGN AND SERVICE VOLTAGE PROVIDED BY THE ELECTRIC UTILITY COORDINATED WITH OTHER TRADES.
      b. ARRANGE FOR UTILITY REVENUE METER.
      c. COORDINATE INSTALLATION OF METERING C.T.'S AND P.T.'S FURNISHED BY THE ELECTRIC UTILITY.
      d. PAY ANY CHARGES REQUIRED BY THE ELECTRIC UTILITY FOR CONNECTION AND TURN-ON.
   6. DURING THE CONSTRUCTION OF THE PROJECT, THE EXISTING ELECTRICAL SERVICE MUST REMAIN FULLY FUNCTIONAL IN ORDER TO SUPPLY UNINTERRUPTED ELECTRICAL POWER TO THE FACILITY AND ITS ANCILLARY BUILDINGS AND STRUCTURES.

D. BEFORE COMMENCING SITE WORK, COORDINATE UNDERGROUND CONDUIT INSTALLATIONS WITH OTHER WORK TO ELIMINATE CONFLICTS AND AVOID INTERFERENCES WITH OTHER UNDERGROUND SYSTEMS.

# LUMINAIRE GENERAL SPECIFICATIONS

1. RECESSED LUMINAIRES INSTALLED IN GYP. BOARD OR PLASTER CEILINGS SHALL HAVE PLASTER FRAMES INSTALLED PRIOR TO CEILING MATERIAL.

2. RECESSED LUMINAIRES INSTALLED INDOORS SHALL BE THERMALLY PROTECTED.

3. COORDINATE THE LOCATION OF LUMINAIRES WITH THE ARCHITECTURAL REFLECTED CEILING PLAN. UNLESS OTHERWISE VERIFIED IN WRITING THE REFLECTED CEILING PLAN LOCATIONS SHALL GOVERN.

4. LUMINAIRES INDICATED ABOVE SHALL BE USED AS A BASIS FOR BIDDING. ANY ALTERNATE LUMINAIRE PACKAGES SHALL BE SUBMITTED IN ACCORDANCE WITH THE LUMINAIRE SUBSTITUTION PROVISIONS IN THE GENERAL CONDITIONS OF THE CONTRACT.

5. MANUFACTURERS CATALOG NUMBERS SHOWN INDICATE BASIC LUMINAIRE TYPES REQUIRED FOR THIS PROJECT. VERIFY WITH MANUFACTURER TO INCLUDE ALL ACCESSORIES REQUIRED FOR ACTUAL INSTALLATION.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LUMINAIRE LOCATIONS, MOUNTING REQUIREMENTS AND ALL U.L. LABELING OF LUMINAIRES PRIOR TO ORDERING. INCLUDE MOUNTING CLIPS, HARDWARE, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION.

7. WHERE AREAS ON THE PLANS ARE INDICATED FOR DUAL SWITCHING SHALL BE SWITCHED AS FOLLOWS: ONE SWITCH SHALL OPERATE THE THE INNER LAMP AND THE OTHER SWITCH SHALL OPERATE THE OUTER LAMPS. PROVIDE ALL BALLASTS, LUMINAIRE WHIPS, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION.

8. PRIOR TO PASSING FINAL INSPECTION, THE CONTRACTOR SHALL PROVIDE EVIDENCE THAT THE LIGHTING CONTROL SYSTEMS HAVE BEEN TESTED TO ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED, AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTRUCTIONS.

9. COMMISSION REPORT ON LIGHTING SYSTEMS PER 2015 IECC C408.3.

# CONDUIT AND WIRE

1. WIRE SHALL BE COPPER, 75°C RATED FOR GENERAL USE. FOR HID FIXTURES AND WIRING WITHIN 3 INCHES OF FLUORESCENT BALLASTS WIRE SHALL BE COPPER, MINIMUM 90°C RATED. SIZES INDICATED ARE FOR INSTALLATION IN A MAXIMUM 30°C AMBIENT TEMPERATURE. CONDUCTOR AMPACITY SHALL BE DERATED FOR HIGHER AMBIENT INSTALLATIONS. 600 VOLT STABILOY 8030 SERIES ALLOY ALUMINUM WIRE AND CABLE (OR EQUAL) IN SIZES 1/0 AND LARGER MAY BE SUBSTITUTED FOR COPPER ON SERVICES AND FEEDERS IF AMPACITY IS EQUAL TO OR GREATER THAN COPPER AND VOLTAGE DROP IS EQUAL TO OR LESS THAN COPPER. SUBMIT CALCULATIONS TO ENGINEER PRIOR TO SUBSTITUTION.

2. ALL EMPTY RACEWAY SYSTEMS SHALL HAVE A #12 PULLWIRE OR EQUAL AND SHALL BE IDENTIFIED AT ALL JUNCTION, PULL AND TERMINATION POINTS, USING PERMANENT METALLIC TAGS. TAG SHALL INDICATE INTENDED USE OF CONDUIT, ORIGINATION AND TERMINATION POINTS OF EACH INDIVIDUAL CONDUIT. STUB CONDUIT OUT 6" INTO AN ACCESSIBLE AREA. CAP OPEN ENDS NOT TERMINATED IN A JUNCTION BOX.

3. FIRE ALARM, SOUND, TELEPHONE, COMPUTER, AND SIMILAR SYSTEMS CONDUITS LARGER THAN 1" SHALL HAVE LONG RADIUS SWEEPS (12 TIMES THE DIAMETER OF THE CONDUIT).

4. NON-METALLIC AND FLEXIBLE METAL CONDUITS SHALL HAVE A CODE SIZED COPPER GROUNDING CONDUCTOR. INCREASE CONDUIT SIZE AS REQUIRED.

5. CONDUITS PENETRATING THRU ROOF SHALL HAVE ROOF FLASHING WITH CAULKED TYPE COUNTER FLASHING SLEEVE. INSTALLATION SHALL BE WATERTIGHT.

6. PROVIDE SEPARATE NEUTRAL CONDUCTOR FOR EACH ARC-FAULT OR GROUND FAULT CIRCUIT.

7. FINAL CONNECTIONS TO MOTORS, TRANSFORMERS AND OTHER VIBRATING EQUIPMENT SHALL BE WITH SEAL-TITE FLEX (3'-0" MAXIMUM LENGTH) AND APPROVED FITTINGS. DO NOT SECURE CONDUITS, DISCONNECTS OR DEVICES TO DUCTWORK OR MECHANICAL EQUIPMENT.

8. ALL WIRING SHALL BE INSTALLED IN LISTED METALLIC RACEWAYS. RACEWAYS IN SLAB-ON-GRADE OR BELOW GRADE SHALL BE SCHEDULE 40 PVC. TRANSITIONS FROM BELOW TO ABOVE GRADE SHALL BE WITH SCHEDULE 80 PVC OR APPROVED EQUAL PROTECTION. EMT FITTINGS SHALL BE STEEL. CONNECTORS SHALL BE INSULATED THROAT TYPE. TYPE MC CABLE MAY BE USED FOR BRANCH CIRCUITS #8 AWG AND SMALLER AND WHERE ALLOWED BY NEC 330. TYPE NM CABLE MAY BE USED WHERE ALLOWED BY NEC 334.

9. WIRE TERMINATION PROVISIONS FOR PANELBOARDS, CIRCUIT BREAKERS, SAFETY SWITCHES, AND ALL OTHER ELECTRICAL APPARATUS SHALL BE LISTED AS SUITABLE FOR 75°C.

10. MULTIWIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH A DISCONNECTING MEANS PER NEC 210.4(B).

# UNDERGROUND AND EXTERIOR INSTALLATIONS

1. VERIFY EXACT LOCATIONS OF EXISTING AND NEW UNDERGROUND UTILITIES, PIPING AND RACEWAY SYSTEMS PRIOR TO TRENCHING. PROVIDE NECESSARY TRENCHING, BACKFILL, EXCAVATION, SUPPORTS, SERVICE FEEDERS (CONDUIT AND/OR WIRE), PULLBOXES, TRANSFORMER PADS, SAWCUTTING AND PATCHING, CONCRETE/PAVING, ETC., REQUIRED. BACKFILL TRENCHES TO 90% COMPACTION AND PATCH TO MATCH EXISTING. CONTRACTOR SHALL OBTAIN AND VERIFY EXACT UTILITY COMPANY DRAWINGS AND REQUIREMENTS.

2. SPLICES IN EXTERIOR PULLBOXES AND MANHOLES SHALL BE MADE WATERPROOF USING "SCOTCHCAST" SPLICE KIT OR APPROVED EQUAL. SEAL ENDS OF CONDUITS AND DUCTS WITH "DUCTSEAL" OR APPROVED EQUAL.

3. PULLBOXES, CABINETS, ETC., MOUNTED ON THE EXTERIOR AT GRADE LEVEL, SHALL BE WEATHERPROOF TYPE WITH HINGED LOCKABLE COVERS SECURED WITH TAMPER-PROOF SCREWS.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/24
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

GENERAL CONTRACTOR:

| REVISIONS NO. | DESCRIPTION | DATE |
|---|---|---|
| | | |

**SINGLE FAMILY RESIDENCE**
**LOT 22 NOHEA, PHASE 1**
**TMK: 3-6-8-043:022**
NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD, STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
PH: 503-522-9000
monaghan.craig@gmail.com

DATE: 05/13/22

SCALE: As indicated

SHEET TITLE: **ELECTRICAL SPECIFICATIONS**

SHEET NUMBER: E1.1

## NOTICES

1. ALL ELECTRICAL EQUIPMENT LOCATIONS SHALL BE VERIFIED WITH OWNER/ARCHITECT PRIOR TO INSTALLATION.
2. COORDINATE WITH HELCO AND INSTALL PER HELCO 9TH EDITION ESIM. CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING SERVICE APPLICATION AND VERIFYING ALL INTERCONNECTION AND INSTALLATION REQUIREMENTS PRIOR TO START OF CONSTRUCTION.
3. PROVIDE COMMUNICATIONS PER OWNER REQUIREMENTS. VERIFY REQUIRED INTERCONNECTION POINT WITH INTERNET SERVICE PROVIDER AND PROVIDE NECESSARY UNDERGROUND FACILITIES AS REQUIRED.

## NOTES

1. VERIFY INTERCONNECTION WITH HELCO PRIOR TO ROUGH-IN.

A LOT 22 OVERALL ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"
0 8' 16' N

1 BIG ISLAND MAP
NO SCALE

2 VICINITY MAP
NO SCALE

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**TMK: 3-6-8-043:022**
NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD, STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226


CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
PH: 503-522-9000
monaghan.craig@gmail.com


DATE: 05/13/22

SCALE: As indicated

SHEET TITLE: **LOT 22 OVERALL ELECTRICAL PLAN,**

SHEET NUMBER: E2.0

# NOTICES

1. ALL GFCI DEVICES SHALL BE READILY ACCESSIBLE AND SHALL NOT BE CONCEALED BY EQUIPMENT. WHERE GFCI RECEPTACLES ARE SHOWN BEHIND EQUIPMENT, CONTRACTOR SHALL VERIFY FINAL LAYOUT OF EQUIPMENT AND FURNISH GFCI BREAKERS INSTEAD OF GFCI RECEPTACLES IF EQUIPMENT WILL OBSTRUCT ACCESS TO THE WIRING DEVICE.

2. DEVICE LOCATIONS, QUANTITY AND WIRING REQUIREMENTS SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS PER THE NEC AND PROVIDE AFCI PROTECTION WHERE REQUIRED PER ARTICLE 210.

# NOTES

1. VERIFY TV MOUNTING HEIGHT PRIOR TO ROUGH IN COORDINATE WITH ARCHITECT.
2. PROVIDE LEGRAND STRUCTURED MEDIA CABINET OR APPROVED EQUAL. ROUTE (1) 1/4"C FROM MEDIA CABINET TO TELECOMMUNICATIONS CABINET AT GARAGE.
3. CONNECT TO A LIGHTING CIRCUIT.
4. CONTROL WIRING PER MANUFACTURER'S INSTALLATION. SEE POOL EQUIPMENT PACKAGE.
5. DATA RECEPTACLE FOR WLAN. VERIFY LOCATION IN FIELD.

A ELECTRICAL POWER PLAN - GREAT ROOM
SCALE: 1/4" = 1'-0"
0 4' 8'
N

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/24
No. 18572-E
HAWAII, U.S.A.

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**LOT 22 NOHEA, PHASE 1**
**TMK: 3-6-8-043:022**
NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD. STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
PH: 503-522-9000
monaghan.craig@gmail.com

DATE: 05/13/22

SCALE: As indicated

SHEET TITLE: **ELECTRICAL POWER PLAN - GREAT ROOM**

SHEET NUMBER: E2.1

# NOTICES

1. VERIFY ALL SMOKE DETECTOR LOCATIONS WITH RESPECT TO CEILING FANS, VAULTED CEILINGS, AND MECHANICAL AIR TERMINALS. LOCATE AS REQUIRED BY NFPA 72 – 29.8.3.4 AND MANUFACTURERS INSTRUCTIONS.

# NOTES

(1) FIELD INSTALL SWITCH RECEPTACLE IN CEILING COVE AREA FOR LED STRIP LIGHTING TRANSFORMERS. VERIFY ALLOWABLE LIGHTING QUANTITIES WITH LIGHTING MANUFACTURER.

## (A) ELECTRICAL LIGHTING PLAN - GREAT ROOM

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

0 4' 8'

N

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NOHEA AT MAUNA LANI, LLC
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ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

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DATE: 05/13/22

SCALE: As indicated

SHEET TITLE:
**ELECTRICAL LIGHTING PLAN - GREAT ROOM**

SHEET NUMBER:
E2.2

A ELECTRICAL POWER PLAN - GUEST SUITES 2 - 4
SCALE: 1/8" = 1'-0"
0 8' 16' N

## NOTICES

1. ALL GFCI DEVICES SHALL BE READILY ACCESSIBLE AND SHALL NOT BE CONCEALED BY EQUIPMENT. WHERE GFCI RECEPTACLES ARE SHOWN BEHIND EQUIPMENT, CONTRACTOR SHALL VERIFY FINAL LAYOUT OF EQUIPMENT AND FURNISH GFCI BREAKERS INSTEAD OF GFCI RECEPTACLES IF EQUIPMENT WILL OBSTRUCT ACCESS TO THE WIRING DEVICE.

2. DEVICE LOCATIONS, QUANTITY AND WIRING REQUIREMENTS SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS PER THE NEC AND PROVIDE AFCI PROTECTION WHERE REQUIRED PER ARTICLE 210.

## NOTES

(1) CONNECT TO A LIGHTING CIRCUIT.

B ELECTRICAL POWER PLAN - GARAGE
SCALE: 1/8" = 1'-0"
0 8' 16' N

C ELECTRICAL POWER PLAN - POOL VAULT
SCALE: 3/4" = 1'-0"
0 1' 2' 3' N

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NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD. STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

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PH: 503-522-9000
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DATE: 05/13/22

SCALE: As indicated

SHEET TITLE: **ELECTRICAL POWER PLAN - GUEST/GARAGE**

SHEET NUMBER: E2.3

A ELECTRICAL LIGHTING PLAN - GUEST SUITES 2 - 4

SCALE: 1/8" = 1'-0"

0 8' 16' N

B ELECTRICAL LIGHTING PLAN - GARAGE

SCALE: 1/8" = 1'-0"

0 8' 16' N

## NOTICES

1. VERIFY ALL SMOKE DETECTOR LOCATIONS WITH RESPECT TO CEILING FANS, VAULTED CEILINGS, AND MECHANICAL AIR TERMINALS. LOCATE AS REQUIRED BY NFPA 72 – 29.8.3.4 AND MANUFACTURERS INSTRUCTIONS.

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NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD. STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
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DATE: 05/13/22

SCALE: As indicated

SHEET TITLE: **ELECTRICAL LIGHTING PLAN - GUEST/GARAGE**

SHEET NUMBER: E2.4

# LUMINAIRE SCHEDULE

| FIXTURE TYPE | MOUNTING | LAMP TYPE | REMARKS | VOLT |
|---|---|---|---|---|
| A | RECESSED | LED | 6" RECESSED CAN, DIMMABLE | 120 |
| B | RECESSED | LED | 6" RECESSED CAN, SHOWER LIGHT, AIR TIGHT | 120 |
| C | SURFACE | LED | 1X4 SURFACE MOUNTED WITH 4-SIDED LENSES | 120 |
| D | WALL | LED | WALL MOUNTED EXTERIOR LED SCONCE | 120 |
| E | WALL | LED | WALL MOUNTED INTERIOR LED SCONCE | 120 |
| F | RECESSED | LED | 6" RECESSED EXTERIOR CAN | 120 |
| —LED— | SURFACE | LED | LED STRIP LIGHTING, DIMMABLE | 120 |

# SERVICE / LOAD DATA

A. ELECTRIC

1. SERVICE VOLTAGE: 240/120V, 1ø, 3W
2. TYPE OF SERVICE: UNDERGROUND
3. ESTIMATED CONNECTED KVA: 60.0 KVA
   ESTIMATED DEMAND KVA: 35.0 KVA
4. SERVICE CONDUCTORS: (1)#350 PER PHASE
5. METERING: RATE SCH 'R', HELCO STD. B-2B, 4 JAW, 320A/400A CONTINUOUS METER/MAIN
6. BILLING ADDRESS: NOHEA AT MANUA LANI, LLC
   16130 VENTURE BLVD STE. 510
   ENCINO, CA 91436

| | | |
|---|---|---|
| **SERVICE LOAD CALCULATIONS FOR RESIDENCE** | 120/240 | |
| **SQUARE FOOTAGE** | 3387 | SQ. FT. |
| **GENERAL LIGHTING LOAD** | | |
| (SQFT X 3VA) | 10161 | VA |
| **SMALL APPLIANCE LOADS (1,500VA EA.)** | | |
| >2 SMALL APPLIANCE | 3000 | VA |
| LAUNDRY BRANCH CIRCUITS | 1500 | VA |
| BATHROOMS (1.5KVA/BATHROOM) | 9000 | VA |
| SUBTOTAL #1 | 23661 | VA |
| **DEMAND FACTOR** | | |
| 1ST 3KVA @ 100% | 3000 | VA |
| REM KVA @ 35% | 7231 | VA |
| OVER 120KVA @25% | 0 | VA |
| GENERAL LIGHTING/POWER LOADS | 10231 | VA |
| **APPLIANCE LOAD (>4 APPLIANCE @ 75%)** | | |
| Water Heater | 4500 | VA |
| Circ Pump | 1000 | VA |
| Dishwasher | 1000 | VA |
| Oven | 1500 | VA |
| Microwave | 1200 | VA |
| Refrigerator | 1200 | VA |
| Pool Heater | 1200 | VA |
| GENERAL APPLIANCE LOADS | 8700 | VA |
| **DRYER LOAD** | | |
| 5KVA OR NAMEPLATE | 5000 | VA |
| **MOTOR LOADS (@100%)** | | |
| HVAC | 18000 | VA |
| POOL | 8200 | VA |
| **TOTAL** | **50131** | **VA** |
| **MINIMUM SERVICE** | **209** | **A** |

# ELECTRICAL LOAD CALCULATIONS

| | | |
|---|---|---|
| GARAGE | = | 19.0 KVA |
| MAIN HOUSE | = | 15.6 KVA |
| GUEST SUITE 2-4 | = | 7.2 KVA |
| POOL | = | 8.2 KVA |
| TOTAL | = | 50.0 KVA |
| /240V, 1ø | = | 209A |

1 ONE-LINE DIAGRAM
NO SCALE

# NOTICES

1. ALL WIRE SIZE IS IN COPPER. ALUMINUM CONDUCTORS ARE PERMITTED WHERE EQUIVALENT AMPACITY IS REQUIRED.

# NOTES

1. BOND TO ALL AVAILABLE GEC PER NEC 250.52
2. BOND TO ALL AVAILABLE GEC PER NEC 250.32
3. PROVIDE 2"C STUB-OUT AT ACCESSIBLE LOCATION AT EXTERIOR FOR FUTURE PV SYSTEM CONNECTION.

2 SERVICES LOAD CALCULATION
NO SCALE

3 ELECTRICAL DISTRIBUTION ELEVATION
NO SCALE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/24
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

GENERAL CONTRACTOR:

| REVISIONS NO. | DESCRIPTION | DATE |
|---|---|---|

**SINGLE FAMILY RESIDENCE**
**LOT 22 NOHEA, PHASE 1**
**TMK: 3-6-8-043:022**
NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD. STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226


CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
PH: 503-522-9000
monaghan.craig@gmail.com


DATE: 05/13/22

SCALE: As indicated

SHEET TITLE: **ELECTRICAL SCHEDULES & DIAGRAMS**

SHEET NUMBER: E3.0

NEW

## PANEL: G

VOLTAGE: 240 / 120 1Ø 3W
BUS: 400A
MAINS: 300A
AIC RATING: 42,000
CIRCUIT CODE: blank or
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

DATE: 6/14/22 3:55 PM
JOB: 16117-22-03
LOCATION: GARAGE
MOUNTING: FLUSH

| CKT NO | CODE | TRIP | POLE | LOAD DESIGNATION DESCRIPTION | (NOTE) | M | R | L | CONNECTED VA ØA | ØB | A | B | ØA | ØB | L | R | M | (NOTE) | LOAD DESIGNATION DESCRIPTION | TRIP | POLE | CODE | CKT NO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 20 | 1 | LIGHTING GARAGE | | | | | - | | • | | - | | | | | | RECEPT - INTERIOR GARAGE | 20 | 1 | | 2 |
| 3 | | 20 | 1 | RECEPT - EXTERIOR GARAGE | | | | | | - | | • | | - | | | | | WATER HEATER | 30 | | | 4 |
| 5 | | 40 | | ACCU-1 | | | | | - | | • | | - | | | | | | -- | | 2 | | 6 |
| 7 | | | 2 | -- | | | | | | - | | • | | - | | | | | RECEPT RECIR PUMP | 20 | 1 | | 8 |
| 9 | | 40 | | ACCU-2 | | | | | - | | • | | - | | | | | | POOL HEATER | 20 | 1 | | 10 |
| 11 | | | 2 | -- | | | | | | - | | • | | - | | | | | SPARE | 20 | 1 | | 12 |
| 13 | | 40 | | ACCU-3 | | | | | - | | • | | - | | | | | | SPARE | 20 | 1 | | 14 |
| 15 | | | 2 | -- | | | | | | - | | • | | - | | | | | PFFB | | | | 16 |
| 17 | | 20 | 1 | SPARE | | | | | - | | • | | - | | | | | | PFFB | | | | 18 |
| 19 | | 20 | 1 | SPARE | | | | | | - | | • | | - | | | | | PFFB | | | | 20 |
| 21 | | 20 | 1 | SPARE | | | | | - | | • | | - | | | | | | PFFB | | | | 22 |
| 23 | | 50 | | PANEL 'S' | | | | | | - | | • | | - | | | | | PANEL 'P' | 70 | | | 24 |
| 25 | | | 2 | | | | | | - | | • | | - | | | | | | -- | | 2 | | 26 |
| 27 | | 150 | | PANEL 'M' | | | | | | - | | • | | - | | | | | FUTURE PV | | | | 28 |
| 29 | | | 2 | -- | | | | | - | | • | | - | | | | | | -- | | 2 | | 30 |
| 31 | | | | | | | | | | - | | • | | - | | | | | | | | | 32 |
| 33 | | | | | | | | | - | | • | | - | | | | | | | | | | 34 |
| 35 | | | | | | | | | | - | | • | | - | | | | | | | | | 36 |
| 37 | | | | | | | | | - | | • | | - | | | | | | | | | | 38 |
| 39 | | | | | | | | | | - | | • | | - | | | | | | | | | 40 |
| 41 | | | | | | | | | - | | • | | - | | | | | | | | | | 42 |

PANEL NOTES:
PROVIDE ARC FAULT PROTECTION WHERE REQUIRED PER NEC 210.12

30 CIRCUIT PANEL

PHASE TOTALS ØA: 0 ØB: 0

| | |
|---|---|
| TOTAL CONNECTED VA | 0 |
| CONNECTED VA (CODE N) | 0 |
| CONNECTED VA (CODE L) | 0 |
| CONNECTED VA (CODE R) | 0 |
| CONNECTED VA (CODE K) | 0 |
| PANEL CONNECTED KVA | 0.0 |
| PANEL DEMAND KVA | 0.0 |
| PANEL DEMAND AMPS | 0.0 |
| HIGH Ø AMPS w/ DEMAND | 0.0 |

NEW

## PANEL: M

VOLTAGE: 240 / 120 1Ø 3W
BUS: 200A
MAINS: 150A
AIC RATING: 10,000
CIRCUIT CODE: blank or
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

DATE: 6/14/22 3:57 PM
JOB: 16117-22-03
LOCATION: UTIL/LINEN CLOSET
MOUNTING: FLUSH

| CKT NO | CODE | TRIP | POLE | LOAD DESIGNATION DESCRIPTION | (NOTE) | M | R | L | CONNECTED VA ØA | ØB | A | B | ØA | ØB | L | R | M | (NOTE) | LOAD DESIGNATION DESCRIPTION | TRIP | POLE | CODE | CKT NO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 20 | 1 | LIGHTING MASTER | | | | | - | | • | | - | | | | | | LIGHTING GREAT/ENTRY/EXT | 20 | 1 | | 2 |
| 3 | | 20 | 1 | LIGHTING BED RM/SUITE 1 | | | | | | - | | • | | - | | | | | LIGHTING KIT/DINNING/LAUNDRY | 20 | 1 | | 4 |
| 5 | | 20 | 1 | RECEPT MASTER BED 1 | | | | | - | | • | | - | | | | | | RECEPT MAST/BED/SUITE 1 BATH | 20 | 1 | | 6 |
| 7 | | 20 | 1 | RECEPT MASTER BED 2 | | | | | | - | | • | | - | | | | | RECEPT BEDROOM | 20 | 1 | | 8 |
| 9 | | 20 | 1 | RECEPT HALL/UTIL | | | | | - | | • | | - | | | | | | RECEPT GREAT RM | 20 | 1 | | 10 |
| 11 | | 20 | 1 | RECEPT SUITE 1 | | | | | | - | | • | | - | | | | | RECEPT DINNING/HALL | 20 | 1 | | 12 |
| 13 | | 20 | 1 | RECEPT ENTRY | | | | | - | | • | | - | | | | | | RECEPT KITCHEN 2 | 20 | 1 | | 14 |
| 15 | | 20 | 1 | RECEPT KITCHEN 1 | | | | | | - | | • | | - | | | | | RECEPT KITCHEN ISLAND | 20 | 1 | | 16 |
| 17 | | 20 | 1 | RECEPT LANDRY/PANTRY | | | | | - | | • | | - | | | | | | RECEPT WASHER | 20 | 1 | | 18 |
| 19 | | 30 | | RECEPT DRYER | | | | | | - | | • | | - | | | | | RECEPT OVEN | 30 | | | 20 |
| 21 | | | 2 | -- | | | | | - | | • | | - | | | | | | -- | | 2 | | 22 |
| 23 | | 20 | 1 | RECEPT MICROWAVE | | | | | | - | | • | | - | | | | | RECEPT DISHWASHER | 20 | 1 | | 24 |
| 25 | | 20 | 1 | RECEPT STOVE | | | | | - | | • | | - | | | | | | RECEPT GARBAGE DISPOSAL | 20 | 1 | | 26 |
| 27 | | 20 | 1 | RECEPT REFRIGE | | | | | | - | | • | | - | | | | | SMOKE DETECTORS | 20 | 1 | | 28 |
| 29 | | 15 | | FC-1, FC-2A-2D | | | | | - | | • | | - | | | | | | SPARE | 20 | 1 | | 30 |
| 31 | | | 2 | -- | | | | | | - | | • | | - | | | | | SPARE | 20 | 1 | | 32 |
| 33 | | 20 | 1 | RANGE HOOD | | | | | - | | • | | - | | | | | | SPARE | 20 | 1 | | 34 |
| 35 | | | | PFFB | | | | | | - | | • | | - | | | | | PFFB | | | | 36 |
| 37 | | | | PFFB | | | | | - | | • | | - | | | | | | PFFB | | | | 38 |
| 39 | | | | PFFB | | | | | | - | | • | | - | | | | | PFFB | | | | 40 |
| 41 | | | | PFFB | | | | | - | | • | | - | | | | | | PFFB | | | | 42 |

PANEL NOTES:

PHASE TOTALS ØA: 0 ØB: 0

| | |
|---|---|
| TOTAL CONNECTED VA | 0 |
| CONNECTED VA (CODE N) | 0 |
| CONNECTED VA (CODE L) | 0 |
| CONNECTED VA (CODE R) | 0 |
| CONNECTED VA (CODE K) | 0 |
| PANEL CONNECTED KVA | 0.0 |
| PANEL DEMAND KVA | 0.0 |
| PANEL DEMAND AMPS | 0.0 |
| HIGH Ø AMPS w/ DEMAND | 0.0 |

NEW

## PANEL: P

VOLTAGE: 240 / 120 1Ø 3W
BUS: 100A
MAINS: 70A
AIC RATING: 10,000
CIRCUIT CODE: blank or
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

DATE: 6/14/22 3:55 PM
JOB: 16117-22-03
LOCATION: POOL VAULT
MOUNTING: SURFACE

| CKT NO | CODE | TRIP | POLE | LOAD DESIGNATION DESCRIPTION | (NOTE) | M | R | L | CONNECTED VA ØA | ØB | A | B | ØA | ØB | L | R | M | (NOTE) | LOAD DESIGNATION DESCRIPTION | TRIP | POLE | CODE | CKT NO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 20 | | FILTRATION PUMP | | | | | | - | | • | | - | | | | | CHLORINATOR | 15 | 1 | | 2 |
| 3 | | | 2 | -- | | | | | - | | • | | - | | | | | | JET BLOWER | 20 | | | 4 |
| 5 | | 20 | 1 | POOL VAULT RECEPT | | | | | - | | • | | - | | | | | | -- | | 2 | | 6 |
| 7 | | 20 | 1 | SPARE | | | | | | - | | • | | - | | | | | JET PUMP | 20 | | | 8 |
| 9 | | 20 | 1 | SPARE | | | | | - | | • | | - | | | | | | -- | | 2 | | 10 |
| 11 | | 20 | 1 | SPARE | | | | | | - | | • | | - | | | | | SPARE | 20 | 1 | | 12 |
| 13 | | | | PFFB | | | | | - | | • | | - | | | | | | SPARE | 20 | 1 | | 14 |
| 15 | | | | PFFB | | | | | | - | | • | | - | | | | | SPARE | 20 | 1 | | 16 |
| 17 | | | | PFFB | | | | | - | | • | | - | | | | | | PFFB | | | | 18 |
| 19 | | | | PFFB | | | | | | - | | • | | - | | | | | PFFB | | | | 20 |
| 21 | | | | PFFB | | | | | - | | • | | - | | | | | | PFFB | | | | 22 |
| 23 | | | | PFFB | | | | | | - | | • | | - | | | | | PFFB | | | | 24 |
| 25 | | | | | | | | | - | | • | | - | | | | | | | | | | 26 |
| 27 | | | | | | | | | | - | | • | | - | | | | | | | | | 28 |
| 29 | | | | | | | | | - | | • | | - | | | | | | | | | | 30 |
| 31 | | | | | | | | | | - | | • | | - | | | | | | | | | 32 |
| 33 | | | | | | | | | - | | • | | - | | | | | | | | | | 34 |
| 35 | | | | | | | | | | - | | • | | - | | | | | | | | | 36 |
| 37 | | | | | | | | | - | | • | | - | | | | | | | | | | 38 |
| 39 | | | | | | | | | | - | | • | | - | | | | | | | | | 40 |
| 41 | | | | | | | | | - | | • | | - | | | | | | | | | | 42 |

PANEL NOTES:

PHASE TOTALS ØA: 0 ØB: 0

| | |
|---|---|
| TOTAL CONNECTED VA | 0 |
| CONNECTED VA (CODE N) | 0 |
| CONNECTED VA (CODE L) | 0 |
| CONNECTED VA (CODE R) | 0 |
| CONNECTED VA (CODE K) | 0 |
| PANEL CONNECTED KVA | 0.0 |
| PANEL DEMAND KVA | 0.0 |
| PANEL DEMAND AMPS | 0.0 |
| HIGH Ø AMPS w/ DEMAND | 0.0 |

24 CIRCUIT PANEL

NEW

## PANEL: S

VOLTAGE: 240 / 120 1Ø 3W
BUS: 100A
MAINS: 50A
AIC RATING: 10,000
CIRCUIT CODE: blank or
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

DATE: 6/14/22 3:56 PM
JOB: 16117-22-03
LOCATION: GUEST SUITE 2 - CLOSET
MOUNTING: FLUSH

| CKT NO | CODE | TRIP | POLE | LOAD DESIGNATION DESCRIPTION | (NOTE) | M | R | L | CONNECTED VA ØA | ØB | A | B | ØA | ØB | L | R | M | (NOTE) | LOAD DESIGNATION DESCRIPTION | TRIP | POLE | CODE | CKT NO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 20 | 1 | LIGHTING SUITE 2 | | | | | - | | • | | - | | | | | | LIGHTING SUITE 3 | 20 | 1 | | 2 |
| 3 | | 20 | 1 | LIGHTING SUITE 4 | | | | | | - | | • | | - | | | | | RECEPT SUITE 2 | 20 | 1 | | 4 |
| 5 | | 20 | 1 | RECEPT SUITE BATH 2 | | | | | - | | • | | - | | | | | | RECEPT SUITE 3 | 20 | 1 | | 6 |
| 7 | | 20 | 1 | RECEPT SUITE BATH 3 | | | | | | - | | • | | - | | | | | RECEPT SUITE 4 | 20 | 1 | | 8 |
| 9 | | 20 | 1 | RECEPT SUITE BATH 4 | | | | | - | | • | | - | | | | | | SMOKE DETECTORS | 20 | 1 | | 10 |
| 11 | | 15 | | FC-3A - 3C | | | | | | - | | • | | - | | | | | SPARE | 20 | 1 | | 12 |
| 13 | | | 2 | -- | | | | | - | | • | | - | | | | | | SPARE | 20 | 1 | | 14 |
| 15 | | 20 | 1 | SPARE | | | | | | - | | • | | - | | | | | SPARE | 20 | 1 | | 16 |
| 17 | | | | PFFB | | | | | - | | • | | - | | | | | | PFFB | | | | 18 |
| 19 | | | | PFFB | | | | | | - | | • | | - | | | | | PFFB | | | | 20 |
| 21 | | | | PFFB | | | | | - | | • | | - | | | | | | PFFB | | | | 22 |
| 23 | | | | PFFB | | | | | | - | | • | | - | | | | | PFFB | | | | 24 |
| 25 | | | | | | | | | - | | • | | - | | | | | | | | | | 26 |
| 27 | | | | | | | | | | - | | • | | - | | | | | | | | | 28 |
| 29 | | | | | | | | | - | | • | | - | | | | | | | | | | 30 |
| 31 | | | | | | | | | | - | | • | | - | | | | | | | | | 32 |
| 33 | | | | | | | | | - | | • | | - | | | | | | | | | | 34 |
| 35 | | | | | | | | | | - | | • | | - | | | | | | | | | 36 |
| 37 | | | | | | | | | - | | • | | - | | | | | | | | | | 38 |
| 39 | | | | | | | | | | - | | • | | - | | | | | | | | | 40 |
| 41 | | | | | | | | | - | | • | | - | | | | | | | | | | 42 |

PANEL NOTES:

PHASE TOTALS ØA: 0 ØB: 0

| | |
|---|---|
| TOTAL CONNECTED VA | 0 |
| CONNECTED VA (CODE N) | 0 |
| CONNECTED VA (CODE L) | 0 |
| CONNECTED VA (CODE R) | 0 |
| CONNECTED VA (CODE K) | 0 |
| PANEL CONNECTED KVA | 0.0 |
| PANEL DEMAND KVA | 0.0 |
| PANEL DEMAND AMPS | 0.0 |
| HIGH Ø AMPS w/ DEMAND | 0.0 |

24 CIRCUIT PANEL

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/24
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

GENERAL CONTRACTOR:

REVISIONS

| NO. | DESCRIPTION | DATE |
|---|---|---|
| | | |

**SINGLE FAMILY RESIDENCE**
**LOT 22 NOHEA, PHASE 1**
**TMK: 3-6-8-043:022**
NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD. STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
PH: 503-522-9000
monaghan.craig@gmail.com

DATE: 05/13/22

SCALE: As indicated

SHEET TITLE:
**ELECTRICAL SCHEDULES**

SHEET NUMBER:
E3.1

BACKFILL:

TYPE "A" NON–CONTAMINATED NATIVE SOIL MATERIAL WHICH DOES NOT CONTAIN MORE THAN 50% GRAVEL, AND ALSO, DOES NOT CONTAIN HARD LUMPS OF EARTH 3 INCHES IN GREATEST DIMENSION, ROCKS LARGER THAN 3 INCHES IN LARGEST DIMENSION, HIGHLY PLASTIC CLAY, POORLY–GRADED SAND AND GRAVEL (CLASSIFIED AS SP AND GP USING THE UNITED SOIL CLASSIFICATION SYSTEM), ORGANICS, DEBRIS, OR OTHER UNSUITABLE OR DELETERIOUS MATERIALS.

TYPE "B" : SELECT GRANULAR MATERIAL PASSING A ONE (1) INCH SIEVE SUCH AS THREE–QUARTERS (3/4) INCH AGGREGATE BASE COURSE GRAVEL, S4C OR MATERIAL THAT IS FREE OF ORGANICS DEBRIS OR HIGHLY–PLASTIC CLAY AND MEETS THE FOLLOWING GRADATION:

| SIEVE SIZE | PERCENT PASSING BY WEIGHT |
|---|---|
| 1" | 100 |
| 3/4" | 90–100 |
| NO. 4 | 35–100 |
| NO. 40 | 10–30 |
| NO. 200 | 3–15 |

NOTES:

1. WHERE TRENCH ENCOUNTERS EXISITING CONCRETE OR ASPHALT CONCRETE, SURFACE SHALL BE SAWCUT. BACKFILL, COMPACT AND PATCH SURFACE TO MATCH ADJACENT AREA.
2. PROVIDE 3" SEPARATION BETWEEN DUCTS OF SAME SYSTEM AND 12" SEPARATION BETWEEN ELECTRICAL DUCTS AND DUCTS OF DIFFERENT SYSTEMS.

## 1 TYPICAL DUCT SECTION DIRECT BURIED

NO SCALE

BACKFILL:

TYPE "A" NON–CONTAMINATED NATIVE SOIL MATERIAL WHICH DOES NOT CONTAIN MORE THAN 50% GRAVEL, AND ALSO, DOES NOT CONTAIN HARD LUMPS OF EARTH 3 INCHES IN GREATEST DIMENSION, ROCKS LARGER THAN 3 INCHES IN LARGEST DIMENSION, HIGHLY PLASTIC CLAY, POORLY–GRADED SAND AND GRAVEL (CLASSIFIED AS SP AND GP USING THE UNITED SOIL CLASSIFICATION SYSTEM), ORGANICS, DEBRIS, OR OTHER UNSUITABLE OR DELETERIOUS MATERIALS.

TYPE "B" SELECT GRANULAR MATERIAL PASSING A ONE (1) INCH SIEVE SUCH AS THREE–QUARTERS (3/4) INCH AGGREGATE BASE COURSE GRAVEL, S4C OR MATERIAL THAT IS FREE OF ORGANICS DEBRIS OR HIGHLY–PLASTIC CLAY AND MEETS THE FOLLOWING GRADATION:

| SIEVE SIZE | PERCENT PASSING BY WEIGHT |
|---|---|
| 1" | 100 |
| 3/4" | 90–100 |
| NO. 4 | 35–100 |
| NO. 40 | 10–30 |
| NO. 200 | 3–15 |

NOTES:

1. ELECTRICAL AND TELEPHONE DUCTS SIMILAR.
2. PROVIDE 1–1/2" SEPARATION BETWEEN DUCTS OF SAME SYSTEM AND 3" BETWEEN DUCTS OF DIFFERENT SYSTEMS
3. WHERE TRENCH ENCOUNTERS EXISITING CONCRETE OR ASPHALT CONCRETE, SURFACE SHALL BE SAWCUT. BACKFILL, COMPACT AND PATCH SURFACE TO MATCH ADJACENT AREA. SEE TRENCH RESTORATION DETAIL
4. SEE DUCT SECTION DETAILS FOR CONDUIT ARRANGEMENT

## 3 TYPICAL DUCT SECTION CONCRETE ENCASED

NO SCALE

CLEARANCES AROUND METERS

ALLOW THE FOLLOWING CLEARANCES AROUND METERING EQUIPMENT:

1. CLEARANCE AROUND THE METER: 6 INCHES ABOVE, AND TO THE SIDE OF THE METER SOCKET ENCLOSURE OR INSTRUMENT TRANSFORMER ENCLOSURE, TO ANY OBSTRUCTION.
2. A CLEARANCE IN FRONT OF METERING EQUIPMENT OF 4 FEET BY 7 FEET WITH NO OBSTRUCTIONS SUCH AS WALLS, FENCES, TREES, HEDGES, OR OTHER STRUCTURES OR EQUIPMENTS.

- DIAGRAM PROVIDED FOR REFERENCE ONLY
- REFERENCE HAWAII ELECTRIC LIGHT COMPANY ELECTRIC SERVICE INSTALLATION MANUAL, NINTH EDITION FOR ACTUAL REQUIREMENTS

## 5 HELCO METER CLEARANCE REQUIREMENTS

NO SCALE

## NOTES

1. TIMECLOCK INTERMATIK ASTRONOMICAL TIME CLOCK WITH BATTERY BACK UP, DIGITAL DISPLAY. MOUNT ABOVE PANEL.
2. PHOTOCELL TORK 2100 SERIES SPST 120V MOUNT ON ROOF FACING NORTH

## 2 LIGHTING CONTROL WITH TIMECLOCK AND PHOTOCELL

NO SCALE

## 4 2-PORT FACEPLATE

NO SCALE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/24
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

GENERAL CONTRACTOR:

| REVISIONS NO. | DESCRIPTION | DATE |
|---|---|---|
| | | |

**SINGLE FAMILY RESIDENCE**
**LOT 22 NOHEA, PHASE 1**
**TMK: 3-6-8-043:022**
NOHEA AT MAUNA LANI, LLC
16130 VENTURA BLVD. STE 510
ENCINO, CA 91436 2538
PH: (805) 494-7704, FAX: (805) 494-1226

CRAIG MONAGHAN, ARCHITECT
4522 LOWER DR. LAKE OSWEGO, OR 97035
PH: 503-522-9000
monaghan.craig@gmail.com

DATE : 05/13/22

SCALE : As indicated

SHEET TITLE:
**LOT 22 DETAILS**

SHEET NUMBER:
E4.0