





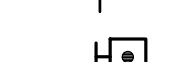








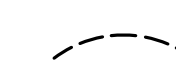

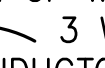

PROJECT LOCATION
NOT TO SCALE

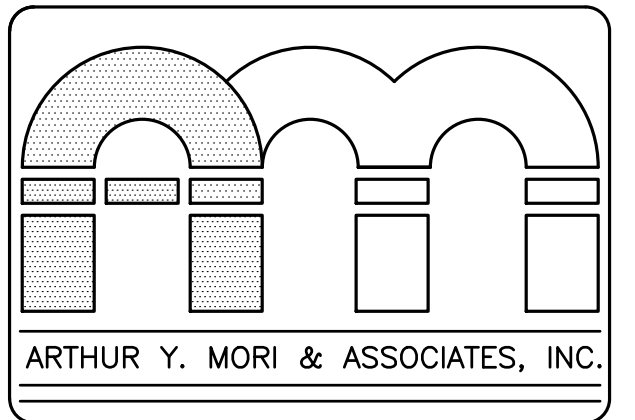
| LUMINAIRE SCHEDULE | | |
|--------------------|---|-----------------------------|
| TYPE | DESCRIPTIONS | LAMP |
| ① | LED, RECESSED VANDAL-RESISTANT ANTI-LIGATURE (CONFINEMENT-TYPE) 1'x4' IN GYP. CLG. 0.187" PRISMATIC POLYCARBONATE DIFFUSER, STAINLESS STEEL TAMPER-RESISTANT HARDWARE, MULTIVOLT ELECTRONIC DRIVER, 1%-100% 0-10V DIMMING TYPE FAIL-SAFE #FMR-S-12-4-LD4-1-STD-35-UNV-85-ED1D-1 OR APP. EQUAL | 2400 LUMEN LED (37W), 3500K |
| | | |
| | | |

ELECTRICAL LEGEND AND NOTES

NUMERALS IN CIRCLES FOR LUMINAIRE SYMBOLS CORRESPOND TO LUMINAIRE SCHEDULE

-  CEILING MOUNTED OUTLET WITH LINEAR LUMINAIRE
 -  CEILING MOUNTED OUTLET WITH LUMINAIRE
 -  SINGLE POLE SWITCH AT +4'-0" UNLESS NOTED
 -  WALL DIMMER SWITCH
 -  DUPLEX CONVENIENCE RECEPTACLE AT +15" UNLESS NOTED
 -  HOSPITAL-GRADE TAMPER-RESISTANT DUPLEX CONVENIENCE RECEPTACLE
 -  DOOR STRIKE PUSHPLATE RELEASE AT +4'-0"
 -  EQUIPMENT TERMINATION
 -  DISCONNECT SWITCH
 -  CEILING MOUNTED SPEAKER
 -  CEILING MOUNTED SMOKE DETECTOR

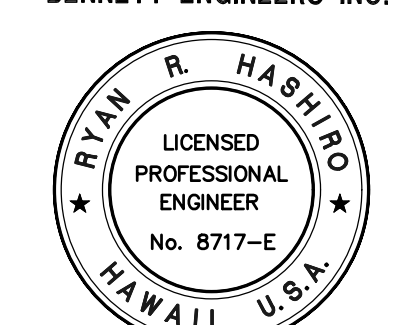
 - E DENOTES EXISTING TO REMAIN
 - R DENOTES EXISTING TO BE REMOVED
 - ER DENOTES EXISTING TO BE RELOCATED
 - RD DENOTES RELOCATED EQUIPMENT
 - GFI DENOTES GROUND FAULT INTERRUPTER
 - +4^o DENOTES 4'-0" ABOVE FINISHED FLOOR
 - +15" DENOTES 15 INCHES ABOVE FINISHED FLOOR
 -  CONDUIT WITH WIRING CONCEALED IN CEILING OR WALL
 -  CONDUIT WITH WIRING CONCEALED IN FLOOR OR WALL
 -  EXPOSED CONDUIT OR OVERHEAD SERVICE
- LOWER CASE LETTERS (a,b,c) ARE USED ON GANGED SWITCHES TO INDICATE OUTLETS CONTROLLED, NUMERALS USED AS SUBSCRIPTS TO OUTLETS INDICATE CIRCUIT TO WHICH EACH IS CONNECTED.
 - ANY CIRCUIT WITHOUT FURTHER DESIGNATION INDICATES A TWO WIRE CIRCUIT. FOR A GREATER NUMBER OF WIRES THE INDICATION IS BY "HASHMARKS" AS FOLLOWS:  3 WIRES,  4 WIRES, ETC.  DENOTES GROUND CONDUCTOR.



ARCHITECTS AIA
1314 SOUTH KING / SUITE 955
HONOLULU, HAWAII 96814

EMERGENCY DEPARTMENT
BHS TREATMENT ROOM
 MAHELEONA MEDICAL CENTER
 4800 KAWAIHAU ROAD
 KAPAA, HI 96746
 TMK: 4 - 6 - 014 : 030
 SHEET TITLE ELECTRICAL LEGEND & NOTES, LUMINAIRE SCHEDULE

BENNETT ENGINEERS INC.



LICENSE EXPIRES: 4/30/20

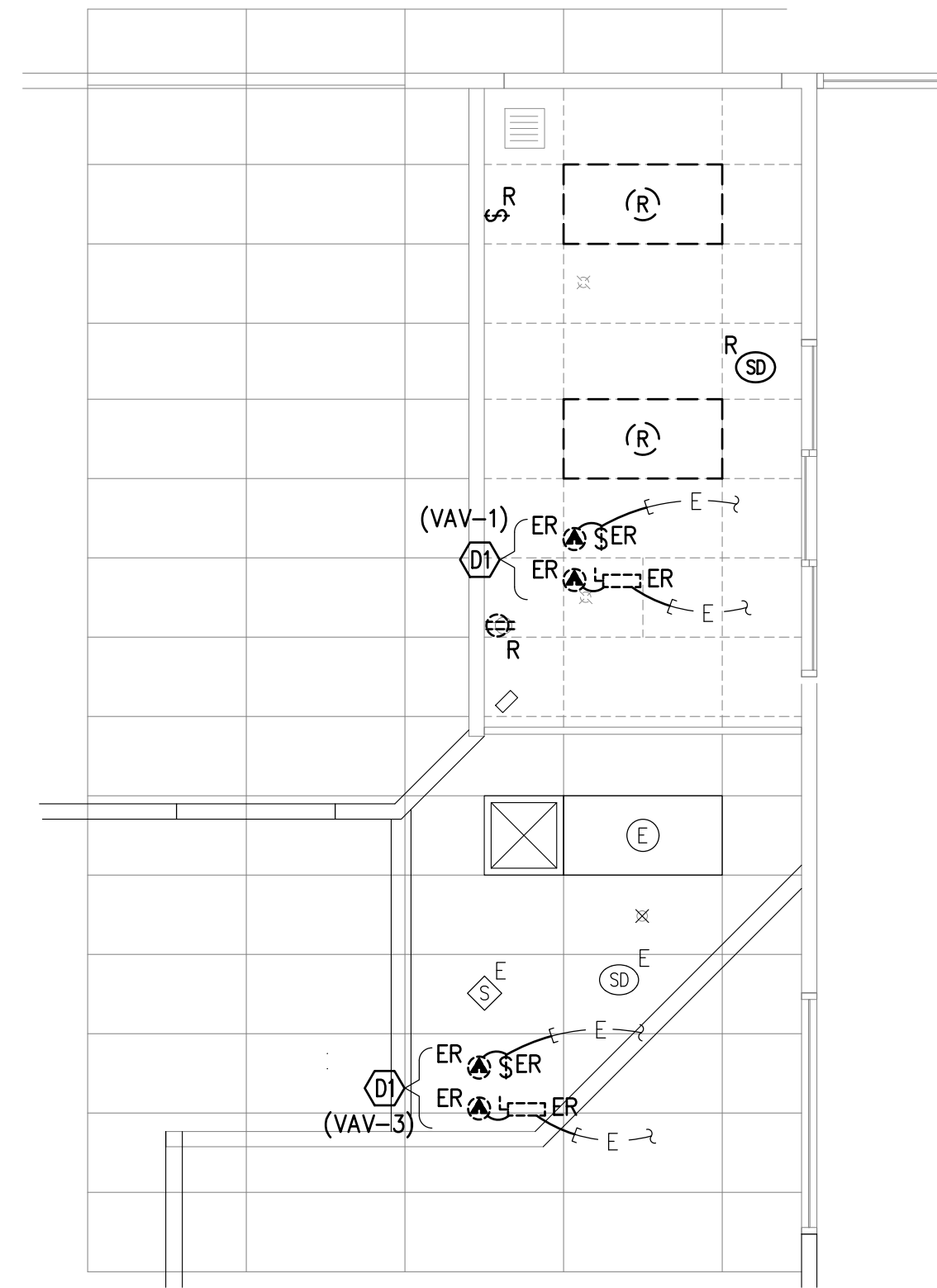
This work was prepared by me or under my supervision and construction of this project will be under my observation (observation of construction as defined in Section 16-115 of the Hawaii Administrative Rules, Department of Commerce and Consumer Affairs entitled Professional Engineers, Architects and Surveyors of the State of Hawaii).

Ryan R. Hashido
SIGNATURE

NOTE:
Contractor to check and verify all dimensions at job before proceeding with work.

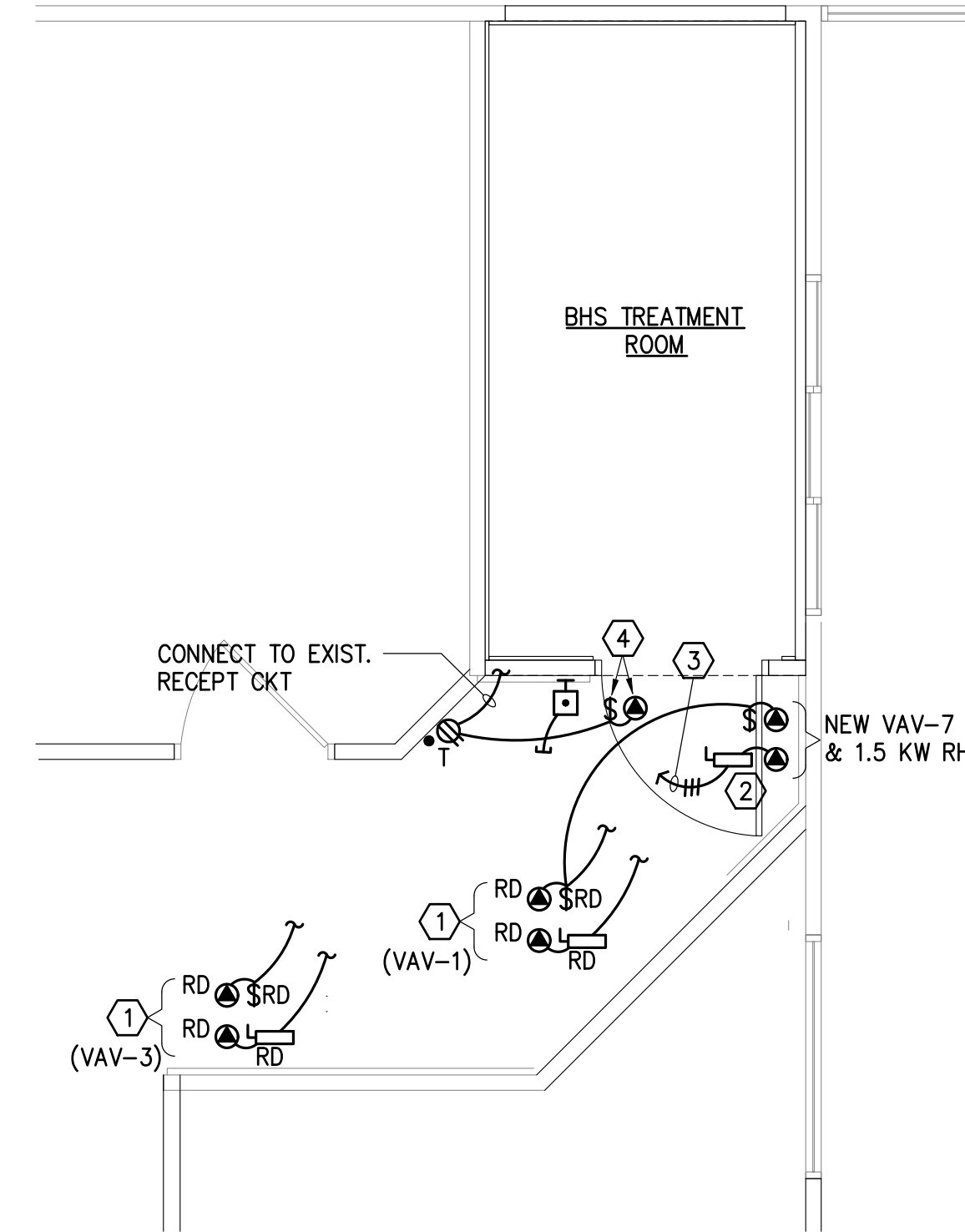
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JOB NO. —



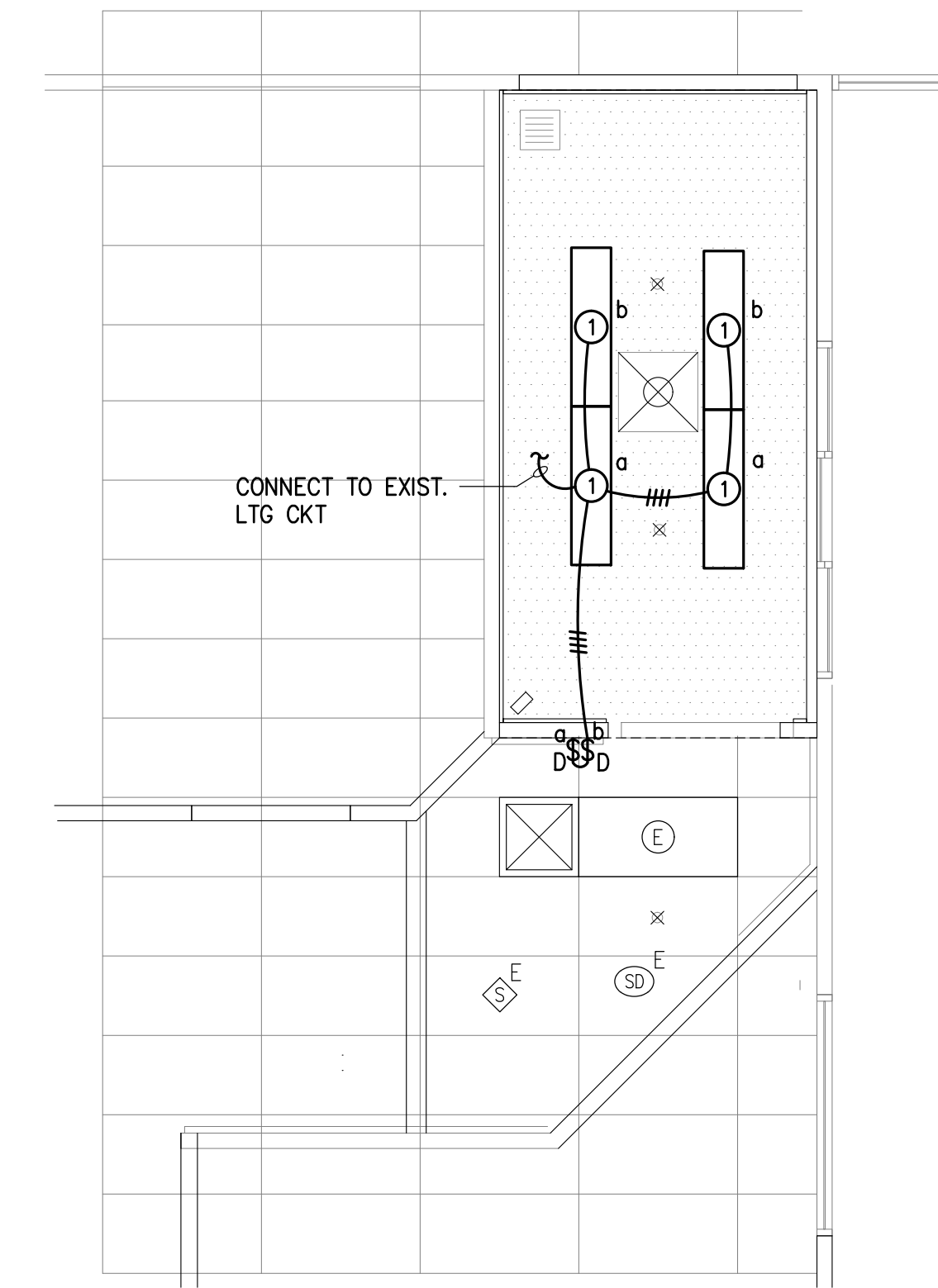
ELECTRICAL DEMOLITION PLAN
SCALE: 1/4" = 1'-0"

ELECTRICAL DEMOLITION PLAN NOTES:
 (D) RELOCATE EXISTING VAV BOX & RH TERMINATIONS AND DISCONNECT SWITCHES TO NEW LOCATIONS.

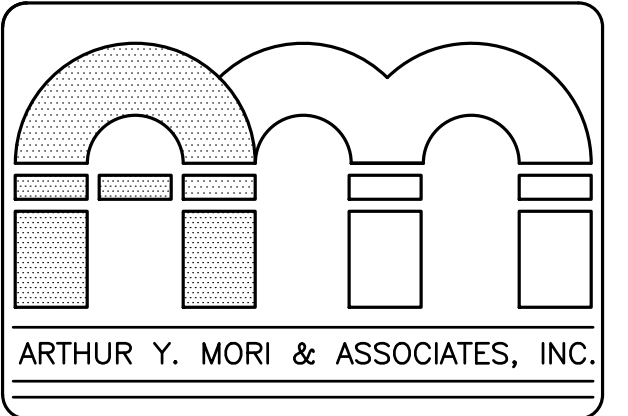


NEW POWER & OUTLETS PLAN
SCALE: 1/4" = 1'-0"

NEW POWER & OUTLETS PLAN NOTES:
 (1) RELOCATED VAV BOX & RH COIL. RELOCATE EXISTING DISC SWITCHES AND CONNECT TO EXISTING CKTS.
 (2) PROVIDE NEW 30A-3P N.F. DISC SW FOR NEW 208V, 3 ϕ RH COIL.
 (3) TO NEW 15A-3P BKR IN EXIST PNL SERVING EXISTING RH COILS. EXISTING 15A-3P RH COIL CKT CAN BE TAPPED, PROVIDED THAT THE TOTAL LOAD ON THE CKT DOES NOT EXCEED 4 KW.
 (4) ELECTRIC DOOR STRIKE POWER SUPPLY. PROVIDE 20A-1P N.F. TOGGLE DISC SW. AT POWER SUPPLY LOCATION.



NEW LIGHTING PLAN
SCALE: 1/4" = 1'-0"



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TMK: 4 - 6 - 014 : 030

SHEET TITLE: ELECTRICAL PLANS

BENNETT ENGINEERS INC.

LICENSE EXPIRES: 4/30/20

This work was prepared by me or under my supervision and construction of this project will be under my observation (observation of construction as defined in Section 16-1.15 of the Hawaii Administrative Rules, Department of Commerce and Consumer Affairs entitled Professional Engineers, Architects and Surveyors of the State of Hawaii).

Ryan R. Hashiro
 SIGNATURE

NOTE:
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JOB NO. —

ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

1.1 SCOPE

- A. The work under this section of the specifications includes all labor, materials, equipment, and services necessary to complete electrical work as shown on the drawings and herein specified including, but not limited to:
1. Branch circuit wiring systems.
2. Luminaires.
3. Equipment connections and disconnect switches.
4. "As-built" drawings.

1.2 RULES AND REGULATIONS

- A. The entire installation shall be made in compliance with the applicable provisions of the latest edition of the National Electrical Code, and Local Ordinances, Rules and Regulations of the Building Department.

1.3 EXAMINATION OF SITE

- A. The Contractor shall examine the project site before submitting his bid so that he may be fully informed of the conditions existing and the amount and kind of work to be performed therein.
B. The Contractor shall be deemed to have complied with this stipulation of these specifications upon submitting his bid. No request for extra payment for work claimed by reason of misunderstanding the amount and kind of work required will be granted.

1.4 GUARANTEE AND STANDARDS

- A. The Contractor shall guarantee all items of material and workmanship for a period of one (1) year from the date of final acceptance by the Owner.
B. All materials shall be new, code gauged and sized, and shall bear the U.L. label of approval for all items where standards have been established and label service is regularly furnished.

1.5 DRAWINGS

- A. These specifications are accompanied by floor plans of the building, and site plans indicating locations of service runs, and other electrical apparatus. These locations are approximate and, before installing, the Contractor shall study the adjacent architectural details and make adjustments as necessary in the most logical manner. Any outlet may be relocated within ten feet (10') before installation at the direction of the Architect without additional cost to the Owner. The layout is generally diagrammatic and the Contractor shall coordinate the installation of conduit runs, outlets, control devices, and power units as permitted by structural conditions and appropriately locate these units with the approval of the Architect.
B. Should it appear that any part of the electrical drawings have been omitted or require clarification, the Bidder shall call such to the attention of the Architect not less than 14 days before the date of bid opening so that clarification or correction may be made. Otherwise, the Contractor shall furnish and install all items in a manner which will provide a complete installation as if the same were specified.
C. The circuit routing is typical only and may be varied in any logical manner. However, "as-built" plans, consisting of one set of sepia and one set of prints, shall be submitted in accordance with the General Conditions. The drawings and specifications are complementary, each to the other, and what is called for by one shall be as binding as if called for by both.

1.6 SHOP DRAWINGS

- A. Contractor shall procure and deliver to the Architect for approval shop drawings, six (6) sets of the manufacturer's technical brochures and detailed description of the following listed items:
1. Luminaires and lighting control components.
2. Apparatus.

1.7 MATERIAL AND WORKMANSHIP

- A. All materials shall be new and of the best grade. They shall bear the label of approval of the Underwriter's Laboratories, Inc., wherever standards have been established and label service is furnished by the agency.
B. All materials that are normally contained in packages shall be delivered in unopened packages to the job site.
C. Brand names and catalog numbers when noted in the drawings or listed in these specifications indicate the standards of quality of the items required. When other manufacturers' products are not mentioned, the Contractor may bid on substitutes only after obtaining written approval from the Architect.
D. All work shall be installed in a workmanlike manner and, when completed, shall be neat and symmetrical, plumb, uniform, properly aligned and firmly secured in place presenting a high quality of workmanship.
E. The Contractor shall take all means necessary to protect installed and stored materials from physical damage, corrosion, construction debris, and vandalism. No metallic conduit, apparatus, luminaires, wiring devices and other construction material shall be stored in the open. All installed conduit, outlet boxes, and panelboard interiors shall be protected at all times against construction debris and water. All materials damaged or rusted in any way shall be removed from the job and replaced with new materials of equal quality at no cost to the Owner.
F. The Architect shall be afforded every opportunity to ascertain the quality of materials and the skill and competency of labor. Concealed work may be opened at random for formal inspection by the Architect.

1.8 GUARANTEE

- A. Any item of material, apparatus or workmanship furnished by the Contractor that develops defects in quality design, construction or serviceability within one (1) year of final acceptance by the Architect shall be replaced by the Contractor, without cost to the Owner, with such new material, apparatus, replacement parts, or work as may be found necessary to make the defective portion of the complete system conform to the true intent and meaning of the plans and specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used under this section. The Contractor shall insure that all materials and equipment incorporated in the project are asbestos-free.
B. New and UL labeled: Material and equipment new and free of defects and suited to the intended use; and be listed by the Underwriters' Laboratories, Inc., meet their requirements and bear their label whenever standards have been established and label service is regularly furnished by that agency.
C. Standards established: Where materials, equipment, apparatus, or other products are specified by manufacturer, brand name, type, or catalog number; such designations are to establish standards or desired quality and style and be the basis of the bid.
D. Product continuity: All equipment or materials for any one system by the same manufacturer. Items such as conduit fittings, wire, wiring devices, etc., to be the same throughout the project.
E. Exterior materials: To be weathertight and of such design for the purpose. All ferrous materials on the exterior galvanized. Exterior fixtures to be constructed of aluminum or bonderized steel with an epoxy coating, except as specifically noted.

2.2 PANELBOARDS

- A. General: Provide new breakers in existing panelboards where shown on the drawings. New breakers shall be U.L. listed for use with the panelboards. Provide updated printed circuit directories for all panelboards with new/modified loads.

2.3 RACEWAYS

- A. Rigid metallic: Conform to industry standards, steel, full weight, threaded fittings, factory bends over 1-inch diameter. Protected inside and outside by galvanizing or sherardizing.
B. Electrical metallic tubing: Protected inside and outside by galvanizing or sherardizing 4-inch maximum. Same manufacturers as for steel rigid conduits. 3/4-inch minimum size.
1. Connectors: With insulated throats.
2. Couplings and Connectors: 3/4-inch and smaller may be set screw or compression threadless. Use compression type or other approved raintight for 1-inch and larger.
C. Flexible conduit: National Flexsteel or equal. Where exposed to weather use American Brass "Sealtite" Type UA, or equal, complete with waterproof fittings. Provide ground wire for length 6 feet and longer.
D. PVC: UL listed, rigid, Schedule 40, 3/4-inch minimum size, unless noted otherwise.

2.4 WIRE AND CABLE

- A. Conductors: All conductors shall be copper. Conductors of soft drawn copper with 600-volt insulation as hereinafter specified. All wires and cables must be delivered to the building in standard coils or reels with a tag bearing the manufacturer's name and trade name of the wire and the Underwriters' Label. NM and BX cabling not acceptable.
B. Size: #12 AWG solid minimum, except fire alarm system #14 AWG minimum. 120 V. branch circuit runs over 100 feet must be #10 AWG solid minimum.
C. Insulation Types:
1. #8 AWG and Smaller - THWN or as noted.
2. #6 AWG and Larger - THW, RHW, THWN, XHHW, or as noted, stranded.
3. Exterior cables - XHHW.
D. Lugs and Connections:
1. #6 AWG to #2 AWG: Thomas & Betts "Lock-Tite" or Burndy "Quicklug".
2. #8 AWG and Smaller: "Scotchlok" with insulator, Thomas & Betts "Sta-Kon" with insulator or Buchanan Series 2002 with insulator.
3. Cable Taps #1 AWG and Larger: OZ type PT/PTC or equal.
4. Splices in handholes: Cast resin or heat shrink type, waterproof, Raychem or equal.
E. Splicing insulation: Electrical tape - Scotch #33 or equal.

2.5 WIRING DEVICES

- A. Switches: Commercial specification grade, 120/277V, 20A, quiet-type, equal to Leviton #CSB1-20, brown. Where more than one switch occurs at the same location, they shall be ganged under one plate.
B. Duplex convenience receptacles: Grounding type, hospital-grade, tamper-resistant, 15 Amp., 125 V., Leviton #T8200, or approved equal - brown. GFI receptacles, U.L. listed, 5 ma pickup, Leviton #GFNL1.
C. Cover plates: For switches, outlets, and receptacles shall be stainless steel, matching for both switches and receptacles. Gangs as required. Cover plates in patient areas shall be secured with stainless steel tamper-resistant ("Torx") type screws.
D. Weatherproof receptacles: Shall be same as Item B in gasketed Type FD cast box with flip up "in-use" covers. Taymac or approved equal.
E. Disconnect switches: Ampere rating as indicated. Type HD, with enclosures as indicated.
F. Wallbox dimmers: Slide-to-off type, heavy-duty, with RFI suppression, rating as noted on plans, brown. Dimmers shall be compatible for use with their respective drivers/loads.

2.6 OUTLET BOXES

- A. General: Outlet boxes shall be of the size and kind best suited to the particular use or location but in any case shall be of sufficient size to contain, without crowding, all conductors and connections which may be required in any outlet box. Boxes shall, where necessary, have suitable covers. All boxes shall be pressed steel, zinc-coated, except that exposed boxes shall be cast type with threaded hubs and matching plates.
B. Support: Fixture studs shall be provided as required and shall be a 3/8-inch malleable iron type, zinc-coated, four-bolt type or "no-bolt" type as desired by the Contractor, except that all must be the same type.
C. Sizes: Boxes shall be installed with particular attention paid to compliance with NEC Section 314.15 and 314.16 except that 4-inch standard trade size shall be the minimum. Outlet boxes for auxiliary systems shall be indicated on the drawings. Locations of all outlets shall be checked against the architectural elevations.

2.7 TERMINAL CABINET AND PULLBOXES

- A. General: Terminal cabinets shall be surface mounted and of a size as indicated. Each shall have a hinged door. The finish of the front of each cabinet shall be the same as that for panelboards installed under this contract. Each cabinet shall contain a 3/4-inch plywood treated backing. Cabinets shall be provided with a flush lock and two keys. The same key shall open all terminal cabinets as well as the panelboards.
B. Construction: Pull and junction boxes shall be code gauged and sized and shall be provided where noted or required. Boxes shall have screw covers. All boxes shall be factory finished in baked gray enamel.

2.8 LUMINAIRES

- A. Luminaires shall be provided complete with lamps. Luminaires shall have integral thermal protection. Where luminaires are installed outdoors, a gasket shall be provided between the outlet box and the fixture and also between the fixture hood and the globe or enclosure. Luminaires installed in dropped ceilings shall have earthquake clips.
B. Luminaires in patient areas shall be vandal-resistant confinement type. Installation shall be flush with the mounting surface such that the luminaire poses no ligature attachment points to the patient. Where existing luminaires are being replaced with new luminaires, the surrounding mounting surfaces shall be modified as necessary to provide a solid, flush-type installation which poses no ligature attachment points to the patient.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. All electrical work shall be neatly executed, workmanlike in appearance, symmetrical, plumb, uniform, properly aligned, and firmly secured in place. Dimensions and locations shown on the drawings shall be verified in the field. Discrepancies and interferences with other work shall be immediately called to the attention of the Architect and corrections or adjustments shall be made as he directs. All cutting and patching necessary for electrical work shall be done by artisans skilled in the trade. Conduit system shall be free of dust and debris.

3.2 CONDUIT SYSTEM

A. Allowed Uses:

- 1. Rigid steel
a. Conduit exposed to weather.
b. Exposed conduit stubbed up or exposed below 8 feet.
2. EMT
a. All branch circuiting above grade slab.
b. All feeders above grade slab.
c. All branch circuits in walls, ceiling spaces, and furring.
3. PVC
a. All site underground and grade slab branch circuits.
b. All utility ducts.

B. Installation:

- 1. The conduit system shall be continuous from outlet to outlet or fitting to fitting so that electrical continuity is obtained between all conduits of the system. Factory threads shall be cleaned with a die before conduit is installed. All conduits shall be concealed where possible.
2. Ends of all conduits shall be cut square and inner edges reamed. Adjoining lengths shall butt together evenly in the couplings to provide passage for installing conductors.
3. Conduits shall be of ample size to allow drawing in or removing of wires and cables without undue strain, and suitable chaffing bushings shall be installed on each end of every run of conduit where wires are installed.
4. Where necessary, powdered soapstone shall be used as a lubricant for drawing wires through conduit. No other means of lubrication will be allowed.
5. Conduit shall be installed entirely free from other piping, valves, or mechanical equipment, and shall not be installed nearer than 6 inches to hot water pipes and steam pipes.
6. Bends, offsets, and crossing of conduits shall be avoided wherever possible. When bends and offsets are necessary, they shall be made with an approved hickey or a conduit-bending machine. The use of a vise or pipe tee will not be permitted. Bends shall be made so that the interior cross-sectional area will not be reduced. The radius of the curve of the inner edge of any field bend shall not be less than ten times the internal diameter of the conduit. A run of conduit between outlets or other boxes shall not include more than the equivalent of two 90 degree angle bends, including those bends located immediately at the outlet or fitting. Junction boxes with blank covers shall be installed as necessary to meet this requirement. The use of running threads will not be permitted. Where conduits cannot be joined by standard threaded couplings, approved watertight conduit unions shall be used with prior approval.
7. Conduits shall be capped during construction with metal capped bushings to prevent the entrance of dirt or moisture. All conduit shall be thoroughly swabbed out and dried before wires or cables are pulled in.
8. Fish wires, cords, strings, chains, or the like, shall not be placed or inserted in the conduit system during installation.
9. After the conduit system has been installed and thoroughly dried out, the empty conduits shall be left with a No. 12 galvanized iron drag wire.
10. Concealed conduit to be laid in concrete slabs, behind wall furring, above false ceiling, in special riser chases and shafts, or underground, shall be installed as the building construction or work progresses. All metallic underground conduit shall be painted with two coats of approved bituminous compound.
11. Conduit in concrete slab floor shall be kept as low as possible and not less than 1-inch below the finished floor line or top finish surface line. Care shall be taken to avoid crossing more than two conduits at any one point unless space provided permits, and conduits shall be run accordingly. Where it is necessary to run conduits through a slab, sleeves shall be provided for this purpose. No cutting of the concrete will be permitted after the concrete is poured.
12. When making threaded conduit joints underground, in concrete, or exposed to weather, the threads shall be first coated with red lead and immediately screwed together. All such joints shall be made watertight. All abrasions or coating shall be painted with approved moisture-proof paint.
13. Where conduits cross construction and/or expansion joints, a rigid steel conduit sleeve shall be provided on both sides of the joint. The inside diameter of the sleeve shall be three times the outside diameter of the conduit, and shall be 3-feet long.
14. All conduits which are deformed or crushed in any way shall be removed from the job at once.
15. Final connections to equipment shall be with liquid-tight flexible conduit.
16. Duct lines traversing through structural footings should be coordinated to ensure settling of the structure does not have a detrimental effect on the duct line.
17. Existing surface-mounted conduits and device junction and backboxes shall be removed and replaced with concealed conduits and recessed junction/backboxes in all patient areas.
18. New conduits shall be run concealed in walls and/or ceiling spaces in all patient areas. New device backboxes shall be recessed type in all patient areas.

3.3 WIRING

- A. All wiring shall be installed after conduit system is complete.
B. No conductor in the branch circuit shall be smaller than the homerun conductor size. The branch circuit conductors in a continuous row of luminaires (wired through their own wireways from one ceiling outlet) shall not be decreased in size from panelboard to farthest ballast. Conductors in fixture wire ways shall be of type approved for such use as per NEC.
C. Where the Contractor finds it necessary to radically reroute any conduit run resulting in marked increase in circuit length from what is indicated on the plans, he shall change the conductor size to prevent a voltage drop to the farthest outlet exceeding 3% under load or notify the Engineer, who shall then stipulate the conductor size.

3.4 MECHANICAL EQUIPMENT CONNECTIONS

- A. Individually mounted starters will be furnished by Mechanical. Installation of starters and all power wiring will be by this Contractor. Power disconnecting devices will be by this Contractor.

3.5 PAINTING

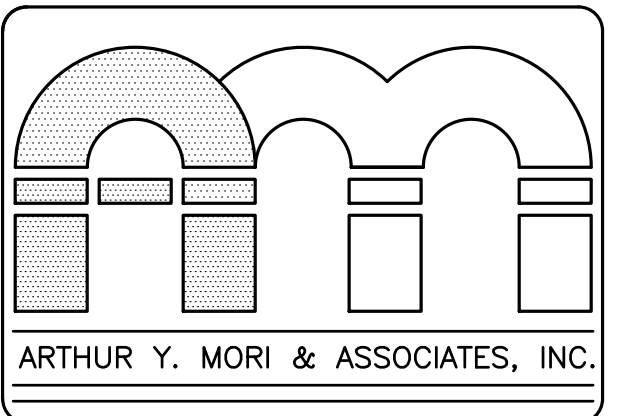
- A. Paint all new exposed conduit, boxes, and cabinets and panel fronts where occurs to match the color of surrounding surfaces. Painting will be done by the Painting Subcontractor.

3.6 GROUNDING

- A. The neutral of the a.c. system and all metallic equipment and enclosures for conductors shall be grounded per the National Electric Code. Equipment grounding conductors for all new branch circuit wiring shall consist of a ground conductor(s) run with the circuit conductors.

3.7 TESTING AND COMPLETION

- A. The Contractor shall provide suitable and neatly stenciled nameplate identifications on all of the electrical devices and/or apparatus installed. Nameplates, legible from distance of 10-feet, letters not less than 3/4-inch high, shall indicate the circuit termination operational directions and/or apparatus and load controlled.
B. All auxiliary systems shall be tested in the presence of a representative of the Owner, Architect, and Manufacturer's Representative. Operational instructions (verbal and written) shall be discussed with and given to the Owner by the various manufacturer's representatives.



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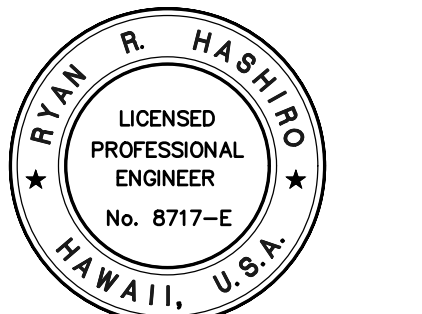
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Table with columns for NO. and REVISION. Below it is a table with columns for JOB NO. and DATE.