



LEAHI HOSPITAL
HAWAII HEALTH SYSTEMS CORPORATION

3675 Kilauea Avenue ■ Honolulu, Hawaii 96816 ■ Telephone: (808) 733-8000

March 30, 2026

TO: Interested Bidders

FROM: Michael Nakada
HHSC Oahu Region

SUBJECT: Addendum No. 1
IFB No. 26L-0309 Leahi Hospital Young Basement Heat Pump Replacement

Addendum No. 1 provides changes to the subject solicitation.

1. See attached.

End of Addendum No. 1

ADDENDUM NO. 1

TO CONSTRUCT

YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI
HOSPITAL
TAX MAP KEY: 3-2-031:001
3675 KILAUEA AVENUE
HONOLULU, OAHU, HAWAI'I, 96816

DATE: MARCH 26, 2026

This addendum modifies the original Solicitation Documents for the Project issued on March 25, 2026 and any previously issued addenda. The items in this addendum shall govern the work, taking precedence over previously issued specifications and drawings governing the items mentioned.

A. REVISED DRAWINGS:

1. Sheet 001: Added DOR Stamp and Signature to border.
2. Sheet M-001: Added DOR Stamp and Signature to border. Added DOR signature to updated date on Energy Code Compliance block. Removed reference to "Hospital" from Phasing Notes.
3. Sheet MD101: Added DOR Stamp and Signature to border.
4. Sheet M-101: Added DOR Stamp and Signature to border.
5. Sheet M-401: Added DOR Stamp and Signature to border.
6. Sheet M-501: Added DOR Stamp and Signature to border.
7. Sheet M-601: Added DOR Stamp and Signature to border. Added "PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION." to Heat Pump schedule remarks.
8. Sheet M-701: Added DOR Stamp and Signature to border. Revised control diagram and sequence of operation to better clarify which portions are existing and which are new. Added new Hot Water Aquastat to the schematic diagram.
9. Sheet E-001: Added DOR Stamp and Signature to border.
10. Sheet ED101: Added DOR Stamp and Signature to border.
11. Sheet E-101: Added DOR Stamp and Signature to border.
12. Sheet E-601: Added DOR Stamp and Signature to border.

LEAHI HOSPITAL
Young Basement Heat Pump Replacement
Honolulu, Hawaii

PREPARED FOR:
Hawaii Health Systems Corporation
Leahi Hospital
3675 Kilauea Ave,
Honolulu, HI 96816

TECHNICAL SPECIFICATIONS

BID SET SUBMITTAL

March 2026

Prepared By:



1001 Bishop Street, Suite 2500 • Honolulu, Hawaii 96813
Tel: 808 521-3773

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DIVISION 0 - INTRODUCTORY, BIDDING AND CONTRACTING REQUIREMENTS

SECTION 00210 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 GENERAL:

- A. Only Bidders with the required contractor's license(s) are eligible to submit a Bid.
- B. Bidders (Contractors) shall be incorporated or organized under the laws of the State or be registered to do business in the State as a separate branch or division that is capable of fully performing under the contract. The following definitions are used in the solicitation documents.
 - 1. Hawaii Business §3-1222-112 HAR: A bidder who is registered and incorporated or organized under the laws of the State is a "Hawaii Business" and eligible for an award.
 - 2. Compliant non-Hawaii Business §3-122-112 HAR: A bidder not incorporated or organized under the laws of the State, but is registered to do business in the State and complies with or is exempt from the requirements of §3-122-112 HAR, is a "Compliant Non-Hawaii Business" and eligible for an award.
 - 3. Non-compliant Bidder: If a bidder is a non-Hawaii business and is not registered with the DCCA Business Registration Division (BREG) or cannot comply with §3-122-112 HAR, then the bidder is non-compliant and is ineligible for an award.
- C. Prospective Bidders shall submit their "Intention to Bid".
- D. Bidders shall submit the "Sealed Bid Form", bid bond (if required), tax clearances, Hawaii business certificates, and any other documents required by the bidding documents.
- E. The GENERAL CONDITIONS set forth additional terms and conditions for the bid and award process. The GENERAL CONDITIONS will be part of the contract documents by which HHSC and the bidder (prospective contractor) will be bound. Bidders are directed to the GENERAL CONDITIONS for contract and statutory requirements and for Bidding and Execution of the Contract Requirements. Bidders are also directed to "Section 00800 - Special Conditions" of these specifications for definitions and modifications to the GENERAL CONDITIONS.

1.02 OFFEROR(S) or BIDDER(S):

- A. The terms "Offeror" and "Bidder" are synonymous when used in this Section 00210 and other solicitation documents.

1.03 ADDENDA, CLARIFICATIONS:

- A. Addenda: The HHSC may periodically issue an addendum that may increase or decrease the scope of work or contract time, provisions or conditions. The HHSC will make the addenda available online on the facility website. Bidders are responsible for the information contained in the addenda or bid clarification whether or not the Bidder receives the addenda or clarification.
- B. Bidders discovering an ambiguity, inconsistency or error when examining the bidding documents or the site and local conditions or bidders with questions or clarification requests shall send their written requests (email or fax notification are acceptable) to the Contract Manager. Bidders shall comply with the following procedures:
 - 1. Identify each request with the Project Name and HHSC Project Number.
 - 2. Indicate the appropriate section number, paragraph, drawing and detail number, schedule or other identifier.
 - 3. The request should be brief, concise, but complete enough to properly evaluate and determine the merits or non-merits of the question or request.
- C. Bidders shall make any requests for clarifications no later than fourteen (14) calendar days prior to the submission date for sealed bids. Refer to the "Notice to Bidders" for submission date.
- D. HHSC will respond to important requests or clarifications by way of addenda. HHSC may not address or respond to all bidders inquiries, if the HHSC determines the request is unimportant or not required to disseminate to all Bidders.

1.04 SEALED BID FORM (BID FORM):

- A. Bidder shall fill out the "Sealed Bid Form" completely. Write in ink or type. Besides the following paragraphs with instructions, there are supplemental Bidder's Instructions within the text of the "Sealed Bid Form" and bidders shall comply with the instructions. Do not alter the "Sealed Bid Form", and maintain the form intact.
- B. RECYCLED PRODUCT PREFERENCE is not applicable to this project.
- C. OTHER CONDITIONS: Bidder acknowledges and agrees to the provisions and certifications stated in this article.
- D. RECEIPT OF ADDENDA: Bidder shall fill in the appropriate dates any addenda were received.

- E. LISTING JOINT CONTRACTORS OR SUBCONTRACTORS:
1. Bidder shall complete the “Joint Contractors or Subcontractors List.” It is the sole responsibility of the bidder to review the requirements of this project and determine the appropriate specialty contractor’s licenses that are required to complete the project. Failure of the bidder to provide the correct names, license numbers, specialty class number, classification description and to indicate that the specialty contractor is required for this project, may cause the bid to be rejected.
 2. Bidder agrees the completed listing of joint contractors or subcontractors is required for the project and that the bidder, together with the listed joint contractors and subcontractors, have all the specialty contractor’s licenses to complete the work.
 3. Based on the Hawaii Supreme Court’s January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Hawaii 450 (2002), the bidder as a general contractor (‘A’ or ‘B’ license) is prohibited from undertaking any work solely or as part of a larger project, which would require the bidder (‘A’ or ‘B’ general contractor) to act as a specialty (‘C’ license) contractor in any area in which the bidder (‘A’ or ‘B’ general contractor) has no specialty contractor’s license. Although the ‘A’ and ‘B’ contractor may still bid on and act as the “Prime Contractor” on an ‘A’ or ‘B’ project (See, *HRS §444-7 for the definitions of an “A” and “B” project*), respectively, the ‘A’ and ‘B’ contractor may only perform work in the areas in which they have the appropriate contractor’s license. The bidder (‘A’ or ‘B’ general contractor) must have the appropriate ‘C’ specialty contractor’s licenses either obtained on its own, or obtained automatically under HAR §16-77-32.
 4. General Engineering ‘A’ Contractors automatically have these ‘C’ specialty contractor’s licenses: C-3, C-9, C-10, C-17, C-24, C-31a, C-32, C-35, C-37a, C-37b, C-38, C-43, C-56, C-57a, C-57b, and C-61.
 5. General Building ‘B’ Contractors automatically have these ‘C’ specialty contractor’s licenses: C-5, C-6, C-10, C-12, C-24, C-25, C-31a, C-42a, and C-42b.
 6. The table that lists the specialty contractor’ classifications in the bid form is from the Department of Commerce and Consumer Affairs’ (DCCA) website www.state.hi.us/dcca/har/index.html. Bidders shall provide the appropriate classifications numbers and descriptions for any specialty contractors that are not included in the bid form and bidders are directed to the DCCA web site for the latest updated list.
 7. Instructions to complete the Joint Contractors or Subcontractors List:
 - a. Determine the specialty contractor classification(s) required for this project and provide the complete firm name and license number of the joint contractor or subcontractor in the respective columns. If the bidder is a general contractor and providing the work of the required specialty contractor

classification, fill in the bidder's (general contractor's) license number and name.

- b. List only one joint contractor or subcontractor per required specialty contractor's classification.
 - c. For projects with alternate(s), fill out the respective "Joint Contractors or Subcontractors List for the Alternate(s)." Bidder shall determine the specialty contractor's classification and description required for the respective alternate. Bidders shall fill in the complete class number, class description, firm name and license number of the respective joint contractor or subcontractor. The bidder shall not include any joint contractor or subcontractor previously listed for the base bid.
- F. **COST AND TIME:** Bidder shall completely fill out the article and enter the cost for the Project Bid Price, and Alternates when provided. Bidder shall tabulate the Project Bid Price, and Alternates when provided, and the Bidders shall then enter the Total Lump Sum Bid Price. **BE SURE TO ENTER THE TOTAL LUMP SUM BID PRICE IN WORDS AND NUMERALS.** Refer to Bidder's Instructions located within the article.
1. If provided, bidder shall fill in total costs for each alternate.
 2. The bidder is directed to the construction time information paragraph "B" for the list of contract times and dates which may include: contract duration, project start date, jobsite start date, jobsite completion, contract completion date and construction time for alternates. Bidder shall refer to "Section 01100 - Summary of Work" of these specifications for additional construction time information, as applicable.
- G. **SIGNATORY PAGE:** Bidder shall completely fill out article (page). Bidder shall indicate if it is a "Hawaii Business" or a "Compliant Non-Hawaii Business." Also, bidder shall refer to Bidder's Instructions located within the article.

1.05 **EVALUATION CRITERIA:**

- A. **EVALUTATING BIDS:** The lowest responsive, responsible bid is determined by the following procedures:
1. The total lump sum bid price is adjusted to reflect the applicable preferences.
 - a. For projects with alternates, the total lump sum base bid price and alternates will be adjusted to reflect the applicable preferences.
 2. Project control budget is established prior to the submission of bids.

1.06 **METHOD OF AWARD:**

- A. The contract will be awarded to the lowest responsive and responsible Bidder whose bid (including any alternates which may be selected) meets the requirements and criteria set forth in the solicitation documents.

- B. In the event the total lump sum bid of all bidders exceeds the project control budget, HHSC reserves the right to make an award to the apparent Low Bidder if additional funds are available or by reducing the scope of work through negotiation.

1.07 OTHER CONDITIONS FOR AWARD:

- A. The Chief Procurement Officer may reject any or all bids and waive any defects if the Chief Procurement Officer believes the rejection or waiver is in the best interest of HHSC.
- B. The Chief Procurement Officer may hold all bids up to 60 calendar days from the date bids were opened. Unless otherwise required by law, bids may not be withdrawn without penalty.
- C. The award of the contract is conditioned upon funds made available for the project (or projects if applicable)

1.08 COMPLIANCE WITH §3-122-112 HAR:

- A. As a condition for award of the contract and as proof of compliance with the requirements of 103D-310(c) HRS, the bidder shall meet the “Hawaii Business” or “Compliant non-Hawaii Business” requirements and shall provide the following documents:
 - 1. Department of Taxation (DOTAX) and the IRS tax clearance certificates.
 - 2. Department of Labor (DLIR) certificate of compliance.
 - 3. Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG) certificate of good standing.
 - a. A Hawaii business that is a sole proprietorship is not required to register with the BREG and therefore not required to submit the DCCA, BREG “Certificate of Good Standing.”
- B. The apparent three low bidders shall furnish the required documents to HHSC within seven calendar days from the bid opening date. If a valid certificate is not submitted on a timely basis for award of a contract, a bidder otherwise responsive and responsible may not receive the award. Bidder is responsible to apply for and submit the documents by the required deadlines.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 REQUIRED DOCUMENTATION FOR HAWAII BUSINESS OR COMPLIANT NON-HAWAII BUSINESS (§3-122-112 HAR):

- A. **TAX CLEARANCE REQUIREMENTS (HRS Chapter 237):** Bidder shall obtain a tax clearance certificate from the Hawaii State Department of Taxation (DOTAX) and the Internal Revenue Service (IRS). The certificate is ~~are~~ valid for six months from the most recently approved stamp date on the certificate; the certificate must be valid on the date received by HHSC.
1. DOTAX *TAX CLEARANCE APPLICATION* Form A-6 (Rev 2003) is available at DOTAX and IRS (State of Hawaii) offices or DOTAX website, and by mail or fax.
 - a. DOTAX website: <http://www.state.hi.us/tax/alphalist.html#a>
 - b. DOTAX forms by fax/mail: (808) 587-7572 or 1-800-222-7572
 2. Mail, fax or submit in person completed tax clearance application forms to the Department of Taxation, Taxpayer Services Branch or to the address listed on the application. Facsimile numbers are:
 - a. DOTAX: (808) 587-1488
 - b. IRS: (808) 539-1573
 3. DOTAX will return the form to the bidder. The bidder is reminded that it is responsible to submit the applications for the tax clearance directly to DOTAX or IRS and not to HHSC.
- B. **DLIR CERTIFICATE of COMPLIANCE (HRS Chapter 383 - Unemployment Insurance, Chapter 386 - Workers' Compensation, Chapter 392 - Temporary Disability Insurance, and 393 – Prepaid Health Care):** Bidder shall obtain a certificate of compliance from the Hawaii State Department of Labor and Industrial Relations (DLIR). The certificate is valid for six months from the date of issue; certificates must be valid on the date received by HHSC.
1. DLIR *APPLICATION FOR CERTIFICATE OF COMPLIANCE WITH SECTION 3-122-112 HAR*, Form LIR#27 is available at DLIR website or at the neighbor island DLIR District Office.
 - a. DLIR website: <http://www.dlir.state.hi.us/LIR#27>
 2. Mail, fax or submit in person completed application form to the Department of Labor and Industrial Relations, Administrative Services Office at the address listed on the application.
 3. DLIR will return the form to the bidder. The bidder is reminded that it is responsible to submit the application for the certificate directly to DLIR and not to HHSC.
- C. **DCCA CERTIFICATE OF GOOD STANDING:** Bidder shall obtain a certificate of good standing issued by the Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG). The

certificate of good standing is valid for six months from the date of issue; certificates must be valid on the date received by HHSC.

1. *DCCA CERTIFICATE OF GOOD STANDING* is available from the business registrations website or by telephone. Bidders are advised there are costs associated with registering and obtaining the certificate.
 - a. DCCA form website: <http://www.BusinessRegistrations.com>
 - b. DCCA telephone: (808) 586-2727, M - F 7:45 to 4:30 HST
2. Submit the application per DCCA's requirements.
3. DCCA will return the form to the bidder. The bidder is reminded that it is responsible to submit the application for the certificate directly to DCCA and not to HHSC.

END OF SECTION

SECTION 00800 - SPECIAL PROVISIONS

PART 1 - GENERAL

1.01 SUBSTITUTION REQUESTS:

- A. Written substitution requests must be submitted with your Invitation for Bid (IFB) in accordance with IFG Section 3. All substitutions will be reviewed and approved in accordance with the GTC.
- B. Substitution requests by FAX are not acceptable.

1.02 PROJECT CONTACT PERSON:

- A. HHSC Representative – For access to the site.

NAME: Mr. Ron Kurasaki
POSITION OR TITLE: Project Manager
TELEPHONE NUMBER: (808) 497-9350
Email: rkurasaki@hhsc.org

- B. Project Coordinator - For questions and clarifications during bidding and Requests for Substitutions.

NAME: Mr. Kai Tachino
POSITION OR TITLE: Project Engineer
TELEPHONE NUMBER: (808) 521-3773
Email: ktachino@insynergyeng.com

- C. Procurement Agency – For questions regarding proposal and contract requirements.

NAME: Mr. Scott Kawai
POSITION OR TITLE: Contracts Manager
TELEPHONE NUMBER: (808) 832-3025
Email: SKawai@hhsc.org

1.03 OFFEROR'S RESPONSIBILITY FOR EXAMINING PLANS, SPECIFICATIONS AND SITE OF WORK:

- A. Offerors herewith refers to sub-contractors, suppliers, manufacturer's representatives as well as contractors.

1.04 LIQUIDATED DAMAGES:

- A. The time of completion for the Work shall be within 220 consecutive calendar days from the official commencement date of the Notice to Proceed (NTP).

- B. In accordance with the General Conditions, upon failure to complete Work or any portion of the Work within the time or times fixed in the contract or extension thereof, the Contractor shall pay liquidated damages to the Department in the amount of \$500.00 per calendar day of delay.
- C. In accordance with the General Conditions, PROJECT ACCEPTANCE DATE, for failure to correct punch list deficiencies, within the time or times fixed in the contract or extension thereof, the Contractor shall pay liquidated damages to the HHSC, in the amount equal to ten percent (10%) of the liquidated damages per calendar day of delay.
- D. In accordance with the General Conditions FINAL SETTLEMENT OF THE CONTRACT, for failure to submit closing documents within the time or times fixed in the contract or extension thereof, it is agreed that the Bidder shall pay liquidated damages to HHSC in the amount equal to five percent (5%) of the liquidated damages per calendar day of delay.

1.05 SPECIALTY CONTRACTOR'S LICENSE:

- A. Contractor shall be solely responsible to assure that all the specialty licenses required to perform the Work are covered by the Contractor or its subcontractor(s).

1.06 WORKING HOURS:

- A. The regular working hours for this project is from 8:00 AM to 4:30 PM Monday through Friday, excluding State Holidays, unless otherwise noted or restricted under "Section 01100 - Summary of Work". The Working Hours provisions of specification "Section 01100 - Summary of Work" shall govern over this article 1.06.
- B. The Contractor may be given approval to work beyond the regular hours including Saturdays, Sundays, State Holidays, night work, or after hours under the provisions of the GENERAL CONDITIONS, "Overtime And Night Work Section" and under specification "Section 01100 - Summary of Work".

1.07 SPECIAL PROCEDURES DURING BIDDING

- A. Bid documents will be available online and from the Contracts Manager's office, at Leahi Hospital, 3675 Kilauea Ave., Honolulu, HI, 96816.
- B. All bids shall be submitted to the Contracts Manager.
- C. All questions regarding the plans and specifications shall be submitted, in writing, to the Engineer. The Engineer will review the questions and issue any responses via Addendum. Only information received by Addendum shall be binding.

- D. All questions regarding the proposal or contractual requirements shall be submitted, in writing to the Contracts Manager. The Contracts Manager will review the questions and issue any responses via Addendum. Only information received by Addendum shall be binding.
- E. Any visitation to the site to examine the scope of work shall be requested through the HHSC Representative. Disruption of facility operations shall not be permitted.

1.08 PROCEDURES DURING CONSTRUCTION

- A. Upon issuance of the Notice to Proceed, the Contractor shall submit a work schedule for review and discussion. The work schedule shall be updated on a weekly or bi-weekly basis as directed by the Architect.
- B. On a weekly or bi-weekly basis, the Contractor shall conduct a progress meeting with Leahi Hospital and Engineer. The meeting will discuss the progress of the construction, discussion of problems, and review of outstanding issues. The Contractor shall conduct the meeting and prepare the meeting notes and minutes and distribute to all parties.
- C. During the construction, submittals and RFIs shall be submitted to the Engineer for review and action. To expedite the review, the Contractor may make submittals via email.
- D. Periodic requests for payment shall be submitted to the Engineer for review and confirmation. Approved requests for payment will be forwarded to the Contracts Officer for processing of payment.
- E. Upon substantial completion of the project, the Contractor shall submit in writing to the Architect a request for a pre-final inspection. The Contractor shall have completed their own inspection and completed all noted discrepancies. Include with the request for the pre-final inspection a list of all outstanding work not completed or corrected.
- F. Upon conducting a pre-final inspection, the Engineer shall prepare a punchlist of noted discrepancies for the Contractor's remedial action. A final inspection will be performed upon completion of all punchlist items.

1.09 PROJECT RESTRICTIONS:

- A. The Contractor is informed that the facilities will be fully occupied and work shall be performed in close coordination with the HHSC representative. Work shall be phased and may be limited to one area at a time. If work will require the relocation of clients from the work area, time shall be allocated for Leahi Hospital to conduct this relocation. Scheduling of the work shall be closely monitored and work performed to minimize the disruption to the remaining areas of the facility. All work schedules shall be approved by HHSC prior to starting.

- B. Staging and storage of materials on-site is limited and shall not be allowed unless coordinated and approved with the HHSC representative. Contractor may be required to store materials off-site at his own expense.
- C. Parking on-site is limited and may be restricted to only active delivery of materials and equipment. Coordinate with the HHSC representative. If on-site parking will not be available, the Contractor shall park off-site.
- D. The above restrictions shall be considered in the work of this project and shall be included in the Contractor's cost. No additional compensation shall be made for not considering these restrictions.

PART 2 - MATERIALS (Not Used)

PART 3 - EXECUTION

3.01 FINAL PAYMENT REQUIREMENTS:

- A. In addition to the requirements in the GENERAL CONDITIONS "Final Payment" section, the contractor shall submit".
 - 1. Tax clearance certificate from DOTAX and IRS, current within two months of the issuance date; and
 - 2. An originally signed Certificate of Compliance for Final Payment (SPO Form - 22, modified), affirming that the contractor remained in compliance with all laws as required by (§3-122-112 HAR). A contractor making a false affirmation shall be suspended and may be debarred pursuant to section 103D-702 HRS.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01019 - GENERAL PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY OF WORK:

- A. Perform operations and furnish equipment, tools, materials, related items and labor necessary to execute, complete and deliver the Work as required by the Contract Documents.

1.02 DIVISION OF WORK:

- A. The Division and Sections into which these specifications are divided shall not be considered an accurate or complete segregation of work by trades. This also applies to work specified within each section.
- B. Where devices, or items, or parts thereof are referred to in the singular, it is intended that such reference shall apply to as many such devices, items or parts as are required to properly complete the Work.
- C. Specifications and Drawings are prepared in abbreviated form and include incomplete sentences. Omission of words or phrases such as "the Contractor shall", "as shown on the drawings", "a", "an", and "the" are intentional. Omitted words and phrases shall be provided by inference to form complete sentences.
- D. Specifying of interface and coordination in the various Specification Sections is provided for information and convenience only. Such requirements in the various Sections shall complement the requirements of this Section.

1.03 NOTIFICATION:

- A. Contact the Engineer and HHSC Representative at least five (5) working days prior to starting any onsite work.

1.04 SAFETY REQUIREMENTS:

- A. The Hawaii Occupational Safety and Health Law, Chapter 396, Hawaii Revised Statutes, effective May 16, 1972, as amended, is applicable and made a part of the Contract. Carefully read and strictly comply with its requirements.
- B. Protect the facility personnel, students, and the public whenever power driven equipment is used. Ensure adequate safety precautions are used when operating any power driven equipment.

1.05 PERFORMANCE AND COORDINATION:

- A. Contractor shall be in charge of the Work and the Project Contract Limits, as well as the directing and scheduling of all work. Contractor shall include general supervision, management and control of the Work of this project, and in addition to other areas more specifically noted throughout the Specifications. Final responsibility for performance, interface, and completion of the Work and the Project shall be the Contractor's.
- B. Jobsite Administration shall be the responsibility of the Contractor. Provide a competent superintendent on the job and provide an adequate staff to execute the Work. In addition, all workers shall dress neatly and conduct themselves properly at all times. Loud abusive behavior, sexual harassment and misconduct will not be tolerated. Workers found in violation of the above shall be removed from the job site as directed by the HHSC Technical Representative.
- C. The HHSC and/or Leahi Hospital will hold the Contractor liable for all the acts of Subcontractors and shall deal only with the Prime Contractor in matters pertaining to other trades employed on the job.
- D. Coordination: Provide project interface and coordination to properly and accurately bring together the several parts, components, systems, and assemblies as required to complete the Work.
 - 1. Provide interface and coordination of all trades, crafts and subcontracts. Ensure and make correct and accurate connections of abutting, adjoining, overlapping, and related work. Provide anchors, fasteners, accessories, appurtenances, and incidental items needed to complete the Work, fully, and correctly in accordance with the Contract Documents.
 - 2. Provide additional structural components, bracing, blocking, miscellaneous metal, backing, anchors, fasteners, and installation accessories required to properly anchor, fasten, or attach material, equipment, hardware, systems and assemblies to the structure.
 - 3. Provide caulking, sealing, and flashing as required to waterproof the building complete and as required to insulate the building thermally and acoustically. Include sealing, flashing, and related work as required to prevent moisture intrusion, air infiltration, and light leakage.
 - 4. Materials, equipment, component parts, accessories, incidental items, connections, and services required to complete the Work which is not provided by subcontractors shall be provided by the Contractor.

1.06 COOPERATION WITH OTHER CONTRACTORS:

- A. Leahi Hospital reserves the right at any time to contract for or otherwise perform other or additional work within the Project Contract Limits. The Contractor of this project shall to the extent ordered by the HHSC Representative, conduct its work so as not to interfere with or hinder the progress or completion of the work performed by Leahi Hospital or other contractors.

1.07 SUBMITTALS:

- A. Furnish required submittals specified in this Section and in the Technical Sections. Submittals include one or more of the following: shop drawings, color samples, material samples, technical data, material safety data information, schedules of materials, schedules of operations, guarantees, certifications, operating and maintenance manuals, and field posted as-built drawings.
- B. Record Drawings: Field Posted As-Built Drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be prepared and submitted by the Contractor. To accomplish this, the following procedure shall be followed by the Contractor:
 - 1. A full-size set of field posted as-built drawings shall be maintained at the job site. All deviations from alignments, elevations and dimensions which are stipulated on the drawings and authorizations given by the HHSC Technical Representative to deviate from the drawings shall be clearly and accurately recorded by the Contractor on this set of record drawings.
 - 2. Changes shall be recorded immediately after they are constructed in place to assure they are not forgotten. Record the changes in red pencil and where applicable, refer to the authorizing document or Change Order. The field posted as-built drawings shall be made available to the Engineer and HHSC Technical Representative at any time so that its clarity and accuracy can be monitored.
 - 3. The words "FIELD POSTED AS-BUILT" shall be labeled on the title sheet and certified by the Contractor as to accuracy and completeness as shown below:

FIELD POSTED AS-BUILT

Certified By: _____ Date: _____
Contractor (Include name and company)

- 4. The words "FIELD POSTED AS-BUILT" shall be labeled on all sheets in the margin space to the right of the sheet number written from the bottom upward.

5. The Index to Drawings shall be revised with the label "FIELD POSTED AS-BUILT" for each sheet. The index shall conclude with the following note: "A COMPLETE SET CONTAINS ____ SHEETS" with the total number of sheets comprising the set to be placed in the blank.
6. Any "FIELD POSTED AS-BUILT" drawing which the Engineer determines does not accurately record the deviation may be corrected by the Engineer and the Contractor shall be charged for the services.
7. Submit the set of "FIELD POSTED AS-BUILT" drawings to the Engineer and notify the HHSC Technical Representative no later than five (5) calendar days prior to the date of final inspection.
8. "AS-BUILT" drawings will be prepared by the design consultant using the "FIELD POSTED AS-BUILT". Both sets of drawings will be sent to the Contractor for review and approval. The Contractor shall retain the "FIELD POSTED AS-BUILT" drawings for records, sign the "AS-BUILT" set of drawings, indicating approval, and return the drawings in a timely manner to the Engineer and notify the HHSC Representative.

1.08 CONSTRUCTION SCHEDULE:

- A. The Construction Schedule completion date will be approved prior to award. The daily activities of the Construction Schedule will be reviewed within fifteen (15) calendar days after the Notice to Proceed or upon earlier written instruction by HHSC.
- B. The schedule shall be related to the entire project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the work. If requested by the Engineer or HHSC Representative, the Contractor shall participate in a preliminary meeting to discuss the proposed schedule and requirements prior to submission of the schedule.
- C. Contractor shall prosecute the work according to the Schedule. The Engineer and HHSC Representative shall rely on the reviewed Contractor's Schedule and regular updates for planning and coordination. The HHSC Representative's review of the Contractor's Construction Schedule does not relieve the Contractor of its obligation to complete the work within the allotted contract time. Nor does the review grant, reject or in any other way act on the Contractor's request for adjustment(s) to complete remaining contract work, or for claims of additional compensation. Such requests shall be processed in accordance with other relevant provisions of the contract.
- D. If the Engineer issues a Field Order or Change Order or requires Force Account Work that affects the sequence or duration of work activities noted on the construction progress schedule, the Contractor shall promptly update the schedule. This shall be accomplished by adding,

deleting or revising the work activities noted, or changing the logic in the schedule to show the Contractor's plan for incorporating the change into the flow of work. All Change Orders and Time Extension requests that affect the construction schedule shall be evaluated based on their impact on the approved Construction Schedule.

1.09 MEETINGS:

- A. Contractor shall meet with Leahi Hospital's representative, weekly or other interval as determined, to discuss the progress of the Work.
- B. For each meeting, Contractor shall take meeting minutes and provide a list stating all items, work or material, which may cause a delay or have an impact on the project's contractual dates. The list shall be inclusive of items requiring action from all responsible parties such as outstanding submittal status, request for information (clarification), force account work, change order, and change proposals. The format of this list shall be at the Contractor's discretion, subject to the Engineer's approval. Submit the list to all parties for discussions as a meeting agenda. Contractor shall provide a plan of corrective action for any item, which is delayed or expected to be delayed, where that item impacts the contractual dates.

1.10 PROJECT AND SITE CONDITIONS:

- A. Project Contract Limits (Contract Zone Limits) shown on the drawings indicate only in general the limits of the work involved. Perform necessary and incidental work, which may fall outside of these demarcation lines. Confine construction activities within the Project Contract Limits and do not spread equipment and materials indiscriminately about the area.

1.11 SANITARY FACILITIES:

- A. The Contractor shall be allowed to utilize on-site restrooms as directed by the Architect and/or HHSC Representative. The Contractor shall maintain the facility in clean and sanitary condition at all time. Failure to do so, may require the Contractor to provide portable temporary toilet facilities for the contractor's use.

1.12 CONSTRUCTION AIDS:

- A. Provide construction aids and equipment required by construction personnel and to facilitate execution of the Work including: scaffolds, ladders, ramps, platforms, railings, and other such facilities and equipment.

PART 2 - MATERIALS

2.01 QUALITY:

- A. Materials, items, equipment and fixtures specified in the various Divisions and Sections shall be new unless otherwise specified.

2.02 STORAGE AND HANDLING:

- A. Contractor shall supervise jobsite delivery and handling, and assign storage space for materials, items, equipment and fixtures of all trades. Contractor and installer are responsible for delivery, unloading, unpacking, handling, storage, distribution, installation and protection of its materials at the jobsite.
- B. Except as otherwise required by these specifications or by Leahi Hospital, determine and comply with manufacturer(s) recommendation(s) on product handling, storage and protection.
- C. Deliver products to the jobsite in manufacturer's original containers, with labels intact and legible. Maintain packaged material with seals unbroken and labels intact until time of use. Promptly remove damaged materials and unusable items from the jobsite, and promptly replace with material meeting the specified requirements, at no additional cost to Leahi Hospital.
- D. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

PART 3 - EXECUTION

3.01 EXAMINING THE SITE:

- A. Contractor and Subcontractors are expected to visit the site and make due allowances for difficulties and contingencies to be encountered. Compare contract documents with work in place. Become familiar, with existing conditions, the conditions to be encountered in performing the Work, and the requirements of the drawings and specifications.
- B. Verify construction dimensions and elevations indicated on the drawings before any construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer, and any change shall be made in accordance with the Architect's instruction. Contractor shall not be entitled to extra payment if it fails to report the discrepancies before proceeding with any work whether within the area affected or not.

- C. Obtain all field measurements required for the accurate fabrication and installation of the Work included in this Contract. Exact measurements are the Contractor's responsibility.
- D. Furnish or obtain templates, patterns, and setting instructions as required for the installation of all Work. All dimensions shall be verified in the field.
- E. The Contractor shall accept the site in the condition which exists at the time access is granted to begin the Work.
 - 1. Verify existing conditions and dimensions shown and other dimensions not indicated but necessary to accomplish the Work.
 - 2. Locate general reference points and take action to prevent their destruction. Lay out work and be responsible for lines, elevations and measurements and the work executed. Exercise precautions to verify figures and conditions shown on drawings before layout of work.
 - 3. Before starting the Work, the Contractor and each Subcontractor, shall verify governing dimensions and shall examine adjoining work on which the Contractor's work is in any way dependent. No additional compensation will be allowed on account of differences between actual measurements and dimensions shown. Submit differences discovered during the verification work to the Engineer for interpretations before proceeding with the associated work.

3.02 UTILITY SERVICE:

- A. Electricity - Make arrangements with the facilities for temporary use of electricity for construction use.
- B. Telephone - Make arrangements with the utility companies for temporary telephone service for construction use or utilize cellular phone service.
- C. Water - Make arrangements for temporary water use with the facilities.

3.03 ENVIRONMENTAL:

- A. General Contractor shall oversee that proper environmental conditions are met regarding temperature, humidity, lighting and ventilation.

3.04 PREPARATION AND PROTECTION:

- A. Protection of Property: Continually maintain adequate protection of the Work from damage and protect all property, including but not limited to buildings, equipment, furniture, grounds, vegetation, material, utility systems located at and adjoining the job site. Repair, replace or pay the expense to repair damages resulting from Contractor's fault or negligence.

- B. Before starting work to be applied to previously erected constructions, make a thorough and complete investigation of such recipient surfaces and determine their suitability to receive required additional construction and finishes. Contractor, at its expense, shall make whatever repairs and conditioning required to properly prepare such surfaces. Contractor shall coordinate the work to provide a suitable surfaces to receive following work.
- C. Commencement of work by any trade will be construed as acceptance of existing conditions and surfaces as being satisfactory for application of subsequent work, and full responsibility for finished results and assumption of warranty obligations under the Contract.
- D. Protect existing work in a manner to prevent damage including interior work from damage by vandals or the elements. Provide temporary protection. Use curtains, barricades, or other appropriate methods. Take positive measures to prevent breakage of glass and damage to plastic, aluminum and other finishes.
- E. Repairs and Replacements: In event of damage, promptly make replacements and repairs to the approval of the Engineer and/or HHSC Representative and at no additional cost to Leahi Hospital. Additional time required to secure replacements and to make repairs will not be considered to justify an extension in the Contract Time or completion.

3.05 BARRICADE:

- A. Erect temporary construction barricade(s) to prevent unauthorized persons from entering the project area and to the extent required by the Engineer and/or HHSC Representative.
- B. Maintain temporary construction barricade(s) throughout the duration of the Work. During the course of the project, the Engineer and/or HHSC Representative may require additional barricades be provided for the safety of the public. Contractor shall erect the additional barricade(s) at its own expense.

3.06 INSTALLATION:

- A. Materials, items, fixtures required by the various Divisions and Sections of the Specifications shall be installed in accordance with Contract Documents, by workers specially trained and skilled in performance of the particular type of work, to meet guarantee and regulatory agency requirements. Should the drawings or specifications be void of installation requirements, install the materials, items, fixtures in accordance with the manufacturer's current specifications, recommendations, instructions and directions, and/or best construction industry standards.

3.07 CUTTING AND PATCHING:

- A. General Contractor shall oversee cutting and patching of concrete, masonry, structural members and other materials where indicated on drawings and as job conditions require. Unless noted elsewhere in the Drawings and Specifications, no cutting or patching of existing or new structural members will be permitted without previously notifying the HHSC Technical Representative.
- B. Patching materials and workmanship shall be of equal quality to that indicated on the drawings, specified for new work, and/or to match the construction of item to be patched.

3.08 CLEAN-UP:

- A. Rubbish and debris resulting from work of the various Divisions and Sections of the specifications shall be collected and disposed of by the Contractor at legal disposal areas away from the project site. Clean up and remove from premises all debris accumulated from operations from time to time and as directed by the Engineer and/or HHSC Representative. Permission to provide on-site trash containers shall be granted by Leahi Hospital and shall be placed where directed by the Architect and/or HHSC Representative.

END OF SECTION

SECTION 01100 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Contract description.
- B. Contractor use of premises.
- C. Owner furnished/Owner installed products.
- D. Owner furnished/contractor installed products.
- E. Hospital occupancy.

1.02 CONTRACT DESCRIPTION:

- A. Description: Upgrade the existing air source heat pump system for the Leahi Hospital:
 - 1. Provide a new air source heat pump and associated piping, ductwork, wiring, and controls.
 - 2. Upgrade the existing control system to incorporate the new additional equipment.
- B. Contract Documents Identification: These are identified as: *HHSC: Young Basement Heat Pump Replacement at Leahi Hospital dated June 27, 2025.*
- C. Contractor shall complete the attached Bid Breakdown with Contractor's Proposal (Bid Breakdown is at the beginning of the specifications).
- D. Related Provisions: The following applies to all the Work.
 - 1. Conditions of the Contract.
 - 2. Contract Drawings.
 - 3. Division 1 Specification Sections.
 - 4. As applicable to each Entity, the appropriate Specification Sections and related Specification Sections of other Installers as necessary for the proper coordination of Work.
 - 5. Modifications to the Contract, if any.
- E. Special Submittals: In addition to other documentation as may be required by the Contract Documents, submit following as a condition for securing the Contract for the Work.
 - 1. List of Primary Contractors: List of primary Subcontractors (Installers) for each work as specified in each Division 2 through

- Division 16 Sections. Include company name, primary contact, telephone number, fax number, and e-mail address.
2. List of Primary Products: List of primary products bid for each Division 2 through Division 16 Sections. Include manufacturer name and specific product name or names.
 3. Certification: Installer certification that specified requirements are in accordance with the Manufacturer requirements as specified in "Section 01600 - Product Requirements" prior to signing the Contractor for the Work.

1.03 CONTRACTOR USE OF PREMISES:

- A. Limit use of premises to allow for continued Hospital occupancy.
- B. Emergency Building Exits During Construction: Must remain open and unblocked at all times. Maintain access for staff, patients, and public.
- C. Construction Operations: Limited to areas noted on Drawings.
- D. Staging and Parking
 1. Staging area and limited contractor employee parking will be made available on site.
 2. Repair and clean pavements and restore landscaping in staging areas at the completion of construction operations.
- E. Time Restrictions for Performing Work:
 1. General: 9:00 am to 5:00 pm. Coordinate w/ Owner, work necessary outside these normal operating hours. Submit written notice a minimum three days in advance.
- F. Cooperate with Leahi Hospital to minimize conflict and to facilitate Leahi Hospital's operations. Coordinate operations with Leahi Hospital's Technical Representative (HTR).
- G. Access to adjacent floors must be approved in advance by Leahi Hospital. Submit written notice not less than seven days in advance of intended work on adjacent floors.
- H. Do not close or obstruct roadways without first consulting with the Owner. Conduct operations with minimum interference to public or private roadways.
- I. Maintain vital services with the minimum of interruption. Outages and interruptions must be approved in advance by Leahi Hospital. Submit written notices of outages and interruptions not less than seven days in advance.

- J. Contractor's personnel:
 - 1. Do not allow personnel to park off site.
 - 2. Contractor's personnel may use Leahi Hospital's cafeteria.
 - 3. Smoking is not permitted anywhere on Leahi Hospital's property. Consumption of food and beverages will not be permitted on the premises except in designated areas.
 - 4. Playing of radios will not be permitted.
 - 5. Shall be properly attired for work. (No tank tops, cut-off jeans, slippers, etc.)
 - 6. Shall conduct themselves with decorum and courtesy toward staff, patients, and public.
 - 7. Shall not use loud and offensive language.

- K. Construction Zone Accessibility Requirements
 - 1. General: Hawaii Revised Statutes (HRS)103-50 requires this project to conform to the requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAG).
 - 2. Ensure accessible routes to emergency entrances and exits to and from accessible parking public pedestrian routes during the construction period as required by ADAAG 4.1.1(4).
 - 3. Temporary buildings and facilities that are not of permanent construction but are extensively used or are essential for public use for a period of time shall be accessible.
 - 4. Provide temporary safe pedestrian passageways around a construction site.
 - a. Areas that are used only as work areas shall be designed and constructed so that individuals with disabilities can approach, enter, and exit the areas.
 - b. These guidelines do not require that any areas used only as work areas be constructed to permit maneuvering within the work area or be constructed or equipped (i.e., with racks or shelves) to be accessible.

1.04 LEAHI HOSPITAL OCCUPANCY:

- A. Leahi Hospital will remain operational during entire period of construction for the conduct of normal operations.

- B. The Contractor is to coordinate the work and details within each phase, to minimize disruption to Leahi Hospital's Technical Representative's operation. Proper notification of disruption due to noise and other factors is required.

- C. Provide dust and noise barriers where specified under other portions of the contract documents. Follow infection control procedures during construction, i.e. Policy #125-54 as attached. Walk off mats at site entrance shall be changed as needed. HEPA filtration units are to be utilized 24 hours per day throughout the construction process. Complete

Interim Life Safety Measures check sheet daily. Portable dust barriers shall be utilized for AC replacement work.

- D. Schedule the Work, and cooperate with Leahi Hospital to minimize conflict with, and to facilitate Leahi Hospital's operations. Take extreme care and caution with work involving dust, noise, and odor.

1.05 QUALITY ASSURANCE:

- A. Other Contract Related Documents: If required by Contractor to determine accurate information for the Project, review such other documents in possession of Leahi Hospital and the Project Consultants that have a bearing on the Contractor's Work; examples as follows:
 - 1. Available documents of existing facilities
- B. Authority Related: Comply with the following:
 - 1. Regulations: All laws, ordinance, rules, and regulations, by any governmental authority, which in any manner apply to or affect those employed in the Work, the materials used in the Work, and the conduct of the Work. Comply with all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the Work and which are or have the affect of law.
 - 2. Disabled Persons:
 - a. ADAAG or UFAS compliance: Applicable requirements or where both is used, comply with the stricter of the requirements applicable to each work.
 - b. Tolerance: Due to actual variations in work tolerances, ensure that each work meets the minimum or maximum dimensions as required by the applicable standard,
 - c. Authority Changes: Where Authority directs changes in the Work, immediately notify consultants, prior to execution of such changes, to ensure such changes are not in conflict with any original approvals made by Authorities.
- C. Community Related:
 - 1. Intent: Owners operation is public sensitive and Contractor shall take necessary precautions in his operations as not to upset or aggravate the public, e.g. polluting operations, other nuisance conditions, and operations which can endanger people, illegal activities, unbecoming conduct, etc.
 - 2. Resolving Contentious Issues: It is the Contractor's responsibility to resolve any contentious issues amenable, fairly, and expeditiously. If a situation occurs, notify the Consultants immediately and keep Consultants informed of methods and results of ongoing negotiations in resolving any issues. Not under any circumstances is Contractor to place Owner in precarious situation that could place owner in a tenuous conflict with any of the public, without the Owner's knowledge. Contractor is ultimately and solely responsible

for his actions and resulting outcomes; regardless of Owner's knowledge of any ongoing contentious events and shall hold Owner harmless from such issues should they result in any litigation.

- D. The Work:
 - 1. Industry Standards: Industry standards apply to the Work whether indicated or not. When not indicated, the industry accepted quality applicable to the class (grade) of work intended shall apply.
 - 2. Completeness of Work: Provide necessary work normally provided for the quality of work indicated to ensure the Work is complete and fully functional for each use.

- E. Project Manual:
 - 1. Language: Imperative language is intended and specified requirements are to be executed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TIMES FOR CONDUCTING WORK:

- A. Daily: In accordance with any Owner's standard published policies for Contractor's conducting work on premises. Secure standards and comply with requirements; unless Owner otherwise agrees to in writing at time of signing Contract for the Work.

- B. Weekends: As approved at time of signing Contract for the Work; otherwise as approved by Owner.

- C. Other Time Restrictions:
 - 1. General: Refer to "Operational Restrictions" paragraphs herein and "Section 01500 - Temporary Facilities and Quality Controls".
 - 2. Polluting Operations: Verify time restrictions on polluting operations, e.g. dust, noise, or any other that may be restricted by Owner and include impacts into Contract for the Work.
 - 3. Special Events: Verify any Owner known and potential scheduled events that would interrupt Contractor's operations and include impacts into Contract for the Work.

3.02 OPERATIONAL RESTRICTIONS:

- A. General: Refer to "Section 01500 - Temporary Facilities and Quality Controls".

- B. Physical Limits: Limit Primary Work to immediate Project Site. Work required on property outside of Project Site, to be done in accordance with the Authorities.
- C. Personal Conduct, General: Owner's work is public sensitive and Contractor and entities under Contract to him shall respect this and refrain from any conduct that would compromise the Owner. Public sensitive issues include, but are not necessary limited to, following.
 - 1. Outside Site/Work Envelope: Any operations that could negatively affect surrounding community adjacent to Site, e.g. noise, pollution, illegal activities, etc.
 - 2. Within Site and Work Areas:
 - a. Archeological or historical related funds.
 - b. General: Any conduct that could negatively affect It's employees and public, e.g. disrespectful and unacceptable language, use of inappropriate alcohol usage at inappropriate times, illegal activities, smoking in non- smoking areas, etc.
 - c. Radios: Not allowed; except two-way communication radios.
 - d. Meals: Eaten only in Owner approved areas.
 - e. Building Areas: Any restricted public and non-public areas on property and within any building structures.
- D. Other Owner Conditions for Performing Work: Work is to be scheduled around the Owner's ongoing operations. Prior to Bid verify following and include impacts into Contract for the Work.
 - 1. Verification of Owner's responsibilities with regard to condition in which each space and surface will be turned over to Contractor and verification of exact degree of preparation work required by Contractor.
 - 2. Verification of extent of each work to be painted and conditions of acceptability.
 - 3. The degree to which Contractor is required to remove or move equipment, furnishings, and other work.
 - 4. Sequence, timing, and extent of areas to be made available to Contractor to complete the required work.
 - 5. Limits and restrictions placed on use of each work area.
 - 6. Methods of moving material and equipment around, within, to and from staging and delivery areas to each work area.
 - 7. Methods for conducting the work due to Contractor's operations which are restrictive to Owner's ongoing operations.
 - 8. Degree and duration in which equipment and materials may be left in place.
 - 9. Available parking.
 - 10. Available services, such as for power and water.
 - 11. Available facilities, such as restrooms.
 - 12. Available staging areas.
 - 13. Availability of elevators for the Work.

14. Conditions under which Owner's available facilities and services are provided.
15. Restrictions on generation of noise.
16. Security required.
17. Safety precautions and amount of protections required.
18. Degree of cleanliness and orderliness expected in Work areas.
19. Special activities of Owner occurring during course of Work and which could impact Contractor's ongoing Work.
20. Verification of all Owner work impacting Work of this Contract, if any.
21. Verify salvageable work, if any, required by Owner and conditions of delivery to Owner.
22. Other Owner requirements.

END OF SECTION

SECTION 01120 - ALTERATION PROJECT PROCEDURES

PART 1 - PRODUCTS

1.01 SALVAGED MATERIALS:

- A. Salvage sufficient quantities of cut or removed material to replace damaged work of existing construction, when material is not readily obtainable on current market.
- B. Incorporate salvaged or used material only as indicated or with permission of Leahi Hospital.

1.02 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: Match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing Work as a standard.

PART 2 - EXECUTION

2.01 EXAMINATION:

- A. Verify that demolition is complete, and areas are ready for installation of new Work.
- B. Beginning of restoration Work means acceptance of existing conditions.

2.02 PREPARATION:

- A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.

- E. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate duct work and piping to prevent condensation in exposed areas.
- F. Do not demolish, chip, or penetrate existing structural members without the expressed approval of the Engineer.
- G. Perform cutting and removal work to remove minimum necessary, and in a manner to avoid damage to adjacent work and provide proper surfaces to receive installation of repair and new Work.

2.03 INSTALLATION:

- A. Coordinate work of alterations and renovations to expedite completion and to accommodate Owner occupancy.
- B. Project areas and Finishes: Complete in all respects including operational mechanical and electrical work.
- C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition as appropriate.
- D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- E. In addition to specified replacement of equipment and fixtures, restore existing plumbing, ventilation, air conditioning, and electrical systems to full operational condition.

2.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.
- B. Cut finish surfaces such as masonry, tile, plaster, or metals by methods to terminate surfaces in a straight line at a natural point of division.
- C. When finished surfaces are cut so that a smooth transition with new Work is possible, terminate existing surface along a straight line at a natural line of division. Provide trim appropriate to finished surface subject to approval of Leahi Hospital's Representative.

2.05 ADJUSTMENTS:

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls and ceilings to a smooth plane without breaks, steps or bulkheads.
- B. Where a change of plane 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Leahi Hospital's Representative review.
- C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.
- D. At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire rated, fire resistant material, full thickness of the construction element.

2.06 REPAIR OF DAMAGED SURFACES:

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.

2.07 FINISHES:

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to product uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

2.08 CLEANING:

- A. In addition to cleaning as specified in these specifications. Broom-clean owner-occupied areas daily.
- B. Clean spillage, over-spray, and dust in Owner-occupied areas immediately.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01140 - WORK RESTRICTIONS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This section includes work restrictions on the Contractor's operations, and construction as required to maintain the facility's operation during the construction period.
- B. Construction Provisions:
 - 1. Rules and Regulations: Consult with the Engineer and HHSC Representative at the pre-construction conference and become familiar with the rules and regulations of the facility.
 - 2. Contractor's Operations: Confine all construction operations to the immediate vicinity of the construction activity. Store building materials, equipment, tools and incidentals in an enclosed area as directed by the HHSC Representative. Take precautions and prevent access to power equipment, tools, etc., by other than authorized construction personnel. Perform operations to insure the safety of the occupants of the buildings at all times.
 - 3. Perform operations to minimize inconvenience or disturbance upon the personnel and residents.
 - 4. Protection of occupants: Special consideration must be made by the Contractor at all times to safely protect the occupants and facility personnel from any and all injuries that may be caused as a result of the work performed under this contract.
 - 5. Caution: The Contractor shall caution his personnel on the job that any association with the occupants be avoided as much as possible, that when spoken to by occupants, normal courtesy shall be maintained at all times.
 - 6. None of the foregoing regulations shall be construed as a restriction on the legal prosecution of the work.

1.02 SEQUENCING OF WORK:

- A. The Contractor shall schedule his work in general consideration for the on-going operation of Leahi Hospital. All work shall be coordinated with the HHSC Representative.
- B. Stoppage of work for the duration of CMS and State Survey audits shall not incur additional costs to the HHSC.
- C. All work shall be coordinated and scheduled with Leahi Hospital and/or HHSC Representative. In general, the Contractor will be restricted to work areas as coordinated with the HHSC Representative.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01210 - ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Alternates.
- B. Related Sections:
 - 1. Division 1 Sections.
 - 2. As indicated in scheduled Alternate descriptions.

1.02 DEFINITIONS:

- A. Alternate
 - 1. General Definition: A lump sum amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to or deducted from Base Bid amount if the Owner decides to accept a corresponding change in either the amount of the construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.
 - 2. Proposed Cost: Each proposed amount for an Alternate to be complete and include entire Bidder's cost for the alternate work. No other adjustments to the Contract Sum will be allowed after signing of Contract for the Work.
 - 3. Work Included: Each proposal for an Alternate to represent all work, e.g., materials and its related workmanship, required to incorporate the work in place. In addition to other work, proposed work for each alternate to include work and coordination required to modify adjacent work at time each alternate required.
 - 4. Owner Action: Owner reserves the right to take action or no action on any Alternate during course of Contract Period. Each proposal to be non retractable and held without change during the Contract Period, except added costs may be negotiated when submitted written documentation is provided that clearly show that added time affects Progress Schedule or added scope of Work for any Alternate has changed by time of Owner acceptance and reasonably affected Contractor's cost to do the work. Any requested added costs are to be for added work and shall not change the cost of any work as proposed by the original proposal.

1.03 SUBMITTALS:

- A. Intent: Submit Change Order Proposals: Submit proposals for work required by Project Consultant's to fully evaluate compliance with Project requirements, e.g., written detailed cost breakdowns, related product

data, published drawings, specifications, tested, performances, and samples.

- B. Progress Schedule: Incorporate into first Progress Schedule required for submittal.
 - 1. Time for Owner's Decision: Indicate latest time when Owner's decision for each Alternate must be made to ensure that each Alternate, if accepted does not increase cost proposed for each Alternate and does not affect Contract Progress Schedule.
 - 2. Notifications: Notify Project Consultants and parties affected by Alternates as to status of Alternates during course of Work to ensure proper and timely coordination. Addendum: relative to allowances in form of Change Order proposals. Itemize in detail, quantities and unit prices of materials, products, and assemblies required, in addition to any other reasonable Contractor's costs for review by Consultants. The proposed work shall be complete assessed to address all changes as a result of the work, and shall not result in additional changes.

1.04 QUALITY ASSURANCE:

- A. Submittals: Prior to purchase and fabrication of any materials, provide Consultants requested submittals and secure successful review for all design considerations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 ADMINISTRATION:

- A. Prior to signing Contract for the Work: Meet with the Owner and Consultants and clearly define scope of work included in each Alternate and conditions for administration of Alternate work. Incorporated changes to scope of Contract, if required.
- B. After Signing Contract for the Work: Upon written notification from Owner of acceptance of any Alternate, institute procedures in accordance with the Contract for changes to the Work

3.02 INSTALLATION OF ALTERNATE WORK:

- A. General: Coordinate adjacent Work and install products in accordance with successfully Consultants reviewed submittals and each Manufacturer's Project specific requirements.

3.03 SCHEDULE:

- A. Alternate No. 1
 - 1. Alternate Type: Additive
 - 2. Include in Base Contact: Not applicable.
 - 3. Alternate: Cos to add item(s) as indicated on Drawings.

END OF SECTION

SECTION 01290 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Applications for payment.
- B. Related Sections:
 - 1. Division 1 Sections.
 - 2. "Section 01330 - Submittal Procedures".
 - 3. "Section 01320 - Construction Progress Documentation".

1.02 SUBMITTALS

- A. Application for Payment Documents: Submit following.
 - 1. Application for Payment documents.
 - 2. Schedule for Values documents.
 - 3. Supporting documentation.
- B. Number of Submittal Sets: Refer to "Section 01330 - Submittal Procedures".
- C. Quality Assurance Submittals: Refer to "Quality Assurance" paragraphs herein. Alternate

1.03 QUALITY ASSURANCE:

- A. Content and Format Approval: Adjust format to satisfaction of Consultants.
- B. Accuracy, Completeness, Coordination of Scheduled Values: Each scheduled item in Schedule of Values and Applications for Payment document submittals to be accurate, complete, and fully coordinated between documents, including cost information.
- C. First Submittal of Schedule of Values: Submit prior to signing of Contract for the Work. Intent: Submit Change Order Proposals: Submit proposals for work required by Project Consultant's to fully evaluate compliance with Project requirements, e.g., written detailed cost breakdowns, related product data, published drawings, specifications, tested, performances, and samples.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 APPLICATION FOR PAYMENT-GENERAL:

- A. Submittal Time:
 - 1. Draft Copies: Seven (7) calendar days before the date scheduled for submittal of the formal Application for Payment.
 - 2. Formal Submittal: Submit corrected Application on regular dates each month; agreed to before signing Contract for the Work; otherwise Owner to determine regular scheduled dates.

- B. Review Process:
 - 1. Consultants:
 - a. Draft Submittal: Review draft. Forward copy to Owner. Make corrections, if required. Return to Contractor after reviews completed and advise Contractor of any actions, if any required.
 - b. Formal Submittal: Review. Sign and forward to Owner.
 - 2. Owner: After satisfactory review of documents, sign and forward documents for payment. Pay Contractor. Prior to signing Contract for the Work: Meet with the Owner and Consultants and clearly define scope of work included in each Alternate and conditions for administration of Alternate work. Incorporated changes to scope of Contract, if required.

3.02 APPLICATION FOR PAYMENT-PRIMARY FORMS:

- A. Documents: Execute on AIA Forms, G702 and Continuation Sheets G703. Information to be correlated with Schedule of Values.

3.03 SCHEDULE OF VALUES:

- A. Breakdown-Level of Detail:
 - 1. General: Each principal subcontract amount to broken down into sufficient detail and organized into a format as to facilitate reasonable and continued evaluation of the progress of each subcontract for duration of Project.
 - 2. Stored Work: List separately. Distinguish work stored on-site and those stored off-site. Show insurance coverage and bonded warehousing costs.
 - 3. Contractor's Option: Temporary facilities and other major cost items that are not direct cost of any specific scheduled work may be shown as separate line items in the schedule of values or distributed as general overhead expense.

- B. Format: In addition to any other format requirements, include following.
 - 1. Project Identification: For each set, indicate following.
 - a. Contractor's name and address.

- b. Contractor's Project submittal tracking number. Put on every sheet of each submittal set.
- c. Date of submittal. Put on every sheet of each submittal set.
- d. Consultant's Project number, name, location.
- e. Consultant's name.
2. Tabular Schedule: For each scheduled value, provide data for following items in a table under separate columns; organize similar to Project Manual Technical Specifications.
 - a. Generic description of the work.
 - b. Related Specification Section.
 - c. Name of Subcontractor
 - d. Name of Primary Manufacturer or Fabricator.
 - e. Name of Supplier.
 - f. Amounts for each value as a percentage and actual dollar value.
 - g. Change Orders that have affected each value.

C. Amounts:

1. Completeness: Each scheduled value to be complete cost for that work and include proportionate values for overhead, profit, and taxes.
2. Values as Percentage: Percent of total Contract Sum; to nearest one hundredth percent.
3. Dollar Values: Round to nearest whole dollar.
4. Contract Sum Reconciliation: All scheduled values to add up to Contract Sum.

D. Schedule Updating: Update and submit for following.

1. With each Application for Payment.
2. When Change Orders result in a change in Contract Sum.

3.04 FIRST APPLICATION-CONDITIONS AFFECTING:

- A. List of Subcontractors.
- B. Contractor's Progress Schedule.
- C. Schedule of principal products.
- D. Submittal Schedule.
- E. List of Contractor's staff assignments.
- F. Initial Progress Report.

- 3.05 APPLICATION AFTER SUBSTANTIAL COMPLETION-CONDITIONS AFFECTING:
- A. Submittals Due Prior to Application: Complete Closeout Submittals and Procedures.
- 3.06 FINAL APPLICATION-CONDITIONS AFFECTING:
- A. Full completion of all work to satisfaction of The Consultants and Owner.
 - B. Full completion of all required Closeout submittals and procedures.
 - C. Proof of payment of all obligations.
 - D. Removal of all Contractors' work.
 - E. Removal of surplus materials, rubbish, and similar elements.
 - F. Satisfactory final cleaning of all work.
- 3.07 SUPPORTING DOCUMENTS:
- A. Waivers of Mechanic's Lien:
 - 1. Intent: Submit waivers of mechanic's lien from every Entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by payment. Waivers to show reasonable, timely, and regular payment by Contractor to Entities completing work performed for him.
 - 2. Form: Acceptable to Owner.
 - 3. Information: Each waiver to include Subcontract Sum amount, total of payments made (prior to last payment), and current work, payment, and date of payment covered by waiver.
 - B. Other: If required by the Consultants, submit receipts or vouchers for payment of labor and materials from Entities and other documentation confirming work claimed for in each Contractor's Application for Payment.
 - C. Specified in Other Sections: As follows.
 - 1. Updated Progress Schedules.

END OF SECTION

SECTION 01296 - CONTRACT CLARIFICATIONS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Request for Information (RFI) procedures.
 - 2. Change Orders procedures.
- B. Related Sections:
 - 1. Division 1 Sections.

1.02 SUBMITTALS:

- A. General: As specified herein.

1.03 QUALITY ASSURANCE:

- A. RFI Content: Make one single request per RFI. Multiple requests under a single RFI number will be rejected.
- B. Basis of RFI's:
 - 1. Contractor Responsibility: RFI's are to be used as a method to clarify the intent of Contract Documents when such intent is not readily evident. It is the responsibility of the Contractor to make a reasonable review of the Contract Documents to ensure that the requested information is not readily inferable from the Contract Documents.
 - 2. Reimbursable Costs: Should The Consultants determine that any RFI could have been reasonably inferred from the Contract Documents, the Consultant reserve the right to deduct a fair and reasonable amount for the time and effort expended by them or their Consultants from the Contract Sum. This is not a penalty, but a fair reimbursement of a cost that the Contractor should have otherwise expended in researching the information.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 REQUEST FOR INFORMATION (RFIs):

- A. Time of Submittal: As soon as issue requiring clarification arises.
- B. RFI Form: Form to be provided by the Consultants.

- C. Submittal: Submit following.
 - 1. Identification of Affected Work: Submit list of Contract drawn work and Specifications affected.
 - 2. Supporting Data:
 - a. General: Submit applicable supporting data, drawings, and materials as required or as otherwise requested by the Consultants. Attach to RFI.
 - b. Field Conditions: If required or requested by the Consultants, submit "As-Built Drawings" complying with "Section 01785 - Project Record Documents".
 - 3. Solutions: Propose potential solutions

3.02 CHANGE ORDERS (MODIFICATIONS):

- A. Proposal Requests:
 - 1. Basis: When changes are made in the Work that require an equitable adjustment to the Contract amount and/or time, submit to The Consultants a written proposal for adjustments to the Contract.
 - 2. Adjustment to Cost: With proposal, submit detailed itemized breakdown, including following.
 - a. Material quantities and item cost.
 - b. Labor costs by material item.
 - c. Construction equipment cost.
 - d. Workmen's compensation and public liability insurance.
 - e. Overhead.
 - f. Profit.
 - g. Taxes. No overhead or profit will be allowed on employment taxes.
 - 3. Adjustment to Time: Submit proposal with justifications.
 - 4. Impact on Design Intent: Submit written and graphic descriptions indicating how proposal differs from original design intent, e.g., physical differences, aesthetic differences in material quality, compliance with Code and Authority requirements, etc.
- B. Change Orders: For each Proposal Request in which The Consultants has determined, and Owner has approved, that equitable adjustment is be made, a Change Order will be issued in writing.

END OF SECTION

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Administration requirements.
 - 2. Coordination of Owner's work.
- B. Related Sections.
 - 1. Division 1 Sections, general.
 - 2. "Section 01100 - Summary of Work".

1.02 SUBMITTALS:

- A. General: Refer to "Execution" paragraphs herein.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PERSONNEL DOCUMENTATION:

- A. Submittals: Submit following.
 - 1. Superintendent: Resume of experience.
 - 2. Key Personnel and Assignments:
 - a. Company hierarchical organization related to Project from President and/or CEO on down.
 - b. Name, title, primary Project responsibility, telephone and facsimile number, and e-mail address of each personnel.
- B. When Submitted: Within ten (10) working days after Notice to Proceed.

3.02 PROGRESS SCHEDULES:

- A. Type: Critical Path Method (CPM) Network Analysis System.
- B. Diagramming Method: Precedence Diagramming Method (PDM).
- C. When Submitted:
 - 1. First Submittal: Within 10 working days after Notice to Proceed.
 - 2. Updates: With each Application for Payment or within six (6) working days for each Change Order affecting Contract Scope and/or Time.

- D. Schedule Types Required:
 - 1. Summary Network Schedule: Schedule showing relationships between primary work types.
 - 2. Detailed Network Schedule: Detailed schedule required by Contractor for proper overall coordination of the Work.

- E. Format:
 - 1. Media:
 - a. Blueprints: 30" x 40" prints; two (2) sets.
 - b. Reproducible Media: 30" x 40" xerox from which blueprints can be made; one set.
 - 2. Data Required: In addition, usual network information, include following.
 - a. Sheet interface registration marks.
 - b. Legend describing all abbreviations.
 - c. Time line.
 - d. Cost loading showing cost and quantities; for each activity.
 - e. Manpower loading showing number of workmen; for each activity.
 - f. Long lead work.
 - g. Submittals to Consultants.

3.03 PROGRESS MEETINGS:

- A. General: Following to apply to all meetings; unless otherwise acceptable to Consultants.
 - 1. Location: Job Site or as otherwise agreed to by the Parties involved.
 - 2. Conduct of Meeting: Contractor to preside.
 - 3. Attendees: Capable of making binding and legal decisions in behalf of each Entity they represent.
 - 4. Agenda: Develop and distribute to all attending parties one (1) working day minimum, but not less than required for proper preparation by attending parties.
 - 5. Minutes:
 - a. Recording: Contractor to record and distribute written minutes within two (2) working days to all parties at meeting and to those impacted by meeting minutes.
 - b. Addenda: Parties who wish to enter revisions or add other statements for the record may do so not later than by the end of the next OAC meeting. Contractor may revise and reissue the previous minutes or record statements to next recorded minutes with specific reference to the original statements that are impacted.

- B. Contractor's Meeting: As required for proper coordination of the Work.

- C. Owner-Architect-Contractor (OAC) Meetings:
 - 1. When: One meeting each two working weeks on regularly scheduled day agreed to by Consultants and Contractor.
 - 2. Submittals:
 - a. Agenda: Submit not less than two working days prior to each scheduled meeting.
 - b. Minutes: Submit.

- D. Preinstallation Conferences:
 - 1. General: Conduct as required or specified for proper coordination of the Work.
 - 2. Consultants Notification: Notify Consultants of scheduled preinstallation conference five (5) working days in advance of each. Consultants to attend when requested by Contractor or when specified that Consultants be present.
 - 3. Agenda: Include following.
 - a. Coordination, including potential problems.
 - b. Interface and preparation, including potential problems.
 - c. Compatibility issues.
 - d. Tolerances.
 - e. Contact compliance, including code, fire, warranty, workmanship, personnel training, and other pertinent issues.
 - f. Review of Progress Schedule, e.g., delivery, installation, etc.
 - g. Housekeeping and cleaning.
 - h. Safety procedures.
 - i. Other issues and potential conflicts.

END OF SECTION

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Construction photographs.
- B. Related Sections.
 - 1. Division 1 Sections.
 - 2. All work.

1.02 DEFINITIONS:

- A. Intent for Number of Photos: The number of photographs will vary and may not be required or exceed the base line maximum specified at any given time; as may be necessary to achieve photographing intent. The general intent is to compile a historical sequence and record of ongoing construction of each primary Project system or product being installed and to show concealed services that can assist the Owner in any future addition, renovation, an ongoing maintenance of his Project. Contractor and Consultants to arrive at a general understanding of desired kinds and number of photos to be taken.

1.03 SUBMITTALS:

- A. Photographs: Submit photographs as follows.
 - 1. Weekly Submittals.
 - a. Number of Photos: Up to 200 photos per week.
 - b. Submittals: Submit two (2) sets of following.
 - 1. Electronic Data: Record to CD-RW or DVD disks or USB Flash Drive. Disks to be identified with data and general listing of photographs.
 - 2. Plan Drawings: Show locations of what is shown on each photograph.
 - c. When Submittals Required: Submit at end of each work week.
 - 2. Closeout Submittals: Submit following.
 - a. Electronic Data: Record on CD-RW or DVD disks or USB Flash Drive, selected Consultants and Owner photos; selected from all photos taken during duration of Project as part of Closeout submittals. Record in historical sequence and as otherwise directed by Consultants.
 - b. Hardcopies: Include hardcopy printouts on photographic paper as part of Owner's Closeout Project Manual.
 - c. Drawings: Plans showing locations of what is shown on each photo.

1.04 QUALITY ASSURANCE

- A. Assigned Personnel: Contractor to assign dedicated personnel to take photographs on regular basis and to work with Consultants in properly documenting progress and details of installed work.
- B. Camera Type: High resolution digital camera producing photographs acceptable to Consultants. Resolution of camera to be highest or very close to highest commercial (not necessarily Professional) resolution available at time Project is started. Digital camera to be capable of placing data and time minimum on each photo.
- C. Electronic Data: Type of electronic data to be viewed on current Owner's computer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EXECUTION:

- A. General: Consultants to continually work with assigned Contractor's personnel to work out general types of photographs to be taken.
- B. Intent-General Types of Photos Required:
 - 1. "Before" photographs of existing work that may be damaged as a result of Contractor's operations.
 - 2. Photos from distance of Site and each Project work.
 - 3. Close-up photos of each installed work to show compliance with Contract requirements.
 - 4. Close up and distant photos of concealed services in detail as necessary to assist Owner in locating each work; whether below grade and in each structure for future addition, renovation and maintenance.
 - 5. Photos of all critical details of all work.
 - 6. Distance and close-up photos of non-complying work, if any.
 - 7. Photos of any cutting and patching and restoration work, if any.
 - 8. Photos documenting Contractor procedures for accomplishing each work.
 - 9. Other as may be determined by Consultants during course of the Work.

END OF SECTION

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. General requirements for submittals.
- B. Related Sections.
 - 1. Division 1 Sections.

1.02 SUBMITTALS:

- A. General: Refer to Contract Conditions and individual Specifications Sections.
 - 1. Administrative Submittals.
 - 2. Work Related Submittals.
 - 3. Quality Assurance Submittals.
 - 4. Closeout Submittals.
- B. Submittal Schedule:
 - 1. Type: Submit a written list of required submittals with planned date of submission and date when submittals are required to be returned to Contractor in advance of critical path and lead times required for proper procurement and fabrication of Project products.
 - 2. Submittal Review: Consultants will review Submittal Schedule and make adjustments to submission dates to allow for reasonable review period by them. Make Consultant's indicated time adjustments to review period; unless other times are agreeable to Consultants.
 - 3. Progress Schedule: Incorporate final Submittal Schedule successfully reviewed by Consultants into Progress Schedule.
 - 4. Submittal Times:
 - a. First: Refer to "Section 01290 - Payment Procedures".
 - b. Subsequent: Update and resubmit each time schedule is changed. Progress Schedule is to be simultaneously updated and resubmitted in accordance with "Section 01310 - Project Management and Coordination".

1.03 QUALITY ASSURANCE:

- A. Review Period: Contractor to include adequate review period for all submittals, including but not limited to following.
 - 1. Adequate time for review by each party requiring review of submittals.

2. Adequate time necessary for delivery of submittals to each party and between parties
 3. Time necessary due to resubmissions for various causes, e.g., incomplete submittals, non-compliance of submitted work, clarifications, design changes, etc.
 4. Each review period to be in advance of Progress Schedule critical path and lead time dates for proper procurement, manufacturer, delivery, and installation of materials.
- B. **Completeness of Submittal Package:** Any single submittal package which is not representative of all required submittals for each work is not acceptable. Consultant's successful review of piecemeal submittals to be considered conditional; until review of all submittals has been completed; to minimize errors in determining Contract compliance, e.g. initial selection from product data does not differ from actual Project samples.
- C. **Submittal Project Specificity:**
1. **General:** Submittals to be clearly and boldly identified, e.g. Contractor inserted underlining, highlighting, bracketing, and written identifications, for all Manufacturer approved Project specific requirements; where specific submitted data is not entirely related to Project requirements. Data not properly identified may be returned for re-submittal.
 2. **Contract Variance:** Distinguish Project data from work which vary from Contract requirements. In addition to highlight, indicate by written text "contract variance" or similar bold text that clearly defines which items vary from Contract requirements.
 3. **Successfully Reviewed Unmarked Data:** Where Contractor submits general data that does not clearly and boldly distinguish Manufacturer approved Project specific data and where any such data has been successfully reviewed by Consultants; then the following applies.
 - a. Contractor's submittal of data contains the Manufacturer approved Project specific requirements.
 - b. Contractor and the specific Entity or Entities responsible for the Work indicated somewhere in any such undistinguished submittals has verified from the Manufacturer specific Project requirements and clearly understands which Manufacturer's requirements are to be implemented in order to comply with the Contract intent.
- D. **Consultant's Review:**
1. **Contractor's Responsibility:** From time to time, the Consultants may include review information is provided solely to assist the Contractor as part of the review process. The Consultants makes no claim to the accuracy of information provided, nor is it to be construed as an infringement of what is the Contractor's responsibility as defined by the Conditions of the Contract. The Contractor is solely responsible

- for all construction means, methods, techniques, sequences and procedures, and therefore shall be responsible for determining the accuracy of such information provided by the Consultants and for the use in the Work.
2. Review of Component vs. Complete Assembly: Consultant's review of single component of a larger assembly does not constitute his approval of the entire assembly, unless otherwise indicated.
 3. Piecemeal Submittals: Do not purchase, fabricate, and manufacture any product for which Consultants has not completed successful review of all required submittals for any product. Contractor assumes risk, e.g. additional costs for compliance with Design Intent, e.g. costs for purchase, manufacture, fabrication, installation, and replacement of non-complying work, costs for Contract time impacts, etc., as a result of beginning any work where Consultant's successful review of all submittals has not been accomplished.
 4. Contractor's Questionable Review: Consultants will reject submittals not reviewed by Contractor; even when stamped.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SUBMITTAL FORMAT:

- A. Submittal Sets: Number of submittals refers to submittal sets. Each submittal set includes all unique documents (not copies of) required for a particular submittal and are assembled together into a single unique and related group for submission.
- B. Contractor Transmittal of Each Submittal Set: Included following minimum information.
 1. Contractor letterhead, company name, address, phone/fax numbers, with responsible person sending submittal with his printed name and signature.
 2. Installer, Supplier, and Manufacturer company name, contact persons, addresses, phone/fax numbers.
 3. Addressee information.
 4. Numbering System: Unless otherwise approved by Consultants, the following system to be used; appended to all submitted documents and not just the cover sheet.
 - a. Initial Submittal: Specification Section Number followed by a sequence number, e.g. 08110-001.
 - b. Resubmissions: Specification Section Number followed by an R, applicable previous sequence number to relate it back to the original initial submission and an extension number to show further sequencing, e.g. 08110-R-001.01.

5. Append applicable numbering system to all documents.
 6. Date.
 7. Impacted Specification Section numbers; with applicable paragraph references.
 8. List of submittals.
- C. Origination Transmittal: Submit copy of Entity originating submitted information to Contractor.
- D. Submittal Sets: Submit not less than following to each entity; for every submittal required; unless otherwise specified.
1. Printed, Written, or Published Data: Digital Format: Portable Document Format or PDF. Provide one (1) reproducible set submitted through email. Upon approval provide (4) sets for Owner and Consultants; consisting of not less than one (1) original publications; other sets shall be clean and clear photocopies of the originals.
 2. Drawings: For Shop Drawings and other similar drafted type work, submit following.
 - a. Digital Format: Portable Document Format or PDF: Provide one (1) reproducible set submitted through email. Upon approval provide (4) sets for Owner and Consultants; consisting of not less than one (1) original publications; other sets shall be clean and clear photocopies of the originals.
 - b. As-Builts: Portable Document Format or PDF: Provide one (1) reproducible set submitted through email. Upon approval provide (4) sets for Owner and Consultants; consisting of not less than one (1) original publications; other sets shall be clean and clear photocopies of the originals. Also provide AutoCAD drawing files.
 3. Samples:
 - a. Type: Same materials and finishes scheduled for Project.
 - b. Sizes: Not less than following sizes; unless otherwise specified or acceptable to Consultants.
 1. Board and Sheet Type Samples: Actual thickness x 8-1/2 x 11"
 2. Running Samples: Profile x 11-1/2" lengths.
 3. Other: As acceptable to the Consultants.
 - c. Number of Submittal Sets: Same as required for "Printed, Written, or Published Data".
- E. Contractor's Review Stamp: Stamp each document. Date and sign each stamp. Stamp to include text that confirms submitted documents fully reviewed by Contractor for compliance with Contract intent.

3.02 ADMINISTRATION SUBMITTALS:

- A. General: Refer to individual Sections for specific requirements.

3.03 WORK RELATED SUBMITTALS:

- A. Product Data: Submit all standard publications available and applicable to Project requirements, including but not limited to, generic material data, installation instructions, tested characteristics, MSDS sheets, standard detail drawings, and color charts. Where standard data not complete, submit other written recommendations necessary to assure that Project data is complete.
- B. Shop Drawings:
 - 1. Types: Include plans, elevations, sections, and details.
 - 2. Scale: Similar to or larger than similar drawn elements on Contract Drawings.
 - 3. References: Same as Consultants; where different than Consultant's method must set up a referencing system so Consultants can readily find relationship to his similarly drawn elements.
 - 4. Level of Detail: As required for proper fabrication and installation of the work. Show relationship and interface to adjacent work.
- C. Samples:
 - 1. Initial Selections: May be made from charts and photographs that accurately depict products; when acceptable to Consultants. If in opinion such replications are not accurate enough, submit actual samples in full range of available characteristics.
 - 2. Final Samples: Actual Project representative materials and finishes selected by Consultants for Project.
 - 3. Colors, Finishes, Textures, Patterns: Where not specified, verify prior to submission of Bid; otherwise provide full range of available standards from Manufacturer for selection by Consultants.
 - 4. Options: Where not specified, verify prior to submission of Bid; otherwise provide full range of options available from Manufacturer for selection by Consultants.

3.04 QUALITY ASSURANCE SUBMITTALS:

- A. General: Refer to specific paragraphs, e.g. "Quality Assurance", "Field Quality Control" and other paragraphs, in individual Specification Sections for specific requirements.

3.05 CLOSEOUT SUBMITTALS:

- A. General: Refer to paragraphs, e.g. "Submittals", "Warranty", "Maintenance", "Owners Instructions" and other paragraphs, in individual Specification Sections for specific requirements.

END OF SECTION

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Quality assurance and control of installation.
 - 2. References.
 - 3. Inspection and testing laboratory services.
 - 4. Special inspections.
 - 5. Manufacturers' field services and reports.
- B. Related Sections.
 - 1. "Section 01330 - Submittal Procedures": Submission of Manufacturers' Instructions and Certificates.
 - 2. "Section 01600 - Product Requirements": Requirements for material and product quality.

1.02 QUALITY ASSURANCE/CONTROL OF INSTALLATION:

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.03 REFERENCES:

- A. Conform to reference standard by date of issue current on date for receiving bids.
- B. Obtain copies of standards when required by Contract Documents.

- C. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 INSPECTION AND TESTING LABORATORY SERVICES:

- A. When the individual specifications sections require it, the Contractor shall appoint, employ, and pay for services of an independent firm to perform inspection and testing. Seismic testing will need to be performed by a special inspector. Contractor to coordinate inspection, but Leahi Hospital will pay for said inspection directly.
- B. Services will be performed in accordance with requirements of governing authorities and with specified standards.
- C. Reports will be submitted by the independent firm to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or non compliance with Contract Documents.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
 - 1. Notify the Project Engineer and independent firm 24 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. Retesting required because of non conformance to specified requirements shall be performed by the same independent firm on instructions by the Project Engineer and shall be paid by the Contractor.

1.05 SPECIAL INSPECTIONS:

- A. Owner will employ Special Inspectors acceptable to Honolulu County to perform inspections on various elements of the work as required by the Building Code as locally adopted. During the course of the work under inspection, each Special Inspector will submit detailed reports relative to progress and conditions of the work including deviations from specified requirements and stipulating dates, times, and locations. Special inspector will submit a final report to the County. Contractor must cooperate fully with the Special Inspectors.

1.06 MANUFACTURERS' FIELD SERVICES AND REPORTS:

- A. Submit qualifications of observer to the Owner Representative 30 days in advance of required observations. Observer subject to approval of the Project Engineer and the Owner.
- B. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start up of equipment, or to test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.
- C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Submit two (2) copies of report written by representative, both to the Owner and to the Project Engineer listing observations and recommendations, within ten days of observation

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01420 - REFERENCES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Use of Standards.
 - 2. Abbreviation use and format
- B. Related Sections.
 - 1. Division 1 Sections.
 - 2. Divisions 15 and 16.

1.02 REFERENCES:

- A. Standards:
 - 1. Requirement: Each type of work provided for this Project is required to comply with recognized Industry standards (also may be referred to as "references") that are applicable to the class of work intended by the Contract Documents. Compliance is required whether such standards are indicated or not and whether such standards are in published form or an unwritten but accepted practice in the Industry for the class of work.
 - 2. Use:
 - a. General: Where a specific standard is indicated, the most current standard is intended and this is to be interpreted as a method for conveying the design intent and its use expands on or clarifies the requirements and its use is not intended to apply to the class of work to be provided.
 - b. Conflict: Where several Industry standards apply to the Work, and where quality requirements of these applicable standards conflict for the class of work required, it is intended that the standard producing the higher quality work is to apply.
 - c. Out-of-Date: Where any specified standard is not current, one of following may be provided.
 - 1) Provide work complying with non-current standard; except where older standards are not compliant with any Code requirements, then provide work complying with standard; but modified to extent as necessary to comply with applicable Codes.
 - 2) Provide work complying with non-current standard; except where older standards are not compliant with any Code requirements, then provide work complying with standard; but modified to extent as necessary to comply with applicable Codes.

- 3) Provide work complying with current standard that is the equivalent of the non-current standard or higher quality standard which is closest equivalent.

B. Abbreviations and Acronyms:

1. Industry Related: Industry accepted abbreviations and acronyms are used throughout the Contract Documents. If any is not understood, these should be verified from the Consultants; prior to Bid.
2. Product Identification Format: Where used in Contract Documents the following format is used
 - a. Format: Abbreviation of one or several letters, followed by a hyphen, followed by an identification number, e.g. WD-1 for wood type number one or WPM-1 for waterproof membrane type number one.
 - b. Number Sequence and Related Sections: Designations may be used between related specification sections where primary product is similar and therefore numbers are not necessarily sequential within a specific specification section, although the numbering will be sequential between all related sections where similar designations are used.

1.03 DEFINITIONS:

- A. Related Sections: The listed specification sections under the "Related Sections" paragraphs indicates some of the primary related work which is impacted by the work of the specific specification section in which the list appears. It is not intended as a complete list (which in many cases would otherwise be enormous) but has been provided to assist the Contractor.
- B. Exposure Definitions: Unless otherwise redefined elsewhere, the following applies.
 1. Exterior Surfaces: Exposed on the outside envelope of structure or surfaces of other constructed elements and equipment which are exposed and not fully enclosed by walls, floors, roofs, windows, and doors, are to be considered as part of the exterior and surfaces occurring in such spaces are to be considered exterior surfaces. Naturally vented, but enclosed, attic or similar spaces to be included.
 2. Interior Surfaces: Surfaces interior to the fully enclosed envelope of a structure or within the fully enclosed envelope of other constructed elements and equipment. These surfaces are not exposed to the "outside air".
 3. Exposed: Surfaces which are exposed to view from most vantage points, which are not concealed from view due to permanent inaccessible construction or earth, and which is not defined as semi-exposed.
 4. Semi-Exposed: Surfaces not readily visible but are accessible and viewable from selected vantage points. These surfaces include

- those hidden by and hidden on removable or openable doors, panels, and drawers, and surfaces or undersides of shelves, counters, desks, and toe spaces, surfaces, which are hidden by moveable equipment/furnishings, and other similar surfaces.
5. Concealed: Surfaces not exposed to view from any vantage point and which is concealed by permanent inaccessible construction, earth, and equipment/furnishings. Such concealed surfaces include those surfaces permanently concealed within walls, above ceilings, within floor construction, within shafts, and those buried underground in earth. Include within this definition, surfaces above otherwise semi-exposed accessible suspended acoustical ceilings, if any.
- C. Type: Word “type” as used herein is defined to mean any characteristic, e.g. shape, size, finish, pattern, texture, color, sheen, of a product that may be different from another similar product.
- D. Defect: Word “defect” as used herein is anything that would make a product less in quality than would be expected of the product at anytime from its time of manufacture to the end of its useful installed life; when normal wear and tear and abnormal impacts, e.g. Acts of God or other impacts for which the product was not designed or engineered for are taken into consideration; except to the extent such abnormal impacts may otherwise be warranted by the Manufacturer by published statements, verbal promises, and written Warrantees.
- E. Wet and or both Humid Interiors:
1. General: Refers to interior areas or rooms that are exposed to higher wet and or both humid conditions, e.g. swimming pools, steam rooms, saunas, bathrooms, showers, restrooms, commercial kitchens, locker rooms with showers or similar gang type wet fixtures, Janitor’s rooms with sinks, etc.; when compared to typical conditioned areas or rooms of a building. Open areas or rooms immediately adjacent to such areas or rooms are included; where exposed to potential effects of such conditions.
 2. Exposed Wet and or both Humid Conditions: Surfaces directly adjacent to and enclosing equipment and or both fixtures producing wet and or both humid conditions, e.g. walls and ceilings directly adjacent to a tub.
 3. Indirectly Exposed Wet and or both Humid Conditions: Surfaces part of area or room directly outside of enclosed or partially enclosed area or room producing wet and or both humid conditions, e.g. surfaces just beyond enclosure of a tub.

LEAHI HOSPITAL
YOUNG BASEMENT
HEAT PUMP REPLACEMENT

01420
References

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01450 - QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Quality control testing and inspection requirements.
- B. Related Sections.
 - 1. Division 1 Sections.

1.02 SUBMITTALS:

- A. From Testing-Inspection Service: Submit Testing-Inspection Reports directly to Consultants.
- B. From Contractor: Schedule each testing-inspection required in Progress Schedules.
- C. Quality Assurance Submittals: Refer to "Quality Assurance" paragraphs herein.
- D. Special Inspector Qualifications.

1.03 QUALITY ASSURANCE:

- A. Testing Owner Requires: In addition to any Authority required and specified testing, Owner reserves right to test and inspect any and all work of Project.
- B. Securing of Testing-Inspection Services:
 - 1. Contractor:
 - a. Responsibility: For Authority required and specified testing, secure a Testing-Inspection Service and pay for testing required.
 - b. Owner Approval: Secure Owner's acceptance of Contractor's selected Testing-Inspection Service, prior to signing any Contract for any required services. Submit proposed Testing-Inspection Service qualifications for review in timely manner. Do not use any Testing - Inspection Service not acceptable to Owner.
 - 2. Other Testing: Except for Authority required and specified testing, Owner to secure his own Testing-Inspection Service and pay for any other testing he may require.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 INSPECTIONS-TESTING, GENERAL:

- A. General: Comply with requirements of the General Conditions of the Contract and requirements specified herein. Use of any testing inspection service shall in no way relieve Contractor of his obligation to perform the Work in accordance with the Contract.
- B. Contractor shall retain any required special inspector and special inspection requirements as required by Honolulu County Department of Planning and Permitting.

3.02 LABORATORY & INSPECTOR DUTIES:

- A. Performance of Service: Perform required inspections, sampling, and testing of materials and methods of construction. Ascertain compliance with requirements of Contract Documents as measured by standards required by specifications, by Authorities, and by recognized ASTM and other acceptable Industry standards applicable to each tested work.
- B. Notifications: Promptly notify Consultants of irregularities or deficiencies of the inspected and/or tested Work. Submit test reports for review.

3.03 CONTRACTOR'S RESPONSIBILITIES:

- A. Contractor Notifications: Notify each Testing-Inspection Service each time required and within time period requested by Service; to allow them to properly preparation for and schedule each type testing-inspection required.
- B. Cooperation: Cooperate with testing service personnel. Provide appropriate access to work where inspections, sampling and testing required. Furnish causal labor as necessary to assist access to work to be tested, to assist in obtaining and handling of samples at the site, and to otherwise facilitate the inspection and testing process.
- C. Protection and Repair: Protect each work being tested-inspected from anything that would invalidate the testing-inspection results and for duration of each testing-inspection period. Upon completion of inspection, testing, and sampling, repair damaged work and restore finishes to match the adjacent finishes.

- D. Contractor Arranged Tests: Contractor may arrange and pay for additional inspections, sampling, special inspection, and testing beyond the required testing from Testing-Inspection Service.
- E. Non-complying Work: Where non-complying work is evidenced by Testing-Inspection Service, Contractor to comply with following.
 - 1. Owner's Costs Directly Attributable to Defective Work: When Owner has paid for testing, pay for all costs incurred by the Owner and the Consultants.
 - 2. Correction of Work: Provide all work necessary to correct defective work to comply with Contract requirements.
 - 3. Time Impact to Work: Request for additional time will not be considered when resulting from installation of defective work.

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES AND QUALITY CONTROLS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Requirements for construction facilities and temporary controls.
- B. Related Sections.
 - 1. Division 1 Sections.

1.02 SUBMITTALS:

- A. Reports and Permits.
 - 1. During Progress of Work: Submit copies of reports and permits required by governing authorities.
 - 2. Closeout Submittals: Refer to "Section 01785 - Project Record Documents".
- B. Quality Assurance Submittals: Refer to "Quality Assurance" paragraphs herein.

1.03 QUALITY ASSURANCE:

- A. Standards: In addition to applicable codes and other Authority requirements, comply with applicable requirements of following.
 - 1. ANSI A10.6.
 - 2. ASHRAE 62.1 and 170
 - 3. NECA, including "Temporary Electrical Facilities".
 - 4. NFPA 70 and 241.
 - 5. NEMA.
 - 6. OSHA.
 - 7. UL.
- B. Use Charges: No additional cost or use charges for temporary facilities or services are chargeable to Owner, unless otherwise agreed to by Owner.
- C. Use Charges:
 - 1. Intent: Include all use charges for temporary facilities and services in Contract Sum.
 - 2. Utilities: Arrange with Utility Companies e.g., sewer, water, power, telephone, etc., for methods necessary for use of services so it is directly chargeable to Contractor during Contract Period. Pay for services.
 - 3. Owner Incidental Use: Allow incidental use of services (without charge) by Owner, Consultants, governing Agencies, and any of

- their designated entities, agents, and personnel that require access to the Project Site.
4. Exception: Long distance telephone charges may be billed directly to Entities responsible for persons making such calls. Owner, Consultants, and governing Agencies are not responsible for any long distance calls made by any other Entity, even where such Entities responsible for such calls are under contract to any of them.
- D. Permits: Secure permits required to carry out the Work.
- E. Regulations:
1. General: Comply with Authorities having jurisdiction over Project.
 2. Community Rules: Refer to "Section 01100 - Summary of Work".
 3. Safety: Temporary work to comply with OSHA as applicable to each Trade.
- F. Pollution Related Submittals:
1. Conditions of Use: Generally any legal toxic, hazardous, or noxious operations, equipment, and materials may be used on the Project when used in strict accordance with the law, except Consultant reserves the right to deny use of any such operations, equipment, and materials where in its opinion the use of such operations, equipment and materials may negatively impact personnel or surrounding community.
 2. Submittal: Submit a list of such operations, equipment, and materials, their intended scheduled time of use, and related product data and MSDS sheets prior to expending any moneys for such operations, equipment, and materials; for approval by Consultants.
 3. Progress Schedule: Incorporate pollution related operations into Progress Schedules when directed by Consultants.
 4. Costs: Where use of any pollution creating operations, equipment, and materials are denied by Consultants and for which there are no prior approval by Consultants prior to spending any moneys for such operations, equipment, and materials, then expended costs and any additional costs which may result from implementing Consultant acceptance alternative means for accomplishing the Work in accordance with Contract requirements are to be borne solely by Contractor.
- G. Owner and Consultant's Use: Unless not possible or where unreasonable, allow general incidental use of available facilities, e.g., conference or desk space, telephones (except for long distance), sanitary facilities, etc., by Owner, the Owner Representatives, and their personnel and designated guests.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT:

- A. Quality, Maintenance, Suitability: Used materials and equipment that are undamaged and in serviceable condition may be used. Provide appropriate maintenance schedule to ensure materials and equipment properly perform during time of service required. Provide only material and equipment suitable for the intended use.

2.02 TEMPORARY SERVICES:

- A. General: Provide equipment and materials from each Utility Company connections as required for the Work.
- B. Telephones: Each Entity to pay for their own telephones and services as they may require for the Work.

2.03 TEMPORARY CONSTRUCTION & SUPPORT FACILITIES:

- A. General: Provide as required for the Work.
- B. Field Offices-Contractor: Provide trailers or other enclosed facilities required by Contractor for his work. In addition to Contractor's facilities, provide following enclosed and furnished facilities which may be a part of Contractor's facilities.
 - 1. Furnished conference room for Project meetings; air conditioned and large enough to hold large meetings up to 20 people minimum.
 - 2. Work area for review of Project record documents; air conditioned.
 - 3. Dedicated storage area for approved Project samples.
 - 4. Dedicated shelved area for codes, standards, and references applicable to specified Project requirements; including applicable UBC Code, set of ASTM Building standards, and ACI standards.
 - 5. Extra supply of hardhats for visitors.
- C. Sanitary Facilities: Provide facilities as required by Contractor for the Work. If portable units are provided, provide types in accordance with Health Authorities. Maintain on reasonable and regular sanitary maintenance schedule, e.g., waste removal, cleaning and supplies.
- D. Temporary Controls: Provide materials, equipment, and facilities necessary to properly implement temporary controls specified herein.
- E. Waste/Refuse Removal: Provide necessary equipment for waste and refuse removal from the Project site.

- F. Temporary Use of Elevators: Verify temporary use of elevators for Work and included impacts in Bid; if not fully restricted, comply with following, prior to signing Contract for the Work.

PART 3 - EXECUTION

3.01 PROCEDURAL REQUIREMENTS:

- A. General: Provide each temporary facility and utility ready for use at each location when it is first needed, to avoid delay in performance of the work. Provide facilities that can be properly maintained throughout their use at the Project site. Adjust service capacity of temporary services and facilities as needed throughout the progress of the Work. Do not remove until services or facilities are no longer required.
- B. Inspections and Testing: Inspect and test each service before placing temporary services in use.
- C. Conditions of Use: Operate temporary services and facilities in a safe and efficient manner. Do not overload temporary services or facilities, and do not permit them to interfere with the progress of the work. Do not allow unsanitary conditions, public nuisances, or hazardous conditions to develop or persist on the site.

3.02 TEMPORARY CONTROLS:

- A. General:
 - 1. Restrict the Work, e.g., deliveries, staging, other operations, materials and facilities, to immediate limits of Site; unless further restricted by other Contract requirements or unless otherwise approved by Owner.
 - 2. Maintain temporary controls whenever required and for periods as long as necessary to control conditions for which temporary controls are required during the Contract Period.
- B. Protection and Security Facilities: Provide temporary protective structures, including enclosures, supports, barricades, partitions, warning signs, warning lights, and other forms of protection as created by ongoing operations and required by working areas and conditions, including, but not necessarily limited to, the following:
 - 1. To protect all persons and property from hazards on ongoing operations.
 - 2. To provide security from access by unauthorized persons.
 - 3. To protect exposed work from damage from the weather.
 - 4. To efficiently route vehicular and pedestrian traffic around obstructing.

- C. Fire Protection Requirements: If any Project areas are secured, maintain security and exist requirements in compliance with Authorities. Provide portable fire extinguishers, if required, by Authorities. Instruct all personnel on use of fire extinguishing equipment and exiting procedures prior to start of Work.
- D. Construction Cleaning: Comply with requirements specified in "Section 01740 - Cleaning".
- E. Waste Disposal: Dispose of all waste material in a legal manner off site. Do not burn or bury any wastes on Project site. Do not dispose of any wastes into the storm or sanitary sewers.
- F. Pollution Controls:
 - 1. Intent: Limit pollution and any possible resulting contamination of the site and surrounding areas to avoid creating hazardous or unreasonable nuisance conditions from the ongoing operations.
 - 2. Authority Requirements: Comply with applicable requirements of following. Secure permits from Authorities having jurisdiction over the Project; as required by law or provided for protection of Contractor.
 - a. Federal Government.
 - b. State Government, including State Department of Health and its "Public Health Regulations".
 - c. City Government.
 - 3. Types of Controls: Include, but not be limited to, the following.
 - a. Dust Control: Use appropriate containment methods as required to limit dust contamination of any built project structures and surrounding community.
 - b. Noise Control: Minimize noise produced by ongoing operations. Secure and pay for "Community Noise Permit" as required by the State of Hawaii Health Department.
 - c. Light Pollution: If any, night operations are required.
 - d. Air Pollution: Limit mist, smoke, vapor, gases, odorous substances, particulate matter, and other similar pollutants to acceptable levels.
 - e. Chemical Control: Limit use of hazardous and toxic chemicals in strict accordance with lawful regulations and Authorities. Prevent contamination by chemicals to the environment. Prevent nuisance conditions which could arise from use of the chemicals.
 - f. Hazardous Waste Disposal: Volatile, toxic, and other hazardous wastes are to be removed daily, except as otherwise allowed and accepted by Authorities having jurisdiction over the Project. Refer to "Waste Disposal" paragraphs herein for additional requirements.

- G. People Controls:
 - 1. Owner Restrictions: Comply with Owner's restrictions for personnel doing business on Site.
 - 2. Contractor Controls: Provide safety measures and programs as required by law and required for protection of those on Site.

- H. Vehicle Controls:
 - 1. Access to Site: Verify acceptance routes of access to Site.
 - 2. Public Road Blockage:
 - a. Intent: Avoid blocking to greatest extent possible.
 - b. Full Blockage: No work to fully block passage around such work for more than 5 minutes; regardless of alternate routes; unless such blockage has been approved by Authorities.
 - c. Partial Blockage: Minimize length of time required.
 - d. Controls: Erect temporary traffic safety devices, e.g. signs, cones, personnel directing traffic, etc. as mandated by Authorities and as required to ensure passage of public safely around ongoing operations.
 - 3. Site Entry: Designate specific Project Site entries. No crossing curbs and sidewalks.
 - 4. Speed: Maintain reasonable and safe speed limits on Site. Outside of Site, comply with Authority posted speed limits.
 - 5. Parking:
 - a. On Site:
 - 1) Designate parking areas and controls.
 - 2) No parking on and driving over built structures, e.g., paved driveways, walks, slabs; unless no other means or paths are available and then only as acceptable to Consultants.
 - b. Off Site: Parking off Site, if required, is to be done legally and in manner not to become a nuisance to surrounding community.
 - 6. Spillage: Vehicles to fully contain materials being transported. Where materials are dropped on public ways and properties, full and immediate removal is required.
 - 7. Mud Tracking: Any mud tracking onto public ways to be removed on daily basis by washing. Removal of waste water to conform to what is allowed by Authorities.
 - 8. Maintenance: Maintenance and fueling to be done only in Contractor designated areas. Set up safety program for use of such areas.
 - 9. Washing of Equipment: Hopper, chute, and wheel cleaning allowed as long as washing operations not detrimental to Site and ongoing operations.

3.03 PROCEDURAL REQUIREMENTS - UNKNOWN HISTORICAL SITES:

- A. Encounter: If any, unknown Sites are encountered, stop operations around the immediate area. Erect temporary barriers to prevent other operations from further damaging and disturbing each such Site.
- B. After Encounter:
 - 1. Notification: Immediately notify Consultants, Owner, Authorities, and Organizations to determine extent and limits of barricades to erect. Where conflict occurs between Parties determining limits of barricades, Owner will prevail in determination of barricade limits.
 - 2. Operations: Continue around barricade limits, unless otherwise directed by Consultants.
- C. Cost Impacts: Prior to signing Contract for the Work, work out a method for cost adjustments to the Contract with the Owner based upon potential effects, e.g., scope and length of delays, degree of work stoppage, scheduling, etc., to the contract due to discovery of such unknown sites; otherwise contract Sum is assumed to include all Contractor's costs for conducting his Work; regardless of scope and length of delays to his operations, is such discoveries are made.

3.04 INSTALLATION:

- A. General: Use qualified Tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire Project adequately and result in minimum interference with the performance of the Work. Adjust services and facilities as required during the course of work so as to accommodate the entire work of the Project.

3.05 OPERATIONS:

- A. General: Establish regular programs for personnel health, safety, fire protection, security, maintenance, and cleaning of Project site and temporary facilities.
- B. Supervision: Enforce strict discipline in use of temporary services and facilities at the site. Limit availability of temporary services and facilities to essential and intended uses to minimize waste and abuse. Do not permit temporary installation to be abused or endangered. Do not allow hazardous, dangerous, or unsanitary conditions to develop or persist on the Project site.
- C. Maintenance: Operate and maintain temporary services and facilities in good operating condition throughout the time of use and until removal is authorized. Protect from damage by dust, rain, and similar elements.

- D. Termination and Removal: Upon completion of each activity remove all unnecessary equipment, materials, and facilities. Upon completion of work remove all equipment, materials, and facilities and remove from site in expeditious manner. Re-establish work areas to clean condition. Repair, restore, or replace any damaged work. Completely clean site of evidence of Contractor's operations.

3.06 DAMAGES:

- A. General: If any damages, e.g., soiling staining, broken elements, damaged landscape, etc., result from Contractor's operations, such damages are to be restored or replaced to "as new" Contract conditions as satisfactory to Consultants. The costs of such remedies shall be borne entirely by the Contractor.

END OF SECTION

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. General requirements for products.
- B. Related Sections.
 - 1. Division 1 Sections.

1.02 DEFINITIONS:

- A. Primary Products: For any given product related Specification Section, the main product of products required for the Project; which is the reason such Specification Section is written.
- B. Related Products: Products required to complete each installation of a primary product.
- C. Defects: Anything about any Project product that would make it less in quality than the intended Contract requirements, e.g., materials not complying with Contract requirements, manufacturing defects, installation defects, damages prior to Contract conclusion, abnormal deterioration, etc., that occur prior to end of any warranties in effect and prior to a reasonable expected life cycle under similar installation conditions and exposures.
- D. Exposures: Refer to "Section 01420 - References" for definitions of exterior", "interior", "exposed", "semi-exposed", and "concealed"; except as otherwise specified.

1.03 SYSTEM DESCRIPTION:

- A. Performance:
 - 1. General: Each product provided shall perform to the Contract requirements under the anticipated conditions of use and installation or exceed such requirements. Performance evaluation of any product to include the performance of the product by itself and its performance relative to the total assembly for which it is a part as exposed to actual installed Project environmental and use conditions.
 - 2. Authority Requirements: Whether specified or not, each Project product to meet all Codes, laws, and other Authority applicable requirements that apply to each product. For any particular product, where specifications does not address any Project applicable

Authority requirement, include in Bid Manufacturer's Code compliant product; which is comparable to original product and that does not jeopardize original Project design intent specified for any such product. Secure Consultant's approval of product; before purchase, fabrication, and installation of such products.

1.04 SUBMITTALS

- A. List of Products: As a condition to securing the Contract for the Work, submit a list of primary products to be used for the Work, prior to signing the signing of the Contract for the Work. Secure the Consultant's general approval of the listed products. List products under each related Specification number. List of Products to indicate product, Manufacturer, Installer, and Supplier.
- B. Work Related Submittals:
 - 1. Specified: Refer to other related Sections as follows.
 - a. "Section 01330 - Submittal Procedures".
 - b. "Section 01785 - Project Record Documents".
 - c. Individual Specification Sections applicable to each Entity.
 - 2. Unspecified: Including substitutions, submit any and all documentation required by Consultants in order to determine compliance with intent of Project.
- C. Closeout Submittals: Refer to "Warranty" and "Maintenance" paragraphs herein.

1.05 QUALITY ASSURANCE

- A. Intent of Section: Requirements specified herein are minimum quality standards that apply to all products required for Project; whether requirements are specified or not and are to be complied with unless otherwise acceptable to Consultants.
- B. Manufacturer, Supplier, Fabricator, Installer Qualifications:
 - 1. General Qualifications: Notify Consultants where any of following qualifications cannot be met.
 - a. The Manufacturer best understands the performances of Its' products relative to Project's requirements.
 - b. Those working with any Project products, e.g. Installer and Fabricator, has secured proper Manufacturer training to professionally fabricate and install their products in accordance with Manufacturer's Project specific design intent.
 - c. Those working with any Project products, e.g. Installer and Fabricator, has fully disclosed and secured written confirmation of specific Project requirements for each Manufacturer's product from reliable and knowledgeable

- Manufacturer's Technical Representatives; prior to Bid and has incorporated such requirements into Bid.
- d. Those working with any Project products, e.g. Installer and Fabricator, have an intimate knowledge of all the available characteristics and options necessary to provide a complete installation in accordance with Contract design intent.
2. Experience: Except as otherwise indicated, as follows.
- a. Type: Current and continuous experience with the specific Project required products and services being provided or equivalent experience acceptable to Product Manufacturer and Consultants.
 - b. Number of Years: Not less than following.
 - 1) Manufacturer: 10.
 - 2) Supplier: 5.
 - 3) Fabricator: 10.
 - 4) Installer: 5.
3. Certification:
- a. Requirement: Where Manufacturer has a certification or licensing program for installation of Project products, Installer to possess current certification or licensing. Certification to have been attained not less than two year prior to time that Project was Bid.
 - b. Submittal: Submit written documentation of such certification when specified or requested by Consultants.
4. Verification of Project Requirements:
- a. Condition of the Contract: It is the responsibility of the Installer and Fabricator of each work to verify that each Manufacturer's product can meet the specified and drawn Project requirements applicable to the Work; including each Manufacturer's Project related requirements and Industry practices and standards. Verify requirements and Industry practices and standards. Verify requirements during Bidding and prior to signing the Contract for the Work by the Contractor.
 - b. Impact: Where Consultants and Owner has not been notified prior to the signing of the Contract for the Work by the Contractor, Entities responsible for such work, including Contractor, are required to provide work necessary to comply with specified requirements at no additional cost to Owner.
- C. Fire Rated Assemblies:
1. Intent: Provide each installed assembly to exactly match each required Product Manufacturer's tested fire assembly applicable to Project fire rating condition.
 2. Alteration: "Engineering Judgments" or other alterations of Manufacturer's fire tested assemblies are not allowed; unless specifically specified or acceptable to Consultants.

- D. Related Products:
 - 1. Intent: Each related product required to complete the installation of a primary Project product and having a performance related impact on a specific Project product to be approved in writing by the Manufacturer for the primary Project product for use on the Project and for each scheduled type of use on Project; whether provided by them or not.
 - 2. Conflict: Where specified requirements are detrimental to performances and not acceptable to any Manufacturer, notify Consultants for resolution of such conflict; prior to purchase, fabrication, and manufacture of such products.

- E. Manufacturer's Packaging and Labels:
 - 1. General: Keep intact and unopened until just prior to each installation. Packaging may be opened when required by Manufacturer to protect products from damages due to environmental conditions, e.g. condensation, humidity, etc., and only to extent as required by them. When required, maintain protections of products.
 - 2. Label Descriptions: Labels to identify Project products. Specified special performances and Authority required information to appear on labels.

1.06 WARRANTY:

- A. Contractor's Project Warranty: Refer to General and Supplementary Conditions of the Contract.

- B. Manufacturer's Standard Warrantees: Whether specified or not, submit standard available warrantees for primary Project products. All products to have not less than a one (1) year warranty from the Manufacturer against manufacturing defects in materials and its workmanship.

- C. Installer's Warrantees: Whether specified or not, submit each Installer's one (1) year Warranty against defects occurring due to installation of materials and its workmanship; except where any required Special Warrantees extend Installer's One Year Warranty.

- D. Special Warrantees: Refer to individual Specification Sections for other warranties required for Project.

1.07 MAINTENANCE:

- A. Maintenance & Servicing Instructions: Whether specified or not, submit standard published user manuals and maintenance and service instructions for Project materials and equipment. These are in addition to any similar requirements specified in other Specification Sections.

PART 2 - PRODUCTS

2.01 PRODUCTS, GENERAL:

- A. Primary Product: Unless otherwise specified or acceptable to Consultants, products to comply with following.
 - 1. Experience: Used 10 years minimum in projects of similar type, scope, under similar environmental conditions, and under the same installation (assembly) conditions.
 - 2. Compatibility: Compatible with related products required to complete each of its installation and compatible with each interfacing product in each assembly.
 - 3. Single Source Intent: For specified primary products in any particular Section, the indicated products are to be generally provided by a single Manufacturer; unless it is clear that specified requirements cannot be met by a single Manufacturer; then limit number of sources to fewest reasonably possible.
- B. Related Products: Refer to "Quality Assurance" paragraphs herein.
- C. Completeness: Provide all materials necessary to provide a complete and fully functional assembly to each product required for Project.
- D. Finishes of Related Products: For exposed components of related products, provide same finish as required for primary product; unless otherwise specified or acceptable to Consultants.

2.02 FABRICATION:

- A. Project Measurements: Establish written documentation with Contractor coordinating measurements and tolerances required to assure that fabricated work fits final intended Project outcome. Where possible verify actual field conditions prior to final fabrication of Project units affected by field conditions.
- B. Manufacturing Products – Intent:
 - 1. General: Generally specified requirements for any product are those which can be met by standard established manufacturing practices of manufacturers producing types of products required for Project. Generally do not alter the manufacture of such products; except as specifically engineered by Manufacturer to conform their products meet required special or custom requirements to meet Contract intent.
 - 2. Customizations: When required, Manufacturer to have ten (10) years minimum experience engineering products for specific custom performances required for Project; unless otherwise acceptable to Consultants. Acclimation Sensitive Products: Where products are sensitive to environmental conditions, adjust manufacturing and

fabrication of products in manner that defects do not occur under final environmental conditions to which product is to be exposed.

2.03 SPECIAL REQUIREMENTS:

- A. Ferrous Products – General: Whether required for exterior or interior use and unless otherwise acceptable to Consultants, comply with following.
 - 1. Do not install any rusted ferrous products in the Work. If rust occurs, rust to be removed completely from surfaces without destroying functionality of product or replaced with new un-rusted and Contract complying work.
 - 2. Ferrous fasteners when used with metals are to be used only with ferrous materials.

- B. Galvanizing of Ferrous Metal Products: Even when not specified, and except where other galvanizing specified, ferrous metal products to be hot dipped galvanized as follows.
 - 1. Location:
 - a. When part of exterior assemblies, including vented attic spaces exposed to exterior air.
 - b. At interior when installed in or attached to concrete and masonry part of exterior wall or similar assemblies.
 - c. When occurring in with or high humidity areas, e.g., restrooms, janitor's closets with sinks, kitchens, swimming pools, shower areas, steam rooms, saunas, etc.
 - 2. Type of Galvanizing: As applicable to assembly type, comply with following.
 - a. Standard: ASTM A 153, ASTM A 123, and ASTM A 653.
 - b. Vent Holes: If required, fully plug flush with lead after galvanizing. Blended smooth with adjacent surfaces.

- C. Stainless Steel: If any, to be products to be fabricated without ferrous contamination in accordance with NiDI requirements

PART 3 - EXECUTION

3.01 GENERAL EXECUTION REQUIREMENTS:

- A. Intent: Comply with Manufacturer's Project specific requirements as fully submitted and successfully reviewed by Consultants; which shall not be less in quality than Contract intent and applicable Industry standards.

3.02 DELIVERY, STORAGE, & HANDLING:

- A. Delivery: Upon arrival of Site, immediately inspect products for defects. Replace defective products in timely manner; without affecting Project Progress Schedule.

- B. Storage: Comply with each Manufacturer's Project specific requirements. Ensure storage methods do not cause defects to occur. Whether storage is on site or off site, maintain insurance covering full replacement of materials.
- C. Handling: Use methods and equipment approved by each Product Manufacturer for types of handling required in Project.
- D. Protection of Products:
 - 1. Intent: Contract requirements cannot anticipate Contractor's means and methods for shipping of ferrous products where exposure conditions can rust product. Specified requirements are intended for Owner acceptance of installed undamaged and un-deteriorated, as-manufactured products at time of Substantial Completion.
 - 2. Protection Responsibility: Contactor is responsible for means and methods, including interim shipping and storage, to ensure Project products are provided with adequate protections during entire procurement and installation process; so products can be installed accordance with the intent.

3.03 PROJECT SITE CONDITIONS:

- A. Environmental Conditions: Do not proceed with any work under any adverse conditions that would cause defects in products.
- B. Acclimation:
 - 1. General: Acclimation interior products prior to each installation under Manufacturer recommended environmental conditions to ensure success of each installation.
 - 2. Interior Products: Install when each space fully enclosed and when temperature and humidity are in strict accordance with each Product Manufacturer's requirements.

3.04 SEQUENCING & SCHEDULING:

- A. Coordination: Each Installer to coordinate work with other Trades, e.g., schedules, sequence of operations, dimensions, tolerances, finish, embedded items, templates, etc., to ensure work by other Trades are constructed in manner to ensure success each of their installations.

3.05 EXAMINATION:

- A. Existing Conditions: Prior to start of each work, verify existing conditions for conformance with requirements necessary to ensure success of each installation. Start of work indicates acceptance of conditions and confirms its conformance.

3.06 PREPARATION:

- A. Responsibility: Each Installer to verify and coordinate following responsibilities; otherwise Installer requiring preparation is required to provide required work necessary to assure success of its installation.
 - 1. Support Work.
 - 2. Substrate preparation.
 - 3. Tolerances.

3.07 INSTALLATION:

- A. General: Refer to "General Execution Requirements" paragraph herein.
- B. Finish, Color, Pattern, Texture Variation: Install products in manner to assure uniform visual appearance acceptable to the Consultants. Methods for insuring uniformity may include utilizing materials in sequence as manufactured from same lots where singular lot may be used for single contiguous area or may require the hand selection of materials between several lots for larger areas.
- C. Defective Work:
 - 1. General: Replace defective work with complying work; unless otherwise acceptable to Consultants.
 - 2. Minor Defects: Very minor damage, deterioration, and other very minor defects may be restored when acceptable to the Consultants.
 - 3. Restoration Intent: In addition to any other requirements, restoration when allowed by Consultants shall meet following minimum criteria.
 - a. After fully finished, no evidence of restoration work to be visible where on any exposed to view surfaces.
 - b. Workmanship of restoration work on concealed surfaces may be less rigorous than work for exposed to view surfaces, but to be generally flush and neat.
 - c. The existing defect and any restoration work is not to reduce the long term performance of the materials and components of the work in any way.
 - d. The method and materials used to restore any defect to be such that it can perform as well or better than the original materials.
 - e. Restoration is to be accomplished at no cost to Owner.

3.08 PROTECTION:

- A. Intent: Provide protections necessary so each work is clean, without contamination, without defects, abnormal deterioration, without damage, and properly functioning at the time of Final Acceptance by the Owner.

3.09 CLEANING:

- A. Intent: Refer to "Section 01740 - Cleaning".

END OF SECTION

SECTION 01620 - PRODUCT OPTIONS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Basis for options available for products.
 - 2. Substitutions proposals.
 - 3. Value engineering proposals.
- B. Related Sections.
 - 1. Division 1 Sections in general.
 - 2. "Section 01600 - Product Requirements".

1.02 DEFINITIONS:

- A. Substitution Proposal: A proposal offered by the Contractor of a product(s) to be used in lieu of the specified product(s); which is generically similar to the specified product(s) and its specified requirements.
- B. Value Engineering (VE) Proposal: A proposal offered by the Contractor of a product(s) to be used in lieu of the specified product(s); which is generically different than the specified product(s) and which offers a significant advantage or advantages to the Owner relative to cost, scheduling, and/or performance; without altering the original design intent in an unacceptable way to the Consultants.
- C. Products: Use of words such as "products", "materials", "assemblies", "systems", are to be used interchangeably and unless the proposal is specifically for only a single most basic (cannot be broken down any further) material unit or material component, the proposal shall mean and be measured in terms of all the materials required for each use in the Project as a final in-place assembly or system.
- D. Material Composition: Where word "material composition" is used, this word is to mean the actual scientific makeup of the product with percentage of each material or chemicals going in to make up the final product being evaluated. Material Safety Data Sheets are to be provided when available. Words such as "100% acrylic" or "100% urethane" or other words to that effect are not acceptable when the product is not in fact only made up of that material alone.
- E. Limitations: Where word "limitations" is used in conjunction with products being evaluated in proposals, this word is to mean "anything" which could reduce or be less than any quality or any characteristic of the product as

required for use in the Project at “any time” during its life expectancy, including its “life expectancy”; when compared to the specified product, when compared with other competitive generic products of the same type, and when compared with other competitive products that basically are designed for the same functional purpose. Examples include, but are not limited to, following.

1. Incompatibility with Other Materials: Where any contracting material is deleterious to the other, e.g. electrolysis, corrosion, contamination, chemical sensitivity, bacteria or plant growth (mildew or algae growth, etc.), or any other deleterious material effects.
2. Life Expectancy: Shorter life expectancy than specified materials.
3. Weatherability: Not as weatherproof as specified product, e.g., water leakage, air leakage, ultra-violet exposure, breathability, and hydrostatic pressure effects.
4. Structural: Strength of product compared with specified material, e.g. compressive, tensile, shear, bond, peel, and durometer hardness characteristics.
5. Durability: Resilience of product compared with specified material. Its ability to withstand physical abuse and movement, e.g., impact resistance, abrasion resistance, puncture resistance, and elongation.
6. Fire Resistance: Ability to resist fire exposures.
7. Product Characteristics: Susceptibility to defects occurring due to the characteristics unique to the product, e.g., sensitivities such as those due to material composition (shelf life, curing methods, etc.), configuration, weight, size, substrate conditions, weather conditions, assembly conditions, applications methods, etc.
8. Other Characteristics: E.g., slip resistance, acoustic properties, and resistance to catastrophic events, etc.

1.03 SUBMITTALS:

- A. Substitution or VE Proposals: Submit complete, readable, and organized information, with all proposal data applicable to Project highlight marked. Information to include, but not necessarily be limited to, following.
 1. Substitution/VE Proposal Form: Copy of form has been inserted in Appendix. This is to be “fully” completed and complied with.
 2. Product Data:
 - a. Published Data: Submit Primary Product Manufacturer’s complete available published product data including, but not limited to, primary product descriptions, related product descriptions, color/pattern/texture charts, specifications, drawings, laboratory tested data, fabrication/installation instructions, and list of comparable Projects in Hawaii and other similar salt air/humid environments, such as Guam, Florida, or any of the Southern States bordering the Gulf of Mexico.

3. Comparison of Products:
 - a. Requirement: Submit a detailed comparison of significant generic qualities of the proposed substitution with those of the work originally specified.
 - b. Characteristics: List significant qualities including, but not necessarily limited to, following.
 - 1) Material composition.
 - 2) Sizes.
 - 3) Weight/density.
 - 4) Color, textures, patterns available.
 - 5) Qualities critical to performances.
 - 6) Limitations of product.
 - 7) How long used in locale.
 - 8) Availability in locale, by U.S. regions, and internationally.
 - 9) Market share locally, regionally, and worldwide; based upon equivalent competitive materials.
 - c. Format: Submit in a typewritten table format in which characteristics are compared side by side.
4. Samples: Submit samples. Provide additional samples or small scale mockups, if requested, by Consultants. Samples to be submitted in accordance with "Section 01330 - Submittals Procedures".
5. Project Modifications: Where standard published drawings are not adequate, submit other drawings or legible to scale sketches to show each of following where applicable to Project.
 - a. Where Project dimensions would be affected, indicate with some typical examples how product affects Project dimensions.
 - b. Show custom modifications of product which are required for Project.
 - c. Show additional work required of other Installers which is not otherwise shown.
 - d. If any, penetrations are required through work, show how penetrations through work is to be accomplished, including any multiple penetrations.
6. Changes to Other Work: Submit a list of written changes to the work of other Installers that would be necessary to accommodate the proposal.
7. Cost Proposal:
 - a. During Bidding Period: Do not provide.
 - b. Post Bidding Period: Submit. Indicate the overall net change, if any, in the Contract Sum. Separately list cost of proposed Work, cost of changes to other Work, Contractor's cost, cost for Consultant's time (verified from Consultants) and other miscellaneous costs.
8. Certifications: Sign certifications indicated on form.
9. Format: Submit proposal form as provided in Appendix and other data requested.

1.04 QUALITY ASSURANCE:

- A. Objective: It is up to those making the proposal to prove to the Consultants that the proposed products will meet the Project requirements. To the extent that the Proposer wishes to pursue the Work, the Consultants reserve the right to request any information and samples necessary for him to make a decision.
- B. Quality of the Proposals: It is intended that the physical appearance and dimensions of the Project and the quality of the specified products required by the Contract Documents be maintained, unless otherwise specifically requested by and acceptable to Consultants. Generally, submit proposals that would result in installations of equivalent quality to that specified.
- C. Conditions for Consideration of a Proposal: The Contractor's proposal will be received and considered when extensive revisions to the Contract Documents are not required, when the proposed changes are in keeping with the primary intent of the Contract Documents, when the requests are timely, fully documented and properly submitted, and when one or more of the following conditions are satisfied.
 - 1. Where the proposal is directly related to an "or equal" or "comparable product" clause or similar language in the Contract Documents.
 - 2. Where the specified product or method cannot be provided within the Contract Time. Do not submit proposals which have resulted from the Contractor's failure to pursue the work promptly or to coordinate the various activities properly.
 - 3. Where the specified requirements cannot receive necessary approval by a governing Authority, and the requested proposal can be approved.
 - 4. Where a substantial advantage is offered by Owner, in terms of cost, time, energy conservation, or other considerations of merit, after deducting additional responsibilities may include such considerations as additional compensation to the Consultants for redesign and evaluation services, the increased cost of other work by the Owner or separate contractors, and similar considerations.
 - 5. When the specified products or methods cannot be provided in a manner which is compatible with other materials of the work, and where the Contractor certifies that the substitution will overcome the incompatibility.
 - 6. When the specified products or methods cannot be properly coordinated with other materials in the work, and where the Contractor certifies that the proposed substitution can be properly coordinated.
 - 7. When the specified products or methods cannot receive a warranty as required by the Contract Documents and where the Contractor

certifies that the proposed substitution can be given the required warranty.

- D. Factors Affecting Acceptance of Proposals:
1. Review Intent: It is intended to give all responsible proposals a fair review, however, the Consultants and Owner reserves the right to deny acceptance of any proposal for any reason. Irresponsible use of proposal process may result in termination of the review process in its entirety by Consultants and Owner.
 2. During Bidding Period: Time period allotted to Consultants for review of submittals is short. It is critical full documentation be received and that documentation complies strictly with requirements specified in "Documentation" paragraphs herein.
 3. Post Bidding Period:
 - a. Value Engineering: Only when Owner has directed Consultants that value engineering proposals be considered. Consultants will determine kinds of proposals acceptable during the review process.
 - b. Post Contract: No proposals will be considered, unless significant disadvantage to Contractor or significant advantage to Owner can be shown.
 4. Documentation:
 - a. Intent, Information Access: Competitors should be fully aware of the advantages and disadvantages of their products and of their competitor's products. Should any knowledge be lacking, each competitor should be fully capable of accessing and securing accurate information. Where this is not possible, and unless the product is proprietary, these competitors should not offer proposals for this Project.
 - b. Quality of Information in Proposal: The Consultants should be able to fully and accurately evaluate the difference between the specified product(s) and the proposed product(s) from each proposal. Do not submit proposals with only a minimum amount of information, as Consultants will base his opinion on the information in the proposal only and will not reconsider any proposal that has been "not accepted" for any reason, including one that is not adequately documented in the Consultant's opinion. It is suggested that a complete and accurate "comparison chart" accompany each proposal, unless otherwise acceptable to Consultants.
 - c. Reduction of Information Provided: When acceptable to the Consultants, the extent of the submittals may be reduced when approved by Consultants prior to the submission of each proposal. Generally, these will be for obvious products which are and fall into generic categories very familiar to the Consultants. Where the Consultants agree to reduce the amount of information to be provided, the Consultants reserves the right to expand the requirement again where the

- Consultants feels that the proposal “objective” was not achieved.
- d. Comparison of Products: In addition to the other required submittals, the “Comparison of Products” table is a key submittal to the whole proposal and is a requisite to acceptance. This submittal is not to be deleted.
 - E. As part of Work-Related Submittals: Submission of unspecified products or methods as part of “work-related” submittals does not constitute an acceptable or valid method for processing substitution or value engineering proposals. Successfully reviewed “work related” submittals does not indicate approval of unspecified products or methods.
 - F. Consultant’s Requirements: Verify prior to submission of any proposal, the Consultant’s requirements necessary to fully conform proposal to Contract requirements. Request for additional costs after acceptance of any proposals will be denied.

PART 2 - PRODUCTS

2.01 PRODUCTS THAT QUALIFY AS SUBSTITUTIONS:

- A. Commercial Usage: Same as specified product or ten (10) years minimum; under similar installation and environmental conditions specified for Project.
- B. Material Composition:
 - 1. Primary performance constituents are for all intents and purposes the same or exceed requirements with regard to chemicals and materials, their quantity, and their quality; without violating applicable patents and copyrights.
 - 2. Enhancements are acceptable; except where the enhancements become the primary reason for its performance and in such cases the product will be evaluated as a “value engineering” product.
- C. Product Construction:
 - 1. Assembly: Manufactured and assembled for all intents and purposes the same as specified product; without violating patents and copyrights.
 - 2. Size and Configuration: Similar to specified product.
- D. Performance Characteristics:
 - 1. Critical performance measures have been tested by same kind and number of tests as specified products. Critical performance measures to be those acceptable to Consultants.
 - 2. Tested performances are similar in results; as acceptable to Consultants.

- E. **Manufactured Characteristics:** Available range of manufactured characteristics, e.g., color, texture, pattern, finish, sizes, configuration, customizability, etc., are not less than the specified product or will not restrict the original design intent in any way if the product is acceptable to Consultants.
- F. **Manufacturer Support:** Not less than required for specified product, e.g., financial capability, technical support, standard and special warranties offered, etc.

2.02 PRODUCTS THAT QUALIFY AS VALUE ENGINEERING PRODUCTS:

- A. **General:** Those that do not qualify as “Substitutions”.

PART 3 - EXECUTION

3.01 PROPOSAL PROCESS:

- A. **Proposals Offered During Bidding Period:**
 - 1. **Submission:** In accordance with the “Instructions to Bidders” and its supplements.
 - 2. **Acceptable Proposals:** Consultants to send written notification to each eligible Bidder of acceptance of the proposal with copies of the accepted proposal. Eligible Bidders may incorporate the substitutions in accordance with the accepted proposal.
 - 3. **Proposals Not Accepted:** Consultants to send each proposal that are not accepted back to the Bidder who originated the proposal. Consultants to have marked the proposal “Not Accepted”. Bidder may resubmit proposal, where specified time period allowed for review of proposals is not exceeded and where resubmission is acceptable to Consultants. Refer to Consultant’s “Comments” for additional requirements suggested for compliance, if any.
- B. **Post Bidding Period Proposals:**
 - 1. **Submission:** As directed by Consultants.
 - 2. **Acceptable Proposals:**
 - a. **Preliminary Acceptance:** Where marked “Acceptable, Preliminary” on form, indicates that further information may be required before a decision is made. Comply with “Comments” on form and where not indicated a complete proposal conforming to new requirements. Adjust costs is required. Use of proposed products are not allowed until “Acceptable, Final” is marked on the proposal.
 - b. **Final Acceptance:** Where marked “Acceptable, Final” on form, indicate acceptance of proposals and may become basis of Contract upon execution of forms required changes in Work.

3. Proposals Not Accepted: Where marked “Not Accepted”, resubmission may be allowed when Consultants indicate “Resubmission Acceptable” and resubmission will be denied when Consultants indicates “Resubmission Denied” on form. Where remarks are indicated under “Comments”, comply with any further requests which may be indicated.

3.02 INCORPORATION:

- A. Incorporation of Proposals: Coordinate work with other affected Installers of other Work. Comply in strict accordance with accepted proposal, which should be in strict conformance Product Manufacturer’s Project specific requirements.

END OF SECTION

SECTION 01735 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Cutting and patching requirements.
- B. Related Sections:
 - 1. Division 1 Sections.
 - 2. "Section 01450 - Quality Control".

1.02 DEFINITIONS:

- A. "Cutting and Patching": The phrase as used herein is defined as follows.
 - 1. Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required restoring surface to their original condition.
 - 2. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.
 - 3. Cutting and patching performed during the manufacture of products, or during the install fasteners and similar operations are also not considered to be "cutting and patching".
 - 4. "Demolition" is recognized as related but separate category of work, which may or may not require cutting and patching as defined in this Section. Cutting and patching work required by demolition to comply with requirements of this Specification Section.

1.03 SUBMITTALS:

- A. Product Data: Submit Product Data on materials to be used in for patching work.
- B. Quality Assurance Submittals: Refer to "Quality Assurance" paragraph herein.

1.04 QUALITY ASSURANCE:

- A. Scheduled Methods: Submit methods for cutting and patching of work prior to execution of any cutting and patching work.
- B. Alternate Methods: Consultants will entertain alternate methods where accomplishing original intent of cutting and patching work. Submit

recommended methods for review. Do not institute alternate methods, unless successful review is secured from Consultants.

- C. Structural Work:
 - 1. General: Do not cut and patch any work in a manner that would result in a reduction of its load-carrying capacity or of its load-deflection ratio.
 - 2. Reinforced Concrete Structures: Do not damage any reinforcing components part of reinforced concrete structures, by drilling, coring, cutting, or other similar operations; including, but not limited for, penetrations, expansion bolts, dowels, etc. Locate reinforcing components with pachometer or other reliable detecting device prior to initiating any potentially damaging operations. Where existing reinforcing components prevent work to be accomplished, notify and secure direction from Consultants prior to conducting any operation.

- D. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life, or decreased safety.

- E. Matching of Exposed-to-View Surfaces:
 - 1. Intent: Cutting and patching work not evident in exposed, final finished, in-place work.
 - 2. Approvals: Consultants to approve following conditions, prior to execution of cutting and patching work.
 - a. Work scheduled with other concealing type finishes, cannot be fully concealed after final finishes are applied, e.g. telegraphing through paint coatings.
 - b. Work not scheduled with any concealing finishes cannot be blended in manner with existing surfaces so that patching is not readily evident to Consultants.
 - 3. Mockups: Consultants approval to be achieved by mockup in existing work in areas selected by Consultants.

- F. Concealed Surfaces: Concealed work may be less rigorous in finishing and final appearance but should be finished flush with adjacent surface with some attempt to smoothly transition the patching materials with adjacent surface.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. General: Except as otherwise indicated or as directed by the Consultants, use materials for patching that are identical in appearance to

existing materials (unless otherwise acceptable to Consultants), result in equal or better performance characteristics than material being patched, and attain bond strengths acceptable to Consultants.

PART 3 - EXECUTION

3.01 PERFORMANCE:

- A. Personnel: Employ skilled workmen to perform cutting and patching work.
- B. Cutting: Cut the work using least destructive but effective methods. In general, it is intended that finish cut surfaces to be clean, straight, and smooth. Method of cutting should minimize damage to adjacent finished surfaces.
- C. Patching: Patch and blend work with adjacent surfaces to obscure evidence of work to greatest extent possible by methods approved by Consultants.

END OF SECTION

SECTION 01740 - CLEANING

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Cleaning during construction.
 - 2. Final Project cleaning.
 - 3. Waste control.
- B. Related Sections.
 - 1. Division 1 Sections in general.
 - 2. "Section 01500 - Temporary Facilities and Quality Controls".

1.02 DEFINITIONS:

- A. Clean:
 - 1. Relative to Installed Products: Products cleaned in accordance with Manufacturer's recommended procedures, cleaning agents and equipment to remove trash, dust, dirt, stains, and mars from product and adjacent surfaces and areas. Polishing materials are included for materials typically polished.
 - 2. Relative to General Construction Trash and Debris: Verify intent form Owner's Construction Manager and include impacts in Bid.

1.03 SUBMITTALS:

- A. Product Data: If specified or requested by Consultants, submit cleaning data.
- B. Closeout Submittals: Refer to "Maintenance" paragraphs herein.

1.04 QUALITY ASSURANCE:

- A. Trash Removal: Refer to "Section 01500 - Temporary Facilities and Quality Controls".
- B. General Construction Trash and Debris:
 - 1. Responsibility: Contractor is responsible for informing all Entities prior to signing Contract for the Work, the expected level of cleanliness expected by the Construction Manager.
 - 2. Warning Notices: If required, no more than three written warning notices will be issued by Construction Manager for removal of ignored trash and debris; depending upon degree of non-compliance, potential hazard to Project, and severity of non-complying conditions, e.g. odors, quantities, appearance, etc. When

reasonable written warning notices are unheeded, Owner at his discretion may remove any trash and debris for which reasonable written warnings have been given and costs for removal deducted from Contractor's payments.

1.05 MAINTENANCE:

- A. Maintenance Instructions: For primary materials in each Specification Section 2-16, submit each Manufacturer's standard published maintenance instructions, whether specified or not. Instructions to include recommended material, equipment, schedules, and procedures.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. General: Use only cleaning materials, methods, and equipment recommended by the Manufacturer of the product to be cleaned; specifically for types of cleaning required. Materials utilized should not be detrimental to the original characteristics of the cleaned product.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION:

- A. Premises: Clean premises daily.
- B. Surfaces, General: Responsible parties to clean surfaces contaminated by them. Remove as quickly as needed to prevent permanent damage and to prevent any deterioration to surfaces. Seek written approval of methods for removal of contaminants from surfaces installed by others.
- C. Existing Work: When work operations involves working with existing work, clean exposed, semi-exposed, and concealed components of dirt, marks, stains, etc., without damage and deterioration to such surfaces.
- D. Construction Trash and Debris: Remove trash offsite daily to prevent obstructions and hazard, e.g., fire hazards, and as required to keep the Project reasonably clean and neat in appearance.
- E. Hazardous Materials: Use in manner approved by Authorities. When not in use, contain in proper containers. Dispose of waste off Site in lawful manner.

3.02 AT TIME OF SUBSTANTIAL COMPLETION:

- A. Schedule cleaning so that work can be inspected in clean condition at all scheduled inspections.

3.03 AT TIME OF FINAL INSPECTION:

- A. Comply with same requirements of "Substantial Completion" Inspection.

END OF SECTION

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Administration requirements for Contract Closeout.
- B. Related Sections.
 - 1. Division 1 Sections, general.
 - 2. "Section 01740 - Cleaning".
 - 3. "Section 01785 - Project Record Documents".
 - 4. "Section 01820 - Demonstration and Training".

1.02 SUBMITTALS:

- A. At Time of Request for Substantial Completion Inspection:
 - 1. Request for Inspection.
 - 2. Application for Payment.
 - 3. Lien waivers.
 - 4. List of incomplete Work.
 - 5. Final adjustment of accounts for change orders.
 - 6. Insurance change-over requirements.
 - 7. Final Authority releases for full use of project.
 - 8. Project Record Documents for review.
 - 9. Owner paid for additional materials and equipment.
- B. After Substantial Completion Inspection.
 - 1. Punch list, if any.
- C. At Time of Request for Final Inspection:
 - 1. Request for Final Inspection.
 - 2. Final Application for Payment.
 - 3. Consent of Surety for Final Payment: AIA Document G707.
 - 4. Final lien releases.
 - 5. Substantial Completion Punch List: Indicate 100% completion.
 - 6. Completed Project Record Documents.
- D. Other: Refer to each Specification Section.

1.03 QUALITY ASSURANCE:

- A. Number of Consultant's Inspections.
 - 1. Number: Consultants has scheduled only two (2) inspections each for Substantial Completion and Final Completion. Re-inspections

- beyond the scheduled inspections are considered additional inspections.
2. Cost for Additional Inspections: Pay for Consultant's reasonable cost including, but not necessarily limited to, Consultant's personal time at current billing rates, costs for transportation and lodging, if required, and meals.
- B. Punch List Records: Contractor to record and submit written record to Consultants. Revise as requested by Consultants.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PREPARATION-SYSTEMS TESTING:

- A. Owner Instruction: Complete systems testing and complete instructions of Owner's designated representatives prior to request for Substantial Completion inspection.
- B. Special Requirement-Video Taped Sessions: Refer to "Section 01820 - Demonstration and Training".

3.02 INSPECTIONS REQUIRED:

- A. Substantial Completion Inspection.
- B. Final Completion Inspection.

3.03 GENERAL INSPECTION PROCEDURE:

- A. Conduct inspection after successful completion of submissions and its acceptance by Consultants.
- B. Contractor to record punch list items, if any.
- C. Consultants to certify successful inspection or schedule additional inspections.

3.04 ADDITIONAL INSPECTIONS:

- A. The Work: Completion of outstanding work is to be completed expeditiously by Contractor without interruption and will full forces. Submit schedule of completion of each work.

- B. Procedure: Re-conduct inspections in accordance with “general procedure”; until successful review by Consultants achieved.

END OF SECTION

SECTION 01785 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Requirements for Project Record Documents.
- B. Related Sections.
 - 1. Division 1 Sections in general.
 - 2. "Section 01770 - Closeout Procedures".

1.02 DEFINITIONS:

- A. Record Documents: Contractor produced documents representing an accurate recording of the Work provided during the Contract Period; including work that varied from that indicated in the original Contract Documents. Documents include Record Contract Drawings, Record Contract Project Manuals, Record Support Data, and Operation & Maintenance Manuals.
- B. Record Contract Drawings: The primary blueprint Contract set of Drawings used to construct the Project and to which drawn changed information is recorded.
- C. Record Contract Project Manuals: The primary Project Manuals used to construct the Project and containing the specifications and other related written Contract data to which changed written information is recorded.
- D. Record Support Data: Consultants approved, drawn written, published Manufacturer's data and Shop Drawings, which are allowed for use as Record Documents; when standard recording methods can be shown not too be effective or not possible.
- E. Operation & Maintenance Manuals: Organized manuals containing following primary data:
 - 1. Historical data as specified herein.
 - 2. Manufacturer's published Product and related data of all primary products from each Specification Section; including warranties.
 - 3. Operation and maintenance data required for mechanical and electrical work
- F. As-Built Documents: Contractor produced Drawings, required during course of the Work, representing an accurate recording of built structures, and used where Contractor requires clarification with regard to Consultant's intent for subsequent work affecting the drawn conditions.

This is not the “historical” definition of this word and should not be construed as such.

1.03 SUBMITTALS:

- A. Record Documents:
 - 1. Record Contract Drawings: One (1) bound record set.
 - 2. Record Project Manuals: One (1) bound record set.
 - 3. Support Data: One (1) bound record set, if any.
 - 4. Operation & Maintenance Manuals: One (1) bound record set.
 - 5. Other:
 - a. Record progress photos as specified in “Section 01310 - Project Management and Coordination”.
 - b. Final site survey as specified in Division 1.
 - c. Audio-video recording of Owner instruction as specified in “Section 01820 - Demonstration and Training”.
- B. As-Built Documents: One (1) set; each time required.

1.04 QUALITY ASSURANCE:

- A. Record Updating:
 - 1. Up-to-Date Records: Maintain up-to-date documents, Record data within five (5) working days after installation of each specific portion of Work requiring recording, except no record data to be recorded after concealment of each work.
 - 2. Out-of-Date Records: If the Records are not being kept reasonably up to date, the Consultants may withhold payment requests until Record Documents are satisfactorily updated.
- B. Operation & Maintenance Manuals: Organization and included materials to be approved by Consultants.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 RECORD DOCUMENTS - GENERAL:

- A. Maintenance of Documents: Maintain documents in clean, dry and undamaged condition. Use documents only as necessary to record required information. Do not use as working Construction Documents.
- B. Availability: Make documents available to the Consultants upon request.
- C. Time of Submission: Refer to “Section 01770 - Closeout Procedures”.

- D. Labeling:
 - 1. Stamp: Secure rubber stamp with words, "RECORD DOCUMENTS", in bold capital letters, approximately 1" high.
 - 2. Document Stamping: Stamp document in permanent red ink as follows.
 - a. Contract Drawings: Each page.
 - b. Manual Inserted Book Bound Information: Front cover.
 - c. Manual Inserted Stapled and Inserted Individual Pages: Each page.

3.02 RECORD DOCUMENTS - RECORD CONTRACT DRAWINGS, RECORD CONTRACT PROJECT MANUALS, & RECORD SUPPORTING DOCUMENTS:

- A. Information Required for Record Drawings and Project Manuals:
 - 1. General: Record installed work ("field conditions") which varies significantly from the work as originally indicated on Contract Document. Record concealed work which is referenced to exposed-to-view features.
 - 2. Contract Drawings: Record data to scale to clean set of blueprints; dedicated only for record purposes and not for any other purpose.
 - 3. Specification of Project Manual: Record changes to specifications as a result of actual installations.
- B. Record Supporting Documents:
 - 1. Option: Changes may be recorded to other documents only where the intended record date cannot be adequately recorded on Record Drawings or Record Project manual and if a supporting document significantly indicates the required information more clearly than the Drawing or Project Manual.
 - 2. Restriction: Minimize use of such documents and where used, such documents shall be acceptable to the Consultants, prior to its use.
 - 3. Recording Information: Reference such documents appropriately to the Drawing and Specifications. Draw and note changes where different than original drawn information. Such documents shall be compiled into logically organized and bound sets; in manner approved by Consultants.
- C. Method of Recording: Legibly mark with erasable red pencils or other contrasting colored pencils when more than one color may more clearly delineate the recorded information. Where to Contract Drawings, record information to same scale as drawings.

3.03 RECORD DOCUMENTS - OPERATING & MAINTENANCE MANUALS:

- A. Format - General:
1. Binders: Assemble data in hard covered 3 ring, D-ring, binders with clear plastic pockets at front, back, & spine. Provide number of binders as required for each set to comfortably house enclosed data.
 2. Cover Sheet: Insert cover sheet, for front and spine, with Project and other information as required by Consultants. Data to be computer generated text and graphics. Where more than one volume submitted, indicate "volume of volumes" applicable to each volume in set provided.
 3. Indexed Data: Index groups of related data. Provide type written identification on each index tab.
 4. Electronic format: Provide reproducible, non-secured Portable Document Format (PDF).
- B. Format - Data Groups: Group data in following broad categories and order. Data within each group to be also logically organized; as acceptable to Consultants.
1. Table of Contents: Detailed listing of contents of each manual.
 2. Contractor's Project Warranty: Original executed warranty, warranting all year from date certified for Substantial Completion.
 3. Contractor Document List:
 - a. List of all Record Drawings.
 - b. List of Sections in Record Project Manual.
 - c. List of Supporting Record Data, if any.
 4. Permits: Signed copies of Authority required permits.
 5. Division 2 - 16 Specification Sections: For each Project Manual listed Specification Section, included following in manuals.
 - a. Intent: Provided information on primary installed products of each information that Owner knows exactly which materials were installed in the Project.
 - b. Entity Documentation: List the Manufacturer, Installer, and Supplier Company Name, Project contact, full address, phone/fax/e-mail number.
 - c. Product Data: Primary published date. All need not be provided.
 - d. Maintenance Data: Manufacturer's standard published data on cleaning materials, recommended equipment, restrictions, etc., as typically published by Manufacturer for each product.
 - e. Standard Warrantees: Insert all standard warrantees available from each Manufacturer; applicable to each product. Execute in behalf of Owner, if execution required by Manufacturer. Submit executed warrantees.
 - f. Special Warrantees: Insert executed, special warrantees, when required for each product.

- g. User Manuals: If any, for product, insert with related literature for product.
- h. Life Safety, Tested, Engineer Requirements: Include for each product, data affecting regulatory life safety issues, e.g. fire and structural performances, and any regulatory and specified testing and engineering required for performances.
- i. Mechanical, Electrical, Electronic Equipment: Insert Services Centers, Maintenance Contracts, user manuals, diagrams, spare parts listing, resting-balancing-adjustment report, final meter readings, start up performance reports, etc., as specified and as

3.04 AS-BUILT DOCUMENTS:

- A. Submittal: Under the conditions related to in the “Quality Assurance” paragraphs herein, submit Drawings; in a legible format, showing the existing conditions that would impact the work as drawn in the Contract Documents. The Drawings shall be in AutoCAD format, unless noted. All drawings shall be clean, neat, and legible with the dimensional information provided and the depiction shown can be correlated with the drawn information in the Contract Documents.
- B. Execution: The Consultants will issue such changes as necessary to conform the Work to his original intent and the Contractor shall proceed in accordance with the requirements indicated.

END OF SECTION

SECTION 01820 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Administration requirements for demonstration and training.
- B. Related Sections.
 - 1. Division 1 Sections, general.
 - 2. "Section 01770 - Closeout Procedures".

1.02 SUBMITTALS:

- A. Training Materials: Submit appropriate materials for following.
 - 1. For each Owner's participant.
 - 2. Dedicated set of materials as part of Closeout submittals.
- B. Closeout Submittals:
 - 1. General: Refer to "Section 01785 - Project Record Documents".
 - 2. System Manuals: Submit number in accordance with individual Specification Sections, but not less than two (2) complete hard copy set of published manuals and other published documents.
 - 3. DVD Disks and USB: Submit two (2) sets of DVD disks and USB flash drive with electronic PDF and MP4 video files required for manufacturer's demonstration and training session.

1.03 QUALITY ASSURANCE:

- A. Audio-Video Recording: Audio-video recording is not required for all Owner instruction, but is required for all primary product systems; including following.
 - 1. Mechanical related systems.
 - 2. Any system that is software monitored or driven.
 - 3. Other as may be specified.
- B. Training Instructors: Manufacturer's instructors to be technically trained and totally familiar with all aspects of each specific Project product or system for which training required.
- C. Classrooms: Where proper training and instruction is specified or required to be performed in classroom type facilities by Manufacturer, comply with following.
 - 1. Availability of Facilities:
 - a. Owner's Facilities: Verify availability and suitability of Owner's facilities; prior to Bid.

2. Provide the following, at a minimum.
 - a. Equipment: If not available at the Facility, bring in or rent appropriate equipment, e.g., audio and video equipment, projection screens, marker boards, etc.
 - b. Training Materials: As required for proper instruction of participants, e.g. usual published training handouts, training videos, writing pads, pens, etc.
- D. Training Period:
 1. Length of Training: As specified; where not specified, verify prior to Bid and include impacts in Bid; otherwise adequacy of training period to be determined by Engineer based on Owner satisfaction and at no additional cost to Owner.
 2. Training Times: Arrange at Owner's convenience.
- E. Recording Conditions:
 1. Manufacturer's standard prerecorded training video tapes or other video formats may be an option to field video recording of instruction; when it can be shown that video instruction is specific to Owner's system and of acceptable quality to Owner. Approval to be in writing.
 2. Regardless of Owner's decision, available prerecorded training video materials are to be submitted as part of Closeout Documents.

PART 2 - PRODUCTS

2.01 EQUIPMENT:

- A. Video Recording Equipment:
 1. Primary Recorder: DVD Camcorder; with following minimum capabilities.
 - a. Resolution: 640 x 480 minimum; digital video.
 - b. Image Format: Color; JPEG minimum.
 - c. Zoom: 10X minimum.
 - d. Audio: Dolby digital; with noise reduction technology.
- B. DVD Disks: DVD-R disks.
- C. Accessories: Following is optional; unless required by Manufacturer or required to ensure quality of recording session.
 1. Tripod.
 2. Camcorder mounted lighting.
 3. Wireless microphones.
 4. Additional independent lighting.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. General: Ensure all conditions for instruction and audio-video recording are ready.

3.02 INSTRUCTION-GENERAL:

- A. Training Materials: Handout appropriate training materials before instruction begins.
- B. Lessons: Ensure that each participant adequately understands instructions being given. Confirm learning of participants by either or both tests and hands on demonstration of their abilities.
- C. Breaks: Instruction to include adequate breaks to allow participants a break from ongoing instruction.
- D. Question and Answer Period: Allow during instruction; when not considered disruptive to instruction and conclude at end of each instruction session to ensure than any outstanding questions can be answered.

3.03 PROJECT CLOSEOUT:

- A. Submittals: Submit required documents as part of Closeout submittals.

3.04 FOLLOW UP:

- A. Manufacturer Availability: After conclusion of each training, each Manufacturer's Technical and Local Representatives to be readily available to help Owner's personnel; until satisfactory understanding of operation of each system is attained.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15000 - GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS:

- A. As specified in Division 1 - GENERAL REQUIREMENTS of this specifications.
- B. These General Mechanical Requirements govern work specified under all sections of "Division 15 - Mechanical".

1.02 GENERAL REQUIREMENTS:

- A. The Contractor shall furnish all labor, materials, tools and equipment and perform all work and services necessary for a complete and properly operating mechanical work, equipment and systems, as shown in drawings and as specified in accordance with provisions of the Contract Documents and completely coordinated with work of all other trades.
- B. The Contractor shall completely examine the Contract Documents and shall report to Leahi Hospital any error, inconsistency or omission he discovers prior to submitting a bid.
- C. Furnish and install all supplementary or miscellaneous items, details, appurtenances and devices incidental to or necessary for a sound, secure and complete mechanical system where work required is not specifically indicated.
- D. Drawings and specifications shall be taken together. Provide work specified and not indicated or work indicated and not specified as though mentioned in both.
- E. The Contractor shall warrant that all materials and equipment furnished under this Contract will be new and that all work will be good quality, free from faults and defects and in conformance with Contract Documents for a guaranteed period of one year.
- F. The Contractor shall maintain at the site one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other modifications in good order and marked to record all changes made during construction. These shall be made available to the Engineer at all times.
- G. The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the work, he shall remove all his waste materials and

rubbish from and about the project as well as all his tools, construction equipment, machinery and surplus materials and shall clean all new equipment and accessories.

- H. The Contractor shall give Leahi Hospital timely notice of its readiness for testing any work including the data arranged so that the Engineer may observe such testing. The Contractor shall bear all cost of such tests.

1.03 SUBMITTALS:

- A. Submit shop drawings, manufacturers' data and certificates for equipment, materials, finish and pertinent details for each system and have them approved before procurement, fabrication or delivery of the items to the job site. Partial submittals will not be acceptable and will be returned without review. Partial submittal for long lead equipment shall be accepted prior to complete submittal. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable industry and technical society publication references and other information necessary to establish contract compliance of each item the Contractor proposes to furnish.
- B. Shop Drawings: Drawings shall be 22 inches by 34 inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, accessories, piping and other items that must be shown to assure a coordinated installation. Drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted.

The Contractor shall review, stamp with his approval and submit, all Shop Drawings required by the Contract Documents or subsequently by Leahi Hospital as covered by modifications. At the time of submission, the Contractor shall inform Leahi Hospital in writing of any deviation in the Shop Drawings from the requirements of the Contract Documents. By approving and submitting Shop Drawings, the Contractor certifies that he has determined and verified all field measurements and obstructions, field construction criteria, materials, catalog numbers and similar data, that he has checked and coordinated each Shop Drawing with the requirements of the work and of the Contract Documents and that all equipment fits within designated spaces.

- C. Manufacturers' Data: Submittals for each manufactured item shall be manufacturers' descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves and catalog cuts. Submittals shall include equipment certification terms and conditions, applicable self-diagnostic testing and start-up procedures.

Equipment submittals shall specifically indicate the specified equipment assembly configurations with all specified standard and optional features, above and beyond general catalog products technical literature.

- D. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA) and Underwriters Laboratories (UL), American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) proof of such conformance shall be submitted to Leahi Hospital for approval. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable test and is approved by Leahi Hospital. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for approval. The certificate shall identify the manufacturer, the product and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.
- E. Certified Test Reports: Before delivery of materials and equipment, certified copies of all test reports specified in the individual section shall be submitted for approval. Furthermore, submit a written certificate, dated and signed by an authorized corporate officer of the Contractor who is either a full-time employee, principal, or a full-time partner delegated with the authority to bind the Contractor in all matters relating to its professional work of the Contractor, evidencing the performance of any portion of the work, or any testing; as a condition precedent to the acceptance of any work or the result of any test. Corporate credentials shall be furnished concurrently with applicable written certificates. Whenever a regulatory agency performs inspections or tests of any portion of the work, a written certificate shall be furnished by the Contractor to validate the results from the respective inspection test.
- F. Certificates of Conformance or Compliance: Submit all certificates applicable to all specified equipment assemblies and parts for the Engineer's approval prior to equipment delivery and commencement of equipment on-site installation. A certification from the manufacturer attesting that materials and equipment to be furnished for this project complies with the requirements of this specification and of the referenced publications. Preprinted certifications will not be acceptable; certifications shall be in the original. The certification shall not contain statements that

could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and result as materials formulated in accordance with the referenced publication," "equal or exceed the service and performance of the specified material." The certification shall simply state that the product conforms to the requirements specified. Furthermore, submit a written certificate, dated and signed by an authorized corporate officer of the Contractor who is either a full-time employee, principal, or a full-time partner delegated with the authority to bind the Contractor in all matters relating to its professional work of the Contractor, evidencing the performance of any portion of the work, or any testing; as a condition precedent to the acceptance of any work or the result of any test. Corporate credentials shall be furnished concurrently with applicable written certificates. Whenever a regulatory agency performs inspections or tests of any portion of the work, a written certificate shall be furnished by the Contractor to validate the results from the respective inspection test.

- G. **Manufacturers' Certified Full Standard Product Warranty:** Submit the manufacturer's certified Full Standard Product Warranty terms and conditions applicable to all specified equipment assemblies and parts for the Engineer's approval prior to equipment delivery and commencement of equipment on-site installation, as approved by the Engineer. All manufacturers' Full Standard Product Warranty certificates are to be provided to Leahi Hospital at the time of equipment delivery and prior to the commencement of equipment on-site installation.

Warranty shall cover all costs for parts, labor, associated travel, and expenses for a period of one year from project acceptance.

- H. **Operation and Maintenance Manuals:** Submit manuals on all equipment and the overall system upon successful completion of equipment on-site installation and start-up and prior to final inspection, as approved by the Engineer.
- I. **Manufacturers' factory trained and certified service personnel:** Prior to the equipment on-site installation, submit to Leahi Hospital documentation as evidence of the respective manufacturers' certification of all personnel responsible for installation, testing, and start-up of the equipment.

1.04 **FIELD POSTED AS-BUILT DRAWINGS:**

- A. Maintain and submit for all work as specified in "Section 01019 - General Project Requirements".

1.05 **LAWS, REGULATIONS AND CODES:**

- A. All work shall be in accordance with government laws, ordinances, rules and regulations and orders.

- B. The following shall govern where applicable; the International Building code, 2018 as amended by City and County of Honolulu, International Energy Conservation Code, 2018 as amended by the City and County of Honolulu, Uniform Plumbing Code, 2018 with local amendments, Uniform Fire code, NFPA 1 2018 with local amendments, Department of Health, Hawaii Administrative Rules, Title 11, Chapter 39, Air Conditioning and Ventilation, OSHA, and all other codes and standards referenced in these specifications. Where requirements differ in these codes and standards, the more stringent shall apply.

1.06 TRADE NAME:

- A. Mentioning of a trade name in the plans and specifications indicates that the manufacturer is acceptable to Leahi Hospital. However, certain specified construction and details may not be regularly included in the manufacturer's catalogued product. The Mechanical Contractor shall provide the material or equipment complete as specified.

1.07 PERMITS AND INSPECTIONS:

- A. Applications for permits will be done by Leahi Hospital. The Mechanical Contractor shall pay for all necessary permits and fees.
- B. The Mechanical Contractor shall apply and pay for all necessary inspections required by any public authority having jurisdiction.

1.08 DISCREPANCIES:

- A. The Drawings and Specifications are intended to be cooperative. Any materials, equipment or system related to this section and exhibited on the Electrical or Mechanical Drawings but not mentioned in the Specifications are to be executed to the intent and meaning thereof, as if it were both mentioned in the Specifications and set forth on the Drawings.
- B. In case of differences between the Drawings and Specifications, the Specifications shall govern first, and then the Drawings. Large scale details shall take precedence over small scale Drawings as to the shape and details of construction. Specifications shall govern as to materials.
- C. Drawings and Specifications are intended to be fully cooperative and to agree, but should any discrepancy or apparent difference occur between Drawings and Specifications or should error occur in the work of others affecting the work, the Contractors shall notify the Engineer at once. If the Contractor proceeds with the work affected without instructions from Leahi Hospital, he shall make good any resultant damage or defect. All interpretations of Drawings and specifications shall be clarified by Leahi Hospital.

1.09 WORKMANSHIP AND MATERIALS:

- A. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. The Contractor shall furnish the services of an experienced superintendent, who will be constantly in charge of the erection of the work, until completed and accepted.
- B. Unless otherwise hereinafter specified, each article of its kind shall be the standard product of a single manufacturer.
- C. Whenever the words "or approved equal" or other words of similar intent or meaning are used, implying that judgment is to be exercised, it is understood that it is the judgment of the Engineer that is referred to.
- D. The Engineer shall have the right to accept or reject material, equipment and/or workmanship and determine when the Contractor has complied with the requirements herein specified.
- E. All manufactured materials shall be delivered and stored in their original containers. Equipment shall be clearly marked or stamped with the manufacturer's name and rating. Equipment and materials shall be carefully handled, properly stored and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Engineer. Damaged or defective items, in the opinion of the Engineer, shall be replaced.
- F. Reference to standards are intended to be the latest revision of the standard specified.

1.10 MANUFACTURER'S RECOMMENDATIONS:

- A. Equipment installed under this Division of the Specifications shall be installed according to manufacturer's recommendations, unless otherwise shown on the drawings or herein specified. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Engineer, prior to the installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can cause rejection of the material.

1.11 INSPECTION OF SITE:

- A. This Contractor shall visit the site and examine the conditions affecting his work before submitting his proposal. The submission of the proposal shall be considered evidence that the Contractor has visited the site and no extra payments will be allowed to the Contractor on account of extra work made necessary by his failure to visit the site. If there are any questions or discrepancies in the design, the Contractor shall bring it to the attention of the Engineer before submitting his proposal.

1.12 CONTINUITY OF SERVICES, PHASING:

- A. Examine site and become familiar with existing local conditions affecting work.
- B. Examine all Drawings and Specifications (i.e. work from other trades) and become familiar with the types and systems of construction to be used. Determine how such types and systems will affect the installation of mechanical work.
- C. Investigate, determine and verify locations of any overhead utilities on or near the site. Determine such locations in conjunction with all public and private utility companies and with all authorities having jurisdiction.

1.13 OPENINGS, CUTTING AND REPAIRING:

- A. The Mechanical Contractor shall cooperate with the work to be done under other sections in providing information as to openings required in walls and slabs for all piping including sleeves where required.
- B. Any drilling or cutting required for the performance of work under this Section shall be the responsibility of this Contractor and the cost shall be borne by him.
- C. Holes in Concrete: The Mechanical Contractor shall pay all costs for cutting holes. All holes through existing concrete shall be either core drilled or saw cut. All holes required shall have the approval of the Engineer prior to cutting and drilling.
- D. It shall be the responsibility of this Contractor to ascertain that all openings are properly located.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. As specified in all sections of "Division 15 - Mechanical".

- B. Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be the manufacturer's latest design that complies with the specifications requirements. Materials and equipment shall be duplicate items that have been in satisfactory commercial or industrial use at least 2 years prior to bid opening. Where 2 or more items of the same class of equipment are required these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate.
- C. The mechanical contractor shall provide all necessary options and/or accessories to comply with the applicable equipment specification requirements. Installation of the options and/or accessories shall be in accordance with the manufacturer's requirements and the complete assembly shall be warranted by the respective equipment manufacturer.
- D. The Mechanical contractor shall provide certified manufacturer's representatives and/or service technicians for any field modification to mechanical equipment. The Contractor shall ensure that any modification to the equipment will not invalidate the manufacturer's warranty.

2.02 SUBSTITUTIONS:

- A. The materials, products, and equipment described in these specifications establish a standard of required function, quality, dimension, capacity, performance and appearance to be met by any proposed substitution.
- B. Specific product listings in these specifications shall not preclude alternative product selections of equivalent or superior quality. Contractor may make reasonable substitutions, provided that these are submitted to the Engineer for acceptance in accordance with the SPECIAL PROVISIONS and the INTERIM GENERAL CONDITIONS. The Contractor shall be responsible for design changes to accommodate the substituted product, at no additional cost to the State.

PART 3 - EXECUTION

3.01 INSTALLATION AND WORKMANSHIP:

- A. Provide competent and qualified manufacturer's factory trained and certified field service personnel on-site to be responsible for execution of all diagnostic testing in accordance with equipment manufacturer's installation and start-up certification requirements and warranty terms and conditions. Perform work using adequate numbers of personnel skilled in the appropriate trades, and provide adequate supervision and management of the work.

- B. All workmanship shall be of the highest standard. The piping systems shall be laid out to ensure a neat, systematic and orderly arrangement of all work. Vertical piping lines shall be plumb and lines that are grouped shall be parallel and as direct as possible. Exposed pipe where indicated, shall be run parallel with walls.

3.02 PROTECTION OF MATERIALS AND EQUIPMENT:

- A. Pipe openings shall be closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water, and chemical or mechanical injury. Upon completion of all work, the fixtures, materials, and equipment shall be thoroughly cleaned, repainted as required, adjusted, and operated.

3.03 CUTTING AND PATCHING:

- A. The Contractor shall arrange for all cutting, fitting, and patching necessary to accommodate the plumbing work as the job progresses and such cutting and patching shall be done by that trade experienced in the particular type of work required.

3.04 PIPING IDENTIFICATION:

- A. Identification of all new pipe lines shall be by means of colored, waterproof, all temperature, self-adhering labels, and directional arrow.
- B. All exposed pipes, whether insulated or not shall be identified. Labels may be omitted from piping where the use is obvious, due to its connection to equipment and where the appearance would be objectionable in finished rooms, as approved by direction.
- C. Identification labels shall be placed as follows:
 1. Near each valve and branch connection.
 2. Wherever piping merges or disappears from view from the floor of the room in which it is installed.
 3. Labels shall not be more than 50 feet apart.

3.05 EQUIPMENT IDENTIFICATION:

- A. Identify all equipment with symbol and service conforming to that indicated on the drawings. Identification shall be on 1-1/4 inch by 3 inch laminated plastic nameplates securely fastened to the equipment. Leave manufacturer's nameplate clean, legible, and unpainted.

3.06 COORDINATION OF WORK AS SPECIFIED IN OTHER SECTIONS:

- A. The Mechanical Contractor is responsible for coordination with the General Contractor to assure proper layout, size, and location of mechanical equipment. Mechanical Contractor shall ensure that power and control wiring are provided and installed.

3.07 INSPECTIONS:

- A. All work and materials are subject to field observation at any and all times by the Engineer.
- B. Contractor shall notify the Engineer a minimum of 2 days prior to testing any piping which must be witnessed and approved before they are covered up or enclosed. Should the Contractor fail to notify the Engineer at the times prescribed, it shall then be the Contractor's responsibility to make accessible any concealed lines, or demonstrate the acceptability of any part of the system. Any extra cost caused by the removal of such work shall be borne by the Contractor.
- C. If observer finds any material or work not conforming to these Specifications, Contractor within 3 days of being notified shall remove said materials from the premises and replace with approved material, at no cost to Leahi Hospital.

3.08 OPERATIONAL ACCEPTANCE TESTS:

- A. The Mechanical Contractor shall perform all tests of the installed work and shall provide all services, labor, equipment, materials and instruments needed for the tests. During pressure tests all items in the system to be tested, not designed for test pressures, shall be removed or isolated from the system and shall be reconnected or unblocked after tests are completed. Should operating tests require the presence of manufacturers' representatives, the Mechanical Contractor shall cooperate with them and shall place at their disposal all assistance, materials and services required to perform such test. The Mechanical Contractor shall certify in writing that all work has passed all required tests and shall complete the attached Operational Performance Tests form.

3.09 POSTED OPERATING INSTRUCTION:

- A. Furnish approved operating instructions for each principal item of equipment for the use of the operation and maintenance personnel. Operating instruction shall be printed or engraved and shall be framed under glass or in approved laminated plastic and posted where directed by the Engineer. Operating instructions shall be attached to or posted adjacent to each principal item of equipment including start up, procedure in the event of equipment failure and other items of instruction as recommended by the manufacturer of each item of equipment. Operating

instructions exposed to the weather shall be made of weather-resistant materials or shall be suitably enclosed and weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

3.10 INSTRUCTION TO LEAHI HOSPITAL PERSONNEL:

- A. The Contractor shall furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation and maintenance, including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work.

Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to Leahi Hospital for regular operation. The number of man-days (8 hours) of instruction furnished shall be as specified in other sections. When more than 4 man-days of instruction are specified, approximately half of the time shall be used for classroom instruction. All other time shall be used for instruction with the equipment or system. When significant changes or modifications in the equipment or systems are made under the term of the contract, additional instruction shall be provided to acquaint the operating personnel with the changes or modifications.

3.11 LOCAL TECHNICAL SUPPORT:

- A. The mechanical equipment supplier shall have a Hawaii office within 500 miles of the project site, staffed with factory trained engineers fully capable of providing instruction, routine maintenance and emergency maintenance service on all system components.
- B. The control system supplier shall have a Hawaii office within 500 miles of the project site, staffed with factory trained engineers fully capable of providing instruction, routine maintenance and emergency maintenance service on all system components.

3.12 SAFETY REQUIREMENTS:

- A. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein.

Items such as catwalks, ladders and guardrails shall be provided where required for safe operation and maintenance of equipment.

3.13 CLEANUP AND REPAIRS:

- A. Debris shall not be allowed to accumulate as a result of this work. Upon completion of this work, remove all debris and excess materials, tools, etc. resulting from this work from the jobsite and leave the location of this work broom-clean in a manner acceptable to the Engineer.
- B. This Contractor shall clean all fixtures and equipment set by him of oil, grease, stains, etc. All plates, trim, etc. shall be polished. Traps and drains shall be clean and unobstructed.
- C. All fixture piping and lines shall be thoroughly cleaned before leaving the work.

3.14 FINAL OBSERVATION:

- A. Final observation shall be requested by the Mechanical Contractor only after submittal of all required certificates. No final observation will be made until all moving parts of equipment are properly guarded, all controls and safety devices tested and operative, all painting required done and the site cleaned up.

3.15 GUARANTEE:

- A. The Mechanical Contractor shall guarantee the installation for a period of one year after 30 consecutive days of trouble-free operation after the date of acceptance of the project by Leahi Hospital against any defects due to faulty materials, equipment, workmanship or installation. Upon notice of defect, the Mechanical Contractor shall correct; replace defective item at no additional cost to the State.

3.16 ONE-YEAR GUARANTEE AND MAINTENANCE SERVICE CONTRACT:

- A. In addition to the Guaranty on materials and workmanship, the Installer shall submit 7 copies of the Maintenance Service Contract, countersigned by the Contractor, that will validate the Guaranty.
- B. The Guarantee and maintenance service shall extend for a period of one year after 30 consecutive days of trouble-free operation after the Project Acceptance Date and shall include all labor, materials, equipment and parts necessary to service the complete system, in accordance with the subsection 3.16 E. Maintenance Schedule, so as to assure proper operation and function of the system. All costs for the periodic maintenance, including emergency calls, shall be borne by the Contractor. This maintenance period and the Guaranty period shall run concurrently (same start and end dates).
Trouble-free operation is defined as a non-disabling condition or a non-recurring failure or disruption and the following:

1. The system shall be free of all discrepancies, contamination and debris which require correction in excess to those described for the monthly service which is included in the Schedule of Maintenance.
 2. The system is maintaining operational conditions and other parameter as measured during acceptance tests.
- C. The Installer shall include a listing of the following items along with the Maintenance Service Contract:
1. Names of the servicing contractor.
 2. Heat Pump system acceptance date.
 3. Service contract expiration date.
 4. Monthly inspection schedule for the maintenance period.
 5. Itemized listing of the equipment covered under the service contract, including a description of the equipment identified, its model and serial number(s) and manufacturer's name(s).
- Maintenance service contractor shall have a local office, staffed with competent and qualified manufacturer's factory trained and certified field service personnel and stocked with full inventory of replacement repair parts, to perform specified service and maintenance tasks on all equipment in accordance with the One-Year Maintenance Service Contract and terms and conditions of all equipment manufacturer's warranties and recommendations. Field service personnel shall be fully capable of providing technical assistance instruction, routine maintenance and emergency maintenance service on all system equipment components.
- D. The Maintenance Service Contract shall be submitted along with the Operations and Maintenance Manual on/or before the Project Acceptance Date.
- Distribution of submittal:
- 1 copy: Contractor
 - 1 copy: DAGS Inspection Branch Engineer Files
 - 2 copies: User (Leahi Hospital)
 - 2 copies: User's Facility Maintenance Agency
 - 1 copy: DAGS, Quality Control Branch
- E. Schedule of Maintenance Service: All service performed by the Contractor shall include applicable items listed but shall not be limited to the following maintenance task:
1. Air-Source Heat Pump:
 - a. Monthly Service:
 - 1) Clean and clear all drip pans and flush all related condensate drain lines with nitrogen. Install pan tablets if necessary to control algae growth. (Note: Contractor may be liable for water damage due to clogged drains.)
 - 2) Wash permanent type filters with an approved detergent and spray coat with an approved filter treatment solution.

- Replace deteriorated permanent type filters which cannot be cleaned.
- 3) Lubricate and oil all fan and motor bearings and connections of dampers and vanes.
 - 4) Check all drives for wear; adjust belt tension. Replace belt as required.
 - 5) Operate equipment to check for proper operation, unusual noise and vibration; adjust or repair all equipment and controls as required; clean-up all equipment.
 - 6) Check time clock for proper operation and time settings.
 - 7) Certify performance of monthly services and that all discrepancies are reported and corrected.
 - 8) Check compressor oil level and refrigerant sight glass; add oil as needed and change filter/drier if moisture indicated.
 - 9) Check refrigerant system for leaks, unusual noise and vibration and record suction, discharge and oil pressures and maintenance log book and correct and report all deficiencies.
- b. Annual Service:
- 1) Adjust alignment of bearings and sheaves; lubricate fan and motor bearings. Replace worn or noisy bearings or sheaves.
 - 2) Clean heating coils of dirt accumulation using nitrogen, high pressure air/water, steam or chemical coil cleaner solution.
 - 3) Check pressure and temperature differential across heating coils and log readings.
 - 4) Clean and adjust water valve; and clean all fan wheels and interior and exterior of equipment housings.
 - 5) Secure all loose housing, seal leaks and touch-up paint after cleaning all rust.
 - 6) Check and calibrate all pneumatic and/or electric temperature controls.
 - 7) Certify performance of annual service and that all discrepancies are reported and corrected.
 - 8) Check compressor coupling alignment; lubricate or replace noisy bearings.
 - 9) Test compressor crankcase oil and replace if contaminated or submit oil test results. Clean or replace strainer and oil filter (open compressor).
 - 10) Test and check system response at various heating load conditions for proper operation, record settings, adjust as required. Recalibrate all safeties, capacity, and temperature controls to proper settings.
 - 11) Check and clean all unit housing (inside and outside and components), seal leaks and remove rust from exterior components and touch-up paint.

- 12) Megger (electrical test to measure wire insulation resistance, i.e. condition) compressor motor and submit report and recommendation; check starter, relays, and control contacts and electrical connections for tightness and clean as required.
2. Standby and Lead-Lag Equipment (Pumps, Chillers, Cooling Towers, Etc.) and Time Clocks
 - a. The Contractor shall be responsible for the operational change-over of all standby and lead-lag equipment.
 - b. Monthly: Clean contacts, replace if necessary; check and adjust time setting as directed or required.
 - c. Certify that all discrepancies are reported and corrected.
3. Valves and Condenser Water Lines, Equipment And Supports
 - a. The Contractor shall exercise all equipment shut-off valves annually for proper operation and tightness.
 - b. Wire brush, prime and paint rust from pipe, equipment and support surface to prevent further rusting.
 - c. Certify that all discrepancies are reported and corrected.

F. Work Schedule:

All maintenance work shall be performed between the hours of 9:00 a.m. to 5:00 p.m., on normal working days, Monday through Friday, excluding State Holidays.

G. Trouble Calls:

Emergency service and repairs required between regular service calls shall be rendered within 24 hours after the Contractor is notified, non-work days excluded.

The Contractor shall call Leahi Hospital, phone number 497-9350 contact person Ronald Kurasaki, the next working day after being notified of the problem and report the status of repairs.

H. Maintenance Report/Checklist:

The Contractor shall prepare and maintain a maintenance service report/checklist which shall include the following:

1. Date maintenance service was performed.
2. The name of the mechanic who performed said maintenance.
3. The type and cost (labor, materials, parts and equipment) of repair work performed on the unit, if any.
4. Documents and other data pertaining to the maintenance performed.

It will be the responsibility of the Contractor to maintain the report/checklist by recording the above noted data after each scheduled maintenance and emergency repairs, and have the checklist available for inspection at the building site. The report shall be sufficiently detailed to properly reflect the past maintenance

history of the equipment. See attached service maintenance report form.

Reports shall be certified by a representative of the facility being served and shall be submitted to Leahi Hospital, attention: Ronald Kurasaki, at the completion of the service contract.

I. Cleanup and Work Practices:

The Contractor shall keep the job site free of debris, litter, discarded parts, etc. and shall clean all oil drippings during the daily progress of work. The Contractor shall remove all tools, parts and equipment from the service areas upon completion of the work. The Contractor shall exercise caution during the progress of his maintenance and repair work to prevent damage to the ceilings, roofing and other building structure. The Contractor shall restore all damages, caused by his negligence, to its original condition at his own expense.

J. All costs for periodic maintenance services and for emergency calls shall be included in the lump sum bid price.

K. The Maintenance Service Contract does not include repairs resulting from vandalism, negligent use or misuse of equipment.

3.17 OPERATION AND MAINTENANCE MANUAL:

A. Submit 3 hard bound copies of the Operating and Maintenance Manual on all equipment and the system as a whole. The manual shall identify project name and number, contractor, consultant, date and all equipment provided. It shall include the equipment manufacturer's name, model and serial number, tag no., capacity, quantity of units, their location and area (room) served and shall include the manufacturer's operation and maintenance manuals including control and wiring diagrams and source of service and replacement parts. When standard manufactures' brochures are used, adequately indicate (highlight, arrow, etc.) the project related information and delete (X or cross-out) the non applicable information.

B. Distribution of submittal:

1 copy: User

2 copies: User's Facility Maintenance Agency

SERVICE MAINTENANCE REPORT

Date: SHEET NO.

Name of Service Personal:

Name of Facility and Location:

Date of Service Call:

Time In, Time Out at Site:

Person(s) Contacted:

Nature of Service Call - (Routine Maintenance or Emergency - Explain and Cost Break-down):

Equipment Readings and Maintenance Performed.

Remarks:

Operational Performance Tests:

Facility:

Date:

A/C Equipment Description and Information:

Qty	Tag	Equipment	Manufact	Model	Capacit	Chw or	Area	Locatio
*1	AHU	Air Handling	Carrier	39LD110	19 Tons	Chw	Library	Mech

*Sample

Remarks:

TEST DATA:

Chillers

Chilled Water Supply Temperature Tchws

Chilled Water Return Temperature Tchwr

Chilled Water Pump Discharge Pressure Pchwpd

Chilled Water Pump Suction Pressure Pchwps

Chilled Water Pump Static pressure Pchwpo

1	2

Compressors

Capacity Reduction

Full Load

75%

50%

25%

	1		2		3	
	RLA	Ref	RLA	Ref	RLA	Ref Press

Air Handling Units

Supply Air Temperature

Tsa

Return Air Temperature

Tra

Differential Air Pressure

Pd

Chilled Water Supply Temperature

Tchws

Chilled Water Return Temperature

Tchwr

Chilled Water Supply Pressure

Pchws

Chilled Water Return Pressure

sPchwr

	1	2	3	4	5

END OF SECTION

SECTION 15400 - PLUMBING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS:

- A. As previously specified.

1.02 SCOPE:

- A. Provide all labor, materials, equipment, services and related work to complete all plumbing work as shown within 5 feet of building line on the drawings and as specified. The work shall include the following:
 1. Removal of existing equipment and piping as indicated.
 2. Domestic hot and cold water piping and insulation.
 3. Connections to existing utilities and to owner furnished equipment.
 4. Disinfection of water supply lines.
 5. Testing and adjusting.
 6. Manufacturer's literature, shop drawings, and record drawings.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

- A. "Section 15650 - Heat Pump System".
- B. Line voltage wiring and conduit shall be performed as indicated on the electrical drawings.

1.04 GENERAL REQUIREMENTS:

- A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions or discrepancies in the plans and specifications, the Contractor shall call the attention of the Engineer to such omissions and discrepancies in advance of the date of bid opening so that the necessary corrections can be made. Otherwise the Contractor shall furnish and install the omissions or discrepancies as if the same were specified and provided for.
 1. Standards:
 - a. All work shall be done in accordance with the latest edition of the Uniform Plumbing Code and applicable ordinances of the City and County of Honolulu.
 - b. Work shall comply with applicable regulations of the State of Hawaii Health Department.
 - c. All plumbing fixtures and installation shall comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG).
 - d. Contractor shall obtain all permits, licenses, and certificates and pay for all fees.

2. Approval of Materials, Fixtures and Equipment: As soon as practicable and within 30 days after award of contract and before commencement of installation of any materials and equipment, a complete schedule of the materials and equipment proposed for installation shall be submitted for the approval of the Engineer. The schedule shall include catalogs, cuts, diagrams, drawings and such other descriptive data as may be required by the Engineer. No consideration will be given to partial lists submitted from time to time. Any scheduled materials, fixtures and equipment not conforming to the specifications may be rejected.
3. Drawings: The drawings and specifications are intended to cover the complete installation of systems to function as described. The omission of reference to any necessary item of labor or material shall not relieve the Contractor from providing such labor or material. Drawings do not attempt to show exact details of piping and ductwork. Provide offsets as necessary to avoid local obstructions or interferences with other trades.
 - a. Contract Drawings: Mechanical plans are essentially diagrammatic, showing locations of pipes and other mechanical equipment. Where locations are not dimensioned, they are approximate, and before installing, Contractor shall study existing conditions and make installation in most logical manner.
 - b. Shop Drawings: The Contractor shall submit 6 copies of shop drawings and brochures or catalog cuts of equipment for review and reply prior to start of work. Drawings shall show complete dimensioned installation, including all piping in building, plumbing fixtures, equipment installation, elevation, invert, supports and foundations. Contractor shall check project drawings to avoid interferences with structural features and with work of other trades. No plumbing or piping work shall commence until plans have been reviewed by the Engineer. Any deviations from the shop drawings shall require prior approval by the Engineer.
 - c. Record Drawings: The Contractor shall keep at the job site a complete, neat and accurate record of all approved deviations from the contract drawings, shop drawings and specifications, indicating the work as actually installed. These changes shall be recorded on prints of the drawings affected and the shop drawings. Reproducible as-builts shall be submitted to the Engineer after final acceptance.

1.05 WARRANTY AND CERTIFICATE:

- A. Warranty: All work and materials executed under this section shall be under warranty to be free from defects of materials and workmanship for one year from date of final acceptance of project as a whole by the Engineer. All work of repair and replacement required, including other

work damaged by this work's defects shall be performed without cost to the Owner.

- B. Certificates: Furnish certificates for evidence of proper performance or compliance with code for the following:
 - 1. Sterilization of domestic water piping.
 - 2. Water leak testing of domestic water piping.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. All materials shall be new and of the best quality available in their respective kinds, free from all defects and shall be of the make and types specified or approved equal.
- B. Domestic Water Piping:
 - 1. Copper tubing, ASTM B88, Type K for buried underground piping and Type L for above ground piping, with ANSI B16.18 or B16.22 solder joint fittings.
 - 2. Exposed piping in finished areas shall be chromium plated brass pipe to the shut off or stop valve of each fixture.
- C. Water Valves: Bronze body, 125 lb. pressure rated valves, with solder joint ends. Nibco, Stockham, Crane, Lunkenheimer, or approved equal.
- D. Drainage System Specialties: Josam, Zurn, or Smith.
- E. Insulation: Pre-molded fiberglass pipe insulation, 1" thick, with all-service jacket, Owens-Corning 25 ASJ/SSL or approved equal. Provide nested insulation segments on fittings, valves, and flanges. Seal ends with vapor barrier mastic. Provide 0.016 inch thick aluminum jacket on piping exposed to the weather.
- F. Miscellaneous Materials:
 - 1. Nipples: Nipples shall be the same material as the piping in which installed.
 - 2. Unions: Unions shall be brass or bronze, either threaded or with solder joint ends, for use in copper tubing.
 - 3. Wall and Ceiling Escutcheon Plates: Provide split hinged, locked type, or one-piece escutcheon plates of pressed steel with heavy coating of copper, nickel or chromium.
 - 4. Solder: 95-5 tin antimony or 10% silver solder.
 - 5. Supports: MSS SP-58 and SP-69, types 1,6,9 or 11 for suspended piping. Provide turnbuckles Type 13 and 15 where required for vertical adjustment. Maximum spacing shall be as specified in SP-69.

6. Piping Isolators: Standard commercial products, consisting of metal-clad hair felt manufactured specifically for isolating pipe from hangers.
 7. Dielectric Fittings: Dielectric union with galvanized or plated steel female pipe threaded end and copper solder-joint end. Union shall have a water-impervious insulation barrier capable of limiting galvanic current to one percent of the short-circuit current in a corresponding bimetallic joint and, when dry, shall also be able to withstand a 600-volt breakdown test.
- G. Fire Stopping: Provide materials classified by UL to provide Fire Barrier equal to time rating of construction being penetrated. Provide asbestos-free materials that comply with applicable codes and have been tested in accordance with UL 1479 or ASTM E-814. 3M, Linkseal, Proset, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION AND WORKMANSHIP:

- A. All workmanship shall be of the highest standard. Vertical piping lines shall be plumbed and lines that are grouped shall be parallel and as direct as possible. Galvanized sheet metal thimbles shall be provided where pipes pass through masonry, and cutting shall be avoided as much as possible. Exposed pipe, where indicated, shall be run parallel with walls.
- B. The installation shall comply with the latest accepted edition of the Plumbing Code, the Fire Marshal's regulations of the State of Hawaii, the regulations of the Department of Health of the State of Hawaii and all other applicable codes.
- C. The Contractor shall obtain and pay for all permits and licenses for the work. At completion, transmit to the Engineer, applicable certificates of inspections.

3.02 EXCAVATION, BACKFILL AND CONCRETE WORK:

- A. All excavation and backfill in connection with plumbing work and mechanical work shall be accomplished in accordance with the Plumbing Code. Excavation shall be provided under a separate section. Provide proper support along the pipe length where rocks are encountered, provide a minimum of 3" of backfill properly tamped for pipe. Coral shall not be used as backfill material for underground piping. Pipes shall be buried a minimum of 12" below grade.

3.03 CROSS CONNECTIONS AND INTERCONNECTIONS:

- A. No plumbing fixtures, device, or piping shall provide a cross connection or interconnection between a distributing supply for drinking or domestic purposes and a polluted supply such as a drainage system or a soil or waste pipe, so as to make possible the backflow of sewage, polluted water, or waste into the water supply system.

3.04 CUTTING AND REPAIRING:

- A. The work shall be carefully laid out in advance providing sleeves, templates or details for chases and openings to be left in the walls, floors, structural members or partitions. Any access cutting of construction will not be permitted. Cutting shall be carefully done, and damage to buildings, piping, wiring or equipment as a result of cutting for installation shall be repaired by skilled mechanics of the trade involved at no additional expense to the Owner. Written permission from the Engineer's representative shall be obtained before any cutting is done.

3.05 PROTECTION TO FIXTURES, MATERIALS AND EQUIPMENT:

- A. Pipe openings shall be closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water and chemical or mechanical injury. Upon completion of all work the fixtures, materials and equipment shall be thoroughly cleaned, repainted as required, adjusted and operated.

3.06 CHLORINATION:

- A. Domestic hot and cold water lines shall be sterilized with chlorine before acceptance of the work. Dosage of chlorine shall be not less than 50 ppm. Chlorinating material shall be introduced into the water lines in a manner approved by the Engineer. After a contact period of not less than 24 hours the system shall be flushed with clean water until the residual chlorine content is not greater than 0.2 ppm. All valves in the lines being sterilized shall be opened and closed several times during the contact period. A certificate shall be furnished to the Engineer evidencing proper performance of sterilizations.

3.07 PIPE INSTALLATION:

- A. No pipe shall be closed up, furred in, buried or otherwise hidden until it has been inspected, tested and approved by the Engineer.
 - 1. Drain pipes shall be run with easy bends and long radius turns. Offsets shall be made at an angle of 45-degrees or less except where cleanouts are provided for shorter turns.
 - 2. All copper water piping joints shall be 95-5 soldered or 10% silver solder.

3. All piping shall be inspected inside and out before installation and no obstructions shall be allowed. Pipe ends shall be taper reamed to full I. D. and all burrs removed.
4. All exposed piping shall be carefully handled to avoid excessive tool marking and polished fittings shall be handled with extra care so that tool marks do not show. All exposed piping shall be in one length, where possible, fittings shall be in walls under counter cabinet or in furred space.
5. Escutcheons: Shall be installed around all exposed pipe passing through a finished floor, wall or ceiling. Escutcheons shall be of sufficient outside diameter to cover the sleeve opening and shall fit snugly around the pipe.
6. Anchor piping in building with approved clamps or adjustable hangers spaced in accordance with the Plumbing Code. Straps for copper tubing shall be copper or brass, or copper plated. Where copper contacts ferrous material, wrap with 2 layers of plastic tape.
7. Provide dielectric unions where copper piping is connected to ferrous pipe.

3.08 PIPE INSULATION:

- A. Provide insulation on all hot water piping. Insulation through wall penetrations shall be a continuous single piece through the entire penetration. All edges, flaps, corners, and exposed insulation shall be neatly tucked or secured.

3.09 TESTING AND INSPECTION:

- A. Contractor shall furnish all equipment for tests and any required retests and pay for all cost of repairing any damage resulting from such tests. Contractor shall adjust systems until they are approved. Tests shall be performed in the presence of, and to the satisfaction of, the Engineer and inspector of the official agency involved.
- B. Water piping shall be tested in accordance with the Plumbing Code. Sanitary shall be tested with a minimum of 10 feet of water for 15 minutes. Water piping shall be tested at 150 psi.

3.10 CLEAN UP:

- A. Debris shall not be allowed as a result of this work. Upon completion of this work, remove all debris and excess materials, tools, etc., resulting from this work from the job site and leave the location of this work broom-cleaned in an acceptable manner as approved by the Engineer. All work including plumbing fixtures, traps and mechanical equipment shall be thoroughly cleaned and ready for use.

END OF SECTION

SECTION 15650 - HEAT PUMP SYSTEM

PART 1 - GENERAL

1.01 GENERAL CONDITIONS:

- A. As previously specified.

1.02 SCOPE:

- A. Provide a complete and operating heat pump system. "Provide" shall mean "Furnish and Install" when used herein. The heat pump system shall include all equipment and all related items necessary to complete the work as shown on the drawings and herein specified. The work shall include the following:
 - 1. Domestic water piping and accessories.
 - 2. Refrigerant piping and accessories.
 - 3. Insulation.
 - 4. Controls and control wiring.
 - 5. Corrosion protection.
 - 6. Adjusting, balancing and testing.
 - 7. Painting and finishing.
 - 8. Operating and maintenance instructions.
 - 9. Manufacturer's literature, shop drawings, record drawings.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

- A. "Section 15400 - Plumbing".
- B. Line voltage wiring and conduit is specified in the provided electrical drawings.

1.04 GENERAL REQUIREMENTS

- A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions or discrepancies in the plans and specifications, the Contractor shall call the attention of the Engineer to such omissions and discrepancies in advance of the date of bid opening so that the necessary corrections can be made. Otherwise the Contractor shall furnish and install the omissions or discrepancies as if the same were specified and provided for.
 - 1. Standards:
 - a. All work shall be done in accordance with applicable ordinances and codes of the County of Honolulu and in accordance with State Department of Health regulations.
 - b. Work shall comply with applicable regulations of the State of Hawaii, National Fire Protection Association (NFPA) Pamphlet

- No. 90A, and American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 15-1978.
- c. Contractor shall obtain all permits, licenses and certificates and pay for all fees.
2. Drawings and Specifications: The drawings and specifications are intended to cover the complete installation of systems to function as described. The omission of reference to any necessary item of labor or material shall not relieve the Contractor from providing such labor or material. Drawings do not attempt to show exact details of piping and ductwork. Provide offsets as necessary to avoid local obstructions or interferences with other trades.
 - a. Contract Drawings: Mechanical plans are essentially diagrammatic, showing locations of ducts, and other mechanical equipment. Where locations are not dimensioned, they are approximate, and before installing, Contractor shall study existing conditions and make installation in most logical manner.
 - b. Shop Drawings: As soon as practical, and within 30 days after award of contract and before commencement of installation of any materials and equipment, six sets of shop drawings shall be submitted. Submittals shall consist of a complete list of equipment and materials, including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Incomplete and partial submittals will be returned unreviewed. Shop drawings shall also be submitted which contain layout drawings of ductwork and piping showing locations of hangers and supports, capacity curves or ratings to assure balanced refrigeration at the design conditions, and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Where piping and equipment are to be supported other than as indicated, the details shall include loadings and types of frames, brackets, stanchions, or other supports. Control diagrams shall be submitted which identify each component and show all interconnected or interlocked components and the control sequence.
 - c. Record Drawings: Contractor shall keep a record set of drawings available at the jobsite on which all changes and additions in the Mechanical Work are shown. Contractor shall furnish the Engineer with reproducible drawings of each installation showing the exact location of all items which are different from the original drawings.

1.05 WARRANTY:

- A. All work in this Section shall be under warranty for a period of one year from the date of acceptance of the work as a whole by the Engineer. Should any equipment or material fall within this period, the Contractor

shall replace or repair that item at no cost for material and/or services, if such is due to faulty workmanship or quality of material furnished.

- B. The Contractor shall be responsible for all damage to any part of the premises caused by failure in the equipment furnished under this section for a period of one year after the final acceptance of the work as a whole.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. All materials delivered to the job site and installed shall be new, best of their respective grades and as specified on the drawings. Materials shall be of the same brand or manufacturer throughout for each class of material or equipment.
1. Refrigerant Piping and Accessories:
 - a. Copper tubing, ASTM B280, soft-annealed where bending is required and hard drawn where no bending is required. Soft annealed shall not be used larger than 1-3/8 inches. Joints shall be brazed.
 - b. Fittings: Wrought copper or forged brass sweat fittings, ANSI B16.22 and ASTM B75.
 - c. Solder: Silver solder conforming to AWS A5.8. Melting point not less than 1145 degree F.
 - d. Refrigerant Shut-Off Valves: Valves shall be designed for use with the refrigerant used and shall have pressure ratings compatible with system working pressures encountered. Valves for copper tubing shall be all-brass, hand wheel operated, diaphragm packless type globe or angle valves in sizes up to and including 5/8 inch. In sizes over 5/8 inch the valves shall be brass or bronze globe or angle type, wrench operated with ground-finish stems, packed especially for refrigerant service, back-seated, and provided with seal caps.
 - e. Supports: MSS-SP-58 and SP-69, types 1,5,6,7,9,10, or 11 for suspended piping. Provide turnbuckles type 13 and 15 where required for vertical adjustment. Maximum spacing shall be specified in SP-69.
 - f. Strainers: Brass or cast iron body, Y-pattern, cleanable, minimum 60-mesh non-corrodible screen with net free area not less than 10 times the pipe area, with pressure rating compatible with refrigerant service.
 - g. Solenoid Valves: The valves shall be of the 2 position, direct acting or pilot operated types, opened or closed, electrically as specified for use with liquid or gas refrigerant. The valves shall be designed for the required pressure drop and temperature range and shall conform to ARI 760 and shall be listed by the Underwriters' Laboratories, Inc. for the service.

- h. Thermostatic Expansion Valves: The expansion valves shall be of the diaphragm and spring loaded type with external equalizers, bulb and tubing, and external superheat adjustment with seal cap. The valve size and superheat adjustment shall be as recommended by the valve manufacturer. Valves shall be tested and rated in accordance with ANSI B60.1 and 750 for capacities up to 135,000 Btu per hour. Valves shall have brass, bronze or semi-steel bodies with stainless steel or non-corrosive non-ferrous internal parts. Valves shall have brazing connections. Thermostatic expansion valve bulb shall be stable, and non-migrating and shall be suitable for the refrigerant valve capacity and evaporator temperature and shall be as recommended by the valve manufacturer.
- i. Liquid Line Driers: The liquid line drier shall be the solid desiccant type. Flow rate capacity shall be within the maximum allowable pressure drop, and safety shall conform to the requirements of ARI Standard 710. Drier body shall be of brass or steel and shall be provided with means for holding the desiccant securely in place and distributing the liquid refrigerant evenly throughout the desiccant. Driers shall be capable of withstanding a pressure of 350 psi. Driers may be of the combination drier-indicator type.
- j. Moisture Indicators: The moisture indicators in the liquid line of refrigerant systems shall contain indicating material that will indicate moisture by varying degrees of color change. Indicators shall be a brass or bronze or heavily copper plated steel fitting with the indicator material located under a bulls-eye. Indicators shall be capable of withstanding a test pressure of 350 psig without damage.
- k. Liquid Refrigerant Sight Glass: The sight glass shall be of the double-port see-through type with two bulls-eyes and part of the moisture indicator. Sight glass indicators shall be capable of withstanding a test pressure of 350 psig without damage. Sight glass body shall be forged brass or bronze with fittings as specified hereinbefore for refrigerant piping.
- l. Liquid Receiver: Liquid receiver shall be the vertical or horizontal type, designed, fitted and rated in conformity with ARI 495, except as modified herein. The receiver shall be constructed and tested in conformity with Section VIII of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Each receiver shall have a storage capacity not less than 20 percent in excess of that required for fully charged system. Each receiver shall be equipped with inlet, outlet drop pipes, drain plug, purging valve, relief valves of capacity and setting required by ANSI B9.1, and two bulls-eye liquid level sight glasses. Sight glasses shall be in same vertical plane, 90 degrees apart, perpendicular to axis of receiver.

2. Insulation: Insulation, adhesives, coatings and accessories shall have surface burning characteristics as determined by ASTM E84, NFPA 255 and UL 723, not to exceed 25 for flame spread and 50 for smoke developed.
 - a. Refrigerant Suction Piping
 - 1) Flexible Unicellular: ASTM C534, Type 2.
 - 2) Polystyrene: Closed cell type, for outdoor use only.
 - b. Pipe Insulation Finishes:
 - 1) All Purpose Jacket: Provide factory applied all purpose jacket with integral vapor barrier. Jackets in exposed locations shall have smooth, white surface suitable for painting. Jacket may be omitted on flexible unicellular insulation only.
 - 2) Vapor Barrier Material: Fed. Spec. HH-B-100, Type I.
 - 3) Aluminum Jackets: ASTM C921, Type II, 0.016 inch thick, smooth.
 - 4) Vinyl Lacquer: Provide two coats of vinyl lacquer finish or equal on flexible unicellular insulation located outdoors.
 - c. Equipment Insulation:
 - 1) Flexible Fiberglass, ASTM C 553, Type 1, Class B-3, with vapor barrier.
 - 2) Rigid Fiberglass, ASTM C 612, Class 2 with vapor barrier.
 - 3) Cellular Glass, ASTM C 552, Type I.

2.02 EQUIPMENT:

- A. Air-Source Heat Pump: The heat pump water heater shall be packaged air source equipment, factory assembled and charged. The heat pump shall be suitable for heating potable water and have the capability of producing no less than 160F water, with heating capacity and C.O.P. as indicated on the drawings.
 1. Heat Pump Unit: Heat pump unit shall consist of compressors, condenser, evaporator, hot water circulating pump, piping, and controls, factory piped and charged. The heat pump shall contain the following components, and features:
 - a. Evaporator: Shall be constructed with aluminum waffle plate fins mechanically bonded to seamless copper tubing. All copper tube joints to be brazed with silver solder. Coils shall have corrosion inhibiting coated fins and type 304 stainless steel coil casings and drain pan.
 - b. Refrigerant: Refrigerant shall be R-513A.
 - c. Expansion valve: Valves shall be specifically designed for heat pump use with field adjustable superheat feature. Expansion valve shall have MOP (Maximum Operating Pressure) type power element to effectively limit saturated suction temperature to 18C (65F).

- d. Compressor: Hermetic scroll type by Copeland Corp., suitable for high temperature operation with R513A refrigerant.
- e. Compressor Controls: Compressor controls/accessories must include the following:
 - 1) High and Low Refrigerant Pressure Safety Switches
 - 2) Indicator Lights for Power On, Hot Water Demand, High Pressure Fail, Low Pressure Fail
 - 3) Multi-function Phase Failure Relay
 - 4) Crankcase Heater and Relay
- f. Condenser: Stainless steel brazed plate vented double wall type. Single wall condenser construction shall not be allowed. UL Listed and suitable for high temperature operation with potable water.
- g. Refrigerant accessories:
 - 1) Filter-driers: Non-Replaceable Core Type
 - 2) Sight Glass: Moisture Indicating Type
- h. Anti-Short Cycle Control: Units shall be factory wired to allow a maximum of twelve compressor starts per hour to prevent compressor short cycling and allow time for suction and discharge pressures to equalize permitting the compressor to start in an unloaded condition.
- i. Hot Water Circulating Pumps: Shall be factory installed in-line all bronze or stainless steel body centrifugal type able to deliver rated flow against the external head shown on the drawings.
- j. Controls: The heat pump unit shall be factory wired for fully automatic operation. Safeties shall include compressor motor thermal overload protection, manual reset pressure stats, anti-cycling compressor relays, plus standard items recommended by the equipment manufacturer.
- k. Constant Leaving Water Temperature Control: The heat pump unit shall be factory equipped with electronic temperature control valve (e-TCV) which automatically maintains constant leaving water temperature regardless of entering water temperature. Leaving water temperature is set by the heat pump operator/user via a field adjustable electronic temperature controller.

2.03 CONTROLS:

- A. General: Controls shall be electric, electronic, or solid-state electronic, or a combination that will provide the required sequence of operation control. Schematic control diagrams shall be submitted. All control work shall be performed by an experienced and licensed controls sub-contractor, and only the following manufacturers/installers shall do the work: Johnson Controls, Honeywell, Barber-Colman, Hawaii Instrumentation and Controls.

- B. Control Relays: General purpose type, with plug in socket screw terminal connections, with 2 normally open and 2 normally closed sets of contacts unless otherwise indicated, and coil voltage as indicated.
- C. Time Delay Relays: Pneumatic type, Agastat 7000 Series, or approved equal.
- D. Timeclocks: Seven-day type, with independently adjustable set points at increments not greater than 15 minutes, minimum of 4 on-off cycles per day, 10 hour reserve power. Intermatic, Paragon, or equal.
- E. Wiring and Accessories: Provide all required interconnecting wiring to complete the system. Provide transformers as required. Electrical work shall comply with local codes and the electrical section of this specification.
- F. Motor Starters: Horsepower rated manual or magnetic starters shall be provided, as indicated. Starters shall conform to NEMA ICS and shall have thermal overload protection and other appurtenances necessary and as indicated.

2.04 CORROSION PROTECTION:

- A. The finned coils shall be coated by an experienced and approved applicator who has developed the coating techniques necessary to apply uniform coating to all surfaces, avoiding excessive buildup on fin edges and other areas that would impair heat exchange. Coating shall be applied under shop conditions utilizing a clean, dry under-roof area with specialized equipment. Such an experienced and approved applicator with proper facilities is International A/C Coatings, Honolulu, Hawaii or approved applicator.
- B. The entire apparatus being coated shall be dismantled to the maximum degree without disturbing piping or wiring. Upon completion of the coating, the apparatus shall be reassembled with care so that the coating surface is not damaged.
- C. Surface preparation and application shall be in strict accordance with the coating manufacturer's instructions.
- D. Coating System for Finned Coils: Heresite P-413, baked phenolic with plasticizer or approved equal shall be properly modified and applied by the approved applicator not to exceed 6 mils DFT in a 4 to 5 coat system. The coating shall withstand dry heat up to 205 degrees C (400 F), and show no signs of attack after 3000 hours of salt spray test to ASTM Specification B117.

- E. Coating System for Other Surfaces: Ameron PSX 700 Engineered Siloxane shall be properly modified and applied by the approved applicator until a total of 6-8 mils DFT is achieved.
- F. Primers: Apply a base primer of Heresite P-700.
- G. Workmanship: Application of coating materials shall be done by skilled applicators. Criteria of good workmanship desired and neat appearance of the finished surfaces are: absence of sags, runs, and unnecessary brush marks. Other criteria are: thorough mixing of coatings, limited use of thinners, uniformity of film thickness, proper drying time between coats, and protection of surfaces not to be coated.

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS:

- A. Necessary supports and vibration isolators shall be provided for equipment and appurtenances as required. Equipment shall be installed in accordance with manufacturer's instructions.

3.02 WATER PIPING INSTALLATION:

- A. Piping: Pipe and fitting installation shall conform to the requirements of ANSI B31.1. Pipe shall be cut accurately to measurements established at the jobsite, and worked into place without springing or forcing, completely clearing all windows, doors, and other openings. Pipe or tubing shall be cut square, shall have burrs removed by reaming, and shall be so installed as to permit free expansion and contraction. Changes in direction shall be made with fittings. Horizontal mains shall be sloped to drain not less than 1 inch in 40 feet. Reducing fittings shall be used for changes in pipe sizes. Open ends of pipelines and equipment shall be capped or plugged during installation to keep foreign materials out of the systems. Connections to equipment shall be made with malleable iron unions for steel pipe 2-1/2 inches or less in diameter, and with flanges for pipe 3 or more inches in diameter. Unions for copper pipe or tubing shall be brass or bronze. Connections between ferrous and copper piping shall be electrically isolated from each other with dielectric unions.
- B. Joints between sections of pipe and between pipe and fittings shall be threaded, flanged, or welded as specified.
 - 1. Threaded joints shall be made with tapered threads and made tight with a stiff mixture of graphite and oil or polytetrafluoroethylene tape or equivalent thread joint compound or material, applied to the male threads only.
 - 2. Joints in copper tubing shall be cut square, ends shall be reamed, and all filings and dust wiped from interior of pipe. Joints shall be soldered with solder applied and drawn through the full fitting

- length. Excess solder shall be wiped from joint before solder hardens.
3. Welded joints shall be fusion-welded unless otherwise required. Beveling, alignment, heat treatment, and inspection of weld shall conform to ANSI B31.1. Weld defects shall be removed and repairs made to the weld, or the weld joints shall be entirely removed and rewelded. Electrodes shall be stored and dried in accordance with AWS D1.1 or as recommended by the manufacturer. Electrodes that have been wetted or that have lost any of their coating shall not be used.
- C. Flanges and unions shall be faced true. Flanges shall be provided with 1/16-inch gasket and made square and tight.
 - D. Dielectric unions shall have metal connections on both ends threaded to match adjacent piping. Metal parts of dielectric unions shall be separate with nylon insulator to prevent current flow between dissimilar metals.
 - E. Hangers and Supports: Hangers used for support of piping of 2 inches nominal pipe size and larger shall be fabricated to permit adequate adjustment after erection while still supporting the load. Pipe guides and anchors shall be installed, as indicated, to keep pipes in accurate alignment, to direct the expansion movement, and to prevent buckling, swaying and undue strain.
 - F. Pipe Penetrations Thru Walls: Pack annular space between pipe and wall with a fire seal of mineral wool or similar non-combustible material. Seal with silicone sealant or caulking.

3.03 REFRIGERANT PIPING INSTALLATION:

- A. Unless otherwise specified, pipe and fitting installation shall conform to requirements of ASHRAE Standard 15 and ANSI B31.5. Pipe shall be cut accurately to measurement established at the jobsite and worked into place without springing or forcing. Pipes shall be cut square, shall have burrs removed by reaming, and shall be so installed as to permit free expansion and contraction. Filings, dust, or dirt shall be wiped from interior of pipe before connections are made. Changes in direction shall be made with fittings. Piping shall be installed with sufficient pitch to insure adequate oil drainage. Open ends of refrigerant lines or equipment shall be capped or plugged during installation to keep moisture, dirt or other foreign material out of the system.
- B. Joints:
 1. Joints in copper tubing shall be brazed with silver solder. Surplus brazing material shall be removed at all joints in lines not insulated. Tubing shall be protected against oxidation during brazing by using nitrogen in the tubes.

2. Threaded joints shall be made with tapered threads and made tight with a stiff mixture of graphite and oil or with polytetrafluoroethylene tape or other equivalent thread-joint compound applied to the male threads only.
- C. Valves: Valves shall be installed with stems horizontal.
- D. Hangers and Supports: Hangers, inserts, and supports shall conform to MSS SP-58 and SP-69. Hangers and other supports for insulated pipe shall be of sufficient size to accommodate the insulation and protection shield.
- E. Returning Oil From Refrigerant System: Refrigerant lines shall be installed so that the gas velocity in the evaporator suction line is sufficient to move the oil along with the gas to the compressor. Except as indicated otherwise where equipment location requires vertical riser, the line size shall be such as to allow sufficient velocity to lift the oil at minimum system loading pressure and corresponding reduction of gas volume. A double riser shall be installed when excess velocity and pressure drop would result from full system loading. The larger riser shall have a trap, of minimum volume, obtained by use of 90 degree and 45 degree ells. The smaller riser shall be arranged with inlet close to end of lower horizontal line, and the larger riser shall connect from end of lower horizontal line to top of upper horizontal line. Valves shall not be installed in risers.
- F. Charging Valves: Except as indicated otherwise provide charging valves for refrigerant system located on the receiver side or in the liquid line between the shut-off valve to the receiver or condenser-receiver and the liquid line sight glass. Valve shall be connected by full size liquid line tee.
- G. Pipe Penetrations Thru Walls: Pack annular space between pipe and wall with a fire seal of asbestos rope, mineral wool or similar non-combustible material. Seal with silicone sealant or caulking.

3.04 INSULATION:

- A. Insulation shall be installed by an experienced licensed insulation contractor in accordance with best trade practices. Insulation shall be continuous through hangers and penetrations. Insulation shall be sealed to maintain integrity of vapor barrier. Insulate fittings, flanges, valves, etc., with premolded or precut insulation segments, same thickness as adjoining pipe.
 1. Pipe Insulation: Insulate all hot water, and refrigerant suction piping.
 - a. Provide protective galvanized shields on pipes passing through hangers, MSS SP-69, Type 40.
 - b. Thickness of pipe insulation shall be as follows:
 - 1) Hot Water Piping:

- a) Cellular Glass and Polystyrene: 1-1/2" thick on pipes up to 3 inches; 2" thick on pipes over 3 inches.
- b) Mineral Fiber (Fiber Glass) and Flexible Unicellular: 1" thick on pipes to 1 inch; 1-1/2" thick on pipes to 3 inches; 2" thick on pipes over 3 inches.
- 2) Refrigerant Suction Piping and Condensate Drain Piping
 - a) Flexible Unicellular: 3/4" thick on pipes up to 2 inches and 1" thick on pipes over 2 inches.
 - b) Polystyrene: 1-1/2" thick on pipes up to 2 inches and 2" thick on pipes over 2 inches.
2. Vapor Barrier Jacket: Insulation shall be covered with vapor barrier jackets.
3. Pipe: Insulation shall be applied with joints tightly butted and ends sealed with vapor barrier coating.
4. Fittings, Flanges, Valves: Insulation of the same thickness and type shall be placed around the item, either premolded or segmented. Voids shall be filled with loose insulation or cement. Insulation shall be coated with glass tape embedded in two coats of vapor barrier coating or with premolded PVC fitting covers applied over a layer of vapor barrier coating.
5. Piping Exposed to Weather: Provide aluminum jacketing with overlapped joints over the above specified insulation and vapor barrier jacket.

3.05 ADJUSTING, BALANCING, AND TESTING:

- A. Cleaning and Adjusting: Pipes, strainers, valves and pumps shall be cleaned free of scale and thoroughly flushed of all foreign matter. Temporary bypass shall be provided for all water coils to prevent flushing water from passing through coils. Strainers and valves shall be thoroughly cleaned. Inside of air-cooled condensers shall be thoroughly cleaned of all debris and blown free of all small particles of rubbish and dust. Equipment shall be wiped clean with all traces of oil, dust, dirt, or paint spots removed. Bearings shall be properly lubricated with oil or grease as recommended by the manufacturer. Belts shall be tightened to proper tension. Control valves and other miscellaneous equipment requiring adjustment shall be adjusted to setting indicated or directed. Fans shall be adjusted to the speed indicated by the manufacturer to meet specified conditions.
- B. Tests:
 1. Refrigerant Piping: The system shall be subjected to a pneumatic test. Pneumatic leak testing shall be done with dry nitrogen before any refrigerant pipe is covered. High and low side of the refrigerant system shall be tested for the minimum refrigerant leak field test pressure specified in ASHRAE 15, for the refrigerant employed in the system. System shall be proved tight under pneumatic test pressure by checking each joint with soap solution and after

- charging with refrigerant system shall be checked with a halide torch or by electronic leak detection. To repair leaks, the joint shall be taken apart, thoroughly cleaned, and remade as a new joint. System shall be proven tight and free of leaks by successfully completing the soap solution test and by allowing the pneumatic leak-test pressure to remain on the system for 24 hours with no drop in pressure. Correction of 0.3 psi will be allowed for each degree change in the initial and final temperature of the surrounding air, plus for an increase and minus for a decrease. After the foregoing tests have been satisfactorily completed and the pressure relieved, entire system shall be evacuated to an absolute pressure of 300 microns. Vacuum line shall be closed, and the system shall stand for 1 hour. After this period the absolute pressure shall not exceed 500 microns. Upon completion of the vacuum test, the system shall be completely charged with dry refrigerant. Provide a complete charge of lubricating oil, type as recommended by the manufacturer.
2. Water Piping: After cleaning, water piping shall be hydrostatically tested at a pressure equal to 1-1/2 times the total system operating pressure for a period of time sufficient for inspection of every joint in the system and in no case less than 2 hours. No loss of pressure will be allowed. Leaks found during tests shall be repairing by tightening, rewelding joints, or replacing pipe or fittings. Concealed piping shall be tested in place before concealing.
- C. Performance Tests: Testing and balancing of the systems shall be performed by an independent testing agency, by personnel who are not employees of the installing contractor. After cleaning and testing are completed as specified, each system shall be tested as a whole to see that all items perform as integral parts of the system. Corrections and adjustments shall be made as necessary.
- D. Balancing: Water piping systems shall be balanced to produce water quantities as indicated with all manual and automatic control valves open.
- E. Test Reports:
1. Typewritten schedules of readings taken during the balancing and testing operations indicating the required or specified reading, and the final balanced reading shall be provided for the following items:
 - a. Balance:
 - 1) Coils: Size, face velocity in fpm; air temperature entering coil and air temperature leaving coil, wet-bulb and dry-bulb in degrees F.; water temperature entering coil and water temperature leaving coil, degrees F.
 - 2) Pumps: Size, type, pump speed in rpm, total head in feet of water, flow rate in gpm, and motor load in amperes.

3.06 ELECTRICAL WORK:

- A. Electric motor driven equipment specified herein shall be provided complete with motors, motor starters, control wiring and controls. Electrical equipment and wiring shall be in accordance with ELECTRICAL Section. Motor starters shall be provided by Mechanical Contractor complete with properly sized thermal overload protection and other appurtenances necessary for the motor control specified. Manual or automatic control and protective devices required for the operation herein specified and any control wiring required for controls and devices but not shown on the electrical plan shall be provided. Electrical work shall conform to NFPA 70. All additional specification of apparatus provided on electrical plan.

3.07 PAINTING AND FINISHING:

- A. Provide touch-up painting on equipment whose factory finish has been damaged and on all walls, ceilings and other finished surfaces affected by this work. Touch up painting shall match adjacent surfaces.
- B. Clean up all areas around the work installed under this section and remove all debris, dust, and dirt caused by the work.

3.08 OPERATING AND MAINTENANCE INSTRUCTIONS:

- A. Bound Instructions: Six complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished. Flysheet shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8-1/2 by 11 inches, with large sheets of drawings folded in. The instructions shall include, but shall not be limited to, the following:
 - 1. Wiring and control diagrams, with data to explain the detailed operation and control of each component.
 - 2. A control sequence describing startup, operation and shutdown.
 - 3. Operating and maintenance instructions for each piece of equipment, including lubrication instructions.
 - 4. Manufacturer's bulletins, cuts and descriptive data.
 - 5. Parts lists and recommended spare parts.
- B. Field Instructions: Upon completion of the work and at a time designated, the services of one or more project engineers shall be provided by the contractor for a period of not less than one day to instruct the Owner's representative in the operation and maintenance of the system. These field instructions shall cover all the items contained in the bound instructions.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16011 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This section specifies the general electrical requirements for all labor, materials, equipment, and services provided under "Division 16 - Electrical".
- B. Work specified in this Division shall include, but not be limited to the following:
 - 1. Distribution system, including overcurrent protection devices, and feeders.
 - 2. Complete electrical system wiring including branch circuits and control devices.
 - 3. Power wiring for electrically-operated equipment and appliances.
 - 4. Include in the bid and pay for the permits, plan review fees, inspection fees and deliver the certificate of final inspection to Engineer.
 - 5. Testing.
 - 6. Record drawings.

1.02 WORK INCLUDED:

- A. The Contractor under this Division shall provide all labor, materials, equipment, supervision and services required for the construction of the electrical systems. The finished installations shall be complete, operable and shall include all work specified herein and shown on the Drawings.
- B. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All systems shall be properly adjusted and in working order at the time of final acceptance.
- C. Electrical equipment and wiring system shall have sufficient capacity to accommodate all equipment, appliances and other electrical loads as specified herein and shown on the drawings and as required per National Electrical Code and other applicable codes, standards and requirements plus spare capacity to accommodate any planned future facilities and additions and minimum 20 percent spare capacity for future growth.
- D. It is the intent of these Specifications and other Contract Documents to require an installation complete in every detail. Consequently, the

Contractor will be responsible for minor details or for any special construction which may be found necessary to properly furnish, install, adjust, test, and place in successful and continuous operation, the entire electrical system and the cost of same shall be included in the contract price.

1.03 REFERENCES:

- A. The publications listed herein form a part of this specification to the extent referenced. The publications may be referred to in the text by the basic designation only. Unless otherwise indicated, the most recent edition of the publication with current revisions and amendments will be enforced.
- B. Comply with the applicable State Code Rules and the ordinances of the County having jurisdiction over this project.
- C. In the event of conflict between pertinent codes and regulations, and the requirements of the referenced standards, or those indicated in Specifications and on drawings, the provisions of the more stringent shall govern.

1.04 RELATED WORK:

- A. "Division 1 - General Requirements".
- B. "Division 15 - Mechanical".

1.05 DEFINITIONS:

- A. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, shall be as defined in IEEE 100.
- B. The technical sections referred to herein are those specification sections that describe products, installation procedures, and equipment operations and that refer to this section for detailed description of submittal types.
- C. The technical paragraphs referred to herein are those paragraphs in PART 2 - PRODUCTS and PART 3 - EXECUTION of the technical sections that describe products, systems, installation procedures, equipment, and test methods.

1.06 SUBMITTALS:

- A. Submit in accordance with "Section 01330 - Submittal Procedures".
- B. Certificates:

1. Submit written certification that electrical systems are complete and operational as stipulated in item entitled "DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS" hereinbelow.
 2. Submit certificate of final inspection and acceptance as stipulated in item entitled "INSPECTION" hereinbelow.
- C. Warranty: Submit warranty as stipulated in item entitled "WARRANTY" hereinbelow.
- D. Record Drawings: After the work is complete, Contractor shall provide record drawings showing the as-built conditions in accordance with "Section 01770 - Closeout Procedures".
- E. Submittals required in the sections which refer to this section shall conform to the following additional requirements. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and technical paragraph reference. Submittals shall also include applicable industry and technical society publication references, and years of satisfactory service, and other information necessary to establish contract compliance of each item to be provided. Photographs of existing installations are unacceptable and will be returned without approval. Transmittal letter shall include a listing of all items by manufacturer and catalog number which are included in the submittal package and shall clearly identify the submittal with this project.
- F. Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Handwritten and typed modifications and other notations not part of the manufacturer's preprinted data may result in the rejection of the submittal. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for certificates of compliance.
- G. Submittal drawings shall be a minimum of 11-inches by 17-inches in size using a minimum scale of 1/8-inch per foot, except as specified otherwise. Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.
- H. Where installation procedures or part of the installation procedures are required to be in accordance with manufacturer's instructions, submit

printed copies of those instructions prior to installation. Installation of the item shall not proceed until manufacturer's instructions are received. Failure to submit manufacturer's instructions shall be cause for rejection of the equipment or material.

- I. Submit manufacturer's certifications as required for products, materials, finishes, and equipment as specified in the technical sections. Certificates from material suppliers are not acceptable. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements to imply that the item does not meet requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; or "equal or exceed the service and performance of the specified material". Certifications shall simply state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official authorized to sign certificates of compliance.
- J. Where equipment or materials are specified to conform to industry and technical society reference standards of organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.
- K. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
- L. Submit text of posted operating instructions for each system and principal item of equipment as specified in the technical sections.
- M. Each submittal shall be prepared with a summary sheet attached to each copy identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.

1.07 QUALITY ASSURANCE:

- A. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction", or words of similar

meaning, to mean the Engineer. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

- B. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where 2 or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in the technical section.
- C. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.
- D. Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.
- E. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70.

1.08 PERMITS AND INSPECTION:

- A. All permits required by local ordinances shall be obtained and paid for by the Contractor.

1.09 COORDINATION:

- A. Refer to all project Drawings and to all Sections of the project Specifications. Coordinate and fit all work accordingly so that all electrical outlets and equipment will be properly located and readily accessible. The Drawings indicate the relation of wiring and connections and must not be scaled for exact locations. Verify all construction dimensions at the project and make changes necessary to conform to the building as constructed. Work improperly installed due to lack of construction verification shall be corrected at the Contractor's expense.
- B. Work shall be scheduled to avoid delays, interferences, and unnecessary work. If any conflicts occur, necessitating departures from the Drawings

and Specifications, details of departures and reasons therefore shall be submitted immediately for consideration by the Engineer.

1.10 DELIVERY, HANDLING AND STORAGE:

- A. Deliver all materials of this Division in manufacturer's original unopened packages or containers with label intact and legible.
- B. Use means necessary to protect the materials of this section before, during and after installation; to protect the installed work and materials of all other trades; and to protect the original structure, work and materials of the State.
- C. In the event of damage, immediately make all repairs and replacements necessary to the acceptance of the Engineer and at no additional cost to the State.

1.11 DRAWINGS AND SPECIFICATIONS:

- A. Electrical system drawings are diagrammatic and symbolic. Locations of outlets, devices, raceways, apparatus, etc., shown are approximate and shall be installed with the required maintenance and code clearances and to avoid conflict with other systems and trades. Visit site and verify lineal footages required and check scales and dimensions shown on architectural drawings prior to bidding to verify locations, routing and lineal footages of electrical work required for inclusion into bid. Study the project drawings and specifications, and make installation in most logical manner for eye appeal and coordination with other systems and trades. Unless dimensioned or noted otherwise, orderly configuration and visual composition are fully intended.
- B. Include additional components and wiring which are not shown or specified herein but are required for proper control and operation to provide for a complete and operable system within intent indicated on the drawings and specifications.
- C. Study the project drawings and specifications prior to bidding and provide additional wiring including apparatus and devices for equipment furnished by others without additional cost.
- D. Relocate devices, fixtures, apparatus and associated wiring including raceways, within 10 feet of the original location, without additional cost, for code compliance and to avoid conflict with other systems or trades, structures, utilities and when directed before installation.
- E. Equipment ratings or wire sizes that are missing or shown in error shall be provided to have adequate capacity to serve the required and future

loads plus minimum 20 percent spare capacity, and be in compliance with NEC.

- F. Verify voltages and other ratings of energy conversion, transformation and electrical utilization equipment prior to placing order with factory. Input voltages of equipment shall match serving utility or system voltage available.

1.12 POSTED OPERATING INSTRUCTIONS:

- A. Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:
 1. Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
 2. Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 3. Safety precautions.
 4. The procedure in the event of equipment failure.
 5. Other items of instruction as recommended by the manufacturer of each system or item of equipment.
- B. Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions where directed. For operating instructions exposed to the weather, provide weather-resistant materials or weatherproof enclosures. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.13 MANUFACTURER'S NAMEPLATE:

- A. Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.14 FIELD FABRICATED NAMEPLATES:

- A. ASTM D709. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified in the technical sections or as indicated on the drawings. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic, 0.125-inch thick, white, with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be one inch by 2.5-inches. Lettering shall be a minimum of 0.25-inch high normal block style.

1.15 WARNING SIGNS:

- A. Provide warning signs/labels for arc flash protection in accordance with NFPA 70E and NEMA Z535.4 for switchboards, panelboards, industrial control panels, and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized. Provide field installed signs/labels to warn qualified persons of potential electric arc flash hazards when warning signs/labels are not provided by the manufacturer. The marking shall be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

1.16 ELECTRICAL REQUIREMENTS:

- A. Electrical installation shall conform to IEEE C2, NFPA 70, and requirements specified herein.

1.17 INSTRUCTION TO GOVERNMENT PERSONNEL:

- A. Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated Government personnel in the adjustment, operation, and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section.

1.18 WARRANTY:

- A. Contractor's Warranty: Installation shall be complete in every detail as specified and ready for use. Unless otherwise indicated, any items supplied by Contractor developing defects of design, construction, or quality within one year of final acceptance by Engineer shall be replaced by such new materials, apparatus or parts to make such defective portion of the complete system conform to the true intent and meaning of the Drawings and Specifications at no additional cost to the State. Lamps shall be warranted for fifty percent of rated lamp life.
- B. The Contractor's Warranty shall be countersigned by the General Contractor.

PART 2 - PRODUCTS

2.01 FACTORY APPLIED FINISH:

- A. Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA 250 corrosion-resistance test and the additional requirements specified in the technical sections.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Install all electrical materials and equipment in accordance with manufacturer's recommendations and as accepted by the Engineer for the seismic zone classification at the project site in accordance with the applicable Building Code.
- B. Cut, break, drill and patch as required, to install electrical system. Repair any surface damaged or marred by notching, drilling or any other process necessary for installation of electrical work. Patch any damaged surfaces to match the existing surface.
- C. All wiring and overcurrent devices for equipment furnished by other trades are sized for a contemplated equipment size. If equipment other than contemplated and indicated on the plan is provided, the Contractor shall be responsible for providing the required wiring, switches, and overcurrent devices at no cost to the State. The Contractor shall submit the proposed revisions to the electrical design to the Engineer for acceptance.
- D. The Electrical Contractor shall coordinate his work with other trades to avoid conflicts with civil, mechanical, structural, and architectural elements of this project.

3.02 JOBSITE CONDITIONS:

- A. These specifications are accompanied by construction drawings including building and site plans of all trades showing locations of all feeder runs, switches, and other electrical equipment. The locations are approximate and before installing, study adjacent architectural details and make installation in most logical manner. Any device may be relocated within 10 feet before installation at the direction of the Engineer without additional cost to the State.
- B. Before installing, verify all dimensions and sizes of equipment.

- C. Verify that electrical system may be installed in strict accordance with the original design, the Drawings and Specifications and the manufacturer's recommendations.
- D. In the event of discrepancy, immediately notify the Engineer. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.03 CONNECTIONS TO EQUIPMENT PROVIDED BY OTHER TRADES:

- A. Electrical Contractor shall provide conduit, wiring and all electrical connections from building wiring to motors for ventilation, air conditioning, and other equipment, including all switches, motor protection devices, and controllers/starters as specified by other trades.
- B. Electrical Contractor shall ascertain from other trades furnishing electrically-operated equipment, the exact size and type of all motors and other loads, the exact locations of such equipment and the proper point where electrical connections should be brought through the floors, ceiling or walls, as the case may be. Locations shown are diagrammatic only; coordination of the correct locations shall be the full responsibility of the Electrical Contractor.
- C. Examine Civil, Mechanical, Architectural, Structural and other Drawings and Specifications for information concerning electrically-operated equipment and control apparatus and diagrams.
- D. Install individually mounted controllers/starters furnished for motors under other Divisions. Provide and install safety switches as necessary for each such motor in accordance with the NEC.
- E. All control devices and control wiring shall be provided as described in the installation manuals of equipment and/or the Drawings and Specifications of other trades and disciplines.

3.04 FIELD APPLIED PAINTING:

- A. Prime and paint all exposed raceways, boxes, fittings, support channels, mounting hardware, and accessories to match finish of adjacent surfaces. Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria.

3.05 FIELD FABRICATED NAMEPLATE MOUNTING:

- A. Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of 2 sheet-metal screws or 2 rivets.

3.06 DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS:

- A. Submit written certification that electrical systems are complete and operational. Submit certification with Contractor's request for final review.
- B. At the time of final review of electrical work, demonstrate the operation of electrical systems. Provide labor, apparatus and equipment for systems' demonstration. The various tests shall be under the direction and supervision of the Engineer.
- C. The Contractor shall provide all test equipment, materials, labor, and temporary power hook-ups to perform start-up and all tests as required, to obtain final field acceptance from the State. All tests shall be conducted in the presence of the Engineer or his representative. All test procedures shall conform to this specification and applicable standards. (ANSI, IEEE, NEMA, OSHA, NFPA, NETA, etc.)
- D. The Contractor shall be responsible for all tests and test record. Testing shall be performed by and under the immediate supervision of the Contractor. Test record shall be kept for each piece of equipment. Copies shall be furnished to the Engineer for his review and/or acceptance.
- E. A visual inspection of all electrical equipment, to check for foreign material, tightness or wiring and connection, proper grounding, matching nameplate charts with specification, etc., shall be made prior to actual testing.
- F. After demonstration of systems, submit to the Engineer 6 sets of keys for electrical equipment locks.

3.07 INSPECTION:

- A. Arrange for periodic inspection by the local authorities and deliver the certificate of final inspection to the Engineer.

END OF SECTION

SECTION 16100 - ELECTRICAL WORK

PART 1 - GENERAL

1.01 SUMMARY:

- A. This section includes, but is not limited to, electrical systems as indicated in the drawings.

1.02 REFERENCES:

- A. The publications listed herein form a part of this specification to the extent referenced. The publications may be referred to in the text by the basic designation only. Unless otherwise indicated, the most recent edition of the publication with current revisions and amendments will be enforced.

1.03 RELATED WORK:

- A. "Section 16011 - General Electrical Requirements" applies to this section with additions and modifications specified herein.

1.04 SUBMITTALS:

- A. Submit in accordance with "Section 01330 - Submittal Procedures".
- B. Submit shop drawings and catalog cuts of the following equipment for approval. Each submittal shall be prepared with a summary sheet attached to each copy identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.
- C. Manufacturer's Catalog Data:
 - 1. Safety switches.
- D. Reports: Submit test results for approval in report form:
 - 1. 600 volt wiring test.

1.05 QUALITY ASSURANCE:

- A. Regulatory Requirements: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" or "must" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Engineer. Provide equipment, materials, installation, and workmanship in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

- B. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where 2 or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.
- C. Alternative Qualifications: Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6,000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.
- D. Material and Equipment Manufacturing Date: Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Materials shall be new and those items listed by the Underwriters' Laboratories shall bear "UL" label of approval.
- B. Brand names, manufacturer's names and catalog numbers indicate the standard of design and quality required. Acceptable manufacturers for electrical apparatus include General Electric, ABB, Square D, Siemens-ITE, and Cutler-Hammer. All apparatus supplied shall bear the name of the approved manufacturer on its nameplates. Substitute materials may be used if pre-qualified prior to bidding by the Engineer.
- C. Electrical equipment shall be supplied through the manufacturer's designated representative by a local distributor.
- D. Proof of compliance shall be furnished when shop drawings are submitted.
- E. Where 2 or more similar type items are furnished, all shall be of the same manufacture, e.g., safety switches shall be of the same manufacturer unless otherwise noted.

2.02 RACEWAYS:

- A. Rigid Steel Conduit: Rigid steel, zinc-coated inside and outside, for use with threaded fittings. ANSI C80.1, UL 6.
- B. Intermediate Metal Conduit (IMC): Rigid steel, zinc- and chromate-coated inside and outside, for use with threaded fittings. UL 1242.
- C. Plastic-Coated Rigid Steel and IMC Conduit: NEMA RN1, Type 40 (40 mils thick).
- D. Electrical Metal Tubing (EMT): Thin-walled steel tubing, zinc-coated. UL 797, ANSI C80.3.
- E. Flexible Metal Conduit: Flexible steel conduit; zinc-coated inside and outside, smooth inside walls, liquid-tight with factory fittings for liquid-tight installation. Provide bushings with bonding jumper lugs for flexible conduit in excess of 6 feet in length. UL 1, UL 360.
- F. Fittings for Metal Conduit, EMT, and Flexible Metal Conduit: UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B.
- G. Fittings for Rigid Metal Conduit and IMC: Threaded-type. Split couplings unacceptable.
- H. Fittings for EMT: Steel compression type.

2.03 WIRES AND CABLES:

- A. Wires and cables shall meet applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to site shall not be used.
- B. Conductors:
 - 1. Conductors No. 8 AWG and larger diameter shall be stranded.
 - 2. Conductors No. 10 AWG and smaller diameter shall be solid.
 - 3. Conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise.
 - 4. Conductor sizes and capacities shown are based on copper, unless indicated otherwise. All conductors shall be copper.
 - 5. Equipment Manufacturer Requirements: When manufacturer's equipment requires copper conductors at the terminations or requires copper conductors to be provided between components of equipment, provide copper conductors or splices, splice boxes, and other work required to satisfy manufacturer's requirements.
 - 6. Minimum Conductor Sizes:

- a. Minimum size for branch circuits shall be No. 12 AWG.
 - b. Class 1 remote-control and signal circuits: No. 14 AWG.
 - c. Class 2 low-energy, remote-control and signal circuits: No. 16 AWG.
 - d. Class 3 low-energy, remote-control, alarm and signal circuits: No. 22 AWG.
- C. Color Coding: Provide for service, feeder, branch, control, and signaling circuit conductors.
1. Color of ground and neutral conductors shall be as follows:
 - a. Grounding conductors: Green.
 - b. Neutral conductors: White.
 - c. Exception, where neutrals of more than one system are installed in same raceway or box, other neutrals shall be white with a different colored (not green) stripe for each.
 2. Color of ungrounded conductors in different voltage systems shall be as follows:
 - a. 208/120 volt, 3-phase:
 - 1) Phase A - black.
 - 2) Phase B - red.
 - 3) Phase C - blue.
- D. Insulation: Unless specified or indicated otherwise or required by NFPA 70, power and lighting wires shall be 600-volt, Type THWN/THHN conforming to UL 83 or Type XHHW or RHW conforming to UL 44, except that grounding wire may be type TW conforming to UL 83; remote-control and signal circuits shall be Type TW or TF, conforming to UL 83.

2.04 SPLICES AND TERMINATION COMPONENTS:

- A. UL 486A-486B for wire connectors and UL 510 for insulating tapes. Connectors for No. 10 AWG and smaller diameter wires shall be insulated, pressure-type in accordance with UL 486A-486B or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.05 SWITCHES:

- A. Disconnect (Safety) Switches: NEMA KS 1. Provide heavy duty-type switches. Switches serving as motor-disconnect means shall be horsepower rated. Provide switches in NEMA 1, enclosure as indicated per NEMA ICS 6.

2.06 ENCLOSED CIRCUIT BREAKERS:

- A. UL 489. Individual molded case circuit breakers with voltage and continuous current ratings, number of poles, overload trip setting, and short circuit current interrupting rating as indicated. Enclosure type as indicated. Provide solid neutral.

2.07 MOTORS:

- A. Provide motors in accordance with the following:
 - 1. NEMA MG 1.
 - 2. Hermetic-type sealed motor compressors shall also comply with UL 984.
 - 3. Provide the size in terms of HP or kVA, or full-load current, or a combination of these characteristics, and other characteristics, of each motor as indicated or specified.
 - 4. Determine specific motor characteristics to ensure provision of correctly sized starters and overload heaters.
 - 5. Motors for operation on 208-volt, 3-phase circuits shall have terminal voltage rating of 200 volts, and those for operation on 480-volt, 3-phase circuits shall have terminal voltage rating of 460 volts.
 - 6. Motors shall be designed to operate at full capacity with voltage variation of plus or minus 10 percent of motor voltage rating.
 - 7. Unless otherwise indicated, motors rated 1 HP and above shall be continuous duty type.
 - 8. Where fuse protection is specifically recommended by the equipment manufacturer, provide fused switches in lieu of non-fused switches indicated.
- B. Premium Efficiency Polyphase Motors and Single-Phase Motors: Select polyphase and continuous-duty single phase motors based on high efficiency characteristics relative to typical characteristics and applications as listed in NEMA MG 10 and NEMA MG 11. In addition, continuous rated, polyphase squirrel-cage medium induction motors must meet the requirements for premium efficiency electric motors in accordance with NEMA MG 1, including the NEMA full load efficiency ratings. In exception, for motor-driven equipment with a minimum seasonal or overall efficiency rating, such as a SEER rating, provide equipment with motor to meet the overall system rating indicated.
- C. Motor Sizes: Provide size for duty to be performed, not exceeding the full-load nameplate current rating when driven equipment is operated at specified capacity under most severe conditions likely to be encountered. When motor size provided differs from size indicated or specified, make adjustments to wiring, disconnect devices, and branch circuit protection to accommodate equipment actually provided. Provide controllers for motors rated 1 HP and above with electronic phase-voltage monitors designed to protect motors from phase-loss, undervoltage, and

overvoltage. Provide protection for motors from immediate restart by a time adjustable restart relay.

2.08 LOCKOUT REQUIREMENTS:

- A. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147. Mechanical isolation of machines and other equipment shall be in accordance with requirements of "Division 15 - Mechanical".

2.09 MANUFACTURER'S NAMEPLATE:

- A. Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

2.10 FIELD FABRICATED NAMEPLATES:

- A. Provide field fabricated nameplates in accordance with the following:
 1. ASTM D709.
 2. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified or as indicated on the drawings.
 3. Each nameplate inscription shall identify the function and, when applicable, the position.
 4. Nameplates shall be melamine plastic, 0.125 inch thick, white with black center core.
 5. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core.
 6. Minimum size of nameplates shall be one inch by 2.5 inches.
 7. Lettering shall be a minimum of 0.25 inch high normal block style.

2.11 WARNING SIGNS:

- A. Provide warning signs for flash protection in accordance with NFPA 70E and NEMA Z535.4 for switchboards, panelboards, industrial control panels, and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized. Provide field installed signs to warn qualified persons of potential electric arc flash hazards when warning signs are not provided by the manufacturer. The marking shall be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

2.12 FIRESTOPPING MATERIALS:

- A. Provide firestopping around electrical penetrations. Utilize UL-listed firestopping systems or assemblies suitable for the penetration being sealed.

2.13 FACTORY APPLIED FINISH:

- A. Provide factory-applied finish on electrical equipment in accordance with the following:
 1. NEMA 250 corrosion-resistance test and the additional requirements as specified herein.
 2. Interior and exterior steel surfaces of equipment enclosures shall be thoroughly cleaned and then receive a rust-inhibitive phosphatizing or equivalent treatment prior to painting.
 3. Exterior surfaces shall be free from holes, seams, dents, weld marks, loose scale or other imperfections.
 4. Interior surfaces shall receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer's standard practice.
 5. Exterior surfaces shall be primed, filled where necessary, and given not less than 2 coats baked enamel with semi-gloss finish.
 6. Equipment located indoors shall be ANSI Light Gray.
 7. Provide manufacturer's coatings for touch-up work and as specified in item entitled "FIELD APPLIED PAINTING" hereinbelow.

2.14 HARDWARE, SUPPORTS, BACKING, ETC.:

- A. Provide all hardware, supports, backing and other accessories necessary to install electrical equipment. Wood materials shall be treated against termites, iron or steel materials shall be galvanized for corrosion protection, and non-ferrous materials shall be brass or bronze. Provide other specialty materials where indicated.
- B. Bolts, nuts, washers, and screws used for exterior use shall be high quality stainless steel or brass.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Electrical installations, including weatherproof and hazardous locations and ducts, plenums and other air-handling spaces, shall conform to requirements of NFPA 70 and IEEE C2 and to requirements specified herein.

- B. Wiring Methods: Provide insulated conductors installed in rigid steel conduit, IMC, rigid nonmetallic conduit, or EMT, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Utilize non-wax type lubricants for pulling, chemically neutral to insulation and sheath. Mechanical means for pulling to be tongue-limiting type and not be used for #2 AWG wires and smaller. Grounding conductor shall be separate from electrical system neutral conductor. Provide insulated green equipment grounding conductor for circuit(s) installed in conduit and raceways. Minimum conduit size shall be 3/4 inch in diameter for low voltage lighting and power circuits. Conduit which penetrates fire-rated walls, fire-rated partitions, or fire-rated floors shall be firestopped.
1. Pull Wire: Install pull wires in empty conduits. Pull wire shall be plastic having minimum 200-pound force tensile strength. Leave minimum 36 inches of slack at each end of pull wire.
- C. Conduit Installation: Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.
1. Restrictions Applicable to EMT:
 - a. Do not install underground.
 - b. Do not encase in concrete, mortar, grout, or other cementitious materials.
 - c. Do not use in areas subject to severe physical damage including but not limited to equipment rooms where moving or replacing equipment could physically damage the EMT.
 - d. Do not use outdoors, including under open-sided covered lanais, patios, walkways or other similar locations.
 - e. Do not use exposed below +8 feet above the finished floor, except in dedicated Electrical Rooms.
 2. Restrictions Applicable to Flexible Conduit: Use only as specified in subparagraph entitled "Flexible Connections" hereinbelow.
 3. Conduit Support: Support conduit by pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Plastic tie-wraps are not allowed for securing or supporting of electrical conduit. Load applied to fasteners shall not exceed 1/4 proof test load. Fasteners attached to concrete ceiling shall be vibration resistant and shock-resistant. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete joints shall not cut main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet metal

- screws. In suspended-ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Conduit and box systems shall be supported independently of both (a) tie wires supporting ceiling grid system, and (b) ceiling grid system into which ceiling panels are placed. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts. Installation shall be coordinated with above-ceiling mechanical systems to assure maximum accessibility to all systems. Spring-steel fasteners may be used for lighting branch circuit conduit supports in suspended ceilings in dry locations. For conduits greater than 2-1/2 inches inside diameter, provide supports to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction.
4. Directional Changes in Conduit Runs: Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of obstructions.
 5. Locknuts and Bushings: Fasten conduits to sheet metal boxes and cabinets with 2 locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits and provide insulating type where required by NFPA 70.
 6. Flexible Connections: Provide flexible steel conduit between 3 feet and 6 feet in length for equipment subject to vibration, noise transmission, or movement; and for motors. Install flexible conduit to allow 20 percent slack. Minimum flexible steel conduit size shall be 1/2 inch diameter. Provide liquid-tight flexible conduit in wet and damp locations for equipment subject to vibration, noise transmission, movement or motors. Provide separate ground conductor across flexible connections.
- D. Boxes, Outlets, and Supports: Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be cast-metal, hub-type when located in wet locations, when surface mounted on outside of exterior surfaces, when surface mounted on interior walls exposed up to 8 feet above floors and walkways, and when specifically indicated. Boxes in other locations shall be sheet steel, except that nonmetallic boxes may be used with nonmetallic conduit system. Each box shall have volume required by NFPA 70 for number of conductors enclosed in box. Boxes for mounting lighting fixtures shall be minimum 4 inches square, or octagonal, except that smaller boxes may

be installed as required by fixture configurations, as approved. Boxes for use in masonry-block or tile walls shall be square-cornered, tile-type, or standard boxes having square-cornered, tile-type covers. Provide gaskets for cast-metal boxes installed in wet locations and boxes installed flush with outside of exterior surfaces. Provide separate boxes for flush or recessed fixtures when required by fixture terminal operating temperature; fixtures shall be readily removable for access to boxes unless ceiling access panels are provided. Support boxes and pendants for surface-mounted fixtures on suspended ceilings independently of ceiling supports. Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel. Threaded studs driven in by powder charge and provided with lockwashers and nuts or nail-type nylon anchors may be used in lieu of wood screws, expansion shields, or machine screws. In open overhead spaces, cast boxes threaded to raceways need not be separately supported except where used for fixture support; support sheet metal boxes directly from building structure or by bar hangers. Where bar hangers are used, attach bar to raceways on opposite sides of box, and support raceway with approved-type fastener maximum 24 inches from box. When penetrating reinforced concrete members, avoid cutting reinforcing steel.

1. Pull Boxes: Construct of at least minimum size required by NFPA 70 of code-gauge galvanized sheet steel except where cast-metal boxes are required in locations specified herein. Provide boxes with screw-fastened covers. Where several feeders pass through common pull box, tag feeders to indicate clearly electrical characteristics, circuit number, and panel designation.
- E. Mounting Heights: Mount panelboards, enclosed circuit breakers, and disconnecting switches so height of any operating handle at its highest position is a maximum 78 inches above finished floor.
- F. Conductor Identification: Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, color coding shall be by factory-applied, color-impregnated insulation. For conductors No. 4 AWG and larger diameter, color coding shall be by plastic-coated, self-sticking markers; colored nylon cable ties and plates; or heat shrink-type sleeves. Identify control circuit terminations in accordance with manufacturer's recommendations.
1. Marking Strips: Provide marking strips in accordance with the following:
 - a. White or other light-colored plastic marking strips, fastened by screws to each terminal block, shall be provided for wire designations.
 - b. The wire numbers shall be made with permanent ink.

- c. The marking strips shall be reversible to permit marking both sides, or 2 marking strips shall be furnished with each block.
 - d. Marking strips shall accommodate the 2 sets of wire numbers.
 - e. Each device to which a connection is made shall be assigned a device designation in accordance with NEMA ICS 1 and each device terminal to which a connection is made shall be marked with a distinct terminal marking corresponding to the wire designation used on the Contractor's schematic and connection diagrams.
 - f. The wire (terminal point) designations used on the Contractor's wiring diagrams and printed on terminal block marking strips may be according to the Contractor's standard practice; however, additional wire and cable designations for identification of remote (external) circuits shall be provided for the Government's wire designations.
 - g. Prints of the marking strips drawings submitted for approval will be so marked and returned to the Contractor for addition of the designations to the terminal strips and tracings, along with any rearrangement of points required.
- G. Splices: Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors No. 8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.
- H. Electrical Penetrations: Openings around electrical penetrations (such as conduit penetrations or flush mounted equipment enclosures or junction boxes) through fire resistance-rated walls, partitions, floors, or ceilings shall be sealed to maintain fire resistive integrity. Use 3M CP25, Type MPP moldable putty or equivalent material or assemblies to maintain fire resistive integrity for conduit penetration and flush mounted outlet boxes. Use other approved construction methods for larger enclosures.
- I. Grounding and Bonding: Provide in accordance with NFPA 70. Ground exposed, non-current-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in metallic and nonmetallic raceways, telecommunications system grounds, and neutral conductor of wiring systems.
- J. Equipment Connections: Provide power wiring for the connection of motors and control equipment under this section of the specification. Except as otherwise specifically noted or specified, automatic control wiring, control devices, and protective devices within the control circuitry are not included in this section of the specifications but shall be provided under the section specifying the associated equipment.

- K. Seismic Bracing: Contractor shall provide seismic bracing for all electrical equipment, apparatus, and raceways. Bracing shall, as a minimum, comply with the County Building Code.
- L. Repair of Existing Work: Repair of existing work, demolition, and modification of existing electrical distribution systems shall be performed as follows:
 - 1. Workmanship: Lay out work in advance. Exercise care where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary for proper installation, support, or anchorage of conduit, raceways, or other electrical work. Repair damage to buildings, piping, and equipment using skilled craftsmen of trades involved.
 - 2. Continuation of Service: Maintain continuity of existing circuits of equipment to remain. Existing circuits of equipment shall remain energized. Circuits which are to remain but were disturbed during demolition shall have circuits wiring and power restored back to original condition.

3.02 FIELD FABRICATED NAMEPLATE MOUNTING:

- A. Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of 2 sheet-metal screws or 2 rivets.

3.03 WARNING SIGN MOUNTING:

- A. Provide the number of signs required to be readable from each accessible side. Space the signs in accordance with NFPA 70E.

3.04 FIELD APPLIED PAINTING:

- A. Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria. Where field painting of enclosures for panelboards, load centers or the like is specified to match adjacent surfaces, to correct damage to the manufacturer's factory applied coatings, or to meet the indicated or specified safety criteria, provide manufacturer's recommended coatings and apply in accordance to manufacturer's instructions.

3.05 FIELD QUALITY CONTROL:

- A. Furnish test equipment and personnel and submit written copies of test results. Give Contracting Officer 5 working days' notice prior to each test.
 - 1. Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least 5 times, demonstrating satisfactory operation each time.

2. 600-Volt Wiring Test: Test wiring rated 600 volt and less to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 500 volts to provide direct reading of resistance. Minimum resistance shall be 250,000 ohms. Submit results to the Contracting Officer.

END OF SECTION

YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL

3675 KILAUEA AVENUE
HONOLULU, HAWAII 96816

PROJECT NO. 25-046
T.M.K.: 3-2-031:001

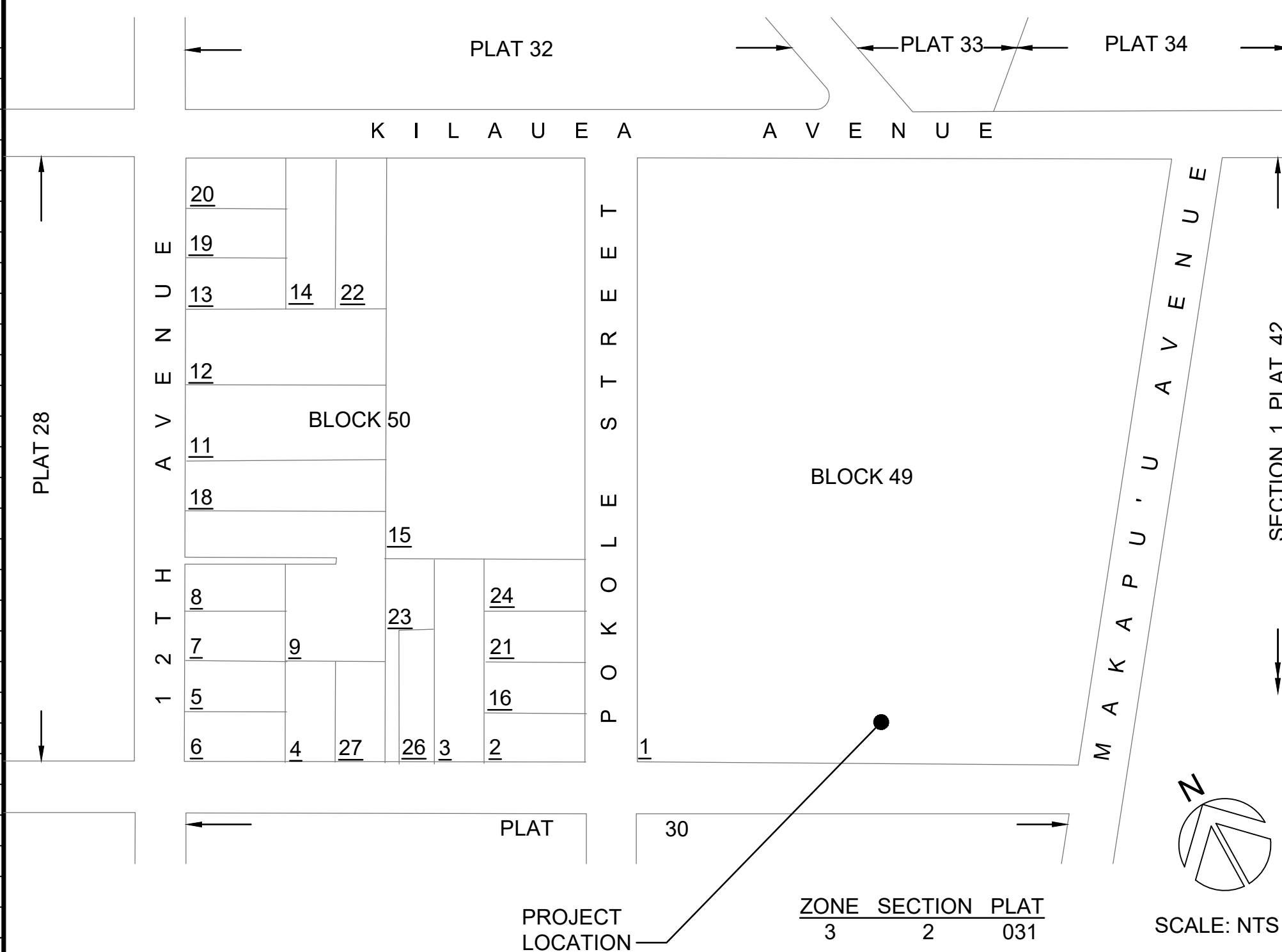
PREPARED BY MECHANICAL / ELECTRICAL ENGINEER: INSYNERGY ENGINEERING, INC.

REVISIONS	BY
1	JY
ADD 1	
03/26/2026	

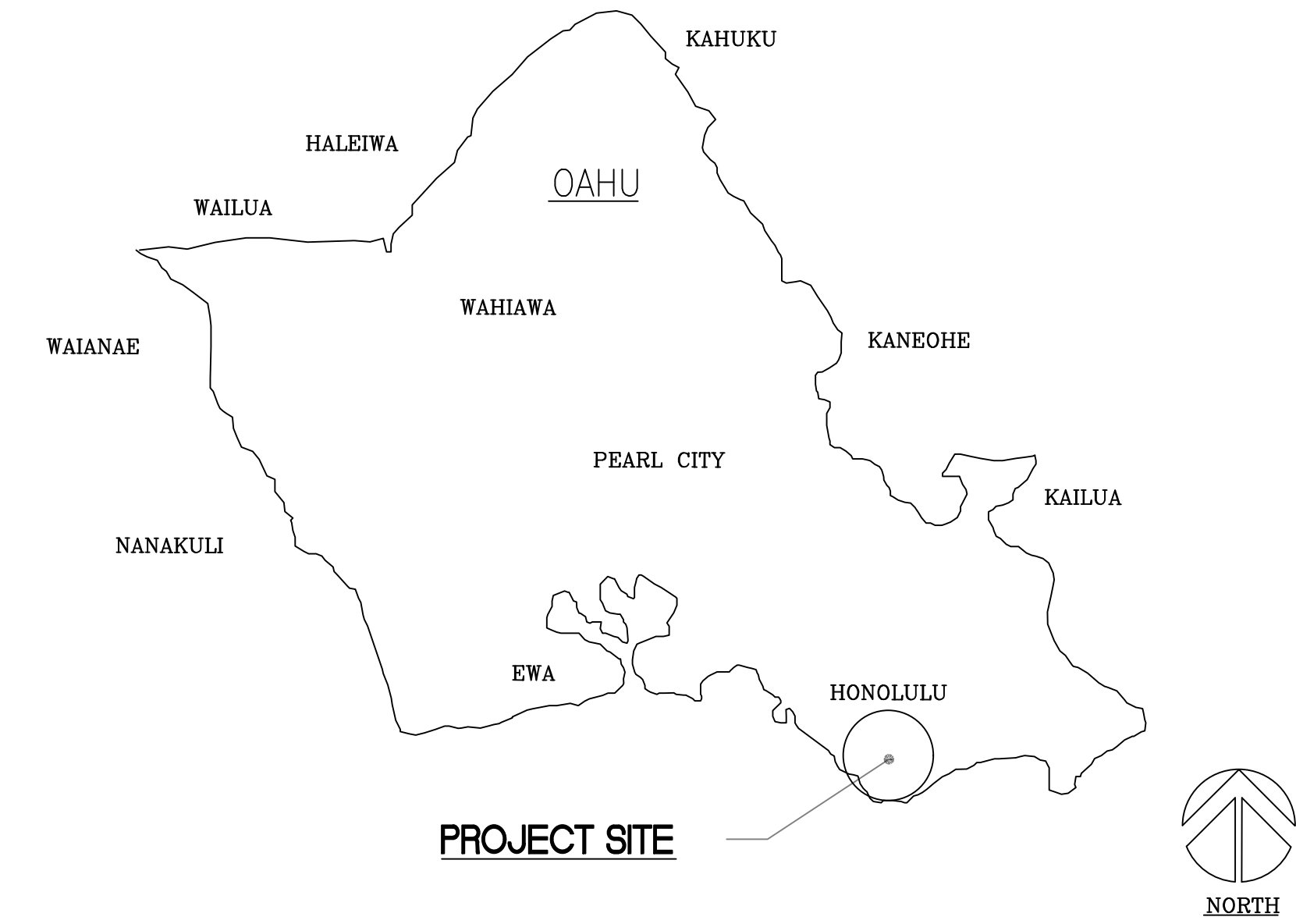
INDEX OF DRAWINGS

SHT. NO.	DWG. NO.	DESCRIPTION
1	001	TITLE SHEET
2	M-001	MECHANICAL GENERAL NOTES AND LEGEND
3	MD101	MECHANICAL BASEMENT DEMOLITION PLAN
4	M-101	MECHANICAL BASEMENT NEW PLAN
5	M-401	HEAT PUMP ISOMETRIC DIAGRAM
6	M-501	MECHANICAL DETAILS
7	M-601	MECHANICAL SCHEDULES
8	M-701	SCHEMATIC, CONTROLS, AND SEQUENCE OF OPERATIONS
9	E-001	ELECTRICAL GENERAL NOTES AND ABBREVIATIONS LIST
10	ED101	ELECTRICAL DEMOLITION PLAN
11	E-101	ELECTRICAL NEW WORK
12	E-601	ONE-LINE DIAGRAM AND EQUIPMENT SCHEDULE

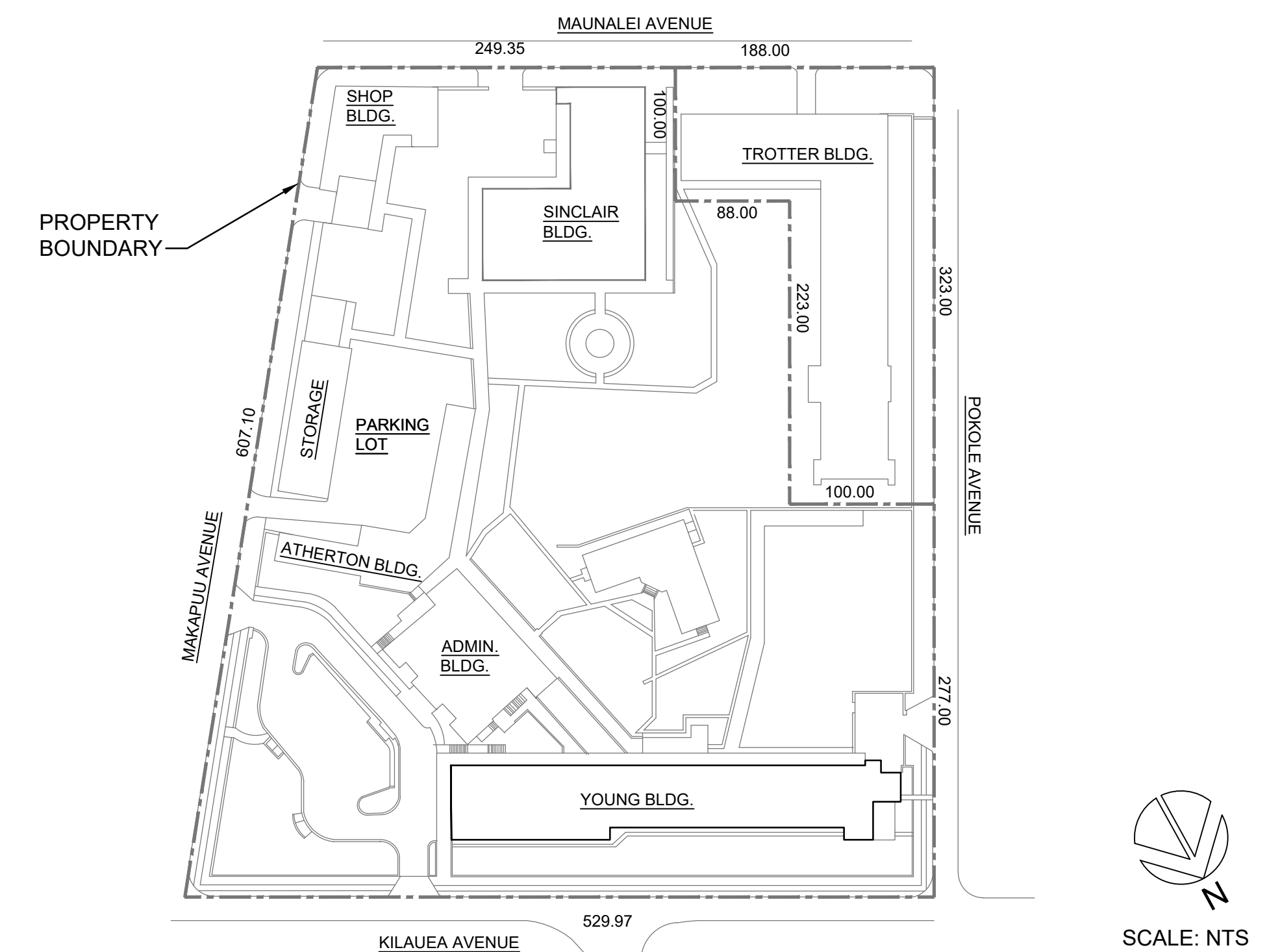
TAX MAP KEY



ISLAND MAP



PLOT PLAN



PROJECT COMMERCIAL BUILDING CODE INFORMATION:

TYPE OF OCCUPANCY GROUP: B

TYPE OF CONSTRUCTION: IIB

STRUCTURE CODE: OFFICE BUILDING

TOTAL NUMBER OF BUILDING STORY HEIGHT: 2 STORIES

THIS PROJECT UNIT FLOOR LEVEL: 1

EXISTING TOTAL FLOOR AREA (SF): 4,650

NEW FLOOR AREA (SF) OF THIS PROJECT: 0

SPECIAL INSPECTIONS ("YES" OR "NO"): NO

CALLED INSPECTION ("YES" OR "NO"): NO

This work was prepared by me or under my supervision and construction of this project will be under my observation.

Joel P. Yuen

EXPIRATION DATE: 03/26/2026

INSYNERGY ENGINEERING

MECHANICAL • ELECTRICAL • FIRE PROTECTION

1001 Bishop Street Suite 2500, Honolulu, Hawaii 96813

Phone: (808) 521-3773 Fax: (808) 521-3993

YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL

3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816

T.M.K.: 3-2-031:01

TITLE SHEET

Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046
Sheet 1	001

Of 12 Sheets

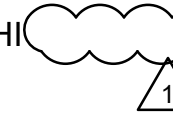
MECHANICAL GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE ENGINEER ANY MAJOR DEVIATIONS FROM THE PLANS DUE TO UNFORESEEN OR VARYING FIELD CONDITIONS.
2. THE ENTIRE INSTALLATION SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE BUILDING CODE OF THE COUNTY OF HONOLULU, THE STATE HEALTH DEPARTMENT REGULATIONS, THE LATEST EDITION OF THE UNIFORM PLUMBING CODE, HAWAII STATE MODEL ENERGY CODE, NFPA 13, AND ALL AGENCIES HAVING JURISDICTION.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT INCLUDING CUTTING AND PATCHING AS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.
4. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES, LICENSES AND INSPECTIONS.
5. SUBMIT FOR REVIEW SIX COPIES OF MANUFACTURER'S LITERATURE ON ALL ITEMS FURNISHED FOR THIS WORK, INCLUDING OPERATION AND MAINTENANCE MANUALS.
6. INSTALL ALL EQUIPMENT AND MATERIALS IN A FIRST CLASS MANNER CONFORMING TO RECOGNIZED COMMERCIAL STANDARDS.
7. PAINT ALL EXPOSED MATERIALS TO MATCH ADJACENT SURFACES.
8. CONTRACTOR SHALL PATCH AND FINISH ALL EXPOSED MATERIALS AND NEW CONSTRUCTION TO MATCH EXISTING SURFACES OR AS INDICATED.
9. ALL PENETRATIONS THROUGH FIRE RATED WALLS, FLOORS OR PARTITIONS SHALL BE PROPERLY FIRESTOPPED WITH APPROVED MATERIALS APPROPRIATE FOR THE PENETRATION TYPE.
10. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE ADEQUATE CLEARANCES FOR MAINTENANCE.
11. PROVIDE CONTROL DEVICES AND CONTROL WIRING AS INDICATED.
12. COORDINATE CONNECTIONS TO EQUIPMENT SUPPLIED BY OTHERS AND MAKE ALL CONNECTIONS FOR CW, HW, DRAIN AND WASTE PIPING.
13. WARRANTY:
 - A. ALL WORK IN THIS SECTION SHALL BE UNDER WARRANTY FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE WORK AS A WHOLE BY THE ENGINEER. SHOULD ANY EQUIPMENT OR MATERIAL FAIL WITHIN THIS PERIOD, THE CONTRACTOR SHALL REPLACE/REPAIR THAT ITEM AT NO COST TO THE OWNER FOR MATERIAL AND/OR SERVICES, IF SUCH IS DUE TO FAULTY WORKMANSHIP OR QUALITY OF MATERIAL FURNISHED.
 - B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE TO ANY PART OF THE PREMISES CAUSED BY FAILURE IN THE EQUIPMENT UNDER THIS SECTION FOR A PERIOD ON ONE YEAR AFTER THE FINAL ACCEPTANCE OF THE WORK AS A WHOLE.

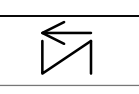

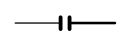
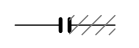
MECHANICAL INSTALLATION NOTES:

1. THE CONTRACTOR SHALL PLUMB THE WATER PIPING AS INDICATED IN THE APPROPRIATE DIAGRAMS IN ACCORDANCE WITH LOCAL AND NATIONAL CODES THAT APPLY.
2. INSULATION: ALL HOT WATER PIPING SHOULD BE INSULATED WITH FIBERGLASS AND PAPER SHEATHING.
3. EXISTING HOT WATER STORAGE TANKS SHOULD HAVE ACCUMULATED SCALE DEPOSITS REMOVED PRIOR TO STARTING THE HEAT PUMP SYSTEM. USING EXISTING TANKS WITHOUT PROPER CLEANING CAN RESULT IN FOULING OF THE INTERNAL HEAT PUMP WATER PIPING AND MAY CAUSE DAMAGE TO THE WATER CIRCULATING PUMP.
4. SET THE DIFFERENTIAL TEMPERATURE LARGE ENOUGH SO THAT THE HEAT PUMP RUNS FOR AT LEAST 10 MINUTES ONCE IT STARTS TO ALLOW PROPER OIL CIRCULATION AND EXPANSION VALVE MODULATION.
5. ENSURE THAT THE WATER SYSTEM VALVE LINE-UP TO ENSURE THAT THE HEAT PUMP IS NOT ISOLATED FROM THE SYSTEM AND THAT THERE IS MAKE-UP WATER AVAILABLE.
6. AT STARTUP, CHECK COMPRESSORS FOR PROPER ROTATION. ON STARTUP, THE DISCHARGE PRESSURE WILL RISE AND THE SUCTION PRESSURE FALL AS INDICATED BY THE INSTALLED SERVICE GAUGES.

PHASING NOTES:

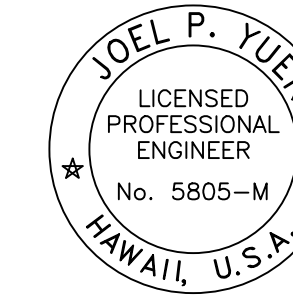
1. MAINTAIN EXISTING HOT WATER SYSTEM OPERATIONAL TO THE MAXIMUM EXTENT POSSIBLE.
2. COORDINATE WITH LEAHI  FOR OUTAGES TO HOT WATER, AND POWER.

MECHANICAL LEGEND

SYMBOL	ABBRV.	DESCRIPTION
		CHECK VALVE
	EXST	EXISTING
	GWH	GAS WATER HEATER
		GATE VALVE
	HP	HEAT PUMP
	HWR	HOT WATER RETURN
	HWS	HOT WATER SUPPLY
	NTS	NOT TO SCALE
	POC	POINT OF CONNECTION
	POR	POINT OF REMOVAL
	ST	STORAGE TANK

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCES OF HONOLULU 2021
CHAPTER 16B

TO THE BEST OF MY KNOWLEDGE, THIS PROJECT'S DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY CONSERVATION CODE FOR:

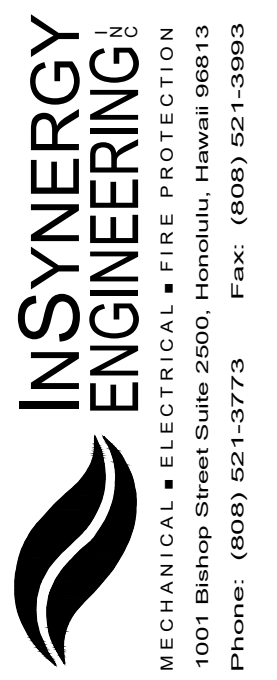


 X MECHANICAL COMPONENT SYSTEMS

SIGNATURE: Joel P. Yuen DATE: 03-26-2026
 NAME: JOEL P. YUEN
 TITLE: MECHANICAL ENGINEER
 LICENSE No.: 5805-M

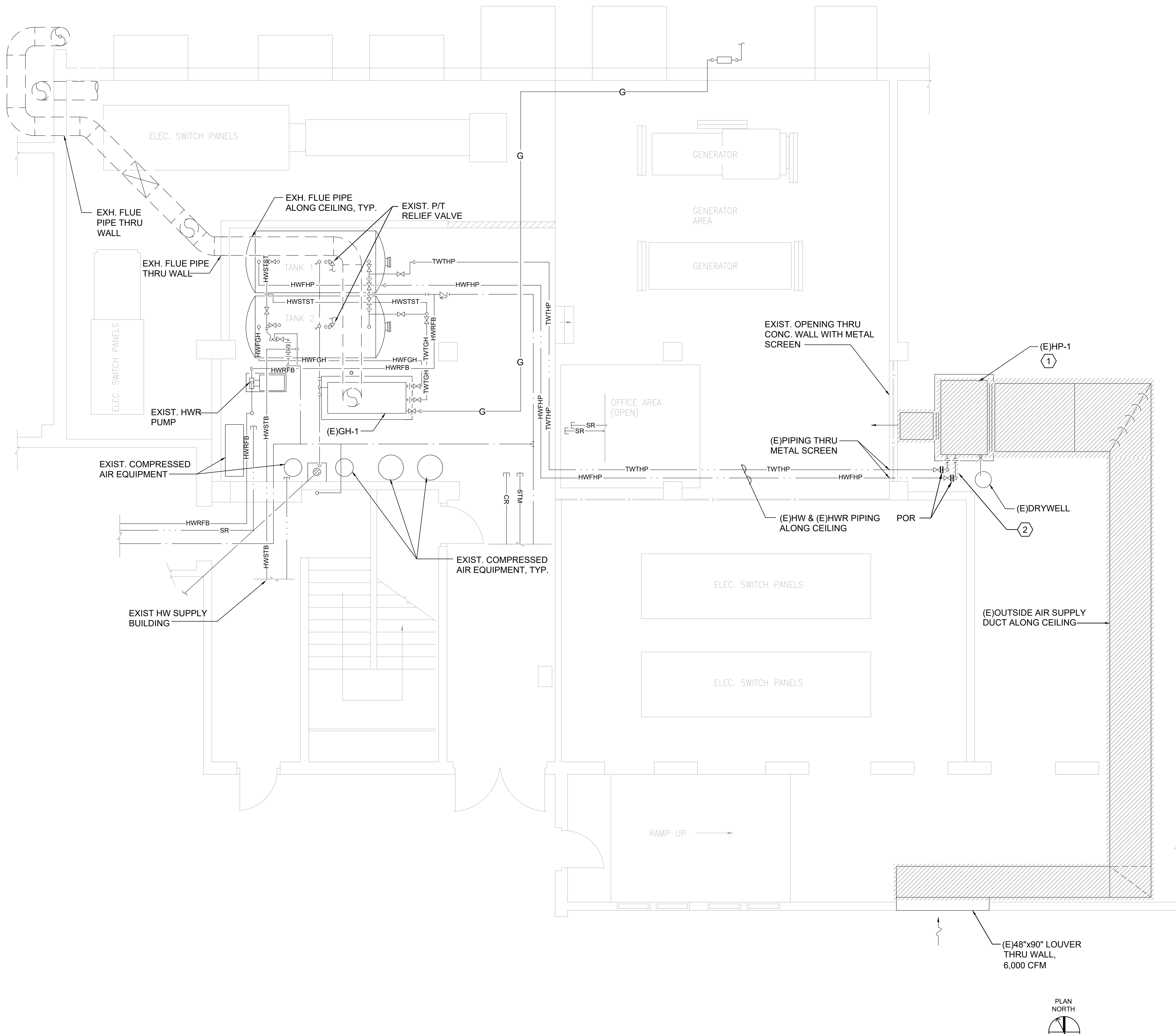
REVISIONS	BY
1 ADD 1	JY
03/26/2026	

This work was prepared by me or under my supervision and construction of this project will be under my observation.
 JOEL P. YUEN
 LICENSED PROFESSIONAL ENGINEER
 No. 5805-M
 HAWAII, U.S.A.
 EXPIRATION DATE: 03/30/2028



YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
 3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
 TMK: 3-2-31.01
 MECHANICAL NOTES, LEGENDS, AND ABBREVIATIONS

Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046
Sheet 2	
M-001	
Of 12 Sheets	



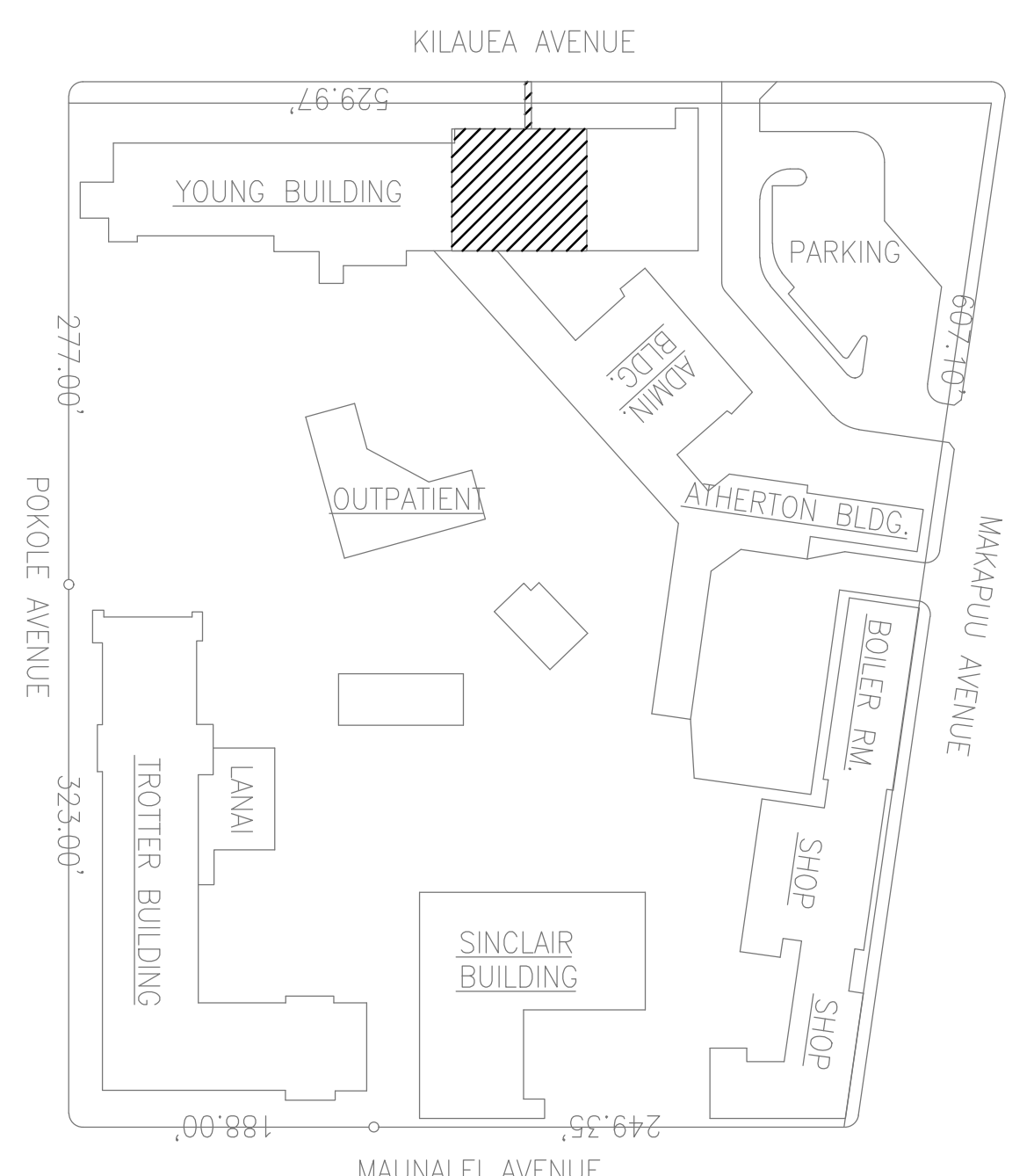
- MECHANICAL DEMO NOTES:**
- 1 REMOVE (E)HP-1 AND ASSOCIATED DUCTWORK, WIRING, AND CONTROLS. EXISTING CONCRETE PAD AND INTAKE LOUVER TO REMAIN.
 - 2 REMOVE EXISTING HOT WATER PIPING UP TO ISOLATION VALVES.

REVISIONS	BY
1	JY
ADD 1	
03/26/2026	

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JOE P. YUEN
 LICENSED PROFESSIONAL ENGINEER
 No. 9805-M
 HAWAII, U.S.A.
 EXPIRATION DATE: 03/26/2026

INSYNERGY ENGINEERING
 MECHANICAL • ELECTRICAL • FIRE PROTECTION
 1001 Bishop Street Suite 2050, Honolulu, Hawaii 96813
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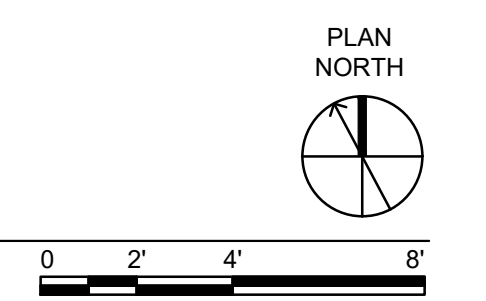
KEY PLAN
NOT TO SCALE

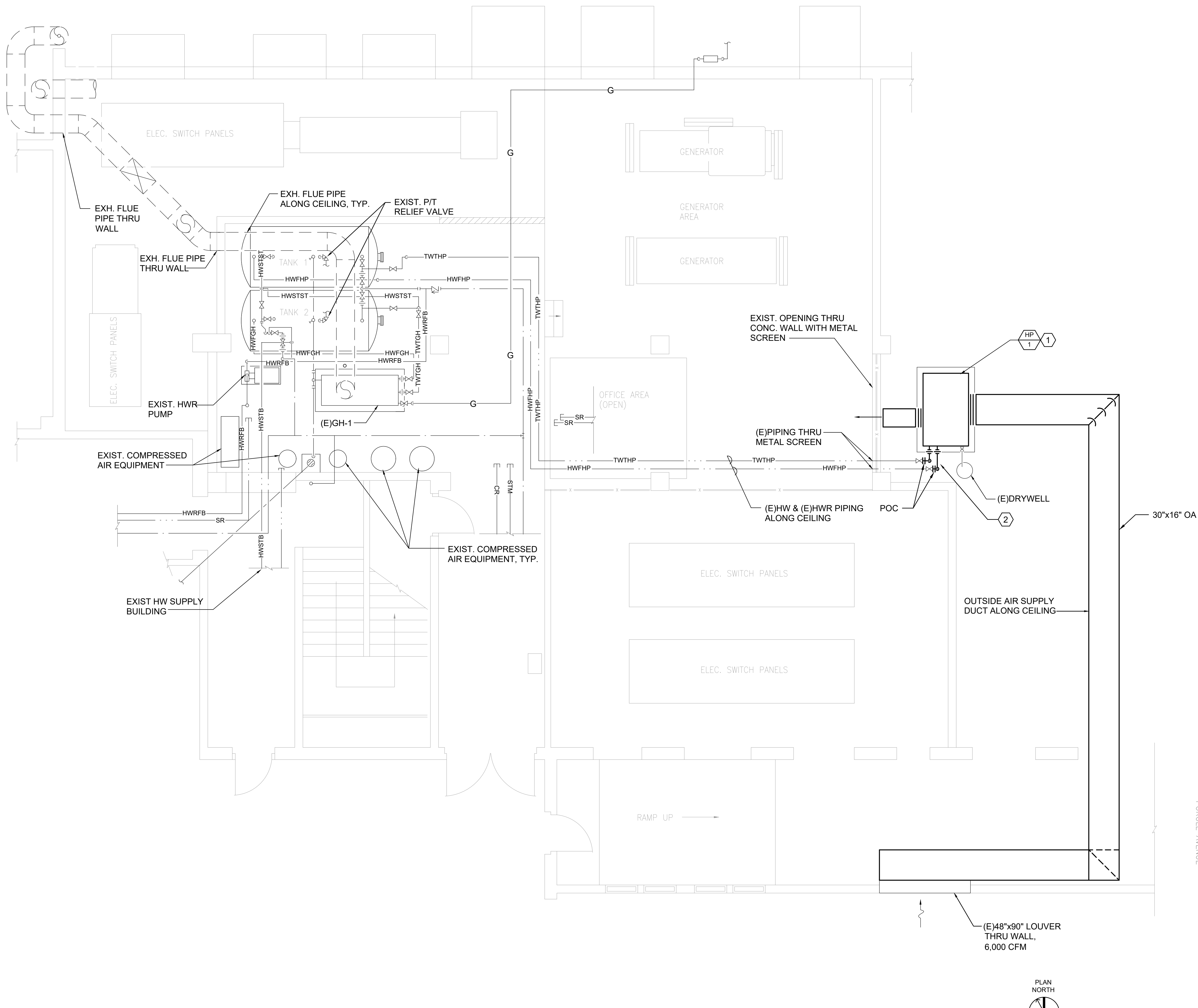
YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEIHI HOSPITAL
 3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
 TMK: 3-2-31.01
 MECHANICAL BASEMENT DEMOLITION PLAN PLAN

Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046

Sheet 3
MD101
 Of 12 Sheets

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





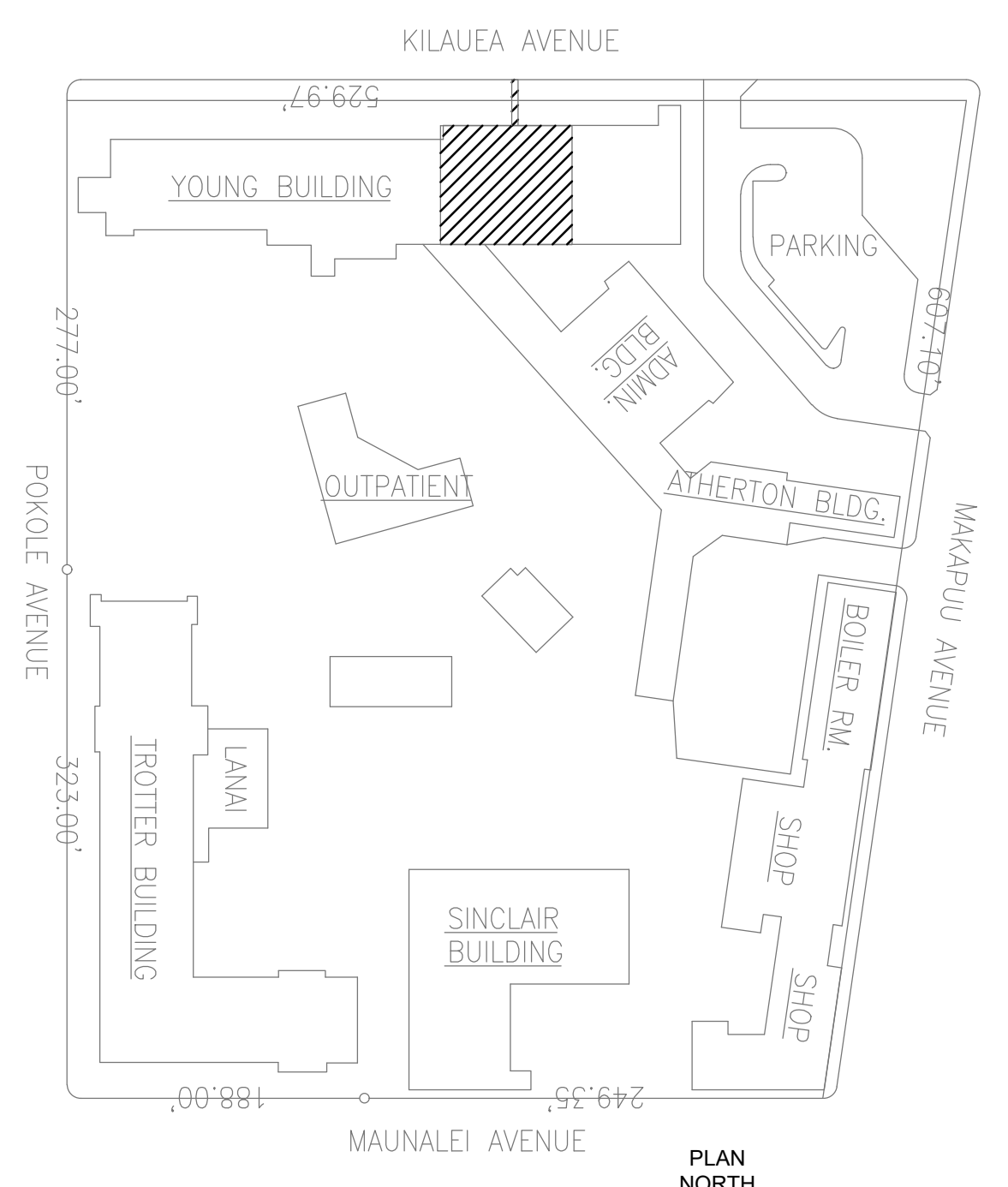
- MECHANICAL DEMO NOTES:**
- 1 INSTALL NEW HP-1 AND ASSOCIATED DUCTWORK, WIRING, AND CONTROLS. EXISTING CONCRETE PAD AND INTAKE LOUVER TO REMAIN. CONNECT TO EXISTING CONDENSATE DRAIN PIPING TO DRYWELL.
 - 2 PROVIDE NEW HOT WATER PIPING UP TO ISOLATION VALVES.

REVISIONS	BY
1	JY
ADD 1	JY
03/26/2026	

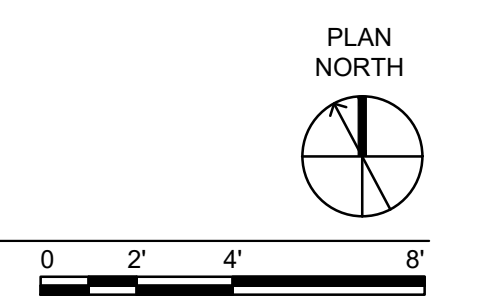
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JOE P. YUEN
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 No. 9805-M
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 EXPIRATION DATE: 03/30/2028

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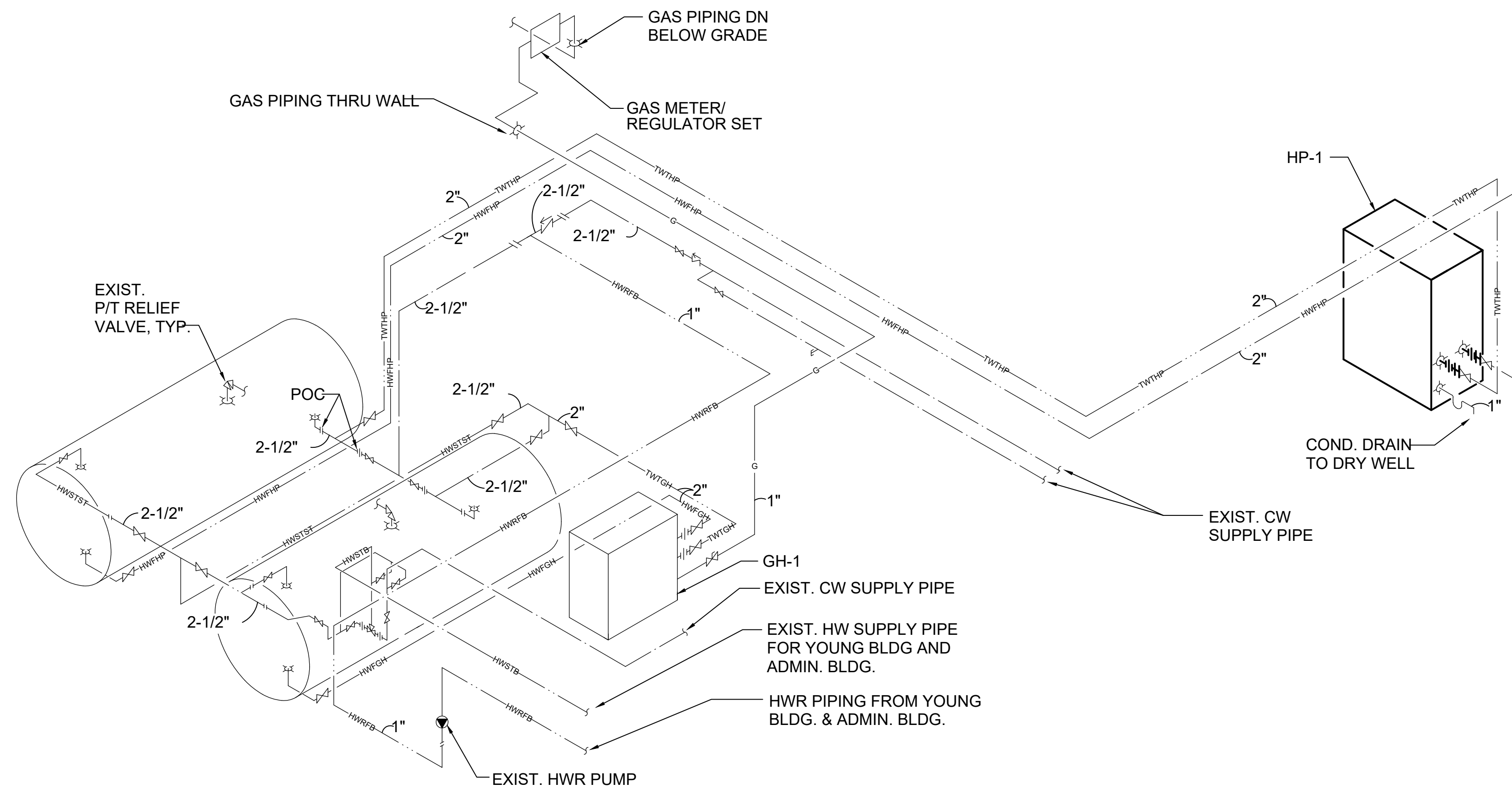
1 MECHANICAL BASEMENT NEW PLAN PLAN
 SCALE: 1/4" = 1' - 0"



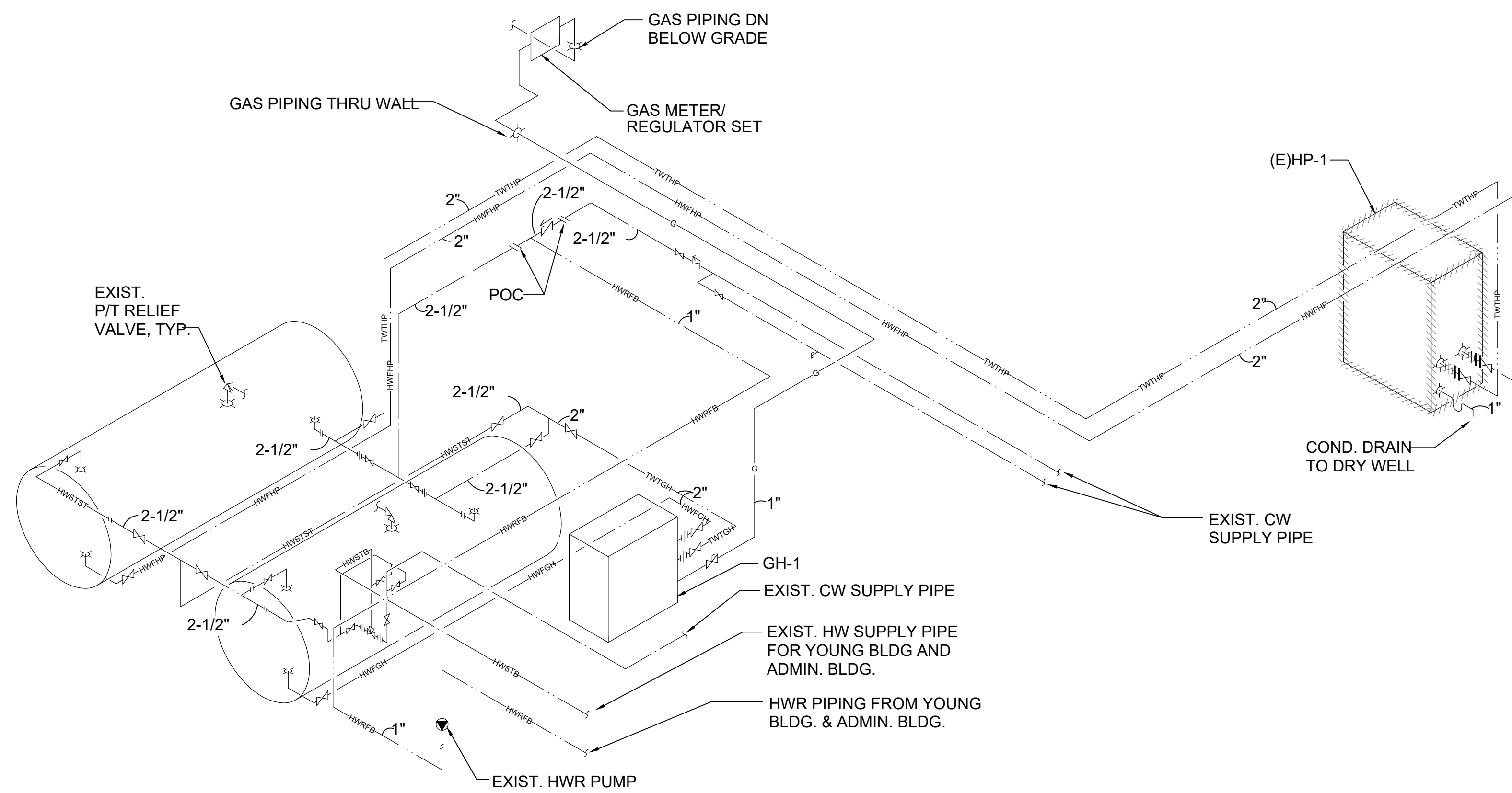
YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
 3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
 TMK: 3-2-31.01
 MECHANICAL BASEMENT NEW PLAN PLAN

Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046
Sheet 4	

M-101
 Of 12 Sheets



2 NEW PIPING SYSTEM DIAGRAM - YOUNG BUILDING
SCALE: NTS



1 EXISTING PIPING SYSTEM REMOVAL DIAGRAM - YOUNG BUILDING
SCALE: NTS

REVISIONS	BY
1	JY
ADD 1	JY
03/26/2026	

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Joel P. Yuen

EXPIRATION DATE: 03/26/2026

JOEL P. YUEN
LICENSED PROFESSIONAL ENGINEER
No. 9805-M
HAWAII, U.S.A.

INSYNERGY ENGINEERING

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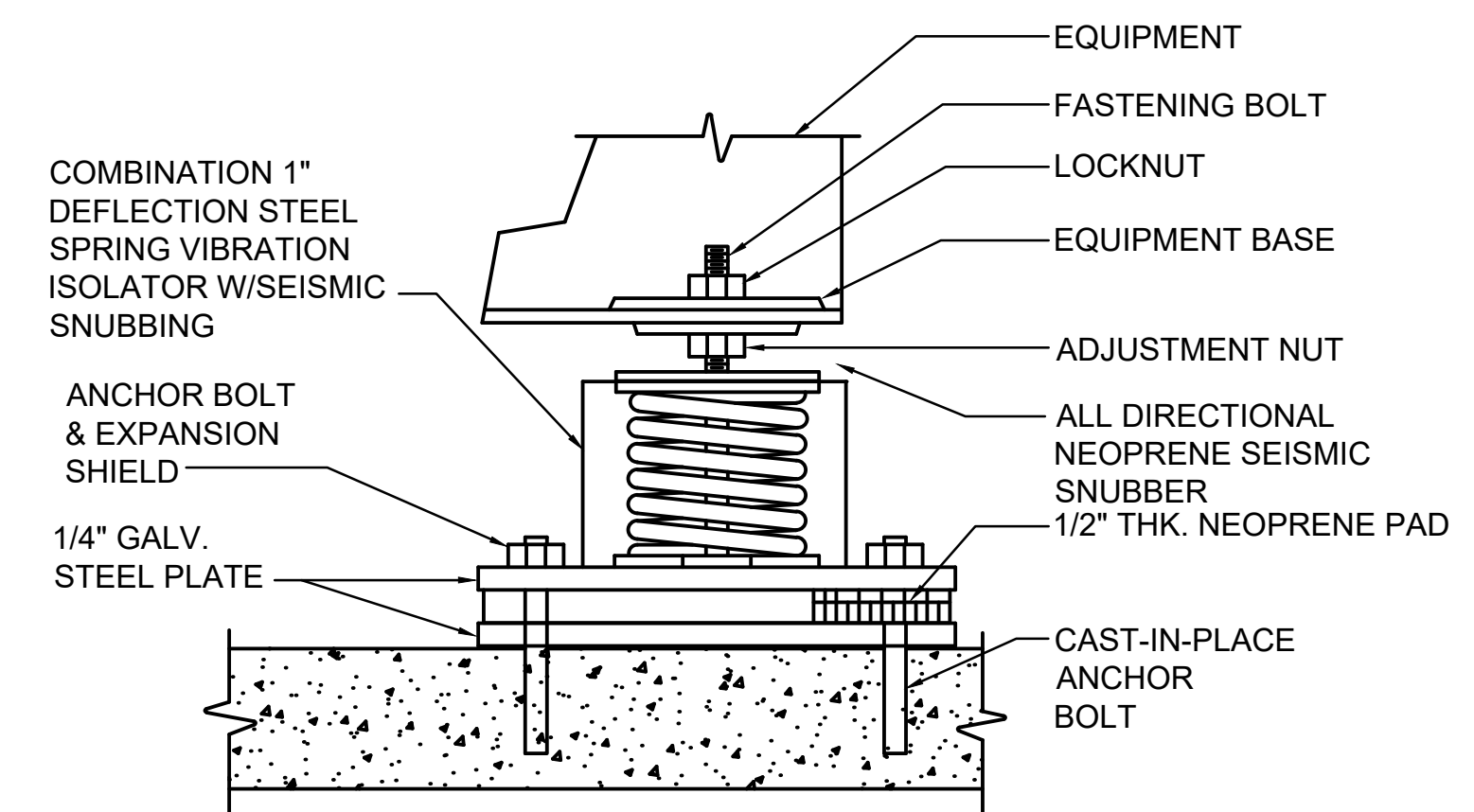
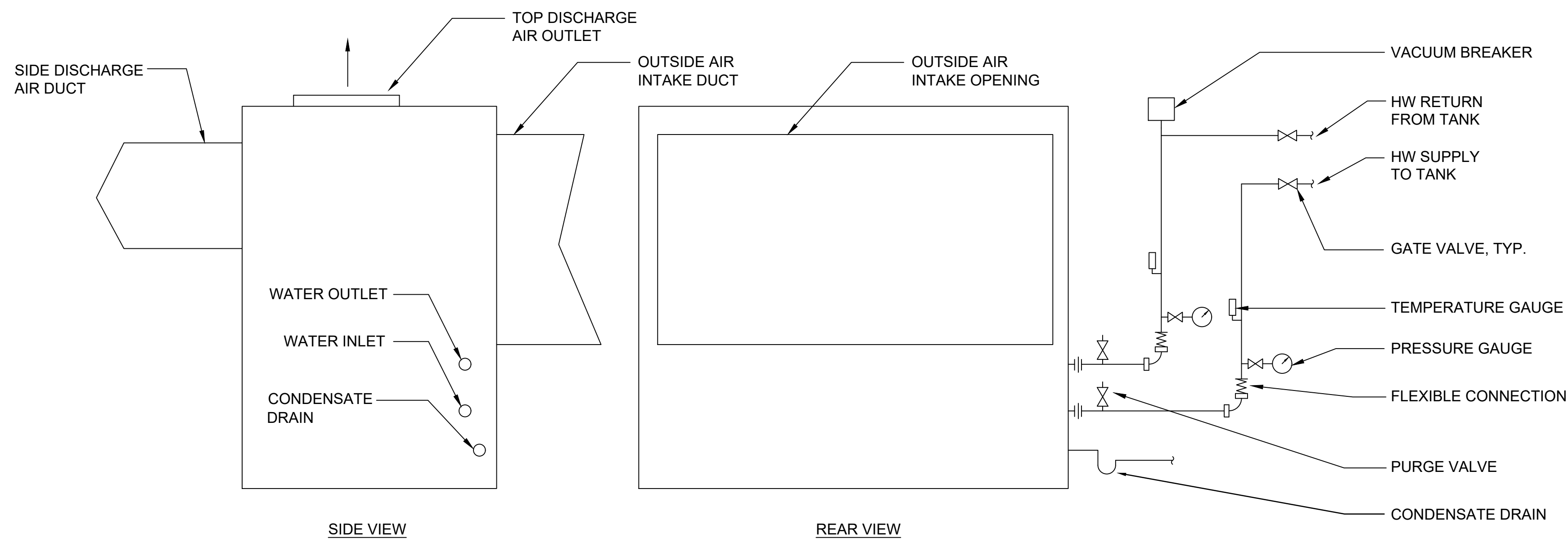
1001 Bishop Street Suite 2500, Honolulu, Hawaii 96813
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YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
TMK: 3-2-31.01

HEAT PUMP ISOMETRIC DIAGRAM

Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046

Sheet 5
M-401
Of 12 Sheets



REVISIONS	BY
1	JY
ADD 1	JY
03/26/2026	

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Joel P. Yuen
 EXPIRATION DATE: 03/31/2028

JOEL P. YUEN
 LICENSED PROFESSIONAL ENGINEER
 No. 9805-M
 HAWAII, U.S.A.

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 MECHANICAL • ELECTRICAL • FIRE PROTECTION
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 Phone: (808) 521-3773 Fax: (808) 521-3993

YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
 3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
 TMK: 3-2-31.01
 MECHANICAL DETAILS

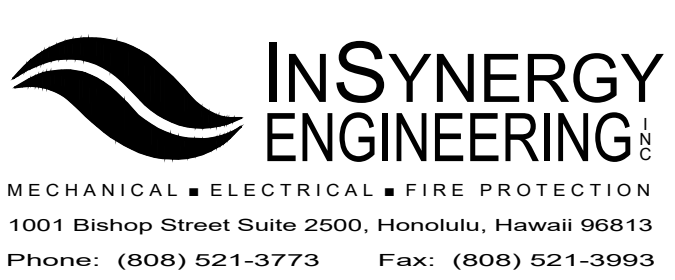
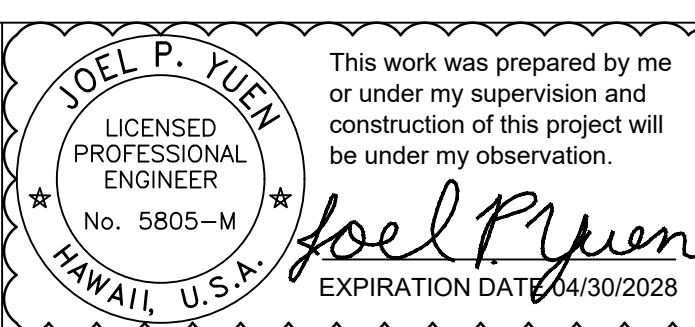
Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046

Sheet 6
M-501
 Of 12 Sheets

AIR SOURCE HEAT PUMP SCHEDULE																				
UNIT	LOCATION	SERVES	REFRIGERANT TYPE	AMBIENT AIR TEMP. (°F)	HEATING CAPACITY (MMBh)	RECOVERY RATE (GPH)	ENTERING WATER TEMP. (°F)	LEAVING WATER TEMP. (°F)	COMPRESSOR TYPE	INPUT POWER (KW)	FLA	MCA	MOP	V	PH	HZ	HEIGHT	DIMENSIONS (IN)	REMARKS	
																		WIDTH	LENGTH	
HP-1	YOUNG BUILDING BASEMENT	YOUNG BUILDING	R-513A	75	180.7	301	68	140	HERMETIC SCROLL	21.3	100.2	119.1	175	208	3	60	42-3/4	42-15/16	72-15/16	PROVIDE WITH CENTRIFUGAL SIDE DISCHARGE BLOWER, INTEGRAL MOTOR, PULSED CONTROL, INCL. HIGH AND LOW PRESSURE SAFETY SWITCHES AND CONTROL PANEL WITH STATUS LIGHTS. PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION.

PROVIDE WITH CENTRIFUGAL SIDE DISCHARGE BLOWER, INTEGRAL MOTOR, PULSED CONTROL, INCL. HIGH AND LOW PRESSURE SAFETY SWITCHES AND CONTROL PANEL WITH STATUS LIGHTS. PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION.

REVISIONS	BY
ADD 1	JY
13/26/2026	

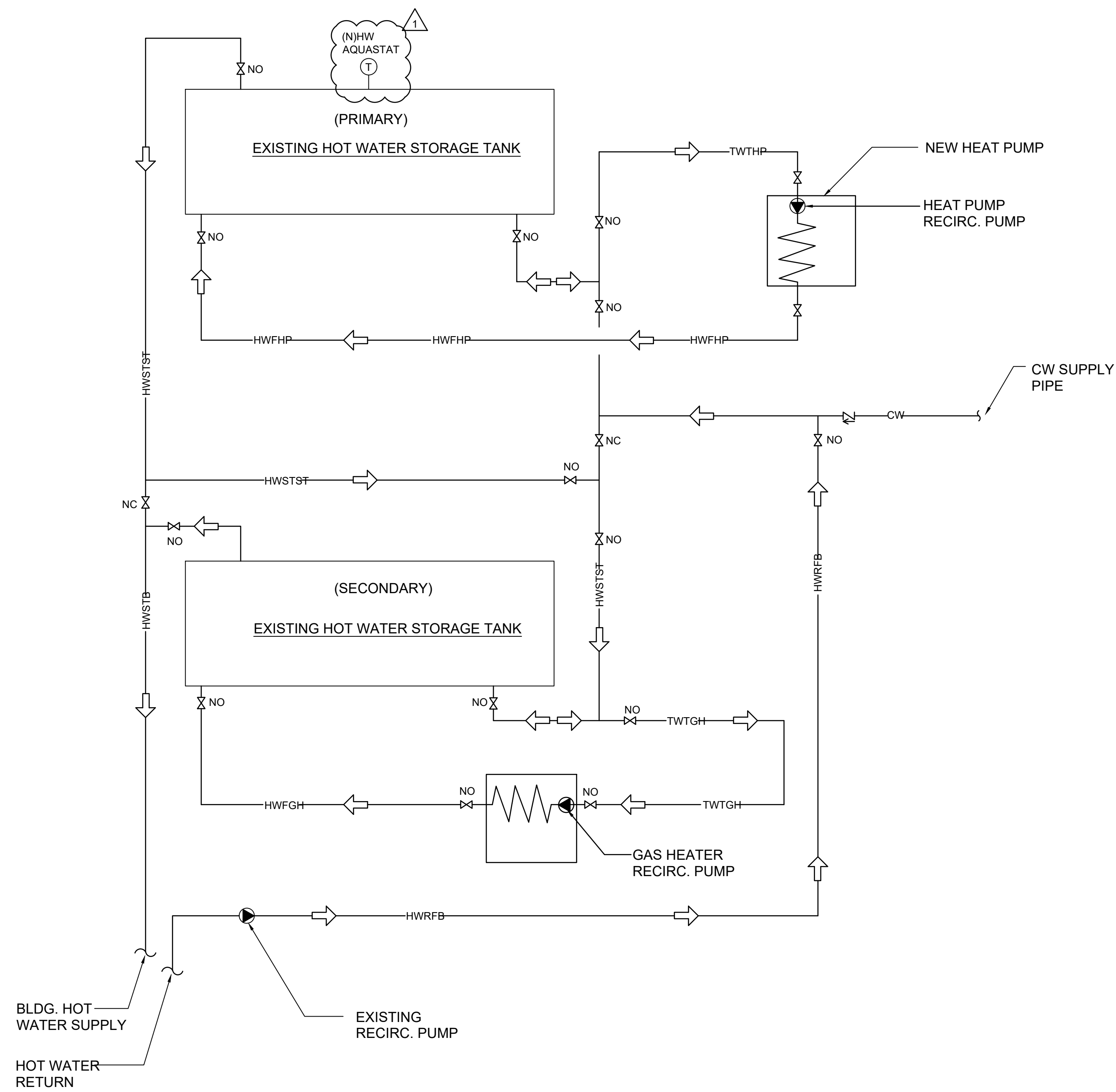


YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
 3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
 TMK: 3-2-31:01

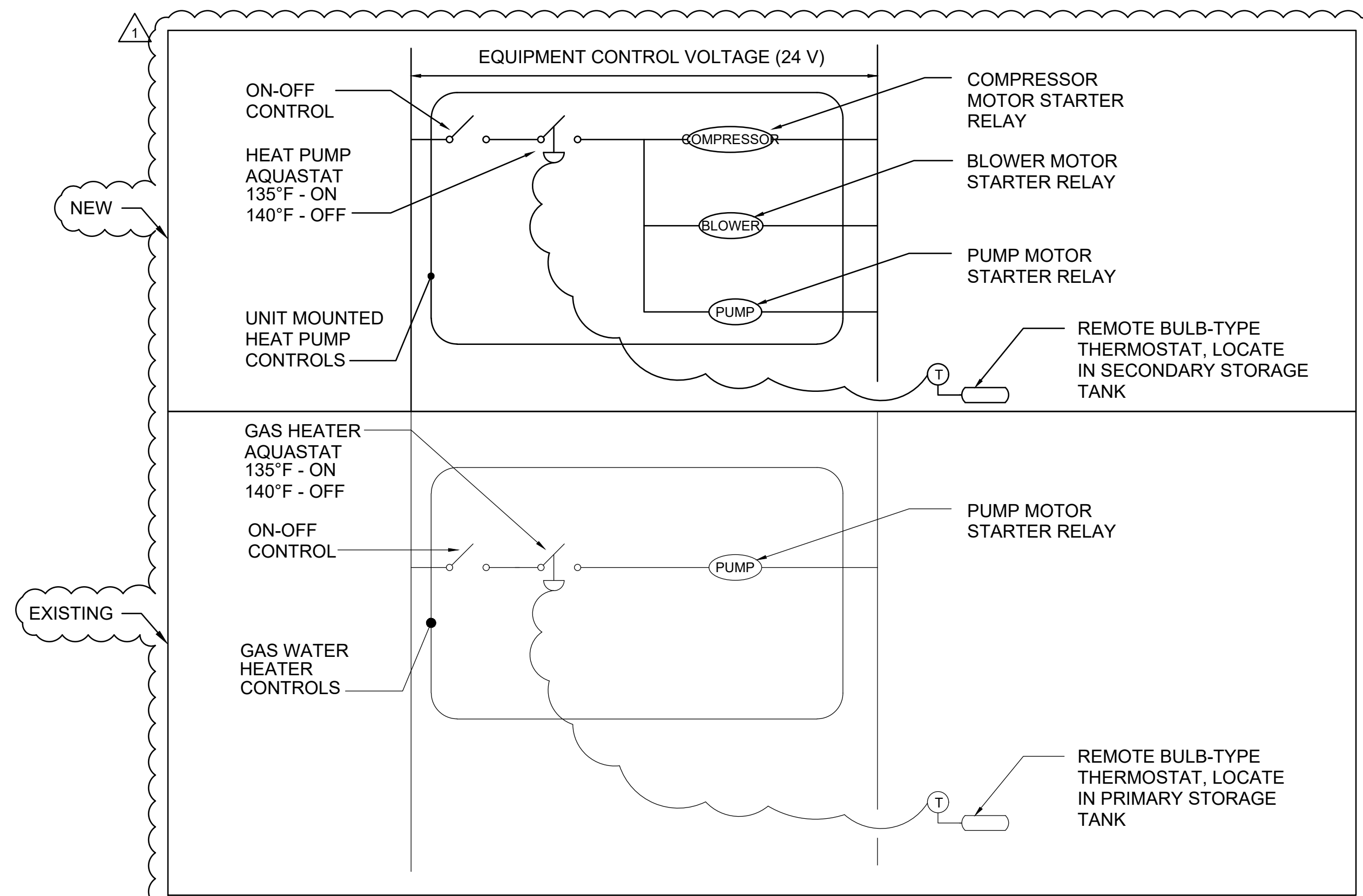
MECHANICAL SCHEDULES

Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046

Sheet 7
M-601
 Of 12 Sheets



1 TYPICAL HOT WATER SYSTEM SCHEMATIC DIAGRAM
SCALE: NTS



SEQUENCE OF OPERATION

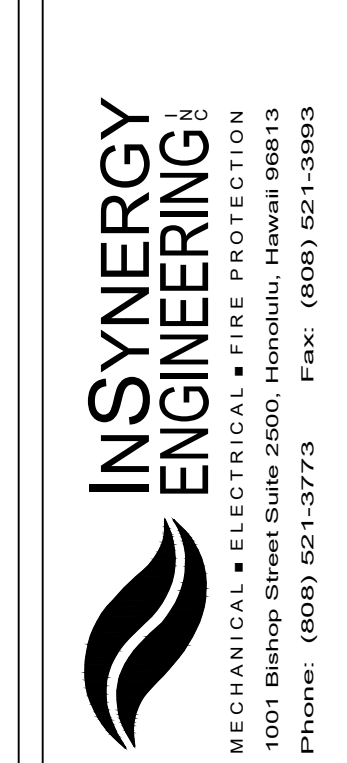
1. THE NEW HEAT PUMP AND EXISTING GAS WATER HEATER WILL BE ENERGIZED 24 HOURS A DAY.
2. WHEN THE NEW TEMPERATURE SENSOR IN THE PRIMARY TANK REGISTERS A TEMPERATURE BELOW 135 F, THE NEW HEAT PUMP COMPRESSOR, BLOWER AND CIRCULATING PUMP WILL ACTIVATE TO HEAT THE WATER IN THE STORAGE TANKS. WHEN THE TEMPERATURE SENSOR IN THE PRIMARY TANK REGISTERS A TEMPERATURE OF 140 F THE HEAT PUMP COMPRESSOR, BLOWER AND CIRCULATING PUMP WILL DEACTIVATE.
3. WHEN THE EXISTING TEMPERATURE SENSOR IN THE SECONDARY TANK REGISTERS A TEMPERATURE BELOW 135 F, THE EXISTING GAS WATER HEATER WILL ACTIVATE, ENERGIZING THE GAS HEATER RECIRCULATION PUMP AND HEATING THE WATER IN THE STORAGE TANKS. WHEN THE TEMPERATURE SENSOR IN THE SECONDARY TANK REGISTERS A TEMPERATURE OF 140 F, THE GAS WATER HEATER WILL DEACTIVATE.

2 TYPICAL WATER HEATING SYSTEM CONTROL DIAGRAM
SCALE: NTS

REVISIONS	BY
1 ADD 1	JY
03/26/2026	

This work was prepared by me or under my supervision and construction of this project will be under my observation.

Joel P. Yuen
EXPIRATION DATE: 03/31/2028



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MECHANICAL • ELECTRICAL • FIRE PROTECTION
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YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
TMK: 3-2-31.01

HOT WATER SCHEMATIC, CONTROLS, AND SEQUENCE OF OPERATIONS

Designed	KT
Drawn	RB
Checked	JY
Date	03-26-26
Job No.	25-046
Sheet 8	
M-701	
Of 12 Sheets	

GENERAL ELECTRICAL NOTES

- ALL WORK SHOWN ON THE ELECTRICAL DRAWINGS IS NEW UNLESS OTHERWISE NOTED. ALL MATERIALS SHALL BE NEW AND "LISTED" OR "LABELED" AS DEFINED BY THE NATIONAL ELECTRICAL CODE (NEC). WORK INCLUDES INSTALLATION OF ALL ELECTRICAL SYSTEMS COMPLETE AND OPERATIONAL AS LIMITED BY THE INTENT OF THE CONTRACT DOCUMENTS.
- ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL ELECTRICAL SAFETY CODE, AND THE CURRENT BUILDING ORDINANCES OF THE COUNTY OF HAWAII IN FORCE AT THE TIME OF PERMITTING. CONSTRUCTION PRACTICES SHALL CONFORM TO THE LATEST EDITION OF AMERICAN ELECTRICIANS' HANDBOOK BY CROFT AND APPLICABLE INSTRUCTIONS OF MANUFACTURERS OF EQUIPMENT AND MATERIAL SUPPLIED FOR THIS PROJECT.
- OBTAIN AND PAY FOR BUILDING / ELECTRICAL PERMIT, ARRANGE FOR PERIODIC INSPECTION BY LOCAL AUTHORITIES, AND DELIVER CERTIFICATE OF FINAL INSPECTION TO THE OWNER.
- RETENTION OF PLANS: ONE SET OF APPROVED PLANS, SPECIFICATIONS, AND COMPUTATIONS SHALL BE RETAINED BY THE BUILDING OFFICIAL FOR A PERIOD OF NOT LESS THAN 90 DAYS FROM DATE OF COMPLETION OF THE WORK COVERED THEREIN, AND ONE SET OF APPROVED PLANS SHALL BE RETURNED TO THE APPLICANT, AND SAID SET SHALL BE KEPT ON THE SITE OF THE BUILDING OR WORK AT ALL TIMES DURING WHICH THE WORK AUTHORIZED THEREBY IS IN PROGRESS.
- STRUCTURES UNDERGOING CONSTRUCTION, ALTERATION, OR DEMOLITION OPERATIONS, INCLUDING THOSE IN UNDERGROUND LOCATIONS, SHALL COMPLY WITH NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS, AND NFPA 1, AS LOCALLY AMENDED.
- FIRE SAFETY DURING ALTERATION:
 - NFPA 1, 16.4.4.1 WHERE THE BUILDING IS PROTECTED BY FIRE PROTECTION SYSTEMS, SUCH SYSTEMS SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES DURING ALTERATION.
 - NFPA 1, 16.4.4.2 WHERE ALTERATION REQUIRES MODIFICATION OF A PORTION OF THE FIRE PROTECTION SYSTEM, THE REMAINDER OF THE SYSTEM SHALL BE KEPT IN SERVICE AND THE FIRE DEPARTMENT SHALL BE NOTIFIED.
 - NFPA 1, 16.4.4.3 WHEN IT IS NECESSARY TO SHUT DOWN THE SYSTEM, THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE ALTERNATE MEASURES OF PROTECTION UNTIL THE SYSTEM IS RETURNED TO SERVICE.
 - NFPA 1, 10.7.1.1 AS NECESSARY DURING EMERGENCIES, MAINTENANCE, DRILLS, PRESCRIBED TESTING, ALTERATIONS, OR RENOVATIONS, PORTABLE OR FIXED FIRE-EXTINGUISHING SYSTEMS OR DEVICES OR ANY FIRE-WARNING SYSTEM SHALL BE PERMITTED TO BE MADE INOPERATIVE OR INACCESSIBLE. A FIRE WATCH SHALL BE REQUIRED AS SPECIFIED IN SECTIONS 13.3.3.6.5.2(4)(b), 13.7.1.5.3, 16.5.4, 34.6.3.3, 41.2.2.6, 41.2.2.7, 41.2.4, 41.3.5, 41.4.1, 34.5.4.3, AND 25.1.8 AT NO COST TO THE AHJ. NFPA 1, AS LOCALLY AMENDED.
- THE DRAWINGS DO NOT REFLECT ALL THE EXISTING CONDITIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. VISIT THE PROJECT SITE AND BECOME FAMILIAR WITH THE READILY OBSERVABLE EXISTING CONDITIONS, THE EXTENT OF ANY DEMOLITION, RELOCATION, RECONNECTION, AND THE NEW WORK PRIOR TO BIDDING. REPORT ANY READILY OBSERVABLE DISCREPANCIES AND/OR DIFFERENCES BETWEEN THE EXISTING CONDITIONS AND THE CONSTRUCTION DOCUMENTS TO THE ENGINEER. RESOLVE ALL READILY OBSERVABLE DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. BID SUBMISSION SHALL BE CONSIDERED AS EVIDENCE THAT THE CONTRACTOR HAS VISITED THE SITE AND RESOLVED ALL READILY OBSERVABLE DISCREPANCIES AND QUESTIONS AND NO EXTRA PAYMENT WILL BE AUTHORIZED FOR WORK REQUIRED BY THE CONTRACTOR'S FAILURE TO DO SO.
- COORDINATE ALL ELECTRICAL WORK WITH THE WORK OF THE OTHER TRADES AND SCHEDULE WORK TO MINIMIZE THE NUMBER AND DURATION OF ELECTRICAL OUTAGES AND IMPACT TO THE OPERATIONS IN OR ADJACENT TO THE PROJECT AREA. COORDINATE ACCESS TO THE PROJECT AREA AND SCHEDULE ALL REQUIRED SYSTEM OUTAGES WITH THE OWNER.
- VERIFY AND COORDINATE ALL PENETRATIONS PRIOR TO THE START OF CONSTRUCTION. OBTAIN APPROVAL BEFORE MAKING ANY PENETRATIONS THROUGH STRUCTURAL MEMBERS OR FIRE RATED WALLS AND CEILINGS.
- SCAN (E.G. X-RAY, ELECTROMAGNETIC, ETC.) ALL CONCRETE WALLS OR FLOOR STRUCTURES PRIOR TO COMMENCING WITH CORING/DRILLING WORK FOR PENETRATIONS TO AVOID DAMAGING THE EXISTING REINFORCING STEEL.
- EXISTING DEVICE AND EQUIPMENT LOCATIONS, CIRCUIT ASSIGNMENTS, WIRING CONNECTIONS, AND CONDUIT RUNS INDICATED WERE DERIVED FROM AVAILABLE REFERENCE DOCUMENTS AND LIMITED FIELD INVESTIGATION. FIELD VERIFY ALL EXISTING CONDITIONS AND MAKE ANY NECESSARY ADJUSTMENTS TO SATISFY THE INTENT OF THE DRAWINGS AND SPECIFICATIONS.
- RE-ROUTE ALL EXISTING CONDUIT, WIRING, AND CABLING TO REMAIN WITHIN THE PROJECT AREA AS NECESSARY TO FACILITATE THE REMOVAL OF EXISTING EQUIPMENT AS WELL AS THE INSTALLATION OF ALL NEW EQUIPMENT. REMOVE AND RE-INSTALL ELECTRICAL EQUIPMENT, INCLUDING LIGHTS, TO REMAIN AS REQUIRED.
- WORK INCIDENTAL TO THE CONTRACT AND NECESSARY TO COMPLETE THE PROJECT, ALTHOUGH NOT SPECIFICALLY REFERRED TO IN THE CONTRACT DOCUMENTS, SHALL BE FURNISHED AND PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT. AN EXAMPLE OF SUCH INCIDENTAL WORK ARE OUTLET BOXES, JUNCTION BOXES, AND PULL BOXES REQUIRED FOR THE INSTALLATION OF ELECTRICAL DEVICES, LIGHTING FIXTURES, AND EQUIPMENT. ALL INCIDENTAL WORK SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE NEC.
- ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL CONDUIT AND WIRING FOR THE POWER CONNECTION TO ALL EQUIPMENT AS INDICATED IN THE DRAWINGS AND SPECIFICATIONS. ALL INCIDENTAL CONDUIT AND WIRING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM MAY NOT BE SHOWN IN THE DRAWINGS OR SPECIFICATIONS. CONTRACTOR SHALL COORDINATE INCIDENTAL CONDUIT AND WIRING REQUIREMENTS BETWEEN ALL TRADES TO ENSURE THE INCIDENTAL CONDUIT AND WIRING IS PROVIDED AND THE AFFECTED SYSTEMS OPERATE AS INTENDED.

GENERAL ELECTRICAL NOTES (CONTINUED)

- THE LOCATION OF ALL ELECTRICAL APPARATUS AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND BEFORE INSTALLING, STUDY THE ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DETAILS, THEN MAKE INSTALLATION IN THE MOST LOGICAL MANNER. CIRCUIT ROUTING IS TYPICAL AND MAY BE VARIED IN ANY MANNER. ANY PIECE OF EQUIPMENT/DEVICE MAY BE RELOCATED WITHIN 10' BEFORE INSTALLATION AT THE DIRECTION OF THE OWNER WITHOUT ADDITIONAL CHARGE TO THE PROJECT.
- SHOULD PROJECT CONDITIONS REQUIRE REARRANGEMENT OF THE PROJECT'S WORK, THE CONTRACTOR SHALL MARK SUCH CHANGES ON THE AS-BUILT DRAWINGS. IF THESE CHANGES REQUIRE AN ALTERNATE METHOD TO THOSE SPECIFIED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SUBMIT DRAWINGS TO REFLECT THE PROPOSED ALTERNATE METHODS TO THE ENGINEER FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL NOT PROCEED UNTIL APPROVAL IS OBTAINED. REARRANGEMENT OF WORK FOR THE PURPOSE OF COORDINATION SHALL NOT BE CONSIDERED AN ITEM FOR EXTRA COST.
- DISCONNECT AND REMOVE ALL ELECTRICAL APPARATUS, LIGHT FIXTURES, WIRING DEVICES, JUNCTION BOXES, AND ASSOCIATED FEEDER AND BRANCH CIRCUIT WIRING IN THE PROJECT AREA, UNLESS OTHERWISE NOTED. THE DEMOLITION DRAWINGS ARE INTENDED TO SHOW THE GENERAL LIMITS OF THE SCOPE OF WORK AND MAY NOT SHOW ALL THE EXISTING DEVICES, CONDUIT RUNS, ETC. FEEDER AND BRANCH CIRCUIT WIRING TO BE REMOVED SHALL BE DISCONNECTED FROM ITS SOURCE. REMOVE ALL CONDUITORS, CONDUIT, AND CONDUIT SUPPORT STRUCTURES WHERE ACCESSIBLE. PATCH/REPAIR WALL, FLOOR, AND CEILING DAMAGES AS A RESULT OF THE REMOVAL WORK.
- THE EXISTING ELECTRICAL, TELECOM, FIRE ALARM, AND OTHER ELECTRICALLY-RELATED SYSTEMS IN AREAS ADJACENT TO, OUTSIDE OF, AND/OR OTHERWISE PASSING THROUGH THE PROJECT LIMITS, MUST REMAIN OPERATIONAL DURING THE CONSTRUCTION PERIOD AND POST-CONSTRUCTION. THE CONTRACTOR SHALL EXERCISE DUE CARE AND CAUTION WHEN WORKING NEAR ANY EXISTING EQUIPMENT, DEVICES, OR CABLING/CIRCUITING. PROVIDE NEW JUNCTION BOXES, CONDUITS, WIRING, AND THE LABOR REQUIRED TO FACILITATE THE REQUIRED OPERATIONAL CONTINUITY. BOXES, CONDUITS, AND WIRING SHALL BE IN ACCORDANCE WITH THE NEC. ANY DAMAGE TO THE EXISTING EQUIPMENT, DEVICES, OR CABLING/CIRCUITING RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED OR OTHERWISE RESTORED TO ITS ORIGINAL WORKING CONDITION AT NO ADDITIONAL COST TO THE PROJECT.
- THE ELECTRICAL DRAWINGS ARE BASED ON PROPOSED EQUIPMENT. VERIFY ALL SYSTEM REQUIREMENTS (ELECTRICAL, MECHANICAL, FIRE ALARM, SPECIALTY SYSTEMS, ETC.) WITH THE SELECTED SYSTEM'S MANUFACTURER OR AUTHORIZED REPRESENTATIVE PRIOR TO COMMENCING WITH ANY WORK. COORDINATE RATINGS OF OVERCURRENT PROTECTION DEVICES, DISCONNECT SWITCHES, CONDUIT, AND WIRING TO MATCH THE ACTUAL EQUIPMENT SUPPLIED FOR THE PROJECT. CORRECT ALL DISCREPANCIES SO AS TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM. RECORD CHANGES ON THE AS-BUILT DRAWINGS.
- ALL EQUIPMENT AND APPARATUS SHALL BE CAPABLE OF FITTING IN THE SPACES SHOWN WHILE MEETING THE MANUFACTURER'S RECOMMENDED ACCESS REQUIREMENTS AND APPLICABLE CODE REQUIREMENTS. REVIEW ALL SPACES WHERE EQUIPMENT IS TO BE INSTALLED PRIOR TO ORDERING OF EQUIPMENT AND NOTIFY THE OWNER OF ANY INADEQUATE CLEARANCES OR CONDITIONS THAT WILL PREVENT THE PROPER INSTALLATION, MAINTENANCE, AND OPERATION OF THE EQUIPMENT.
- PROVIDE TYPEWRITTEN CIRCUIT DIRECTORIES FOR ALL PANELS, NEW OR MODIFIED, REFLECTING THE CIRCUIT ARRANGEMENTS AS THEY WERE ACTUALLY INSTALLED.
- AN ADHESIVE VINYL NAMEPLATE SHALL BE PROVIDED FOR ALL SWITCHES, RECEPTACLES, DISCONNECT SWITCHES, MOTOR STARTERS, AND MISCELLANEOUS DEVICES REQUIRING POWER. THE NAMEPLATE SHALL INDICATE THE PANELBOARD SERVING THE DEVICE AND THE CORRESPONDING CIRCUIT ASSIGNMENT. LETTERING SHALL BE A MINIMUM OF 1/4" HIGH. UTILIZE BROTHER "P-TOUCH" LABEL MAKER OR APPROVED SUBSTITUTE.
- A GREEN, EQUIPMENT GROUND CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC ARTICLE 250 SHALL BE INSTALLED IN ALL RACEWAYS WHETHER INDICATED ON CONTRACT DRAWINGS OR NOT. INSTALL THIS CONDUCTOR IN ALL RACEWAYS INCLUDING THOSE INSTALLED FOR SWITCH LEGS AND ATTACH TO THE DEVICE, LUMINAIRE, OR EQUIPMENT USING A SUITABLE GROUNDING LUG.
- DO NOT USE A COMMON NEUTRAL FOR MULTIPLE BRANCH CIRCUITS INSTALLED IN A COMMON CONDUIT. PROVIDE A DEDICATED NEUTRAL FOR EACH INDIVIDUAL CIRCUIT. WHERE MULTIPLE DEDICATED NEUTRALS ARE INSTALLED IN A COMMON CONDUIT, PROVIDE COLOR CODING OF THE DIFFERENT NEUTRAL CONDUCTORS IN ACCORDANCE WITH THE NEC (WHITE, GRAY, THREE CONTINUOUS WHITE OR GRAY STRIPES, ETC.)
- PROVIDE NYLON PULLSTRINGS IN ALL EMPTY CONDUITS UNLESS OTHERWISE INDICATED.
- ALL SURFACE MOUNTED DEVICES SHALL BE INSTALLED UTILIZING FACTORY PAINTED SURFACE MOUNTING ACCESSORIES AND MATCHING DEVICE BOXES FOR THE MOST AESTHETICALLY PLEASING INSTALLATION.
- PROVIDE KNOCK-OUT PLUGS FOR ALL UNUSED CONDUIT PENETRATIONS IN BOXES AND ENCLOSURES DUE TO CONDUIT REMOVAL.
- PENETRATIONS THROUGH FIRE-RATED WALLS, CEILINGS, AND FLOORS SHALL BE SEALED TO MAINTAIN FIRE RATINGS. UTILIZE 3M CP25, PUTTY 303, OR OTHER SUITABLE UL-LISTED SEALING SYSTEM.
- PATCH, REFINISH, AND PAINT ALL PENETRATIONS THROUGH WALLS AND SLABS TO MATCH FINISH OF ADJACENT SURFACES.
- RESTORE/REPAIR ANY DAMAGE TO EXISTING SURFACES RESULTING FROM THE INSTALLATION OF NEW ELECTRICAL ITEMS. THE AREAS REPAIRED SHALL MATCH THE ADJACENT SURFACES IN TEXTURE, FINISH, AND COLOR.

GENERAL ELECTRICAL NOTES (CONTINUED)

- FOR ALL SWITCHGEAR, SWITCHBOARDS, AND PANELBOARDS, PROVIDE A PERMANENTLY AFFIXED PLAQUE INDICATING THE SOURCE OF THE POWER SERVING THE APPARATUS IN QUESTION IN ACCORDANCE WITH THE NEC.
- ALL ELECTRIFIED UTILIZATION EQUIPMENT, CONTROL DEVICES, CONTROL CIRCUITING, AND SEPARATELY MOUNTED MOTOR STARTERS/CONTROLLERS ARE SPECIFIED AND PROVIDED UNDER THE APPLICABLE SPECIFICATION SECTIONS. ALL LINE VOLTAGE POWER TO THE ELECTRIFIED UTILIZATION EQUIPMENT SHALL BE PROVIDED UNDER THE ELECTRICAL CONTRACT DOCUMENTS.
- FOR ELECTRIFIED UTILIZATION EQUIPMENT, COORDINATE THE MOUNTING HEIGHT OF THE ASSOCIATED JUNCTION BOX, DISCONNECT SWITCH, OR STARTER/CONTROLLER WITH THE ACTUAL EQUIPMENT SUPPLIED.
- PROVIDE EARTHQUAKE BRACING FOR ALL ELECTRICAL EQUIPMENT, APPARATUS, AND RACEWAYS. BRACING SHALL, AS A MINIMUM, COMPLY WITH THE COUNTY BUILDING CODE.

ELECTRICAL SYMBOL LIST / MOUNTING HEIGHT SCHEDULE

MOUNTING HEIGHT FROM FLOOR TO TOP	SYMBOL	(SPECIAL MOUNTING HEIGHTS INDICATED ON PLAN)		DESCRIPTION
		EXISTING	NEW	
				MOTOR CONNECTION
60"				NON-FUSED DISCONNECT SWITCH, 3P30A UNLESS OTHERWISE NOTED, VOLTAGE TO MATCH CIRCUITING
72"				PANELBOARD
				ENCLOSED CIRCUIT BREAKER
				JUNCTION BOX, LARGE, HORIZONTALLY MOUNTED
				LIQUID-TIGHT FLEXIBLE CONDUIT
				EXPOSED RACEWAY, PROVIDE STRAP 8'-0" ON CENTER MAXIMUM
				DENOTES DEMOLITION/REMOVAL
				EQUIPMENT TAG; EXHAUST FAN "EF-1" INDICATED; ALL OTHERS SIMILAR

ELECTRICAL ABBREVIATIONS

ABBREVIATION	DEFINITION
+42"	DENOTES 42" ABOVE FINISHED FLOOR OR GRADE
A or AMPS	AMPERES
C	CONDUIT
GND	GROUND
IN or "	INCH, INCHES
NO. or #	NUMBER
P	POLE

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCES OF HONOLULU 2021
CHAPTER 16B

TO THE BEST OF MY KNOWLEDGE, THIS PROJECT'S DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY CONSERVATION CODE FOR:

X ELECTRICAL COMPONENT SYSTEMS

SIGNATURE: Scott Tomkiyo DATE: 03/26/2026
 NAME: SCOTT TOMKIYO, P.E.
 TITLE: ELECTRICAL ENGINEER
 LICENSE No.: 15968-E

REVISIONS	BY
1 ADD 1 03/26/2026	ST

This work was prepared by me or under my supervision and construction of this project will be under my observation.

Scott Tomkiyo
EXPIRATION DATE 04/30/2028

* SCOTT TOMKIYO *
LICENSED PROFESSIONAL ENGINEER
No. 15968-E
HAWAII, U.S.A.

INSYNERGY ENGINEERING

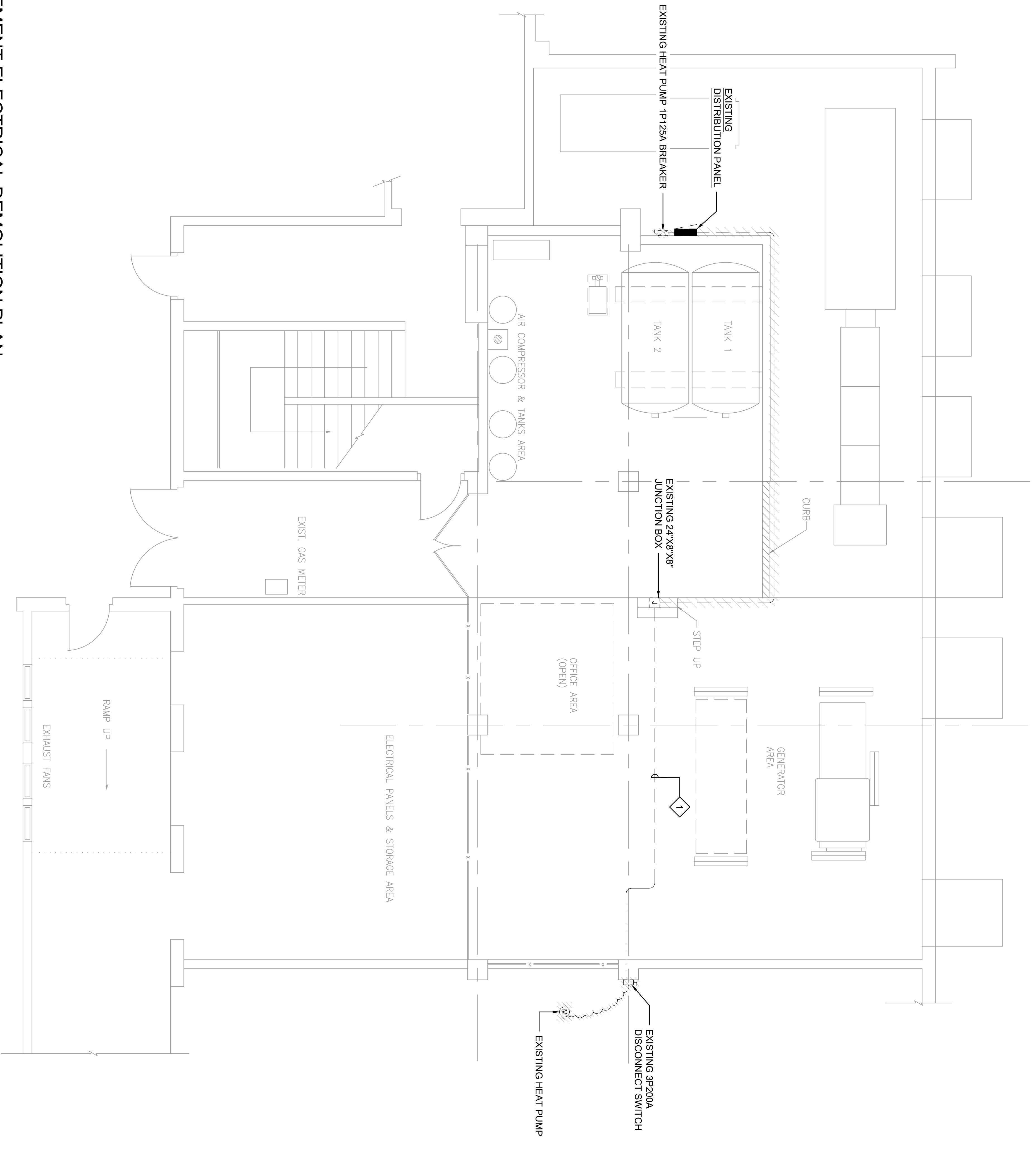
MECHANICAL • ELECTRICAL • FIRE PROTECTION
1001 Bishop Street Suite 2040, Honolulu, Hawaii 96813
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YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
TMK: 9-2-31-01

ELECTRICAL GENERAL NOTES AND ABBREVIATION LIST

Designed	
Drawn	
Checked	
Date	03-26-26
Job No.	25-046
Sheet 9	
E-001	
Of 12 Sheets	

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



KEY NOTES:
 1 DISCONNECT AND REMOVE EXISTING CONDUCTORS BACK TO SOURCE. EXISTING CONDUIT TO REMAIN FOR REUSE.

REVISIONS	BY
ADD 1	ST
03/26/2026	

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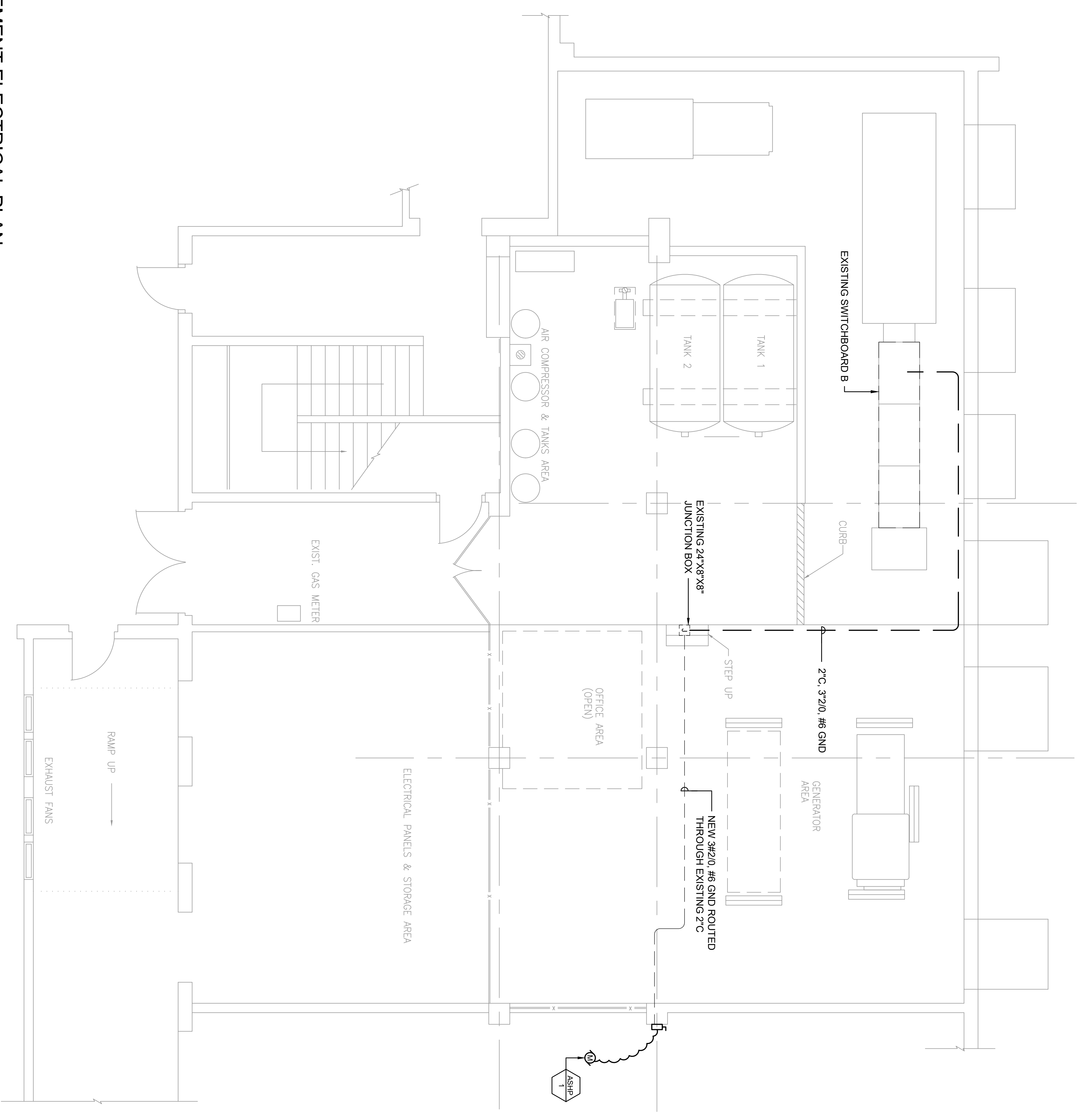
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 TMK: 3-2-31:01
 ENLARGED BASEMENT ELECTRICAL DEMOLITION PLAN

Designed	
Drawn	
Checked	
Date	03-26-26
Job No.	25-046
Sheet	10
	ED101
	Of 12 Sheets

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



DESIGNED	
DRAWN	
CHECKED	
DATE	03-26-26
JOB NO.	25-046
SHEET 11	
E-101	
OF 12 SHEETS	

YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
 3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
 TMK: 3-2-31:01

ENLARGED BASEMENT ELECTRICAL PLAN

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Scott Tomkiwa
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REVISIONS	BY
ADD 1	ST
03/26/2026	

REVISIONS	BY
1 ADD 1 03/26/2026	ST

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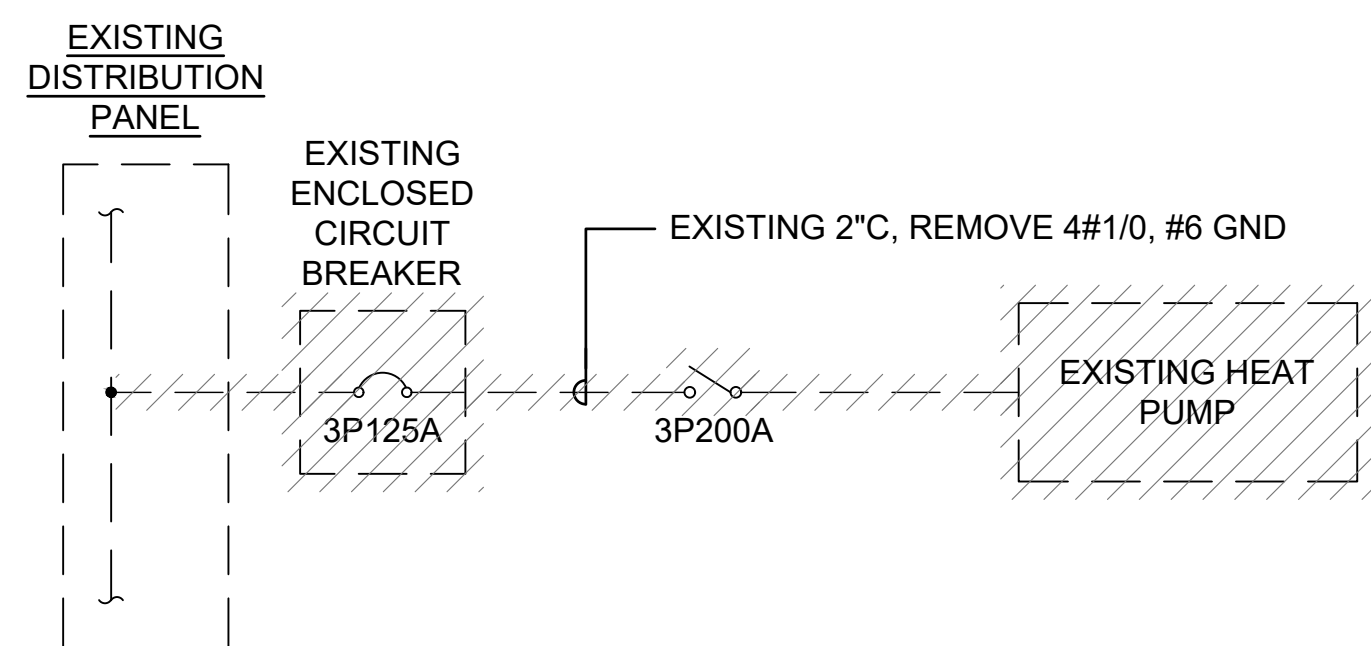
Scott Tompkins
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YOUNG BASEMENT HEAT PUMP REPLACEMENT AT LEAHI HOSPITAL
 3675 KILAUEA AVENUE, HONOLULU, HAWAII 96816
 TMK: 3-2-31-01
 ONE-LINE DIAGRAM AND EQUIPMENT SCHEDULE

Designed
 Drawn
 Checked
 Date 03-26-26
 Job No. 25-046
 Sheet 12
E-601
 Of 12 Sheets

EQUIPMENT SCHEDULE											
EQUIPMENT ID	EQUIPMENT DESCRIPTION	SPECIFIED RATING (HP / KW)	VOLTAGE / PHASE	FLA / RLA	MOCB	MCA	TERMINATION TYPE	DISCONNECT SWITCH		BRANCH CIRCUIT REQUIREMENT	REMARKS
								POLES / AMPS	ENCLOSURE		
ASHP-1	AIR SOURCE HEAT PUMP		208V / 3PH	100.24A	3P175A	119.09A	HARDWIRED	3P200A	NEMA 1	2" C, 3#2/0, #6 GND	

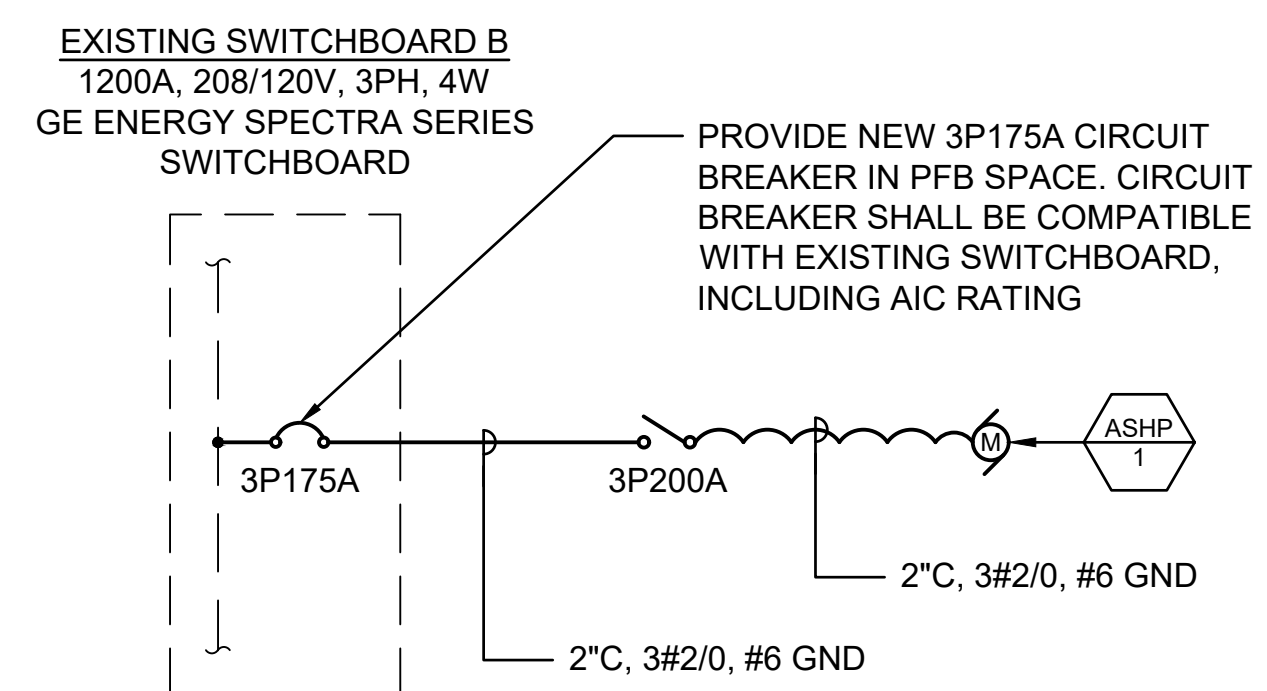


LEGEND:

--- DASHED LINE INDICATES EXISTING ITEM

HATCH MARK INDICATES DEMOLITION

2 ONE-LINE DIAGRAM DEMOLITION WORK
 SCALE: NTS



LEGEND:

--- DASHED LINE INDICATES EXISTING ITEM

— BOLD LINE INDICATES NEW WORK

1 ONE-LINE DIAGRAM NEW WORK
 SCALE: NTS