Invitation for Bids

Leahi Hospital Sinclair Building Heat Pump Replacement
21L-0220

The Hawaii Health Systems Corporation (HHSC) Oahu Region is requesting bids from qualified companies for the replacement of the Sinclair Building Heat Pump at Leahi Hospital located at 3675 Kilauea Ave., Honolulu, HI 96816.

The IFB may be obtained electronically from the following website:
http://leahi.hhsc.org/procurement/notices/

Due to COVID-19, a pre-bid orientation will not be scheduled. The deadline for submission of written/emailed questions pertaining to the IFB is March 22, 2022.

All bids must be received by HHSC by April 5, 2022, 2:00 p.m. Hawaii Standard Time. Due to COVID-19, all bids shall be sent digitally to skawai@hhsc.org. E-mail bids not received by deadline will be disqualified for consideration. No exceptions will be made even if network provider or software (e.g. MS Outlook) delays delivery. Please note that large files (>10MB) may experience network delivery issues.

Addenda to the IFB will be posted on the website listed above.

For any inquiries, please contact Scott Kawai, Oahu Region Contracts Department, at (808) 832-3025 or by email at skawai@hhsc.org.

Leahi Hospital
3675 Kilauea Ave.
Honolulu, HI 96816

TABLE OF CONTENTS

SECTION 1
ADMINISTRATION

1.0 INTRODUCTION

This Invitation for Bid (hereinafter "IFB") is issued by the Hawaii Health Systems Corporation (hereinafter "HHSC"), a public body corporate and politic and an instrumentality and agency of the State of Hawaii. All procedures and processes will be in accordance with HHSC Oahu Region policy and procedures.

In order for HHSC to accept Bidder's response in a timely manner, please thoroughly read this IFB and follow instructions as presented.

1.1 IFB TIMETABLE AS FOLLOWS

The timetable as presented represents HHSC's best estimated schedule. If an activity of the timetable, such as "Closing Date for Receipt of Bids" is delayed, the rest of the timetable dates may be modified. BIDDER will be advised, by addendum to the IFB, of any such modifications to the timetable. Contract start date will be subject to the issuance of a Notice to Proceed.

	ACTIVITY	**SCHEDULED DATES**
1.	IFB Public Announcement	March 8, 2022
2.	No Pre-Bid Orientation due to COVID-19	N/A
3.	Closing Date for Receipt of Questions	March 22, 2022
4.	**Closing Date for Receipt of Bids 2:00 p.m.**	**April 5, 2022**
5.	Contractor Selection/Award Notification (on/about)	April 6, 2022
6.	Contract Start Date (on/about)	April 27, 2022

1.2 AUTHORITY

This IFB is issued following the provisions of Chapter 323F, Hawaii Revised Statutes (HRS), and its administrative rules. All BIDDERS are charged with presumptive knowledge of all requirements of the cited authorities. Submission of a valid executed bid by any BIDDER shall constitute admission of such knowledge on the part of such BIDDER.

1.2.1 IFB ORGANIZATION

This IFB is organized into four sections:

SECTION 1: ADMINISTRATIVE
Provides information regarding administrative requirements.

SECTION 2: SCOPE OF SERVICES
Provides a detailed description of goods and/or services to be provided and delineates HHSC and CONTRACTOR responsibilities.

SECTION 3: BID FORMS AND GENERAL CONDITIONS
Describes the required format and content for submission of the bid.

SECTION 4: BID EVALUATION AND AWARD
Describes how bids will be evaluation and procedures for selection and award of contract.

1.3 HEAD OF PURCHASING AGENCY (HOPA)

The HOPA for HHSC, or designee, is authorized to execute any and all Agreements (Contracts), resulting from this IFB.

The HOPA for this IFB is:

Derek Akiyoshi
Regional Chief Executive Officer
Hawaii Health Systems Corporation

1.4 DESIGNATED OFFICIALS

The officials identified in the following paragraphs have been designated by the HOPA as HHSC's procurement officials responsible for execution of this IFB, award of Agreement and coordination of CONTRACTOR's satisfactory completion of contract requirements.

1.4.1 ISSUING OFFICER

The Issuing Officer is responsible for administrating/facilitating all requirements of the IFB solicitation process and is the **sole point of contact** for BIDDER from date of public announcement of the IFB until the selection of the successful BIDDER. The Issuing Officer will also be responsible for contractual actions throughout the term of the contract. For purposes of this IFB, the designated Issuing Officer is:

Scott Kawai
Director of Contracts and Project Management
e-mail: skawai@hhsc.org
phone: (808) 832-3025

1.5.1 CHARTER

HHSC is a public body corporate and politic and an instrumentality and agency of the State of Hawaii. HHSC is administratively attached to the Department of Health, State of Hawaii and was created by the legislature with passage of Act 262, Session Laws of the State of Hawaii 1996. Act 262 affirms the State's commitment to provide quality health care for the people in the State of Hawaii, including those served by small rural facilities.

1.5.2 STRUCTURE AND SERVICES

HHSC is organized into four operational regions and provides a broad range of healthcare services including acute, long term, rural and ambulatory health care services. As the fourth largest public health system in the country, HHSC is the largest provider of healthcare in the Islands, other than on Oahu. This solicitation is for the Oahu Region.

1.5.3 MISSION

The mission of HHSC is to provide and enhance accessible, comprehensive health care services that are quality-driven, customer-focused and cost-effective.

1.6 FACILITY INFORMATION

Detailed information pertaining to HHSC facilities is located at http://www.hhsc.org.

1.7 SUBMISSION OF QUESTIONS

Questions must be submitted in writing via electronic mail, facsimile or post mail to the Issuing Officer no later than the "Closing Date for Receipt of Questions", identified in paragraph 1.1 in order to generate an official answer. All written questions will receive an official written response from HHSC and become addenda to the IFB.

IMPORTANT

BIDDER may request changes and/or propose alternate language to the attached HHSC General and Special Terms and Conditions during this phase only. All requests will be presented to the HHSC Legal Department for review. No requests to change the HHSC General or Special Terms and Conditions will be entertained after the bids have been submitted or during the contracting process. All written questions and/or approved changes will receive an official written response from HHSC and shall be recorded as addenda to the IFB.

HHSC reserves the right to reject or deny any request(s) made by BIDDER.

Responses by HHSC shall be due to the BIDDER prior to notice of award.

Impromptu, un-written questions are permitted and verbal answers will be provided during pre-bid conferences and other occasions, but are only intended as general direction and will not represent the official HHSC position. The only official position of HHSC is that which is stated in writing and issued in the IFB as addenda thereto.

No other means of communication, whether oral or written, shall be construed as a formal or official response/statement and may not be relied upon.

SEND QUESTIONS TO:

Scott Kawai, Issuing Officer
e-mail: skawai@hhsc.org

1.8 SOLICITATION REVIEW

BIDDER should carefully review this solicitation for defects and questionable or objectionable matter. Comments concerning defects and questionable or objectionable matter, **excluding requests to revise the General or Special Conditions**, must be made in writing and should be received by the Issuing Officer, Scott Kawai, no later than the "Closing Date for Receipt of Bids" as identified in Section 1.1. This will allow issuance of any necessary amendments to the IFB. It will also assist in preventing the opening of bids upon which award may not be made due to a defective solicitation package.

1.9 IFB AMENDMENTS

HHSC reserves the right to amend the IFB any time prior to the deadline date of the IFB. IFB Amendments will be in the form of addenda.

1.10 CANCELLATION OF IFB

The IFB may be canceled when it is determined to be in the best interests of HHSC.

1.11 PROTESTS

Any protest shall be submitted in writing to the HOPA as noted below.

A protest based upon the content of the solicitation shall be submitted in writing within five (5) working days **after** the aggrieved individual/business knows or should have known of the facts giving rise thereto; provided further that the protest shall not be considered unless it is submitted in writing prior to and not later than the "Closing Date for Receipt of Bid" identified in section 1.1.

A protest of an award or proposed award shall be submitted within five (5) working days after the posting of award of the contract. The notice of award, if any, resulting from this solicitation shall be posted at the following website: http://leahi.hhsc.org/procurement/notices/

Any and all protests shall be submitted in writing to the HOPA, as follows:

Derek Akiyoshi
Hawaii Health Systems Corporation
Oahu Region
3675 Kilauea Avenue
Honolulu, Hawaii 96816

1.12 PERFORMANCE AND PAYMENT BOND

Performance and payment bonds shall be required for contracts $25,000 and higher. At the time of the execution of the contract, the successful Bidder shall file good and sufficient performance and payment bonds, each in an amount equal to one hundred percent (100%) of the amount of the contract price unless otherwise stated in the solicitation of bids.

1.13 SPECIALTY CONTRACTOR'S LICENSE

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

1.14 WORKING HOURS

A. Regular working hours for this project shall take place between the hours of 8:00 AM to 4:30 PM Monday through Friday, excluding State Holidays, unless otherwise noted or restricted.

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.

1.15 SPECIAL PROCEDURES DURING BIDDING

A. Bid documents will be available upon request from the office of the Chief Executive Officer, at Leahi Hospital, 3675 Kilauea Avenue, Honolulu, HI, 96816.

B. All bids shall be submitted to the Issuing Officer.

C. All questions regarding the IFB shall be submitted, in writing, to the Issuing Officer, who shall 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.

SECTION 2
SCOPE OF SERVICES

2.0 INTRODUCTION

LEAHI HOSPITAL SINCLAIR BUILDING HEAT PUMP REPLACEMENT

Work for this project shall include, but is not limited to demolition and replacement of domestic water heating heat pump, electrical work, sheet metal work, wall partition/door work, and painting as indicated in the Plans.

2.1 CONTRACT PERIOD

The work shall be completed within 220 consecutive calendar days.

2.2 SCOPE OF SERVICES

A. The CONTRACTOR shall complete the work specified in the specifications and drawings in APPENDIX C.

B. Qualifications. The CONTRACTOR shall have:

1. A current and valid license to perform the scope of work.
2. Have been in business for the past three (3) consecutive years.
3. A permanent, on-island office location in conducting business which is accessible to telephone calls. An answering service is not acceptable.

C. HOSPITAL shall provide:

Technical Representatives who shall have the authority to oversee the successful completion of contract requirements, including monitoring, coordinating and assessing CONTRACTOR performance; placing requests for services; and, approving completed work/services with verification of same for CONTRACTOR's invoices. Technical Representatives will also serve as points of contact for "technical" matters throughout the term of the contract.

SECTION 3
Bid Forms and General Conditions

General Instructions for Completing Forms

- *Bids shall be submitted in the prescribed format outlined in this IFB*
- *No supplemental literature, brochures or other unsolicited information should be included in the bid packet.*
- *A written response is required for each item unless indicated otherwise.*

3.0 Bid Form

The bid form must be completed and submitted to HHSC by the required due date and time, and in the form prescribed by the HHSC. Facsimile transmissions shall not be accepted.

Interested bidders shall submit their bid under the interested bidder's exact legal name that is registered with the Department of Commerce and Consumer Affairs and shall indicate this exact legal name in the appropriate space on page 1 of the bid form. Failure to do so may delay proper execution of the Contract.

Interested bidders shall certify its ability to provide services on April 27, 2022 or upon execution of the Contract agreement by both parties. The Hospital reserves the right to apply liquidated damages for the delay in Contract execution on the part of the Contractor.

The interested bidder's authorized signature shall certify bid documents. If the Bid Form on Appendix A is unsigned the bid shall be automatically rejected.

The option to extend the Contract shall be at the sole discretion of the Hospital and determined to be in the best interests of the State.

3.1 Bid Security

All lump sum bids of $25,000 and higher, or lump sum base bids including alternates of $25,000 and higher, that are not accompanied by bid security are non –responsive.

a. The bid security shall be in an amount equal to at least five percent (5%) of the lump sum bid or lump sum base bid including alternates or in an amount required by the terms of the federal funding, where applicable.

3.2 General Conditions

The State of Hawaii INTERIM GENERAL CONDITIONS, dated August 1999, and AMENDMENTS shall be read by the Contractor as they form a part of the Agreement to be entered into between the Contractor and HHSC. The Interim General Conditions are not physically included in these specifications, but are included by reference. Copies of the INTERIM GENERAL CONDITIONS may be obtained from the Division of Public works, Department of Accounting and General Services, State of Hawaii at the following website: http://hawaii.gov/pwd/construction_bids/Members/qc/gen_cond_constr

The General Conditions are hereby amended as follows:

a. The following terms specified in Section 1 are hereby defined:

i) Bidder shall have the same definition as Contractor.

ii) Comptroller shall be the Chief Financial Officer at HHSC or his authorized representative.

iii) Department shall be HHSC or its designee.

iv) Engineer shall be the person so designated by HHSC.

v) State shall be HHSC or its designee.

b. Section 1.20 and 1.25 replace "State of Hawaii" with "State".

c. The last two sentences of the third paragraph of Section 2.1.1.2, in the Interim General Conditions is deleted and is replaced with the following:

" If the notice is faxed, the time of receipt by the CEO's fax machine shall be official. The submittal of intention to bid via fax is acceptable only to this office."

d. Section 2.1.2.1: second sentence is hereby deleted in its entirety.

e. Last sentence of paragraph 2.1.2.3 of the Interim General Conditions is amended to read as follows:

"Failure to submit either the required tax clearance certificate or Bid Form will be sufficient grounds for HHSC to refuse to receive or consider the prospective bidder's proposal."

f. The addresses specified in Section 2.6.1 of the Interim General Conditions shall be changed to Leahi Hospital 3675 Kilauea Avenue Honolulu Hawaii 96816.

g. Sections 2.10 through 2.11 are hereby deleted in their entirety.

h. Paragraph 3.8.1 of the Interim General Conditions is amended to read as follows:

“The contract shall be signed and forwarded to HHSC (Contracts Office), by the successful bidder all within three (3) days of receipt of the contract. The performance and payment bonds shall be received by HHSC (Contracts Office) within ten (10) calendar days after the bidders is awarded the contract. No proposal or contract shall be considered binding until the contract has been fully and properly executed by all parties thereto.”

i. In paragraph 3.9.2 of the Interim General Conditions, “ten (10) calendar days after such award or within such further time as the Comptroller may allow” shall be replaced with, “the time allowed in the previous section.”

j. Section 4.1: the words “accepted bid” is deleted from the first sentence.

k. Section 4.9.3: the words “submission of bids” is replaced with the words “execution of this contract”.

l. Section 5.5: the last sentence is hereby deleted in its entirety and replaced with the following:

"In the event of conflict among the Contract Documents, the order of precedence is listed in paragraph 5 of this contract and is further detailed in the following subparagraphs:"

m. Sections 5.5.1 and 5.5.2 are hereby deleted in their entirety.

n. Section 5.8.1: "twenty-four (24)" is hereby changed to "three (3)".

o. Section 5.11 is hereby deleted in its entirety.

p. Section 5.12.4 is hereby deleted in its entirety.

q. Section 7.3.7.4, subparagraphs a and b: Replace "If the project falls within the State University System, The University of Hawaii" with "HHSC."

r. Section 7.4.1 is hereby deleted in its entirety and replaced with the following:

"The Contractor shall prepare, process, obtain, and pay for all permits necessary for the proper execution of the work."

s. Section 7.7.2 is amended to read as follows: "The wage rate schedule is attached to this contract."

t. Sections 7.14.2, 7.19.2, and 7.19.4: delete "Departments and Agencies and their" and insert "directors" between "officers" and "representatives".

u. Section 7.14.4 is hereby added and reads as follows:

"Contractor warrants that it and none of its employees, agents or subcontractors performing services or providing goods pursuant to this Agreement are excluded from participation in federal health care programs, as defined in the Social Security Act (section 1128 and 1128A), and other federal laws and regulations relating to health care. HHSC reserves the right to verify that the above warranty is true and to immediately cancel this Agreement in the event it is violated."

v. Section 7.15 delete "and its Departments and Agencies".

w. Section 7.21.8.6 — Delete the word "bad" before the words "weather day conditions."

x. Section 7.35.1: the last word "earlier" is changed to "later".

3. CORPORATE COMPLIANCE PROGRAM. A description of the Corporate Compliance Program of HHSC is posted on the HHSC Internet (www.hhsc.org). The CONTRACTOR, by signing this contract, acknowledges that it has read said description, and that the CONTRACTOR knows of the fact and substance of the Corporate Compliance Program, which governs operations at all facilities of the HHSC. The CONTRACTOR understands and agrees that employees, agents, and contractors performing any services at any of the HHSC facilities shall be fully subject to such Corporate Compliance Program, as may be amended from time to time, as well as all federal program requirements and applicable policies and procedures of HHSC and its facilities. The Corporate Compliance Program requires periodic training, including an orientation program, of all people who provide financial, business office, personnel, coding, medical records information systems and clinical services in the facility. The CONTRACTOR agrees to cause its employees, agents, and contractors who provide any services at any financial, business office, personnel, coding, medical records information systems and clinical services at any of the HHSC facilities to participate in the orientation and training programs.

4. CONFIDENTIAL INFORMATION. It is acknowledged and agreed that all of the trade secrets, business plans, marketing plans, know how, data, contracts, documents, scientific and medical concepts, billing records, personnel records, medical records of any kind, and referral resources for existing or future services, products, operations, management, business, pricing, financial status, valuations, business plans, goals, strategies, objectives and agreements of HHSC and any of its facilities, affiliates or subsidiaries, and all patient information, in any form, whether written, verbal, or electronic, are confidential ("Confidential Information"); provided, however, that Confidential Information, with the exception of patient information, shall not include information that is in the public domain.

5. CONTRACTOR EXCLUSION FROM FEDERAL PROGRAMS. CONTRACTOR warrants that it and none of its employees, agents or subcontractors performing services or providing goods pursuant to this Agreement are excluded from participation in federal health care programs, as defined in the Social Security Act (section 1128 and 1128A), and other federal laws and regulations relating to health care. HHSC reserves the right to verify that the above warranty is true and to immediately cancel this Agreement in the event it is violated.

6. CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS.
CONTRACTORs are hereby notified of the applicability of Section 11-205.5, HRS, which states that campaign contributions are prohibited from specified State or county government contractors during the term of the contract if the contractors are paid with funds appropriated by a legislative body. For more information, please consult with the Campaign Spending Commission, or visit its website, www.hawaii.govicampaign.

(END OF SECTION)

SECTION 4
BID EVALUATION AND AWARD

4.0 Bid Evaluation

Each bid offer will be reviewed for exact conformity of the requirements in the IFB, known as a responsible bid. Information provided in/with the bid offer will be used to determine whether the interested bidder has the technical and financial capacity to deliver the goods or services, known as a responsive bid.

4.1 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.

4.2 Contract Execution

Upon receipt of the Contract document, the CONTRACTOR shall have ten (10) business days to execute and return the Contract to the Issuing Officer. Explicit execution instructions will accompany the Contract. A copy of the fully executed Contract will be provided the CONTRACTOR within seven (7) business days of Contract execution.

Award of Contract may be withdrawn if the CONTRACTOR is unable to meet Contract execution requirements.

(END OF SECTION)

APPENDIX A

SAMPLE
BID TRANSMITTAL COVER LETTER

Dear Mr. Kawai,

(Name of Business) proposes to provide any and all goods and services as set forth in the "Invitation for Bid" for Leahi Hospital Sinclair Building Heat Pump Replacement IFB No. 21L-0220, for which fees/costs have been set. The fees/costs offered herein shall apply from XXX, 2022 to XXX, 2024.

It is understood and agreed that (Name of Business) have read HHSC's Scope of Services described in the IFB and that this bid is made in accordance with the provisions of such Scope of Services. By signing this bid, (Name of Business) guarantee and certify that all items included in this bid meet or exceed any and all such Scope of Services. (Name of Business) agree, if awarded the contract, to provide the goods and services set forth in the IFB; and comply with all terms and conditions indicated in the IFB; and at the fees/costs set forth in this bid. The following individual(s) may be contacted regarding this bid:_____

_____

Other information:

Address:		Federal Tax ID #:	
Phone No.:		Hawaii GET ID #:	
E-mail address:			

(Name of Business) is a: ☐ Sole Proprietor ☐ Partnership ☐ Corporation ☐ Joint Venture Other (Specify)_____

State of Incorporation is: (Specify)_____

Year of Business started: _____

The exact legal name of the business under which the contract, if awarded, shall be executed is:_____

_____

(Authorized Bidder's Signature, Printed Name/Title; Corporate Seal or Notarized)

P R O P O S A L

FOR

FURNISHING LABOR AND MATERIALS

REQUIRED FOR

LEAHI HOSPITAL
SINCLAIR BUILDING HEAT PUMP REPLACEMENT

TAX MAP KEY: 03-02-031:001

HONOLULU, OAHU, HAWAII

FOR THE

HAWAII HEALTH SYSTEMS CORPORATION
STATE OF HAWAII

After carefully examining the bid documents, drawings and specifications identified above, the Bidder proposes to furnish at its own expense all necessary labor, materials, tools and equipment to complete the work according to the true intent and meaning of the drawings and specifications, all for the Lump Sum Bid of:

_____

_____DOLLARS ($_____).

BASE BID

1. Remove and dispose of heat pump room wall and door and provide new. $_____

2. Provide new heat pump system and associated duct and piping work. $_____

3. Provide new electrical work for new heat pump system. $_____

TOTAL BASE BID (item 1, 2, 3) $_____

SCHEDULE AND COMPLETION OF WORK

The Bidder agrees to commence and complete all work under this contract as follows:

PART 1

Upon receipt of the Letter of Award with written instructions from the Engineer, proceed with preparatory work including processing submittals, obtaining approvals, and permits, or other work as approved by the Engineer. No work will be allowed at the jobsite. No ordering of materials will be allowed until;

(a) the date stipulated in the Letter of Notice to Proceed, or
(b) upon earlier written notice from the Engineer, or
(c) upon receipt of the executed contract for the project.

PART II

The Contractor shall fully complete all work under this contract within 220 consecutive calendar days from the date stipulated in the Letter of Notice to Proceed.

time frame will be increased by 20 consecutive calendar days.

EVALUATION CRITERIA

Evaluating Bids: The lowest responsive, responsible bid is determined by the following procedures:

1) Project control budget is established at $193,000.

2) The project will be evaluated based on the lowest bid price.

METHOD OF AWARD

The contract will be awarded to the lowest responsive and responsible Bidder whose bid meet the requirements and criteria set forth in the solicitation documents and as determined by the HHSC.

In the event that the total lump sum base bid for of all bidders exceed the project control budget, HHSC shall reserve the right to make an award to the apparent Low Bidder and seek additional funds and increase the project control budget or reduce the scope of work through negotiation to meet the project control budget.

OTHER CONDITIONS FOR AWARD

HHSC reserves the right to reject any and/or all bids and waive any defects when, in its opinion, such rejection or waiver will be for the best interest of HHSC;

The award of the contract shall be conditioned upon funds being made available for these projects and further upon the right of the HHSC to hold all bids received for a period of sixty (60) days from the date of the opening thereof, unless otherwise required by law, during which time no bid may be withdrawn;

Any agreement arising out of this offer is subject to approval of HHSC as to form, and to all further approvals, including the approval of the Administrator, required by statute, regulation, rule, order, or other directive.

OTHER CONDITIONS

1. Bidder agrees to pay liquidated damages to the HHSC to be specified.

2. By submitting this proposal, the Bidder is declaring that its firm has not been assisted or represented on this matter by an individual who has, in a HHSC capacity, been involved in the subject matter of this contract in the past two years;

3. Anti-collusion certification. In accordance with HAR 3-122-192, by submitting this proposal, the Bidder is declaring that the price submitted is independently arrived at without collusion.

4. Certification for Safety and Health Program for bids in excess of $100,000. In accordance with HRS 396-18, the Bidder certifies that its organization will have a written safety and health plan for this project that will be available and implemented by the Notice to Proceed date of this project. Details of the requirements of this plan may be obtained from the Department of Labor and Industrial Relations, Occupational Safety and Health Division (HIOSH); and

5. Upon the acceptance of the proposal by the HHSC, the Bidder must enter into and execute a contract for the same and furnish a Performance and Payment bond, as required by law. These bonds shall conform to the provisions of Sections 103D-324 and 325, Hawaii Revised Statutes and any law applicable thereto.

Receipt of the following addenda issued by HHSC is acknowledged by the date(s) of receipt indicated below:

Addendum No. 1_____ Addendum No. 5_____
Date

Addendum No. 2_____ Addendum No. 6_____

Addendum No. 3_____ Addendum No. 7_____

Addendum No. 4_____ Addendum No. 8_____

It is understood that failure to receive any such addendum shall not relieve the Contractor from any obligation under this Proposal as submitted.

ALL JOINT CONTRACTORS OR SUBCONTRACTORS TO BE ENGAGED ON THIS PROJECT

The Bidder certifies that the following is a complete listing of all joint contractors or subcontractors covered under Chapter 444, Hawaii Revised Statutes, who will be engaged by the Bidder on this project to perform the nature and scope of work indicated pursuant to Section 103D-302, Hawaii Revised Statutes and understands that failure to comply with this requirement may be just cause for rejection of the bid.

The Bidder further understands that only those joint contractors or subcontractors listed shall be allowed to perform work on this project and that all other work necessary shall be performed by the Bidder with his own employees. If no joint contractor or subcontractor is listed, it shall be construed that all of the work shall be performed by the Bidder with its own employees.

The Bidder must be sure that it has and that the subcontractor(s) listed in the proposal have all the necessary specialty licenses needed to perform the work for this project. The Bidder shall be solely responsible for assuring that all the specialty licenses required to perform the work are covered in its bid.

The Bidder shall include the license number of the joint contractors or subcontractors listed below. Failure to provide the correct names and license numbers as registered with the Contractor's Licensing Board may cause rejection of the bid submitted.

Complete Firm Name Joint Contractor or Subcontractor for Lump Sum Base Bid	License Number	Nature and Scope of Work to be Performed

Enclosed herewith:

1. Surety Bond (*1))
2. Legal Tender (*2))
3. Cashier's Check (*3))
4. Certified Check (*3))

(Cross Out Those Not Applicable)

in the amount of:

_____

_____ DOLLARS ($_____).

as required by law.

Respectfully submitted,

_____

Name of Company, Joint Venture or Partnership

_____

License No.

By_____

Signature (*4)

Title_____

Date_____

Address_____

_____

Telephone No._____

(Corporate Seal)

(*5)

NOTES:

1. Surety bond underwritten by a company licensed to issue bonds in this State;

2. Legal tender; or

3. A cashier's or a certified check accepted by, and payable on demand to the HHSC by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation.

    a. These instruments may be utilized only to a maximum of $100,000.

    b. If the required security or bond amount totals over $100,000, more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be accepted.

4. Please attach to this page evidence of the authority of this officer to submit bids on behalf of the Company, and also the names and residence addresses of all officers of the Company.

5. Fill in all blank spaces with information asked for or bid may be invalidated. PROPOSAL MUST BE INTACT. MISSING PAGES MAY INVALIDATE YOUR BID.

END OF PROPOSAL

APPENDIX C

S P E C I F I C A T I O N S

FOR

FURNISHING LABOR AND MATERIALS

REQUIRED FOR

LEAHI HOSPITAL
SINCLAIR BUILDING HEAT PUMP REPLACEMENT

3675 KILAUEA AVENUE,
HONOLULU, OAHU, HAWAII 96816

TAX MAP KEY: 03-02-031:001

HONOLULU, OAHU HAWAII

FOR THE

HAWAII HEALTH SYSTEMS CORPORATION (HHSC)

STATE OF HAWAII

MECHANICAL ENGINEER: INTERFACE ENGINEERING, INC.
ARCHITECT: WRNS STUDIO
ELECTRICAL ENGINEER: INTERFACE ENGINEERING, INC.

MARCH 2022

TABLE OF CONTENTS

P R O P O S A L

FOR

FURNISHING LABOR AND MATERIALS

REQUIRED FOR

LEAHI HOSPITAL
SINCLAIR BUILDING HEAT PUMP REPLACEMENT

TAX MAP KEY: 03-02-031:001

HONOLULU, OAHU, HAWAII

FOR THE

HAWAII HEALTH SYSTEMS CORPORATION
STATE OF HAWAII

After carefully examining the bid documents, drawings and specifications identified above, the Bidder proposes to furnish at its own expense all necessary labor, materials, tools and equipment to complete the work according to the true intent and meaning of the drawings and specifications, all for the Lump Sum Bid of:

_____

_____DOLLARS ($_____).

BASE BID

1. Remove and dispose of heat pump room wall and door and provide new. $_____

2. Provide new heat pump system and associated duct and piping work. $_____

3. Provide new electrical work for new heat pump system. $_____

TOTAL BASE BID (item 1, 2, 3) $_____

SCHEDULE AND COMPLETION OF WORK

The Bidder agrees to commence and complete all work under this contract as follows:

PART 1

Upon receipt of the Letter of Award with written instructions from the Engineer, proceed with preparatory work including processing submittals, obtaining approvals, and permits, or other work as approved by the Engineer. No work will be allowed at the jobsite. No ordering of materials will be allowed until;

(a) the date stipulated in the Letter of Notice to Proceed, or
(b) upon earlier written notice from the Engineer, or
(c) upon receipt of the executed contract for the project.

PART II

The Contractor shall fully complete all work under this contract within 220 consecutive calendar days from the date stipulated in the Letter of Notice to Proceed.

time frame will be increased by 20 consecutive calendar days.

EVALUATION CRITERIA

Evaluating Bids: The lowest responsive, responsible bid is determined by the following procedures:

1) Project control budget is established at $193,000.

2) The project will be evaluated based on the lowest bid price.

METHOD OF AWARD

The contract will be awarded to the lowest responsive and responsible Bidder whose bid meet the requirements and criteria set forth in the solicitation documents and as determined by the HHSC.

In the event that the total lump sum base bid for of all bidders exceed the project control budget, HHSC shall reserve the right to make an award to the apparent Low Bidder and seek additional funds and increase the project control budget or reduce the scope of work through negotiation to meet the project control budget.

OTHER CONDITIONS FOR AWARD

HHSC reserves the right to reject any and/or all bids and waive any defects when, in its opinion, such rejection or waiver will be for the best interest of HHSC;

The award of the contract shall be conditioned upon funds being made available for these projects and further upon the right of the HHSC to hold all bids received for a period of sixty (60) days from the date of the opening thereof, unless otherwise required by law, during which time no bid may be withdrawn;

Any agreement arising out of this offer is subject to approval of HHSC as to form, and to all further approvals, including the approval of the Administrator, required by statute, regulation, rule, order, or other directive.

OTHER CONDITIONS

1. Bidder agrees to pay liquidated damages to the HHSC to be specified.

2. By submitting this proposal, the Bidder is declaring that its firm has not been assisted or represented on this matter by an individual who has, in a HHSC capacity, been involved in the subject matter of this contract in the past two years;

3. Anti-collusion certification. In accordance with HAR 3-122-192, by submitting this proposal, the Bidder is declaring that the price submitted is independently arrived at without collusion.

4. Certification for Safety and Health Program for bids in excess of $100,000. In accordance with HRS 396-18, the Bidder certifies that its organization will have a written safety and health plan for this project that will be available and implemented by the Notice to Proceed date of this project. Details of the requirements of this plan may be obtained from the Department of Labor and Industrial Relations, Occupational Safety and Health Division (HIOSH); and

5. Upon the acceptance of the proposal by the HHSC, the Bidder must enter into and execute a contract for the same and furnish a Performance and Payment bond, as required by law. These bonds shall conform to the provisions of Sections 103D-324 and 325, Hawaii Revised Statutes and any law applicable thereto.

Receipt of the following addenda issued by HHSC is acknowledged by the date(s) of receipt indicated below:

Addendum No. 1_____ Addendum No. 5_____
Date

Addendum No. 2_____ Addendum No. 6_____

Addendum No. 3_____ Addendum No. 7_____

Addendum No. 4_____ Addendum No. 8_____

It is understood that failure to receive any such addendum shall not relieve the Contractor from any obligation under this Proposal as submitted.

ALL JOINT CONTRACTORS OR SUBCONTRACTORS TO BE ENGAGED ON THIS PROJECT

The Bidder certifies that the following is a complete listing of all joint contractors or subcontractors covered under Chapter 444, Hawaii Revised Statutes, who will be engaged by the Bidder on this project to perform the nature and scope of work indicated pursuant to Section 103D-302, Hawaii Revised Statutes and understands that failure to comply with this requirement may be just cause for rejection of the bid.

The Bidder further understands that only those joint contractors or subcontractors listed shall be allowed to perform work on this project and that all other work necessary shall be performed by the Bidder with his own employees. If no joint contractor or subcontractor is listed, it shall be construed that all of the work shall be performed by the Bidder with its own employees.

The Bidder must be sure that it has and that the subcontractor(s) listed in the proposal have all the necessary specialty licenses needed to perform the work for this project. The Bidder shall be solely responsible for assuring that all the specialty licenses required to perform the work are covered in its bid.

The Bidder shall include the license number of the joint contractors or subcontractors listed below. Failure to provide the correct names and license numbers as registered with the Contractor's Licensing Board may cause rejection of the bid submitted.

Complete Firm Name Joint Contractor or Subcontractor for Lump Sum Base Bid	License Number	Nature and Scope of Work to be Performed

Enclosed herewith:

1. Surety Bond (*1))
2. Legal Tender (*2))
3. Cashier's Check (*3))
4. Certified Check (*3))

(Cross Out Those Not Applicable)

in the amount of:

_____

_____ DOLLARS ($_____).

as required by law.

Respectfully submitted,

_____

Name of Company, Joint Venture or Partnership

_____

License No.

By_____

Signature (*4)

Title_____

Date_____

Address_____

_____

Telephone No._____

(Corporate Seal)

(*5)

NOTES:

1. Surety bond underwritten by a company licensed to issue bonds in this State;

2. Legal tender; or

3. A cashier's or a certified check accepted by, and payable on demand to the HHSC by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation.

    a. These instruments may be utilized only to a maximum of $100,000.

    b. If the required security or bond amount totals over $100,000, more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be accepted.

4. Please attach to this page evidence of the authority of this officer to submit bids on behalf of the Company, and also the names and residence addresses of all officers of the Company.

5. Fill in all blank spaces with information asked for or bid may be invalidated. PROPOSAL MUST BE INTACT. MISSING PAGES MAY INVALIDATE YOUR BID.

END OF PROPOSAL

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 in 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" 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.
   1. Mr. Ron Kurasaki
      a. POSITION OR TITLE: Project Manager
      b. TELEPHONE NUMBER: (808) 497-9350
      c. Email: rkurasaki@hhsc.org

B. Project Coordinator - For questions and clarifications during bidding and Requests for Substitutions.
   1. Mr. Mark Koller
      a. POSITION OR TITLE: Project Engineer
      b. TELEPHONE NUMBER: (808) 445-9169
      c. Email: MarkK@interfaceeng.com

C. Procurement Agency - For questions regarding proposal and contract requirements.
   1. Mr. Scott Kawai
      a. POSITION OR TITLE: Contracts Manager
      b. TELEPHONE NUMBER: (808) 832-3025
      c. 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 $250.00 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 6:30 PM to 4:00 AM Monday through Friday, excluding State Holidays, unless otherwise noted or restricted under “Section 01100”. The Working Hours provisions of specification “Section 01100” 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”.

1.07 SPECIAL PROCEDURES DURING BIDDING

A. Bid documents will be available online and from the Contracts Manager’s office, at Maluhia, 1027 Hala Drive, Honolulu, HI, 96817.

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 up-dated 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 the Hospital and Architect. 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 the 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

SECTION 01019 - GENERAL PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

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 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. The 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 the 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:
   a. FIELD POSTED AS-BUILT
   b. Certified By: Date:_____
   c. 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 Architect 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 the 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 the 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 the 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. 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 the 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 the Hospital and shall be placed where directed by the Architect and/or HHSC Representative.

END OF SECTION

SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: The work shall generally consist of demolition, replacement of domestic water heating heat pump, electrical work, sheet metal work, wall partition/door work, and painting as indicated on the drawings and specified herein.
   1. Project Location: Leahi Hospital, 3675 Kilauea Avenue, Honolulu, Hawaii 96816.

B. 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.

C. 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

D. Contractor shall not alter the Drawings and Specification. If an error or discrepancy is found, notify the Architect.

E. Specifying of interface and coordination in the various specification sections is provided for information and convenience only. These requirements in the various sections shall complement the requirements of this Section.

1.02 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated 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. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates. 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.
   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
      a. The words “shall,” “shall be,” or “shall comply with,” depending on the context, are implied where a colon (:) is used within a sentence or phrase.
   3. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research’s “Encyclopedia of Associations” or in Columbia Books’ “National Trade & Professional Associations of the U.S.”

B. Definitions
   1. Directed: Terms such as “directed,” “requested,” “authorized,” “selected,” “approved,” “required,” and “permitted” mean directed by Contracting Officer, requested by Contracting Officer, and similar phrases.
   2. Indicated: The term “indicated” refers to graphic representations, notes, or schedules on drawings or to other paragraphs or schedules in specifications and similar requirements in the Contract Documents. Terms such as “shown,” “noted,” “scheduled,” and “specified” are used to help the user locate the reference.

3. Furnish: The term “furnish” means to supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar operations.
4. Install: The term “install” describes operations at project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
5. Provide: The terms “provide” or “provides” means to furnish and install, complete and ready for the intended use.
6. Installer: An installer is the contractor or another entity engaged by contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
7. Submit: Terms such as “submit,” “furnish,” “provide,” and “prepare” and similar phrases in the context of a submittal, means to submit to the Contracting Officer.

C. Industry Standards
1. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
2. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
3. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Contracting Officer for a decision before proceeding.

1.03 WORK SEQUENCE

A. The Work will be conducted in a single construction phase.

1.04 USE OF PREMISES AND WORK RESTRICTIONS

A. General: Contractor shall have full use of construction zone for construction operations, including restricted use of project site, during construction period. Contractor’s use of premises is limited only by State’s right to perform work or to retain other contractors on portions of the project site.

B. Contractor’s use of premises is restricted as follows:
1. Construction Times and Schedule:
a. The Contractor shall coordinate the work schedule with the Engineer and/or HHSC Representative. An advanced notice of 15 calendar days shall be provided prior to the start of work. Work shall be scheduled for weekdays (6:30 PM to 4:00 AM) with advanced notice by the Contractor.
b. The normal operational hours of the hospital are 8:00 AM to 4:30 PM, Monday through Friday.
c. Work performed during normal operating hours shall not impede public traffic or office personnel. An alternate route around the work areas may be required.
2. Site Access and Parking:
a. Arrange all on-site parking and access with the Engineer and/or HHSC Representative.
b. Subject to availability, the Engineer and/or HHSC Representative will designate other on-site areas that may be used by the Contractor other than assigned stalls. Restore any property damaged by construction activities at the completion of the project.
3. Sanitation and Utilities:
a. Contractor may use designated restrooms, however, shall maintain the facilities in clean condition at all times. Coordinate with the HHSC Representative.
b. Arrange all temporary electricity and water service with the HHSC Representative. There will be no charges for reasonable electricity and water service.

c. Should interruption of any utility services be required, outages shall be coordinated with the HHSC Representative. A minimum five (5) working days notice shall be provided. Contractor is forewarned that the HHSC Representative may require outages to be done at specific times to minimize disruptions to the facility operations.

4. Other Conditions:
   a. Noise and other disrupting activities normally resulting from construction operations are detrimental to the conduct of normal activities in adjacent locations surrounding the project area. Accordingly, exercise every precaution to keep noise levels to a minimum. Internal combustion engines and compressors shall be equipped with mufflers to reduce noise to a minimum.
   b. Use or application of materials with offensive odors should be avoided and may be restricted from use on this project.

1.05 WORK UNDER OTHER CONTRACTS

A. Separate Contract: The HHSC may execute a separate contract for certain construction at the facility that was not known at the time Offers were submitted.

B. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

PART 2 - PRODUCTS (NOT USED)

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.

1.02 CONSTRUCTION PROVISIONS

A. 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.

B. 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.

C. Perform operations to minimize inconvenience or disturbance upon the personnel and residents.

D. 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.

E. 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.

F. None of the foregoing regulations shall be construed as a restriction on the legal prosecution of the work.

1.03 SEQUENCING OF WORK

A. The Contractor shall schedule his work in general consideration for the on-going operation of the 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 the 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 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Where indicated in these specifications, provide submittals to the Engineer for review.

1.02 PROCEDURES

A. Unless otherwise specified, deliver submittals to the Engineer with copy of transmittal to the Contracts Manager.

B. Transmit all items using form which identifies Project, Contractor, Subcontractor, and major supplier. Identify pertinent drawing sheet, detail number, and specification section number, as appropriate. Identify deviations from Contract Documents. Provide space for the Architect or his Consultant's review stamp.

C. Upon completion of review by the Engineer, the Engineer will return submittals to the Contractor with copy to the Contracts Manager and HHSC Representative.

1.03 SCHEDULE OF WORK

A. Coordinate Schedule with Work Sequence specified in Section 01014.

1.04 SHOP DRAWINGS AND SAMPLE SUBMITTALS

A. All submittals shall be made in accordance with the following unless otherwise specified. Minimum sheet size is 8-1/2" x 11". Maximum sheet size is same size as the Contract Drawings. Drawings shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet, schedule, and detail shown on Contract Drawings.

B. Mark each copy to identify applicable products, and other data. Supplement manufacturer's standard data to provide information unique to the work. Include manufacturer's installation instructions when required by the specification.

1. The Contractor shall review, stamp with his approval and submit with reasonable promptness and in orderly sequence so as to cause no delay in work of any other Subcontractor, all shop drawings, and product data required by these specifications.
2. Properly identify shop drawings and samples as specified. At the time of submission, the Contractor shall inform the HHSC Technical Representative in writing of any deviation in the shop drawings or submittals from requirements of the Contract Documents.
3. By approving and submitting the shop drawings and submittals the Contractor thereby represents that he has determined and verified all field measurements, field criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each shop drawing and sample with the requirements of these specifications.
4. Six (6) copies of the Shop Drawings and submittals shall be submitted for review. Upon review, the Engineer will retain three (3) copies and return the balance to the Contractor.
5. The Engineer will review the shop drawings and submittals with reasonable promptness so as to cause no delay but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Engineer's review of a separate item shall not indicate approval of an assembly in which the item functions.
6. The Contractor shall make any corrections required by the Engineer and shall resubmit the required number of corrected copies of shop drawings or submittals for review. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Engineer on previous submissions.
7. The Engineer's review of shop drawings or submittals shall not relieve the Contractor of responsibilities for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Hospital in writing of such deviation, at time of submission, and the HHSC Representative has given written approval to the specific deviation; nor shall the Engineer's review relieve the Contractor from responsibility for errors or omissions in the shop drawings or samples.

8. No portion of the work requiring a shop drawing or sample submission shall be commenced until the submission has been reviewed by the Engineer. All such portions of the work shall be in accordance with reviewed shop drawings and samples.

C. Samples: Submit full range of manufacturer's standard textures, colors, and patterns for the Hospital's selection. Submit samples as specified in the respective Specification sections and as noted above. Samples shall illustrate functional characteristics of the Product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work. Include identification on each sample, giving full information.

1.05 BIDDER'S SPECIAL RESPONSIBILITY FOR COORDINATING CONTRACTUAL WORK AND SUBMITTALS:

A. The General Contractor shall be responsible for the coordination of all contractual work and submittals.

B. The General Contractor shall have a rubber stamp made up in the following format:

C. Contractor's Name

1. PROJECT:
2. PROJECT NO.:
3. THIS SUBMITTAL HAS BEEN CHECKED BY THIS GENERAL CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL INTO THEIR OWN WORK.
4. DATE RECEIVED
5. SPECIFICATION SECTION #
6. SPECIFICATION PARAGRAPH #
7. DRAWING
8. SUBCONTRACTOR
9. SUPPLIER
10. MANUFACTURER
11. CERTIFIED BY:

D. This stamp, "filled-in", should appear on the title sheet of each shop drawing, on a cover sheet of submittals in an 8-1/2" x 11" format, or on one face of a cardstock tag (min. 3" x 6") tied to each sample. The tag on the samples should state what the sample is, so that if the tag is accidentally separated from the sample, they can be matched up again. The back of this tag will be used by the Engineer for his receipt, review, and log stamp and for any comments that relate to the sample.

E. All submittals for material and shop drawings listed in the contract documents, shall be required and shall be first reviewed and certified by the General Contractor, then reviewed and approved by the Engineer prior to any ordering of materials and equipment. Submittals that have not been reviewed by the General Contractor shall be returned for review.

1.06 MANUFACTURER'S CERTIFICATES

A. Submit certificates, warranties, operating and maintenance instructions in accordance with requirements of each specification section. Submit in triplicate.

1.07 MSDS

A. MSDS shall be submitted prior to the pre-construction meeting. The Contractor shall submit MSDS log and reference each MSDS to its specification Section number and product system.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01715 - EXISTING CONDITIONS ASBESTOS AND LEAD-BASED PAINT SURVEY

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the results of the Contracting Officer's Asbestos- Containing Materials and Lead-Based Paint Survey for the project, which is provided for the Contractor's information.

B. Related Sections include the following:
   1. SECTION 13282 – LEAD PAINT CONTROL MEASURES for requirements of all work which disturbs materials with lead or paint with lead.
   2. SECTION 13289 – LEAD TESTING AND AIR MONITORING for lead air monitoring requirements.

1.02 ASBESTOS

A. The structure to be renovated or modified under this contract were surveyed for the presence of asbestos containing materials (ACM). A copy of the initial survey report, as well as any subsequent supplemental survey report if performed, is included in this Section.
   1. The report is included, even when no ACM was found, for the Contractor's information. Review the attached report for the basis on which the negative ACM finding was made. The Contractor may perform further surveys at its own expense, if ACM not shown in the report is suspected in the areas of the building in which work will be performed. If ACM is found, notify the Contracting Officer and/ or General Contractor immediately. The Contracting Officer will reimburse the Contractor for reasonable costs for the testing cost if ACM is found.
   2. If there is ACM outside of the areas in which work will be performed, this ACM shall not be disturbed in any way.

B. If applicable, notify employees, subcontractors, and all other persons engaged on the project of the presence of asbestos in the existing buildings in accordance with the State of Hawaii: Occupational Safety and Health Administration and 29 CFR 1926.1101, Asbestos.

C. In the event that work is required in any building or buildings on the site other than the one designated within this project scope, request copies of the asbestos survey report for such building from the Contracting Officer. Based on the information contained in the additional survey, notify affected personnel.

1.03 LEAD-BASED PAINT

A. The structure or structures to be renovated or modified under this contract were surveyed for the presence of lead-based paint (LBP). A copy of the survey report is included in this Section.

B. Inform employees, Subcontractors, and all other persons engaged in the project that lead-based paint (LBP) is present in the existing building and at the job site. Follow the requirements of 29 CFR 1926.62 Lead.

C. Review the attached lead testing data which identify locations LBP was found. Lead testing was for design purposes only and the results do not satisfy any of the requirements of OSHA 29 CFR 1926.62 Lead.

D. The Contractor shall follow all applicable rules and regulations pertaining to the handling, removal and disposal of lead paint.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SURVEY ATTACHED

A. Inspection Report for Asbestos and Lead-Based Paint, 22 pages, dated July 2021, prepared by EnviroQuest, Inc.

END OF SECTION

EnviroQuest

SERVICES

HAZMAT Inspections

Remediation Design

Asbestos Management

Lead Management

Lead Risk Assessment

Industrial Hygiene

Indoor Air Quality

Mold Assessment

Environmental Site Assessments

Subsurface Investigation

Water Sampling

Asbestos Training

Lead Training

OSHA Training

OSHA Compliance

INSPECTION REPORT FOR ASBESTOS AND LEAD-BASED PAINT

LEAHI HOSPITAL
SINCLAIR HEAT PUMP

EnviroQuest Project: 300790

July 2021

Prepared for:

Interface Engineering
1002 Bishop Street, Suite 750
Honolulu, Hawaii 96813

Prepared by:

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea, Hawaii 96701
808.486.5881

Jesus Sacramento
HIASB-0173
PB-0070

Jim Cardenas
HIASB-0175

TABLE OF CONTENTS

Table of Contents

TABLES

APPENDICES

1 INTRODUCTION

A limited hazardous building material survey (HBMS) was conducted on June 29, 2021 at Sinclair Heat Pump room located at Leahi Hospital, Honolulu, Hawaii.

The purpose of the activities under this project were to perform an inspection of specific areas prior to its renovation works and to identify asbestos-containing materials (ACMs), and lead-based paints (LBPs), which will be impacted by the building renovation work.

1.1 SITE LOCATION

The inspection was limited to the areas affected by the renovation work under the direction of Interface Engineering representative. The listed area was included in our inspection.

Leahi Hospital – Sinclair Heat Pump room

2 ASBESTOS

Fifteen samples were collected from suspect asbestos-containing materials.

2.1 METHODOLOGY

A visual inspection for suspect ACM and homogeneous areas (areas that have uniform color, texture, and appearance) was conducted. Suspect materials were divided into three Environmental Protection Agency (EPA) categories:

- Surfacing Materials (sprayed or troweled-on materials)
- Thermal Systems Insulations (materials generally applied to various mechanical systems)
- Miscellaneous Materials (any materials which do not fit in the above categories)

Sampling methodology generally followed the procedures presented in EPA 40 CFR 763 Asbestos and Hawaii Department of Health (HDOH), Hawaii Administrative Rules (HAR) Titles 11-501 *Asbestos Requirements* and 11-502 *Asbestos Containing Materials in Schools*.

2.2 RESULTS

Samples were submitted to Hawaii Analytical Laboratory, LLC, a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory. The samples were analyzed by polarized-light microscopy (PLM), following EPA Method 600/R-93-116, *Visual Area Estimation*. Hawaii Analytical Laboratory is also registered to provide asbestos laboratory services in Hawaii under HDOH 11-504 *Asbestos Abatement Certification Program.*

Based on the laboratory analytical results, no asbestos was identified in the samples. The National Emission Standard for Hazardous Air Pollutants (NESHAP), 40 CFR 61 Part M, defines ACM as those which contain greater than 1% asbestos. In accordance with NESHAP requirements, samples consisting of distinct layers of materials were analyzed and reported separately by the laboratory. Refer to the accompanying appendices for laboratory analytical results and photographs.

3 LEAD

Six paint film samples were collected from painted or coated materials.

3.1 METHODOLOGY

A visual inspection for painted or coated building surfaces was conducted. Sampling methodology generally followed the procedures presented in the U.S. Department of Housing and Urban Development's document *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* and EPA 40 CFR 745 *Lead-Based Paint Poisoning Prevention in Certain Residential Structures.*

Samples were submitted to Hawaii Analytical Laboratory, LLC. The samples were analyzed in accordance with NIOSH Method 7082m *Flame Atomic Absorption Spectrophotometry* (FAAS). Hawaii Analytical Laboratory is accredited for lead analysis through successful participation in the American Industrial Hygiene Association's Environmental Lead Laboratory Accreditation Program.

3.2 RESULTS

Based on the paint film analysis, two of the 6 lead-in paint concentrations exceeded the EPA guidelines for lead in paint. EPA defines lead-based paint as paint or other surface coatings that contain lead equal to or more than 0.5% by weight. Lead at concentrations below the EPA guidelines were also detected. These paints have a lead concentration of less than 0.5% by weight and are identified as lead-containing paint (LCP). Refer to the accompanying appendices for laboratory analytical results and photographs.

4 SUMMARY

4.1 ASBESTOS

Asbestos-containing materials were not identified in this inspection.

4.2 LEAD

The listed materials were identified as lead-based paint.

Color	Location	Condition
Beige over blue paint	CMU wall (exterior side) adjacent to the hallway	Intact
White paint	Concrete ceiling deck	Intact

The lead-based paint was found to be “intact” and no immediate action is necessary. LCP or lead at measurement below the EPA guidelines were also detected. Prior to the disturbance of any paint, the contractor’s employees disturbing the painted material must be informed that it contains lead and must have received training under Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 *Lead*. If any untested paints are disturbed, they should be assumed to contain lead.

If lead paint debris is generated during any disturbance activity, a composite sample should be collected for *Toxicity Characteristic Leaching Procedure* (TCLP) lead analysis for waste disposal characterization. HDOH 11-261, *Hazardous Waste Management,* allows a maximum lead concentration of 5.0 mg/L. TCLP results exceeding this threshold requires disposal as hazardous waste. Note that painted metal components are exempt from TCLP testing if recycled.

5 LIMITATIONS

The information set forth is based solely on the agreed upon scope of services, on personal observation, laboratory data, and information provided by Interface Engineering.

Although this inspection provides information on the relative presence or absence of asbestos-containing materials and lead-based paint, it should not be construed as a final statement that all hazardous materials have been identified.

Given the often obscure and elusive nature of hazardous materials, it is never possible to absolutely dismiss the possibility of additional hazardous materials. EnviroQuest, Inc. expressly disclaims any and all liability, representations, expressed or implied, contained in, or for omission from this report, or any other written or oral communication which might be interpreted as establishing the total extent of all liability present at the subject property.

Our services have been performed with usual thoroughness and competence of the consulting profession, in accordance with the standard of professional services at this time. No other warranty or representation, either expressed or implied is included or intended.

Any question regarding our work and this report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned. EQI greatly appreciates this opportunity to assist you with your industrial hygiene needs. We look forward to working with you again in the future.

TABLE 1: ASBESTOS HOMOGENOUS MATERIAL SUMMARY
LEAHI HOSPITAL – SINCLAIR HEAT PUMP ROOM

Homogenous Material	ACM[1] (Y/N)	Location	Sample ID	Friable (Y/N)	Est Qty (ACM) (ft^2)	Condition[2]	Photo No.
Light-gray caulking	N	Doorframe sealant	300790-01 300790-02 300790-03	N	-	G	2
White paper wrap and yellow fiberglass	N	Pipe run, elbow and tees - 3” diameter pipe insulation	300790-04 300790-05 300790-06	Y	-	G	3
Black vinyl sheet	N	Air condition (AC) duct vibration joint	300790-07 300790-08 300790-09	N	-	G	4
White paper/silver foil wrap and yellow fiberglass	N	Pipe run, elbow and tees – 6” diameter pipe insulation located outside the heat pump room	300790-10 300790-11 300790-12	N	-	G	5
Gray caulking	N	Wall sidings and ceiling joint sealant	300790-13 300790-14 300790-15	N	-	G	6

1. ACM=>1% asbestos content
2. Good (G); Damaged (D) <10% distributed or 25% localized; Significant Damage (SD), >10% distributed or 25% localized
3. Treat as ACM unless verified by point count

TABLE 2: LEAD PAINT SUMMARY BY AAS
LEAHI HOSPITAL – SINCLAIR HEAT PUMP ROOM

Paint Color	Int/Ext	LBP[1] (Y/N)	LCP[2] (Y/N)	Paint Location	Sample ID	Results (%)	Condition[3,4]	Photo No.
Gray	Int	N	Y	Wood window frame	300790-01P	0.29	Intact	7
Light-gray	Int	N	Y	CMU wall (interior side)	300790-02P	0.053	Intact	8
Off-white	Int	N	Y	Metal window screen	300790-03P	0.14	Intact	9
Beige over blue	Ext	Y	-	CMU wall (exterior side) – adjacent to the hallway	300790-04P	0.70	Intact	10
Gray	Int/Ext	N	Y	Metal door and frame	300790-05P	0.0063	Intact	11
White	Int	Y	-	Concrete ceiling deck	300790-06P	0.89	Intact	12

1. LBP = >0.5% lead by weight
2. LCP = >laboratory detection limit but <0.5%
3. Exterior: Intact – Entire surface is intact; Fair - ≤ 10ft^2; Poor - >10 ft^2
4. Interior: Intact – Entire surface is intact; Fair - ≤ 2ft^2 or ≤ 10%; Poor - >2 ft^2 or >10%

EnviroQuest

APPENDIX A

REFERENCE PHOTOGRAPHS

Photo 1: Sinclair Heat Pump room.

Photo 2: Doorframe sealant
Non asbestos-containing light-gray caulking.

Photo 3: Pipe run, elbow and tee insulations.
Non asbestos-containing white paper wrap and yellow fiberglass.

Photo 4: AC duct vibration joint connection.
Non asbestos-containing black sheet vinyl.

Photo 5: Pipe run, elbow and tee insulations.
Non asbestos-containing white paper/silver foil wrap and yellow fiberglass.

Photo 6: Metal wall sidings/ concrete ceiling joint sealant. Non asbestos-containing gray caulking.

EnviroQuest

PHOTOGRAPHIC LOG

LEAHI HOSPITAL – SINCLAIR HEAT PUMP ROOM

Photo 7: Wood window frame.
Lead-containing gray paint.

Photo 8: CMU wall (interior side and exterior side).
Lead-containing light-gray paint on the interior side of the CMU.

Photo 9: Metal window screen.
Lead-containing off-white paint.

Photo 10: CMU wall (exterior side) adjacent to the hallway. Lead-based beige over blue paint.

Photo 11: Metal door and frame.
Lead-containing gray paint.

Photo 12: Concrete ceiling.
Lead-based white paint.

EnviroQuest

APPENDIX B

LABORATORY ANALYTICAL REPORTS

Hawaii Analytical Laboratory
ANALYTICAL REPORT

Friday, July 2, 2021

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea HI 96701

Phone Number: (808)486-5881
Facsimile: (808) 486-5889
Email: eqi@enviroquestinc.com

Lab Job No: 202106177
Date Submitted: 6/30/2021
Your Project: 300790, Leahi Hospital - Sinclair Heat Pump Relocation, 6/29/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202138341	**300790-01**		NONE DETECTED		None detected		Binder	7/1/2021
Layer	Gray caulking							
Comments								
202138342	**300790-02**		NONE DETECTED		None detected		Binder	7/1/2021
Layer	Gray caulking							
Comments								
202138343	**300790-03**		NONE DETECTED		None detected		Binder	7/1/2021
Layer	Gray caulking							
Comments								
202138344	**300790-04**		NONE DETECTED		Fibrous glass (amorphous) + cellulose (undulose)	**40**	Aluminum + other	7/1/2021
Layer	White/silver wrap							
Comments								
202138344	**300790-04**		NONE DETECTED		Fibrous glass (amorphous)	**95**	Other	7/1/2021
Layer	Yellow insulation							
Comments								
202138345	**300790-05**		NONE DETECTED		Cellulose (undulose)	**20**	Vinyl	7/1/2021
Layer	White paper / plastic							
Comments								

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea HI 96701

Phone Number: (808)486-5881
Facsimile: (808) 486-5889
Email: eqi@enviroquestinc.com

Lab Job No: 202106177
Date Submitted: 6/30/2021
Your Project: 300790, Leahi Hospital - Sinclair Heat Pump Relocation, 6/29/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202138345	**300790-05**		NONE DETECTED		Fibrous glass (amorphous)	**95**	Other	7/1/2021
Layer	Yellow insulation							
Comments								
202138346	**300790-06**		NONE DETECTED		Cellulose (undulose) + wollastonite (+/- optical sign)	**10**	Binder + other	7/1/2021
Layer	White coat							
Comments								
202138346	**300790-06**		NONE DETECTED		Fibrous glass (amorphous) + cellulose (undulose)	**40**	Aluminum + other	7/1/2021
Layer	White/silver wrap							
Comments								
202138346	**300790-06**		NONE DETECTED		Fibrous glass (amorphous)	**95**	Other	7/1/2021
Layer	Yellow insulation							
Comments								
202138347	**300790-07**		NONE DETECTED		Fibrous glass (amorphous)	**15**	Binder + other	7/1/2021
Layer	Black vibratioin cloth							
Comments								
202138348	**300790-08**		NONE DETECTED		Fibrous glass (amorphous)	**15**	Binder + other	7/1/2021
Layer	Black vibratioin cloth							
Comments								
202138349	**300790-09**		NONE DETECTED		Fibrous glass (amorphous)	**15**	Binder + other	7/1/2021
Layer	Black vibratioin cloth							
Comments								
202138350	**300790-10**		NONE DETECTED		Fibrous glass (amorphous)	**95**	Other	7/1/2021
Layer	Brown insulation							
Comments								

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea HI 96701

Phone Number: (808)486-5881
Facsimile: (808) 486-5889
Email: eqi@enviroquestinc.com

Lab Job No: 202106177
Date Submitted: 6/30/2021
Your Project: 300790, Leahi Hospital - Sinclair Heat Pump Relocation, 6/29/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202138350	**300790-10**		NONE DETECTED		Fibrous glass (amorphous) + cellulose (undulose)	**40**	Aluminum + other	7/1/2021
Layer	White/silver wrap							
Comments								
202138351	**300790-11**		NONE DETECTED		None detected		Vinyl	7/1/2021
Layer	White plastic							
Comments								
202138351	**300790-11**		NONE DETECTED		Fibrous glass (amorphous)	**95**	Other	7/1/2021
Layer	Yellow insulation							
Comments								
202138352	**300790-12**		NONE DETECTED		Fibrous glass (amorphous)	**95**	Other	7/1/2021
Layer	Brown insulation							
Comments								
202138352	**300790-12**		NONE DETECTED		None detected		Vinyl	7/1/2021
Layer	White plastic							
Comments								
202138352	**300790-12**		NONE DETECTED		Fibrous glass (amorphous) + cellulose (undulose)	**40**	Aluminum + other	7/1/2021
Layer	White/silver wrap							
Comments								
202138353	**300790-13**		NONE DETECTED		None detected		Binder	7/1/2021
Layer	Gray caulking							
Comments								
202138354	**300790-14**		NONE DETECTED		None detected		Binder	7/1/2021
Layer	Gray caulking							
Comments								

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea HI 96701

Phone Number: (808)486-5881
Facsimile: (808) 486-5889
Email: eqi@enviroquestinc.com

Lab Job No: 202106177
Date Submitted: 6/30/2021
Your Project: 300790, Leahi Hospital - Sinclair Heat Pump Relocation, 6/29/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202138355	**300790-15**		NONE DETECTED		None detected		Binder	7/1/2021
Layer	Gray caulking							
Comments								

General Comments
The bulk sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures outlined in the United States Environmental Protection Agency's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (EPA-600/M4-82-020, Dec. 1982) and / or "Method for Determination of Asbestos in bulk Building Materials" (EPA-600/R-93-116, July 1993). The analysis of each bulk sample relates only to the material examined, and may or may not represent the overall composition of its original source. Floor tile and other resinously bound materials, when analyzed by the EPA methods referenced above may yield false negative results because of limitations in separating closely bound fibers and in detecting fibers of small length and diameter. Alternative methods of identification, including Transmission Electron Microscopy (TEM) may or may not be applicable. We utilize calibrated visual area estimation on a routine basis and do not conduct point counting unless specifically requested to do so. Estimated error for the visual determinations presented are 75% relative (1 to 2%), 50% relative (3 to 5%); 25% relative (6 to 25%) and 20% (>26% v/v). We will not separate layers which in our opinion are not readily discernable. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Governement. Unless otherwise indicated, the sample condition at the time of receipt was acceptable.

Results and Symbols Definitions
> This testing result is greater than the numerical value listed.
< This testing result is less than the numerical value listed.
None Detected = asbestos was not observed in the sample. If trace amount of asbestos was detected below our quantifiable limits of 1.0%, <1% (trace) would be indicated and the asbestos type listed. Point counting, where applicable, are recommended to improve accuracy.

Jennifer Hsu Liao
Laboratory Manager

EnviroQuest

202106177

PLM DATA SHEET

Project No.: 300790 Project Name: Leahi Hospital – Sinclair Heat Pump Relocation Date: 6/29/21

Page: 1 of 2

Material Description: L-gray caulking — Friable / Non-friable

Sample No.	Location	
300790-01	Sinclair Heat Pump room – door frame sealant	202138341
-02		202138342
-03		202138343

CONDITION:	% Damaged: 26	% Localized:	% Distributed:	Total Material Quantity:

Surfacing Material		TSI		Misc.	
☐ Sig. Damage	% Crumbling -	☐ Sig. Damage	% Gouge/Punct -	☐ Sig. Damage	% Crumbling -
☐ Damaged	% Delaminating -	☐ Damaged	% Crushed -	☐ Damaged	% Delaminating -
☐ Good Cond.	% H_2O/Gouges -	☐ Good Cond.	% H_2O Stains -	☑ Good Cond.	% H_2O/Gouges-

Contact Potential	☐ High	☐ Moderate	☑ Low
Vibration Potential	☐ High	☐ Moderate	☑ Low
Air Erosion	☐ High	☐ Moderate	☑ Low
OVERALL POTENTIAL RATING	☐ Significant Damage	☐ Damage	☑ Minimal Damage

Material Description: White paper wrap & yellow fiberglass — Friable / Non-friable

Sample No.	Location		
300790-04	Sinclair Heat Pump room	pipe run	202138344
-05	– 3"Ø pipe insulation	pipe elbow	202138345
-06		pipe tee	202138346

CONDITION:	% Damaged:	% Localized:	% Distributed:	Total Material Quantity:

Surfacing Material		TSI		Misc.	
☐ Sig. Damage	% Crumbling -	☐ Sig. Damage	% Gouge/Punct -	☐ Sig. Damage	% Crumbling -
☐ Damaged	% Delaminating -	☑ Damaged	% Crushed -	☐ Damaged	% Delaminating -
☐ Good Cond.	% H_2O/Gouges -	☐ Good Cond.	% H_2O Stains -	☐ Good Cond.	% H_2O/Gouges-

Contact Potential	☐ High	☐ Moderate	☑ Low
Vibration Potential	☐ High	☐ Moderate	☑ Low
Air Erosion	☐ High	☐ Moderate	☑ Low
OVERALL POTENTIAL RATING	☐ Significant Damage	☐ Damage	☐ Minimal Damage

Sampled By: J. Sacramento/ J. Cardenas No: HIASB-0173	Relinquished By/Date/Time: 6/29/21	Relinquished By/Date/Time:
Delivered to Lab By:	Received By/Date/Time: Corin Forrest	Received By/Date/Time: 06-30-21 A10:32 IN

TURNAROUND TIME: ☐ < 12 Hours ☐ 24 Hours ☒ 3 Days ☐ 5 Days ☐ _____

Surfacing	<1,000 ft² = 3 Samples	1,000 – 5,000 ft² = 5 Samples	>5,000 ft² = 7 Samples
TSI	Minimum of 3 Samples UNLESS….	<6 In. or ft² = 1 Sample	Minimum of 2 Samples *(Cement/plaster valves, elbows & 'T')*
Misc. Non-Friable	Minimum of 2 Samples (*AHERA*)	Minimum of 3 Samples (*Hawaii*)	
Misc. Friable	Minimum of 2 Samples		

Surfacing	Sig. Damage = > *10% Dist. or 25% Local*	Damaged = < *10% Dist. or 25% Local*	*Good = Very Limited Damage*
TSI	Sig. Damage = *>10% Missing Jacket OR >10% Dist. or 25% Local*	Damaged = *< 10% Missing Jacket OR < 10% Dist. or 25% Local*	Good = *Very Limited Damage*
Misc	Sig. Damage = > *10% Dist. or 25% Local*	Damaged = < *10% Dist. or 25% Local*	*Good = Very Limited Damage*

Hawaii Analytical Laboratory Samples picked up at EQI office.

98-029 HEKAHA STREET, SUITE 21 AIEA, HAWAII 96701 PHONE: (808) 486-5881
6-15-17 KAMITSURUMA, MINAMI-KU, SAGAMIHARA-SHI, KANAGAWA-KEN 252-0302 PHONE: (042) 851-5675

Hawaii Analytical Laboratory

202106177

EnviroQuest

PLM DATA SHEET

Project No.: 300790 Project Name: Leahi Hospital – Sinclair Heat Pump Relocation Date: 6/29/21

Page: 2 of 2

Material Description: Black vibration sheet vinyl — Friable / Non-friable

Sample No.	Location
300790-07	Sinclair Heat pump room
-08	AC duct vibration joint connection
-09	
	202138347
	202138348
	202138349

CONDITION:	% Damaged:	% Localized:	% Distributed:	Total Material Quantity:

Surfacing Material		TSI		Misc.	
☐ Sig. Damage	% Crumbling -	☐ Sig. Damage	% Gouge/Punct -	☐ Sig. Damage	% Crumbling -
☐ Damaged	% Delaminating -	☐ Damaged	% Crushed -	☐ Damaged	% Delaminating -
☐ Good Cond.	% H_2O/Gouges -	☐ Good Cond.	% H_2O Stains -	☑ Good Cond.	% H_2O/Gouges-

Contact Potential	☐ High	☐ Moderate	☑ Low
Vibration Potential	☐ High	☐ Moderate	☑ Low
Air Erosion	☐ High	☐ Moderate	☑ Low
OVERALL POTENTIAL RATING	☐ Significant Damage	☐ Damage	☐ Minimal Damage

Material Description: White paper/silver wrap & fiberglass — Friable / Non-friable

Sample No.	Location
300790-10	pipe insulation (6" Ø) -run -elbow -tee adjacent or outside the Sinclair Heat pump room
-11	
-12	
	202138350
	202138351
	202138352

CONDITION:	% Damaged:	% Localized:	% Distributed:	Total Material Quantity:

Surfacing Material		TSI		Misc.	
☐ Sig. Damage	% Crumbling -	☐ Sig. Damage	% Gouge/Punct -	☐ Sig. Damage	% Crumbling -
☐ Damaged	% Delaminating -	☐ Damaged	% Crushed -	☐ Damaged	% Delaminating -
☐ Good Cond.	% H_2O/Gouges -	☐ Good Cond.	% H_2O Stains -	☑ Good Cond.	% H_2O/Gouges-

Contact Potential	☐ High	☐ Moderate	☑ Low
Vibration Potential	☐ High	☐ Moderate	☑ Low
Air Erosion	☐ High	☐ Moderate	☑ Low
OVERALL POTENTIAL RATING	☐ Significant Damage	☐ Damage	☐ Minimal Damage

Material Description: Gray caulking — Friable / Non-friable

Sample No.	Location
300790-13	Sinclair Heat pump room – perimeter metal wall & ceiling joint sealant
-14	
-15	
	202138353
	202138354
	202138355

CONDITION:	% Damaged:	% Localized:	% Distributed:	Total Material Quantity:

Surfacing Material		TSI		Misc.	
☐ Sig. Damage	% Crumbling -	☐ Sig. Damage	% Gouge/Punct -	☐ Sig. Damage	% Crumbling -
☐ Damaged	% Delaminating -	☐ Damaged	% Crushed -	☑ Damaged	% Delaminating -
☐ Good Cond.	% H_2O/Gouges -	☐ Good Cond.	% H_2O Stains -	☐ Good Cond.	% H_2O/Gouges-

Contact Potential	☐ High	☐ Moderate	☑ Low
Vibration Potential	☐ High	☐ Moderate	☑ Low
Air Erosion	☐ High	☐ Moderate	☑ Low
OVERALL POTENTIAL RATING	☐ Significant Damage	☐ Damage	☐ Minimal Damage

98-029 HEKAHA STREET, SUITE 21 AIEA, HAWAII 96701 PHONE: (808) 486-5881
6-15-17 KAMITSURUMA, MINAMI-KU, SAGAMIHARA-SHI, KANAGAWA-KEN 252-0302 PHONE: (042) 851-5675

Hawaii Analytical Laboratory
ANALYTICAL REPORT

Friday, July 2, 2021

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea HI 96701

Phone Number: (808)486-5881
Facsimile: (808) 486-5889
Email: eqi@enviroquestinc.com

Lab Job No: 202106176
Date Submitted: 6/30/2021
Your Project: 300790, Leahi Hospital, Sinclair Heat Pump Relocation, 6/29/21

Total Lead (paint chips)

NIOSH Method: 7082m LEAD by FAAS

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202138335	**300790-01P**	0.29	wt %	7/1/2021
Comments				
202138337	**300790-03P**	0.14	wt %	7/1/2021
Comments				
202138338	**300790-04P**	0.7	wt %	7/1/2021
Comments				
202138339	**300790-05P**	0.0063	wt %	7/1/2021
Comments				
202138340	**300790-06P**	0.89	wt %	7/1/2021
Comments				

Total Recoverable Lead

EPA Method: 3051m / 7000Bm

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202138336	**300790-02P**	0.053	wt %	7/1/2021
Comments				

EnviroQuest, Inc.
98-029 Hekaha Street, Suite 21
Aiea HI 96701

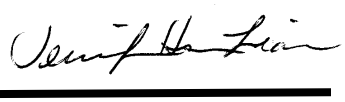
Phone Number: (808)486-5881
Facsimile: (808) 486-5889
Email: eqi@enviroquestinc.com

Lab Job No: 202106176
Date Submitted: 6/30/2021
Your Project: 300790, Leahi Hospital, Sinclair Heat Pump Relocation, 6/29/21

All Quality Control data are acceptable unless otherwise noted.
MRL for lead air is 5ug.
MRL for lead wipe is 10ug.
MRL for lead paint or soil is 40 mg/kg for a 0.25g sample.

General Comments
The sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures associated with the "analytical method" referenced above. Modifications to this methodology may have been made based upon the analyst's professional judgment and / or sample matrix effects encountered. The analysis of sample relates only to the sample analyzed, and may or may not be representative of the original source of the material submitted for our analysis. All analysts participate in interlaboratory quality control testing to continuously document profiency. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report should not be construed as an endorsement for a product or a service by the AIHA LAP, LLC or any affiliated organizations. Sample and associated sampling / collection data is reported as provided by client. TWA values have been calculated based on information supplied by the client that the laboratory has not independently verified. Results have not been corrected for blank determinations unless noted in remarks. Unless otherwise indicated the sample condition at the time of receipt was acceptable.

Results and Symbols Definitions
> This testing result is greater than the numerical value listed.
< This testing result is less than the numerical value listed.
# = Analytical methods marked with an "#" are not within our AIHA LAP, LLC Scope of Accreditation.
MRL = Method Reporting Limit.



Jennifer Hsu Liao
Laboratory Manager

EnviroQuest

202106176

MISCELLANEOUS BULK DATA SHEET

Project Name: LEAHI HOSPITAL
SINCLAIR HEAT PUMP RELOCATION

Page: 1 of 1
Date: 6/29/21
Project No.: 300790

Location:

Turnaround Time: ☐<12 Hrs ☐24 Hrs ☐48 Hrs ☒3 Days ☐5 Days ☐Other:

Analysis:
☐TCLP Lead
☐TCLP RCRA 8
☒Total Lead
☐Micro ID (spore)
☐
☐ (wt %)

Sampling Media:
☒Bulk ☐Tape ☐Wipe
☐Soil ☐Vacuum ☐
☐Swab ☐Water ☐

Sample #	Building	Int/ Ext	Flr.	Room	Component	Substrate	Color	% of Waste Stream	Area / Vol	Result
300790-01P	Sinclair Heat Pump Room	Int			window frame	wood	Gray		202138335	
300790-02P	Sinclair Heat Pump Room	Int			wall	CMU	L-gray		202138336	
300790-03P	Sinclair Heat pump room	Int/Ext			window screen	metal	off-white		202138337	
300790-04P	Sinclair Heat pump room - adjacent to hallway	Ext			wall	CMU	Beige/L-blue		202138338	
300790-05P	Sinclair Heat pump room	Int/Ext			door & frame	metal	Gray		202138339	
300790-06P	Sinclair Heat pump room	Int/Ext			ceiling deck	Concrete	White		202138340	

Sampled By: J. Sacramento Pb 0070	Relinquished By/Date/Time 6/29/21	Relinquished By/Date/Time Corin Forrest	Analyzed By
Delivered to Lab By:	Received By/Date/Time	Received By/Date/Time 06-30-21 A17 16PA 10:24 AM	Date Analyzed

SEND ALL CORRESPONDENCE TO: ☐FAX: 808.486.5889 ☐E-mail: eqi@enviroquestinc.com

Samples picked up at EQI office.

Hawaii Analytical Laboratory
98-029 Hekaha Street, Suite 21, Aiea, HI 96701 Phone: (808) 486-5881 Fax: (808) 486-5889 E-mail: eqi@enviroquestinc.com

SECTION 13282 - LEAD PAINT CONTROL MEASURES

PART 1 - GENERAL

1.01 SUMMARY

A. In performing this project, all possible safeguards, precautions and protective measures shall be utilized to prevent exposure of any individual to lead particulates.

1.02 DESCRIPTION OF WORK:

A. Furnish all labor, materials and equipment necessary to carry out the safe removal, clean-up, handling, transportation and disposal of lead containing materials and associated debris in compliance with all applicable laws and regulations concerning lead, including all incidental and pertinent operations. The work covered by this section includes the removal and disposal of lead paint/coating, lead painted/coated building components as identified in the 'Inspection Report for Asbestos and Lead-Based Paint at Leahi Hospital Sinclair Heat Pump', dated July 2021, prepared by EnviroQuest, Inc.

B. The Contractor shall assume any untested paint to contain lead.

C. The Contractor shall inform his employees, Subcontractors and all other persons performing work in this project, that painted surfaces within the project areas of the building contain lead. The Contractor, his employees, Subcontractors, etc. shall initiate and maintain all programs necessary to execute the work in accordance with the contract documents, federal, state and local laws, codes, rules and regulations.

D. The Contractor shall be responsible for ensuring that all work generating lead paint containing debris conforms to the following applicable federal, state and local laws, codes, rules and regulations
   1. Occupational Safety and Health Administration (OSHA); Hawaii Occupational Safety and Health (HIOSH) standards and rules.
   2. Environmental Protection Agency (EPA), Toxic Substance Control Act (TSCA), 40 CFR Part 745, Lead, Requirements for Lead- Containing Paint Activities in Target Housing and Child Occupied Facilities.
   3. Environmental Protection Agency (EPA), Resource Conservation and Recovery Act (RCRA) of 1976, amended in 1980 and 1984.

E. The Contractor shall be responsible for initiating and maintaining all safety precautions and programs necessary to keep the work place safe for his employees and Subcontractors; and ready for safe use of the work area and building by the buildings occupants.

1.03 COORDINATION WITH OTHER SECTIONS

A. The Contractor shall coordinate all of his lead disturbance activities with the Architect and/or Leahi Hospital Representative, General Contractor and and the Qualified Consultant.

1.04 CONTRACTOR RESPONSIBILITIES:

A. The Contractor acknowledges that he alone is responsible for the instruction and for enforcing personnel protection requirements and that these specifications provide only a minimum acceptable standard. Contractor shall comply with all requirements of 29 CFR 1926.62 and HIOSH 12-148.1. The Contractor shall also be responsible for complying with all applicable EPA regulations in regards to lead-containing materials.
   1. Respirators: Use appropriate respirators and filters which meet all requirements of OSHA 29 CFR 1926.62 and HIOSH 12-148.1.
   2. Protective Clothing: Use appropriate personal protective clothing (disposable suits, eye protection, gloves, etc.) as required by OSHA 29 CFR 1926.62 and HIOSH 12-148.1.

1.05 GENERAL REQUIREMENTS

A. The work specified herein shall include the handling of components painted or coated with lead paint, transportation and disposal procedures as required of lead containing materials by persons with at least Training in accordance with OSHA 29 CFR 1926.62. This work must be

performed in compliance with all applicable federal, state, and local regulations and be performed by workers who are capable of and willing to perform the work of this contract.

B. Applicable Standards and Guidelines: All work under this contract, and any other trade work conducted with the project, shall be done in strict accordance with all applicable federal, state and local regulations, standards and codes governing lead paint removal, transportation and disposal of lead materials.
   1. The most recent edition of any relevant regulation, standard, document or code shall be in effect.

C. Specific Statutory and Regulatory Requirements:
   1. Title 29, Code of Federal Regulations, section 1926.62, entitled "Lead Exposure in Construction; Interim Final Rule".
   2. Department of Labor and Industrial Relations: State of Hawaii, Occupational Safety and Health Standards; Title 12, Subtitle 8, Chapter 148.1, (also known as chapter 12-148.1, Hawaii Administrative Rules, entitled "Lead Exposure in Construction".
   3. Title 29 Code of Federal Regulations Part 1910.134, Respiratory Protection.
   4. Federal Register: Vol. 54, No. 131; Tuesday, July 11, 1989. Department of Labor, Occupational Safety and Health Administration; 29 CFR Parts 1910, 1915, 1917, and 1918; Occupational Exposure to Lead; Statement of Reasons; Final Rule.
   5. Title 40 Code of Federal Regulations Part 61, National Emissions Standards for Hazardous Air Pollutants
   6. Title 40 Code of Federal Regulations Part 745, Lead; Requirements for Lead-Based Paint Activities in Target Housing and Child Occupied Facilities; Final Rule
   7. Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing.

1.06 DEFINITIONS

A. Action Level (AL): Employee exposure averaged over an 8-hour period, without regard to the use of respirators, to a particular airborne concentration. OSHA requirements become effective at this level. Lead: 30 micrograms per cubic meter of air.

B. Air Monitoring: The process of measuring the content of a specific, known, volume of air in a stated period of time. For this project, NIOSH 7082 method for lead monitoring.

C. Authorized Visitor: The Architect and/or Leahi Hospital Representative, Contractor hired Qualified Consultant, their representatives, air monitoring personnel, or a representative of any regulatory or other agency having jurisdiction over the project.

D. Contaminated Area: An area where unwanted toxic or harmful substances exists.

E. HEPA Filter: A High Efficiency Particulate Absolute filter capable of trapping and retaining 99.97% of particulates greater than 0.3 micron in length.

F. Lead: Metallic lead, all inorganic lead compounds, and inorganic lead soaps. Excluded are all other organic lead compounds.

G. Permissible Exposure Limit (PEL): The employer shall ensure that no employee is exposed to concentrations greater than the PEL as determined from an 8-hour time weighted average. Lead: 50 micrograms per cubic meter.

H. Personal Monitoring: Contractor's sampling of lead in air concentrations within the breathing zone of an employee to determine the 8-hour time weighted average. The samples shall be representative of the employee's work tasks. The breathing zone shall be considered an area within 12 inches of the nose or mouth of an employee.

I. Qualified Consultant: A third party independent consultant hired by the General Contractor, who is educated and trained in recognizing and evaluating work place hazards and stress (in this instance, lead paint removal and related work in accordance with 40 CFR 745, 29 CFR 1926.62 and HIOSH 12-148.1) and providing guidance on the methods and means of removing or correcting such hazards and stresses within the work environment. The Qualified Consultant will be accredited as a State of Hawaii Department of Health accredited Lead Supervisor.

1.07 ABBREVIATIONS

A. CFR - Code of Federal Regulations

B. HIOSH - Department of Occupational Safety and Health, Department of Labor and Industrial Relations, State of Hawaii

C. EPA - U.S. Environmental Protection Agency

D. NIOSH - National Institute for Occupational Safety and Health

E. OSHA - Occupational Safety and Health Administration

F. NESHAP - National Emissions Standards for Hazardous Air Pollutants

G. LP - Lead Paint

H. TCLP - Toxicity Characteristic Leaching Procedure

1.08 SUBMITTALS PRIOR TO WORK

A. Initial payment will not be made until copies of all submittals have been furnished to and accepted by the Contracting Officer. Submit 6 copies of the submittal package no later than 10 work days from the notice of award unless otherwise specified in this section. The submittal package will include the items listed below.

B. Detailed Work Plan: The Contractor shall submit a project work plan for the lead paint disturbance work. The Plan shall be prepared by the State of Hawaii accredited lead supervisor. The Contractor shall also provide detailed information concerning:
   1. Preparation of the work area
   2. Personal protective equipment including respiratory protection and protective clothing.
   3. Employees who will participate in the project: include documentation of experience, documented proof of lead removal training based on 29 CFR 1926.62 and/or the proposed EPA Model Accreditation for Lead-based Paint Removal Work Training, in addition to any current EPA regulatory requirements, and assigned responsibilities during the project.
   4. Decontamination procedures for the personnel who may be exposed to lead paint.
   5. Lead paint treatment, handling and disposal methods and procedures to be used.
   6. Required air monitoring procedures and sampling protocols.
   7. Procedures for final cleanup.
   8. A sequence of work and performance schedule in coordination with other trades.
   9. Emergency procedures.

C. Shop Drawings: Submit shop drawings for the following items as a minimum:
   1. Descriptions of any equipment to be employed not discussed in this section.
   2. Security provisions, if any, in and around the project area.
   3. Outline of work procedures to be employed.
   4. Location of the waste storage area.
   5. Staging of the work, the sequence
   6. Entrances and exits to the work place
   7. Location and construction of worker decontamination units
   8. Water filtration system for all contaminated water. Description of water disposal and copy of water disposal permit from the City & County of Honolulu, Environmental Services, Division of Environmental Quality, Temporary Industrial Wastewater Discharge Permit.

D. Notices: The Contractor shall obtain a Generator's EPA Identification number (if necessary) for the lead-containing waste material generated from the project that is determined to be hazardous.

E. Insurance: Proof of insurance for Workman’s Compensation and General Liability which covers asbestos, lead, and pollution.

F. Manufacturer's Data: Copies of manufacturer's specifications, installation instructions and field test procedures for each material and all equipment related to lead handling and abatement and include other data as may be required to show compliance with these specifications and proposed uses.

G. Documentation for Instructions:
   1. Submit documentation satisfactory to the Contracting Officer that the Contractor's employees, including foremen, supervisors, and any other company personnel or agents who will be exposed to airborne lead dust or who shall be responsible for any aspects of the lead paint removal work activities, have received training in accordance with this specification, 29 CFR 1926.62, (OSHA Lead Awareness or the EPA Model Accreditation for Lead-based Paint Removal Work Training) and any current EPA regulatory requirements.
   2. Submit to the Contracting Officer a written respiratory protection program meeting the requirements of 29 CFR 1910.134 documentation that all employees using respirators have received training, and documentation of respirator fit-testing for all Contractor employees and agents who will enter the work area wearing negative pressure respirators. The Contractor shall be solely responsible for his employee's personal protection.

H. Documentation From Physician: Before exposure to lead dust or fumes, the Contractor shall provide workers with a comprehensive medical examination as required by 29 CFR 1926.62, or whichever is stricter. This examination will not be required if adequate records show the employees have been examined as required by the aforementioned regulations within the last year.

I. Respirators: Submit document NIOSH approvals for all respiratory protective devices used on site. Include manufacturer certification of HEPA filtration capabilities for all cartridges and filters.

J. Emergency Planning Procedures:
   1. The Contractor shall submit an emergency evacuation plan for the Contrating Officer’s acceptance prior to the commencement of work. This plan shall include consideration of fire explosion, toxic atmospheres, electrical hazards, slips, trips and falls, confined spaces and heat related injury. In non-life threatening situations, the injured or incapacitated employee shall decontaminate following normal procedures, with assistance from co-workers if necessary, before exiting the work area to obtain proper medical treatment. In life threatening situations, worker decontamination shall take least priority after measures to stabilize the injured worker, remove the injured worker from the work area, and secure proper medical treatment.
   2. Emergency Response and Evacuation: The Contractor shall provide and document training in emergency response and evacuation procedures to all workers entering the work area.

K. Waste Disposal and Landfill Requirements: Contractor shall separate lead paint chips and debris from non-hazardous waste materials such as used plastics, disposable tools, etc. Contractor shall clean all bulk lead- containing debris and waste from non-hazardous plastic, tools, suits, etc. prior to disposal.
   1. If Toxic Characteristic Leaching Procedure (TCLP) test results of the containers of waste material are below the EPA limit the lead- containing waste materials (paint chips, contaminated materials, etc.) shall be disposed of at a landfill approved for such purposes. The Contractor shall submit to the Architect and/or HHSC Representative, documentation that the lead-containing waste material removed from the work area has been accepted by the landfill Owner.
   2. If the TCLP test results are above the EPA limit or if materials are identified as hazardous waste, the lead-containing waste materials shall be disposed of at an EPA approved facility capable of accepting such hazardous waste.
   3. The Contractor shall submit to the Architect and/or Leahi Hospital Representative, documentation that disposal of the lead- containing waste material at the selected landfill is approved by the State of Hawaii, or the EPA approved mainland facility for hazardous lead-containing waste material.

1.09 SUBMITTAL AFTER WORK IS COMPLETED

A. Final payment will not be made until copies of all submittals have been furnished to and accepted by the Contracting Officer. At the completion of the work, one complete and compiled electronic final report shall be prepared by the Contractor for acceptance by the Contracting Officer. The report shall be submitted and shall include the items listed below.

B. The project name, Abatement Contractor, Abatement Contractor license number, EPA waste generator number, work duration, material removed, respiratory protection employed, waste manifest signed by the Contractor, waste transporter, and ladnfill operator, and total quantity of waste, TCLP lead reports, employee exposure air sample results, and results of the most current PAT round results for the laboratory conducting the employee exposure air sample analysis.

C. Certification of the Abatement Contractor's employees.

D. Visitor/Worker Entry Log: The daily log of all personnel including the Contractor's employees and agents who enter the work area while lead abatement operations are in progress, until final clearance is received fromt eh Qualified Consultant. The log shall contain the listed information as a minimum and shall be certified by the Contractor hired Qualified Consultant.
   1. Date of visit/worker entry
   2. Visitor/Worker's name, employer, business address and telephone number
   3. Time of entry and exit from work area
   4. Purpose of visit
   5. Type of protective clothing and respirator worn
   6. Certificate of release signed and filed with the contractor

E. Clearance certifications received from the Qualified Consultant.

F. A statement signed by the Lead Abatement Contractor that all lead abatement and disposal was completed in compliance with this specification, Federal and State regulations, and the approved Work Plan.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 POTENTIAL LEAD HAZARD

A. The disturbance or dislocation of lead-containing materials may cause lead-containing dust to be released into the atmosphere, thereby creating a potential health hazard to the workers and the general public. Apprise all workers, supervisory personnel, subcontractors, consultants, authorized visitors, occupants and neighbors who will be at or near the job site of the seriousness of the hazard and of proper work and protective procedures which must be followed.

B. Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants who may encounter, disturb, or otherwise function in the immediate vicinity of any identified lead-containing materials, take appropriate continuous measures as necessary to protect all workers and the general public from the potential hazard of exposure to respirable airborne lead dust. Such measures shall include the procedures and methods described in the regulations of applicable federal, state and local agencies.

3.02 WORK AREA PREPARATION:

A. Protect occupants, and surrounding area from possible contamination: Inform occupants of the removal work involving lead.

B. Treatment of Surfaces: During disturbance work, acceptable industry standard dust control methods shall be used to control dust (such as wetting items to be disturbed, by misting; provide dust screens; remove items in large, whole pieces; avoid crushing and pulverizing removal methods; encapsulate material prior to disturbace; use amended water; and containerize wet waste material). Prevent contamination spreading to the surrounding public and residential area.

C. Install 6-mil poly sheeting on all ground surfaces below all potential paint dirsturbance areas. The sheeting shall be extend a minimum of 10 feet out from below the materials being removed.

D. Paint Removal: If cutting of any lead coated materials is required, remove the paint first, using manual methods, to the extent necessary to allow for the cutting of the material. Cuts shall not be performed through painted materials.

E. Barriers: Standard barriers such as construction warning tape, fencing, etc. shall be used to prevent the general public access on to the work site. Seal any penetrations to the affected work area with 6 mil polyethylene plastic sheeting and duct tape.

F. NESHAP Compliance: Compliance with the requirements of EPA's NESHAP regulation is required for this project. Proper notification of the renovation of the building to the Department of Health shall be the Contractor's responsibility.

G. Ensure that all personnel working on site during the removal work are properly trained and protected as required by law.

3.03 CLEANUP AND TESTING

A. Post-work visual clearance will be conducted by the Qualified Consultant.

B. All non-hazardous waste shall be removed from the site by the completion of the project. The Contractor, in the preseance of the Qualified Consultant, shall collect representative samples of the waste stream for TCLP lead analysis. All hazardous waste shall be removed from the site to an EPA approved disposal facility within 90 days of the removal work.

C. Clean Up and Testing: Wet clean and HEPA vacuum clean surfaces and surrounding ground within the lead control area daily. Do not allow lead painted/coated debris, paint chips, and dust to accumulate. Restrict the spread of dust and debris. Keep waste from being distributed over the general area. Do not dry sweep or use compressed air to clean the area. When the removal operation has been completed, the area will be cleaned of all visible lead paint contamination by vacuuming with a High Efficiency Particulate Absolute (HEPA) filtered vacuum cleaner followed by wet mopping where applicable. The Qualified Consultant will visually inspect the affected surfaces for residual lead paint chips and accumulated dust. The Contractor shall reclean areas showing dust or residual paint chips. If recleaning is required, the process will be repeated until the visual clearance is given by the Qualified Consultant. Do not remove the lead control area or roped-off perimeter and warning signs prior to the receipt of the Qualified Consultant's lead clearance certification.

3.04 TRANSPORTATION AND DISPOSAL

A. Disposal of Hazardous Waste and Non-hazardous Waste: Contractor shall separate potentially non-hazardous waste material (i.e. plastic sheeting, disposable protective suits, etc.) from hazardous waste material prior to testing. All other debris, scraps, waste materials, rubbish and trash contaminated with lead paint and contaminated dust from the immediate work area and place in UN approved (49 CFR 178) and appropriately labeled containers and store on site for TCLP lead testing. The Contractor shall be responsible for collecting and paying of all TCLP testing.

1. Local waste landfill facilities do not accept any RCRA hazardous waste. All hazardous waste must be disposed of at an EPA approved mainland U.S. RCRA hazardous waste disposal facility. Hazardous waste must be disposed of within 90 days of the waste being created.
2. Non-hazardous lead waste and debris may be disposed of at the local waste landfill facility that is State approved to accept such waste.
    a. Notify Non-hazardous Waste Landfill Operator: The Contractor shall advise the Non-hazardous Waste landfill operator, at least twenty-four (24) hours prior to transportation, of the material to be delivered.
    b. Provide the Non-hazardous Waste Landfill Operator with applicable TCLP results which indicate that the waste material is non-hazardous.

B. Disposal of Non-Hazardous Painted Construction Debris (TCLP for Lead Not Exceeding EPA Limits): Remove non-hazardous lead waste including, debris, scraps, waste materials, rubbish, and trash from the site and disposed of at a landfill approved for disposal.

C. The Contractor shall submit disposal manifest and receipts showing acceptance of all waste material by the approved waste disposal site to the Qualified Consultant. The shipping papers shall include a chain-of- custody form and include names and addresses of the Facility Owner, the Contractor, and the Landfill Operator and information on the type and number of waste containers.

3.05 CLEARANCE CRITERIA:

A. Visual Clearance of Removal Work Areas: Remove all visible accumulation of lead-containing materials and debris by HEPA vacuums, sponging, and wet-wiping. The work areas shall be totally visibly clean of any lead debris or waste. The Contractor, in the presence of the Qualified Consultant, shall make a complete visual inspection of the work area to ensure lead debris free conditions.

B. Once the Qualified Consultant certifies that the work areas are essentially clean of lead debris the other Contractors may proceed with their work. The removal of signage required by lead disturbance work shall be allowed after all lead-containing material designated to be removed is removed. Signage applicable to job site safety and the performance of the remaining portions of the work shall remain as applicable.

3.06 TESTING AND AIR MONITORING

A. The Qualified Consultant shall have the authority to instigate engineering controls during the project.

B. Testing, daily area (environmental) air monitoring and final clearance inspections shall be provided by the Qualified Consultant, for the purpose of:
   1. Verifying compliance with the specifications and the applicable regulations listed in this Section;
   2. Ensuring that the documentation required by these specifications and by law is collected and reported to the Contracting Officer;
   3. Instigating engineering control during the project.

3.07 CONTRACTOR RESPONSIBILITIES

A. The Contractor shall be responsible for all TCLP lead testing and alaysis.

B. The Contractor shall be responsible for his employees' personnel protection, personal air monitoring and necessary records as required by OSHA, Hawaii State Law and all other applicable laws and as required in these specifications. The Contractor shall provide all required documentation to the government. Contractor shall collect daily personal air samples on at least 25% of the personnel performing removal work with the most exposure for the duration of the project.

3.08 MONITORING RESULTS

A. Airborne lead levels in areas adjacent to the work area or in any part of the work site impacted by the removal activities shall not exceed 30 micrograms per cubic meter of air.

B. If the above ambient concentrations and/or the PEL's are exceeded, the Contractor shall cease all work immediately in any work area causing or contributing to such a condition. The Contractor shall take remedial action (e.g. misting with more water, encapsulation, provide dust screens, etc.) to reduce concentrations to acceptable levels.

C. The Contractor is solely responsible for monitoring his personnel in compliance with all OSHA and HIOSH requirements.

END OF SECTION

SECTION 13289 - LEAD TESTING AND MONITORING

PART 1 - GENERAL

1.01 SUMMARY

A. In performing this project, all possible safeguards, precautions and protective measures should be utilized to prevent exposure of any individual to lead.
   1. These specifications are based upon procedures and standards derived from U.S. regulatory agencies (EPA, OSHA, NIOSH) and the Hawaii State Department of Health as well as from industry and sound industrial hygiene practice. They must be followed to ensure that no measurable amounts of contaminants are released to the uncontrolled work and public areas.

B. Abatement Contractor's Responsibilities for personnel monitoring and record keeping.

C. Testing, daily area air monitoring and visual inspections shall be provided by the Qualified Consultant hired by the Contracting Officer for the purpose of:
   1. Verifying compliance with the specifications and the applicable regulations listed in SECTION 13282 - LEAD PAINT CONTROL MEASURES;
   2. Ensuring that the Contracting Officer legally required documentation is collected;
   3. Providing engineering control during the project.

1.02 DEFINITIONS

A. Action Level (AL): Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of thirty micrograms per cubic meter of air (30 mg/m3) calculated as an 8-hour time-weighted average (TWA).

B. Building Representative(s): The person or persons designated by the users of the building to act on their behalf.

C. Contractor: The Construction firm engaged to remove and dispose of the lead-containing materials.

D. Consultant: The firm contracted by the Contracting Officer to inspect the work of the Contractor during the removal and disposal of the lead- containing materials and is capable or has a Subcontractor to perform personal air monitoring, sampling and testing before, during and after the lead removal. The Consultant may be the Construction Manager or said Construction Manager may be a Subcontractor to the Consultant.

E. Engineering Controls: Measures other than respiratory and other personal protection or administrative controls that are implemented at the worksite to contain, control, and/or otherwise reduce exposure to lead- contaminated dust and debris usually in the occupational health setting. The measures include process and product substitution, isolation, and ventilation. The term may be used in the occupational health setting in order to prevent workers' exposures to lead; it can also be used in other lead hazard control settings, such as preventing residents' exposure.

F. Project Designer: The person or firm, certified by the DOH, State of Hawaii, who prepared the plans and specifications to remove and dispose of the lead-containing materials.

G. Project Monitor: A person hired by the Contracting Officer who shall certify and document removal and clean-up of all lead-containing material and associated waste from the project site and perform visual clearances and testing.

1.03 COORDINATION WITH OTHER SECTIONS

A. Coordinate with the Contracting Officer's Consultant/Project Monitor for the testing and monitoring requirements included in Section 13282 – LEAD PAINT CONTROL MEASURES for testing/ air monitoring consultants or Project Monitor, and all applicable Federal, State and local regulations.

1.04 PRE-CONSTRUCTION CONFERENCE

A. Hold conference prior to construction and shall be conducted by the Contracting Officer assisted by the Project Designer.
   1. Attendance: Present also shall be the Contractor, Project Designer and/or the Project Monitor and Building Representative. When the abatement Contractor is a Subcontractor to a General Contractor, a representative of the General Contractor shall also attend.
   2. Agenda:
      a. Review final schedule for project.
      b. Verify legal requirements and special conditions.
      c. Verify compliance with pre-construction requirement.
      d. Obtain copies of all mandatory notifications.
      e. Inspect sample respiratory equipment and other abatement equipment.
      f. Review procedures and responsibilities.
      g. Clarify the scope of work and its best impact on the users of the building.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 STATE'S RESPONSIBILITIES

A. CONTRACTING OFFICER'S RESPONSIBILITIES
   1. Testing and monitoring will be supplied by the Contracting Officer.

B. CONTRACTOR'S RESPONSIBILITIES
   1. The Contractor shall be responsible for providing the daily personal air monitoring and necessary records for all of the Contractor's employees for the duration of the project as required by OSHA (29 CFR 1926.62), and all other applicable laws.
   2. The Contractor shall obtain the OSHA required reports for personnel air monitoring as part of the contract.
   3. The Contractor shall be responsible for daily personal air samples that shall be collected on at least 25% of the Contractor's personnel performing removal work on similar tasks and for the duration of the project. Submit within 5 working days to the Contracting Officer.
   4. The Contractor is solely responsible for protecting his workers, other personnel, and the public from any of his work activities at the work site regardless of the testing and monitoring conducted by the Contracting Officer.
   5. Monitoring information developed by the Qualified Consultants activities while under contract with the Contracting Officer shall be for the use of the Contracting Officer. The information will be available and offered to the Contractor when developed, but not thereafter, and shall not waive the Contractor's obligations stated elsewhere in this section.
   6. Air monitoring and testing which becomes necessary to follow up on the work by the Contractor which is rejected as not conforming to the requirements shall be the responsibility of the Contracting Officer. However, the full cost of such additional monitoring and testing shall be borne by the Contractor and shall be deducted from the final contract payment.
   7. Personal air monitoring that becomes part of the Consultant's scope of work shall be accommodated by the Contractor.
   8. Prior to disposal of lead contaminated wastewater, one wastewater (as applicable) sample shall be collected by the Contractor, to determine whether it can be disposed of as non-hazardous waste or with an EPA approved hazardous waste disposal facility as hazardous waste. Contractor shall obtain and submit to the Contracting Officer, a permit to conduct such disposal into the sanitary sewer system prior to disposal. Disposal of all wastewater suspected of being contaminated with lead in the storm drain system is prohibited. Wastewater, no matter what its lead content, shall not be dumped on the ground. Contractor is ultimately responsible for and shall include in his bid the cost to properly dispose of all waste, hazardous or non-hazardous. Submit a copy of the permit to the Contracting Officer.

9. Perform lead Toxic Characteristic Leaching Procedure (TCLP) metals testing on all solid waste debris contaminated with lead (except for painted scrap metal), in accordance with 40 CFR Part 261 “Identification and Listing of Hazardous Waste”. Painted metal debris shall be separated from the rest of the lead- contaminated waste and disposed of as scrap metal at a metal recycler (when disposed of as scrap metal, TCLP testing is not required). The TCLP testing shall be used to determine whether waste is hazardous or non-hazardous prior to disposal. Dispose of lead- contaminated debris as hazardous waste if the waste is determined to be hazardous by the TCLP testing. If the TCLP testing indicates that the waste is non- hazardous, the Contractor shall dispose of the waste as non- hazardous, construction waste.

3.02 AIR MONITORING AND INSPECTIONAL SERVICES

A. Duties of the Consultant:
   1. Photographic Record of Project: Record the lead abatement project with representative photos to the Contracting Officer. All photos shall become the property of the Contracting Officer and are to be accompanied by a detailed log.
   2. Project Log: Maintain daily field reports detailing all key activities during abatement and make a submittal of summary project activities to the project designer and the Contracting Officer’s Project Manager. Incorporate the contents of the daily field reports with other project data into a final project report.
   3. Visual Inspection of all Containment Areas: Perform regular inspection of all containment areas. Conduct inspections during the actual work performance of the Contractor to document the work practices employed by the Contractor and conduct visual clearances to verify that all materials scheduled for abatement were removed and the area was properly cleaned. Submit clearances to the Contracting Officer.

B. Air Monitoring: The Contracting Officer’s on-site air Project Monitor shall perform the following activities associated with this portion of the project:
   1. On-site personnel air monitoring (if not provided by the Contractor) as required by OSHA and HIOSH, and the project specifications (See methodology below).
   2. Laboratory analysis for lead-in-air using NIOSH 7082 or OSHA 105 method.
   3. Monitoring of decontamination procedures at site entry/exit.
   4. Monitoring of containment maintenance by visual and instrumental inspection.
   5. Interface with project inspectors, building representatives, representatives of regulatory agencies, and project designers during site visits.
   6. Ensure that proper respiratory protection is utilized by all persons at the project site.
   7. Relay to the Contracting Officer’s Project Manager any discrepancies in Contractor's action with provisions of project specifications.
   8. Act quickly in case of emergencies with appropriate response.

3.03 LABORATORY ANALYSIS

A. All personal air samples collected by the Contracting Officer’s Project Monitor shall be analyzed by an AIHA certified laboratory for the analysis being requested. All laboratories shall be registered with the Hawaii Department of Health.

3.04 DAILY TESTING RECORDS

A. At the conclusion of every day’s testing the Contracting Officer’s Project Monitor shall provide copies of all testing and monitoring records to the Contracting Officer’s Project Manager and the Contracting Officer.

END OF SECTION

SECTION 15010 - PLUMBING BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work included in 15010, Plumbing Basic Requirements applies to Division 15, Plumbing work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of plumbing systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
   1. Provide: To furnish and install, complete and ready for intended use.
   2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
   3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work furnished.
   4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent", substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
   5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.02 RELATED SECTIONS

A. Contents of Section applies to Division 15, Plumbing Contract Documents.

B. Related Work:
   1. Additional conditions apply to this Division including, but not limited to:
      a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
      b. Drawings
      c. Addenda
      d. Owner/Architect Agreement
      e. Owner/Contractor Agreement
      f. Codes, Standards, Public Ordinances and Permits

1.03 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, individual Division 15, Plumbing Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
   1. State of Hawaii:
      a. IBC - International Building Code, with Hawaii Amendments
      b. IECC - International Energy Conservation Code, with Hawaii Amendments
      c. IMC - International Mechanical Code
      d. NEC - National Electrical Code, with Hawaii Amendments
      e. UFC - Uniform Fire Code, with Hawaii Amendments
      f. UPC - Uniform Plumbing Code, with Hawaii Amendments

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:
   1. ABA - Architectural Barriers Act
   2. ADA - Americans with Disabilities Act
   3. AHRI - Air-Conditioning Heating & Refrigeration Institute
   4. ANSI - American National Standards Institute
   5. ASCE - American Society of Civil Engineers
   6. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
   7. ASHRAE Guideline 0, the Commissioning Process
   8. ASME - American Society of Mechanical Engineers
   9. ASPE - American Society of Plumbing Engineers
   10. ASSE - American Society of Sanitary Engineering
   11. ASTM - ASTM International
   12. AWWA - American Water Works Association
   13. CFR - Code of Federal Regulations
   14. CGA - Compressed Gas Association
   15. CISPI - Cast Iron Soil Pipe Institute
   16. ETL - Electrical Testing Laboratories
   17. EPA - Environmental Protection Agency
   18. FM - FM Global
   19. IAPMO - International Association of Plumbing and Mechanical Officials
   20. GAMA - Gas Appliance Manufacturers Association
   21. HI - Hydraulic Institute Standards
   22. ISO - International Organization for Standardization
   23. MSS - Manufacturers Standardization Society
   24. NEC - National Electric Code
   25. NEMA - National Electrical Manufacturers Association
   26. NFGC - National Fuel Gas Code
   27. NFPA - National Fire Protection Association
   28. NRCA - National Roofing Contractors Association
   29. NSF - National Sanitation Foundation
   30. OSHA - Occupational Safety and Health Administration
   31. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association, Inc.
   32. TEMA - Tubular Exchanger Manufacturers Association
   33. TIMA - Thermal Insulation Manufacturers Association
   34. UL - Underwriters Laboratories Inc.

D. See Division 15, Plumbing individual Sections for additional references.

1.04 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as specific individual Division 15, Plumbing Sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. In addition:
   1. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.
   2. Provide product submittals and shop drawings in electronic format only. Electronic format must be submitted via zip file via e-mail. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each

Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Architect. At Contractor's option, two separate submittals may be provided, consisting of underground work and building work. Deviations will be returned without review.

3. Product Data: Provide Manufacturer's descriptive literature for products specified in Division 15, Plumbing Sections.
4. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the Specifications and Drawings.
    a. Label submittal to match numbering/references as shown in Contract Documents and schedules. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
    b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference Division 15, Plumbing Sections for specific items required in product data submittal outside of these requirements.
    c. Provide pump curves, operation characteristics, capacities, ambient noise criteria, etc. for equipment.
    d. For vibration isolation of equipment, list make and model selected with operating load and deflection. Indicate frame type where required. Submit manufacturer's product data.
    e. See Division 15, Plumbing Sections for additional submittal requirements outside of these requirements.
5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; Bear costs of additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
6. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer's comments. Identify Engineer's comments and provide an individual response to each of the Engineer's comments. Cloud changes in the submittals and further identify changes which are in response to Engineer's comments.
7. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-10 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
8. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 15, Plumbing Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 16, Electrical submittals.
9. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
10. Substitutions and Variation from Basis of Design:
    a. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
    b. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of

that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.

11. Shop Drawings: Provide coordinated Shop Drawings which include physical characteristics of all systems, equipment and piping layout plans, and control wiring diagrams. Reference individual Division 15, Plumbing Sections for additional requirements for Shop Drawings outside of these requirements.
    a. Provide Shop Drawings indicating sanitary and storm cleanout locations and type to Architect for approval prior to installation.
    b. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
12. Samples: Provide samples when requested by individual Sections.
13. Resubmission Requirements:
    a. Make any corrections or change in submittals when required. Provide submittals as specified. The engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Cloud changes in the submittals.
        1) Resubmit for review until review indicates no exception taken or "make corrections as noted".
        2) When submitting drawings for Engineers re-review, clearly indicate changes on drawings and "cloud" any revisions. Submit a list describing each change.
14. Operation and Maintenance Manuals, Owner's Instructions:
    a. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Include valve charts. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
        1) Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
        2) Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, quantities, relevant to each piece of equipment: belts, motors, lubricants, and filters.
        3) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
        4) Include copy of startup and test reports specific to each piece of equipment.
        5) Include copy of final water systems balancing log along with pump operating data.
        6) Include commissioning reports.
        7) Include copy of pressure, flow, leakage and purity test data and air and water systems test data, as applicable. Include copy of third-party and state and local jurisdiction inspection reports.
        8) Include copy of valve charts/schedules.

9) Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.
10) Include product certificates of warranties and guarantees.
11) Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.

b. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 15010, Plumbing Basic Requirements article titled "Demonstration".

c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.

15. Record Drawings:
a. Maintain at site at least one set of drawings for recording “As-constructed” conditions. Indicate on Drawings changes to original documents by referencing revision document, and include buried elements, location of cleanouts, and location of concealed mechanical items. Include items changed by field orders, supplemental instructions, and constructed conditions.
b. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.
c. At completion of project, input changes to original project on CAD Drawings and make one set of black-line drawings created from CAD Files in version/release equal to contract drawings. Submit CAD disk and drawings upon substantial completion.
d. Provide Invert elevations and dimensioned locations for water services, building waste, and storm drainage piping below grade extending to 5-feet outside building line.
e. See Division 15, Plumbing individual Sections for additional items to include in record drawings.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturers equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e., piping) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

F. Provide products that are UL listed.

G. Piping Insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

H. All potable water system components, devices, material, or equipment containing a weighted average of greater than 0.25 percent lead are prohibited, and shall be certified in accordance with current editions of the Safe Drinking Water Act (SDWA), NSF 61 & NSF 372. Endpoint devices used to dispense water for drinking shall meet the requirements of NSF 61.

I. ASME Compliance: ASME listed water heaters and boilers with an input of 200,000 BTUH and higher, hot water storage tanks which exceed 120 gallons, and hot water expansion tanks which are connected to ASME rated equipment or required by code or local jurisdiction.

J. Provide safety controls required by National Boiler Code (ASME CSD 1) for boilers and water heaters with an input of 400,000 BTUH and higher.

1.06 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Contracting and Procurement Requirements, Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty in Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.07 COORDINATION DOCUMENTS

A. Prior to construction, prepare and submit coordinated layout drawings (composite drawings) to coordinate installation and location of ductwork, grilles, diffusers, piping, fire sprinklers, plumbing, lights, and electrical services. Composite Drawings show services on single sheet. Key Drawings to structural column identification system. Prior to completion of Drawings, coordinate proposed installation with architectural and structural requirements, and other trades (including plumbing, HVAC, fire protection, electrical, ceiling suspension, and ceiling tile systems, etc.), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence. Unless otherwise required by Division 00, Procurement and Contracting Requirements and/or Division 01, General Requirements, Division 15, HVAC to combine information furnished by other trades onto master coordination documents.

B. Prepare Drawings as follows:
   1. Drawings in CAD Format. CAD format release equal to design documents. Drawings to be same sheet size and scale as Contract Drawings and indicate location, size and elevation above finished floor of equipment and distribution systems.
   2. Review and revise, as necessary, section cuts in Contract Drawings after verification of field conditions.
   3. Indicate plumbing system piping including fittings, hangers, access panels, valves, and bottom of pipe elevations above finished floor.
   4. Indicate inverts and provision for piping that must be graded to have right-of-way over more flexible items. Drawings also to indicate proposed ceiling grid and lighting layout as shown on electrical drawings and architectural reflected ceiling drawings and HVAC equipment, ductwork and piping.
   5. Incorporate Addenda items and change orders.
   6. Distribute drawings to trades and provide additional coordination as requested by other trades.

C. Advise Architect in event conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Architect of conflict.

D. Verify in field exact size, location, invert, and clearances regarding existing material, equipment and apparatus, and advise Architect of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.

E. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

1.08 WORK INCLUDED

A. Furnish and install sleeves, inserts and anchorage required for the installation, which are embedded in work of other trades. Sleeve, wrap and seal piping in concrete.

B. Electrical: For plumbing trim/devices/equipment, provide, from the line voltage connection by Division 16, the low voltage electrical connections and wiring as required for complete and operable system. Includes, but is not limited to: Low voltage electrical raceway, wiring and accessories, such as step-down transformers as necessary for function of sensors and automatic valve and faucet controls. Supply step-down transformers and size wiring as recommended by manufacturer of plumbing trim/faucets requiring electrical low voltage connection.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer, including but not limited to fixtures, pumps, drains and equipment.

2.02 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL approved or have adequate approval or be acceptable by State, County, and City authorities.

B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

C. Hazardous Materials:
   1. Comply with local, State of Hawaii, and Federal regulations relating to hazardous materials.
   2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
   3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Architect. Hazardous materials will be removed by Owner under separate contract.

PART 3 - EXECUTION

3.01 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

B. Install equipment requiring access (i.e., drain pans, drains, control operators, valves, motors, cleanouts and water heaters) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in obvious passageways, doorways, scuttles or crawlspaces which would impede or block intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Architect prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Pipe Installation:
   1. Provide installation of piping systems coordinated to account for expansion and contraction of piping materials and building as well as anticipated settlement or shrinkage of building. Install work to prevent damage to piping, equipment, and building and its contents. Provide piping offsets, loops, expansion joints, sleeves, anchors or other means to control pipe movement and minimize forces on piping. Verify anticipated settlement and/or shrinkage of building with Project Structural Engineer. Verify construction phasing, type of building construction products and rating for coordinating installation of piping systems.
   2. Include provisions for servicing and removal of equipment without dismantling piping.

3.02 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 15 Plumbing Sections.

B. General:
   1. Earthquake resistant designs for Plumbing (Division 15) equipment and distribution, i.e. motors, plumbing systems, piping, equipment, water heaters, boilers, etc. to conform to regulations of jurisdiction having authority.
   2. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.
   3. Provide stamped Shop Drawings from licensed Structural Engineer of seismic bracing and seismic movement assemblies for piping equipment and water heaters. Submit Shop Drawings along with equipment submittals.
   4. Provide stamped Shop Drawings from licensed Structural Engineer of seismic flexible joints for piping and crossing building expansion or seismic joints. Submit Shop Drawings along with seismic bracing details.

C. Piping:
   1. Per "Seismic Restraints Manual Guidelines for Mechanical Systems" latest edition published by SMACNA or local requirements.

D. Provide means to prohibit excessive motion of plumbing equipment during earthquake.

3.03 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

B. Notify Architect, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:
   1. Underground piping installation prior to backfilling.
   2. Prior to covering walls.
   3. Prior to ceiling cover/installation.
   4. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Bear responsibility and cost to make piping accessible, to expose concealed lines, or to demonstrate acceptability of the system. If Contractor fails to notify Architect at times prescribed above, costs incurred by removal of such work are the responsibility of the Contractor.

D. Final Punch:
   1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Plumbing Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the plumbing systems are ready for final punch.

2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.04 CONTINUITY OF SERVICE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 15, Plumbing Sections and the following:
   1. During remodeling or addition to existing structures, while existing structure is occupied, current services to remain intact until new construction, facilities or equipment is installed.
   2. Prior to changing over to new service, verify that every item is thoroughly prepared. Install new piping, and wiring to point of connection.
   3. Coordinate transfer time to new service with Owner. If required, perform transfer during off peak hours. Once changeover is started, pursue to its completion to keep interference to a minimum.
      a. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work.
   4. Organize work to minimize duration of power interruption.

3.05 CUTTING AND PATCHING

A. Confirm Cutting and Patching requirements in Division 01, General Requirements. In absence of specific requirements, comply with individual Division 15, Plumbing Sections and the following:
   1. Proposed floor cutting/core drilling/sleeve locations to be approved by Project Structural Engineer. Submit proposed locations to Architect/Project Structural Engineer. Where slabs are of post tension construction, perform x-ray scan of proposed penetration locations and submit scan results including proposed penetration locations to Project Structural Engineer/Architect for approval. Where slabs are of waffle type construction, show column cap extent and cell locations relative to proposed penetration(s).
   2. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.
   3. Additional openings required in building construction to be made by drilling or cutting. Use of jack hammer is specifically prohibited. Patch openings in and through concrete and masonry with grout.
   4. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing piping and devices are removed as part of this project. Where alterations disturb lawns, paving, and walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
   5. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.06 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

3.07 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Division 15, Plumbing Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Insulation and lining that becomes wet from improper storage and handling to be replaced before installation. Products and/or materials that become damaged due to water, dirt and/or dust as a result of improper storage to be replaced before installation.

2. Protect equipment and pipe to avoid damage. Close pipe openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.
3. Protect bright finished shafts, bearing housings and similar items until in service.

3.08 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

B. Upon completion of work and adjustment of equipment and test systems, demonstrate to Owner's Authorized Representative, Architect and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.09 CLEANING

A. Confirm cleaning requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

B. Upon completion of installation, thoroughly clean exposed portions of equipment, removing temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.10 INSTALLATION

A. Confirm installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

B. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
1. Do not place equipment in sustained operation prior to initial balancing of plumbing systems.
2. Provide pump impellers to obtain Basis of Design design capacities.

D. Provide miscellaneous supports/metals required for installation of equipment and piping.

3.11 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In absence of specific requirements, comply with individual Division 15, Plumbing Sections and the following:
1. Ferrous Metal: After completion of plumbing work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces, i.e., hangers, hanger rods, equipment stands, with one coat of black asphalt for exterior or black enamel for interior, suitable for hot surfaces.
2. In a mechanical room, on roof or other exposed areas, machinery and equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.

3. See individual equipment Specifications for other painting.
4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
5. Piping: Clean, primer coat and paint exposed piping on roof or at other exterior locations with two coats paint suitable for metallic surfaces and exterior exposures. Color selected by Architect.
6. Covers: Covers such as manholes, cleanouts and the like will be furnished with finishes which resist corrosion and rust.

3.12 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In absence of specific requirements, comply with individual Sections in Division 15, Plumbing and the following:
   1. System cannot be considered for acceptance until work is completed and demonstrated to Architect that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
      a. Testing and Balancing Reports
      b. Cleaning
      c. Operation and Maintenance Manuals
      d. Training of Operating Personnel
      e. Record Drawings
      f. Warranty and Guaranty Certificates
      g. Start-up/Test Document and Commissioning Reports

3.13 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 15010, Plumbing Basic Requirements and individual Division 15, Plumbing Sections.

B. Tests:
   1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
   2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

3.14 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that plumbing items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

3.15 ELECTRICAL INTERLOCKS

A. Where equipment motors are to be electrically interlocked with other equipment for simultaneous operation, utilize plumbing equipment wiring diagrams to coordinate with electrical systems so that proper wiring of equipment involved is affected.

END OF SECTION

SECTION 16410 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Safety Switches

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:
   1. Section 16217, Overcurrent Protective Devices.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Safety Switches:
   1. Eaton Electrical
   2. ABB/General Electric
   3. Schneider Electric/Square D
   4. Or approved equivalent.

2.02 SAFETY SWITCHES

A. Heavy duty fusible type and non-fusible type (as indicated on drawings), dual rated, quick-make, quick-break with fuse rejection feature for use with Class R fuses only, unless other fuse type is specifically noted.

B. Clearly marked for maximum voltage, current, and horsepower.

C. Operable handle interlocked to prevent opening front cover with switch in 'on' position.

D. Switches rated for maximum available fault current.

E. Handle lockable in 'off' position.

F. Enclosure:
   1. NEMA 1: Dry locations/Indoors.
   2. NEMA 3R Stainless Steel: Damp or wet locations/Outdoors.

G. Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Provide fuse rejection feature for Class R or J fuses up to 600 amp. Remove if circuit breaker type is used. Provide switches of 30 to 200 amp with plug-on line side connections.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Obtain and review the submitted product data for equipment furnished by the Owner, and furnished under other Divisions of this contract, particularly under Division 15.

B. Confirm the equipment nameplate maximum overcurrent protection (MOCP) and make accommodations and adjustments to switches, fuses and circuit breakers as necessary to coordinate with the nameplate rating

C. Install in accordance with manufacturer's instructions.

D. Provide engraved nameplates per Section 16075, Identification for Electrical Systems.

E. Apply neatly typed adhesive tag on inside door of each fusible switch indicating NEMA fuse class and size installed.

3.02 SAFETY SWITCHES

A. Install products, systems and equipment in accordance with manufacturer's written instructions and requirements.

B. See General Installation Requirements above.

END OF SECTION

SECTION 15060 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Pipe Hangers and Supports for Plumbing Piping and Equipment
   2. Building Attachments
   3. Miscellaneous Metal and Materials

1.02 RELATED SECTIONS

A. Contents of Division 15, Plumbing and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. ASCE 7-10, Minimum Design Loads for Buildings and Other Structures.
   2. Hanger spacing installation and attachment to meet all manufacturer's requirements and MSS SP-58.
   3. Terminology: As defined in MSS SP-90 "Guidelines on Terminology for Pipe Hangers and Supports".
   4. Install piping per SMACNA's requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.07 PERFORMANCE REQUIREMENTS

A. General - Provide pipe and equipment hangers and supports in accordance with the following:
   1. When supports, anchorages, and seismic restraints for equipment, and supports, anchorages, and seismic restraints for piping are not shown on the Drawings, the contractor is responsible for their design.
   2. Connections to structural framing are not to introduce twisting, torsion, or lateral bending in the framing members. Provide supplementary steel as required.

B. Engineered Support Systems:
   1. Support frames such as pipe racks or stanchions for piping and equipment which provide support from below.
   2. Equipment and piping support frame anchorage to supporting slab or structure.

C. Provide channel support systems, for piping to support multiple pipes capable of supporting the combined weight of supported systems, system contents and test water.

D. Provide heavy-duty steel trapezes for piping to support multiple pipes capable of supporting the combined weight of supported systems, system contents and test water.

E. Provide seismic restraint hangers and supports for piping and equipment.

F. Obtain approval from AHJ for seismic restraint hanger and support system to be installed for piping and equipment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Pipe Hangers and Supports for Plumbing Piping and Equipment:
   1. Pipe Hangers/Supports:
      a. B-Line Systems, Inc.
      b. Anvil International
      c. HOLDRITE
      d. Erico Co., Inc.
      e. Snappitz Thermal Pipe Shield Manufacturing
      f. Rilco Manufacturing Co. Inc.
      g. Nelson-Olson Inc.
      h. Or approved equivalent.

B. Building Attachments:
   1. Anchor-It
   2. Gunnebo Fastening Corp.
   3. ITW Ramset/Red Head
   4. Masterset Fastening Systems, Inc.
   5. Or approved equivalent.

C. Miscellaneous Metal and Materials:
   1. See Miscellaneous Metal and Materials article below.
   2. Powder-Actuated Fastener Systems:
      a. Gunnebo Fastening Corp.
      b. Hilti, Inc.
      c. ITW Ramset/Red Head.
      d. Masterset Fastening Systems, Inc.
      e. Or approved equivalent.

2.02 PIPE HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

A. Horizontal Piping Hangers and Supports - Horizontal and Vertical Piping, and Hanger Rod Attachments:
   1. Factory fabricated horizontal piping hangers and supports to suit piping systems in accordance manufacturer's published product information.
   2. Use only one type by one manufacturer for each piping service.
   3. Select size of hangers and supports to exactly fit pipe size for bare piping and to exactly fit around piping insulation with saddle or shield for insulated piping.
   4. Provide copper-plated hangers and supports for uninsulated copper piping systems.
   5. Provide padded pipe hangers, clamps and supports for thermoplastic piping system. Minimum 1/4-inch thick felt or ribbed neoprene lined. Copper plating and pipe wrap tape are not acceptable isolation material at pipe hangers. The felt lining (or neoprene) should extend 1/4-inch past the hanger.
   6. Install no hub cast iron pipe and fittings per CISPI 301-09 Installation Procedures for Hubless Cast Iron Pipe and Fittings for Sanitary and Storm Drain Waste and Vent Piping Applications. Brace hubless cast iron pipe and fittings 5-inch and larger with HOLDRITE No Hub Pipe Restraints or approved equivalent.

B. Pipe Hangers, Guides and Channel Systems:
   1. Hanger Rods: Hanger rods continuously threaded or threaded ends only in concealed spaces and threaded ends only in exposed spaces; finish electro-galvanized or cadmium-plated in concealed spaces and prime painted in exposed spaces; sizes per MSS.
   2. Hanger Rod Couplings: Malleable iron rod coupling with elongated center sight gap for visual inspection; to have same finish as hanger rods.
   3. Pipe Rings for Hanger Rods: Pipe sizes 2-inch and smaller, MSS SP Type 6 or Type 10, or approved equivalent. Pipe sizes 2-1/2-inches and larger, clevis type hangers with adjustable nuts on rod. MSS SP Type 1. Pipe rings to have same finish as hanger rods.

4. Pipe Slides: Type 35 reinforced Teflon slide material (3/32-inch minimum thickness) bonded to steel; highly finished steel or stainless steel contact surfaces to resists corrosion; 60-80 PSI maximum active contact surface loading; steel parts 3/16-inch minimum thickness; attachment to pipe and framing by welding.
5. Pipe Guides:
    a. Furnish and install pipe guides on continuous runs where pipe alignment must be maintained. Minimum two on each side of expansion joints, spaced per manufacturer's recommendations for pipe size. Fasten guides securely to pipe and structure. Any contact with chilled water pipe is not to permit heat to be transferred in sufficient quantity to cause condensation on any surface.
    b. Furnish and install guides approximately 4 pipe diameters (first guide) and 14 diameters (second guide) away from each end of expansion joints. Guides are not to be used as supports and are in addition to other pipe hangers and supports.
6. Channel Type Pipe Hanging System: Framing members No. 12 gauge formed steel channels, 1-5/8-inch square, conforming to ASTM A570 GR33; one side of channel to have a continuous slot with in-turned lips; framing nut with grooves and spring 1/2-inch size, conforming to ASTM 675 GR60; screws conforming to ASTM A307; fittings conforming to ASTM A575; parts enamel painted or electro-galvanized.

C. Pipe Saddles and Shields:
1. Factory fabricated saddles or shields under piping hangers and supports for insulated piping.
2. Size saddles and shields for exact fit to mate with pipe insulation. 1/2 round, 18 gauge, minimum 12-inches in length (4-inch pipe and larger to be three times longer than pipe diameter).

D. Beam Clamps:
1. MSS Type 19 and 23, wide throat, with retaining clip.
2. Universal Side Beam Clamp: MSS Type 20.

E. Hangers for Pipe Size 2-inches and Smaller:
1. Adjustable swivel ring hanger, UL listed, Type 6 or Type 10.

F. Hangers for Pipe Size 2-1/2-inches and Larger:
1. Adjustable clevis type, UL listed, Type 1.

G. Riser Clamps:
1. Steel, UL listed. MSS Type 8.
2. 3/4-inch thick neoprene waffle pad: Mason Super W, Hubbard Holdrite Silencer 275-T.

H. Plumbers Tape:
1. Not permitted as pipe hangers or pipe straps.

2.03 BUILDING ATTACHMENTS

A. General: Anchor supports to existing masonry, block and tile walls per anchoring system manufacturer's recommendations or as modified by project Structural Engineer. Provide anchor bolts suitable for cracked concrete.

B. Anchor Bolts:
1. Anchor Bolts (Cast-In-Place): Steel bolts, ASTM A307. Nuts to conform to ASTM A194. Design values for shear and tension not more than 80 percent of the allowable listed loads.
2. Anchor (Expansion) Bolts: Carbon steel to ASTM A307; nut to conform to ASTM A194; drilled-in type. Design values for shear and tension not more than 80 percent of the allowable listed loads.
3. Anchor (Adhesive) Bolts: Consisting of two-part adhesive cartridge and zinc-plated Type A307 steel anchor bolt rod assembly with ASTM A194 nut.

C. Beam Clamps:
1. MSS Type 19 and 23, wide throat, with retaining clip.
2. Universal Side Beam Clamp: MSS Type 20.

D. Powder-Actuated Drive Pin Fasteners:
   1. Powder-Actuated Drive-Pin Fasteners: Powder actuated type, drive pin attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.

E. Mechanical-Anchor Fasteners: Insert-type attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.

F. Grout: ASTM C1107, Grade B, factory mixed and packaged, nonshrink and nonmetallic, dry, hydraulic-cement grout.
   1. Characteristics: Post hardening and volume adjusting; recommended for both interior and exterior applications.
   2. Properties: Nonstaining, noncorrosive, and non-gaseous.
   3. Design Mix: 5000-PSI (34.5-MPa), 28-day compressive strength.

2.04 MISCELLANEOUS METAL AND MATERIALS

A. Miscellaneous Metal: Provide miscellaneous metal items specified hereunder, including materials, fabrication, fastenings and accessories required for finished installation, where indicated on Drawings or otherwise not shown on drawings, that are necessary for completion of the project. The Contractor is responsible for their design.
   1. Fabricate miscellaneous units to size, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.

B. Structural Shapes: Where miscellaneous metal items are needed to be fabricated from structural steel shapes and plates, provide members constructed of steel conforming with requirements of ASTM A36 or approved equivalent.

C. Steel Pipe: Provide seamless steel pipe conforming to requirements of ASTM A53, Type S, Grade A, or Grade B. Weight and size required as specified.

D. Fasteners: Provide fasteners of types as required for assembly and installation of fabricated items; surface-applied fasteners are specified elsewhere.

E. Bolts: Low carbon steel externally and internally threaded fasteners conforming with requirements of ASTM A307; include necessary nuts and plain hardened washers. For structural steel elements supporting mechanical material or equipment from building structural members or connection thereto, use fasteners conforming to ASTM A325.

F. Miscellaneous Materials: Provide incidental accessory materials, tools, methods and equipment required for fabrication.

G. Provide hot dipped galvanized components for items exposed to weather.

H. Use straps, threshold rods and wire with sizes required by SMACNA to support piping.

I. Grout: ASTM C1107, Grade B, factory mixed and packaged, nonshrink and nonmetallic, dry, hydraulic-cement grout.
   1. Characteristics: Post hardening and volume adjusting; recommended for both interior and exterior applications.
   2. Properties: Nonstaining, noncorrosive, and non gaseous.
   3. Design Mix: 5000-PSI (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Examination:
   1. Verify building materials to have hangers and attachments affixed in accordance with hangers to be used. Provide supporting calculations.

B. Preparation:
   1. Examine Drawings and coordinate for verification of exact locations of fire and smoke rated walls, partitions, floors and other assemblies. Indicate, by shading and labeling on Record Drawings such locations and label as "1-Hour Wall," "2-Hour Fire/Smoke Barrier," and the like. Determine proper locations for piping penetrations. Set sleeves in place in new floors, walls or roofs prior to concrete pour or grouting.

C. Install hangers, supports, anchors and sleeves after required building structural work has been completed in areas where the work is to be installed. Coordinate with project structural engineer proper placement of inserts, anchors and other building structural attachments.

3.02 PIPE HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

A. Hangers and Supports:
   1. Comply with MSS SP-58. Pipe Hanger and Support Installation: Install hangers, supports, clamps, and attachments as required to properly support piping from building structure. For horizontally hung grooved-end piping, provide a minimum of 2 hangers per pipe section.
   2. Pipe Ring Diameters:
      a. Uninsulated and Insulated Pipe, except where oversized pipe rings are specified: Ring inner diameter to suit pipe outer diameter.
      b. Insulated Piping Where Oversized Pipe Rings are Specified and Vibration Isolating Sleeves: Ring inner diameter to suit outer diameter of insulation or sleeve.
   3. Oversize Pipe Rings: Provide oversize pipe rings of 2-inch and larger size.
   4. Pipe Support Brackets: Support pipe with pipe slides.
   5. Steel Backing in Walls: Provide steel backing in walls to support fixtures and piping hung from steel stud walls.
   6. Channel Support System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled channel systems.
      a. Field assemble and install according to manufacturer's written instructions.
   7. Pipe Guides:
      a. Install on continuous runs where pipe alignment must be maintained. Provide a minimum of two on each side of expansion joints, spaced per manufacturer's recommendations for pipe size. Fasten guides to pipe structure. Any contact with chilled water pipe should not permit heat to be transferred in sufficient quantity to cause condensation on any surface.
      b. Install approximately 4 pipe diameters (first guide) and 14 diameters (second guide) away from each end of expansion joints. Do not use as supports. Provide in addition to other required pipe hangers and supports.
   8. Heavy-Duty Steel Trapeze Installation: Arrange for grouping of parallel runs of horizontal piping and support together on field -fabricated, heavy-duty trapezes.
      a. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
      b. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D-1.1
   9. Group parallel runs of horizontal piping to be supported together on trapeze-type hangers.
   10. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe.
   11. Do not support piping from other piping.
   12. Fire protection piping will be supported independently of other piping.
   13. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated.
   14. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.

15. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchor, and to facilitate the action of expansion joints, expansion loops, expansion bends and similar units.
16. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
17. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping" is not exceeded.
18. Insulated Piping: (comply with the following)
    a. Attach clamps and spacers to piping.
        1) Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
        2) Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
        3) Do not exceed pipe stress limits according to ASME B31.9.
    b. Install MSS SP-58, Type 39 protection saddles, if insulation without a vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
        1) Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.
    c. Install MSS SP-58, Type 40 protective shields on cold piping having a vapor barrier. Shields to span arc of 180 degrees.
        1) Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN100) and larger if pipe is installed on rollers.
    d. Shield Dimensions for Pipe, not less than the following:
        1) NPS 1/4 to NPS 3-1/2 (DN8 to DN 90): 12-inches long and 0.048-inch thick.
        2) NPS 4 (DN100): 12-inches long and 0.06-inch thick.
        3) NPS 5 and NPS 6 (DN125 and DN150): 18-inches long and 0.06-inch thick.
        4) NPS 8 to NPS 14 (DN200 to DN350): 24-inches long and 0.075-inch thick.
        5) NPS 16 to NPS 24 (DN400 to DN600): 24-inches long and 0.105-inch thick.
    e. Pipes NPS 8 (DN200) and Larger: Include wood inserts.
    f. Insert Material: Length at least as long as protective shield.
    g. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.
19. Equipment Clearances: Do not route equipment or piping through electrical rooms, transformer vaults, elevator equipment rooms, IT rooms, MPOE rooms, or other electrical or electronic equipment spaces and enclosures and the like. Within equipment rooms, provide minimum 3-feet lateral clearance from all sides of electric switchgear panels. Do not route piping or equipment above any electric power or lighting panel, switchgear, or similar electric device. Coordinate with Electrical and coordinate exact equipment or pipe routing to provide proper clearance with such items.
20. Pipe supports and hanger spacing (pipe supported from structure or floor-supported) to meet the requirements of References and Standards Article in Part 1 above.

B. Vertical Piping:
    1. Support with U-clamps fastened to wall to hold piping away from wall unless otherwise approved.
    2. Riser clamps to be directly under fitting or welded to pipe. Provide neoprene pads for all systems except natural gas.
    3. Riser to be supported at each floor penetration.
    4. Provide structural steel supports at the base of pipe risers. Size supports to carry forces exerted by piping system when in operation.

C. Adjusting and Painting:
    1. Adjust hangers so as to distribute loads equally on attachments. Provide grout under supports to bring piping and equipment to proper level and elevations.
    2. Prime paint ferrous nongalvanized hangers, accessories, and supplementary steel which are not factory painted.

3.03 BUILDING ATTACHMENTS

A. Install within concrete slabs or attach to structural steel or wood. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints and at changes in direction of piping.

B. Attachment to Wood Structure: Provide MSS Type 34 for attachment to wooden beam or approved attachment for a wood structure.

C. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

D. Install concrete inserts before concrete is placed; fasten insert secure to forms. Where concrete with compressive strength less than 2500 PSI is indicated, install reinforcing bars through openings at top in inserts.

E. Install powder-actuated drive pin fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual. Test powder-actuated insert attachments with a minimum load of 100 pounds.

F. Bolting: Provide bored, drilled or reamed holes for bolting to miscellaneous structural metals, frames or for mounts or supports. Flame cut, punched or hand sawn holes will not be accepted.

G. Anchor Bolts:
   1. Install anchor bolts for mechanical equipment and piping as required. Tightly fit and clamp base-supported equipment anchor bolts at equipment support points. Provide locknuts where equipment and piping are hung.
   2. Anchor Bolts (Cast-In-Place): Embed anchor bolts in new cast-in-place concrete to anchor equipment. Install a pipe sleeve around the anchor bolt for adjustment of the top 1/3 of the bolt embedment; sizes and patterns to suit the installation conditions of the equipment to be anchored.

H. Pipe Anchors: Provide anchors to fasten piping which is subject to expansion and contraction, and adjacent to equipment to prevent loading high forces onto the equipment.

I. Escutcheon Plates: Install around horizontal and vertical piping at visible penetrations through walls, partitions, floors, or ceilings, including penetrations through closets, through below ceiling corridor wall, and through equipment room walls and floors.

J. Installation of metallic or plastic piping penetrations through non fire-rated walls and partitions and through smoke-rated walls and partitions:
   1. Install fabricated pipe sleeve.
   2. After installation of sleeve and piping, tightly pack entire annular void between piping or piping insulation and sleeve identification with specified material.
   3. Seal each end airtight with a resilient nonhardening UL listed fire resistant ASTM 814 sealant.

K. Piping Penetrations Through Fire-rated (1 to 3 hour) Assemblies:
   1. Select and install pre-engineered pipe penetration system in accordance with the UL listing and manufacturer's recommendation.
   2. Provide proper sizing when providing sleeves or core-drilled holes to accommodate the penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet the requirements of ASTM E814. Use HOLDRITE HydroFlame or approved equivalent.

L. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.

3.04 MISCELLANEOUS METAL AND MATERIALS

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required. Avoid cutting concrete reinforcing when drilling for inserts. Reference structural drawings and reinforcing shop drawings and determine locations of stirrups prior to drilling into concrete.

C. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete masonry or similar construction.

D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

E. Setting Loose Plates: Clean concrete and masonry bearing surfaces of any bond reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
   1. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated.
   2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

F. Fabrication:
   1. General: Verify dimensions prior to fabrication. Form metal items to accurate sizes and configurations as indicated on Drawings and otherwise required for proper installation; make with lines straight and angles sharp, clean and true; drill, countersink, tap, and otherwise prepare items for connections with work of other trades, as required. Fabricate to detail of structural shapes, plates and bars; weld joints where practicable; provide bolts and other connection devices required. Include anchorages; clip angles, sleeves, anchor plates and similar devices. Hot dip galvanize after fabrication items installed in exterior locations. Set accurately in position as required and anchor securely to building construction. Construct items with joints formed for strength and rigidity, accurately machining for proper fit; where exposed to weather, form to exclude water.
   2. Finishes:
      a. Ferrous Metal: After fabrication, but before erection, clean surfaces by mechanical or chemical methods to remove rust, scale, oil, corrosion, or other substances detrimental to bonding of subsequently applied protective coatings. For metal items exposed to weather or moisture, galvanize in manner to obtain G90 zinc coating in accordance with ASTM A123. Provide other non-galvanized ferrous metal with 1 coat of approved rust-resisting paint primer, in manner to obtain not less than 1.0 mil dry film thickness. Touch-up damaged areas with primer of same material before installation. Apply zinc coatings and paint primers uniformly and smoothly; leave ready for finish painting as specified elsewhere.
      b. Metal in contact with Concrete, Masonry and Other Dissimilar Materials:
         1) Where metal items are to be erected in contact with dissimilar materials, provide contact surfaces with coating of an approved zinc-chromate primer in manner to obtain not less than 1.0 mil dry film thickness, in addition to other coatings specified in these specifications.
      c. For Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A780.

G. Metal Fabrication:
   1. Cut, drill, and fit miscellaneous metal fabrications for heavy-duty steel trapezes and equipment supports.

2. Fit exposed connections together to form hairline joints. Field-weld connections that cannot be shop-welded because of shipping size limitations.
3. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of weld and methods used in correcting welding work, and with the following:
    a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    b. Obtain fusion without undercut or overlap.
    c. Remove welding flux immediately.
    d. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.
4. Provide hot dipped galvanized components for items exposed to weather.

END OF SECTION

SECTION 15081 - PLUMBING INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Type 1, Glass Wool Pipe Insulation
   2. Jacketing
   3. Accessories
   4. Pipe Fitting Insulation Covers

1.02 RELATED SECTIONS

A. Contents of Division 15, Plumbing and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Piping insulation products to contain less than 0.1 percent by weight PBDE in all insulating materials.

1.04 SUBMITTALS

A. Submittals as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Installer qualifications.
   2. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.
   3. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets with requirements indicated. Include dates of tests.
   4. Installer Certificates: Signed by the Contractor certifying that installers comply with requirements.
   5. Submit manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements apply to this Section.

B. In addition, meet the following:
   1. Formaldehyde Free: Should be third-party certified with UL Environment Validation.
   2. Recycled Content: A minimum of 40 percent post-consumer recycled glass content certified and UL validated.
   3. Low Emitting Materials: For all thermal and acoustical applications of Glass Mineral Wool Insulation products, provide materials complying with the testing and products requirements of UL GREENGUARD Gold Certification.
   4. Installer to have minimum 5 years' experience in the business of installing insulation.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.07 FIRE HAZARD CLASSIFICATION

A. Maximum fire hazard classification of the composite insulation construction as installed to be not more than a Flame Spread Index (FSI) of 25 and Smoke Developed Index (SDI) of 50 as tested by current edition of ASTM E84 (NFPA 255) method.

B. Test pipe insulation in accordance with requirements of current edition of UL "Pipe and Equipment Coverings".

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Type 1, Glass Wool Pipe Insulation:
   1. Owens-Corning
   2. Johns Manville
   3. Or approved equivalent.

B. Jacketing:
   1. ITW Insulation Systems
   2. Or approved equivalent.

C. Accessories:
   1. ITW Insulation Systems
   2. Or approved equivalent.

D. Pipe Fitting Insulation Covers:
   1. Zeston Johns Manville
   2. ITW Insulation Systems
   3. Or approved equivalent.

2.02 TYPE 1, GLASS WOOL PIPE INSULATION

A. Glass Fiber: ASTM C547 Type I and IV; rigid molded, noncombustible.
   1. Thermal Conductivity Value: 0.27 BTU*in/(hr*sf*F) at 75 degrees F.
   2. Maximum Service Temperature: 850 degrees F to 1000 degrees F.
   3. Vapor Retarder Jacket: White Kraft paper reinforced with glass fiber and bonded to aluminum foil, with self-sealing longitudinal laps and butt strips or vapor barrier mastic.

2.03 JACKETING

A. Canvas Jacket: UL listed fabric, 6 oz/sq.yd., plain weave cotton treated with dilute fire retardant lagging adhesive.

B. Aluminum Jacket: 0.016-inch-thick sheet, smooth or embossed finish, with longitudinal slip joints and 2-inch laps, die-shaped fitting covers with factory attached protective liner. ASTM B 209, ASTM 1729, C1371.

C. Stainless Steel Jacket: Type 304 stainless steel, 0.010-inch, smooth or corrugated finish. ASTM A 666

D. Equipment Insulation Jacketing: Pre-sized glass cloth, not less than 7.8 ounces/sq.yd., except as otherwise indicated. Coat with gypsum based cement.

2.04 ACCESSORIES

A. Equipment Insulation Compounds: Provide adhesives, cement, sealers, mastics and protective finishes as recommended by insulation manufacturer for applications indicated.

B. Provide staples, bands, wire, wire netting, tape corner angles, anchors, stud pins and metal covers as recommended by insulation manufacturer for applications indicated. Accessories, i.e., adhesives, mastics, cements and tape to have same flame and smoke component ratings as insulation materials with which they are used. Shipping cartons to bear a label indicating that flame and smoke ratings do not exceed those listed above. Provide permanent treatment of jackets or facings to impart flame and smoke safety. Provide non-water soluble treatments. Provide UV protection recommended by manufacturer for outdoor installation.

2.05 PIPE FITTING INSULATION COVERS

A. PVC Plastic Fitting Covers: Schuller Zeston 2000, Knauf Proto Fitting or approved equivalent. One-piece molded type fitting covers and jacketing material, gloss white. Connections: Tacks; pressure sensitive color matching vinyl tape.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION INFORMATION

A. Verification of Conditions:
   1. Do not apply insulation until pressure testing and inspection of piping has been completed.
   2. Examine areas and conditions under which insulation will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Preparation: Clean and dry surfaces to be insulated.

C. Installation:
   1. Insulation: Continuous through walls, floors and partitions except where noted otherwise.
   2. Piping and Equipment:
      a. Install insulation over clean, dry surfaces with adjoining sections firmly butted together and covering surfaces. Fill voids and holes. Seal raw edges. Install insulation in a manner such that insulation may be split, removed, and reinstalled with vapor barrier tape on strainer caps and unions. Do not install insulation until piping has been leak tested and has passed such tests. Do not insulate manholes, equipment manufacturer's nameplates, handholes, and ASME stamps. Provide beveled edge at such insulation interruptions. Repair voids or tears.
      b. Cover insulation on pipes above ground, outside of building, with aluminum jacketing. Position lap on bottom of pipe.

D. Provide accessories as required. See Part 2 Article "Accessories" above.

E. Protection and Replacement: Protect installed insulation during construction. Replace damaged insulation which cannot be repaired satisfactorily, including units with vapor barrier damage and moisture saturated units.

F. Insulation Shields: Provide hangers and shields (18 gauge minimum) outside of insulation for cold piping (<60 degrees F). Hot water piping hangers may penetrate insulation to contact pipe directly. Provide 18-inch long, noncompressible insulation section at insulation shields for lines 1-1/2-inches and larger (hot and cold piping).

G. Piping Surfaces to be Insulated:

Item to be Insulated	System Insulation Type	Pipe Size	Insulation Thickness
Hot Water Piping Above Grade (105F to 140F)	1	Runouts up to 1-1/2-inch (uncirculated branches) Mains =<1-1/4-inch Mains >1-1/4-inch	1-inch 1-inch 1-1/2-inch
Hot Water Circulation Piping Above Grade (105F to 140F)	1	Runouts up to 1-1/2-inch Mains =<1-1/4-inch Mains >1-1/4-inch	1-inch 1-inch 1-1/2-inch
Cold Water Piping Above Grade	1	=<1-1/2-inch >1-1/2-inch	1/2-inch 1-inch
Hot Water Piping Below Grade	2	=<1-1/2-inch >1-1/2-inch	1-inch 1-1/2-inch
Hot Water Circulation Piping Below Grade	2	=<1-1/2-inch >1-1/2-inch	1-inch 1-1/2-inch

Water Piping Exposed to Weather	1, 2, 4	All	1-1/2-inch
Piping with Heat Tracing	1, 2, 4	=<1-1/2-inch >1-1/2-inch	1-inch 1-1/2-inch
Above Grade Roof Drain/Overflow Drain Piping	1, 2	All	1/2-inch
Roof Drain Underbodies	5, 6	N/A	1-inch
Overflow Roof Drain Underbodies	5, 6	N/A	1-inch
ADA Accessible Lavatory/Sink	7	All	As Listed
Storage Tanks	3, 5	All	2-inch
Condensate Drain Piping	1, 2	All	1/2-inch
Aboveground Refrigerated Water Systems	1, 2	All	1-inch
Solar Hot Water and Glycol Piping	1,4	=<1-1/2-inch >1-1/2-inch	1-inch 1-1/2-inch

3.02 TYPE 1, GLASS WOOL PIPE INSULATION

A. See General Installation Requirements above.

B. Install in accordance with manufacturer's instructions for below grade installation.

C. Lap seal insulation with waterproof adhesive. Do not use staples or other methods of attachment which would penetrate vapor barrier. Apply fitting covers with seated tacks and vapor barrier tape.

D. Apply insulation to pipe and seal with self-sealing lap. Use self-sealing butt strips to seal butt joints. Insulate fittings, valves and unions with single or multiple layers of insulation and cover to match pipe or use preformed PVC molded insulation covers.

E. Above Grade Roof Drain/Overflow Drain Piping: Cover all roof drain piping and overflow drain piping with sectional pipe covering.

3.03 JACKETING

A. See General Installation Requirements above.

B. Install in accordance with manufacturer's instructions.

3.04 ACCESSORIES

A. See General Installation Requirements above.

B. Install in accordance with manufacturer's instructions.

C. Furnish and install accessories for all insulation types listed in this Section.

3.05 PIPE FITTING INSULATION COVERS

A. See General Installation Requirements above.

B. Install in accordance with manufacturer's instructions.

END OF SECTION

SECTION 15100 - PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Hot and Cold Domestic Water Above Grade
   2. Condensate Piping

1.02 REFERENCES AND STANDARDS

A. References and Standards as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. NSF 61, Annex G.
   2. Steel pipe to conform to ASTM and ANSI Standards as specified in this Section.
   3. Copper piping to conform to ASTM B88, B306 and B208 and the standards of Copper Development Association (CDA), and American Welding Society, (AWS).
   4. Cast Iron Piping to conform to standards of ASTM A-74, CISPI 301 and FM 1680.
   5. Manufacturer's Standards Society (MSS) for valving and support reference standard.
   6. American Water Works Association (AWWA) for Valving Assembly Standards.
   7. American Society of Sanitation Engineers (ASSE) for Valving Standards.
   8. American National Standards Institute (ANSI) for Piping Standards.
   9. NFPA Standard 51B - “Fire Prevention in Use of Cutting and Welding Processes”.
   10. Crosslinked polyethylene (PEX) pipe conforming to ASTM F876, F877 and CSA B1375, or DIN 16892 and 16893.

1.03 SUBMITTALS

A. Submittals as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.04 QUALITY ASSURANCE

A. Quality assurance as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.05 WARRANTY

A. Warranty of materials and workmanship as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. See component manufacturers listed in individual articles below.

B. Or approved equivalent.

2.02 GENERAL

A. Provide pipe, tube and fittings of the same type, fitting requirements, grade, class and the size and weight indicated or required for each service, as indicated in other Division 15, Plumbing Specifications. Where type, grade, or class is not indicated, provide proper selection as determined by installer for installation requirements, and comply with governing regulations and industry standards.

B. Manufactured materials delivered, new to the project site and stored in their original containers.

C. Product Marking: Furnish each item with legible markings indicating name brand and manufacturer, manufacturing process, heat number and markings as required per ASTM and UL/FM Standards.

2.03 HOT AND COLD DOMESTIC WATER ABOVE GRADE

A. Copper Tube: 3-inches and above. ASTM B88 (ASTM BA88m), Type K (A), Drawn.

1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
2. Joints: Brazed BCuP2.

B. Copper Tube: 2-1/2-inches and smaller. ASTM B88 (ASTM B88M), Type L (B), Drawn.
1. Fittings: ASME B16.18 copper.
2. Joints: ASTM B32, alloy Sn95 solder.

C. Copper Tube: Water pressures up to 250 PSI gauge. ASTM B 88 (ASTM BA 88m), Type K (A), Drawn.
1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
2. Joints: Brazed BCuP2.

D. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), Drawn.
1. Fittings: ASME B16.22, wrought copper.
2. Joints: Roll grooved mechanical coupling. ASTM A536.

2.04 CONDENSATE PIPING

A. Copper Tube: ASTM B 88 (ASTM B898M), Type K (A), L (B), or M (C).
1. Fittings: ASME B16.29, wrought copper.
2. Joints: ASTM B32, alloy Sn50 solder.

B. Use chemical resistant piping for drainage of condensate from combustion fuel sources (such as condensing boilers and water heaters), as noted in this Section for area of application.

C. CPVC (Chlorinated Poly Vinyl Chloride) Pipe and Fittings:
1. Pipe and Fittings: Schedule 40, NSF-14, ASTM 439, IAPMO IS20-96, socket fittings, solvent weld.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. General Installation:
1. Work performed by experienced journeyman plumbers. No exceptions.
2. Provide access panels for concealed valves, shock arrestors, trap primers and the like.
3. Install pipes and pipe fittings in accordance with recognized industry practices and manufacturer's recommendations.
4. Align piping accurately at connections, within 3/32-inch misalignment tolerance. Comply with ANSI B31 Code for Pressure Piping.
5. Locate piping runs, as indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details, and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, and other structural and permanent-enclosure elements of building. Limit clearance to 1/2-inch where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1-inch clearance outside insulation. Whenever possible in finished and occupied spaces, conceal piping from view by locating it in column enclosures, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as indicated.
a. Do not run piping through transformer vaults, telephone, elevator, electrical or electronic equipment spaces or enclosures unless indicated on Drawings.
b. Concealed Piping Above Suspended Ceiling: Plan and coordinate to avoid interferences; install to maintain suspended ceiling heights shown on Architectural Drawings. Allow sufficient space above removable ceiling panels for panel removal. Locate piping so that valves are visible and accessible within 24-inches horizontally and vertically from point of access to the ceiling space. Provide plenum rated materials for ceiling spaces which are being used as plenums.
c. Exposed Work: Run pipes parallel to the closest wall unless otherwise shown on Drawings; maintain maximum headroom; avoid light fixtures.

d. Insulation Space Allowance: In piping work, allow space for pipe insulation and jackets. If interferences occur, move the piping to accommodate insulation thickness specified.
e. Pipe Lengths: Do not use short lengths or nipples at locations where a full length of pipe will fit.
f. Alignment Prior to Supporting and Anchoring: Place piping in proper alignment and position prior to connection to anchors, expansion loops, and equipment. Furnish jacking devices, temporary steel structural members, and assembled structures as necessary. Remove temporary equipment and structures supplied by contractor at completion; such items to remain Contractor property.
g. Valve and Equipment Connections: Piping not to place undue stress on flanged valves and equipment connections. Install mating flange faces true and parallel to each other and not requiring springing of piping for assembly. Pipe hangers and supports to carry the full weight of the pipe and fluid.
h. Piping Leaks: Correct immediately; use new materials; leak-sealing compounds or peening not permitted.
i. Pressure Ratings of Fittings, Valves, and Devices in Piping Systems: Pressure rating to be equal to, or greater than, the maximum working pressure of the system.
j. Equipment Vents and Drains: Provide for coils and vessels which contain water. Provide isolation valves and outlet valves at piping high and low points to permit venting and draining of the vessel without venting and draining connected piping. Provide hose connections and caps on drain lines.
k. Escutcheon Plates: Where exposed insulated and uninsulated piping passes through walls, floors or ceilings; provide spring clip type. Provide plates on both sides of wall or floor.

B. Testing:
1. General:
a. Provide temporary equipment for testing, including pumps, compressors, tanks, and gauges, as required. Test piping systems before insulation (if any) is installed and remove or disengage control devices before testing. Where necessary, test sections of each piping system independently, but do not use piping valves to isolate sections where test pressures exceed local valve operating pressure rating. Fill each section with water, compressed air, or nitrogen and pressurize for the indicated pressure and time.
b. Notify Architect and local Plumbing Inspector 2 days before tests.
c. Drainage, Waste and Vent Piping: Test in accordance with governing plumbing code or as follows: Test drainage and venting systems, with necessary openings plugged, to permit system to be filled with water and subjected to water pressure of minimum of 5 PSI head. System to hold water without water level drop greater than 1/2 pipe diameter of largest nominal pipe size within 24-hour period. Test system in sections if minimum head cannot be maintained in each section. 5 PSI head to be minimum pressure at highest joint.
d. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for period of two hours with no loss in pressure.
e. Send test results to Architect for review and approval and include in Operation and Maintenance Manual.
2. Testing of Pressurized Systems:
a. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.
b. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.
3. Test hot and cold domestic water piping systems upon completion of rough-in and before connection to fixtures at hydrostatic pressure of 125 PSIG.

C. Protection:
   1. Keep pipe openings closed by means of plugs or caps to prevent entrance of foreign matter. Protect piping, ductwork, fixtures, equipment and apparatus against dirty water, chemical or mechanical damage both before and after installation. Restore to its original condition or replace fixtures, equipment or apparatus damaged prior to final acceptance of work.

D. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:
   1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

E. Cut piping squarely, free of rough edges and reamed to full bore. Insert piping fully into fittings.

F. Provide joints of type indicated in each piping system.

G. Thread pipe in accordance with ANSI/ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Remove excess cutting oil from piping prior to assembly. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed.

3.02 HOT AND COLD DOMESTIC WATER ABOVE GRADE

A. Water Piping: Eliminate air from system. Fill and test at 125 PSIG or minimum 1-1/2 times static pressure at connection to serving utility main for period of two hours with no loss in pressure.

B. Testing of Pressurized Systems:
   1. Test each pressurized piping system at 150 percent of operating pressure indicated, but not less than 125 PSIG test pressure.
   2. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 2 percent of test pressure.

C. Test hot and cold domestic water piping systems upon completion of rough-in and before connection to fixtures at hydrostatic pressure of 125 PSIG.

D. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:
   1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

E. Solder copper tube and fitting joints with lead free nickel/silver bearing solder meeting ASTM Std. B-32, in accordance with IAPMO Is 3-93, ASTM B-828 and Copper Development Association recommended procedures. Clean joints by other than chemical means prior to assembly. "Shock" cooling is prohibited. Fluxes to be water soluble for copper and brass potable water applications, and meeting CDA standard test method 1.0 and ASTM B813-91. Apply solder until a full fillet is present around the joint. Do not apply solder and flux in such excessive quantities as to run down interior of pipe. Lead solder or corrosion flux not to be present at the jobsite.

F. Braze copper tube and fitting socket with BCuP series filler metal without flux. Use listed brazing flux for joining of copper tube to brass or bronze fittings, meeting AWS FB3A or FB3C. "Shock" cooling is prohibited. A continuous fillet is to be visible around the completed joint. After cooling, thoroughly remove flux residue with warm water and a brush prior to testing. Do not use BCuP filler on copper alloys containing over 10 percent nickel. Cap or plug piping during construction to prevent entry of foreign material.

G. Domestic Water:
   1. "Piping" to include pipes, fittings, nipples, valves and accessories connected thereto.
   2. Run piping generally parallel to the axis of the building, arranged to conform to the building requirements and to suit the necessities of clearance for other mechanical ducts, flues, conduits and work of other trades, and as close to ceiling or other construction as practical, free of unnecessary traps or bends.

3. Grade water supply piping for complete drainage of the system. Install hose bibbs at low points.
4. Use unions for piping connections to equipment.
5. Provide sufficient elbows, swings and offsets to permit free expansion and contraction.
6. Use reducers or increasers. Use no bushings.
7. Ream or file each pipe to remove burrs. Inspect each length of pipe and each fitting for workmanship and clear passageways.
8. Cover, cap or otherwise protect open ends of piping during construction to prevent damage to threads or flanges and prevent entry of foreign matter. Disinfect and sterilize water supply piping as specified. Furnish written report on final water quality results.
9. Install exposed connections to equipment with special care, showing no tool marks or threads at fittings and piping. No bowed or bent piping permitted.
10. Make ferrous to non-ferrous connections with dielectric fittings.
11. Use extra heavy pipe for nipples, where unthreaded portion is less than 1-1/2-inches. Use no close nipples. Use only shoulder-type nipples.
12. Through-Wall Pipes: Type 'L' copper tubing for through-wall pipes which connect to exposed stops at wall surface. Anchor the pipes in the wall; attach pipe with U-bolts to steel back-up plates or steel angles anchored in the wall. Provide wrought copper elbow which securely anchors ears in wall at through-wall pipes.
13. Provide drain valves at base of risers and at low points on the system.
14. Backflow Preventers: Pipe relief to nearest drain. Slope at 2 percent.

H. Sterilization of Domestic Water System:
1. General: Upon completion of tests and necessary replacements, thoroughly flush and disinfect domestic water piping.
2. Method: After thoroughly flushing system with water to remove sediment, fill system with a solution containing 50 parts per million of chlorine for not less than 24 hours or 200 parts per million of chlorine for not less than 3 hours. After retention, drain, reflush and return system to service.
3. Certification: Provide copy of domestic water chlorination certificate in each operations and maintenance manual.
4. Provide water line disinfections performed by a licensed contractor with training in potable water line disinfections.

3.03 CONDENSATE PIPING

A. Firestopping Penetrations in Fire-Rated Wall/Floor Assemblies:
1. Provide proper sizing when providing sleeves or core-drilled holes to accommodate penetration. Firestop voids between sleeve or core-drilled hole and pipe passing through to meet requirements of ASTM E814.

END OF SECTION

SECTION 15110 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Valves, General
   2. Ball Valves
   3. Swing Check Valves

1.02 RELATED SECTIONS

A. Contents of Division 15, Plumbing and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. NSF 61, Annex G and/or NSF/ANSI 372 for potable water services. Valves must be 3rd-party certified.
   2. ISO 9001 Certified.
   3. IAPMO Certified for Low Lead.

C. Source Limitations for Valves: Obtain each type of valve from a single source and from a single manufacturer.

D. Model numbers indicated as Basis-of-Design indicate valve characteristics. All valves are to meet code Low Lead/Lead Free Standards.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations for Valves: Obtain each type of valve from a single source and from a single manufacturer.

B. Valves, General:
   1. Apollo
   2. Armstrong
   3. ASCO
   4. Cla-Val
   5. Conbraco
   6. Crane
   7. Clow
   8. Griswold
   9. Hammond
   10. Hays
   11. Jenkins
   12. Josam
   13. Kennedy

14. Milwaukee
15. Mueller
16. Nibco
17. Red-White Valve
18. Smith
19. Stockham
20. Tour Anderson
21. Wade
22. Watts
23. Wilkins
24. Zurn
25. Or approved equivalent.

C. Ball Valves:
1. See Valves General above.
2. NSF Valves:
a. Clow
b. Kennedy
c. Nibco
d. Or approved equivalent.

D. Swing Check Valves:
1. See Valves General above.

2.02 VALVES - GENERAL

A. General:
1. Sizes: Unless otherwise indicated, provide valves of same size as upstream pipe size.
2. Operators: Provide handwheels, fastened to valve stem, for valves other than quarter-turn. Provide lever handle for quarter-turn valves 6-inches and smaller. Provide gear operators for quarter-turn valves 8-inches and larger and plug valves installed over 5-feet above finished floor.
3. Valve Identification: Manufacturer's name (or trademark) and pressure rating clearly marked on valve body.

B. Valves in Insulated Piping: With 2-inch stem extension and following features:
1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation on valve without breaking the vapor seal or disturbing insulation and memory stops that are fully adjustable after insulation is applied.

C. Valve-End Connections:
1. Flanged: With flanges according to ASME B16.1 for iron valves.
2. Solder Joint: With sockets according to ASME B16.18.
3. Threaded: With thread according to ASME B1.20.1.

D. Valve Bypass and Drain Connections: MSS SP-45.

E. Building Service:
1. Shutoff and Isolation Valves:
a. Pipe Sizes 3-inches and Smaller: Ball Valve.
2. Drain Service: Ball Valves.
3. Strainer Blow-Off: Ball Valve.
4. Check Valves: Swing.

2.03 BALL VALVES

A. All ball valves on brazed piping are to be three-piece.

B. 2-1/2 Inches and Smaller: MSS SP-110, 400-600 PSI, two-piece full port ball configuration, bronze body, extended soldered ends for copper pipe and threaded ends for iron pipe, lead-free brass or stainless steel ball, lead-free brass stem, Teflon seat, extended steel handle. Apollo 77CLF 100 Series two-piece.

C. 3 Inches and Larger: MSS SP-110, 400-600 PSI, three-piece full port ball configuration, bronze body, extended soldered ends for copper pipe and threaded ends for iron pipe, lead-free brass or stainless steel ball, lead-free brass stem, Teflon seat, extended steel handle. Apollo 82-100/82A 140 Series three-piece.

D. Full Port Ball Valve: 2- to 4-inch ductile iron, ASTM A536, micro finish steel chrome plated or stainless steel ball and stem. TFE seats, 600 PSI.

2.04 SWING CHECK VALVES

A. 2-inches and Smaller: Class 125, bronze body, horizontal swing, regrinding type, Y-pattern, renewable disc. Nibco 413. MSS SP-80.

B. 2-1/2-inches and Larger: Class 125, iron body, bolted bonnet, horizontal swing, renewable seat and disc, flanged ends. Nibco F918. MMS SP-71.

C. Rubber Flapper Check Valve: Horizontal or vertical upward flow installation. Working pressure to 175 PSI. Ductile iron or cast iron body. Steel reinforced Buna-N rubber flapper epoxy coating on wetted parts. MSS SP-80.

D. Gruvlok Series 7800 Check Valve: Horizontal installation. Working pressure to 300 PSI, Type 304/302 Stainless Steel conforming to ASTM 167. Ductile body, ASTM A536, and stainless clapper, EPDM, nitrile or optional viton bumper and bonnet seals. Stainless wetted parts.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Prepare valves for shipping as follows:
   1. Protect internal parts against rust and corrosion.
   2. Protect threads, flange faces, grooves, and weld ends.
   3. Set ball valves open to minimize exposure of functional surfaces.
   4. Block check valves in either closed or open position.

B. Use the following precautions during storage:
   1. Maintain valve end protection.
   2. Store valves indoors and maintain at higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Inspect the shipping container before unpacking to look for damage that could have occurred during transport, and report it to the transportation company immediately. After visual inspection, remove the valve from the shipping container. Make sure the faces are free of any scratches and that there is not any obvious damage to the actuator assembly or valve body.

D. Make sure to note the valve's model number during the unpacking process. The model number will need to be provided when purchasing replacement parts.

E. Purge and clean all piping to be connected to valve.

F. Install per manufacturer's recommendations.

G. Determine that the valve and its plumbing piping is adequately supported when installed. If a valve is not adequately supported, this could prevent the valve from operating and sealing correctly. Be sure that all mating flanges are in line and parallel to minimize straining on joints and valve body.

H. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

I. Do not attempt to repair defective valves; replace with new valves.

J. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

K. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with

hose end adapter and cap on chain for each valve that must be installed with stem below horizontal plane. Ensure installation provides full stem movement.

L. Insulation: Where insulation is indicated, install extended stem valves, arranged in proper manner to receive insulation.

M. Mechanical Actuators: Install with chain operators where indicated. Extend chains to 5-feet above floor and hook to clips to clear aisle passage.

N. Stem Selection: Outside screw and yoke stems, except provide inside screw, non-rising stem where space prevents full opening of OS&Y valves.

O. Seats: Renewable seats, except where otherwise indicated.

P. When soldering, use paste flux that are approved by the manufacturer for use with lead free alloys.

Q. If valve applications are not indicated on Drawings, use the following:
   1. Shutoff Service: Ball valves.

R. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

S. Valves, except wafer/butterfly types, with the following end connections:
   1. For Copper Tubing, 2-inches and Smaller. Threaded ends except where solder-joint valve-end.
   2. For Copper Tubing, 2-1/2-inches to NPS 4-inches. Flanged ends except where threaded valve-end.
   3. For Copper Tubing: 5-inches and Larger: Flanged ends.
   4. For Steel Piping, 2-inches and Smaller: Threaded ends.
   5. For Steel Piping, 2-1/2-inches to NPS 4-inches: Flanged ends except where threaded valve-end.
   6. For Steel Piping, 5-inches and Larger: Flanged ends.

T. Valve Adjusting and Cleaning:
   1. Inspect valves for leaks. Adjust or replace packing to stop leaks. Replace valve if leak persists.

3.02 BALL VALVES

A. See General Installation Requirements above.

3.03 SWING CHECK VALVES

A. See General Installation Requirements above.

B. Swing Check Valve Installation: Install in horizontal position with hinge pin horizontally perpendicular to centerline of pipe. Install for proper direction of flow. Only install where there are 10 pipe diameters of straight pipe upstream of valve.

C. Ejector and Sump Pump-Discharge Check Valves:
   1. 2-inches and Smaller: Bronze swing or spring-loaded lift check valves with bronze disc.
   2. 2-1/2-inches and Larger: Rubber flapper swing check valves with lever and weight.

D. Domestic Water and Circulation Pump Discharge Check Valves:
   1. 2-inches and Smaller: Bronze body, spring loaded, lead free, lift check.
   2. 2-1/2-inches and Larger: Wafer style, silent lift check valve, lead free.

END OF SECTION

SECTION 15120 - PLUMBING DEVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Pressure Gauges
   2. Thermometers
   3. Test Plugs

1.02 RELATED SECTIONS

A. Contents of Division 15, Plumbing and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements apply to this Section.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 15010, Plumbing Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Pressure Gauges:
   1. Dwyer Instruments, Inc.
   2. Moeller Instrument Co., Inc.
   3. Omega Engineering, Inc.
   4. Trerice
   5. Or approved equivalent.

B. Thermometers:
   1. Ashcroft
   2. Trerice
   3. Weiss
   4. Marshaltown
   5. Weksler
   6. Or approved equivalent.

C. Test Plugs:
   1. Pete's Plug
   2. Or approved equivalent.

2.02 PRESSURE GAUGES

A. Pressure Gauges: ASME B40.100, phosphor-bronze bourdon type, dry type.
   1. Case: Cast aluminum, stem-mounted, flange less.
   2. Size: 4-1/2-inch diameter.
   3. Window: Clear glass.
   4. Connector: Brass.
   5. Scale: White aluminum with black graduation and markings.
   6. Pointer: Black, adjustable.
   7. Mid-Scale Accuracy: One percent.

8. Scale: PSI and KPa.
9. Basis of Design: Trerice Model 600CB.

2.03 THERMOMETERS

A. Thermometers - Adjustable Angle: Red or blue appearing organic liquid in glass, ASTM E 1; lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device; adjustable 360 degrees in horizontal plane, 180 degrees in vertical plane.
   1. Size: 9-inch scale.
   2. Window: Acrylic.
   3. Scale: Aluminum, white background, black graduations and markings.
   4. Stem: 3/4-inch NPT brass (aluminum for installation in air ducts).
   5. Accuracy: 2 percent, per ASTM E 77.
   6. Calibration: 0-160 with 2 Degrees F graduations.
   7. Basis of Design: Trerice BX9.

2.04 TEST PLUGS

A. Test Plug Description: 1/4-inch or 1/2-inch fitting and cap for receiving 1/8-inch outside diameter pressure or temperature probe.

B. Body: Brass or Stainless steel body test plug. Provide "XL" fitting to extend beyond insulation.

C. Pressure Rating: 500 PSIG maximum.

D. Core Inserts: One or two self-sealing valves, suitable for inserting 1/8-inch OD probe from dial-type thermometer or pressure gauge.

E. Core Material:
   1. For waxes, fats, oils, greases, petroleum products and most refrigerants: 32 to 200 degrees F, chloroprene synthetic rubber (Neoprene).
   2. For hot and cold water, low steam, detergents, phosphate esters, keytone, alcohols, and glycols (not suitable for petroleum products): 32 to 275 degrees F, ethylene-propylene-diene-monomer synthetic rubber (Nordel).

F. Test Plug Cap: Gasketed and threaded cap, with retention chain or strap.

G. Test Kit: Pressure gauge and adapter with probe, two bimetal dial thermometers, and carrying case.
   1. Pressure Gauge and Thermometer Ranges: Approximately two times the system's operating conditions.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. For plumbing devices requiring access from access panels (i.e. trap primers, water hammer arrestors and the like) submit location/size of all access panels to Architect for approval prior to purchase and installation of access panel. See Section 15010, Plumbing Basic Requirements for additional requirements.

B. Provide instruments with scale ranges selected according to service with largest appropriate scale.

C. Install per manufacturer recommendations.

3.02 PRESSURE GAUGES

A. Install pressure gauge where exposure to heat and vibration are minimal and where the dial can be easily read. It is also important to install the gauge in a location with undisturbed and continuous flow of the pressure medium.

B. Provide a needle valve or gauge cock, installed between the process and the pressure gauges.

C. Install pressure gauges in piping tee with pressure gauge cock, in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

D. Locations: Install in the following locations, and elsewhere as indicated.
   1. At each pump inlet and outlet.
   2. At inlet and discharge of each pressure reducing valve.
   3. At make-up water service outlets.

E. Adjust gauges to final angle, clean windows and lenses, and calibrate to zero.

F. Install per manufacturer recommendations.

G. Pressure Gauge Range/Graduations:
   1. Cold Water: 0-100 PSI; graduation 1 PSI
   2. Hot Water: 0-100 PSI; graduation 1 PSI

3.03 THERMOMETERS

A. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2-inch for installation of thermometer sockets. Ensure sockets allow clearance from insulation.

B. Install thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

C. Adjust thermometers to final angle, clean windows and lenses, and calibrate to zero.

D. Install per manufacturer recommendations.

E. Thermometer Range/Graduations:
   1. Cold Water: 25-125 degrees F; graduation 1 degree F
   2. Hot Water: 30-240 degrees F; graduation 2 degrees F

3.04 TEST PLUGS

A. Locate test plugs adjacent to thermometers and thermometer sockets, adjacent to pressure gauges and pressure gauge taps, adjacent to control device sockets, or where indicated.

B. Install per manufacturer recommendations.

END OF SECTION

SECTION 16000 - ELECTRICAL BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work included in 16000, Electrical Basic Requirements applies to Division 16, Electrical work to provide materials, labor, tools, permits, incidentals, and other services to provide and make ready for Owner's use of electrical systems for proposed project.

B. Contract Documents include, but are not limited to, Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Drawings, Addenda, Owner/Architect Agreement, and Owner/Contractor Agreement. Confirm requirements before commencement of work.

C. Definitions:
   1. Provide: To furnish and install, complete and ready for intended use.
   2. Furnish: Supply and deliver to project site, ready for unpacking, assembly and installation.
   3. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at project site as required to complete items of work furnished.
   4. Approved or Approved Equivalent: To possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity. For equipment/products defined by the Contractor as "equivalent", substitution requests must be submitted to Engineer for consideration, in accordance with Division 01, General Requirements, and approved by the Engineer prior to submitting bids for substituted items.
   5. Authority Having Jurisdiction (AHJ): Indicates reviewing authorities, including local fire marshal, Owner's insurance underwriter, Owner's Authorized Representative, and other reviewing entity whose approval is required to obtain systems acceptance.

1.02 RELATED SECTIONS

A. Contents of Section applies to Division 16, Electrical Contract Documents.

B. Related Work:
   1. Additional conditions apply to this Division including, but not limited to:
      a. Specifications including Division 00, Procurement and Contracting Requirements and Division 01, General Requirements.
      b. Drawings
      c. Addenda
      d. Owner/Architect Agreement
      e. Owner/Contractor Agreement
      f. Codes, Standards, Public Ordinances and Permits

1.03 REFERENCES AND STANDARDS

A. References and Standards per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, individual Division 16, Electrical Sections and those listed in this Section.

B. Codes to include latest adopted editions, including current amendments, supplements and local jurisdiction requirements in effect as of the date of the Contract Documents, of/from:
   1. State of Hawaii:
      a. IBC - International Building Code, with Hawaii Amendments
      b. IECC - International Energy Conservation Code, with Hawaii Amendments
      c. IMC - International Mechanical Code
      d. NEC - National Electrical Code, with Hawaii Amendments
      e. UFC - Uniform Fire Code, with Hawaii Amendments
      f. UPC - Uniform Plumbing Code, with Hawaii Amendments

C. Reference standards and guidelines include but are not limited to the latest adopted editions from:

1. ABA - Architectural Barriers Act
2. ADA - Americans with Disabilities Act
3. ANSI - American National Standards Institute
4. APWA - American Public Works Association
5. ASCE - American Society of Civil Engineers
6. ASHRAE Guideline 0, the Commissioning Process
7. ASTM - ASTM International
8. CFR - Code of Federal Regulations
9. EPA - Environmental Protection Agency
10. ETL - Electrical Testing Laboratories
11. FCC - Federal Communications Commission
12. FDA - Food & Drug Administration
13. FM - FM Global
14. IBC - International Building Code
15. IEC - International Electrotechnical Commission
16. IEEE - Institute of Electrical and Electronics Engineers
17. IES - Illuminating Engineering Society
18. ISO - International Organization for Standardization
19. MSS - Manufacturers Standardization Society
20. NEC - National Electric Code
21. NECA - National Electrical Contractors Association
22. NEMA - National Electrical Manufacturers Association
23. NETA - National Electrical Testing Association
24. NFPA - National Fire Protection Association
25. OSHA - Occupational Safety and Health Administration
26. UL - Underwriters Laboratories Inc.

D. See Division 16, Electrical individual Sections for additional references.

1.04 SUBMITTALS

A. See Division 01, General Requirements for Submittal Procedures as well as individual Division 16, Electrical Sections.

B. Provide drawings in format and software release equal to the design documents. Drawings to be the same sheet size and scale as the Contract Documents.

C. In addition:
   1. "No Exception Taken" constitutes that review is for general conformance with the design concept expressed in the Contract Documents for the limited purpose of checking for conformance with information given. Any action is subject to the requirements of the Contract Documents. Contractor is responsible for the dimensions and quantity and will confirm and correlate at the job site, fabrication processes and techniques of construction, coordination of the work with that of all other trades, and the satisfactory performance of the work.
   2. Provide product submittals and shop drawings in electronic format only. Electronic format must be submitted via zip file via e-mail. For electronic format, provide one file per division containing one bookmarked PDF file with each bookmark corresponding to each Specification Section. Arrange bookmarks in ascending order of Specification Section number. Individual submittals sent piecemeal in a per Specification Section method will be returned without review or comment. All transmissions/submissions to be submitted to Engineer. Deviations will be returned without review.
      a. Provide separate submittals for lighting control cutsheets, and for lighting control shop drawings.
   3. Product Data: Provide manufacturer's descriptive literature for products specified in Division 16, Electrical Sections.
   4. Identify/mark each submittal in detail. Note what differences, if any, exist between the submitted item and the specified item. Failure to identify the differences will be considered

cause for disapproval. If differences are not identified and/or not discovered during the submittal review process, Contractor remains responsible for providing equipment and materials that meet the specifications and drawings.

a. Label submittal to match numbering/references as shown in Contract Documents. Highlight and label applicable information to individual equipment or cross out/remove extraneous data not applicable to submitted model. Clearly note options and accessories to be provided, including field installed items. Highlight connections by/to other trades.
b. Include technical data, installation instructions and dimensioned drawings for products, fixtures, equipment and devices installed, furnished or provided. Reference individual Division 16, Electrical specification Sections for specific items required in product data submittal outside of these requirements.
c. See Division 16, Electrical individual Sections for additional submittal requirements outside of these requirements.

5. Maximum of two reviews of complete submittal package. Arrange for additional reviews and/or early review of long-lead items; Bear costs of these additional reviews at Engineer's hourly rates. Incomplete submittal packages/submittals will be returned to contractor without review.
6. Resubmission Requirements: Make corrections or changes in submittals as required, and in consideration of Engineer’s comments. Identify Engineer’s comments and provide an individual response to each of the Engineer’s comments. Cloud changes in the submittals and further identify changes which are in response to Engineer’s comments.
7. Structural/Seismic: Provide weights, dimensions, mounting requirements and like information required for mounting, seismic bracing, and support. Indicate manufacturer's installation and support requirements to meet ASCE 7-10 requirements for non-structural components. Provide engineered seismic drawings and equipment seismic certification. Equipment Importance Factor as specified in Division 01 and in Structural documents.
8. Trade Coordination: Include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and connections as required per Division 16, Electrical Coordination Documents. For equipment with electrical connections, furnish copy of approved submittal for inclusion in Division 16, Electrical submittals. Electric motors are supplied and installed by Division 15, Mechanical unless otherwise specified. During shop drawing stage of the project, verify correct disconnect sizes, conductor sizes, etc., and bring any discrepancies to the attention of the Mechanical trade. Be responsible for any modifications to electrical equipment or installations as a result of equipment incompatibility discovered after shop drawing review.
9. Make provisions for openings in building for admittance of equipment prior to start of construction or ordering of equipment.
10. Substitutions and Variation from Basis of Design:
    a. The Basis of Design designated product establishes the qualities and characteristics for the evaluation of any comparable products by other listed acceptable manufacturers if included in this Specification or included in an approved Substitution Request as judged by the Design Professional.
    b. If substitutions and/or equivalent equipment/products are being proposed, it is the responsibility of parties concerned, involved in, and furnishing the substitute and/or equivalent equipment to verify and compare the characteristics and requirements of that furnished to that specified and/or shown. If greater capacity and/or more materials and/or more labor is required for the rough-in, circuitry or connections than for the item specified and provided for, then provide compensation for additional charges required for the proper rough-in, circuitry and connections for the equipment being furnished. No additional charges above the Base Bid, including resulting charges for work performed under other Divisions, will be allowed for such revisions. Coordinate with the requirements of "Submittals". For any product marked "or approved equivalent", a substitution request must be submitted to Engineer for approval prior to purchase, delivery or installation.

11. Shop Drawings: Provide coordinated shop drawings which include physical characteristics of all systems, device layout plans, and control wiring diagrams. Reference individual Division 16, Electrical specification Sections for additional requirements for shop drawings outside of these requirements.
    a. Provide Shop Drawings indicating access panel locations, size and elevation for approval prior to installation.
12. Samples: Provide samples when requested by individual Sections.
13. Resubmission Requirements:
    a. Make any corrections or change in submittals when required. Provide submittals as specified. The engineer will not be required to edit and/or interpret the Contractor's submittals. Indicate changes for the resubmittal in a cover letter with reference to page(s) changed and reference response to comment. Cloud changes in the submittals.
    b. Resubmit for review until review indicates no exception taken or "make corrections as noted".
14. Operation and Maintenance Manuals, Owner's Instructions:
    a. Submit, at one time, electronic files (PDF format) of manufacturer's operation and maintenance instruction manuals and parts lists for equipment or items requiring servicing. Submit data when work is substantially complete and in same order format as submittals. Include name and location of source parts and service for each piece of equipment.
        1) Include copy of approved submittal data along with submittal review letters received from Engineer. Data to clearly indicate installed equipment model numbers. Delete or cross out data pertaining to other equipment not specific to this project.
        2) Include copy of manufacturer's standard Operations and Maintenance for equipment. At front of each tab, provide routine maintenance documentation for scheduled equipment. Include manufacturer's recommended maintenance schedule and highlight maintenance required to maintain warranty. Furnish list of routine maintenance parts, including part numbers, sizes, quantities, relevant to each piece of equipment.
        3) Include Warranty per Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.
        4) Include product certificates of warranties and guarantees.
        5) Include copy of complete parts list for equipment. Include available exploded views of assemblies and sub assemblies.
        6) Include commissioning reports.
        7) Include copy of startup and test reports specific to each piece of equipment.
        8) Engineer will return incomplete documentation without review. Engineer will provide one set of review comments in Submittal Review format. Contractor must arrange for additional reviews; Contractor to bear costs for additional reviews at Engineer's hourly rates.
    b. Thoroughly instruct Owner in proper operation of equipment and systems. Where noted in individual Sections, training will include classroom instruction with applicable training aids and systems demonstrations. Field instruction per Section 16000, Electrical Basic Requirements, Demonstration.
    c. Copies of certificates of code authority inspections, acceptance, code required acceptance tests, letter of conformance and other special guarantees, certificates of warranties, specified elsewhere or indicated on Drawings.
15. Record Drawings:
    a. Maintain at site at least one set of drawings for recording “As-constructed” conditions. Indicate on drawings changes to original documents by referencing revision document, and include buried elements, location of conduit, and location of

concealed electrical items. Include items changed by field orders, supplemental instructions, and constructed conditions.

b. Record Drawings are to include equipment and fixture/connection schedules that accurately reflect "as constructed or installed" for project.

c. At completion of project, input changes to original project on CAD Drawings and make one set of black-line drawings created from CAD Files in version/release equal to contract drawings. Submit CAD disk and drawings upon substantial completion.

d. See Division 16, Electrical individual Sections for additional items to include in record drawings.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Work and materials installed to conform with all local, State and Federal codes, and other applicable laws and regulations. Where code requirements are at variance with Contract Documents, meet code requirements as a minimum requirement and include costs necessary to meet these in Contract. Machinery and equipment are to comply with OSHA requirements, as currently revised and interpreted for equipment manufacturer requirements. Install equipment provided per manufacturer recommendations.

B. Whenever this Specification calls for material, workmanship, arrangement or construction of higher quality and/or capacity than that required by governing codes, higher quality and/or capacity take precedence.

C. Drawings are intended to be diagrammatic and reflect the Basis of Design manufacturer's equipment. They are not intended to show every item in its exact dimensions, or details of equipment or proposed systems layout. Verify actual dimensions of systems (i.e. distribution equipment, duct banks, light fixtures, etc.) and equipment proposed to assure that systems and equipment will fit in available space. Contractor is responsible for design and construction costs incurred for equipment other than Basis of Design, including, but not limited to, architectural, structural, electrical, HVAC, fire sprinkler, and plumbing systems.

D. Manufacturer's Instructions: Follow manufacturer's written instructions. If in conflict with Contract Documents, obtain clarification. Notify Engineer/Architect, in writing, before starting work.

E. Items shown on Drawings are not necessarily included in Specifications or vice versa. Confirm requirements in all Contract Documents.

F. Provide products that are UL listed.

1.06 WARRANTY

A. Provide written warranty covering the work for a period of one year from date of Substantial Completion in accordance with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.

B. Sections under this Division can require additional and/or extended warranties that apply beyond basic warranty under Division 01, General Requirements and the General Conditions. Confirm requirements in all Contract Documents.

1.07 COORDINATION DOCUMENTS

A. Prior to construction, coordinate installation and location of HVAC equipment, ductwork, grilles, diffusers, piping, plumbing equipment/fixtures, fire sprinklers, plumbing, lights, cable tray and electrical services with architectural and structural requirements, and other trades (including ceiling suspension and tile systems), and provide maintenance access requirements. Coordinate with submitted architectural systems (i.e. roofing, ceiling, finishes) and structural systems as submitted, including footings and foundation. Identify zone of influence from footings and ensure systems are not routed within the zone of influence.

B. Advise Engineer in event a conflict occurs in location or connection of equipment. Bear costs resulting from failure to properly coordinate installation or failure to advise Engineer of conflict.

C. Verify in field exact size, location, and clearances regarding existing material, equipment and apparatus, and advise Engineer of discrepancies between that indicated on Drawings and that existing in field prior to installation related thereto.

D. Submit final Coordination Drawings with changes as Record Drawings at completion of project.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Articles, fixtures, and equipment of a kind to be standard product of one manufacturer.

2.02 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Base contract upon furnishing materials as specified. Materials, equipment, and fixtures used for construction are to be new, latest products as listed in manufacturer's printed catalog data and are to be UL approved or have adequate approval or be acceptable by state, county, and city authorities. Equipment/fixture supplier is responsible for obtaining State, County, and City acceptance on equipment/fixtures that are not UL approved or are not listed for installation.

B. Names and manufacturer's names denote character and quality of equipment desired and are not to be construed as limiting competition.

C. Hazardous Materials:
   1. Comply with local, State of Hawaii, and Federal regulations relating to hazardous materials.
   2. Comply with Division 00, Procurement and Contracting Requirements and Division 01, General Requirements for this project relating to hazardous materials.
   3. Do not use any materials containing a hazardous substance. If hazardous materials are encountered, do not disturb; immediately notify Owner and Engineer. Hazardous materials will be removed by Owner under separate contract.

PART 3 - EXECUTION

3.01 ACCESSIBILITY AND INSTALLATION

A. Confirm Accessibility and Installation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.

B. Install equipment requiring access (i.e., junction boxes, light fixtures, power supplies, motors, etc.) so that they may be serviced, reset, replaced or recalibrated by service people with normal service tools and equipment. Do not install equipment in passageways, doorways, scuttles or crawlspaces which would impede or block the intended usage.

C. Install equipment and products complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of equipment and examine instructions thoroughly. When requirements of installation instructions conflict with Contract Documents, request clarification from Engineer prior to proceeding with installation. This includes proper installation methods, sequencing, and coordination with other trades and disciplines.

D. Firestopping:
   1. Confirm requirements in Division 07, Thermal and Moisture Protection. In the absence of specific requirements, comply with individual Division 16, Electrical Sections and the following:
      a. Coordinate location and protection level of fire and/or smoke rated walls, ceilings, and floors. When these assemblies are penetrated, seal around piping and equipment with approved firestopping material. Install firestopping material complete as directed by manufacturer's installation instructions. Meet requirements of ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops.

E. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

F. Provide miscellaneous supports/metals required for installation of equipment and conduit.

3.02 SEISMIC CONTROL

A. Confirm Seismic Control requirements in Division 01, General Requirements, Structural documents, and individual Division 16, Electrical Sections.

B. General:
   1. Earthquake resistant designs for Electrical (Division 16) equipment and distribution, i.e. power distribution equipment to conform to regulations of jurisdiction having authority.
   2. Restraints which are used to prevent disruption of function of piece of equipment because of application of horizontal force to be such that forces are carried to frame of structure in such a way that frame will not be deflected when apparatus is attached to a mounting base and equipment pad, or to structure in normal way, utilizing attachments provided. Secure equipment and distribution systems to withstand a force in direction equal to value defined by jurisdiction having authority.
   3. Provide stamped shop drawings from licensed Structural Engineer of seismic bracing and seismic movement assemblies for conduit and equipment. Submit shop drawings along with equipment submittals.
   4. Provide stamped shop drawings from licensed Structural Engineer of seismic flexible joints for conduit crossing building expansion or seismic joints. Submit shop drawings along with seismic bracing details.
   5. Provide means to prohibit excessive motion of electrical equipment during earthquake.

3.03 REVIEW AND OBSERVATION

A. Confirm Review and Observation requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.

B. Notify Engineer, in writing, at following stages of construction so that they may, at their option, visit site for review and construction observation:
   1. When main systems, or portions of, are being tested and ready for inspection by AHJ.

C. Final Punch:
   1. Prior to requesting a final punch visit from the Engineer, request from Engineer the Electrical Precloseout Checklist, complete the checklist confirming completion of systems' installation, and return to Engineer. Request a final punch visit from the Engineer, upon Engineer's acceptance that the electrical systems are ready for final punch.
   2. Costs incurred by additional trips required due to incomplete systems will be the responsibility of the Contractor.

3.04 CONTINUITY OF SERVICE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 16, Electrical Sections and the following:
   1. During remodeling or addition to existing structure, while existing structure is occupied, present services to remain intact until new construction, facilities or equipment is installed.
   2. Prior to changing over to new service, verify that every item is thoroughly prepared. Install new wiring, and wiring to point of connection.
   3. Coordinate transfer time to new service with Owner. If required, perform transfer during off-peak hours. Once changeover is started, pursue to its completion to keep interference to a minimum.
      a. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work.
   4. No interruption of services to any part of existing facilities will be permitted without express permission in each instance from Owner. Requests for outages must state specific dates, hours and maximum durations, with outages kept to these specific dates, hours and maximum durations. Obtain written permission from Owner for any interruption of power, lighting or signal circuits and systems.

a. Organize work to minimize duration of power interruption.
b. Coordinate utility service outages with utility company.

3.05 CUTTING AND PATCHING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements in Division 01, General Requirements, comply with individual Division 16, Electrical Sections and the following:
   1. Cutting, patching and repairing for work specified in this Division including plastering, masonry work, concrete work, carpentry work, and painting included under this Section will be performed by skilled craftsmen of each respective trade in conformance with appropriate Division of Work.
   2. Restore new or existing work that is cut and/or damaged to original condition. Patch and repair specifically where existing items have been removed. This includes repairing and painting walls, ceilings, etc. where existing conduit and devices are removed as part of this project. Where alterations disturb lawns, paving, and/or walks, surfaces to be repaired, refinished and left in condition matching existing prior to commencement of work.
   3. Additional work required by lack of proper coordination will be provided at no additional cost to the Owner.

3.06 EQUIPMENT SELECTION AND SERVICEABILITY

A. Replace or reposition equipment which is too large or located incorrectly to permit servicing, at no additional cost to Owner.

3.07 DELIVERY, STORAGE AND HANDLING

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements, comply with individual Division 16, Electrical Sections and the following:
   1. Handle materials delivered to project site with care to avoid damage. Store materials on site inside building or protected from weather, dirt and construction dust. Products and/or materials that become damaged due to water, dirt, and/or dust as a result of improper storage and handling to be replaced before installation.
   2. Protect equipment to avoid damage. Close conduit openings with caps or plugs. Keep motors and bearings in watertight and dustproof covers during entire course of installation.

3.08 DEMONSTRATION

A. Confirm Demonstration requirements in Division 00, Procurement and Contracting Requirements, Division 01, General Requirements, and individual Division 16, Electrical Sections.

B. Upon completion of work and adjustment of equipment, test systems and demonstrate to Owner's Authorized Representative, Architect, and Engineer that equipment furnished and installed or connected under provisions of these Specifications functions in manner required. Provide field instruction to Owner's Maintenance Staff as specified in Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.

C. Manufacturer's Field Services: Furnish services of a qualified person at time approved by Owner, to instruct maintenance personnel, correct defects or deficiencies, and demonstrate to satisfaction of Owner that entire system is operating in satisfactory manner and complies with requirements of other trades that may be required to complete work. Complete instruction and demonstration prior to final job site observations.

3.09 CLEANING

A. Confirm Cleaning requirements in Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.

B. Upon completion of installation, thoroughly clean electrical equipment, removing dirt, debris, dust, temporary labels and traces of foreign substances. Throughout work, remove construction debris and surplus materials accumulated during work.

3.10 INSTALLATION

A. Confirm Installation requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.

B. Install equipment and fixtures in accordance with manufacturer's installation instructions, plumb and level and firmly anchored to vibration isolators. Maintain manufacturer's recommended clearances.

C. Start up equipment, in accordance with manufacturer's start-up instructions, and in presence of manufacturer's representative. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

D. Provide miscellaneous supports/metals required for installation of equipment.

3.11 PAINTING

A. Confirm requirements in Division 01, General Requirements and Division 09, Finishes. In the absence of specific requirements, comply with individual Division 16, Electrical Sections and the following:
   1. Ferrous Metal: After completion of work, thoroughly clean and paint exposed supports constructed of ferrous metal surfaces (i.e., hangers, hanger rods, equipment stands, etc.) with one coat of black asphalt varnish for exterior or black enamel for interior, suitable for hot surfaces.
   2. In Mechanical Room, or other exposed areas, equipment not painted with enamel to receive two coats of primer and one coat of rustproof enamel, colors as selected by Architect.
   3. See individual equipment Specifications for other painting.
   4. Structural Steel: Repair damage to structural steel finishes or finishes of other materials damaged by cutting, welding or patching to match original.
   5. Conduit: Clean, primer coat and paint interior/exterior conduit exposed in public areas with two coats paint suitable for metallic surfaces. Color selected by Architect.

3.12 DEMOLITION

A. Confirm requirements in Division 01, General Requirements and Division 02, Existing Conditions. In the absence of specific requirements, comply with individual Division 16, Electrical Sections and the following:
   1. It is the intent of these documents to provide necessary information and adjustments to electrical system required to meet code, and accommodate installation of new work.
   2. Coordinate with Owner so that work can be scheduled not to interrupt operations, normal activities, building access or access to different areas. Owner will cooperate to best of their ability to assist in coordinated schedule, but will remain final authority as to time of work permitted.
   3. Examination:
      a. Determine exact location of existing utilities and equipment before commencing work, compensate Owner for damages caused by failure to locate and preserve utilities. Replace damaged items with new material to match existing.
      b. Verify that abandoned wiring and equipment serve only abandoned facilities.
      c. Demolition drawings are based on casual field observation and existing record documents.
         1) Verify accuracy of information shown prior to bidding and provide such labor and material as is necessary to accomplish work.
         2) Verify location and number of electrical outlets, disconnects, etc. in field.
      d. Report discrepancies to Engineer before disturbing existing installation.
         1) Promptly notify Owner if utilities are found which are not shown on Drawings.

4. Execution:
    a. Remove and restore wiring which serves usable existing outlets clear of construction or demolition.
    b. If existing junction boxes will be made inaccessible, or if abandoned outlets serve as feed through boxes for other existing electrical equipment which is being retained, provide new conduit and wire to bypass inaccessible junction boxes and abandoned outlets.
    c. Remove abandoned wiring to source of supply.
    d. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
    e. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
    f. Existing lighting which is to remain, leave luminaires in proper working order.
    g. Repair adjacent construction and finishes damaged during demolition work.
    h. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

3.13 ACCEPTANCE

A. Confirm requirements in Division 00, Procurement and Contracting Requirements and Division 01, General Requirements. In the absence of specific requirements, comply with individual Division 16, Electrical Sections and the following:
    1. System cannot be considered for acceptance until work is completed and demonstrated to Engineer that installation is in strict compliance with Specifications, Drawings and manufacturer's installation instructions, particularly in reference to following:
        a. Cleaning
        b. Operation and Maintenance Manuals
        c. Training of Operating Personnel
        d. Record Drawings
        e. Warranty and Guaranty Certificates
        f. Start-up/Test Document and Commissioning Reports

3.14 FIELD QUALITY CONTROL

A. Confirm Field Quality Control requirements in Division 01, General Requirements, Section 16000, Electrical Basic Requirements and individual Division 16, Electrical Sections.

B. Tests:
    1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified. Reference individual Specification Sections for required tests. Document tests and include in operation and maintenance manuals.
    2. During site evaluations by Architect or Engineer, provide appropriate personnel with tools to remove and replace trims, covers, and devices so that proper evaluation of installation can be performed.

3.15 LETTER OF CONFORMANCE

A. Provide Letter of Conformance, copies of manufacturers' warranties and extended warranties with a statement that Electrical items were installed in accordance with manufacturer's recommendations, UL listings and FM Global approvals. Include Letter of Conformance, copies of manufacturers' warranties and extended warranties in Operation and Maintenance Manuals.

3.16 SALVAGED EQUIPMENT AND RECYCLED MATERIAL

A. Salvage the following equipment not being reused and return to Owner:
    1. Disconnect Switch

B. Electrical equipment that cannot be salvaged for reuse, sell/give to recycling company. Recycle following excess, removed, or demolished electrical material:
    1. Copper or aluminum conductors and motor/transformer windings.
    2. Steel and aluminum from raceways, boxes, enclosures, and housings.

C. Provide separate on-site storage space for recycled and salvaged material. Clearly label space.

D. Confirm additional salvaged equipment and recycled materials in the Contract Documents.

END OF SECTION

SECTION 16060 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Connectors and Accessories
   2. Grounding Conductor

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Comply with the requirements of ANSI/NFPA 70.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Connectors and Accessories:
   1. Burndy Hyground Compression System
   2. Erico/Cadweld
   3. Amp Ampact Grounding System
   4. Pipe Grounding Clamp:
      a. Burndy GAR Series
      b. O Z Gedney
      c. Thomas & Betts
      d. Or approved equivalent.

B. Grounding Conductor
   1. General Cable
   2. Okonite
   3. Southwire
   4. Or approved equivalent

2.02 CONNECTORS AND ACCESSORIES

A. Grounding Connectors: Hydraulic compression tool applied connectors or exothermic welding process connectors or powder actuated compression tool applied connectors.

B. Pipe Grounding Clamp: Mechanical ground connector with cable parallel or perpendicular to pipe.

2.03 GROUNDING CONDUCTOR

A. Grounding Electrode Conductor: Soft-draw bare stranded copper for wire sizes larger than #10 AWG Bare. Solid copper for wire sizes #10 AWG and smaller.

B. Equipment Grounding Conductor: Green insulated, insulation type to match that of associated feeder or branch circuit wiring, size as indicated on drawings.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Verify site conditions prior to beginning work.

B. Corrosion inhibitors: Apply a corrosion inhibitor to contact surfaces when making grounding and bonding connections. Use corrosion inhibitor appropriate for protecting a connection between metals used.

C. Inspect and test in accordance with NETA Standard ATS, Except Section 4.

D. Perform inspections and tests listed in NETA Standard AB, Section 7.13.

3.02 CONNECTORS AND ACCESSORIES INSTALLATION

A. Install per manufacturer's instructions.

3.03 GROUNDING CONDUCTOR INSTALLATION

A. Raceways:
   1. Ground metallic raceway systems. Bond to ground terminal with code size jumper except where code size or larger equipment grounding conductor is included with circuit, use grounding bushing with lay-in lug.
   2. Connect metal raceways, which terminate within an enclosure but without mechanical connection to enclosure, by grounding bushings and ground conductor to grounding bus.
   3. Where equipment supply conductors are in flexible metallic conduit, install stranded copper equipment grounding conductor from outlet box to equipment frame.
   4. Install equipment grounding conductor, code size minimum unless noted on drawings, in metallic and nonmetallic raceway systems.

B. Feeders and Branch Circuits:
   1. Provide continuous green insulated copper equipment grounding conductors for feeders and branch circuits.
   2. Where installed in a continuous solid metallic raceway system and larger sizes are not detailed, provide insulated equipment grounding conductors for feeders and branch circuits sized in accordance with the latest adopted edition of NEC Article 250, Table 250-122.

C. Bond enclosure equipment grounding conductors to enclosure with specified conductors and lugs. Install lugs only on thoroughly cleaned contact surfaces.

D. Motors, Equipment and Appliances: Install code size equipment grounding conductor to (motor) equipment frame or manufacturer's designated ground terminal.

END OF SECTION

SECTION 16070 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Anchors, Threaded Rod and Fasteners
   2. Support Channel, Hangers and Supports

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals not required for this Section.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Manufacturers regularly engaged in the manufacture of bolted metal framing support systems, whose products have been in satisfactory use in similar service for not less than 10 years.
   2. Support systems to be supplied by a single manufacturer.
   3. Engineering Responsibility: Design and preparation of Shop Drawings and calculations for each multiple pipe support, trapeze, equipment hangers/supports, and seismic restraint by a qualified Structural Professional Engineer.
      a. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of hangers and supports that are similar to those indicated for this Project in material, design, and extent.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.07 PERFORMANCE REQUIREMENTS

A. General: Provide conduit and equipment hangers and supports in accordance with the following:
   1. When supports, anchorages, and seismic restraints for equipment and supports, anchorages and seismic restraints for conduit, cable tray and equipment are not shown on the Drawings, the Contractor is responsible for their design.
   2. Connections to structural framing shall not introduce twisting, torsion, or lateral bending in the framing members. Provide supplementary steel as required.

B. Engineered Support Systems: The following support systems to be designed, detailed, and bear the seal of a professional engineer registered in the State of Hawaii.
   1. Support frames such as conduit racks or stanchions for conduit and equipment which provide support from below.
   2. Equipment and piping support frame anchorage to supporting slab or structure.

C. Provide channel support systems, for conduits to support multiple conduits capable of supporting combined weight of support systems and system contents.

D. Provide seismic restraint hangers and supports for conduit and equipment.

E. Obtain approval from AHJ for seismic restraint hanger and support system to be installed for piping and equipment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Anchors, Threaded Rod and Fasteners:
   1. Anchor It
   2. Epcon System
   3. Hilti-Hit System
   4. Power Fast System
   5. Or approved equivalent.

B. Support Channel, Hangers and Supports:
   1. B-Line
   2. Kindorf
   3. Superstrut
   4. Unistrut
   5. Or approved equivalent.

2.02 ANCHORS, THREADED ROD AND FASTENERS

A. Anchors, Threaded Rod and Fasteners - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.

B. Anchors and Fasteners:
   1. Do not use powder-actuated anchors.
   2. Steel Structural Elements: Use beam clamps.
   3. Concrete Surfaces: Use self-drilling anchors.
   4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts.
   5. Solid Masonry Walls: Use expansion anchors.
   6. Sheet Metal: Use sheet metal screws.

C. Fasteners: Provide fasteners of types as required for assembly and installation of fabricated items; surface-applied fasteners are specified elsewhere.

D. Bolts: Low carbon steel externally and internally threaded fasteners conforming with requirements of ASTM A307; include necessary nuts and plain hardened washers. For structural steel elements supporting mechanical material or equipment from building structural members or connection thereto, use fasteners conforming to ASTM A325.

E. Miscellaneous Materials: Provide incidental accessory materials, tools, methods, and equipment required for fabrication.

2.03 SUPPORT CHANNEL, HANGERS AND SUPPORTS

A. Hangers and Supports - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.
   1. Channel Material: Carbon steel.
   2. Coating: Hot dip galvanized.

B. Pipe Straps: Two-hole galvanized or malleable iron.

C. Miscellaneous Metal: Provide miscellaneous metal items specified hereunder, including materials, fabrication, fastenings and accessories required for finished installation, where indicated on Drawings or otherwise not shown on drawings that are necessary for completion of the project. The Contractor is responsible for their design.
   1. Fabricate miscellaneous units to size shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.

D. Structural Shapes: Where miscellaneous metal items are needed to be fabricated from structural steel shapes and plates, provide members constructed of steel conforming with requirements of ASTM A36 or approved equivalent.

E. Steel Pipe: Provide seamless steel pipe conforming to requirements of ASTM A53, Type S, Grade A, or Grade B. Weight and size required as specified.

F. Miscellaneous Materials: Provide incidental accessory materials, tools, methods, and equipment required for fabrication.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Fabrication - Miscellaneous Metals
   1. General: Verify dimensions prior to fabrication. Form metal items to accurate sizes and configurations as indicated on Drawings and otherwise required for proper installation; make with lines straight and angles sharp, clean and true; drill, countersink, tap, and otherwise prepare items for connections with work of other trades, as required. Fabricate to detail of structural shapes, plates and bars; weld joints where practicable; provide bolts and other connection devices required. Include anchorages; clip angles, sleeves, anchor plates, and similar devices. Hot dipped galvanize after fabrication items installed in exterior locations. Set accurately in position as required and anchor securely to building construction. Construct items with joints formed for strength and rigidity, accurately machining for proper fit; where exposed to weather, form to exclude water.
   2. Finishes:
      a. Ferrous Metal: After fabrication, but before erection, clean surfaces by mechanical or chemical methods to remove rust, scale, oil, corrosion, or other substances detrimental to bonding of subsequently applied protective coatings. For metal items exposed to weather or moisture, galvanize in manner to obtain G90 zinc coating in accordance with ASTM A123. Provide other non-galvanized ferrous metal with one coat of approved rust-resisting paint primer, in manner to obtain not less than 1.0 mil dry film thickness. Touch-up damaged areas in primer with same material, before installation. Apply zinc coatings and paint primers uniformly and smoothly; leave ready for finish painting as specified elsewhere.
      b. Metal in contact with Concrete, Masonry and Other Dissimilar Materials: Where metal items are to be erected in contact with dissimilar materials, provide contact surfaces with coating of an approved zinc-chromate primer in manner to obtain not less than 1.0 mil dry film thickness, in addition to other coatings specified in these specifications.
      c. For Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A780.

3.02 ANCHORS, THREADED ROD AND FASTENERS INSTALLATION

A. Safety factor of 4 required for every fastening device or support for equipment installed. Supports to withstand four times the weight of equipment it supports.

B. Do not use other trade's fastening devices as supporting means for equipment or materials.

C. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

D. Do not use supports or fastening devices to support other than one particular item.

E. Securely suspend junction boxes, pull boxes or other conduit terminating housings located above suspended ceiling from floor above or roof structure to prevent sagging and swaying.

F. Provide seismic bracing per IBC requirements.

G. Install surface-mounted cabinets and panelboards with minimum of four anchors.

H. Use spring lock washers under fastener nuts for strut.

I. Cutting and Drilling
   1. Do not drill or cut structural members without prior permission from Engineer.

3.03 SUPPORT CHANNEL, HANGERS AND SUPPORTS INSTALLATION

A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.

B. Safety factor of 4 required for every fastening device or support for equipment installed. Supports to withstand four times the weight of equipment it supports.

C. Install vertical support members for equipment, straight and parallel to building walls.

D. Install horizontal support members straight and parallel to ceilings or finished floor unless otherwise noted.

E. Provide independent supports to structural member for materials, or equipment installed in or on ceiling, walls or in void spaces or over suspended ceilings.

F. Do not use other trade's fastening devices as supporting means for equipment or materials.

G. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

H. Do not use supports or fastening devices to support other than one particular item.

I. Support conduits within 18-inches of boxes, cabinets and deflections unless more stringently required by NEC.

J. Maximum distance between supports not to exceed 8 foot spacing unless otherwise required by NEC.

K. Support flexible conduits and metal clad cable within 12-inches of boxes, cabinets and deflections unless otherwise required by NEC.

L. Maximum distance between supports for flexible conduits and metal clad cable not to exceed 48-inches spacing unless otherwise required by NEC.

M. Install strut hangers as instructed by strut manufacturer. Suspend strut hangers as instructed by strut manufacturer for the load, with a maximum spacing of 8-feet on center and within 2-feet of cabinet, junction box or other channel raceway termination unless otherwise required by NEC.

N. Provide seismic bracing per IBC requirements.

O. Install surface-mounted cabinets with minimum of four anchors.

P. Wet and Damp Locations:
   1. In wet and damp locations use steel channel supports to stand cabinets 1-inch off wall.

END OF SECTION

SECTION 16075 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Equipment Nameplates
   2. Device Labels
   3. Wire Markers

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals not required for this Section.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, meet the following:
   1. Manufacturer's Qualifications: Firms regularly engaged in manufacture of identification devices of types and sizes required.
   2. Manufacturer's standard products of categories and types required for each application as referenced in other Division 16, Electrical Sections. Where more than a single type is specified for application, provide single selection for each product category.
   3. Codes and Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices unless otherwise indicated.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Equipment Nameplates:
   1. B & I Nameplates
   2. Intellicum
   3. JBR Associates
   4. Or approved equivalent.

B. Device Labels:
   1. Kroy
   2. Brady
   3. Or approved equivalent.

C. Wire Markers:
   1. Brady
   2. Panduit
   3. Sumitomo
   4. Or approved equivalent.

2.02 EQUIPMENT NAMEPLATES

A. Engraved phenolic plastic, laminate, minimum 1/8-inch thick in the size indicated, with beveled edge border matching letter color. Federal specification L-P-387. All upper case letters in

engraver standard letter style of the size and wording indicated. Punched for mechanical fastening, except where adhesive mounting is necessary due to substrate. Embossed tape style labels are not acceptable.

B. Color:
   1. Normal (Utility): White letters on black background.

C. Letter Size:
   1. Use 1/2-inch letters minimum for identifying major equipment and loads, including switchgear, switchboards, etc.
   2. Use 1/4-inch or 1/2-inch letters minimum for identifying panels, breakers, etc.
   3. Use 3/16-inch minimum for identifying source, voltage, current, phase, and wire configurations.

D. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

E. The Architect, Engineer, Commissioning Agent and Owner reserve the right to make modifications to the nameplates as necessary.

F. Locations:
   1. Equipment including, but not limited to disconnects.

2.03 DEVICE LABELS

A. Extra strength, laminated adhesive tape, with 3/16-inch black letters on clear background. Use only for identification of individual wall switches and receptacles. Indicate device name, source panel, and source circuits. Panel and circuit designation written in permanent marker on the back of the plate and inside the back-box. Do not provide punch tape style labels.

B. Label all junction boxes to show system identification, source circuit, or raceway origin. In finished areas, utilize device label. In unfinished areas or above ceilings, use of permanent ink marker is acceptable.

2.04 WIRE MARKERS

A. Description: Vinyl-cloth self-adhesive type wire markers.

B. Locations: Each conductor at pull boxes, junction boxes, and each load connection.

C. Power Circuits: Branch circuit or feeder number as indicated on drawings and source panel.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Coordinate designations used on Drawings with equipment nameplates and device labels.

B. Install nameplates and labels parallel to equipment lines.

C. Identify empty conduit and boxes with intended use.

3.02 EQUIPMENT NAMEPLATES

A. Degrease and clean surfaces to receive nameplates.

B. Secure equipment nameplates to equipment front using self-tapping stainless steel screws.

3.03 DEVICE LABELS

A. Reference 3.01, General Installation Requirements.

B. Install per manufacturer's instructions and recommendations.

C. Degrease and clean surfaces to receive labels.

3.04 WIRE MARKERS

A. Reference 3.01, General Installation Requirements.

B. Install per manufacturer's instructions and recommendations.

C. Provide wire markers on each conductor for power.

END OF SECTION

SECTION 16110 - EQUIPMENT WIRING

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Equipment connections, whether furnished by Owner or other Divisions of the Contract.

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition:
   1. Verify mechanical and utilization equipment electrical characteristics with Drawings and equipment submittals prior to ordering equipment. Submit confirmation of this verification as a part of, or addendum to, the electrical product submittals.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements apply to this Section.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials and Equipment for Equipment Wiring: As specified in individual Sections.

2.02 GENERAL

A. Unless otherwise noted, the following voltage and phase characteristics apply to motors:
   1. 5 HP and Over: 208 volt, 3 phase.

B. Safety Switches: Provide as required by NEC and as specified in Section 16410, Enclosed Switches and Circuit Breakers.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to submittal of product data for electrical distribution equipment, obtain and examine product data and shop drawings for equipment furnished by the Owner and by other trades on the project. Update the schedule of equipment electrical connections accordingly, noting proper ratings for overcurrent devices, fuses, safety disconnect switches, conduit and wiring, and the like. As a minimum, this requirement applies to equipment furnished by Owner and equipment furnished under the following divisions of work under this contract:
   1. Division 8, Openings
   2. Division 11, Equipment
   3. Division 13, Special Construction
   4. Division 15, Mechanical

3.02 INSTALLATION

A. Do not install unrelated electrical equipment or wiring on mechanical equipment without prior approval of Engineer.

B. Provide moisture tight equipment wiring and switches in ducts or plenums used for environmental air.

C. Connect motor and appliance/utilization equipment complete from panel to motor/equipment as required by code.

D. Install motor starters and controllers for equipment furnished by others.

E. Appliance/Utilization Equipment:
   1. Provide appropriate cable and cord cap for final connection unless equipment is provided with same. Provide receptacle configured to receive cord cap.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Division 01, General Requirements.

3.04 SYSTEMS STARTUP

A. Provide field representative to prepare and start equipment.
   1. Test and correct for proper rotation of polyphase motors.

B. Adjust for proper operation within manufacturer's published tolerances.

C. Demonstrate proper operation of equipment to Owner's Authorized Representative.

END OF SECTION

SECTION 16125 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Lugs and Pads
   2. Wires and Cables
   3. Splices
   4. Connectors

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Cable insulation test reports in project closeout documentation.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Lugs and Pads:
   1. Anderson
   2. Ilsco
   3. Panduit
   4. Thomas & Betts
   5. 3M
   6. Or approved equivalent.

B. Wires and Cables:
   1. General:
      a. General Cable
      b. Okonite
      c. Southwire
      d. Or approved equivalent.

C. Splices:
   1. Branch Circuit Splices:
      a. Ideal
      b. 3M Scotchlok
      c. Uraseal, Inc.
      d. Or approved equivalent.
   2. Feeder Splices:
      a. 3M
      b. Uraseal, Inc.

D. Connectors:
   1. Anderson Power Products
   2. Burndy
   3. Ilsco
   4. 3M
   5. Thomas & Betts
   6. Or approved equivalent.

2.02 LUGS AND PADS

A. Ampacity: Cross-sectional area of pad for multiple conductor terminations to match ampere rating of panelboard bus or equipment line terminals.

B. Copper Pads: Drilled and tapped for multiple conductor terminals.

C. Lugs: Compression type for use with stranded branch circuit or control conductors; mechanical lugs for use with solid branch and feeder circuit conductors.

2.03 WIRES AND CABLES

A. Building Wires:
   1. Copper: Soft-drawn with conductivity of not less than 98 percent IACS at 20 degrees C (68 degrees F). 600 volt rated throughout. Conductors 12 AWG and 10 AWG, solid. Conductors 8 AWG and larger, stranded. 12 AWG minimum conductor size. Minimum insulation rating of 90 degrees C. Insulation Type: THHN/THWN-2.

B. Phase color to be consistent at feeder terminations; A-B-C, top to bottom, left to right, front to back.

C. Color Code Conductors as Follows:

PHASE	208 VOLT WYE
A	Black
B	Red
C	Blue
Neutral	White
Ground	Green
Isolated Ground	Green w/yellow trace

D. AC Cable (Armored Cable): Not allowed.

E. NMB Cable: Not allowed.

2.04 SPLICES

A. Branch Circuits: Twist on, high temperature, grounding type wing nuts.
   1. Ideal Industries Wing-Nut Twist-On Connectors.
   2. 3M Scotchlok Twist-On Wire Connectors.

B. Feeders:
   1. Compression barrel splice with two layers Scotch 23 and four layers Scotch 33+ as vapor barrier.
   2. Uraseal Shake N' Seal series splice kits.

2.05 CONNECTORS

A. Split bolt connectors not allowed.

B. Conductor Branch Circuits: Wire nuts with integral spring connectors for conductors 12 AWG through 8 AWG. Push-in type connectors where conductors are not required to be twisted together are not acceptable.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Install per manufacturer instructions and NEC.

B. Field Quality Control:

1. Test conductor insulation on feeders of 100 amp and greater for conformity with 1000 volt megohmmeter. Use Insulated Cable Engineers Association testing procedures. Minimum insulation resistance acceptable is 1 megohm for systems 600 volts and below. Notify Engineer if insulation resistance is less than 1 megohm.
2. Test Report: Prepare a typed tabular report indicating the testing instrument, the feeder tested, amperage rating of the feeder, insulation type, voltage, the approximate length of the feeder, conduit type, and the measured resistance of the megohmmeter test. Submit test reports with project closeout documents.
3. Inspect and test in accordance with NETA Standard ATS, except Section 4.
4. Perform inspections and tests listed in NETA Standard ATS, Section 7.3.2.

3.02 LUGS AND PADS

A. Thoroughly clean surfaces to remove all dirt, oil, great or paint.

B. Use torque wrench to tighten per manufacturer's directions.

3.03 WIRES AND CABLES

A. General:

1. Do not install or handle thermoplastic insulated wire and cable in temperatures below -10 degrees C (14 degrees F). Do not handle thermoset insulated wire and cable in temperatures below -40 degrees C (-40 degrees F).
2. Install conductors in raceways having adequate, code size cross-sectional area for wires indicated.
3. Install conductors with care to avoid damage to insulation.
4. Do not apply greater tension on conductors than recommended by manufacturer during installation.
5. Use of pulling compounds is permitted. Clean residue from exposed conductors and raceway entrances after conductor installation. Do not use pulling compounds for installation of conductors connected to GFCI circuit breakers or GFCI receptacles.
6. Conductor Size and Quantity:
   a. Install no conductors smaller than 12 AWG unless otherwise shown.
   b. Provide required conductors for a fully operable system.

B. Conductors in Cabinets:

1. Cable and tree wires in panels and cabinets for power and control. Use plastic ties in panels and cabinets.
2. Tie and bundle feeder conductors in wireways of panelboards.
3. Hold conductors away from sharp metal edges.

C. Exposed cable is not allowed.

D. All cable must be run parallel or perpendicular to building lines and hidden from view when possible. Where installed in tray each power cable is to be identified with Lamacoid nametag engraved with identification of equipment being fed. Tag to be fastened to cable using tie-wraps. Provide nametag at each floor level.

3.04 SPLICES

A. Make splices complete and promptly after wire installation.

B. Make splices for No. 8 and larger wires with mechanically applied pressure type connectors. Make all taped joints with Scotch 33+ or equal, applied in half-lap layers without stretching to deform. Uraseal splice kits are also acceptable through 250 KCMIL.

C. Remove insulation with a stripping tool designed specifically for that purpose. A pocket knife is not an acceptable tool. Leave all conductors nick-free.

3.05 CONNECTORS

A. Install to assure a solid and safe connection.

B. Select hand twist connectors for wire size and install tightly on conductors.

C. Install compression connectors using methods and tools recommended by the manufacturer.

D. Do not install stranded conductors under screw terminals unless compression lugs are installed.

E. Do not connect wiring without UL listed connectors that are listed for the purposes.

END OF SECTION

SECTION 16130 - BOXES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Pull and Junction Boxes

B. Provide electrical boxes and fittings for a complete installation. Include but not limited to junction boxes, pull boxes, bushings, locknuts and other necessary components.

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Pull and Junction Boxes:
   1. Eaton/Crouse-Hinds
   2. Hoffman
   3. Or approved equivalent.

2.02 PULL AND JUNCTION BOXES

A. Construction: Provide ANSI 49 gray enamel painted sheet steel (NEMA 3R Stainless steel where outdoors) junction and pull boxes, with screw-on covers; of type shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

B. Location:
   1. Provide junction boxes and pull boxes to facilitate installation of conductors and limiting accumulated angular sum of bends between boxes, cabinets and appliances to 270 degrees.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1, Standard Practice of Good Workmanship in Electrical Construction.

B. Secure boxes rigidly to substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.

C. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NEC. Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.

D. Set wall mounted boxes at elevations to accommodate mounting heights shown on Architectural Elevations.

E. Electrical enclosures are shown on drawings in approximate locations unless dimensioned.
   1. Adjust box locations up to 10-feet if required to accommodate intended purpose.

F. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12-inches of box.

G. Adjust boxes to be parallel with building lines. Boxes not plumb to building lines are not acceptable.

H. Install knockout closures in unused box openings.

I. Clean interior of boxes to remove dust, debris, and other material.

J. Clean exposed surfaces and restore finish.

3.02 PULL AND JUNCTION BOXES INSTALLATION

A. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

B. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

END OF SECTION

SECTION 16135 - RACEWAYS

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Rigid Metal Conduit (RMC)
   2. Flexible Metal Conduit (FMC)
   3. Liquidtight Flexible Metal Conduit (LFMC)
   4. Conduit Fittings

B. Provide a complete system of conduit and fittings, with associated couplings, connectors, and fittings, as shown on drawings and described in these specifications.

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

B. In addition, reference the following:
   1. Section 16070, Hangers and Supports for Electrical Systems and Equipment
   2. Section 16130, Boxes

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.07 DEFINITIONS

A. Raceway system is defined as consisting of conduit, tubing, duct, and fittings including but not limited to connectors, couplings, offsets, elbows, bushings, expansion/deflection fittings, and other components and accessories. Complete electrical raceway installation before starting the installation of conductors and cables.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Rigid Metal Conduit (RMC):
   1. Allied Tube & Conduit
   2. Beck Manufacturing Inc.
   3. Picoma
   4. Wheatland Tube Company
   5. Or approved equivalent.

B. Flexible Metal Conduit (FMC):
   1. AFC Cable Systems Inc.
   2. Electri-Flex Company
   3. International Metal Hose
   4. Or approved equivalent.

C. Liquidtight Flexible Metal Conduit (LFMC):
   1. AFC Cable Systems Inc.

2. Electri-Flex Company
3. International Metal Hose
4. Or approved equivalent.

D. Conduit Fittings:
1. Bushings:
a. Insulated Type for Threaded Raceway Without Factory Installed Plastic Throat Conductor Protection:
1) Thomas & Betts 1222 Series
2) O-Z Gedney B Series
3) Or approved Equivalent.
2. Raceway Connectors and Couplings:
a. Thomas & Betts Series
b. O-Z Gedney Series
c. Or approved Equivalent.

2.02 RIGID METAL CONDUIT (RMC)

A. UL 6, ANSI C80.1. Hot dipped galvanized steel conduit after thread cutting.
1. Fittings: NEMA FB2.10.

2.03 FLEXIBLE METAL CONDUIT (FMC)

A. Description: UL 1, Interlocked steel construction.

B. Fittings: NEMA FB 2.20.

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: UL 360, inner core made from spiral wound strip of heavy gauge, hot dipped galvanized low carbon steel. 3/4-inch through 1-1/4-inch trade sizes to have a square lock core and contain an integral bonding strip of copper. 1-1/2-inch and larger to have fully interlocked core. Jacket material to be moisture, oil and sunlight resistant flexible PVC.

B. Fittings: NEMA FB 2.20.

2.05 CONDUIT FITTINGS

A. Bushings:
1. Insulated type for threaded raceway connectors without factory-installed plastic throat conductor protection.
2. Insulated grounding type for threaded raceway connectors.

B. Raceway Connectors and Couplings:
1. Steel connectors, couplings, and conduit bodies, hot-dip galvanized.
2. Connector locknuts to be steel, with threads meeting ASTM tolerances. Locknuts to be hot-dip galvanized.
3. Connector throats (flexible conduit) to have factory installed plastic inserts permanently installed. For normal cable or conductor exiting angles from raceway, the cable jacket or conductor insulation to bear only on plastic throat insert.
4. Steel gland, Tomic or Breagle connectors and couplings are recognized for this Contract as having acceptable raceway to fitting electrical conductance.
5. Set screw connectors and couplings, without integral compression glands, are recognized for this Contract as not having acceptable raceway to fitting electrical conductance. A ground conductor sized per this Specification must be included and bonded within raceway assembly utilizing this type connector or coupling.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Finished Surfaces: Schedule raceway installation to avoid conflict with installed wall and ceiling surfaces. If unavoidable, coordinate work and repairs with Engineer.

B. Conduit Size:
   1. Minimum Size: 3/4-inch for power.

C. Verify that field measurements are as shown on drawings.

D. Plan locations of conduit runs in advance of the installation and coordinate with ductwork, plumbing, ceiling and wall construction in the same areas.

E. Verify routing and termination locations of conduit prior to rough-in.

F. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

G. Install raceways securely, in neat and workmanlike manner, as specified in NECA 1, Standard Practices for Good Workmanship in Electrical Construction.

H. Install steel conduit as specified in NECA 101, Standard for Installing Steel Conduits.

I. Install nonmetallic conduit in accordance with manufacturer's instructions.

J. Inserts, anchors and sleeves.
   1. Coordinate location of inserts and anchor bolts for electrical systems prior to concrete pour.
   2. Coordinate location of sleeves with consideration for other building systems prior to concrete pour.

K. Conduit Supports:
   1. Arrange supports to prevent misalignment during wiring installation.
   2. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
   3. Group related conduits; support using conduit rack. Construct rack using steel channel. Provide space on each for 25 percent additional conduits.
   4. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
   5. Do not attach conduit to ceiling support wires.

L. Flexible steel conduit length not-to-exceed 6-feet, 3-feet in concealed walls. Provide sufficient slack to reduce the effect of vibration.

M. Install conduit seals at boundaries where ambient temperatures differ by 10 degrees F or more as shown on the drawings. Install seals on warm side of partition.

N. Seal raceways stubbing up into electrical equipment. Plug raceways with conductors with duct-seal.

O. Arrange conduit to maintain headroom and present neat appearance.

P. Do not install conduits across floors, unless otherwise noted on drawings.

Q. Exposed conduits are permitted only in following areas:
   1. Mechanical rooms, electrical rooms or spaces where walls, ceilings and floors will not be covered with finished material.
   2. Existing walls that are concrete or block construction.
   3. Where specifically noted on Drawings.
   4. Route exposed conduit parallel and perpendicular to walls, tight to finished surfaces and neatly offset into boxes.

R. Do not install conduits or other electrical equipment in obvious passages, doorways, scuttles or crawl spaces which would impede or block area passage's intended usage.

S. Install continuous conduit and raceways for electrical power wiring.

T. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

U. Maintain adequate clearance between conduit and piping.

V. Keep conduits a minimum of 12-inches away from steam or hot water radiant heating lines (at or above 104 degrees F) or 3-inches away from waste or water lines.

W. Cut conduit square using saw or pipecutter; deburr cut ends.

X. Bring conduit to shoulder of fittings; fasten securely.

Y. Use conduit hubs to fasten conduit to cast boxes in damp and wet locations.

Z. Install no more than the equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams.

AA. Use hydraulic one shot bender to fabricate elbows for bends in metal conduit larger than 2-inch size.

AB. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

AC. Feeders: Do not combine or change feeder runs.

AD. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07, Thermal and Moisture Protection.

3.02 RIGID METAL CONDUIT (RMC) INSTALLATION

A. Outdoor Locations Above Grade: RMC.

B. Damp Locations: RMC.

C. In areas exposed to mechanical damage: RMC.

D. For security conduits installed exposed and subject to tampering: RMC.

3.03 FLEXIBLE METAL CONDUIT (FMC) INSTALLATION

A. Dry Locations: Motors, recessed luminaires and equipment connections subject to movement or vibration, use flexible metallic conduit.

B. Install 12-inch minimum slack loop on flexible metallic conduit.

3.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC) INSTALLATION

A. Use PVC coated liquidtight flexible metallic conduit for motors and equipment connections subject to movement or vibration and subjected to any of following conditions: Exterior location, moist or humid atmosphere, corrosive environments, water spray, oil, or grease.

B. Install 12-inch minimum slack loop on liquidtight flexible metallic conduit.

3.05 CONDUIT FITTINGS INSTALLATION

A. Conduit Joints: Assemble conduits continuous and secure to equipment with fittings to maintain continuity. Provide watertight joints in damp locations. Seal metal conduit with metal thread primer. Rigid conduit connections to be threaded, clean and tight (metal to metal). Threadless connections are not permitted for RMC.

B. Use set screw type fittings only in dry locations. When set screw fittings are utilized provide insulated continuous equipment ground conductor in conduit, from overcurrent protection device to outlet.

C. Use compression fittings in dry locations, damp and rain-exposed locations. Maximum size permitted in damp locations is 2-inches in diameter.

D. Use threaded type fittings in wet locations, hazardous locations, and damp or rain-exposed locations where conduit size is greater than 2-inches.

E. Use insulated type bushings with ground provision at safety disconnect switches, junction boxes that have feeders 60 amperes and greater.

F. Condulets and Conduit Bodies:
   1. Do not use condulets and conduit bodies in conduits in feeders 100 amp and larger, or for conductor splicing.

G. Sleeves and Chases - Wall Penetrations: Provide necessary rigid conduit sleeves, openings and chases where conduits or cables are required to pass walls.

END OF SECTION

SECTION 16217 - OVERCURRENT PROTECTIVE DEVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Fuses

1.02 RELATED SECTIONS

A. Contents of Division 16, Electrical and Division 01, General Requirements apply to this Section.

1.03 REFERENCES AND STANDARDS

A. References and Standards as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

1.04 SUBMITTALS

A. Submittals as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

B. In addition, provide:
   1. Product data and instantaneous let-through current curves and average melting time current curves for fuses supplied to project.
   2. Product data and time/current trip curves for circuit breakers supplied to project.

1.05 QUALITY ASSURANCE

A. Quality assurance as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements apply to this Section.

1.06 WARRANTY

A. Warranty of materials and workmanship as required by Section 16000, Electrical Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Fuses:
   1. Bussmann
   2. Ferraz-Shawmut
   3. Littelfuse
   4. McGraw-Edison
   5. Or approved equivalent.

2.02 FUSES

A. Characteristics:
   1. Dual element, time delay, current limiting, nonrenewable type, rejection feature.
   2. Combination Loads: UL Class RK1, RK5, or J, 1/10 to 600 amp. UL Class L, above 600 amps.
   3. Motor Loads: UL Class RK5, 1/10 to 600 amp.
   4. Fuse pullers for complete range of fuses.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Coordination:
   1. Obtain and review the submitted product data for equipment furnished by the Owner, and furnished under other Divisions of this contract, particularly under Division 15, Mechanical.
   2. Confirm the equipment nameplate maximum overcurrent protection (MOCP) and make accommodations and adjustments to overcurrent protective devices as necessary to coordinate with the nameplate rating.

B. Install all items in accordance with manufacturers written instructions.

3.02 FUSES

A. Fuses: For each class and ampere rating of fuse installed, provide the following quantities of spares for quantity of fuses installed:
   1. 0 to 24: Provide 6 spare.

END OF SECTION

LEAHI HOSPITAL:

SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE.
HONOLULU, HAWAII 96816
TMK#: 3-2-031: 001

INTERFACE ENGINEERING

1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

JESSE E. A. FINES
LICENSED PROFESSIONAL ENGINEER
18862E
HAWAII U.S.A.

EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING

PROJECT 2020-0453
CONTACT Scott Sato
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
COVER SHEET

REVISIONS

DRAWN BY

CHECKED BY

JOB NO.
2020-0453

DATE
01-10-2022

SHEET NUMBER
T0.01

VICINITY MAP

PROJECT INFORMATION

OCCUPANCY GROUP: GROUP B

CONSTRUCTION TYPE: ?

NUMBER OF STORIES: 6

SCOPE OF WORK:

A. REPLACEMENT OF EXISTING HEAT PUMP.
B. INSTALLATION OF NEW DOOR TO HEAT PUMP ROOM.

NOTE: THIS PROJECT HAS BEEN DESIGNED IN ACCORDANCE WITH THE ADA GUIDELINES.

BUILDING CODES

IBC - 2012, WITH CURRENT AMENDMENTS
NEC - 2017, WITH CURRENT AMENDMENTS
NFPA 1 - 2012, WITH LOCAL AMENDMENTS
IECC - 2015, WITH CURRENT AMENDMENTS
UPC - 2012, WITH CURRENT AMENDMENTS

ZONING DATA

FEMA FLOOD DESIGNATION: X

SPECIAL MANAGEMENT AREA: NOT IN SMA

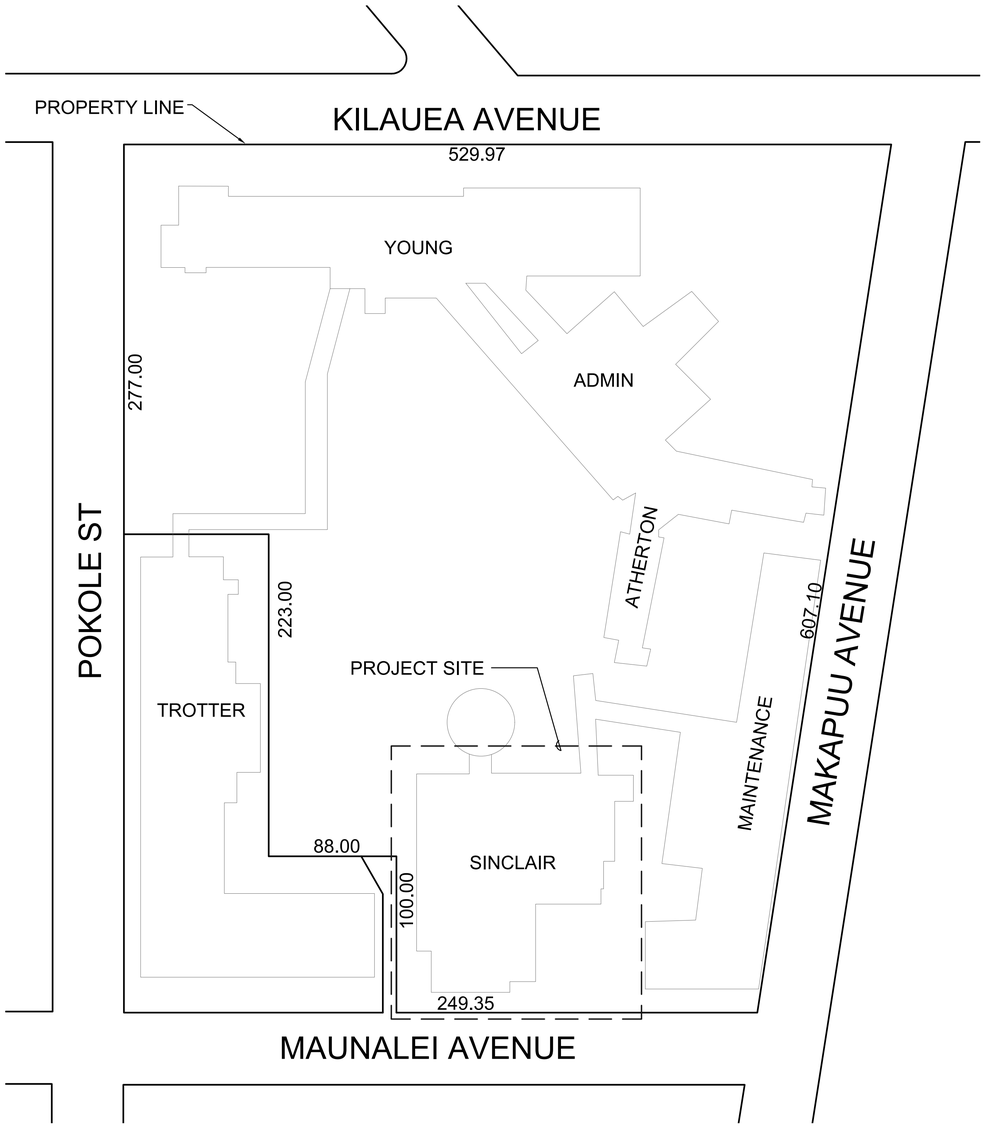
TSUNAMI EVACUATION ZONE: NO

ZONING: R-5

LOT SIZE: 6.662 ACRES (290,196 SQ.FT.)

HEIGHT LIMIT: 25 FEET

SHEET INDEX



1 PLOT PLAN
NO SCALE

ROH 18.5.2
SEC. 18-5.2 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. (SEC. 18-5.2 R.O. 1978 (1983 ED.); AM. ORD. 93-59)

FIRE SAFETY NOTE
16.1.1 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 THIS CHAPTER. 2012 NFPA 1.

ALTERATION OF BUILDINGS
16.4.4.1 WHERE THE BUILDING IS PROTECTED BY FIRE PROTECTION SYSTEMS, SUCH SYSTEMS SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES DURING ALTERATION.
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.
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.
16.4.4.4 THE FIRE DEPARTMENT SHALL BE NOTIFIED WHEN THE SYSTEM IS SHUT DOWN AND WHEN THE SYSTEM IS RETURNED TO SERVICE.
10.8.1.1 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.
13.1.9 WHEN A FIRE PROTECTION SYSTEM IS OUT OF SERVICE FOR MORE THAN 4 HOURS IN A 24-HOUR PERIOD, THE AHJ SHALL BE PERMITTED TO REQUIRE THE BUILDING TO BE EVACUATED OR AN APPROVED FIRE WATCH TO BE PROVIDED FOR ALL PORTIONS LEFT UNPROTECTED BY THE FIRE PROTECTION SYSTEM SHUTDOWN UNTIL THE FIRE PROTECTION SYSTEM HAS BEEN RETURNED TO SERVICE.

APPROVAL AND ACCEPTANCE.
13.7.3.2.1.3 BEFORE REQUESTING FINAL APPROVAL OF THE INSTALLATION, IF REQUIRED BY THE AHJ, THE INSTALLING CONTRACTOR SHALL FURNISH A WRITTEN STATEMENT STATING THAT THE SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND TESTED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS AND THE APPROPRIATE NFPA REQUIREMENTS.
13.7.3.2.1.4* THE RECORD OF COMPLETION FORM, FIGURE 10.18.2.1.1 OF NFPA 72, SHALL BE PERMITTED TO BE A PART OF THE WRITTEN STATEMENT REQUIRED IN 13.7.3.2.1.3. WHEN MORE THAN ONE CONTRACTOR HAS BEEN RESPONSIBLE FOR THE INSTALLATION, EACH CONTRACTOR SHALL COMPLETE THE PORTIONS OF THE FORM FOR WHICH THAT CONTRACTOR HAD RESPONSIBILITY.

CITY AND COUNTY OF HONOLULU
2015 INTERNATIONAL ENERGY CONSERVATION CODE

To the best of my knowledge, this project's design substanially conforms to the Buiilding Energy Conservation Code for:

____ Building Component Systems
____ Electrical Component Systems
X Mechanical Component Systems

Signature: _____ Date: 01/10/2022
Name: MARK O. KOLLER
Title: ASSOCIATE PRINCIPAL
License No: 17102-M

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCES OF HONOLULU 1990
CHAPTER 32

To the best of my knowledge, this project's design substanially conforms to the Buiilding Energy Conservation Code for:

____ Building Component Systems
X Electrical Component Systems
____ Mechanical Component Systems

Signature: _____ Date: 01/10/2022
Name: JESSE E. A. FINES
Title: ELECTRICAL ENGINEER
License No: 18862-E

INTERFACE ENGINEERING
1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

JESSE E. A. FINES
LICENSED PROFESSIONAL ENGINEER
18862E
HAWAII U.S.A.
EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING

PROJECT 2020-0453
CONTACT Scott Sato
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR AIR HEAT PUMP REPLACEMENT

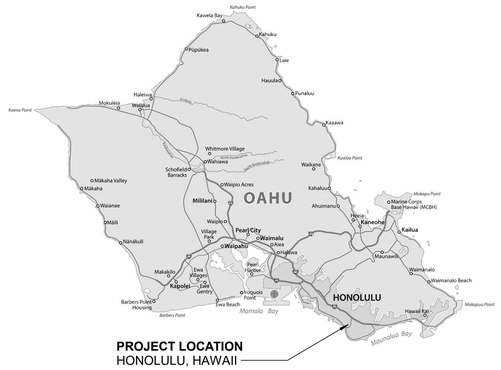
3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
TITLE SHEET AND PROJECT INFORMATION

REVISIONS

DRAWN BY
CHECKED BY
JOB NO. 2020-0453
DATE 01-10-2022
SHEET NUMBER
T0.02

LOCATION MAP



PROJECT LOCATION
HONOLULU, HAWAII

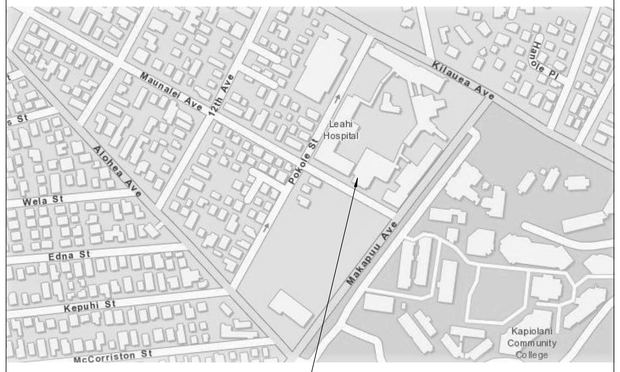
LEAHI HOSPITAL
SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVENUE
HONOLULU, HI, 96816

PERMIT SET
9/10/2021

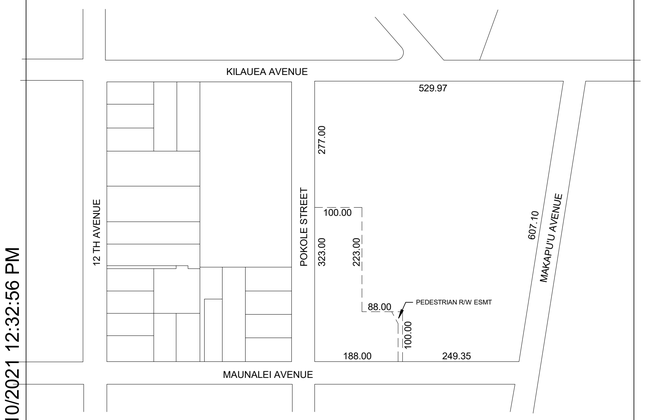
TMK: 3-2-031:001

VICINITY MAP



PROJECT LOCATION
LEAHI HOSPITAL SINCLAIR
BULIDING
TMK:3-2-031:001

SITE PLAN



PROJECT DESCRIPTION

SCOPE OF WORK CONSISTS OF THE REPLACEMENT OF THE EXISTING HEAT PUMP EQUIPMENT. INTERIOR WORK WILL INVOLVED THE PARTIAL DEMOLITION OF THE WALL AND ONE EXISTING DOOR. NEW PORTION OF WALL AND NEW DOUBLE DOORS TO BE INSTALLED. EXISTING CONCRETE PAD FOR EQUIPMENT TO BE REPAIRED AS NEEDED.

CODE INFORMATION
(LIMITED TO ARCHITECTURAL SCOPE)

PER TABLE 803.13 INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY, ALL WALL AND CEILING FINISHES FOR ROOMS AND ENCLOSED SPACES FOR INSTITUTIONAL OCCUPANCY SHALL BE A MINIMUM OF CLASS C FINISHES. ALL WALL AND CEILING FINISHES IN PROJECT WILL BE NO LESS THAN CLASS C FINISHES.

302.3 NONSTRUCTURAL. NONSTRUCTURAL ALTERATIONS OR REPAIRS TO AN EXISTING BUILDING OR STRUCTURE ARE PERMITTED TO BE MADE OF THE SAME MATERIALS OF WHICH THE BUILDING OR STRUCTURE IS CONSTRUCTED, PROVIDED THAT THEY DO NOT ADVERSELY AFFECT ANY STRUCTURAL MEMBER OR THE FIRE- RESISTANCE RATING OF ANY PART OF THE BUILDING OR STRUCTURE.

SECTION 308 ACCESSIBILITY FOR EXISTING BUILDINGS
ALTERATION SHALL NOT REDUCE OR HAVE THE EFFECT OF REDUCING ACCESSIBILITY OF A BUILDING, PORTION OF A BUILDING OR FACILITY.

308.6 ALTERATIONS. A BUILDING, FACILITY OR ELEMENT THAT IS ALTERED SHALL COMPY WITH THE APPLICABLE PROVISIONS IN CHAPTER 11 OF THE INTERNATIONAL BUILDING CODE AND ICC A117.1, UNLESS TECHNICALLY INFEASIBLE. WHERE COMPLIANCE WITH THIS SECTION IS TECHNICALLY INFEASIBLE, THE ALTERATION SHALL PROVIDE ACCESS TO THE MAXIMUM EXTENT THAT IS TECHNICALLY FEASIBLE.

SECTION 402 REPAIRS
402.1 SCOPE. REPAIRS, AS DEFINED IN CHAPTER 2, INCLUDE THE PATCHING OR RESTORATION OR REPLACEMENT OF DAMAGED MATERIALS, ELEMENTS, EQUIPMENT OR FIXTURES FOR THE PURPOSE OF MAINTAINING SUCH COMPONENTS IN GOOD OR SOUND CONDITIONS WITH RESPECT TO EXISTING LOADS OR PERFORMANCE REQUIREMENTS.

402.2 APPLICATION. REPAIRS SHALL COMPLY WITH THE PROVISIONS OF CHAPTER 5

402.3 RELATED WORK. WORK ON NONDAMAGED COMPONENTS THAT IS NECESSARY FOR THE REQUIRED REPAIR OF DAMAGED COMPONENTS SHALL BE CONSIDERED PART OF THE REPAIR AND SHALL NOT BE SUBJECT TO THE PROVISIONS OF CHAPTER 6,7,8,9, OR 10

SECTION 501 GENERAL
501.1 SCOPE. REPAIRS AS DESCRIBED IN SECTION 302 SHALL COMPY WITH THE REQUIREMENTS OF THIS CHAPTER. REPAIRS TO HISTORICAL BUILDINGS SHALL COMPLY WITH THIS CHAPTER EXCEPT AS MODIFIED IN CHAPTER 11.

SECTION 505 ACCESSIBILITY
505.1 GENERAL. REPAIRS SHALL BE DONE IN A MANNER THAT MAINTAINS THE LEVEL OF ACCESSIBILITY PROVIDED.

APPLICABLE CODES & AGENCIES

THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO CONSTRUCT REFERENCED PROJECT IN ACCORDANCE WITH CURRENT VERSION OF THE REVISED ORDINANCES OF THE CITY AND COUNTY OF HONOLULU. SHOULD ANY CONDITION DEVELOP NOT COVERED BY THE CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH SAID REVISED ORDINANCES OF THE CITY AND COUNTY OF HONOLULU, A CHANGE ORDER DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY THE AGENCY HAVING JURISDICTION BEFORE PROCEEDING WITH THE WORK. 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 THIS CHAPTER. 2012 NFPA 1."

REVISED ORDINANCES OF CITY AND COUNTY OF HONOLULU

CHAPTER 16: BUILDING, ROH (ADOPTED & AMENDED 2018 INTERNATIONAL BUILDING CODE)
(ADOPTED & AMENDED INTERNATIONAL EXISTING BUILDING CODE)

CHAPTER 17: ELECTRICITY, ROH (ADOPTED & AMENDED 2017 NATIONAL ELECTRICAL CODE)

CHAPTER 19: PLUMBING, ROH (ADOPTED & AMENDED HAWAI'I STATE PLUMBING CODE INCORPORATING 2012 UNIFORM PLUMBING CODE)

CHAPTER 20: FIRE, ROH (ADOPTED & AMENDED HAWAI'I STATE FIRE CODE-INCORPORATING 2012 NFPA UNIFORM FIRE CODE)

CHAPTER 32: BUILDING ENERGY CONSERVATION CODE, ROH (ADOPTED & AMENDED 2015 INTERNATIONAL ENERGY CONSERVATION CODE)

CHAPTER 21: REVISED ORDINANCES OF CITY AND COUNTY OF HONOLULU (ROH), LAND USE ORDINANCE FEBRUARY 2018

ADA COMPLIANCE

THIS PROJECT IS SUBJECT TO THE CONFORMANCE WITH THE DESIGN AND CONSTRUCTION REQUIREMENTS OF THE AMERICAN'S WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES ADMINISTERED BY THE DEPARTMENT OF JUSTICE OR THE FAIR HOUSING ACT ACCESSIBILITY GUIDELINES ADMINSTERED BY THE DEPARTMENT OF HOUSING AND URBAN HOUSING AND URBAN DEVELOPMENT SHALL BE EQUIVALENT TO MEETING THE ACCESSIBILITY OF THIS CODE.

TO THE BEST OF KNOWLEDGE, THIS PROJECT HAS BEEN DESIGNED TO MEET THE REQUIREMENTS AND STANDARD OF THE "AMERICAN WITH DISABILITIES ACT" (PER THE IBC, SECTION 1101.2, SECTION 1102, AS AMENDED BY THE CITY AND COUNTY OF HONOLULU (AND PER THE REQUIREMENTS OF ARTICLE 9, EQUAL ACCESS FOR PERSONS WITH DISABILITIES, ADAAG)

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCES OF HONOLULU 1990
CHAPTER 32

To the best of my knowledge, this project's design substantially conforms to the Building Energy Conservation Code for:

Building Component Systems

Signature: _____ Date: 01/10/2022
Name: ADAM WOLTAG
Title: ARCHITECT
License No.: AR-18327 (EXP. 4/30/22)

ARCHITECTURAL DRAWING SHEET INDEX

SHEET #	SHEET NAME	REV
04 ARCHITECTURAL		
A-001	DRAWING INDEX, PROJECT DIRECTORY, PROJECT INFO	
A-002	GENERAL NOTES, ARCHITECTURAL SYMBOLS AND ABBREVIATIONS	
A-003	CONSTRUCTION SPECIFICATIONS	
A-101	DEMOLITION AND NEW FLOOR PLAN	
A-201	DOOR SCHEDULE AND DETAILS	

ZONING & CODE INFORMATION

ZONING INFORMATION

TMK:	3-2-031:001
ADDRESS:	LEAHI HOSPITAL 3675 KILAUEA AVENUE HONOLULU, HI 96816
LOT AREA:	290,196 SF NO CHANGE TO EXISTING BUILDING AREA, FOOTPRINT
ZONING USE:	R-5 RESIDENTIAL DISTRICT
SPECIAL DISTRICT:	DIAMOND HEAD SPECIAL DISTRICT
STATE LAND USE:	URBAN DISTRICT
FLOOD ZONE:	X- BEYOND YEAR FLOOD PLAN
SMA:	OUTSIDE SMA
PARKING:	EXISTING TO REMAIN UNCHANGED
LOADING:	EXISTING TO REMAIN UNCHANGED

BUILDING CODE INFORMATION

CONSTRUCTION TYPE:	TYPE IA
BUILDING LEVELS:	2 STORIES, EXISTING BUILDING
PROJECT LEVEL:	GROUND LEVEL
FIRE PROTECTION:	EXISTING, FULLY-AUTOMATIC SPRINKLER SYSTEM
SPECIAL INSPECTION:	TBD
OCCUPANCY GROUP	
EXISTING USE:	GROUP I-2 - INSTITUTIONAL
PROPOSED USE:	GROUP I-2 - INSTITUTIONAL (UNCHANGED)
PROJECT WORK AREA	
EXISTING:	135 SF
PROPOSED:	135 SF (UNCHANGED)
OCCUPANT LOAD CALCUALTION	UNCHANGED
NUMBER OF EXITS REQUIRED:	UNCHANGED
NUMBER OF EXITS PROVIDED:	UNCHANGED

NOTE: EXISTING BUILDING OCCUPANCY, CONSTRUCTION TYPES, FIRE PROTECTION AND AREA CALCULATIONS BUILT UNDER PREVIOUS PERMIT REMAIN UNCHANGED. ANY INFORMATION PROVIDED ON EXISTING OCCUPANCIES AND CONSTRUCTION TYPES IS BASED ON PREVIOUS PERMIT REFERENCES OF DOCUMENTATION SUPPLEMENTED BY A VISUAL SURVEY CONSIDERING MATERIALS OF THE BUILDING AND ESTIMATE OF CURRENT USE.

WRNS STUDIO
677 ALA MOANA BLVD
3RD FLOOR, STE. 307
H O N O L U L U
H A W A I I 9 6 8 1 3
808.356.5880 TEL
415.358.9100 FAX
WWW.WRNSSTUDIO.COM

ISSUES	DATE
PERMIT SET	09/10/2021

#	REVISION LIST	DATE

ADAM G. WOLTAG
LICENSED PROFESSIONAL ARCHITECT
No. 18327
HAWAII, U.S.A.

EXPIRATION DATE 04/30/2022

SIGNATURE

LEAHI HOSPITAL-
SINCLAIR HEAT PUMP REPLACEMENT
3675 KILAUEA AVENUE
HONOLULU, HI, 96816
TMK: 3-2-031:001

KEYPLAN

PROJECT NO.: 20038.22
DATE: 01/10/22
SCALE: 1/8" = 1'-0"

SHEET TITLE:

DRAWING INDEX, PROJECT DIRECTORY, PROJECT INFO

SHEET NO:

A-001

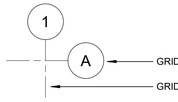
9/10/2021 12:32:56 PM

All drawings and written material appearing herein constitute original and unpublished work of the Architect/Engineer and may not be duplicated, used or disclosed without consent of Architect/Engineer.

If this drawing is not 24"x36", then the drawing has been revised from its original size. Noted scales must be adjusted. This line should be equal to one inch

ARCHITECTURAL SYMBOLS

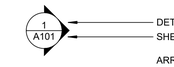
GRID SYMBOL



ROOM IDENTIFIER

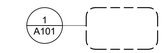
DETAIL SYMBOL

ELEVATION/SECTION SYMBOL



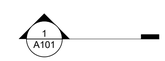
ALIGN SYMBOL

DETAIL REFERENCE

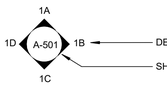


DETAIL SECTION

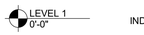
WALL / BUILDING SECTION



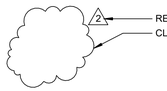
INTERIOR ELEVATION



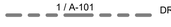
HEIGHT / ELEVATION DATUM



REVISION SYMBOL



MATCHLINE



ARCHITECTURAL ABBREVIATIONS

A/C	AIR CONDITIONING
ABV	ABOVE
ACC	ADA ACCESSIBLE
ACOUS	ACOUSTICAL
ACP	ACOUSTICAL CEILING PANEL
ACT	ACOUSTICAL CEILING TILE
AD	AREA DRAIN
ADDL	ADDITIONAL
ADJ	ADJUSTABLE
AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL
AFF	ABOVE FINISH FLOOR
AGGR	AGGREGATE
ALT	ALTERNATE
ALUM	ALUMINUM
ANC	ANCHOR
ANOD	ANODIZED
APPROX	APPROXIMATE
ARCH	ARCHITECT / ARCHITECTURAL
ASPH	ASPHALT
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
BD	BOARD
BITUM	BITUMEN / BITUMINOUS
BKG	BACKING
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOTT	BOTTOM
BR	BACKER ROD
BRKT	BRACKET
BSMT	BASEMENT
BTWN	BETWEEN
BUR	BUILT-UP ROOF
CAB	CABINET
CB	CATCH BASIN
CEM	CEMENT
CER	CERAMIC
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
CG	CORNER GUARD
CH	CHANNEL
CI	CAST IRON
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLO	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMM	COMMUNICATION /S
COMP	COMPENSATING /TION
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CORR	CORRIDOR
CP	CEMENT PLASTER
CPT	CARPET
CR	CARD READER
CSWK	CASEWORK
CT	CERAMIC TILE
CTR	CENTER / COUNTER
CTSK	COUNTERSUNK
CW	CURTAIN WALL
DBL	DOUBLE
DD	DECK DRAIN
DEMO	DEMOLISH / DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM /S	DIMENSION /S
DISP	DISPENSER
DN	DOWN
DO	DOOR OPENING
DR	DOOR
DSA	DIVISION OF STATE ARCHITECT
DTL	DETAIL
DWG /S	DRAWING /S
DWR	DRAWER
(E)	EXISTING
E	EAST
EA	EACH
EAS	EACH SIDE
EAW	EACH WAY
EF	EACH FACE
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMBED	EMBED /MENT
EMERG	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EOS	EDGE OF SLAB
EP	ELECTRICAL PANEL
EPS	EXPANDED POLYSTYRENE
EQ	EQUAL
EQUIP	EQUIPMENT
ESCUT	ESCUTCHEON
ET	ET CETERA
EWC	ELECTRIC WATER COOLER
EXP	EXPANSION / EXPOSED
EXT	EXTERIOR
EXTR	EXTRUDED
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FG	FINISH GRADE
FHC	FIRE HOSE CABINET
FIN	FINISH
FL	FLOOR
FLUOR	FLUORESCENT
FO	FACE OF
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOG	FACE OF GLASS
FOS	FACE OF STUD
FP	FIREPROOF /ING
FR	FIRE RATED
FS	FLOOR SINK
FSD	FIRE SMOKE DAMPER
FSL	FIRE SPRINKLER
FSR	FIRE SPRINKLER RISER
FT	FOOT / FEET
FTG	FOOTING
FURR	FURRING
FWP	FABRIC WRAPPED PANEL
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFRC	GLASS FIBER REINFORCED CONCRETE
GFRG	GLASS FIBER REINFORCED GYPSUM
GL	GLASS / GLAZING
GLB	GLUE LAMINATED BEAM
GLU-LAM	GLUE LAMINATED
GND	GROUND
GR	GRADE
GRD	GUARD
GSM	GALVANIZED SHEET METAL
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
HAT CH	HAT CHANNEL
HB	HOSE BIB
HC	HOLLOW CORE
HDBD	HARDBOARD
HDR	HEADER
HDWD	HARDWOOD
HDWR	HARDWARE
HM	HOLLOW METAL
HO	HOLD OPEN /MAGNETIC
HORIZ	HORIZONTAL
HP	HIGH POINT
HPL	HIGH PRESSURE LAMINATE
HR	HOUR
HRAIL	HANDRAIL
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
ID	INSIDE DIAMETER / DIMENSION
IN	INCH
INCAND	INCANDESCENT
INCL	INCLUDE /ING
INSUL	INSULATION /ING
INT	INTERIOR
INTER	INTERMEDIATE
INTUM	INTUMESCENT
INV	INVERT
JAN	JANITOR /IAL
JST	JOIST
JT	JOINT
K	KIPS
KIT	KITCHEN
KP	KICK PLATE
LAB	LABORATORY
LAM	LAMINATE /D
LAV	LAVATORY
LB	POUND
LKR	LOCKER
LL	LEAD LINED
LOC	LOCATION
LP	LOW POINT
LW	LIGHT WEIGHT
MACH	MACHINE
MAT	MATERIAL
MAX	MAXIMUM
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MED	MEDIUM
MEMB	MEMBRANE
MEPS	MOLDED EXPANDED POLYSTYRENE
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM / MINUTE
MIRR	MIRROR
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MUL	MULLION
(N)	NEW
N	NORTH
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NR	NON-RATED
NTS	NOT TO SCALE
O/	OVER
O/H	OVERHEAD
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER / DIMENSION
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFD	OVERFLOW DRAIN
OFF	OFFICE
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
PAF	POWDER ACTUATED FASTENER
PENN	PENETRATION
PERF	PERFORATED
PERIM	PERIMETER
PIV	POST INDICATOR VALVE
PL	PLATE
PL	PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLMB	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
PR	PAIR
PRCST	PRECAST
PREFAB	PREFABRICATED
PROJ	PROJECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT / PAINT
PTD	PAINTED
PTD/R	PAPER TOWEL DISPENSER OR RECEPTACLE
PTN	PARTITION
PTR	PRESSURE TREATED
PTRWD	PRESSURE TREATED WOOD
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
QTY	QUANTITY
R	RISER
RAD	RADIUS
RAIL	RAILING
RB	RESILIENT BASE
RCP	REINFORCED CONCRETE PIPE / REFLECTED CEILING PLAN
RD	ROOF DRAIN
RDWD	REDWOOD
REF	REFERENCE
REFL	REFLECTED
REFR	REFRIGERATOR
REINF	REINFORCED /ING /MENT
REQ	REQUIRED
RESIL	RESILIENT
RET	RETAINING / RETARDANT
REV	REVISION
RGTR	REGISTER
RM	ROOM
RO	ROUGH OPENING
RWL	RAIN WATER LEADER
S	SOUTH
SAF	SELF-ADHERING FLASHING
SAN	SANITARY
SASM	SELF-ADHERING SHEET MEMBRANE
SC	SOLID CORE
SCD	SEE CIVIL DRAWINGS / SEAT COVER DISPENSER
SCHD	SCHEDULED
SCWD	SOLID CORE WOOD
SD	SOAP DISPENSER
SECT	SECTION
SED	SEE ELECTRICAL DRAWINGS
SF	SQUARE FOOT / FEET
SF	STOREFRONT
SHT	SHEET
SHTG	SHEATHING
SHWR	SHOWER
SIM	SIMILAR
SJ	SEISMIC JOINT
SK	SINK
SLBB	SHORT LEGS BACK TO BACK
SLD	SEE LANDSCAPE DRAWINGS
SLOT	SLOTTED
SM	SHEET METAL
SMD	SEE MECHANICAL DRAWINGS
SMS	SHEET METAL SCREW
SND	SANITARY NAPKIN DISPENSER
SNR	SANITARY NAPKIN RECEPTACLE
SOFF	SOFFIT
SOG	SLAB ON GRADE
SPAC	SPACING
SPD	SEE PLUMBING DRAWINGS
SPEC /S	SPECIFICATION /S
SQ	SQUARE
SRF	SURFACE
SS	STAINLESS STEEL / SOLID SURFACE
SSD	SEE STRUCTURAL DRAWINGS
SSK	SERVICE SINK
SSM	SOLID SURFACING MATERIAL
ST	STAIR
STA	STATION
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STOR	STORAGE
STR	STRUCTURAL
STS	SELF TAPPING SCREW
SUSP	SUSPENDED
SY	SQUARE YARD
SYM	SYMMETRICAL
SYN	SYNTHETIC
SYS	SYSTEM
T	TREAD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TEL	TELEPHONE
TEMP	TEMPERATURE / TEMPORARY
TER	TERRAZZO
THERM	THERMOSTAT / THERMAL
THK	THICK
TO	TOP OF
TOC	TOP OF CONCRETE
TOIL	TOILET
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TV	TELEVISION
TYP	TYPICAL / TYPICAL UON
UL	UNDERWRITERS LABORATORIES
UON	UNLESS OTHERWISE NOTED
UR	URINAL
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
W	WEST / WIDTH
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WGL	WIRE GLASS
WK	WORK
WO	WHERE OCCURS
WP	WATERPROOF /ING
WPT	WORKING POINT
WR	WATER RESISTANT
WSCT	WAINSCOT
WT	WEIGHT
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
XFMR	TRANSFORMER

GENERAL NOTES

1. THE CONSTRUCTION CONTRACT IS FOR THE CONSTRUCTION OF A COMPLETE AND FULLY FUNCTIONING INSTALLATION. THESE DOCUMENTS DESCRIBE THE DESIGN INTENT AND SPECIFIC REQUIREMENTS OF THE INSTALLATION. THESE DOCUMENTS DO NOT INTEND TO SHOW EVERY ITEM REQUIRED TO CONSTRUCT THE WORK. ITEMS SUCH AS FASTENERS, CONNECTORS, FILLERS, MISCELLANEOUS CLOSURE ELEMENTS, ANCILLARY CONTROL WIRING AND POWER WHERE REQUIRED FOR THE CONTROL OR OPERATION OF THE PROVIDED EQUIPMENT ARE NOT ALWAYS SHOWN BUT ARE CONSIDERED INCLUDED IN THE SCOPE OF THE WORK. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A FULLY FUNCTIONING INSTALLATION WHICH MEETS THE DESIGN INTENT, INCLUDING THE SPECIFIC REQUIREMENTS INCLUDED IN THESE DOCUMENTS.

2. ALL WORK SHOWN, NOTED OR DETAILED IS EXISTING TO REMAIN, EXCEPT WHERE INDICATED FOR DEMOLITION OR SALVAGE.

3. THESE DOCUMENTS DESCRIBE A SINGLE CONSTRUCTION CONTRACT. THE USE OF SUBCONTRACTORS IS THE ELECTION OF THE CONTRACTOR. THESE DOCUMENTS DO NOT INTEND TO DIVIDE THE WORK AMONG THE CONTRACTOR'S SUBCONTRACTORS. WHERE THE DOCUMENTS DO IDENTIFY WORK WHICH IS "NOT IN MECHANICAL WORK" OR "NOT IN ELECTRICAL WORK" IT MEANS THAT THE WORK IS NOT FURTHER DESCRIBED OR SPECIFIED IN THE MECHANICAL OR ELECTRICAL DRAWINGS OR SPECIFICATIONS. IT DOES NOT PRECLUDE THE CONTRACTOR FROM DELEGATING THE WORK TO THE ENTITIES OF HIS ELECTION. IN ADDITION THE DIVISION OF THE CONTRACT DOCUMENTS INTO ARCHITECTURAL, STRUCTURAL MECHANICAL, ELECTRICAL, AND OTHER DESIGN DISCIPLINES NEITHER DIVIDES THE WORK BETWEEN THE CONTRACTOR'S SUBCONTRACTOR NOR IMPLIES THAT ALL OF THE WORK FOR THOSE DISCIPLINES IS SHOWN ONLY IN THOSE DRAWINGS OR SPECIFICATIONS.

4. PHOTOS, IF SHOWN IN THIS SET OF DRAWINGS, DO NOT PRECLUDE THE PRE-BID SITE VISIT REQUIREMENTS OF THE BIDDER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR APPROPRIATE SITE VISITS TO CONFIRM EXISTING FIELD CONDITIONS PRIOR TO BIDDING.
5. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS AT THE SITE AND SHALL REPORT ANY DISCREPANCIES IN WRITING TO THE LANDLORD BY THE MEANS OF AN REQUEST FOR INFORMATION (RFI) OR AS PART OF THE APPLICABLE SHOP DRAWINGS OR SUBMITTALS.

6. SPECIFIC ITEMS NOTED TO BE VERIFIED OR FIELD VERIFIED ARE REQUIRED TO BE VERIFIED PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH THE WORK.
7. CONTRACTOR IS RESPONSIBLE FOR ALL INCIDENTAL WORK NECESSARY TO COMPLETE THE INSTALLATION OF NEW WORK. THIS INCLUDES, BUT IS NOT LIMITED TO, THE REMOVAL AND/OR REINSTALLATION OF ALL EXISTING ITEMS, OF PORTIONS OF THE EXISTING CONSTRUCTION WHETHER SHOWN OR NOT.

8. THE GENERAL CONTRACTOR IS RESPONSIBLE TO HAVE EMERGENCY SHUT-OFF PROCEDURES IN PLACE PRIOR TO START OF CONSTRUCTION. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH ALL SHUT-OFF VALVE LOCATIONS ON THE SITE AND HAVE PROPER TOOLS READILY AVAILABLE TO OPERATE VALVES.

9. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND THE SUBCONTRACTORS TO REVIEW ALL DRAWINGS, ADDENDA, ETC. IN ORDER TO ASSURE THE COORDINATION OF ALL WORK AFFECTING EACH TRADE. FAILURE TO REVIEW AND COORDINATE ALL CONTRACT DOCUMENTS BY THE GENERAL CONTRACTOR WITH ALL THE SUBCONTRACTORS FOR APPLICABLE ITEMS OF THE WORK SHALL NOT RELIEVE THE RESPONSIBLE PARTY FROM PERFORMING ALL WORK SO REQUIRED AS PART OF THE CONTRACT.

10. THE CONTRACTOR SHALL LAYOUT AND SEQUENCE THE INSTALLATION OF THE WORK SO THAT THE DIFFERENT SYSTEMS DO NOT OBSTRUCT THE INSTALLATION OF SUCCESSIVE WORK. IN GENERAL, SYSTEMS INSTALLED FIRST SHOULD BE KEPT AS HIGH AND TIGHT TO STRUCTURE AS POSSIBLE SO AS TO LEAVE SPACE AVAILABLE FOR SYSTEMS WHICH FOLLOW.

11. ANY QUESTIONS REGARDING THE COORDINATION OF NEW WORK OR EXISTING CONDITIONS MUST BE SUBMITTED TO THE LANDLORD IN WRITING PRIOR TO THE BID SUBMISSION AND WITH ADEQUATE TIME FOR RESPONSE TO ALL BIDDERS. THE LANDLORD WILL RESPOND TO QUESTIONS, SUBMITTED IN A TIMELY MANNER, WITH WRITTEN CLARIFICATIONS FORWARDED TO ALL BIDDERS.

12. THE EXISTING DIMENSIONS AND CONDITIONS SHOWN ON THESE DRAWINGS ARE ASSUMED TO BE ACCURATE BASED ON AVAILABLE INFORMATION. THE CONTRACTOR SHALL, PRIOR TO THE START OF CONSTRUCTION, VERIFY ALL EXISTING CONDITIONS, PROVIDE A COMPLETE FIELD LAYOUT ON THE JOB SITE, AND NOTIFY IN WRITING (RFI) TO THE LANDLORD AND ARCHITECT OF ANY DEVIATIONS OR CONFLICTS WITH THESE DRAWINGS.

13. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING WORK AREAS AND MATERIALS FROM THEFT, VANDALISM, AND OTHER LOSSES. ALL CONSTRUCTION ACTIVITIES SHALL BE CONTAINED WITHIN FENCED OR BARRICADED AREAS PER THE GENERAL CONDITIONS.
14. THE DRAWINGS SHALL NOT BE SCALED. THE CONTRACTOR SHALL REFER TO THE DIMENSIONS INDICATED OR THE ACTUAL SIZES OF CONSTRUCTION ITEMS. WHERE NO DIMENSION OR METHOD OF DETERMINING A LOCATION IS GIVEN, VERIFY CORRECT DIMENSION OR LOCATION WITH THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

15. THE DRAWINGS AND REFERENCED DETAILS HAVE BEEN DIMENSIONED IN ORDER TO ESTABLISH THE CONTROL AND GUIDELINES FOR FIELD LAYOUT. WHERE DISCREPANCY EXISTS BETWEEN THE DRAWING AND THE DETAIL THE CONTRACTOR SHALL NOTIFY THE ARCHITECT FOR CLARIFICATION PRIOR TO INSTALLATION.

16. DIMENSIONS ARE TO FACE OF FINISH OR CENTERLINE OF WALL, UNLESS OTHERWISE NOTED.

17. WALLS MUST BE PLUMB AND CORNERS AT 90 DEGREES U.O.N.

18. WHERE DIMENSIONS ARE NOTED TO BE VERIFIED IN THE FIELD (V.I.F.) THE DIMENSION SHOWN IS THE DESIGN BASIS, BUT MAY DIFFER FROM ACTUAL CONDITIONS. CONTRACTOR SHALL VERIFY THESE DIMENSIONS WHILE LAYING OUT THE WORK AND REPORT ANY DISCREPANCIES BETWEEN THE DESIGN BASIS AND ACTUAL DIMENSIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH THE WORK. WHERE DIMENSIONS ARE NOTED "±" OR "F.D.", FIELD DIMENSIONS MAY VARY FROM THE NOTED DIMENSIONS BY MINOR AMOUNTS. CONTRACTOR SHALL VERIFY THESE DIMENSIONS, BUT DOES NOT NEED TO REPORT DISCREPANCIES.

19. INTERIOR DETAILS ARE KEYED TO THE PLANS AT TYPICAL LOCATIONS. TYPICAL DETAILS APPLY TO ALL LOCATIONS WHICH ARE SIMILAR BUT ARE NOT OTHERWISE DETAILED. THE CONTRACTOR AND SUBCONTRACTORS ARE RESPONSIBLE TO COORDINATE THE LOCATION OF ALL TYPICAL DETAILS AND INSTALL THE WORK INDICATED. IF DISCREPANCIES EXIST OR QUALIFICATION IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE FOR CLARIFICATION PRIOR TO PROCEEDING.

20. ABBREVIATIONS ON THIS SHEET APPLY TO THE ENTIRE SET UNLESS OTHERWISE NOTED.

SELECTIVE DEMOLITION NOTES

A. DEMOLITION IS NOT NECESSARILY LIMITED TO WHAT IS SHOWN ON THE DRAWINGS. THE INTENT OF THE DRAWINGS IS TO INDICATE THE GENERAL SCOPE OF DEMOLITION REQUIRED TO COMPLETE THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
B. IF ANY QUESTIONS ARISE AS TO THE REMOVAL OF ANY MATERIAL, CLARIFY WITH THE ARCHITECT BEFORE PROCEEDING.
C. ITEMS INDICATED TO BE REMOVED AND SALVAGED REMAIN LANDLORD'S PROPERTY. CAREFULLY DETACH FROM EXISTING CONSTRUCTION, IN A MANNER TO PREVENT DAMAGE. ALL ITEMS TO BE REUSED TO BE STORED IN A SAFE LOCATION TO PREVENT DAMAGE. SALVAGED ITEMS TO BE RETURNED TO LANDLORD. INCLUDE FASTENERS OR BRACKETS NEEDED FOR REATTACHMENT ELSEWHERE.

D. ALL ITEMS SCHEDULED TO BE REMOVED BY THE CONTRACTOR, UNLESS NOTED FOR SALVAGE, SHALL BE CONSIDERED TO BE THE CONTRACTOR'S PROPERTY. PROMPTLY REMOVE DEMOLITION WASTE MATERIALS FROM PROJECT SITE AND LEGALLY DISPOSE OF THEM. DO NOT BURN DEMOLISHED MATERIALS.

E. COMPLY WITH EPA REGULATIONS AND HAULING AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION. COMPLY WITH ANSI A10.6 AND NFPA 241.

F. IT IS NOT EXPECTED THAT HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK. IF MATERIALS SUSPECTED OF CONTAINING HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; IMMEDIATELY NOTIFY ARCHITECT AND LANDLORD. LANDLORD TO PROVIDE WRITTEN DIRECTION ON HOW TO PROCEED.

G. CONDUCT SELECTIVE DEMOLITION SO OTHER TENANT'S OPERATIONS WILL NOT BE DISRUPTED.

H. COORDINATE ELECTRICAL AND MECHANICAL DEMOLITION WITH LANDLORD TO MINIMIZE NECESSARY SHUT DOWN PERIODS. NOTIFY LANDLORD AT LEAST ONE WEEK IN ADVANCE OF ANY TEMPORARY SHUTDOWN AND RECEIVE THE LANDLORD'S WRITTEN APPROVAL. MAINTAIN SERVICES/ SYSTEMS INDICATED TO REMAIN AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS. BEFORE PROCEEDING WITH DEMOLITION, PROVIDE TEMPORARY SERVICES/ SYSTEMS THAT BYPASS AREA OF SELECTIVE DEMOLITION AND THAT MAINTAIN CONTINUITY OF SERVICES/SYSTEMS TO OTHER PARTS OF THE BUILDING.
I. LOCATE, IDENTIFY, SHUT OFF, DISCONNECT, AND SEAL OR CAP OFF INDICATED UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS SERVING AREAS TO BE SELECTIVELY DEMOLISHED. REMOVE TO SOURCE ALL PIPES, VENTS, OR DRAINS NOT BEING RE-USED.
J. MAINTAIN EXISTING FIRE AND LIFE SAFETY SYSTEMS AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.

K. PROVIDE AND MAINTAIN BRACING AND STRUCTURAL SUPPORTS AS REQUIRED TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF CONSTRUCTION AND FINISHES TO REMAIN, AND TO PREVENT UNEXPECTED OR UNCONTROLLED MOVEMENT OR COLLAPSE OF CONSTRUCTION BEING DEMOLISHED.

L. PROVIDE TEMPORARY BARRICADES AND OTHER PROTECTION REQUIRED TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDINGS AND FACILITIES TO REMAIN.

M. PROVIDE TEMPORARY WEATHER PROTECTION TO PREVENT WATER LEAKAGE AND DAMAGE TO STRUCTURE AND INTERIOR AREAS.

N. PROTECT WALLS, CEILINGS, FLOORS, AND OTHER EXISTING FINISH WORK THAT ARE TO REMAIN. ERECT AND MAINTAIN DUSTPROOF PARTITIONS. COVER AND PROTECT FURNISHINGS AND EQUIPMENT THAT HAVE NOT BEEN REMOVED.

O. NEATLY CUT OPENINGS AND HOLES PLUMB, SQUARE, AND TRUE TO DIMENSIONS REQUIRED. USE CUTTING METHODS LEAST LIKELY TO DAMAGE CONSTRUCTION TO REMAIN OR ADJOINING CONSTRUCTION.

P. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE DEMOLITION OPERATIONS BEGAN. THE CONSTRUCTION AREA(S) SHALL BE LEFT IN "BROOM CLEAN" CONDITION.

Q. CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING AND REPAIRING ANY DAMAGE CAUSED BY HIM OR HIS SUBCONTRACTORS TO THE EXISTING CONSTRUCTION IN PUBLIC CORRIDORS,
RESTROOMS, OR TENANT SPACES. REFINISH TO MATCH EXISTING FINISH.
DEMOLITION SPECIFICATIONSFIRE SAFETY

CUTTING AND PATCHING

A. PROVIDE CUTTING AND PATCHING INCLUDING, BUT NOT LIMITED TO, GENERAL CUTTING AND PATCHING AS REQUIRED DURING EXECUTION OF THE WORK.

B. PROVIDE TEMPORARY SUPPORT OF WORK TO BE CUT. DO NOT CUT STRUCTURAL MEMBERS OR OPERATIONAL ELEMENTS WITHOUT PRIOR WRITTEN APPROVAL OF ARCHITECT.
C. WHERE EXISTING SERVICES/ SYSTEMS ARE REQUIRED TO BE REMOVED, RELOCATED, OR ABANDONED, BYPASS SUCH SERVICES/SYSTEMS BEFORE CUTTING TO PREVENT INTERRUPTION TO OCCUPIED AREAS.

D. PATCH WITH DURABLE SEAMS THAT ARE AS INVISIBLE AS POSSIBLE. PROVIDE MATERIALS AND COMPLY WITH INSTALLATION REQUIREMENTS SPECIFIED IN OTHER SECTIONS.
1. RESTORE EXPOSED FINISHES OF PATCHED AREAS AND EXTEND FINISH RESTORATION INTO ADJOINING CONSTRUCTION IN A MANNER THAT WILL MINIMIZE EVIDENCE OF PATCHING AND REFINISHING.

2. WHERE PATCHING OCCURS IN A PAINTED SURFACE, PREPARE SUBSTRATE AND APPLY PRIMER AND INTERMEDIATE PAINT COATS APPROPRIATE FOR SUBSTRATE OVER THE PATCH, AND APPLY FINAL PAINT COAT OVER ENTIRE UNBROKEN SURFACE CONTAINING THE PATCH. PROVIDE ADDITIONAL COATS UNTIL PATCH BLENDS WITH ADJACENT SURFACES.

WRNS STUDIO
677 ALA MOANA BLVD
3RD FLOOR, STE. 307
HONOLULU
HAWAII 96813
808.356.5880 TEL
415.358.9100 FAX
WWW.WRNSSTUDIO.COM

ISSUES	DATE
PERMIT SET	09/10/2021

#	REVISION LIST	DATE

ADAM G. WOLPAG
LICENSED PROFESSIONAL ARCHITECT
No. 18327
HAWAII, U.S.A.

EXPIRATION DATE 04/30/2022

SIGNATURE

LEAHI HOSPITAL- SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVENUE
HONOLULU, HI, 96816
TMK: 3-2-031:001

KEYPLAN

PROJECT NO.: 20038.22
DATE: 01/10/22
SCALE: 1 : 1

SHEET TITLE:

GENERAL NOTES, ARCHITECTURAL SYMBOLS AND ABBREVIATIONS

SHEET NO:

A-002

9/10/2021 12:32:57 PM

All drawings and written material appearing herein constitute original and unpublished work of the Architect/Engineer and may not be duplicated, used or disclosed without consent of Architect/Engineer.

If this drawing is not 24"x36", then the drawing has been revised from its original size. Noted scales must be adjusted. This line should be equal to one inch

GENERAL CONDITIONS

A. SUBSTITUTIONS
1. DEFINITION: SUBSTITUTION: CHANGES IN PRODUCTS, MATERIALS, EQUIPMENT, AND METHODS OF CONSTRUCTION FROM THOSE REQUIRED BY THE CONTRACT DOCUMENTS AND PROPOSED BY CONTRACTOR.
A. SUBSTITUTIONS FOR CAUSE: CHANGES PROPOSED BY CONTRACTOR THAT ARE REQUIRED DUE TO CHANGED PROJECT CONDITIONS, SUCH AS UNAVAILABILITY OF PRODUCT, REGULATORY CHANGES, OR UNAVAILABILITY OF REQUIRED WARRANTY TERMS.
B. SUBSTITUTIONS FOR CONVENIENCE: CHANGES PROPOSED BY CONTRACTOR OR OWNER THAT ARE NOT REQUIRED IN ORDER TO MEET OTHER PROJECT REQUIREMENTS BUT MAY OFFER ADVANTAGE TO CONTRACTOR OR OWNER.
2. SUBSTITUTION REQUESTS: SUBMIT THREE COPIES OF EACH REQUEST FOR CONSIDERATION. IDENTIFY PRODUCT, FABRICATION, OR INSTALLATION METHOD TO BE REPLACED. CITE TITLE AND DRAWING NUMBER.
A. STATEMENT INDICATING WHY SPECIFIED PRODUCT OR FABRICATION OR INSTALLATION CANNOT BE PROVIDED, IF APPLICABLE.
B. STATEMENT INDICATING WHY SPECIFIC SUBSTITUTION BENEFITS THE OWNER.
C. COORDINATION INFORMATION, INCLUDING A LIST OF CHANGES OR REVISIONS NEEDED TO OTHER PARTS OF THE WORK AND TO CONSTRUCTION PERFORMED BY OWNER AND SEPARATE CONTRACTORS, THAT WILL BE NECESSARY TO ACCOMMODATE PROPOSED SUBSTITUTION.
D. DETAILED COMPARISON OF SIGNIFICANT QUALITIES OF PROPOSED SUBSTITUTION WITH THOSE OF THE WORK SPECIFIED. INCLUDE ANNOTATED COPY OF APPLICABLE SPECIFICATION SECTION. SIGNIFICANT QUALITIES MAY INCLUDE ATTRIBUTES SUCH AS PERFORMANCE, WEIGHT, SIZE, DURABILITY, VISUAL EFFECT, SUSTAINABLE DESIGN CHARACTERISTICS, WARRANTIES, AND SPECIFIC FEATURES AND REQUIREMENTS INDICATED. INDICATE DEVIATIONS, IF ANY, FROM THE WORK SPECIFIED.
E. PRODUCT DATA, INCLUDING DRAWINGS AND DESCRIPTIONS OF PRODUCTS AND FABRICATION AND INSTALLATION PROCEDURES.
F. SAMPLES, WHERE APPLICABLE OR REQUESTED.
G. CERTIFICATES AND QUALIFICATION DATA, WHERE APPLICABLE OR REQUESTED.
H. RESEARCH REPORTS EVIDENCING COMPLIANCE WITH BUILDING CODE IN EFFECT FOR PROJECT.
I. DETAILED COMPARISON OF CONTRACTOR'S CONSTRUCTION SCHEDULE USING PROPOSED SUBSTITUTION WITH PRODUCTS SPECIFIED FOR THE WORK, INCLUDING EFFECT ON THE OVERALL CONTRACT TIME. IF SPECIFIED PRODUCT OR METHOD OF CONSTRUCTION CANNOT BE PROVIDED WITHIN THE CONTRACT TIME, INCLUDE LETTER FROM MANUFACTURER, ON MANUFACTURER'S LETTERHEAD, STATING DATE OF RECEIPT OF PURCHASE ORDER, LACK OF AVAILABILITY, OR DELAYS IN DELIVERY.
J. COST INFORMATION, INCLUDING A PROPOSAL OF CHANGE, IF ANY, IN THE CONTRACT SUM.
K. CONTRACTOR'S CERTIFICATION THAT PROPOSED SUBSTITUTION COMPLIES WITH REQUIREMENTS IN THE CONTRACT DOCUMENTS EXCEPT AS INDICATED IN SUBSTITUTION REQUEST, IS COMPATIBLE WITH RELATED MATERIALS, AND IS APPROPRIATE FOR APPLICATIONS INDICATED.
L. CONTRACTOR'S WAIVER OF RIGHTS TO ADDITIONAL PAYMENT OR TIME THAT MAY SUBSEQUENTLY BECOME NECESSARY BECAUSE OF FAILURE OF PROPOSED SUBSTITUTION TO PRODUCE INDICATED RESULTS.
3. ARCHITECT'S ACTION: IF NECESSARY, ARCHITECT WILL REQUEST ADDITIONAL INFORMATION OR DOCUMENTATION FOR EVALUATION WITHIN SEVEN DAYS OF RECEIPT OF A REQUEST FOR SUBSTITUTION. ARCHITECT WILL NOTIFY CONTRACTOR OF ACCEPTANCE OR REJECTION OF PROPOSED SUBSTITUTION WITHIN 15 DAYS OF RECEIPT OF REQUEST, OR SEVEN DAYS OF RECEIPT OF ADDITIONAL INFORMATION OR DOCUMENTATION, WHICHEVER IS LATER.
A. FORMS OF ACCEPTANCE: CHANGE ORDER, CONSTRUCTION CHANGE DIRECTIVE, OR ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS FOR MINOR CHANGES IN THE WORK.
B. USE PRODUCT SPECIFIED IF ARCHITECT DOES NOT ISSUE A DECISION ON USE OF A PROPOSED SUBSTITUTION WITHIN TIME ALLOCATED.

B. SUBMITTALS
1. SUBMITTAL SCHEDULE: SUBMIT A LIST OF SUBMITTALS, ARRANGED IN CHRONOLOGICAL ORDER BY DATES REQUIRED FOR CONSTRUCTION SCHEDULE. INCLUDE TIME REQUIRED FOR REVIEW, ORDERING, MANUFACTURING, FABRICATION, AND DELIVERY WHEN ESTABLISHING DATES.
2. ASSEMBLE COMPLETE SUBMITTAL PACKAGES INTO A SINGLE BOOKMARKED PDF FILE FOR ELECTRONIC SUBMISSION. ARRANGE FILES IN A SEQUENCE CONSISTENT IN SCALE FROM MACRO TO MICRO, LOCATE SIMILAR AND/OR RELATED ELEMENTS IN SEQUENCE, AND CLEARLY LABEL ALL ELEMENTS/ SECTIONS CITING THE SPECIFICATION SECTION AND DRAWING PERTAINING TO EACH ELEMENT.
3. CONTRACTOR TO REVIEW ALL SUB-CONTRACTOR SUBMITTAL MATERIALS BEFORE COMPILING AND SUBMITTING TO ARCHITECT.
4. INCOMPLETE OR POORLY COMPILED SUBMITTALS ARE UNACCEPTABLE, WILL BE CONSIDERED NON-RESPONSIVE, AND WILL BE RETURNED FOR RESUBMITTAL WITHOUT REVIEW.
5. PROCESSING TIME: ALLOW FOR SUBMITTAL REVIEW, INCLUDING TIME FOR RESUBMITTALS AS FOLLOWS:
A. INITIAL REVIEW: ALLOW 10 WORKING DAYS.
B. INTERMEDIATE REVIEW: IF NECESSARY, PROCESS IN SAME MANNER AS INITIAL REVIEW.
C. RESUBMITTAL REVIEW: ALLOW 5 WORKING DAYS.
D. ARCHITECT WILL ADVISE THE CONTRACTOR WHEN A SUBMITTAL BEING PROCESSED MUST BE DELAYED FOR COORDINATION.
6. CLOSEOUT SUBMITTAL: PROVIDE LANDLORD WITH CLOSEOUT BINDER, CLEARLY LABELED, INCLUDING MAINTENANCE AND OPERATIONS MANUALS, INCLUDING INSTALLER AND MANUFACTURER CONTACT INFORMATION, FOR ALL CONTRACTOR INSTALLED ITEMS.

C. TEMPORARY FACILITIES AND CONTROLS
1. USE CHARGES: INSTALLATION AND REMOVAL OF, AND USE CHARGES FOR, TEMPORARY FACILITIES AND SERVICES SHALL BE INCLUDED IN THE CONTRACT SUM. ALLOW OTHER ENTITIES ENGAGED IN THE PROJECT TO USE TEMPORARY SERVICES AND FACILITIES WITHOUT COST.
2. COORDINATE WITH LANDLORD ON PAYMENT OF USE CHARGES FOR SEWER, WATER, AND ELECTRIC POWER FOR ALL ENTITIES DURING CONSTRUCTION OPERATIONS.
3. COORDINATE WITH LANDLORD ACCESS TO RESTROOMS ON SITE AND CONDITIONS FOR USE.
4. COORDINATE WITH LANDLORD DESIGNATED AREAS FOR CONSTRUCTION PERSONNEL PARKING.

D. FIRE SAFETY PROGRAM: DEMONSTRATE TO LANDLORD COMPLIANCE WITH REQUIREMENTS OF NFPA 241 AND AUTHORITIES HAVING JURISDICTION'S REQUIREMENTS. INDICATE TO LANDLORD CONTRACTOR PERSONNEL RESPONSIBLE FOR MANAGEMENT OF FIRE-PREVENTION PROGRAM.

E. MOISTURE PROTECTION PLAN: DESCRIBE THE ARCHITECT, PROCEDURES AND CONTROLS FOR PROTECTING MATERIALS AND CONSTRUCTION FROM WATER ABSORPTION AND DAMAGE.

F. DUST CONTROL: PROVIDE FLOOR TO CEILING DUSTPROOF PARTITIONS TO LIMIT DUST AND DIRT MIGRATION AND TO SEPARATE AREAS OCCUPIED BY OTHER TENANTS FROM FUMES AND NOISE. POLYETHELENE SHEETING AS REQUIRED. PROVIDE WALK OFF MATS, MINIMUM, 36 IN x 60 IN, AT EACH POINT OF ACCESS TO PROJECT.

CONCRETE FLOOR REHABILITATION

A. PATCHING MORTAR: MIX DRY-PACK PATCHING MORTAR, CONSISTING OF ONE PART PORTLAND CEMENT TO TWO AND ONE-HALF PARTS FINE AGGREGATE PASSING A NO. 16 SIEVE, USING ONLY ENOUGH WATER FOR HANDLING AND PLACING.
B. CONCRETE SURFACE REPAIRS: REPAIR AND PATCH DEFECTIVE AREAS IDENTIFIED BY ARCHITECT COMPLETE SURFACE REPAIRS PRIOR TO APPLICATION OF LIQUID HARDENERS.
1. LOW AREAS: CUT OUT LOW AREAS TO ENSURE A MINIMUM REPAIR TOPPING DEPTH OF 1/4 INCH TO MATCH ADJACENT FLOOR ELEVATIONS. PREPARE, MIX, AND APPLY REPAIR TOPPING AND PRIMER ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS TO PRODUCE A SMOOTH, UNIFORM, PLANE, AND LEVEL SURFACE.
2. CRACKS AND HOLES: REPAIR RANDOM CRACKS AND SINGLE HOLES 1 INCH OR LESS IN DIAMETER WITH PATCHING MORTAR. GROOVE TOP OF CRACKS AND CUT OUT HOLES TO SOUND CONCRETE AND CLEAN OFF DUST, DIRT, AND LOOSE PARTICLES. DAMPEN CLEANED CONCRETE SURFACES AND APPLY BONDING AGENT. PLACE PATCHING MORTAR BEFORE BONDING AGENT HAS DRIED. COMPACT PATCHING MORTAR AND FINISH TO MATCH ADJACENT CONCRETE. KEEP PATCHED AREA CONTINUOUSLY MOIST FOR AT LEAST 72 HOURS.

CONCRETE

A. DEFINITIONS:
1. CEMENTITIOUS MATERIALS: PORTLAND CEMENT ALONE OR IN COMBINATION WITH ONE OR MORE OF BLENDED HYDRAULIC CEMENT, FLY ASH AND OTHER POZZOLANS, GROUND GRANULATED BLAST-FURNACE SLAG, AND SILICA FUME.

B. SUBMITIALS:
1. PRODUCT DATA FOR EACH TYPE OF MANUFACTURED PRODUCT AND MATERIAL.
2. LOG OF CONCRETE BATCH TICKETS.

C. QUALITY ASSURANCE:
1. INSTALLER QUALIFICATION: AN EXPERIENCED INSTALLER WHO HAS COMPLETED CONCRETE WORK SIMILAR IN MATERIAL, DESIGN, AND EXTENT TO THAT INDICATED FOR THIS PROJECT.

2. SOURCE LIMITATIONS: OBTAIN EACH TYPE OR CLASS OF CEMENTITIOUS MATERIAL OF THE SAME MANUFACTURER, EACH AGGREGATE FROM ONE SOURCE, AND EACH ADMIXTURE FROM THE SAME MANUFACTURER.

3. ACI PUBLICATIONS: COMPLY WITH THE FOLLOWING, UNLESS MORE STRINGENT PROVISIONS ARE INDICATED: ACI 117, "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS."

D. DELIVERY AND STORAGE
1. STORE MATERIALS UNDER COVER AND PROTECTED FROM MOISTURE.
2. DELIVER, STORE, AND HANDLE STEEL REINFORCEMENT TO PREVENT BENDING AND DAMAGE.

E. CONCRETE MATERIALS:
1. CLASS: NEGLIGIBLE WEATHER, 5M, 1N, OR 2N.
2. PORTLAND CEMENT: ASTM C150, TYPE I (NORMAL) OR ASTM C1157, TYPE GU (GENERAL USE)
3. NORMAL WEIGHT AGGREGATE: ASTM C33, UNIFORMLY GRADED, AND AS FOLLOWS:
A. NOMINAL MAXIMUM AGGREGATE SIZE: 3/4 INCH
B. COMBINED AGGREGATE GRADATION: WELL GRADED FROM COARSEST TO FINEST WITH NOT MORE THAN 18 PERCENT AND NOT LESS THAN 8 PERCENT RETAINED ON AN INDIVIDUAL SIEVE.
4. WATER. POTABLE AND COMPLYING WITH ASTM C1602

F. STEEL REINFORCEMENT:
1. REINFORCING BARS: ASTM A615/A, 615M, GRADE 60, DEFORMED.

G. REINFORCEMENT ACCESSORIES:
1. BAR SUPPORTS: BOLSTERS, CHAIRS, SPACERS, AND OTHER DEVICES FOR SPACING, SUPPORTING, AND FASTENING REINFORCING BARS IN PLACE. MANUFACTURE BAR SUPPORTS ACCORDING TO CR.SI'S "MANUAL OF STANDARD PRACTICE" FROM STEEL WIRE, PLASTIC, OR PRECAST CONCRETE OR FIBER-REINFORCED CONCRETE OF GREATER COMPRESSIVE STRENGTH THAN CONCRETE.

H. EPOXY-BONDING ADHESIVE: ASTM C881, TWO-COMPONENT EPOXY RESIN, CAPABLE OF HUMID CURING AND BONDING TO DAMP SURFACES, OF CLASS AND GRADE TO SUIT REQUIREMENTS AS FOLLOWS:
1. TYPES I AND II, NON-LOADING BEARING, FOR BONDING FRESHLY MIXED CONCRETE TO HARDENED CONCRETE.

I. CONCRETE MIXES:
1. SLAB-ON-GRADE: PROPORTION NORMAL-WEIGHT CONCRETE MIX AS FOLLOWS:
A. COMPRESSIVE STRENGTH (28 DAYS): 3,000 PSI
B. MAXIMUM SLUMP: 3-1/2 INCHES,+/- 1/2 INCH.
2. USE ADMIXTURES ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

J. CONCRETE MIXING:
1. PROJECT-SITE MIXING: MEASURE, BATCH, MIX, AND DELIVER CONCRETE MATERIALS AND CONCRETE ACCORDING TO ASTM C94. MIX CONCRETE IN APPROPRIATE DRUM-TYPE BATCH MACHINE MIXER.
A. FOR MIXER CAPACITY OF 1 CU. YD. OR SMALLER, CONTINUE MIXING AT LEAST ONE AND ONE-HALF MINUTES, BUT NOT MORE THAN FIVE MINUTES AFTER INGREDIENTS ARE IN MIXER, BEFORE ANY PART OF BATCH IS RELEASED.
B. FOR MIXER CAPACITY LARGER THAN 1 CU. YD, INCREASE MIXING TIME BY 15 SECONDS FOR EACH ADDITIONAL 1 CU. YD.
C. PROVIDE BATCH TICKET FOR EACH BATCH DISCHARGED AND USED IN THE WORK, INDICATING PROJECT IDENTIFICATION NAME AND NUMBER, DATE, MIX TYPE, MIX TIME, QUANTITY, AND AMOUNT OF WATER ADDED. RECORD APPROXIMATE LOCATION OF FINAL DEPOSIT IN STRUCTURE.

K. EXECUTION:
1. REFER TO VAPOR BARRIER SPECIFICATION FOR INSTALLATION OF UNDER SLAB BARRIER.
2. ACCURATELY POSITION, SUPPORT, AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. DO NOT TACK WELD CROSSING REINFORCING BARS. SET WIRE TIES WITH ENDS INTO CONCRETE AND NOT TOWARD EXPOSED CONCRETE SURFACES. DO NOT CUT OR PUNCTURE VAPOR BARRIER.
3. SECURE DOWELS IN EXISTING CONCRETE WITH EPOXY, ONE HALF OF DOWELS EMBEDDED.
4. ENSURE EDGES OF EXISTING CONCRETE SLAB IS FREE OF LOOSE OR CRACKING MATERIAL. CLEAN EDGES OF SAW CUT EXISTING SLAB OF DUST AND LOOSE MATERIAL. CLEAN TOP OF VAPOR BARRIER SHEET OF DUST AND DEBRIS.
5. CONCRETE PLACEMENT
A. DEPOSIT CONCRETE CONTINUOUSLY OR IN LAYERS OF SUCH THICKNESS THAT NO NEW CONCRETE WILL BE PLACED ON, OR BESIDE, CONCRETE THAT HAS HARDENED ENOUGH TO CAUSE SEAMS OR PLANES OF WEAKNESS. IF A SECTION CANNOT BE PLACED CONTINUOUSLY, PROVIDE CONSTRUCTION JOINTS TO ALIGN WITH MOVEMENT JOINTS OF THE TILE AS INDICATED ON THE PLANS.
B. CONSOLIDATE PLACED CONCRETE WITH MECHANICAL VIBRATING EQUIPMENT. USE EQUIPMENT AND PROCEDURES FOR CONSOLIDATING CONCRETE RECOMMENDED BY ACI 309R. DO NOT USE VIBRATORS TO TRANSPORT CONCRETE INSIDE FORMS. LIMIT DURATION OF VIBRATION TO TIME NECESSARY TO CONSOLIDATE CONCRETE WITHOUT CAUSING MIX TO SEGREGATE.
C. HOT-WEATHER PLACEMENT: PLACE CONCRETE ACCORDING TO RECOMMENDATIONS IN ACI 305R AND AS FOLLOWS: COOL INGREDIENTS BEFORE MIXING TO MAINTAIN CONCRETE TEMPERATURE BELOW 90 DEG FAT TIME OF PLACEMENT. CHILLED MIXING WATER OR CHOPPED ICE MAY BE USED TO CONTROL TEMPERATURE, PROVIDED WATER EQUIVALENT OF ICE IS CALCULATED TO TOTAL AMOUNT OF MIXING WATER.
6. POUR SLABS TO ACHIEVE REQUIRED ELEVATIONS AND SLOPES IN FINISHED CONCRETE SURFACES. SLOPE UNIFORMLY TO DRAINS.
7. CONCRETE PROTECTION AND CURING:
A. BEGIN CURING IMMEDIATELY AFTER FINISHING CONCRETE BY ONE OF THE FOLLOWING METHODS FOR AT LEAST SEVEN DAYS:
1. MOISTURE CURING: KEEP SURFACES CONTINUOUSLY MOIST WITH THE FOLLOWING MATERIALS: WATER, FOG SPRAY, AND/OR ABSORPTIVE COVER KEPT CONTINUOUSLY WET.
2. MOISTURE-RETAINING-COVER CURING: COVER CONCRETE SURFACES WITH MOISTURE-RETAINING COVER, WITH SIDES LAPPED AT LEAST 12 INCHES, AND SEALED.
3. CURING COMPOUND: APPLY UNIFORMLY IN CONTINUOUS OPERATION ACCORDING TO MANUFACTURER'S WRITIEN INSTRUCTIONS.

L. QUALITY CONTROL:
1. IF SLUMP TEST DEMONSTRATES STRENGTH OF CONCRETE IS INSUFFICIENT, CONTRACTOR SHALL REJECT THAT BATCH AND PREPARE FRESH MIX.
2. LOG OF CONCRETE BATCH TESTS SHALL BE SUBMITIED TO THE ARCHITECT WITHIN 48 HOURS OF PLACEMENT.
3. IF THE ARCHITECT HAS REASON TO BELIEVE THE STRENGTH OF CONCRETE IS NOT SUFFICIENT, THE CONTRACTOR SHALL ARRANGE FOR AN IMPACT HAMMER TEST, SONOSCOPE, OR OTHER NON-DESTRUCTIVE TESTING BE PERFORMED TO CONFIRM STRENGTH.
4. SLUMP TEST RESULTS, CONCRETE BATCH TESTS, NON-DESTRUCTIVE TESTING, AND FIELD OBSERVATION OF THE APPEARANCE OF CONCRETE SHALL FORM THE BASIS FOR ACCEPTANCE OR REJECTION OF CONCRETE.

FIRESTOPPING

A. SUBMITTALS: PRODUCT DATA AND PRODUCT CERTIFICATES SIGNED BY MANUFACTURER CERTIFYING THAT PRODUCTS FURNISHED COMPLY WITH REQUIREMENTS.

B. PROVIDE FIRESTOPPING SYSTEMS WITH FIRE-RESISTANCE RATINGS INDICATED BY REFERENCE TO UL DESIGNATIONS AS LISTED IN ITS "FIRE RESISTANCE DIRECTORY," OR TO DESIGNATIONS OF ANOTHER TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

C. FOR EXPOSED FIRESTOPPING, PROVIDE PRODUCTS WITH FLAME-SPREAD INDEXES OF LESS THAN 25 AND SMOKE-DEVELOPED INDEXES OF LESS THAN 450, AS DETERMINED ACCORDING TO ASTM E 84.

D. UL-CLASSIFIED SYSTEM DESIGNATIONS ARE INDICATED ON DRAWINGS.

E. INSTALL FIRESTOPPING SYSTEMS TO COMPLY WITH REQUIREMENTS LISTED IN TESTING AGENCY'S DIRECTORY FOR INDICATED FIRE-RESISTANCE RATING.

JOINT SEALANTS

A SUBMITTALS: PRODUCT DATA AND COLOR SAMPLES.

B. ENVIRONMENTAL LIMITATIONS: DO NOT PROCEED WITH INSTALLATION OF JOINT SEALANTS WHEN AMBIENT AND SUBSTRATE TEMPERATURE CONDITIONS ARE OUTSIDE LIMITS PERMITTED BY JOINT-SEALANT MANUFACTURER OR ARE BELOW 40 DEG F.

C. COMPATIBILITY: PROVIDE JOINT SEALANTS, JOINT FILLERS, AND OTHER RELATED MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER AND WITH JOINT SUBSTRATES UNDER SERVICE AND APPLICATION CONDITIONS.

D. SEALANT MATERIALS:
1. GENERAL PURPOSE EXTERIOR SEALANT: SINGLE-COMPONENT, NEUTRAL-CURING SILICONE SEALANT, ASTM C 920, TYPES; GRADE NS; CLASS 50; FOR USE NT.
2 GENERAL PURPOSE INTERIOR SEALANT (NON-WET AREAS): ACRYLIC LATEX OR SILICONIZED ACRYLIC LATEX, ASTM C 834, TYPE OP, GRADE NF.
3. ACOUSTICAL SEALANT: NONSAG, PAINTABLE, NONSTAINING LATEX SEALANT COMPLYING WITH ASTM C 834 THAT EFFECTIVELY REDUCES AIRBORNE SOUND TRANSMISSION AS DEMONSTRATED BY TESTING ACCORDING TO ASTM E 90.
4. OUTLET BOX SEALANT: RESILIENT SEALER PADS; USE TO SEAL BACK AND SIDES OF ALL JUNCTION BOXES RECESSED IN ACOUSTICALLY-RATED PARTITIONS.
A. FIRE-RATED PARTITIONS: HEVI-DUTY NELSON FSP FIRESTOP PUTTY PADS.
B. NON-FIRE-RATED PARTITIONS: LOWRY'$ OUTLET BOX PAD.

E. ACCESSORY MATERIALS:
1. GENERAL: PROVIDE SEALANT BACKINGS OF MATERIAL THAT ARE NONSTAINING; ARE COMPATIBLE WITH JOINT SUBSTRATES, SEALANTS, PRIMERS, AND OTHER JOINT FILLERS; AND ARE APPROVED FOR APPLICATIONS INDICATED BY SEALANT MANUFACTURER BASED ON FIELD EXPERIENCE AND LABORATORY TESTING.
2. CYLINDRICAL SEALANT BACKINGS: ASTM C 1330, OF SIZE AND DENSITY TO CONTROL SEALANT DEPTH AND OTHERWISE CONTRIBUTE TO PRODUCING OPTIMUM SEALANT PERFORMANCE.
3. BOND-BREAKER TAPE: POLYETHYLENE TAPE OR OTHER PLASTIC TAPE RECOMMENDED BY SEALANT MANUFACTURER FOR PREVENTING SEALANT FROM ADHERING TO RIGID, INFLEXIBLE JOINT-FILLER MATERIALS OR JOINT SURFACES AT BACK OF JOINT. PROVIDE SELF-ADHESIVE TAPE WHERE APPLICABLE.
4. PRIMER: MATERIAL RECOMMENDED BY JOINT-SEALANT MANUFACTURER WHERE REQUIRED FOR ADHESION OF SEALANT TO JOINT SUBSTRATES INDICATED, AS DETERMINED FROM PRECONSTRUCTION JOINT-SEALANT-SUBSTRATE TESTS AND FIELD TESTS.

F. INSTALLATION
1. COMPLY WITH ASTM C 1193.
2. INSTALL SEALANT BACKINGS TO SUPPORT SEALANTS DURING APPLICATION AND TO PRODUCE CROSS-SECTIONAL SHAPES AND DEPTHS OF INSTALLED SEALANTS THAT ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY.
3. INSTALL BOND-BREAKER TAPE BEHIND SEALANTS WHERE SEALANT BACKINGS ARE NOT USED BETWEEN SEALANTS AND BACKS OF JOINTS.
4. ACOUSTICAL SEALANT INSTALLATION: AT SOUND-RATED ASSEMBLIES AND ELSEWHERE AS INDICATED, SEAL PERIMETERS, CONTROL JOINTS, OPENINGS, AND PENETRATIONS WITH A CONTINUOUS BEAD OF ACOUSTICAL SEALANT. INSTALL ACOUSTICAL SEALANT AT BOTH FACES OF PARTITIONS. COMPLY WITH ASTM C 919.

NON-STRUCTURAL METAL FRAMING

A. SUBMITTALS: PRODUCT DATA.

B. FIRE-RESISTANCE-RATED ASSEMBLIES: PROVIDE MATERIALS AND CONSTRUCTION IDENTICAL TO THOSE TESTED IN ASSEMBLIES PERASTM E 119 BY AN INDEPENDENT TESTING AND INSPECTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

C. STC-RATED ASSEMBLIES: PROVIDE MATERIALS AND CONSTRUCTION IDENTICAL TO THOSE TESTED IN ASSEMBLIES PER ASTM E 90 AND CLASSIFIED PER ASTM E 413 BY A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY.

D. SUSPENDED CEILING AND SOFFIT FRAMING:
1. TIE WIRE: ASTM A 641/A641M, CLASS 1 ZINC COATING, SOFT TEMPER, GAGE AS INDICATED ON THE DRAWINGS.
2. WIRE HANGERS: ASTM A 641/A 641M, CLASS 1 ZINC COATING, SOFT TEMPER, GAGE AS INDICATED ON THE DRAWINGS.
3. CARRYING CHANNELS: COLD-ROLLED STEEL; GAGE AND DEPTH AS INDICATED ON THE DRAWINGS.
4. FURRING CHANNELS: STEEL, RIGID HAT-SHAPED CHANNELS; GAGE AND DEPTH AS INDICATED ON THE DRAWINGS.

E. PARTITION AND SOFFIT FRAMING:
1. STUDS, RUNNERS, FLAT STRAP AND BACKING, RIGID HAT-SHAPED FURRING CHANNELS, AND Z-FURRING: IN SIZES AND GAGES INDICATED ON THE DRAWINGS.

F. ACCESSORIES: COMPLY WITH REFERENCED INSTALLATION STANDARDS.
1. FASTENERS FOR METAL FRAMING: OF TYPE, MATERIAL, SIZE, CORROSION RESISTANCE, HOLDING POWER, AND OTHER PROPERTIES REQUIRED TO FASTEN STEEL MEMBERS TO SUBSTRATES.

G. INSTALLATION:
1. INSTALL STEEL FRAMING TO COMPLYWITHASTM C 754AND WITH ASTM C 840 REQUIREMENTS THAT APPLY TO FRAMING INSTALLATION AND WITH UNITED STATES GYPSUM'S "GYPSUM CONSTRUCTION HANDBOOK."
2. INSTALL SUPPLEMENTARY FRAMING, AND BLOCKING TO SUPPORT FIXTURES, EQUIPMENT SERVICES, HEAVY TRIM, GRAB BARS, TOILET ACCESSORIES, FURNISHINGS, OR SIMILAR CONSTRUCTION.
3. ISOLATE STEEL FRAMING FROM BUILDING STRUCTURE, EXCEPT AT FLOOR, TO PREVENT TRANSFER OF LOADING IMPOSED BY STRUCTURAL MOVEMENT.
A. WHERE STUDS ARE INSTALLED DIRECTLY AGAINST EXTERIOR WALLS, INSTALL ASPHALT-FELT OR FOAM-GASKET !SOLA TION STRIP BETWEEN STUDS AND WALL.
4. FIRE-RESISTANCE-RATED ASSEMBLIES: COMPLY WITH REQUIREMENTS OF LISTED ASSEMBLIES.

HOLLOW METAL DOORS AND FRAMES

A SUBMITTALS: PRODUCT DATA AND SHOP DRAWINGS.

B. BASIS-OF-DESIGN PRODUCTS: PRODUCTS BY ONE OF THE FOLLOWING.
1. AMWELD BUILDING PRODUCTS, LLC.
2 CECO DOOR PRODUCTS.
3. CURRIES COMPANY.
4. STEELCRAFT.
5. EQUAL.

C. MATERIALS:
1. COLD-ROLLED STEEL SHEETS: ASTM A 1008/A 100BM, SUITABLE FOR EXPOSED APPLICATIONS.
2. METALLIC-COATED STEEL SHEET: ASTM A 653/A 653M, G60 OR A60.
3. FRAME ANCHORS: ASTM A 591/A 591M, 40Z COATING DESIGNATION; MILL PHOSPHATIZED. FOR ANCHORS BUil T INTO EXTERIOR WALLS, SHEET STEEL COMPLYING WITH ASTM A 1008/A 1008M OR ASTM A 1011/A 1011M. HOT-DIP GALVANIZED ACCORDING TO ASTM A 153/A 153M, CLASS B.
4. INSERTS, SOL TS, AND FASTENERS: HOT-DIP GALVANIZED ACCORDING TO ASTM A 153/A 153M.

D. DOORS: COMPLYING WITH ANSI 250.8 FOR LEVEL AND MODEL AND ANSI A250.4 FOR PHYSICAL-ENDURANCE LEVEL INDICATED, 1-314 INCHES THICK UNLESS OTHERWISE INDICATED.
1. EXTERIOR DOORS: LEVEL 3 AND PHYSICAL PERFORMANCE LEVEL A (EXTRA HEAVY DUTY), MODEL 2 (SEAMLESS), METALLIC-COATED STEEL SHEET FACES.
2. HARDWARE REINFORCEMENT: FABRICATE ACCORDING TO ANSI/SDI A250.6 WITH REINFORCEMENT PLATES FROM SAME MATERIAL AS DOOR FACE SHEETS.

E. FRAMES: ANSI A250.8; FABRICATE FRAMES OF CONSTRUCTION INDICATED, WITH FACES OF CORNERS MITERED AND CONTACT EDGES CLOSED TIGHT.
1. EXTERIOR DOOR FRAMES: WELDED, FABRICATED FROM 14 GAGE, METALLIC-COATED STEEL SHEET.
2. HARDWARE REINFORCEMENT: FABRICATE ACCORDING TO ANSI/SDI A250.6 WITH REINFORCEMENT PLATES FROM SAME MATERIAL AS FRAMES.
3. FRAME ANCHORS: NOT LESS THAN 0.042 INCH THICK.

F. GLAZING STOPS: NONREMOVABLE STOPS ON OUTSIDE OF EXTERIOR DOORS AND ON SECURE SIDE OF INTERIOR DOORS; SCREW-APPLIED, REMOVABLE, GLAZING STOPS ON INSIDE, FABRICATED FROM SAME MATERIAL AS DOOR FACE SHEET IN WHICH THEY ARE INSTALLED.

G. HARDWARE PREPARATION:
1. PREPARE DOORS AND FRAMES TO RECEIVE MORTISED AND CONCEALED HARDWARE ACCORDING TO ANSI A250.6 AND ANSI A115 SERIES STANDARDS.
2. REINFORCE DOORS AND FRAMES TO RECEIVE SURFACE-APPLIED HARDWARE.

H. FINISH: MANUFACTURER'S STANDARD, FACTORY-APPLIED COAT OF LEAD-AND CHROMATE-FREE PRIMER COM PL YING WITH ANSI/SDI A250.10 ACCEPTANCE CRITERIA.

HOLLOW METAL DOORS AND FRAMES - CONTINUED

I. INSTALLATION:
1. INSTALL HOLLOW METAL FRAMES TO COMPLY WITH ANSI/SDI A250.11.
2. INSTALL DOORS TO PROVIDE CLEARANCES BETWEEN DOORS AND FRAMES AS INDICATED IN ANSI/SDI A250.11.
3. PRIME-COATTOUCHUP: IMMEDIATELY AFTER ERECTION, SAND SMOOTH RUSTED OR DAMAGED AREAS OF PRIME COAT AND APPLY TOUCHUP OF COMPATIBLE AIR-DRYING RUST-INHIBITIVE PRIMER. USE GALVANIZING REPAIR PAINT FOR METALLIC COATED SURFACES.

DOOR HARDWARE

A SUBMITTALS: HARDWARE SCHEDULE, PRODUCT DATA, AND KEYING SCHEDULE.

B. WARRANTY:
PART OF RESPECTIVE MANUFACTURERS' REGULAR TERMS OF SALE. PROVIDE MANUFACTURERS' WRITTEN WARRANTIES:

LOCKSETS:	THREE YEARS
CYLINDRICAL LOCKS:	SEVEN YEARS
CLOSERS:	TEN YEARS
HINGES:	ONE YEAR
OTHER HARDWARE:	TWO YEARS

C. HINGES:
1. STAINLESS-STEEL HINGES WITH STAINLESS-STEEL PINS FOR EXTERIOR.
2. NONREMOVABLE HINGE PINS FOR EXTERIOR AND PUBLIC INTERIOR EXPOSURE.
3. BALL-BEARING HINGES FOR DOORS WITH CLOSERS AND ENTRY DOORS.
4. 3 HINGES FOR 1-3/4-INCH- THICK DOORS 90 INCHES OR LESS IN HEIGHT; 4 HINGES FOR DOORS MORE THAN 90 INCHES IN HEIGHT.
D. LOCKSETS AND LATCHSETS:
1. BHMAA156.2, SERIES 4000, GRADE 1 FOR BORED LOCKS AND LATCHES.
2. BHMA A156.3, GRADE 1 FOR EXIT DEVICES.
3. BHMA A 156.13, SERIES 1000, GRADE 1 FOR MORTISE LOCKS AND LATCHES.
4. LEVER HANDLES ON LOCKSETS AND LATCHSETS.
5. PROVIDE TRIM ON EXIT DEVICES MATCHING LOCKSETS.
E. KEY LOCKS TO OWNER'S EXISTING MASTER-KEY SYSTEM.
1. CYLINDERS WITH SIX-PIN TUMBLERS AND REMOVABLE CORES.
2. PROVIDE CYLINDERS FOR ACCESS DOORS AND OTHER LOCKING DOORS THAT DO NOT REQUIRE OTHER HARDWARE.
3. PROVIDE CONSTRUCTION KEYING.
F. CLOSERS:
1. MOUNT CLOSERS ON INTERIOR SIDE (ROOM SIDE) OF DOOR OPENING. PROVIDE REGULAR-ARM, PARALLEL-ARM, OR TOP-JAMB-MOUNTED CLOSERS AS NECESSARY.
2. ADJUSTABLE DELAYED OPENING (ACCESSIBLE TO PEOPLE WITH DISABILITIES) FEATURE ON CLOSERS.
G. PROVIDE HARDWARE FINISHES AS FOLLOWS:
1. HINGES: MATCHING FINISH OF LOCKSET/ LATCHSET.
2. LOCKSETS, LATCHSETS, AND EXIT DEVICES: SATIN CHROME PLATED.
3. CLOSERS: ALUMINUM ENAMEL MATCHING FINISH OF LOCKSET/ LATCHSET.
4. OTHER HARDWARE: MATCHING FINISH OF LOCKSET/ LATCHSET.

H. MOUNT HARDWARE IN LOCATIONS RECOMMENDED BY THE DOOR AND HARDWARE INSTITUTE UNLESS OTHERWISE INDICATED.

I. DELIVER KEYS TO OWNER

J. CONTRACTOR TO COORDINATE KEYING FOR ALL CYLINDRICAL LOCKS AND LATCHES WITH LANDLORD.

K. SUBSTITUTIONS: SUBMIT PRODUCT DATA AND INDICATE BENEFIT TO PROJECT.

HARDWARE GROUP 1:	STOREROOM OR CLOSET FUNCTION
INTERIOR AND EXTERIOR PULLS:	SARGENT L LEVER DESIGN, L ROSE
HINGES:	MCKINNEY TA2314 4.5 X 4.5 US26D
LOCKSET:	SARGENT 10 LINE CYLINDRICAL LEVEL LOCK 28-1G04 LL US26D WBS, STOREROOM LOCK, ANSI/BHMA F86, KEY AS DIRECTED.
DUST PROOF STRIKE:	ROCKWOOD 570 626
FLUSH BOLT:	ROCKWOOD 555 626
DOOR CLOSER,	
CONCEALED O.H. STOP:	SARGENT 1538 S US26D (32-5/8" - 40")
SPLIT ASTRAGAL:	PEMKO 29310 CS 84"

WRNS STUDIO
677 ALA MOANA BLVD
3RD FLOOR, STE. 307
HONOLULU
HAWAII 96813
808.356.5880 TEL
415.358.9100 FAX
WWW.WRNSSTUDIO.COM

ISSUES	DATE
PERMIT SET	09/10/2021

# REVISION LIST	DATE

ADAM G. WOLTAG
LICENSED PROFESSIONAL ARCHITECT
No. 18327
HAWAII, U.S.A.

EXPIRATION DATE 04/30/2022

SIGNATURE

LEAHI HOSPITAL-SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVENUE
HONOLULU, HI, 96816
TMK: 3-2-031:001

KEYPLAN

PROJECT NO.: 20038.22
DATE: 01/10/22
SCALE:

SHEET TITLE:

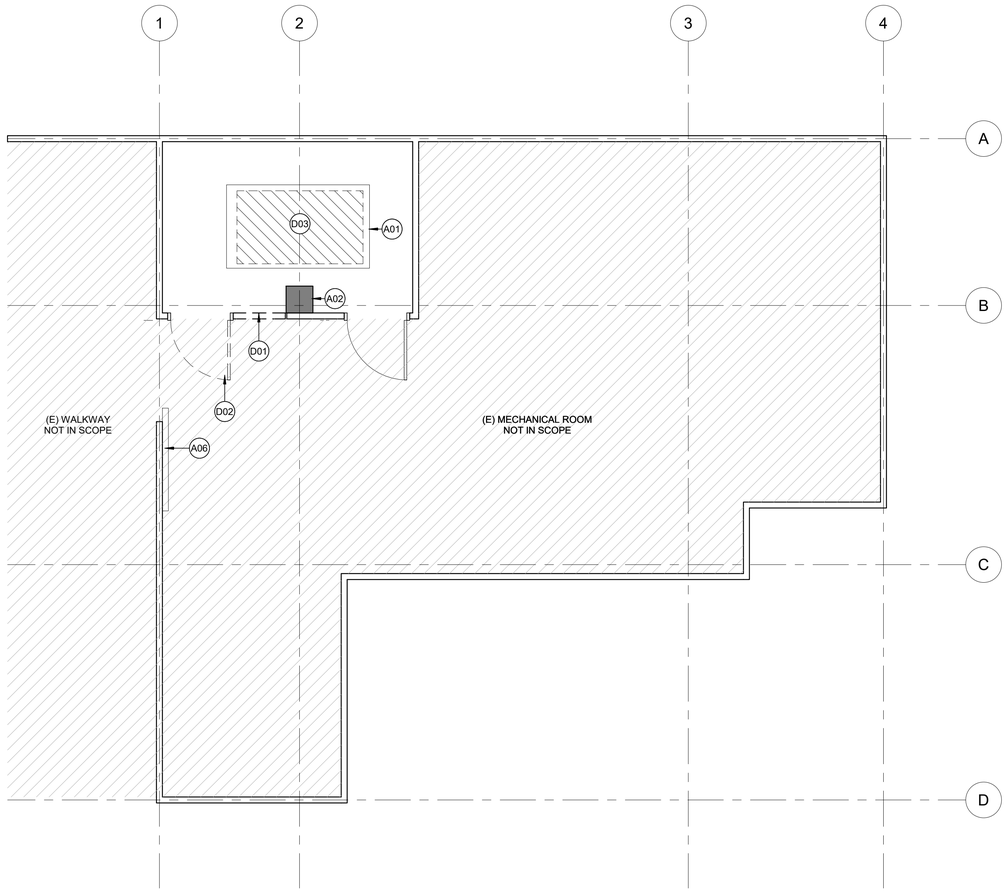
CONSTRUCTION SPECIFICATIONS

SHEET NO:
A-003

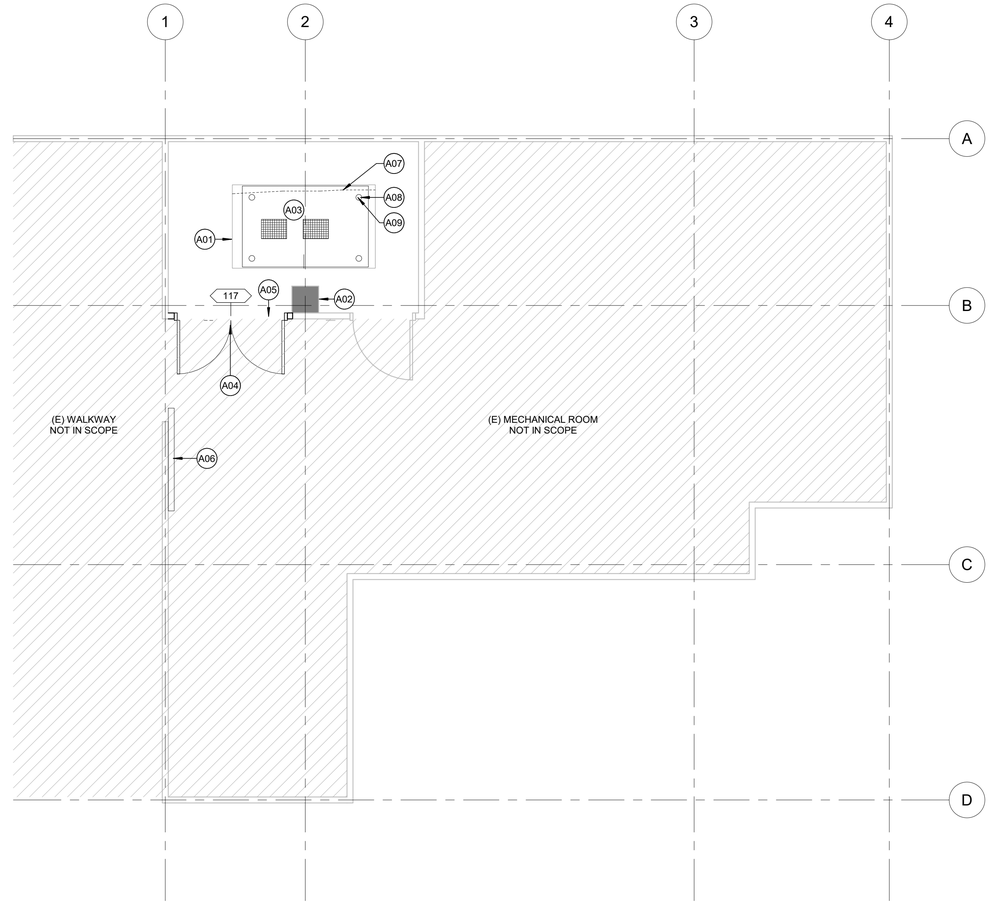
All drawings and written material appearing herein constitute original and unpublished work of the Architect/Engineer and may not be duplicated, used or disclosed without consent of Architect/Engineer.

If this drawing is not 24"x36", then the drawing has been revised from its original size. Noted scales must be adjusted. This line should be equal to one inch

9/10/2021 12:32:58 PM



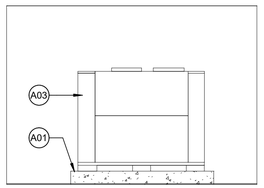
1 EXISTING/ DEMOLITION PLAN
1/4" = 1'-0"



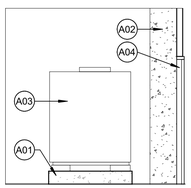
2 NEW FLOOR PLAN
1/4" = 1'-0"

KEYNOTES

A01	(E) CONCRETE CURB, REPAIR AS NEEDED. SEE SPECS A-003
A02	(E) CONCRETE COLUMN, TO REMAIN.
A03	(N) HEAT PUMP EQUIPMENT, SEE MECH DWGS.
A04	(N) HOLLOW METAL DOOR FRAME AND METAL DOUBLE DOOR.
A05	(N) SHEET METAL WALL AND DOOR HEADER.
A06	(E) SLIDING DOOR TO REMAIN.
A07	CONCRETE REPAIR AT (E) EQUIPMENT PAD. FIELD VERIFY LOCATION AND EXTENT. COORDINATE W/ EQUIPMENT ANCHOR LOCATIONS.
A08	EQUIPEMENT ANCHOR LOCATION, TYP. SEE MECH DWGS.
A09	FIELD VERIFY AND COORDINATE ANCHOR LOCATION FOR REBAR LOCATIONS PRIOR TO FABRICATION AND INSTALLATION.
D01	DEMOLISH (E) SHEET METAL WALL.
D02	REMOVE (E) DOOR AND DOOR FRAME.
D03	REMOVE (E) HEAT PUMP EQUIPMENT AND RELATED ITEMS. REFER TO MECH AND ELEC DWGS.



3 Elevation 1 - a
1/4" = 1'-0"



4 Elevation 1 - b
1/4" = 1'-0"

9/10/2021 12:32:58 PM

All drawings and written material appearing herein constitute original and unpublished work of the Architect/Engineer and may not be duplicated, used or disclosed without consent of Architect/Engineer.

If this drawing is not 24"x36", then the drawing has been revised from its original size. Noted scales must be adjusted. This line should be equal to one inch

WRNS STUDIO
677 ALA MOANA BLVD
3RD FLOOR, STE. 307
H O N O L U L U
HAWAII 96813
808.356.5880 TEL
415.358.9100 FAX
WWW.WRNSSTUDIO.COM

ISSUES	DATE
PERMIT SET	09/10/2021

#	REVISION LIST	DATE

ADAM G. WOLFAG
LICENSED PROFESSIONAL ARCHITECT
No. 18327
HAWAII, U.S.A.

EXPIRATION DATE 04/30/2022

SIGNATURE

LEAHI HOSPITAL- SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVENUE
HONOLULU, HI, 96816
TMK: 3-2-031:001

KEYPLAN

PROJECT NO.: 20038.22
DATE: 01/10/22
SCALE: 1/4" = 1'-0"

SHEET TITLE:

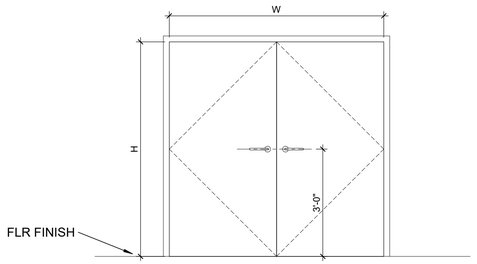
DEMOLITION AND NEW FLOOR PLAN

SHEET NO:

A-101

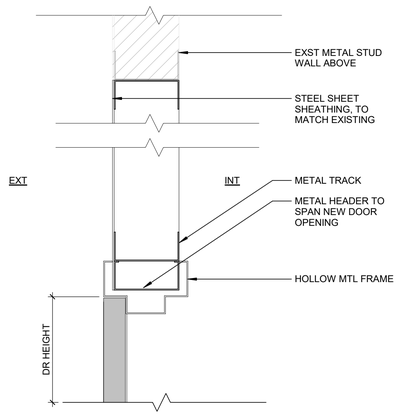
INTERIOR DOOR SCHEDULE

MARK	DOOR TYPE	DOOR MAT'L	DOOR FINISH	FRAME TYPE	FRAME FINISH	FIRE RATING	HEIGHT (H)	WIDTH (W)	SIDELIGHT (A)	TRANSOM (B)	HDWR GROUP	HEAD DETAIL	JAMB DETAIL	SILL DETAIL	COMMENTS
LEVEL 1															
117	DFL-1	HM	PTD	FR-1	HM/ PTD	0	7'-0"	6'-0"	0"	0"	1	1/A-701	1/A-701	1/A-701	

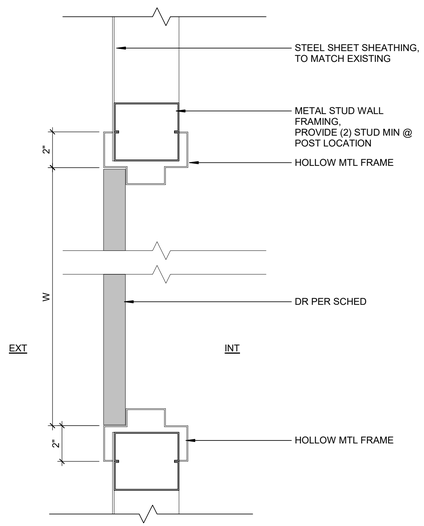


TYPE DFL-1

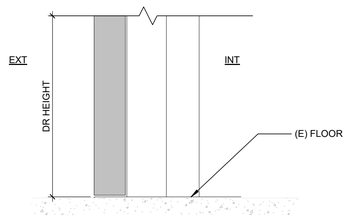
DOUBLE SWINGING DOOR



DOOR HEADER SECTION



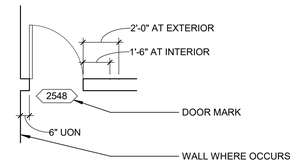
DOOR JAMB @ PLAN VIEW



DOOR THRESHOLD SECTION

1 SWING DOOR DETAIL
3" = 1'-0"

DOOR SCHEDULE NOTES



1. THE PURPOSE OF THIS SHEET IS TO DESCRIBE AND ILLUSTRATE DOOR TYPES. NOT ALL DOOR TYPES SHOWN ARE NECESSARILY USED. SEE DOOR MARK SCHEDULE FOR DOOR TYPES USED.
2. SEE FLOOR PLANS FOR DOOR SYMBOL REFERENCES.
3. DOOR OPENING LOCATIONS:
   A. IMMEDIATELY ADJACENT TO A FLANKING WALL (AS SHOWN ABOVE) U.O.N.
   B. AT THE CENTERLINE OF THE ROOM, U.O.N. CENTERED ON A GRID LINE.
   C. DOOR OPENINGS IN OTHER LOCATIONS ARE LOCATED BY DIMENSIONS.
4. SEE SPECIFICATIONS FOR HARDWARE SCHEDULE AND DETAIL FOR HARDWARE MOUNTING INFORMATION.
5. TYPICAL DOOR CONSTRUCTION UON ON SCHEDULE: WOOD (SCWD) = SOLID CORE WOOD DOOR. HOLLOW METAL (HM)ALUMINUM (AL) = SEE SPECIFICATIONS.
6. DOOR FRAME NOTES:
   A. METAL DOOR FRAME STOPS ARE FULL STOPS U.O.N
7. GLASS:
   A. INTERIOR DOORS:
      1. 1/4" CLEAR TEMPERED GLASS TYPICAL AT NON-RATED DOORS.
      2. 1/4" WIRED GLASS AT 20 MINUTE RATED DOORS.
      3. 1/4" CLEAR FIRE-LITE GLASS AT DOORS 45 MINUTE RATED AND ABOVE.
   B. MAXIMUM GLASS SIZE IN FIRE RATED DOORS:
      1. 20 MINUTE DOORS: 1296 SQUARE INCHES MAX.
      2. 60 MINUTE DOORS: 1296 SQUARE INCHES MAX.
      3. 90 MINUTE DOORS: 100 SQUARE INCHES MAX PER LITE.
8. FINISH FLOOR TRANSITIONS OCCUR AT CENTERLINE OF DOORS, UON SEE DETAILS SHEET FOR TYPICAL FLOOR TRANSITIONS.
9. ALL INTERIOR DOORS WITH FIRE-RATINGS GREATER THAN 20 MINUTE SHALL HAVE A NONCOMBUSTIBLE SILL WITH AN UNDERCUT OF 3/8" MAXIMUM ABOVE THE SILL.
10. ALL EXTERIOR DOORS SHALL HAVE METAL THRESHOLDS. SEE HARDWARE SCHEDULE AND DOOR DETAILS SHEETS
11. WHERE DOOR HOLD-OPEN DEVICES OCCUR AT WALLS PROVIDE BACKING PLATE PER BACKING PLATE SCHEDULE.
12. ALL HOLLOW METAL DOORS AND FRAMES TO BE PAINTED.

WRNS STUDIO
677 ALA MOANA BLVD
3RD FLOOR, STE. 307
H O N O L U L U
H A W A I I 9 6 8 1 3
808.356.5880 TEL
415.358.9100 FAX
WWW.WRNSSTUDIO.COM

ISSUES	DATE
PERMIT SET	09/10/2021

#	REVISION LIST	DATE

ADAM G. WOLPAG
LICENSED PROFESSIONAL ARCHITECT
No. 18327
HAWAII, U.S.A.

EXPIRATION DATE 04/30/2022

SIGNATURE

LEAHI HOSPITAL- SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVENUE
HONOLULU, HI, 96816
TMK: 3-2-031:001

KEYPLAN

PROJECT NO.: 20038.22
DATE: 01/10/22
SCALE: As indicated

SHEET TITLE:

DOOR SCHEDULE AND DETAILS

SHEET NO:

A-201

9/10/2021 12:32:59 PM

All drawings and written material appearing herein constitute original and unpublished work of the Architect/Engineer and may not be duplicated, used or disclosed without consent of Architect/Engineer.

If this drawing is not 24"x36", then the drawing has been revised from its original size. Noted scales must be adjusted. This line should be equal to one inch

PLUMBING SYMBOL LIST

NOTE: This is a standard symbol list and not all items listed may be used.

Abbreviations

#	NUMBER
&	AND
(A)	ABANDON IN PLACE
(E)	EXISTING
(N)	NEW
(X)	DEMOLISH
AFF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
BFP	BACKFLOW PREVENTER
BLDG	BUILDING
BTU	BRITISH THERMAL UNIT
CV	CHECK VALVE
CW	COLD WATER
DN	DOWN
GAL	GALLONS
HP	HEAT PUMP, HORSE POWER, HOUSEKEEPING PAD
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
M	METER, MECHANICAL
MAX	MAXIMUM
MX	MIXING VALVE
NC	NORMALLY CLOSED
T&P	TEMPERATURE AND PRESSURE
TP	TRAP PRIMER, TOTAL PRESSURE

General

- DEMOLISH
- DEMOLISH (DASH-DOT)
- EXISTING WORK
- NEW WORK
- PIPE OR CONDUIT BELOW GRADE
- CONTINUATION
- DETAIL NUMBER AND SHEET LOCATION
- EXTENT OF DEMOLITION
- POINT OF CONNECTION
- SECTION NUMBER AND SHEET LOCATION

Piping Fittings

- ACCESS PANEL
- FLEXIBLE CONNECTION
- FLOW DIRECTION
- FLOW METER
- FLOW SWITCH
- MANUAL AIR VENT
- PRESSURE GAUGE WITH COCK
- PRESSURE RELIEF
- PRESSURE SENSOR
- STRAINER
- TEMPERATURE SENSOR
- THERMOMETER
- UNION

Piping Systems

- 120°HW 120° HOT WATER PIPING
- 120°HWR 120° HOT WATER RETURN PIPING

Valves

- BACKFLOW PREVENTER
- CHECK VALVE
- PRESSURE REDUCING VALVE
- SHUTOFF VALVE, GENERAL

HEAT PUMP WATER HEATER SCHEDULE - AIR SOURCE

SYMBOL	BASIS OF DESIGN MFR	MODEL	RECOVERY GAL/HR	PUMP GPM	PUMP FT HEAD	BLOWER CFM	BLOWER IN WC	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT (LB)	SOUND (DB)	REFRIG.	PIPE CON. SIZE (IN)	NOTES
HPWH-1	AO SMITH	AHPA-250	340	50	18.48	8,000	1.52	208/230	3	129	150	2,175	65	R134A	2	1,2,3,4

NOTES:
1. PROVIDE SPRING VIBRATION ISOLATOR MOUNTS.
2. PROVIDE BLOWER CONFIGURATION.
3. PROVIDE MANUFACTURER'S "CORROSIVE DUTY PACKAGE" OPTION.
4. UNIT TO BE RATED / LISTED FOR POTABLE WATER USE.

GENERAL PLUMBING NOTES

A. GENERAL SCOPE OF WORK INCLUDES, BUT IS NOT LIMITED TO, REPLACEMENT OF EXISTING HEAT PUMP WATER HEATER WITH NEW SIMILAR HEAT PUMP WATER HEATER.

B. COORDINATE ALL WORK, SCHEDULE, AND DOWN-TIMES WITH OWNER PRIOR TO STARTING CONSTRUCTION. SUBMIT SCHEDULE OF WORK TO OWNER/ENGINEER FOR APPROVAL PRIOR TO STARTING WORK.

SHEET INDEX

INTERFACE ENGINEERING

1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

MARK O. KOLLER
LICENSED PROFESSIONAL ENGINEER
17102-M
HAWAII U.S.A.

EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING
PROJECT 2020-0453
CONTACT Steven Kim
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
SYMBOL LIST, GENERAL NOTES AND SCHEDULES - PLUMBING

REVISIONS

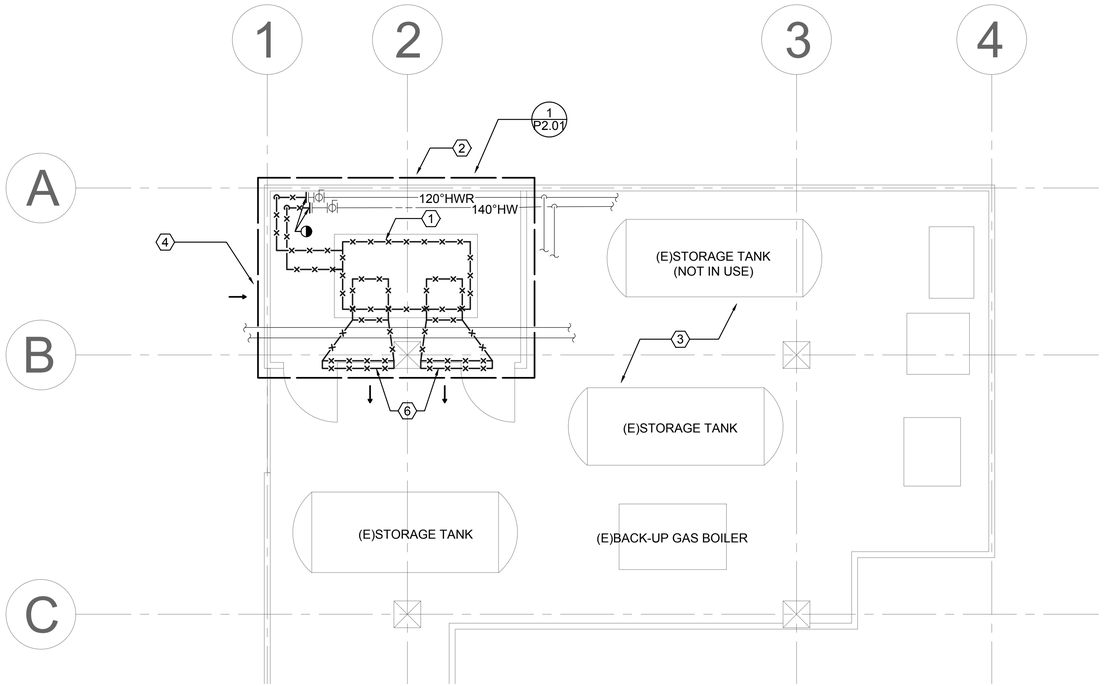
DRAWN BY

CHECKED BY

JOB NO. 2020-0453

DATE 01-10-2022

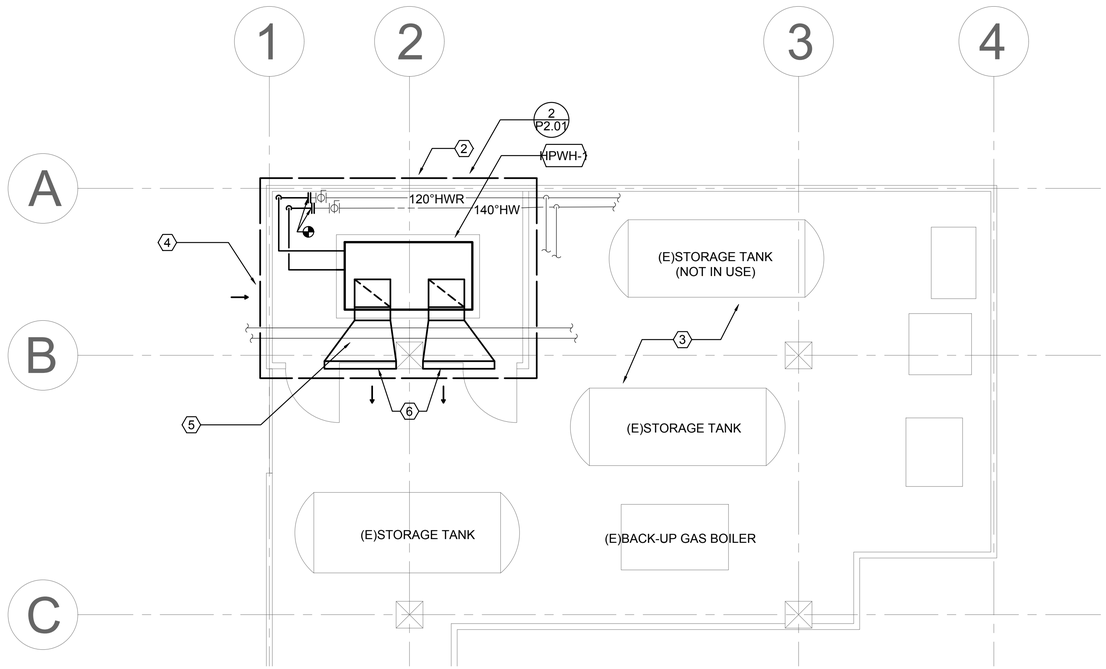
SHEET NUMBER P0.01



1 DEMOLITION PLUMBING PLAN

0 2' 4' 8'

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



2 NEW PLUMBING PLAN

0 2' 4' 8'

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

GENERAL SHEET NOTES

A. FOR CLARITY, ALL PIPING NOT SHOWN ON FLOOR PLAN. REFER TO PIPING DIAGRAMS ON SHEET P2.01 FOR CONFIGURATION

SHEET KEYNOTES

1 DEMOLISH EXISTING HEAT PUMP WATER HEATER, ASSOCIATED PIPING, AND DISCHARGE DUCT TO BOUNDARY OF WORK AS INDICATED.

2 BOUNDARY OF WORK.

3 NO SCOPE OF WORK IN THIS AREA.

4 EXISTING SCREEN WALL TO EXTERIOR TO REMAIN.

5 NEW DISCHARGE DUCT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. ROUTE BELOW EXISTING PIPING IN THE AREA.

6 EXISTING DUCT OPENING - 48"X12", B.O.D. AT 8'-0" AFF. NEW DUCT TO ALIGN WITH EXISTING OPENINGS.

INTERFACE ENGINEERING

1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

MARK O. KOLLER
LICENSED PROFESSIONAL ENGINEER
17102-M
HAWAII U.S.A.

EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING
PROJECT 2020-0453
CONTACT Steven Kim
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
DEMO/NEW PLUMBING PLANS

REVISIONS

DRAWN BY

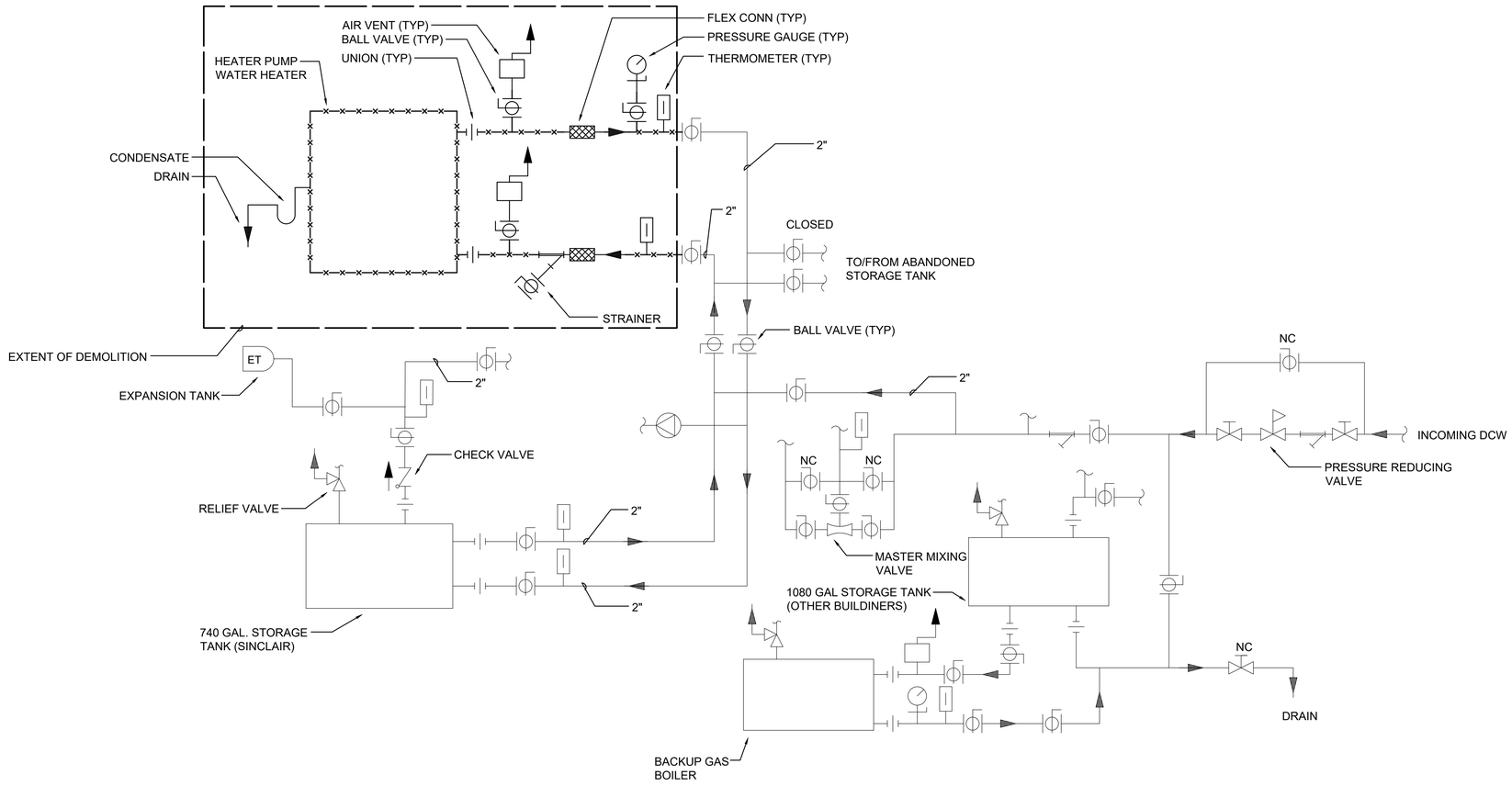
CHECKED BY

JOB NO. 2020-0453

DATE 01-10-2022

SHEET NUMBER

P1.01



1 DEMO PLUMBING PIPING DIAGRAM

NO SCALE

INTERFACE ENGINEERING

1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

MARK O. KOLLER
LICENSED PROFESSIONAL ENGINEER
17102-M
HAWAII U.S.A.

EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING

PROJECT **2020-0453**
CONTACT **Steven Kim**
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL **808.445.9169**
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR WING AIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
DEMO PLUMBING PIPING DIAGRAM

REVISIONS

DRAWN BY

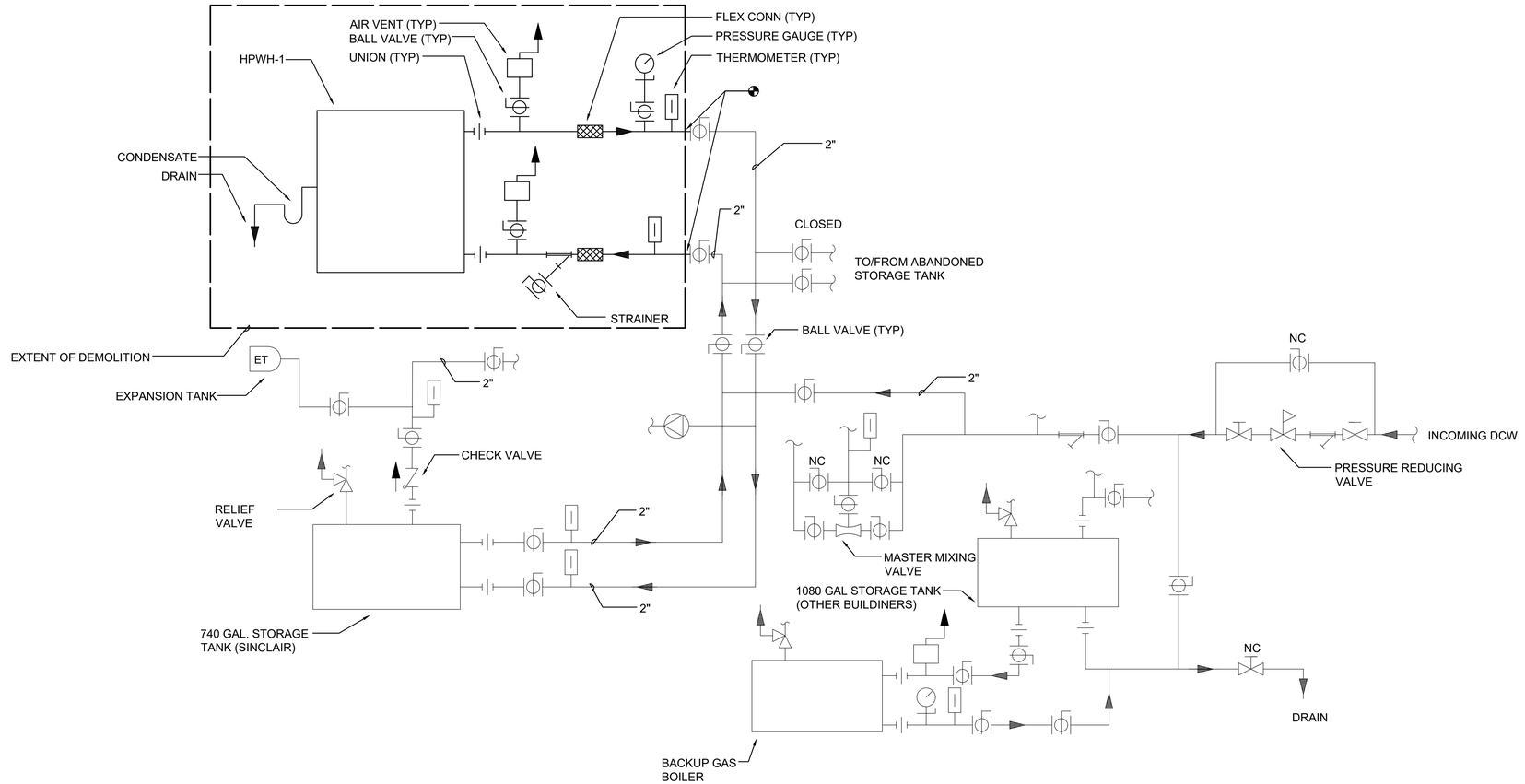
CHECKED BY

JOB NO.
2020-0453

DATE
01-10-2022

SHEET NUMBER

P2.01



1 NEW PLUMBING PIPING DIAGRAM

NO SCALE

INTERFACE ENGINEERING

1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

MARK O. KOLLER
LICENSED PROFESSIONAL ENGINEER
17102-M
HAWAII U.S.A.

EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING
PROJECT 2020-0453
CONTACT Steven Kim
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
NEW PLUMBING PIPING DIAGRAM

REVISIONS

DRAWN BY

CHECKED BY

JOB NO. 2020-0453

DATE 01-10-2022

SHEET NUMBER

P2.02

ELECTRICAL SYMBOL LIST

NOTE: This is a standard symbol list and not all items listed may be used.

Abbreviations

(E)	EXISTING
(N)	NEW
(X)	DEMOLISH
A	AMPERES, AMBER
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AVAILABLE INTERRUPTING CAPACITY
AWG	AMERICAN WIRE GAUGE
C	CONDUIT, CLOSE, CONTROL
CU	COPPER
EMT	ELECTRICAL METALLIC TUBING
FMC	FLEXIBLE METAL CONDUIT
FT	FOOT, FEET
G, GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
IN	INCH, INCHES
KVA	KILOVOLT AMPERES
KW	KILOWATT
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
MCA	MINIMUM CIRCUIT AMPS
MOCP	MAXIMUM OVERCURRENT PROTECTION
N.I.C.	NOT IN CONTRACT
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
PH	PHASE
PVC	POLY-VINYL-CHLORIDE
RMC	RIGID METAL CONDUIT
SHT	SHEET
TBD	TO BE DETERMINED
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
V	VOLTS, VOLTAGE
WP	WEATHERPROOF

Connections / Equipment

- HEAVY DUTY FUSED DISCONNECT SWITCH
- MOTOR CONNECTION

General

- DEMOLISH
- EXISTING WORK
- NEW WORK
- XX-X LOCATION — EQUIPMENT IDENTIFICATION
- 1 — KEYED NOTE

Miscellaneous

- BRANCH PANEL
- SURFACE MOUNT EQUIPMENT ENCLOSURE AS NOTED

Raceways

- CONDUIT/WIRING CONTINUATION

Switches and Receptacles

- DUPLEX RECEPTACLE

GENERAL ELECTRICAL NOTES

A. COORDINATE WITH OWNER SO THAT WORK CAN BE SCHEDULED NOT TO INTERRUPT OPERATIONS, NORMAL ACTIVITIES, BUILDING ACCESS, ACCESS TO DIFFERENT AREAS. THE OWNER WILL COOPERATE TO THE BEST OF THEIR ABILITY TO ASSIST IN A COORDINATED SCHEDULE, BUT WILL REMAIN THE FINAL AUTHORITY AS TO TIME OF WORK PERMITTED.

B. ANY ELECTRICAL OUTAGE REQUIRED BY THE WORK SHALL BE COORDINATED WITH THE OWNER AND CONFIRMED IN WRITING. ANY OUTAGE SHALL NOT BE SCHEDULED DURING BUSINESS HOURS. ALL COSTS FOR OVERTIME SHALL BE INCLUDED IN BID

C. VISIT THE SITE BEFORE SUBMITTING A BID TO OBSERVE EXISTING CONDITIONS. ELECTRICAL CONTRACTOR SHALL VISIT AND EXAMINE THE SITE PRIOR TO CONSTRUCTION TO ASCERTAIN THE EXISTING CONDITIONS AND LIMITS OF CONSTRUCTION. ELECTRICAL CONTRACTOR SHALL MAKE NOTE OF ANY ADDITIONAL DEMOLITION AND/OR ANY ADDITIONAL REMOVAL AND RELOCATION WHICH MAYBE REQUIRED TO ACCOMPLISH CONSTRUCTION. ELECTRICAL CONTRACTOR TO NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES. FAILURE TO DO SO INDICATES THAT CONTRACTOR ACCEPTS THE CONDITION AS THEY EXIST AND SHALL PERFORM THE WORK REQUIRED.

D. FIELD VERIFY PANELBOARDS LOADS, BUS RATINGS AND AVAILABLE SPARE AND SPACES.

E. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROTECT AND RETAIN POWER TO ALL EXISTING ACTIVE EQUIPMENT DURING NEW CONSTRUCTION PERIOD.

F. COORDINATE EXACT LOCATION AND POWER REQUIREMENTS OF HVAC UNITS WITH DIVISION 15 [23] PRIOR TO INSTALLATION.

G. COORDINATE WITH OTHER TRADES FOR ITEMS IN THEIR SCOPE OF WORK WHICH MAY REQUIRE ELECTRICAL WORK AND ARE NOT INDICATED ON THE ELECTRICAL PLANS.

H. REMOVE WIRING DEVICES, FIXTURES, COMPONENTS, ELECTRICAL EQUIPMENT AND BOXES IN REMODELED AREAS NOT REQUIRED TO REMAIN IN SERVICE WHEN THIS PROJECT IS COMPLETE.

1. REMOVE WIRE, CONDUITS AND BOXES FOR SUCH DEVICES BACK TO SOURCE. WHERE A CIRCUIT IS INTERRUPTED BY SUCH REMOVAL OF A DEVICE OR FIXTURE FROM THAT CIRCUIT, INSTALL WIRE AND CONDUIT AS REQUIRED TO RESTORE SERVICE TO THE REMAINING DEVICES AND FIXTURES ON THAT CIRCUIT.
2. WHERE THIS WORK WILL DISTURB AREAS NOT BEING RENOVATED, CONSULT WITH THE ARCHITECT BEFORE PERFORMING THE WORK.
3. LEAVE IN PLACE CONCEALED CONDUIT LOCATED IN PARTITIONS OR HARD CEILING NOT TO BE DEMOLISHED. REMOVE CONDUCTORS FROM SUCH CONDUITS. USE PERMANENT MARKER PENS TO LABEL SUCH CONDUITS AS "ABANDONED" AT EACH END, AND NOTE WHERE SUCH CONDUITS REEMERGE FROM THE CONCEALED AREA. CAP SUCH CONDUITS.
4. WHERE ELECTRICAL CIRCUITS, FEEDERS OR WIRING RUN THROUGH A SPACE TO BE DEMOLISHED, MAINTAIN THEM. REPAIR ANY DAMAGE CAUSED BY DEMOLITION OR CONSTRUCTION PERFORMED UNDER THIS CONTRACT.
5. WHERE ELECTRICAL CIRCUITS, FEEDERS OR WIRING RUNS SERVING OTHER AREAS ARE SERVED FROM THE SPACE TO BE DEMOLISHED, RECONNECT THEM TO OTHER SOURCES AS REQUIRED TO MAINTAIN SERVICE TO THE EXISTING DEVICES.

I. WHERE DRAWINGS INDICATE EXISTING ELECTRICAL EQUIPMENT OR DEVICES TO REMAIN IN SERVICE, OR TO BE RELOCATED AND/OR REUSED, REFURBISH THEM. THOROUGHLY CLEAN SUCH ITEMS AND NOTIFY ARCHITECT OF ANY DEFECTS IN SUCH INSTALLATIONS. REPAIR ANY EXISTING DAMAGE AND DAMAGE CAUSED BY DEMOLITION OR CONSTRUCTION PERFORMED UNDER THIS CONTRACT.

J. BEFORE DEMOLITION, OFFER REMOVED EQUIPMENT TO THE OWNER IF THE OWNER CHOOSES TO RETAIN THESE ITEMS. CAREFULLY REMOVE AND RETURN SUCH ITEMS TO THE OWNER. REMOVE AND DISPOSE OF ITEMS REJECTED BY THE OWNER FROM THE PROJECT SITE AND IN A LEGAL MANNER.

K. ELECTRICAL CIRCUITS SHALL BE INTERRUPTED ONLY WITH PRIOR WRITTEN CONSENT. SUCH INTERRUPTIONS SHALL BE PRECEDED BY ALL POSSIBLE PREPARATIONS BY THE CONTRACTOR WHICH ARE NECESSARY TO KEEP THE ELECTRICAL CIRCUITS OFF FOR A MINIMUM PERIOD IN AN EXPEDITIOUS MANNER PURSUANT WITH GOOD WORKMANSHIP. THIS INCLUDES CIRCUIT TRACING TO IDENTIFY THE ELECTRICAL LOAD BEING SERVED AND THE ORIGIN OF THE CIRCUIT.

L. COORDINATE THE EXACT LOCATION OF EXISTING UTILITIES AND EQUIPMENT PRIOR TO COMMENCEMENT OF WORK. COMPENSATE THE OWNER FOR DAMAGES CAUSED BY THE FAILURE TO LOCATE AND PRESERVE UTILITIES. REPLACE DAMAGED ITEMS WITH NEW MATERIAL TO MATCH EXISTING.

M. MAINTAIN ELECTRICAL CONTINUITY OF EXISTING SYSTEMS TO REMAIN. REMOVE OR RELOCATE ELECTRICAL BOXES, CONDUIT, WIRING, EQUIPMENT, LUMINAIRES, AND THE LIKE, AS REQUIRED IN REMOVED OR REMODELED AREAS IN THE EXISTING CONSTRUCTION AFFECTED BY THIS WORK.

N. PROVIDE TEMPORARY SUPPORT FOR ELECTRICAL SYSTEMS THAT REMAIN IN PLACE.

O. THE WORK SHALL BE CAREFULLY LAID OUT IN ADVANCE WHERE CUTTING, CHANNELING CHASE, CHASING OR DRILLING OF WALLS, PARTITIONS, CEILINGS, SLABS OR OTHER SURFACES IS NECESSARY FOR THE PROPER INSTALLATION, SUPPORT OR ANCHORAGE OF THE CONDUIT, RACEWAY OR OTHER ELECTRICAL WORK. THIS WORK SHALL BE CAREFULLY DONE, AND ANY DAMAGE TO BUILDING, PIPING OR EQUIPMENT SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER. PATCHING AND PAINTING SHALL BE DONE TO MATCH EXISTING SURFACES.

P. ALL CONDUCTORS AND EQUIPMENT TO BE INSTALLED OR PERMANENTLY CONNECTED (HARDWIRED) MUST BE LISTED, LABELED OR CERTIFIED FOR ITS USE BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) AS RECOGNIZED BY THE U.S. DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION. [NEC 110.2]

Q. IN ALL CASES AND FOR ALL SYSTEMS AND COMPONENTS, USE ONLY EQUIPMENT IN ACCORDANCE WITH ITS LISTING OR LABELING. [NEC 110.3(B)]

R. USE ONLY EQUIPMENT MARKED (LISTED/LABELED) AS SUITABLE FOR INSTALLATION AND WITH HIGHER TEMPERATURE RATED CONDUCTORS AT THE AMPACITY OF THE HIGHER RATED CONDUCTORS. REFER TO THE UL ELECTRICAL CONSTRUCTION MATERIAL DIRECTORY FOR CIRCUIT BREAKERS, SWITCHES, PANELBOARDS, SWITCHBOARDS, ETC. [NEC 110.14(C)]

S. PROVIDE SUFFICIENT ACCESS AND WORKING CLEARANCE ABOUT THE ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC 110.26(A).

T. PROVIDE ACCESS AND ENTRANCES TO AND EGRESS FROM WORKING SPACE ABOUT ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC 110.26(C).

U. INSTALL ONLY RECEPTACLE OUTLETS WITH GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION IN LOCATIONS SPECIFIED AS BATHROOMS, COMMERCIAL AND INSTITUTIONAL KITCHENS, ROOFTOPS AND OUTDOOR PUBLIC SPACES. SEE EXCEPTIONS. [NEC 210.8(B)]

V. PROVIDE OUTLET DEVICE(S) INSTALLED ON A BRANCH CIRCUIT WITH A RATING IN ACCORDANCE WITH NEC 210.21(B) (SEE EXCEPTIONS, AND REFER TO 210.21(B) TABLE(S)).

W. THE GOVERNING ELECTRICAL CODE IS THE 2017 NEC, ALSO KNOWN AS THE NATIONAL ELECTRICAL CODE.

X. SEE OTHER NOTES AND REQUIREMENTS ON ALL DRAWINGS.

Y. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

Z. DRAWINGS AND SPECIFICATIONS COMPLIMENT EACH OTHER. REQUIREMENT BY EITHER INFERS REQUIREMENT BY BOTH.

AA. CONNECT EQUIPMENT AND DEVICES FURNISHED UNDER OTHER DIVISIONS OF THIS CONTRACT, BY OWNER OR BY OTHER CONTRACTS.

SHEET INDEX

INTERFACE ENGINEERING

1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

JESSE E. A. FINES
LICENSED PROFESSIONAL ENGINEER
18862E
HAWAII U.S.A.

EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING

PROJECT 2020-0453
CONTACT Scott Sato
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
SYMBOL LIST AND GENERAL NOTES - ELECTRICAL

REVISIONS

DRAWN BY

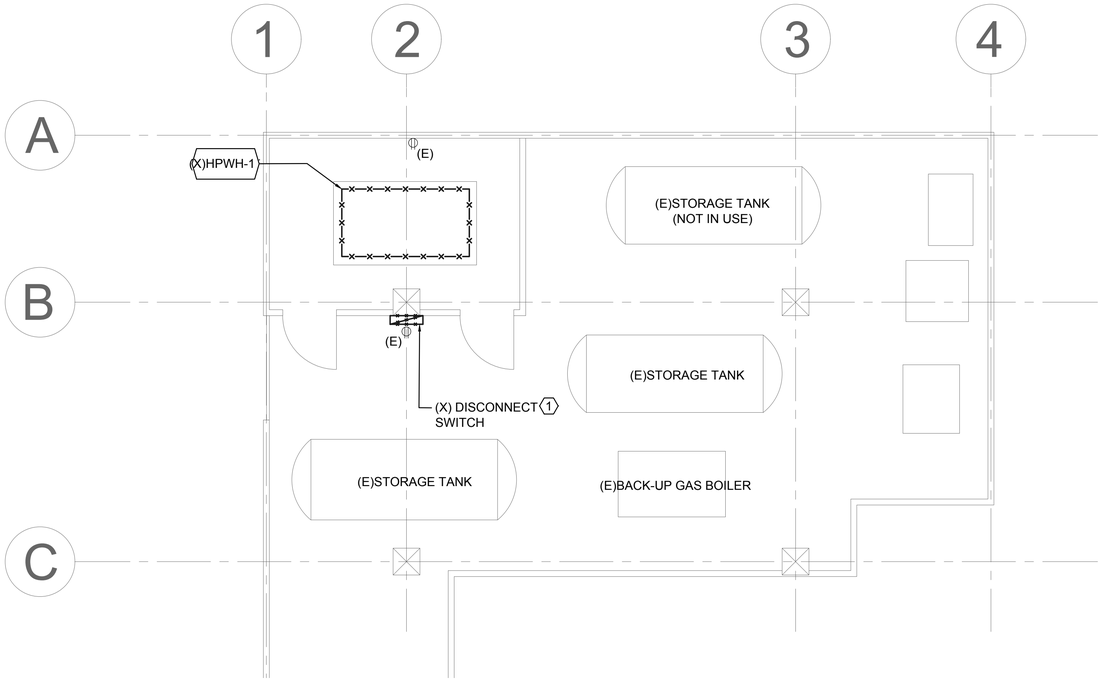
CHECKED BY

JOB NO. 2020-0453

DATE 01-10-2022

SHEET NUMBER

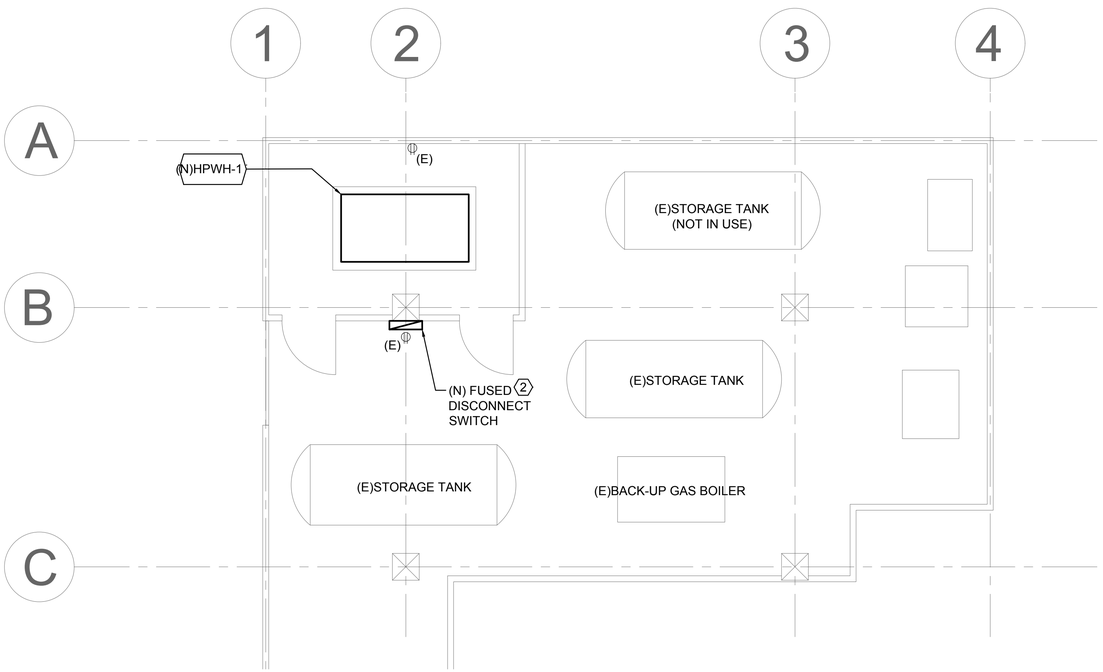
E0.01



1 DEMOLITION FLOOR PLAN - ELECTRICAL

0 2' 4' 8'

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



2 FLOOR PLAN - ELECTRICAL

0 2' 4' 8'

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

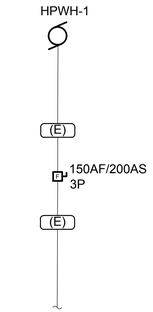
GENERAL SHEET NOTES

A. DRAWINGS INDICATE EXISTING CONDITIONS WHICH WERE TAKEN FROM RECORD DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF THESE CONDITIONS. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS.

⬡ SHEET KEYNOTES

1 DEMOLISH EXISTING 200A DISCONNECT SWITCH. ASSOCIATED UPSTREAM FEEDER TO REMAIN FOR CONNECTION TO NEW DISCONNECT. ASSOCIATED DOWNSTREAM FEEDER TO REMAIN FOR CONNECT TO NEW HEAT PUMP.

2 PROVIDE 150AF/200AS AS FUSED DISCONNECT. RECONNECT EXISTING UPSTREAM AND DOWNSTREAM FEEDERS.



3 SINGLE LINE POWER DISTRIBUTION DIAGRAM

NO SCALE

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

ITEM	DESCRIPTION	LOCATION	VOLTS / PHASE	LOAD	MCA	MOCP	WIRE / CONDUIT	CIRCUIT	NOTES
HPWH-1	HEAT PUMP		208/3	103.2 FLA	129	150	-	-	1

GENERAL MECHANICAL EQUIPMENT CONNECTION SCHEDULE NOTES

A. THE ABOVE INFORMATION IS FOR A SPECIFIC MANUFACTURER. ACTUAL MANUFACTURER FOR EQUIPMENT MAY BE DIFFERENT. COORDINATE WITH MECHANICAL EQUIPMENT SUBMITTALS FOR LOADS AND OVER CURRENT PROTECTION REQUIREMENTS PRIOR TO INSTALLATION OF WIRING.

B. MOCP = MAXIMUM OVER CURRENT PROTECTION
MCA = MINIMUM CIRCUIT AMPACITY

C. PROVIDE DISCONNECTING MEANS FOR EACH ITEM OF EQUIPMENT LISTED IN THE SCHEDULE ABOVE, EXCEPT AS SPECIFICALLY NOTED OTHERWISE IN SCHEDULE NOTES, BELOW.

MECHANICAL EQUIPMENT CONNECTION SCHEDULE NOTES

1 UTILIZE EXISTING FEEDER.

WIRE / CONDUIT SCHEDULE

INTERFACE ENGINEERING

1003 Bishop Street
Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

JESSE E. A. FINES
LICENSED PROFESSIONAL ENGINEER
18862E
HAWAII U.S.A.

EXPIRES: 4/30/22

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "SUPERVISION OF CONSTRUCTION" AS DEFINED UNDER SECTION 16-82-2 OF CHAPTER 82; RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND LAND SURVEYORS: STATE OF HAWAII.)

INTERFACE ENGINEERING
PROJECT 2020-0453
CONTACT Scott Sato
1003 Bishop Street, Suite 750
Honolulu, HI 96813
TEL 808.445.9169
www.interfaceengineering.com

LEAHI HOSPITAL - SINCLAIR HEAT PUMP REPLACEMENT

3675 KILAUEA AVE, HONOLULU, HI, 96816
TMK: 3-2-031:001

SHEET TITLE
FLOOR PLANS & DIAGRAMS - ELECTRICAL

REVISIONS

DRAWN BY

CHECKED BY

JOB NO. 2020-0453

DATE 01-10-2022

SHEET NUMBER

E3.01