REQUEST FOR PROPOSALS
(COMPETITIVE SEALED PROPOSALS)

New Clinical Laboratory

RFP No:
26-0178

for

Hawaii Health Systems Corporation
West Hawaii Region
Kona Community Hospital

Yvonne S. Taylor, Contracts
79-1019 Haukapila Street
Kealakekua, HI 96750
Telephone: (808) 365-2415
Email: WHRContractsMgmt@hhsc.org
http://www.kch.hhsc.org/Procurement
An Agency of the State of Hawaii

Date: December 2, 2025

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SECTION 1 ADMINISTRATION

1.0 INTRODUCTION

HHSC invites proposals from qualified and experienced licensed general contractors to perform improvements on the ground floor of the Kona Community Hospital (KCH). The project involves renovation of an old Maintenance Space to a new Clinical Laboratory. See Section 01100 – Summary of Work for a more detailed description.

This Request for Proposals (hereinafter "RFP") is issued by the Hawaii Health Systems Corporation West Hawaii Region Kona Community Hospital (hereinafter "HHSC"), a public body corporate and politic and an instrumentality and Agency of the State of Hawaii. This solicitation is governed by the applicable provisions of Hawaii Revised Statutes ("HRS") and implementing policies. All procedures and processes will be in accordance with applicable HRS Chapters including, but not limited to, 323F. To the extent this solicitation contains any terms or provisions inconsistent with applicable HRS Chapters and implementing policies, the statutes and the policies will control.

Thank you for your interest in submitting a proposal for this solicitation. The rationale for this competitive sealed RFP is to promote and ensure the fairest, most efficient means to obtain the **most qualified contractor** to HHSC, i.e. the proposal offering the greatest overall combination of quality of work and service and pricing. Hereinafter, organizations interested in submitting a proposal in response to this RFP shall be referred to as "OFFEROR".

As an offeror, you are expected to submit proposals that are accurate, complete, and contain all terms and conditions which you feel are necessary. If, after submitting your proposal, you find changes are necessary, you may change or withdraw your proposal any time up to the time of the proposal opening. However, after the opening, the proposal may not be changed or altered in any way.

In order for HHSC to evaluate OFFEROR'S response in a timely manner, please thoroughly read this RFP and follow instructions as presented.

1.1 RFP TIMETABLE

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

No.	Activity	Planned Date
1.	RFP Public Announcement	**December 3, 2025**
1A	Pre-Proposal Conference at Kona Community Hospital Tour of Hospital Facilities. Reservation form (Appendix G) and signed Confidentiality Agreement (Appendix H) must be received no later than 12:00pm HST Tuesday, December 9, 2025 This meeting IS mandatory for all Offerors. See Appendix F for Agenda.	**Thursday, December 11** **12:00 pm – 1:30 pm HST**
2.	Closing Date for Receipt of Questions	**Tuesday, December 16** **12:00pm HST**
3.	Addendum for HHSC Response to OFFEROR's Questions	**Monday, December 22**
4.	**Closing Date for Receipt of Proposals**	**Thursday, January 8** **10:00am HST**
5.	Mandatory Requirements Evaluation	**Thursday, January 8**
6.	Proposal Evaluations	**Tuesday, January 13**
7.	Proposal Discussions (optional)	
8.	Best and Final Offers (optional)	
9.	Contractor Selection/Award Notification (on/about)	**January 14**
10.	Contract Execution Period	**January 19 - 23**
11.	Contract Tentative Award Date	**January 23**

Figure 1. Procurement Schedule

1.2 AUTHORITY

This RFP is issued under the provisions of the applicable Hawaii Revised Statutes (HRS). All OFFERORS are charged with presumptive knowledge of all requirements of the cited authorities. Submission of a valid executed proposal by any OFFEROR shall constitute admission of such knowledge on the part of such OFFEROR.

1.2.1 RFP ORGANIZATION

This RFP is organized into five 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: **PROPOSALS**
Describes the required format and content for submission of a proposal.

SECTION 4: **EVALUATION**
describes how proposals will be evaluated and lists the "value weight percentages" of the evaluation categories.

SECTION 5: **AWARD OF CONTRACT**
Describes procedures for selection and award of contract.

1.3 REGIONAL CHIEF EXECUTIVE OFFICER (RCEO)

The RCEO for HHSC West Hawaii Region, or designee, is authorized to execute any and all Agreements (Contracts), resulting from this RFP.

The RCEO for this RFP is:

Clayton R. McGhan
West Hawaii Region
Hawaii Health Systems Corporation
79-1019 Haukapila Street
Kealakekua, HI 96750

Figure 2. RCEO – Regional Chief Executive Officer

1.4 DESIGNATED OFFICIALS

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

1.4.1 ISSUING OFFICER

The Issuing Officer and her designee are responsible for administrating/facilitating all requirements of the RFP solicitation process and are the **only points of contact** for OFFEROR from date of public announcement of the RFP until the selection of the successful OFFEROR. The Senior Issuing Officer will also serve as the Senior Contract Manager responsible for contractual actions throughout the term of the contract. The Issuing Officers are:

Yvonne S. Taylor, Sr. Contracts Manager
West Hawaii Region
Email WHRContractsMgmt@hhsc.org
Direct (808) 365-2415

AND

Loretta Buasriyottiya, Office Asst V (designee)
Email WHRContractsMgmt@hhsc.org
Direct (808) 322-6992

Figure 3. Issuing Officer

1.5 HHSC ORGANIZATIONAL INFORMATION

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 oversees the operation of nine public health facilities throughout the Hawaiian Island chain, including Oahu, Kauai and Hawaii. In addition to the nine HHSC facilities, Kahuku Medical Center, Hawaii Health Systems Foundation, and Alii Community Care are wholly owned subsidiaries.

HHSC is organized into five 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, and is the only acute care provider on the Islands of Maui and Lanai. In fiscal year 2009, HHSC had a total of 3,892 full time employees, operating 1,260 licensed beds, located on five different islands, with approximately 22,378 in-patient admissions.

HHSC West Hawaii Region has two hospitals: Kohala Hospital and Kona Community Hospital.

Kona Community Hospital is a 94-bed full-service acute care hospital with 24-hour emergency services, proudly serving the West Hawaii community. For nearly 100 years Kona Community Hospital has been caring for the people of West Hawaii. Adding more and more services, Kona Community Hospital has constantly improved our abilities to serve our residents and visitors whenever they are in need.

The Kona Community Hospital staff includes over 400 highly skilled employees and 100 medical staff practitioners, many who have been with our hospital for over 20 years. Along with our professional and experienced staff, Kona Community Hospital has many volunteers and affiliates that support our hospital. Kona Community Hospital also is one of the largest employers in West Hawaii.

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

Relevant 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 Figure 1 in order to generate an official answer. All written questions will receive an official written response from HHSC and become addenda to the RFP.

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

Responses by HHSC shall be due to the OFFEROR no later than the dates for initial questions and final questions stipulated in Figure 1.

Impromptu, un-written questions are permitted and verbal answers may be provided during pre-proposal conferences and other occasions, but are only intended as general direction and will not represent the official HHSC position and/or represent a modification in the design or specifications. The only official position of HHSC is that which is stated in writing and issued in the RFP 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 relevant questions to:

Email: WHRContractsMgmt@hhsc.org

Figure 4. Contact for Relevant Questions

1.8 RFP REVIEW

OFFEROR should carefully review this RFP for defects and questionable or objectionable matter. Comments concerning RFP's defects and questionable or objectionable matter, including requests to revise the General or Special Conditions, must be made in writing and should be received by the Issuing Officer, Yvonne Taylor, no later than the "Closing Date for Receipt of Questions" as identified in Figure 1. This will allow issuance of any necessary amendments to the RFP.

1.9 RFP AMENDMENTS

HHSC reserves the right to amend the RFP any time prior to the ending date for the proposal evaluation period. RFP Amendments will be in the form of addenda and posted on the KCH Procurement website and well as electronically mailed to all bidders who have requested a RFP package.

1.10 CANCELLATION OF RFP

The RFP may be canceled at any time for any reason when it is determined to be in the best interests of HHSC.

1.11 GRIEVANCE

It is the policy of the West Hawaii Region to work cooperatively with all vendors to the end of fair and fiscally sound procurement decisions. In the event a vendor or prospective vendor feels that a procurement decision has been made or is about to be made that is not in accordance with applicable law or policies, the vendor is encouraged to proceed as follows:

Request a debriefing in writing by the Issuing Officer.

If the debriefing does not satisfy the vendor, a meeting may be requested with the Issuing Officer who may invite others to participate as needed.

If the Issuing Officer does not resolve the issue, the vendor may request a meeting with the RCEO. The RCEO is the last recourse for disputes relating to procurement decisions and all decisions made by the RCEO shall be final.

A grievance based upon the content of the RFP shall be submitted in writing within five (5) working days **after** the aggrieved individual/business knows or should have known of the facts; provided further that the grievance shall not be considered unless it is submitted in writing prior to and not later than the "Closing Date for Receipt of Questions" identified in Figure 1.

Such grievances 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 on the Kona Community Hospital website:

http://www.kch.hhsc.org/Procurement/

Figure 5. Website for all Procurement Activities

2.0 SCOPE OF SERVICES

PROJECT PARAMETERS and SCOPE OF SERVICES

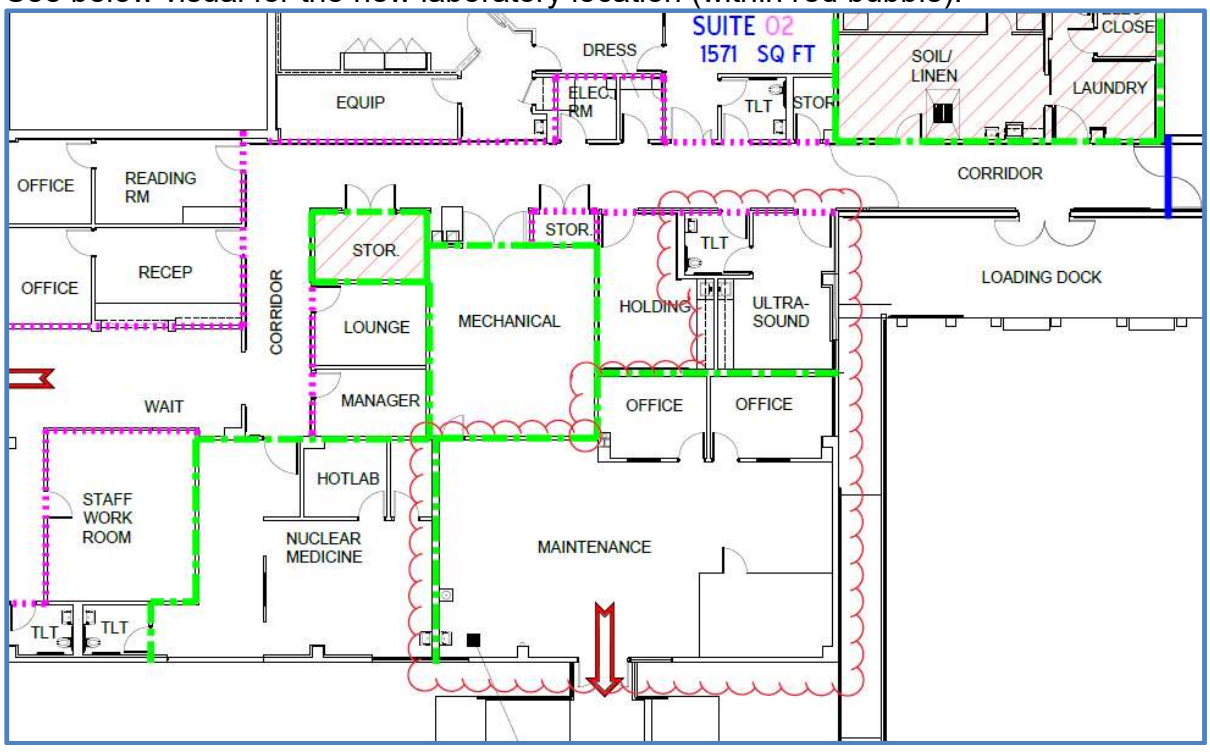
KCH is renovating a space that was previously used as an Ultrasound Room and the Maintenance Department. Once renovations are complete, the space as identified by the red bubble in the graphic below will be leased to an independent laboratory services company. Spaces within the red bubble that will be renovated are: Toilet, Ultrasound, 2 offices and Maintenance.

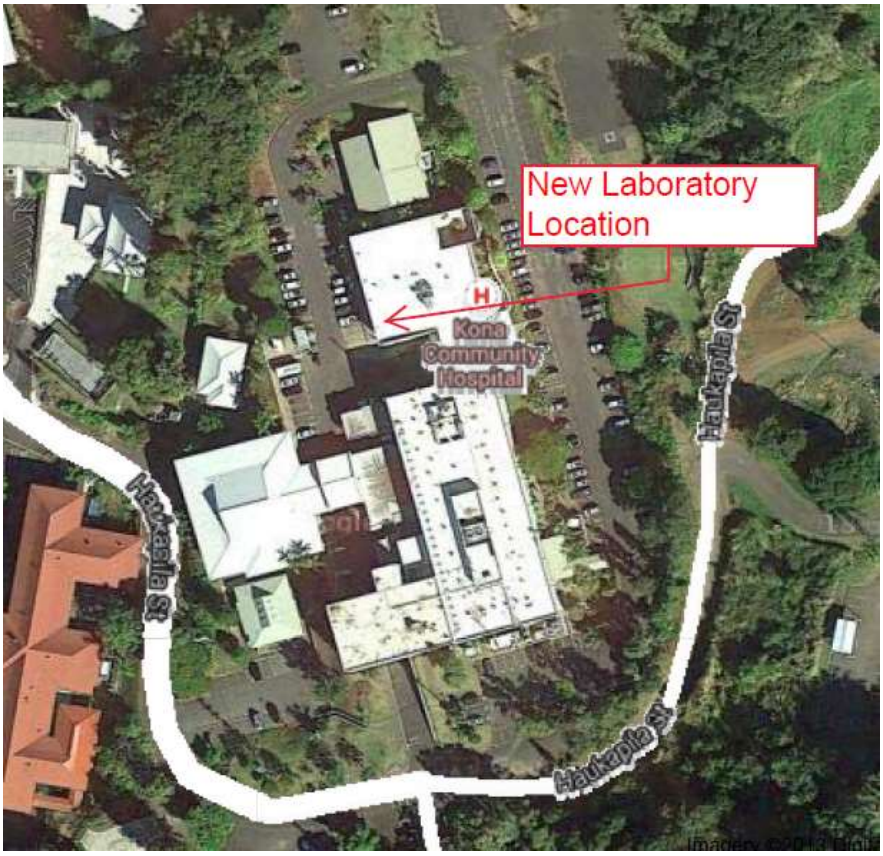
For the duration of the project, the hospital will be in full operation, however access to the space will be directly from the outside so patient interruptions should be minimal.

See Specificaton Section 01100 – Summary of Work for a description of the project.

As a part of infection control requirements, responsibilities of the CONTRACTOR are identified in Appendix L. The requirements as written, may not be all-inclusive so it is imperative for KCH and CONTRACTOR to discuss the site specific requirements.

See below visual for the new laboratory location (within red bubble).




New Laboratory Location
H
Kona Community Hospital
Haukapila St
Haukapila St
Haukapila St


entrance

A specification manual and engineered drawings are provided for this project in Appendices J and K.

All work, including mold remediation, if required, must be performed in accordance with all applicable federal, state and local codes and laws.

The Contractor represents that, prior to submitting a response to this Request for Proposal, they have carefully reviewed the enclosed documents and inspected the site of the proposed work. In addition, they are fully informed of the conditions under which the work is to be performed. The Contractor further represents that they have satisfied themselves to the actual conditions of the premises, existing construction, actual elevations site logistics, local code restrictions, and any other conditions affecting the completion of the intended work. It being hereby understood and agreed that no considerations will be allowed subsequently to the Contractor's submission of their response to the Request for Proposal by reason of error, or oversight, on the part of the Contractor or, on account of, interference by other Contractor's activities. The Contractor's Proposal shall include, as a minimum, the following Scope of Services. **The following scope items are intended to clarify, but not limit, the Request for Proposal:**

1. Contractor shall manage, with his own personnel and qualified subcontractors, all construction work required for the construction, and refurbishment in accordance with the Contract Documents prepared by the Architect and its Engineer's. It is the intent of this Request for Proposal to contract with a General Contractor who will provide "above" industry standard construction services as referenced in this Request for Proposal.

2. Rubbish removal will be the Contractor's responsibility. Rubbish removal must be completed at the end of every construction day. Worksite shall be, at a minimum, broom cleaned on a daily basis. It is imperative that the Contractor maintain a clean and efficient worksite. KCH shall provide dumpsters, both regular rubbish and metal waste. Please notify Construction Supervisor when dumpster is nearly full so pick up can be arranged. Dumpsters shall be located near the maintenance building, exact location to be agreed up by both KCH and Contractor. Contractor will be required to transport rubbish from the job site to the dumpsters.

3. Contractor shall visit the site to verify that he has familiarized himself with the jobsite regarding staging, site and building access, existing conditions, etc.

4. The Contractor shall maintain a detailed and accurate accounting system that shall be necessary for the proper financial management of the project. Contractor's records and receipts shall allow for ready identification of all charges included in subcontracts, purchase orders, change orders, invoices

and Application for Payments. The Owner shall have the right to audit, at any time, all the Contractors records related to this project and the work. Waiver of lien documents shall be provided for all subcontractor/suppliers and tier subcontract/suppliers.

5. Contractor shall keep the Construction Supervisor advised and copied on all communications with the Architect, Architect's consultants, other consultants or vendors contracted by the Owner for this specific project.

6. Contractor shall communicate with the Construction Supervisor, Architect and Architects' consultants utilizing telephone, email, file storage/sharing for issue tracking, submittal tracking, cost tracking, requests for information, etc..

7. Contractor shall utilize the preferred route and procedures for the removal of construction debris and shall coordinate all necessary additional clean-up as part of construction operations, such that the building corridors, elevators, stairwells and common areas are maintained free from accumulations of waste material, rubbish and debris.

8. Contractor shall maintain a detailed and accurate shop drawing and product submittal control system for the project. The system shall be updated on a regular basis and reported to the Construction Supervisor, Architect, Engineer and other applicable consultants for coordination at all appropriate meetings. The schedule responsibility is that of the Contractor and negligence in coordinating the shop drawing process does not relieve Contractor from its contractual obligation to meet the Substantial Completion deadline.

9. The Contractor shall provide the following services as part of their proposed scope of services:

Pre-Construction Phase

1. Ensure that each employee who will spend more than ten (10) hours per week on the jobsite inside the SSB has completed all requirements contained in the Contractor Guidelines Handbook (Appendix L) at least two (2) weeks before he/she is permitted to start work on the project. **Employees who have not completed all requirements will not be allowed on the project site.**

2. Verify with Construction Supervisor the proper sequence of work.

3. Work with Architect and/or building department for permitting issues. After the building permit has been approved, the Contractor shall pick it up. The building permit fee will be paid for by the Owner.

4. Commit sub-contractors.

5. Finalize construction schedule and present to HHSC for approval.

6. Obtain performance and payment bonds. Provide original to Contracts Department within thirty (30) days of execution of Agreement.

7. Obtain required levels and types of insurance. Provide copies to the Contracts Department within thirty (30) days of execution of Agreement.

8. Submit infection control plan for KCH's approval. For questions or assistance, please contact Lisa Downing, Infection Control Officer at ldowning@hhsc.org or 808/322-4478.

9. Preview OFCI equipment, if any, to ensure all items are on-site.

10. Preview OFOI equipment, if any, to ensure that the Contractor is aware of the intended installation locations, and if required, that rough-ins and/or blocking is provided.

11. Any other work required to ensure a successful project and as required by applicable laws.

Construction Phase

1. Construction

a) Provide, coordinate and supervise all construction work for the project. Verify that materials furnished, and work performed meet all plans, specifications and applicable code and regulatory requirements.

b) Regulate and control all subcontractors.

c) Coordinate all subcontractors to ensure that the project schedule is met.

d) Develop and implement a quality control system for all General Contractor activities.

e) Coordinate and review for compliance all shop drawings and items submitted by subcontractors prior to submission to the Architect. Establish and maintain on site a complete file of all shop drawings and items submitted.

f) Coordinate with Construction Supervisor as necessary to provide coordination with trades, job schedules, storage, deliveries, etc. and ensure Owner's project completion dates are on schedule.

g) Conduct weekly Owner Architect Contractor ("OAC") meetings with the team members, prepare meeting agenda and distribute meeting minutes

following each meeting. It is understood that most OAC meetings will occur via video conference unless determined otherwise.

h) KCH standard working hours are Monday through Friday 7:00am through 3:30pm.

2. Accounting and Cost Control Systems

a) Prepare a schedule of values for all areas of work. The Contractor may submit the schedule of values using the AIA G703 Continuation Sheet.

b) Review all progress payments and make recommendations for approval to Construction Supervisor.

c) Submit invoices monthly using the AIA G702 – Application and Certificate for Payment and the AIA G703 Continuaton Sheet to the Owner and Architect. Review all changes proposed by Owner and/or the Architect and make recommendations regarding their practicality, cost and impact on the schedule.

d) Receive and review all change order requests from subcontractors and prepare independent take-offs to evaluate each subcontractor requests.

e) Construction Supervisor must review and approve each change order in writing.

f) Hawaii law requires all State and County construction projects greater than $2,000.00 to pay prevailing wages to laborers and mechanics on the project jobsite and file certified payrolls with the contracting agency (KCH). The CONTRACTOR is responsible for complying with all requirements and rules regarding the State of Hawaii Wage Rate Schedule (http://labor.hawaii.gov/rs/home/wages/72-2/). Not complying with the prevailing wage requirements will result in KCH immediately shutting down the jobsite until the CONTRACTOR is in full compliance.

g) Weekly certified payroll reports certifying the hourly rate of wage of each worker for both CONTRACTOR and SUB-CONTRACTORS must be submitted to KCH in a timely and consistent manner. Submit reports to Loretta Buasriyottiya, lbuasriyottiya@hhsc.org in the Contracts department.

Post Construction

1. Coordinate the punch list walk through date with the Owner and Architect. Prepare an initial punch list and furnish the punch list to the Owner and Architect for review. The Architect, its Engineer's and the Owner will also prepare a punch list(s). The Architect will combine the punch lists into a comprehensive punch list. The Contractor shall ensure that all items on the comprehensive punch list are completed on a timely basis, no later than

thirty (30) days after project acceptance unless otherwise agreed upon by both parties in writing.

2. Assemble a binder(s) containing all guarantees, warranties, operation and maintenance manuals and other similar materials as required, and deliver all such documents to Owner with certificates that they are complete. Provide digital copies of all documents as required and/or requested on a flash drive. All items shall be provided to KCH within thirty (30) days of project acceptance.

3. Coordinate and expedite the preparation of subcontractor care and maintenance manuals and deliver all such manuals to Owner with a certificate of completion within thirty (30) days of project acceptance

4. Receive and verify all releases of claims required prior to issuance of final certificates of completion and payment to subcontractors.

5. Coordinate the preparation of as-built drawings of the entire project including architectural and engineering drawings and provide to HHSC. Completed as-built drawings shall be provided to KCH within thirty (30) days of project acceptance.

6. Provide evidence that all bulding permit related matters have been closed.

7. If a Certificate of Occupancy is required, provide the Certificate(s) as applicable.

Items listed above in this section are not all-inclusive and it is expected that the CONTRACTOR know and perform all appropriate activities at the appropriate times during the renovation process.

Any questions or clarifications the CONTRACTOR may have shall be brought to the Construction Supervisor's attention in a timely manner so as to not delay the progress of the project.

Additional specifics regarding the Scope of Services may be discussed at the Pre-Bid meeting and documented in writing via Addendum to the RFP. ***The Pre-Bid meeting is mandatory for all OFFERORS.***

SECTION 3 PROPOSALS

3.0 INTRODUCTION

One of the objectives of the RFP is to make proposal preparation easy and efficient, while giving OFFEROR ample opportunity to highlight their proposal. When an OFFEROR submits a proposal, it shall be considered a complete plan for accomplishing the requirements described in this RFP.

3.1 PROPOSAL PREPARATION

OFFEROR shall prepare a written proposal in accordance with requirements of this Section. Proposals shall include all data and information requested to qualify proposals for evaluation and consideration for award. Non-compliance may be deemed sufficient cause for disqualification of a proposal. Examples of Non-Compliance are, but not limited to, quoting non-approved alternates or not submitting Sub Contractor information. The development of overly elaborate proposals and presentation material, not required and/or related to RFP requirements, is HIGHLY DISCOURAGED. Emailed proposals must contain pages for the mandatory tabs, as stated below in section 3.1.1 so different sections can be identified easily.

3.1.1 MANDATORY PROPOSAL TABS

The following tabs must be used in the OFFEROR's proposal:

Mandatory Tabs	
1.	PROPOSAL TRANSMITTAL COVER LETTER
2.	TECHNICAL SECTION
	SUMMARY
	MANDATORY QUESTIONS
3.	PRICE (USE BID PROPOSAL FORM SECTION 00400)
	REQUIREMENTS (see section 3.9)
4.	REQUIRED DOCUMENTATION/COMPLIANCE DOCUMENTS
	CERTIFICATE OF VENDOR COMPLIANCE (CURRENT WITHIN LAST 30 DAYS)
	W-9
	VENDOR TERMS AND CONDITIONS (if any)
	CONFIDENTIALITY AGREEMENT (Appendix H)
	GENERAL EXCISE LICENSE (copy)
	GENERAL CONTRACTOR LICENSE (copy)
	LETTER FROM SURETY COMMITTING TO PROVIDE PAYMENT AND PERFORMANCE BOND
5.	PROPOSAL SUBMISSION CHECKLIST

Figure 6. Mandatory Proposal Tabs

Relevant material should be placed in the appropriate tabbed area. Greyed in areas in the Mandatory Proposal Tabs (Figure 6) indicate category titles and separate sections. Inapplicable material or material placed in the incorrect tabbed area may not be evaluated.

3.2 COSTS FOR PROPOSAL PREPARATION

Any and all costs incurred in the development of proposals, i.e. preparing and submitting, on-site product/service demonstrations, on-site visits, oral presentations, travel and lodging, etc. shall be the sole responsibility of OFFEROR.

3.3 DISQUALIFICATION OF PROPOSALS

HHSC reserves the right to consider as acceptable only those proposals submitted in accordance with all requirements set forth in the RFP and which demonstrate an understanding of the Scope of Services. HHSC reserves the right to ask for clarification of any item in the proposal.

An OFFEROR will be disqualified and the proposal automatically rejected for any one or more of the following reasons:

Proof of collusion among OFFERORS, in which case all proposals involved in the collusive action will be rejected.

The OFFEROR'S lack of responsibility and cooperation as shown by past work or services.

The proposal shows any noncompliance with applicable law.

The proposal is conditional, incomplete, or irregular in such a way as to make the proposal incomplete, indefinite, or ambiguous as to its meaning.

The proposal has any provision reserving the right to accept or reject award, or to enter into a contract pursuant to an award, or provisions contrary to those required in the solicitation.

Proof of exclusion 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.

3.4 SUBMISSION OF PROPOSALS

Each OFFEROR may submit only one (1) proposal (response). Alternate proposals will not be accepted. The Issuing Officer must receive one (1) proposal via electronic mail no later than the "Closing Date for Receipt of Proposals", identified in Figure 1. **Proposals received after this time/date may be rejected.**

Proposals transmitted via email shall have the following information in the subject line:

Proposal for RFP #26-0178
New Clinical Laboratory _YOUR COMPANY NAME

3.5 PROPOSAL TRANSMITTAL COVER LETTER

OFFEROR is required to submit proposal with a transmittal cover letter. The transmittal cover letter must be on the OFFEROR'S official business letterhead; signed by an individual authorized to legally bind the OFFEROR and minimally include information, as written/requested, on the "sample" letter in APPENDIX A.

3.6 PUBLIC INSPECTION

Proposals shall not be opened publicly, but shall be opened in the presence of two or more procurement officials. The register of proposals and OFFERORS' proposals shall be open to public inspection after the contract is executed by all parties, subject to the nondisclosure provisions of HRS Chapter 92F.

OFFEROR shall request in writing the nondisclosure of designated trade secrets or other proprietary data to be confidential. Such data shall accompany the proposal and shall be readily separable from the proposal in order to facilitate eventual public inspection of the non-confidential portion of the proposal. The proposals are subject to disclosure rules set forth in Chapter 92F, H.R.S. The OFFEROR bears the burden of establishing that the designated data is exempted from the disclosure requirements set forth in Chapter 92F.

All proposals and other material submitted by OFFEROR become the property of HHSC and may be returned only at HHSC's option.

3.7 TECHNICAL SECTION

Any proposal offering a significantly non-compliant Technical Section may be disqualified without further notice.

The Technical Section is comprised of all contractor, sub-contractor and project details (Appendix E will be completed by OFFEROR) with the exception of pricing and should include the following categories:

3.7.1 SUMMARY

Clearly, concisely and briefly summarize and highlight the contents of the technical proposal in such a way to provide HHSC with a broad understanding and the unique, most promising aspects of the proposal. Summary should not exceed 1 page in length.

3.7.2 *THIS SECTION IS DELETED.*

3.7.3 MANDATORY QUESTIONS

See Appendix E (Mandatory Questions) and insert the questions and answers in this section.

3.7.4 PERSONNEL

See Appendix I (Subcontractor Table) and insert the completed form in this section.

3.8 PRICE PROPOSAL

Provide price summary and details. Use the Bid Form in Section 00400 in the Specificatons.

3.8.1 PRICE

Price shall be a fixed fee for all work described in the drawing and specification package identified under Appendices J and K.

Any State of Hawaii funded projects over $50,000.00 are required to have contract performance and payment bonds, the costs of which shall be included in the Offeror's price proposal.

3.8.2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

The Time of Performance is the number of calendar days available to the Contractor to substantially complete the Work.

The date of commencement shall be identified in the Notice to Proceed. The Notice to Proceed will be issued by the Owner.

Subject to adjustments of the Time of Performance as provided in the Contract Document, the Contractor shall provide KCH with a project schedule, within thirty (30) days of contract award, for approval by KCH.

3.8.3 REQUIREMENTS

A. **Non Applicable Requirements.** Excluding HHSC General and Special Terms and Conditions, and any objectionable or defective RFP matters, if any proposal requirement, as described in this Section, is not applicable to the OFFEROR and therefore will/cannot be provided, list what the requirement(s) are and why the requirement(s) are not applicable.

B. **Non Acceptance of any RFP Requirement.** If any RFP requirement, as described in this RFP, is not acceptable to the OFFEROR, list what the requirement(s) are and why the requirement(s) are not acceptable. Should you have an alternate solution submit it.

C. **HHSC Furnished Items.** If the OFFEROR's proposal requires any goods, services, equipment, third-party vendor support, or anything of value to be provided by HHSC, these items must be clearly detailed and stated in the OFFEROR's proposal.

HHSC reserves the right to consider as acceptable only those proposals submitted in accordance with all requirements set forth in the RFP.

3.9 REQUIRED DOCUMENTATION/COMPLIANCE DOCUMENTS

In addition to the requirements outlined in this RFP, OFFEROR must submit the following documentation with response:

A. CERTIFICATE OF VENDOR COMPLIANCE (CURRENT WITHIN LAST 30 DAYS)
B. W9
C. VENDOR TERM'S AND CONDITIONS (IF ANY)
D. CONFIDENTIALITY AGREEMENT (APPENDIX H)
E. GENERAL EXCISE LICENSE (*COPY*)
F. GENERAL CONTRACTOR'S LICENSE (*COPY*)
G. LETTER FROM SURETY COMMITTING TO PROVIDE PERFORMANCE & PAYMENT BONDS

3.10 PROPOSAL SUBMISSION CHECKLIST

The proposal submission checklist is provided by HHSC and is designed to be used as a tool to ensure that all required documents and information are being submitted with OFFEROR's proposal. HHSC recommends the OFFEROR go through the checklist before submitting the response. The proposal submission checklist is in Appendix B and is required to be returned as a part of your RFP response.

SECTION 4 EVALUATIONS

4.0 INTRODUCTION

The evaluation of proposals shall be conducted comprehensively, fairly, and impartially. Structural, quantitative scoring techniques will be utilized to maximize the objectivity of the evaluation.

4.1 PROPOSAL EVALUATION COMMITTEE

An evaluation committee will be selected from HHSC to perform all evaluation requirements. The committee will be composed of individuals with experience in, knowledge of, and program responsibility for the requirements identified in the RFP. HHSC reserves the right to request information from OFFEROR to clarify the OFFEROR's proposal.

4.2 EVALUATION PHASES

Evaluation phases will be conducted as follows:

Phase	Phase Description
Phase 1	Evaluation of Mandatory Requirements
Phase 2	Technical Section Evaluation
Phase 3	Determination of Short List of Offerors (optional)
Phase 4	Proposal Discussions by Short-List (optional)
Phase 5	Best and Final Offers by Short List (optional)
Phase 6	Recommendation for Contract Award

Figure 7. Proposal Evaluation Phases

4.2.1 PHASE 1 EVALUATION OF MANDATORY REQUIREMENTS

The evaluation of the mandatory requirements, as listed below, shall be based upon a "Pass/ No Pass" basis. The purpose of this phase is to determine whether an OFFEROR's proposal is sufficiently responsible and responsive to RFP requirements to permit a complete evaluation, i.e. responsible in terms of "Does the OFFEROR have the capability to perform fully the Scope of Services requirements"; and, "Were proposal documents received by HHSC and do they contain the required information?" Failure to meet any mandatory requirement will be grounds for deeming the proposal non-responsible, non-responsive or both and disqualification ("No Pass") thereof.

4.2.2 PHASE 2 TECHNICAL SECTION EVALUATION

Evaluation of OFFEROR'S technical section shall be conducted using the technical section categories and the value weight percentages identified in Paragraph 4.3 and the evaluation scoring system identified in Paragraph 4.4.

4.2.3 PHASE 3 DETERMINATION OF SHORT-LISTED OFFERORS (OPTIONAL)

At its discretion, following Phase 1 and 2, HHSC may develop a Short List of OFFERORs based on the evaluation of OFFERORS' Technical section.

4.2.4 PHASE 4 PROPOSAL DISCUSSIONS WITH SHORT-LISTED OFFERORS (OPTIONAL)

The OFFERORS on the Short List of OFFERORs may be asked to conduct discussions with HHSC. OFFEROR's proposal may be accepted without discussions. In the event that HHSC elects to hold discussions, HHSC shall inform Short-Listed OFFERORS of specific discussion topics and issues; and schedule the discussion.

4.2.5 PHASE 5 BEST AND FINAL OFFERS (OPTIONAL)

OFFEROR(s) may be requested to submit a Best and Final offer. Best and Final offers shall be evaluated and scoring of the OFFEROR's proposal adjusted, accordingly. If a Best and Final offer is requested but not submitted, the original submittal shall be accepted as the Best and Final offer.

4.2.6 PHASE 6 RECOMMENDATION FOR CONTRACT AWARD

The Evaluation Committee shall prepare a report summarizing proposal evaluation findings/rankings and provide recommendation for award of contract to the RCEO.

4.3 EVALUATION CATEGORIES AND VALUE WEIGHT PERCENTAGES

The following Evaluation Categories and Value Weight Percentages shall be used:

Value Weight Percentages	Points	Evaluation Category
Pass/No Pass	N/A	MANDATORY REQUIREMENTS. Category includes:
		PROPOSAL TRANSMITTAL COVER LETTER
		REQUIRED DOCUMENTATION/COMPLIANCE DOCUMENTS PROVIDED
		REQUIRED QTY OF ORIGINAL AND COPIES
50%	50	TECHNICAL APPROACH. Category includes:
		SUMMARY
		MANDATORY QUESTIONS
40%	40	PRICE. Category includes:
		SUMMARY AND DETAILS
10%	10	COMPLIANCE WITH REQUIREMENTS. Category includes:
		NON APPLICABLE PROPOSAL REQUIREMENT
		NON ACCEPTANCE OF ANY RFP REQUIREMENT
		HHSC FURNISHED ITEMS
		PROPOSAL WAS COMPLETED IN ACCORDANCE WITH RFP REQUIREMENTS

Figure 8. Evaluation Categories and Value Weight Percentages

4.4 EVALUATION SCORING SYSTEM

The maximum number of points available for scoring is one hundred (100) per evaluator. The proposal receiving the highest cumulative number of points is considered statistically the best proposal to HHSC; and will be recommended for award of contract, unless otherwise determined and justified by the evaluation committee.

Each Evaluation Committee Member shall review OFFEROR proposals that pass Phase 1 Evaluation of Mandatory Requirements. The Evaluation Committee Members shall determine the score for each Evaluation Category for each OFFEROR in accordance with Figure 11. The OFFEROR'S total score will be the sum of all scores by all evaluators.

SECTION 5 AWARD OF CONTRACT

5.0 AWARD OF CONTRACT

Award of contract shall be made to the most responsible and responsive OFFEROR whose proposal is determined by the Evaluation Committee to provide the best value to HHSC, considering all evaluation reviews and results.

5.1 CONTRACT AWARD NOTIFICATION

The notice of award, if any, resulting from this solicitation shall be posted on the Kona Community Hospital website: http://www.kch.hhsc.org/Procurement/. This will serve as the official notification to all OFFERORS. In addition, the Issuing Officer will inform the successful OFFEROR of contract award selection by an official "notice of award" letter.

At its discretion and as a courtesy to the OFFEROR the Issuing Officer may issue a "Notice of Posting of Award" or "Notice of Non-Award" to the unsuccessful OFFERORS. However a delay in issuing the notice or the inadvertent omission of such courtesy notice will not extend the grievance filing time.

5.2 CONTRACT AWARD DEBRIEFING

If requested by unsuccessful OFFEROR, HHSC shall provide a contract award debriefing. The purpose of a debriefing is to inform the non-selected OFFEROR of the basis for the source selection decision and contract award. A written request to the Issuing Officer for a debriefing shall be made within three (3) working days after receipt of non-award letter from HHSC and/or posting of the award of the contract.

5.2.1 CONTRACT DOCUMENT

The contract will be awarded by executing an "Agreement for Goods or Services Based Upon Competitive Sealed Proposals" (hereinafter "CONTRACT") by HHSC and the successful OFFEROR (hereinafter "CONTRACTOR"). This document will serve as the official, legal contractual instrument between both parties. This document will incorporate (by attachments or reference) the RFP, with any and all addendums; 1999 INTERIM GENERAL CONDITIONS and any SPECIAL CONDITIONS; and the CONTRACTOR's accepted proposal, with any and all addendums, changes, negotiated agreements, all of which becomes part and whole of the CONTRACT.

A "sample" CONTRACT is located as Appendix C. **DO NOT complete or execute the "sample" CONTRACT.**

5.2.2 GENERAL EXCISE/USE TAX

Work to be performed under this solicitation is a business activity taxable under Chapter 237, Hawaii Revised Statutes (HRS), and Chapter 238, HRS, where applicable. Both out-of-state and Hawaii CONTRACTOR are advised that the gross receipts derived from this solicitation are subject to the general excise tax imposed by Chapter 237, HRS, and where applicable to tangible property imported into the State of Hawaii for resale, subject to the use tax imposed by Chapter 28, HRS.

Pursuant to Section 237-9, HRS, the CONTRACTOR is required to obtain and/or possess a valid General Excise Tax License from the Hawaii State Department of Taxation (DOTAX) prior to executing a contractual agreement with a State Agency (Reference the GENERAL CONDITIONS - NON-PHYSICIAN HEALTHCARE SERVICES, APPENDIX D).

The General Excise Tax License shall be obtained from the DOTAX offices in the State of Hawaii or the DOTAX Web Site and by mail or FAX.

5.3 CONTRACT EXECUTION

Upon receipt of the CONTRACT document, the CONTRACTOR shall have five (5) business days to execute and return the CONTRACT to the Issuing Officer. A copy of the fully executed CONTRACT will be provided the CONTRACTOR within five (5) business days of CONTRACT execution.

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

5.4 CONTRACT COMMENCEMENT DATE

No work is to be undertaken by the CONTRACTOR prior to the commencement date specified in the **Fully Executed Contract**. HHSC is not liable for any work, contract, costs, expenses, loss of profits, or any damages whatsoever incurred by the CONTRACTOR prior to the official, notice to proceed "Commencement" date stated in the **Fully Executed Contract**.

APPENDIX A

SAMPLE PROPOSAL TRANSMITTAL COVER LETTER

Dear Yvonne Taylor:

(Name of Business) proposes to provide any and all goods and services as set forth in the "Request for Proposals for Competitive Sealed Proposals" to provide **"Kona Community Hospital – New Clinical Laboratory, RFP # HHSC 26-0178**, for which fees/costs have been set. The fees/costs offered herein shall apply for (Please insert applicable period of time) .

It is understood and agreed that (Name of Business) have read HHSC's Scope of Services described in the RFP and that this proposal is made in accordance with the provisions of such Scope of Services. By signing this proposal, (Name of Business) guarantees and certifies that all items included in this proposal meet or exceed any and all such Scope of Services.

(Name of Business) agrees, if awarded the contract, to provide the goods and services set forth in the RFP; and comply with all terms and conditions indicated in the RFP; and at the fees/costs set forth in this proposal. The following individual(s) may be contacted regarding this proposal:

_____

_____

Other information:

Business Phone #:		Federal Tax ID #:	
Facsimile #:		Hawaii GET Lic. ID #:	
E-mail address:			

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

Other (Specify) _____

State of Incorporation is: (Specify) _____

The exact legal name of the business under which the contract, if awarded, shall be executed is (must match W9):

_____

(Authorized Bidder's Signature, Printed Name/Title)

APPENDIX B

PROPOSAL SUBMISSION CHECKLIST

***IF SPECIFIC ITEM(S) IS NOT APPLICABLE, MARK WITH "N/A"---DO NOT LEAVE BLANK.**

Please Check Off OFFEROR Submitted	HHSC Use	Proposal Items
	☐	Proposal Received "On-Time"
☐	☐	One (1) Original & Three (3)Copies of Proposals or one (1) e-mail
☐	☐	Proposal Transmittal Cover Letter:
☐	☐	i. Official Business Letterhead
☐	☐	ii. Authorized Signature
☐	☐	iii. Required Information
☐	☐	Technical Proposal
☐	☐	i. Summary
☐	☐	ii. Mandatory Questions
☐	☐	Price
☐	☐	i. Summary and Offer (Bid Proposal Form Section 00400)
☐	☐	ii. Non Applicable Proposal Requirement(s)
☐	☐	iii. Non Acceptance of any RFP Requirement(s)
☐	☐	iv. HHSC Furnished Items
☐	☐	Required Documentation/Compliance Documents
☐	☐	i. Certificate of Vendor Compliance (current within last 30 days)
☐	☐	ii. W-9
☐	☐	iii. Vendor's terms and conditions (if any)
☐	☐	iv. Confidentiality Agreement
☐	☐	v. General Excise License (copy)
☐	☐	vi. General Contractor's License (copy)
☐	☐	vii. Surety Company's letter of commitment
☐	☐	Proposal Submission Checklist

APPENDIX C

SAMPLE

HAWAII HEALTH SYSTEMS CORPORATION
AGREEMENT FOR GOODS OR SERVICES
BASED UPON
COMPETITIVE SEALED PROPOSALS

AGREEMENT #: SAMPLE

SAMPLE

THIS AGREEMENT, executed on the respective dates of the signatures of the parties shown hereafter, is effective as of **xxx** , between **Kona Community Hospital**, a division of **Hawaii Health Systems Corporation** (hereinafter "HHSC"), by its Regional Chief Executive Officer, (hereinafter "CEO"), whose address is 79-1019 Haukapila Street, Kealakekua, HI 96750, and **[___CONTRACTOR NAME___]** (hereinafter "CONTRACTOR"), a **sole proprietor**, under the laws of the State of **Hawaii**, whose business address is **[___CONTRACTOR ADDRESS___]** and FEIN No **[___CONTRACTOR FEIN___]**.

RECITALS

A. The HHSC is in need of the goods or services, or both, described in this Agreement and its attachments.

B. The HHSC has issued a request for competitive proposals, and has received and reviewed proposals submitted in response to the request.

C. The CONTRACTOR has been identified as the responsible and responsive OFFEROR whose proposal is the most advantageous for the HHSC, taking into consideration price and the evaluation factors set forth in the request.

SAMPLE

D. The HHSC desires to retain and engage the CONTRACTOR to provide the goods or services, or both, as the case may be, and the CONTRACTOR is agreeable to providing said goods or services, or both.

NOW, THEREFORE, in consideration of the promises contained in this Agreement, the HHSC and the CONTRACTOR agree as follows:

1. **SCOPE OF SERVICES.** The CONTRACTOR shall, in a proper and satisfactory manner as determined by the HHSC, provide all the goods set forth in **Attachment 1 Scope of Services**.

2. **TIME OF PERFORMANCE.** The performance required of the CONTRACTOR under this Agreement shall be executed in accordance with the time period set forth in the **Attachment 2 Time of Performance**, which is made a part of this Agreement.

3. **COMPENSATION.** The CONTRACTOR shall be compensated for services performed under this Agreement pursuant to the provisions as set forth in **Attachment 3 Compensation**, which is hereby made a part of this Agreement..

4. **BONDS.** The CONTRACTOR ☒(is) or ☐(is not) required to provide a performance bond.

5. **STANDARDS OF CONDUCT DECLARATION.** The Standards of Conduct Declaration of the CONTRACTOR is attached and is made a part of this Agreement.

6. **OTHER TERMS AND CONDITIONS.** The General Conditions and any Special Conditions are attached hereto and made a part of this Agreement (or, Any Special Conditions are attached hereto and made a part of this Agreement). In the event of a conflict between the General Conditions and the Special Conditions, the Special Conditions shall control. In the event of a conflict among the documents, the order of

SAMPLE

precedence shall be as follows: (1) Agreement, including all attachments and addenda; (2) Request, including all attachments and addenda; and (3) Proposal.

7. LIQUIDATED DAMAGES. Liquidated damages are applicable.

The Contract with the successful Offeror will require that it be mutually understood and agreed between the parties to the Contract that time shall be an essential part of the Contractor to complete the Contract within the time specified and agreed upon, the Owners will be damaged thereby; and the amount of said damage being difficult, if not impossible, of definite ascertainment and proof, shall be estimated, agreed upon, and fixed at the sum of One Thousand Dollars ($500.00) for each and every calendar day the Contractor shall delay in the completion of the Contract after the date specified in the contract for the completion of the work; and the Contractor shall agree to pay the Owner as liquidated damages and not by way of penalty such total sum as shall be due for such delay, computed as aforesaid, and this sum shall be deducted from any payment due or to become due to the Contractor.

8. TECHNICAL REPRESENTATIVE. The Technical Representative shall have the right to oversee the successful completion of contract requirements, including monitoring, coordinating and assessing performance; and, approving completed work/services with verification of same on invoices. The Technical Representative also serves as the point of contact for the CONTRACTOR for "Technical" matters (non-contractual) from award to contract completion. The Technical Representative is:

Mr. Robert Hollandsworth, Bldg Operations Manager
Kona Community Hospital
79-1019 Haukapila Street
Kealakekua, HI 96750
Telephone 808-322-4555
Email: rhollandsworth@hhsc.org

SAMPLE

9. **NOTICES.** Any written notice required to be given by any party to this Agreement shall be (a) delivered personally, or (b) sent by United States first class mail, postage prepaid. Notice required to be given to the CEO shall be sent to: **Kona Community Hospital, 79-1019 Haukapila Street, Kealakekua, HI 96750**. Notice to the CONTRACTOR shall be sent to the CONTRACTOR'S address as indicated in this Agreement. A notice shall be deemed to have been received three (3) days after mailing or at the time or actual receipt, whichever is earlier. The CONTRACTOR is responsible for notifying the HHSC in writing of any change of address.

SAMPLE

IN VIEW OF THE ABOVE, the parties execute this Agreement by their signatures, on the dates below, to be effective as of the date first above written.

HHSC

SIGNATURE: _____

PRINTED NAME: _____

TITLE: Regional CEO, West Hawaii Region

DATE: _____

CONTRACTOR * [___CONTRACTOR NAME___]

SIGNATURE: _____

PRINTED NAME: _____

TITLE: _____

DATE: _____

SAMPLE

STANDARDS OF CONDUCT DECLARATION

For the purposes of this declaration:

"Controlling interest" means an interest in a business or other undertaking which is sufficient in fact to control, whether the interest is greater or less than fifty percent (50%).

"Employee" means any nominated, appointed, or elected officer or employee of the State or HHSC, including members of boards, commissions, and committees, and employees under contract to the State or of the constitutional convention, but excluding legislators, delegates to the constitutional convention, justices, and judges.

On behalf of **[CONTRACTOR NAME]**, CONTRACTOR, the undersigned does declare, under penalty of perjury, as follows:

1. CONTRACTOR ☐ IS or ☐ IS NOT a legislator or an employee or a business in which a legislator or an employee has a controlling interest.*

2. CONTRACTOR has not been assisted or represented by a legislator or employee for a fee or other compensation to obtain this Agreement and will not be assisted or represented by a legislator or employee for a fee or other compensation in the performance of the Agreement, if the legislator or employee had been involved in the development or award of the Agreement.

3. CONTRACTOR has not been assisted or represented for a fee or other compensation in the award of this Agreement by a State or HHSC employee or, in the case of the Legislature, by a legislator.

4. CONTRACTOR has not been represented or assisted personally on matters related to the Agreement by a person who has been an employee of the State or HHSC within the preceding two (2) years and who participated while in state office or employment on the matter with which the Agreement is directly concerned.

5. CONTRACTOR has not been represented or assisted on matters related to this Agreement, for a fee or other consideration by an individual who, within the past twelve (12) months, has been a State or HHSC employee, or in the case of the Legislature, a legislator.

6. CONTRACTOR has not been represented or assisted in the award of this Agreement for a fee or other consideration by an individual who, 1) within the past twelve (12) months, served as a State or HHSC employee or in the case of the Legislature, a legislator, and b) participated while an employee or legislator on matters related to this Agreement.

CONTRACTOR understands that the Agreement to which this document is attached is voidable on behalf of the State or HHSC if this Agreement was entered into in violation of any provision of chapter 84, Hawaii Revised Statutes, commonly referred to as the Code of Ethics, including the provisions which are the source of the declarations above. Additionally, any fee, compensation, gift, or profit received by any person as a result of a violation of the Code of Ethics may be recovered by the State or HHSC.

CONTRACTOR

SIGNATURE: _____

Print Name: _____

Title: _____

Date: _____

SAMPLE

ATTACHMENT 1

PROJECT PARAMETERS and SCOPE OF SERVICES

Final Scope of Services will be included in the contract.

SAMPLE

ATTACHMENT 2

TIME OF PERFORMANCE

1. The CONTRACTOR shall provide the services required under this Agreement for a period from **XX** to and including **XX**, unless sooner terminated or extended as provided.

-OPTIONAL-

2. **OPTION TO EXTEND:** The TIME OF PERFORMANCE of this Agreement may be extended for XX ( ) additional XX ( ) month intervals, subject to mutual written agreement between HHSC and the CONTRACTOR, prior to the end of the current contract period. A Supplemental Agreement will be executed by the CONTRACTOR and HHSC to exercise extensions.

SAMPLE

COMPENSATION AND PAYMENT SCHEDULE

In full consideration for the services to be performed by the CONTRACTOR under this Agreement, the HHSC agrees, subject to appropriation and allotments, to pay to the CONTRACTOR a total sum of money not to exceed **XXX AND NO/100 DOLLARS ($XXX.00)** including all applicable taxes and expenses incurred, and in accordance with the following:

Item	Price
Materials and all labor	$
Permit(s) and inspections*	$
GE Tax 4.712%*	$
Performance and Payment Bonds*	$
Subtotal	$
Contingency (includes taxes)	$
GRAND TOTAL**	**$**
*The price is an estimate. Item to be billed at actual cost.	

The CONTRACTOR shall submit monthly progress invoices for approval and payment to the Hospital's "Technical Representative(s)" in accordance with provisions of section 8.4 of the State of Hawaii 1999 Interim General Conditions. Invoices shall reference the Agreement number and include, at a minimum, an itemized account of all compensation due.

SAMPLE

A. Total Contract Award. This Total Sum shall include any and all taxes, shipping and handling and other miscellaneous costs to complete the work required in the Scope of Services.

B. Invoicing Schedule. Contractor shall invoice Hospital in accordance with the following:

1. This is a Fixed Price Agreement.
2. The contractor is paid according to monthly progress invoices.
3. Travel costs are not allowable.
4. If the not-to-exceed value is insufficient to complete all phases of the Project, Hospital may, at their sole discretion, issue a separate agreement in accordance with their procurement policies for the remainder of the work or complete the work with Hospital personnel.
5. HHSC will work with the CONTRACTOR to determine a reasonable construction schedule, milestone schedule and completion date.

C. Payment Guidelines

6. Company shall provide W-9 and Certificate of Insurance upon Contract Award.
7. **The Contract Number (XX-XXXX) and Payment Milestone Number must appear on every Invoice.**
8. The "Invoice To" must be "Kona Community Hospital".
9. The "Remit To" name on your invoice must match your company name as you are registered with the State of Hawaii and the name stated in Contract.
10. If the "Remit To" address on the invoice is different from the address stated on the face of the Contract, we must state the "Remit To" address in Contract.
11. Invoice shall be transmitted (electronically is preferred) to:

Robert Hollandsworth
Kona Community Hospital
79-1019 Haukapila Street
Kealakekua, HI 96750
Telephone 808-322-4555
Email: rhollandsworth@hhsc.org

****** If your invoice does not contain your contract number, it may be rejected and payment delayed. ******

SAMPLE

APPENDIX D

1999 DAGS INTERIM GENERAL CONDITIONS

LOCATED AT: HTTPS://KCH.HHSC.ORG/PROCUREMENT/

(NOT PHYSICALLY ATTACHED TO RFP
BUT WILL BE ATTACHED TO AGREEMENT)

APPENDIX E

MANDATORY QUESTIONS

See following pages.

APPENDIX E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	3.7.3 A. Background, Qualifications and Experience	
	Provide a brief description of Company's qualifications to perform the Scope of Services requirements.	
	Does your company have previous experience working with Healthcare facilities in the past 3 years? If yes, provide details of applicable projects.	
	Does your company have previous experience working in a fully functioning hospital? Please explain.	
	Does your company have experience with the following healthcare procedures and/or policies:	
	- Infection Control	
	- Fire Safety	
	- Containment & Temporary Barriers	
	- Means of Egress	
	Does your company have any letters of recommendations that can be submitted as a part of this RFP? If yes, please include.	
	How long has your company been in business?	
	Have you ever operated under another business name? If yes, please list the name(s) and date(s).	
	What state is your company incorporated in?	
	How many employees does your company employ? Direct employees only.	

APPENDIX E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	What is the shortest timeframe an employee has worked with you and what is the longest?	
	In what types of projects do you specialize?	
	What sets you or your company apart from your competitors?	
	What does your company offer its employees by way of job education?	
	What is the longest amount of down-time your company experienced between jobs and why?	
	Have you, individually or as a part of your company, ever failed to complete any construction project? If yes, explain why.	
	Identification of litigation currently impacting the Company, if any. State “NONE”, if none.	
	Identification of any fines or violations received in the past 3 years relative to safety and environmental issues. State “NONE”, if none.	
	State your Experience Modification Rate (EMR). This can be obtained from your insurance company.	
	Have you had any legal action brought against you as the result of work you have performed? If yes, why, and what was the outcome?	
	Have you or any of your company’s ever declared bankruptcy?	
	How will you identify which sub-contractors to work on this Project?	

APPENDIX E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	Describe your Company's warranty program.	
	Describe your project close-out process.	
	Is your company bondable for 100% of the project cost for both performance and payment?	Yes or No
	B. Project Management	
	How much lead-time does your company need to begin dedicating resources to this project once the contract is signed?	
	Will there be a supervisor on site or will the project be managed from a different location?	
	- Supervisor must be knowledgeable in all aspects of managing a construction site. Site Supervisor must be able to communicate from the site via electronic means.	
	Conflicts between Company and KCH may occur from time to time during this project; how do you anticipate mitigating disagreements as well as resolving them?	
	Do you have a project management plan to ensure cost-effective, efficient and timely performance of all project tasks? If yes, please describe. If not,	
	How do you track and manage questions, resolutions, decisions, directions and other information matters throughout your projects?	
	Does your company have a West Hawaii office? If not, will you be willing to discuss partnering with a locally based general contractor?	

APPENDIX E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	How many projects will your company have occurring at the same time as this project?	
	- If multiple projects, how will your company successfully manage all projects at the same time?	
	How many outstanding bids does your company have at this time?	
	In order to execute the project by the agreed upon completion date, what will you require of HHSC? What do you see as HHSC's responsibilities?	
	Submit a detailed yet approximate project timeline. A separate sheet inserted behind the mandatory questions may be used if necessary.	
	What steps will your company take to execute the project in a cost-effective, efficient and timely manner?	
	How familiar are you with special requirements for Hospital construction? State the concerns applicable to this project and how OFFEROR proposes to minimize risk associated with the concerns.	
	Provide an overview of your plan to achieve and maintain negative air pressure in active work areas throughout the project.	
	What potential project risks or issues are anticipated and how will they be addressed in order to minimize risk?	
	C. Financial	
	What is your company's legal structure?	

APPENDIX E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	What is your OH&P percentage for this project?	
	How is OH&P calculated?	
	How do you calculate OH&P on additive and deductive change orders?	
	How do you ensure your subcontractors are providing fair pricing?	
	What is your Company's bonding capacity?	
	If it is determined some work must be performed on off-work or weekend, how will the upcharge be computed with this being a fixed fee agreement?	
	Do you bill monthly or according to milestones? Please explain in detail your billing method as well deposit requirements, if any.	
	Do you see any opportunities for value engineering the project? If yes, please identify.	
	D. References	
	Provide a brief description of three (3) past and/or present contracts demonstrating Company's qualifications, experience and performance with regard to performance of the Scope of Services requirements. Include customer name, contact name, email address and telephone number.	
	If KCH was to contact any of your subcontractors for a reference, what do you think they would tell us about your company and your projects?	
	Who are your top 3 material suppliers?	

APPENDIX E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	- Are your accounts in good standing? If not, why?	
	Why should KCH hire your company to perform the requirements of this project?	
	Is there any additional information that might be valuable to KCH in determining which company to award the Laboratory project?	

APPENDIX F

AGENDA FOR PRE-PROPOSAL CONFERENCE WITH TOUR OF HOSPITAL FACILITIES

General Information		
Date	**Thursday, December 11, 2025**	
Location	Kona Community Hospital **Special Services Building, Conference Room 2 (CR2), then job walk** 79-1019 Haukapila Street Kealakekua, HI 96750 Map is below	
Point of Contact	Contracts Management Yvonne Taylor, Sr. Contracts Manager West Hawaii Region Email whrcontractsmgmt@hhsc.org Direct (808) 365-2415 OR	Contracts Management Loretta Buasriyottiya West Hawaii Region Email whrcontractsmgmt@hhsc.org Direct (808) 322-6992
Agenda		
11:50 am - 12:00 pm	Meet in front of the Special Services Building	
12:00 pm to 12:45 am	Briefing, project overview and questions in CR2	
12:45 pm to 1:30 pm	Project site tour	



Map of Kona Community Hospital

APPENDIX G

RFP CONFERENCE RESERVATION FORM

Submit completed forms to Issuing Officer by 12:00PM HST Tuesday, December 9, 2025.

Conference Information	
RFP No:	HHSC 26-0178
RFP Title:	Kona Community Hospital – New Clinical Laboratory
	December 11, 2025, 12:00 pm – 1:30pm HST

OFFEROR Information		
Business Name		
Street Address		
City		
State		Zip code

Priority	Attendee Name, Title	Email Address	Role in Procurement	Will Attend Meeting & Hospital Tour
1				☐
2				☐

Due to space constraints and to avoid disruption to Hospital operations, it is necessary to limit the number of attendees to two per company. Please limit Hospital Tour participants to those individuals that have a need to view the work areas in order to prepare the OFFEROR's proposal.

An executed Confidentiality Agreement (Appendix H) is necessary to participate in Hospital Tour.

Please bring a copy of the RFP and drawings with you to the meeting.

PLEASE SUBMIT RESERVATION FORM AND SIGNED CONFIDENTITALITY AGREEMENT AT LEAST 24 HOURS PRIOR TO THE MEETING

APPENDIX H

MANDATORY HOSPITAL TOUR CONFIDENTIALITY AGREEMENT

I understand that while attending the hospital tour, I may hear patients discussing their health information and I may see someone I know. I understand that I cannot disclose this confidential information to friends, relatives, co-workers or anyone else.

If I violate this agreement, I may be subject to adverse action up to and including termination of my ability to work at Kona Community Hospital. In addition, under applicable law, I may be subject to criminal or civil penalties.

I have read and understand the above and agree to be bound by it.

OFFEROR

Name: _____

Title: _____

Company: _____

Signature: _____

Date: _____

[THE REMAINDER OF THIS PAGE IS LEFT BLANK INTENTIONALLY.]

APPENDIX I

SUBCONTRACTOR TABLE

*Any changes with your subcontractor must be requested in writing to the Hospital Technical Representative prior to starting that phase of work.

TRADE	COMPANY NAME	COMPANY ADDRESS	LICENSE NUMBER	YEARS IN BUSINESS

APPENDIX J

DRAWINGS

See following pages

STATE OF HAWAII
HAWAII HEALTH SYSTEMS CORPORATION
KONA COMMUNITY HOSPITAL

NEW CLINICAL LAB & MISCELLANEOUS ALTERATIONS

KEALAKEKUA, HAWAII
TMK: 7-9-010: 081

PROJECT DATA

PROJECT SITE INFORMATION:

OWNER:	HAWAII HEALTH SYSTEMS CORP
PROPERTY OWNER:	HAWAII HEALTH SYSTEMS CORP
PROPERTY ADDRESS:	79-1019 HAUKAPILA STREET KEALAKEKUA, HAWAII 96750
TAX MAP KEY:	(3) 7-9-010:081
LOT AREA:	12.075 ACRES 525,987 SF

LAND USE INFORMATION:

ZONING:	RS-15 RESIDENTIAL
FRONT YARD:	25 FEET
REAR YARD:	25 FEET
SIDE YARD:	15 FEET
HEIGHT LIMIT:	35 FEET
FLOOD ZONE:	ZONE X
SMA:	NOT IN SMA
HISTORIC REGISTER:	NOT IN HISTORIC REGISTER
SPECIAL DISTRICT:	NOT IN SPECIAL DISTRICT
STATE LAND USE:	U - URBAN
PROPOSED USE:	MEDICAL CLINIC
EXISTING USE:	MAINTENANCE AREA

PARKING & LOADING: NO CHANGE

CODES & STANDARDS:

2018 INTERNATIONAL BUILDING CODE
AS AMENDED BY THE STATE OF HAWAII
2018 INTERNATIONAL EXISITING BUILDING CODE
AS AMENDED BY THE STATE OF HAWAII
2018 UNIFORM PLUMBING CODE
2012 NFPA
2017 NATIONAL ELECTRIC CODE
2010 ADA STANDARDS FOR ACCESSIBLE DESIGN
2014 FACILITY GUIDELINES INSTITUTE
2013 GUIDELINES FOR LABORATORY DESIGN

2018 IBC WIND LOADS:

1.	RISK CATEGORY:	III
2.	WINDSPEED:	150 VMPH
3.	OPENING PROTECTION:	OPENINGS REMAINING AS EXISTING. NO RETROFIT REQUIRED ACCORDING TO EBC 2018 SEC 503.1

IBC 2018 DATA:

OCCUPANCY GROUP:	B
TYPE OF CONSTRUCTION:	IIA
ALLOWABLE AREA(S):	37,500
ALLOWABLE HEIGHT:	5 STORIES
NO. OF STORIES	2

FLOOR AREA CALCULATIONS:

SPACE	AREA (SF)	OCC LOAD FACTOR	NO. OF OCC (SF/OCC)
CLINICAL LAB	1677	100	16.77

TOTAL AREA: 1,677

LOT COVERAGE:	AREA (SF)
BUILDING:	21,150
PERCENTAGE OF LOT COVERAGE;	4.00%

SCOPE OF WORK:

RENOVATION OF AN EXISTINGN MAINTENANCE SPACE, OFFICE, COPY, AND ULTRASOUND ROOM TO A NEW CLINICAL LABORATORY

SPECIAL INSPECTION:

CONCRETE REINFORCING STEEL & FORMWORK ANCHOR BOLTS (RODS) IN CONCRETE. EPOXY ANCHORS & DOWELS.

INDEX TO DRAWINGS

SHT NO	DWG NO	SHEET DESCRIPTION
1.	T-001	TITLE SHEET - INDEX TO DRAWINGS, PROJECT DATA, VICINITY & LOCATION MAP, CONSULTANT LIST, APPROVALS, & IECC COMPLIANCE
2.	A-001	ABBREVIATIONS, PLAN SYMBOLS, & DRAWING SYMBOLS
3.	A-002	GENERAL NOTES, ADA MOUNTING HEIGHTS, & ACCESSIBILITY NOTES
4.	A-003	SIGN SCHEDULE & DETAILS
5.	A-004	PARTITION TYPES
6.	A-100	OVERALL SITE PLAN
7.	A-101	OVERALL FLOOR PLAN & LIFE SAFETY PLAN
8.	A-110	DEMOLITION FLOOR PLAN
9.	A-111	DEMOLITION REFLECTED CEILING PLAN
10.	A-120	REPAIR FLOOR PLAN
11.	A-121	REPAIR BENCH FLOOR PLAN & BENCH SCHEDULE
12.	A-122	REPAIR EQUIPMENT PLAN & EQUIPMENT & FINISH SCHEDULE
13.	A-123	REPAIR REFLECTED CEILING PLAN
14.	A-201	EXTERIOR & INTERIOR ELEVATIONS
15.	A-202	INTERIOR ELEVATIONS
16.	A-301	WALL SECTIONS
17.	A-501	DOOR & LOUVER SCHEDULE, TYPES, & DETAILS
18.	A-502	DETAILS
19.	S-001	STRUCTURAL NOTES
20.	S-002	STRUCTURAL NOTES AND ABBREVIATIONS
21.	S-101	CONC REPAIR PLAN - LABORATORY
22.	S-201	DETAILS
23.	M01	LEGEND ABBREVIATIONS NOTES
24.	M02	MECHANICAL NOTES
25.	M03	PARTIAL FORMER MAINTENANCE DEMOLITION MECHANICAL PLAN
26.	M04	PARTIAL FORMER MAINTENANCE DEMOLITION MECHANICAL PLAN
27.	M05	PARTIAL FORMER MAINTENANCE DEMOLITION REHEAT PLAN
28.	M06	PARTIAL FORMER MAINTENANCE DEMOLITION PLUMBING PLAN
29.	M07	PARTIAL LABORATORY MECHANICAL PLAN
30.	M08	PARTIAL LABORATORY REHEAT PLAN
31.	M09	PARTIAL LABORATORY PLUMBING PLAN
32.	M10	DETAILS
33.	M11	DETAILS
34.	M12	MECHANICAL EQUIPMENT SCHEDULE & DDC SYSTEM POINTS LIST
35.	M13	CHILLED WATER PIPING DIAGRAM
36.	M14	REHEAT WATER PIPING DIAGRAM
37.	M15	WATER PIPING DIAGRAM - LABORATORY
38.	M16	SANITARY PIPING DIAGRAM - LABORATORY
39.	F01	FIRE PROTECTION NOTES, LEGEND, & ABBREVIATIONS
40.	F02	PARTIAL FORMER MAINTENANCE DEMOLITION FIRE PROTECTION PLAN
41.	F03	PARTIAL LABORATORY FIRE PROTECTION PLAN
42.	F04	FIRE PROTECTION DETAILS
43.	E-001	ELECTRICAL SYMBOLS, IECC, & ABBREVIATIONS
44.	E-101	OVERALL ELECTRICAL PLAN
45.	E-201	EXISTING/DEMOLITION POWER & LIGHTING PLANS - FORMER MAINT
46.	E-202	EXISTING/NEW POWER PLAN - LABORATORY
47.	E-203	EXISTING/NEW LIGHTING PLAN - LABORATORY
48.	E-301	ELECTRICAL ONE LINE DIAGRAM
49.	E-401	ELECTRICAL SCHEDULES

LIST OF CONSULTANTS

ARCHITECT
UCHIYAMA ERSKINE ARCHITECTS LLC
540 LAGOON DRIVE, SUITE 4
HONOLULU, HAWAII 96819

ELECTRICAL ENGINEER
ENGINEERING PARTNERS, INC
455 E LANIKAULA STREET
HILO, HAWAII 96720

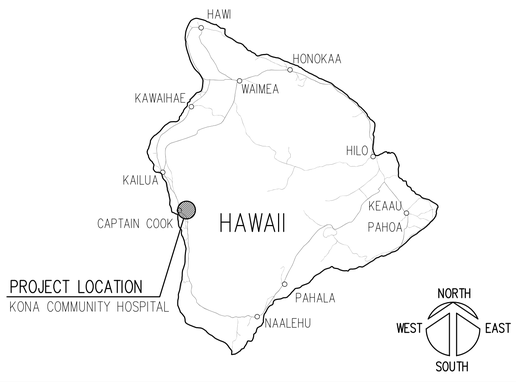
STRUCTURAL ENGINEER
ENGINEERING PARTNERS, INC
455 E LANIKAULA STREET
HILO, HAWAII 96720

MECHANICAL ENGINEER
THERMAL ENGINEERING CORPORATION
512 KALIHI STREET
HONOLULU, HAWAII 96819

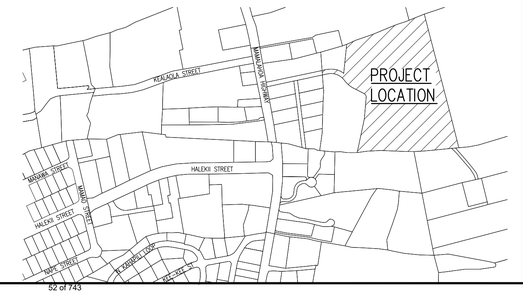
FIRE PROTECTION ENGINEER
THERMAL ENGINEERING CORPORATION
512 KALIHI STREET
HONOLULU, HAWAII 96819

ENVIRONMENTAL ENGINEER
ENVIROSERVICES & TRAINING CENTER, LLC
505 WARD AVENUE, SUITE 202
HONOLULU, HAWAII 96814

VICINITY MAP



LOCATION MAP



HAWAI'I COUNTY ENERGY CODE

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

COMMERCIAL BUILDING ENERGY EFFICIENCY STANDARDS

I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THIS PROJECTS DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE **COMMERCIAL PROVISIONS FOR BUILDING ENVELOPE COMPONENTS (C402)** OF THE 2018 IECC WITH AMENDMENTS PER HAR 3 -181.1:

COMPLIANCE METHOD
- ☒ 2018 IECC as amended. Mandatory & Prescriptive
- ☐ 2018 IECC as amended. Mandatory & Total Building Performance
- ☐ ASHRAE Standard 90.1-2013. Mandatory & Prescriptive
- ☐ ASHRAE Standard 90.1-2013. Mandatory & Energy Cost Budget Method

INFORMATION IN CONSTRUCTION DOCUMENTS	Yes	N/A
Roof insulation R-value	☐	☒
Roof insulation type and location	☐	☒
Roof membrane solar reflectance and thermal emittance	☐	☒
Wall insulation R-value	☒	☐
Wall insulation type and location	☒	☐
Window SHGC	☐	☒
Window U-factor	☐	☒
Skylight SHGC	☐	☒
Skylight U-factor	☐	☒

NOTES

WORK IS PRIMARILY INDOORS. THE ONLY EXTERIOR RELATED WORK ARE LOUVER REPLACEMENT, PARTIAL WALL INFILL, AND RELOCATION OF FUEL MONITOR DEVICE TO THE FUEL TANK. EXISTING EXTERIOR WINDOWS AND ROOF ARE TO REMAIN. THERE ARE NO SKYLIGHTS IN THIS PROJECT.

Signature: _____ Date: 10/17/2025 Stamp, Date & Two-Part Statement

Name: FRED K. ERSKINE
Title : PRESIDENT
License No. : 10192
Project Name: NEW CLINICAL LAB & MISCELLANEOUS ALTERATIONS
Project TMK: (7)-9-010: 081

HAWAII HEALTH SYSTEMS CORPORATION
Quality Healthcare for All

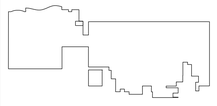
KONA COMMUNITY HOSPITAL
79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750
ADDRESS

CLINICAL LAB REDESIGN
FOR DIAGNOSTIC
LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:



FRED K. ERSKINE
LICENSED PROFESSIONAL ARCHITECT
No. 10192
HAWAII, U.S.A.

THIS LICENSE EXPIRES APRIL 30, 2026

SIGNATURE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115 OF THE HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS ENTITLED PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS).

BUILDING: -

DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		KMA
DATE:		OCTOBER 17, 2025
SCALE:		AS SHOWN
TITLE:		TITLE SHEET
NUMBER:		T-001

ABBREVIATIONS

ABV	ABOVE
AC	ASPHALT CONCRETE
A/C	AIR CONDITIONING
AD	AREA DRAIN
ADJ	ADJUSTABLE
AF	ACCESS FLOOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISH GRADE
AHU	AIR HANDING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AP	ACCESS PANEL
APRX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ASPH	ASPHALT
ASSY	ASSEMBLY
BD	BOARD
BEL	BELOW
BVL	BEVELED
BIT	BITUMINOUS
BKS	BACKSPLASH
BL	BUILDING LINE
BLDG	BUILDING
BM	BEAM
BOT	BOTTOM
BRG	BEARING
BS	BOTH SIDES
BTW	BETWEEN
BYD	BEYOND
C/C (CC)	CENTER TO CENTER
CAB	CABINET
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CJT	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
COMB	COMBINATION
CONC	CONCRETE
CONX	CONNECTION
CONST	CONSTRUCTION
CORR	CORRIDOR
CPT	CARPET
CRM	CONCRETE ROCK MASONRY
CSWK	CASEWORK
CT	CERAMIC TILE
CTR	CENTER
CTSK	COUNTERSINK
DBL	DOUBLE
DEMO	DEMOLITION
DF	DRINKING FOUNTAIN
DIAG	DIAGONAL
DIM	DIMENSION
DISP	DISPENSER
DIV	DIVISION
DN	DOWN
DP	DAMPPROOFING
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DWG(S)	DRAWING(S)
E	EAST
EA	EACH
ECO	EXISTING CLEAN OUT
EDS	EXISTING DOWNSPOUT
EF	EXHAUST FAN
EFD	EXISTING FLOOR DRAIN
EFG	ENTRANCE FOOT GRILLE
EFS	EXISTING FLOOR SINK
EXST, (E)	EXISTING
EG	EXISTING GRADE
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATION
ENCL	ENCLOSURE
EQ	EQUAL
EQPM	EQUIPMENT
ESEW	EMERGENCY SHOWER/EYE WASH
EWS	EYE WASH STATION
EWC	ELECTRIC WATER COOLER
EXH	EXHAUST
EXP	EXPOSED
EXPS	EXPANSION
EXT	EXTERIOR
FA	FIRE ALARM
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FFE	FURNITURE, FIXTURE & EQUIPMENT/ FINISH FLOOR ELEVATION
FFS	FINISH FLOOR SEPARATION
FP	FIRE PROTECTION
FIN	FINISH
FL	FLOOR
FLEX	FLEXIBLE
FLASH'G	FLASHING
FLRG	FLOORING
FOS	FACE OF STUD
FOW	FACE OF WALL
FPRF	FIREPROOF
FR	FRAME
FS	FLOOR SINK
FT	FOOT/FEET
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GL	GLASS
GR	GRADE
GYP	GYPSUM
HD	HEAD
HDW	HARDWARE
HDWD	HARDWOOD
HM	HOLLOW METAL
HNDRL	HANDRAIL
HORIZ	HORIZONTAL
HP	HIGH POINT
HGT	HEIGHT
HWH	HOT WATER HEATER
ID	INSIDE DIAMETER
IF	INSIDE FACE
IG	INSULATED GLASS
IN	INCHES
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
J.C.	JANITOR CLOSET
JT	JOINT
L	LEFT
LAM	LAMINATE(D)
LAV	LAVATORY
LH	LEFT HAND
LONG	LONGITUDINAL
LP	LOW POINT
LS	LINOLEUM SHEET
LT	LIGHT
LTG	LIGHTING
LVR	LOUVER
LVT	LUXURY VINYL TILE
MAT	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MET LKRS	METAL LOCKERS
MET RLG	METAL RAILING
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MOUNTING HEIGHT
MIN	MINIMUM
MISC	MISCELLANEOUS
MLDG	MOULDING
MLWK	MILL WORK
MNT	MOUNT/MOUNTED
MO	MASONRY OPENING
MS	METAL STUD
MR	METAL RAILING
MTG	MEETING
MTL (MET)	METAL
MULL	MULLION
N	NORTH
N/A	NOT APPLICABLE
NC	NO CHANGE
NIC	NOT IN CONTRACT
NO(#)	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
O/O	OUT TO OUT
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OD	OVERFLOW DRAIN
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFRD	OVERFLOW ROOF DRAIN
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OVERHEAD
OPNG (OPG)	OPENING
OPP	OPPOSITE
OPH	OPPOSITE HAND
ORD	OVERFLOW ROOF DRAIN
OS	ONE SIDE
OVHG	OVERHAND
OVS	OVERFLOW SCUPPER
PJ	PANEL JOINT
PL	PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLBG	PLUMBING
PNL	PANEL
POL	POLISHED
PR	PAIR
PREFAB	PREFABRICATED
PROJ	PROJECTED
PT	POINT
PNT	PAINT
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PVMT	PAVEMENT
QTY	QUANTITY
R	RISER
RAD	RADIUS
RAR	RETURN AIR REGISTER
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RDL	ROOF DRAIN LEADER
REC (R)	RECESSED
RECT	RECTANGULAR
REINF	REINFORCING
REMV	REMOVABLE
REQ'D	REQUIRED
REQMT(S)	REQUIREMENT(S)
REV	REVISION/REVISED
RFRG	REFRIGERATOR
RH	RIGHT HAND
RM	ROOM
RO	ROUGH OPENING
ROD	ROOF OVERFLOW DRAIN
ROOF'G	ROOFING
RT	RIGHT
S	SOUTH
SACP	SUSPENDED ACOUSTICAL CEILING PANEL
SAD	SUPPLY AIR DIFFUSER
SCD	SEE CIVIL DRAWINGS
SCHED	SCHEDULE
SCWD	SOLID CORE WOOD DOOR
SECT	SECTION
SESD	SEE ELECTRICAL/SECURITY DRAWINGS
SF	SQUARE FOOT
SH	SHELF/SHELVES
SHT	SHEET
SHWR	SHOWER
SIM	SIMILAR
SJ	SEISMIC JOINT
SLNT	SEALANT
SL	SLOPE OR SLOPED
SMD	SEE MECHANICAL DRAWINGS
SOG	SLAB ON GRADE
SPD	SEE PLUMBING DRAWINGS
SQ	SQUARE
SSD	SEE STRUCTURAL DRAWINGS
SST	STAINLESS STEEL
STAG	STAGGERED
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SVC	SERVICE
SYS	SYSTEM
T	TREAD
T&B	TOP AND BOTTOM
TBS	TO BE SELECTED
TEMP	TEMPERED
TEX	TEXTURE
THK	THICK
THRESH	THRESHOLD
THRU	THROUGH
TKB	TACKBOARD
TLT	TOILET
TOC	TOP OF CONCRETE
TOE	TOP OF EAVE
TOF	TOP OF FLOOR
TOM	TOP OF MASONRY
TOP	TOP OF PLATE
TOS	TOP OF SLAB/TOP OF STEEL
TOW	TOP OF WALL
TP	TOILET PARTITION
TPD	TOILET PAPER DISPENSER
TPP	TELE-POWER POLE
TR	TRASH RECEPTACLE
TRTD	TREATED
TS	TUBE STEEL OR THIN SET
TWF	THROUGH-WALL FLASHING
TYP	TYPICAL
UC	UNDER COUNTER
UGND	UNDERGROUND
UNEX	UNEXCAVATED
UNFIN	UNFINISHED
UON	UNLESS OTHERWISE NOTED
UR	URINAL
VCT	VINYL COMPOSITION TILE
VDU	VIDEO DISPLAY UNIT
VENT	VENTILATION
VERT	VERTICAL
VEST	VESTIBULE
VRC	VERTICAL RECIPROCATING CONVEYOR
VTR	VENT THRU ROOF
W	WEST
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WM	WATER MESH
WP	WATERPROOF
WPG	WATERPROOFING
WO	WHERE OCCURS
WR	WATER RESISTANT
WS	WOOD STUDS
WSHP	WATER SOURCE HEAT PUMP
YD	YARD

DRAWING SYMBOLS

ENLARGED PLANS — ENLARGED PLAN OR SECTION DETAIL AREA; X / A-X; DRAWING NUMBER LOCATION; SHEET NUMBER LOCATION

DETAILS — X / A-X; DRAWING NUMBER LOCATION; SHEET NUMBER LOCATION

ELEVATIONS/ SECTIONS — X / A-X; DRAWING NUMBER LOCATION; SHEET NUMBER LOCATION; DIRECTION OF ELEVATION

NORTH ARROW — NORTH; WEST; EAST; SOUTH

INTERIOR ELEVATION KEY — A; B; C; D; KEY TO INTER. ELEV.

COLUMN LINE — A; 1; LETTERS IN ONE DIRECTION; NUMBERS IN OTHER DIRECTION

CHANGE IN ELEVATION — X"; LEVEL CHANGE

WORK POINT, CONTROL POINT, DATUM POINT — F.F. ELEV. 00.00' (TYP.) UON

MATCHLINE — MATCHLINE; SEE 1/A-1 FOR PLAN CONT.

REVISION CLOUD — 1; REVISION NUMBER; REVISION SYMBOL

ROOM IDENTIFICATION — X; X; X; ROOM NAME; ROOM NUMBER OR CEILING HEIGHT (ON RELECTED CEILING PLAN); FLOOR OR CEILING FINISH

PHOTOGRAPH IDENTIFICATION — A; PHOTOGRAPH LOCATION LETTER; DIRECTION OF PHOTOGRAPH

DOOR — X; DOOR NUMBER; DOOR SYMBOL

WINDOW — X; WINDOW NUMBER; WINDOW SYMBOL

WALL TYPE — X; WALL TYPE NUMBER; WALL TYPE SYMBOL

SIGNAGE — X; SIGN NUMBER; SIGN SYMBOL

FINISH IDENTIFICATION — PT-1; FINISH NUMBER; FINISH SYMBOL

KEY NOTE — A; KEY NOTE NUMBER; KEY NOTE SYMBOL

CEILING HEIGHT — +8'-6"

TELE-POWER POLE — SIDE WHERE RECEPTACLE OCCURS

PLAN SYMBOLS

FLOOR	WALL MTD	CEILING MTD	DESCRIPTION
FD			FLOOR DRAIN
CO			CLEAN OUT
FS			FLOOR SINK
			TELE POWER POLE
			RECESSED ELECTRICAL PANEL
			SURFACE MOUNTED ELECTRICAL PANEL
			SURFACE MOUNTED LIGHT FIXTURE
			RECESSED LIGHT FIXTURE
			WALL SCONCE
			LAY-IN FLUORESCENT FIXTURE
			UNDER CABINET LIGHT FIXTURE
			EMERGENCY LIGHT FIXTURE
			ELECTRICAL PANEL
	N		NURSE'S CALL PULL STATION
	N	N	NURSE'S CALL LIGHT
	J	J	JUNCTION BOX
			EXHAUST FAN
			SUPPLY AIR DIFFUSER
			RETURN AIR REGISTER
			ACCESS PANEL
			SACP & GRID
			GYP BD CEILING
			LIGHT FIXTURE
			EXIT LIGHT, WALL MOUNTED W/ EMERGENCY LIGHTING
			FIRE SPRINKLER
	FE		WALL MTD FIRE EXTINGUISHER
			EXIT LT FIXT – ARROW INDICATE DIRECTION
	SD	SD	SMOKE DETECTOR
	FA		FIRE ALARM PULL STATION
	FA	FA	FIRE ALARM HORN/STROBE
	T		THERMOSTAT
	CR		CARD READER
	S	S	SPEAKER
	C	C	CAMERA
	FEC-SR		FEC-SR: FIRE EXTINGUISHER CAB – SEMI-RECESSED MTD
			1-HOUR FIRE RATED WALL
			SMOKE RATED WALL
			INDICATES LEAD LINED WALL
			INDICATES EXST TO BE DEMOLISHED
			INDICATES EXSTING TO REMAIN
			INDICATES NEW WORK
			SAWCUTTING/CONC SOG REMOVAL

HAWAII HEALTH SYSTEMS CORPORATION
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ADDRESS

CLINICAL LAB REDESIGN
FOR DIAGNOSTIC
LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:

FRED K. ERSKINE — LICENSED PROFESSIONAL ARCHITECT — No. 10192 — HAWAII, U.S.A.

THIS LICENSE EXPIRES APRIL 30, 2026

SIGNATURE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115 OF THE HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS ENTITLED PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS).

BUILDING: -

DRAWING	
PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	SEPTEMBER 16, 2025
SCALE:	AS SHOWN
TITLE:	ABBREVIATIONS, PLAN SYMBOLS, & DRAWING SYMBOLS
NUMBER:	A-001

GENERAL NOTES

1. ALL WORK SHOWN IS NEW UNLESS OTHERWISE NOTED.
2. SEE STRUCTURAL, MECHANICAL, FIRE PROTECTION, & ELECTRICAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.
3. ALL DIMENSIONS SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
4. ALL DIMENSIONS ARE TAKEN FROM THE FACE OF FIN. UNLESS OTHERWISE NOTED.
5. ALL WORK SHALL BE PERFORMED IN A MANNER THAT PROTECTS BUILDING OCCUPANTS, VISITORS, AND OTHER PROFESSIONS FROM EMISSION, NOISE, DUST, AND OTHER SOURCES OF INTERFERENCE. THE CONTRACTOR SHALL PROVIDE ADEQUATE VENTILATION DURING ALL WORK EMITTING FUMES AND ODORS SO AS NOT TO AFFECT ANY PERSON IN THE WORK AREA AND BUILDING IN GENERAL. INSTALL HARD BARRIER PER 2012 NFPA 241 SECTION 8.6.2 BETWEEN CONSTRUCTION AREA AND ADJACENT SPACES UNTIL CONSTRUCTION CLOSURE IS COMPLETE.
6. CONTRACTOR SHALL PREPARE & PAINT ALL NEW WORK & ALL OTHER AREAS DAMAGED AS A RESULT OF THE WORK, UON.
7. COMPLY WITH ALL APPLICABLE COUNTY OF HAWAII, STATE, AND FEDERAL LAWS, BUILDING CODES, THEIR ADDITIONS, ADDENDUMS, AND AMENDMENTS IN THE CONSTRUCTION OF THIS PROJECT.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, HAWAII ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.
9. WORKMANSHIP SHALL CONFORM TO THE STATE BUILDING CODE. HOWEVER, WHERE REFERENCE IS MADE TO PERFORMANCE CONFORMING WITH OTHER STANDARDS, THE MORE STRINGENT SHALL APPLY.
10. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL BE AWARE OF ALL EXISTING CONDITIONS INVOLVED IN THE WORK. NOTIFY THE ARCHITECT IMMEDIATELY, IN WRITING, OF ANY DISCREPANCIES OR DEVIATIONS BETWEEN THE EXISTING DRAWINGS AND CONDITIONS IN THE FIELD, INCLUDING, BUT NOT LIMITED TO, DIMENSIONS, ELEVATIONS, AND CLEARANCES.
11. CAUTION SHALL BE EXERCISED SO THAT NO EXISTING AREAS TO REMAIN ARE DAMAGED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY/ALL CORRECTIVE WORK REQUIRED TO RESTORE DAMAGE TO THE SITE, EXISTING STRUCTURE, AND/OR EXISTING SURFACES. DAMAGED SURFACES SHALL BE CORRECTED TO MATCH EXISTING ADJACENT SURFACES.
12. THE CONTRACTOR SHALL RESTORE TO THE ORIGINAL OR BETTER CONDITION ALL IMPROVEMENTS AND VEGETATION DAMAGED AS A RESULT OF THE CONSTRUCTION INCLUDING PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL, DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL.
13. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL, OR DEBRIS IN ANY FORM TO FALL, SLIDE, OR FLOW ONTO ADJOINING PROPERTIES, STREETS, OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION SHALL BE PAYABLE BY THE CONTRACTOR.
14. THE UNDERGROUND PIPES, CABLES, OR DUCTLINES KNOWN TO EXIST BY THE ARCHITECT FROM SEARCH OF RECORDS ARE INDICATED ON PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. ALL DAMAGED PORTIONS SHALL BE REPLACED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE AFFECTED UTILITY COMPANY AND SHALL BE THE CONTRACTORS RESPONSIBILITY. PERSONAL INJURY RESULTING FROM CONTACT WITH EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR NEW LINES.
15. ALL EXISTING UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION AND ANY DAMAGE TO THE EXISTING UTILITIES SHALL BE REPAIRED AND PAID FOR BY THE CONTRACTOR.
16. THE CONTRACTOR SHALL NOTIFY ALL AGENCIES TO VERIFY THE ACTUAL LOCATION OF ALL UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATION. THE CONTRACTOR SHALL COORDINATE THE WORK WITH THE UTILITY AGENCIES.
17. ALL REQUIRED UTILITY ADJUSTMENTS SUCH AS MANHOLE AND/OR VALVE BOX FRAMES AND COVERS SHALL BE DONE BY THE CONTRACTOR AND SHALL BE CONSIDERED INCIDENTAL TO THE WORK.
18. EXCEPT WHERE OTHERWISE DIRECTED BY THE OWNER, ALL DISPLACED MATERIALS HAVING SALVAGE VALUE SHALL BE CAREFULLY AND NEATLY STACKED OR STORED ON THE PREMISES WHERE DIRECTED BY THE OWNER AND SHALL REMAIN THE PROPERTY OF THE OWNER. ALL DISMANTLED AND DEMOLISHED MATERIALS HAVING NO SALVAGE VALUE AS DETERMINED BY THE OWNER, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE COMPLETELY REMOVED AND HAULED AWAY FROM THE PREMISES.
19. THE FACILITY SHALL REMAIN OPEN DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY TEMPORARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES FOR THE PROTECTION OF LIFE AND SAFETY. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF THE PUBLIC THROUGHOUT THE CONSTRUCTION PERIOD.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE JOB SITE IN A NEAT AND SAFE CONDITION. ALL WORK SHALL BE PERFORMED WITHIN LIMITS OF WORK AREAS COORDINATED WITH THE ARCHITECT. DELIVERY OF MATERIALS AND EQUIPMENT SHALL BE COORDINATED TO MINIMIZE DISRUPTION OF FACILITY OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL OF NOISE, DEBRIS AND DUST TO PREVENT DISRUPTION OF FACILITY OPERATIONS. CONTRACTOR SHALL PROVIDE AND MAINTAIN SUITABLE BARRIERS AS REQUIRED TO PREVENT PUBLIC ENTRY, AND TO PROTECT THE WORK AND ADJACENT BUILDINGS, AREAS, AND PROPERTIES FROM CONSTRUCTION ACTIVITIES. BARRIERS SHALL BE REMOVED WHEN NO LONGER REQUIRED.
21. THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORK HOURS.
22. THE JOB SITE MUST BE LEFT IN A SAFE, SECURE CONDITION AT THE END OF EACH CONSTRUCTION WORK DAY. CLEAN UP AND REMOVE FROM THE JOB SITE ALL RUBBISH AND MAINTAIN THE PREMISES IN A CLEAN, ORDERLY CONDITION AT ALL TIMES.
23. UPON COMPLETION OF CONSTRUCTION THE ENTIRE JOB SITE SHALL BE CLEANED OF ALL RUBBISH AND DEBRIS.
24. AREAS FOR CONTRACT ZONE LIMITS, MATERIALS STORAGE, SCHEDULING OF WORK, TRASH DISPOSAL, WORKMEN'S PARKING, ETC., SHALL BE COORDINATED WITH THE OWNER. COORDINATE ALL WORK, SCHEDULING, STAGING, AND ADMINISTRATIVE REQUIREMENTS WITH THE OWNER.
25. ALL WORK SHALL CONFORM WITH THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN.
26. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. TEMPORARY PASSAGEWAYS SHALL BE ACCESSIBLE PER 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN CHAPTER 2, SECTION 201.3 AND 206.1.
27. ALL REQUIRED SUBMITTALS SHALL BE PROVIDED TO THE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO THE START OF THE WORK. THE ARCHITECT SHALL BE GIVEN SUFFICIENT TIME TO REVIEW AND RETURN SUBMITTALS SO AS NOT TO IMPACT THE CONSTRUCTION SCHEDULE.
28. NO BLASTING SHALL BE ALLOWED ON THIS PROJECT.
29. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS FROM APPROPRIATE GOVERNMENT AGENCIES.
30. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR UTILITY USAGE WITH THE OWNER, SUCH AS ELECTRICITY, WATER, ETC REQUIRED FOR CONSTRUCTION OPERATIONS.
31. THE CONTRACTOR SHALL TONE ALL AREAS PRIOR TO SAWCUTTING, TRENCHING, EXCAVATION, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING INFRASTRUCTURE.
32. PREPARE CONC SOG AS REQ'D FOR NEW FLOOR FINISHES. CONTRACTOR SHALL PERFORM MOISTURE TESTS AS RECOMMENDED BY THE MANUFACTURER OF EACH FLOOR FINISH PRIOR TO INSTALLATION OF FLOOR FINISHES. TEST RESULTS SHALL BE FURNISHED TO THE ARCHITECT. MOISTURE TESTS SHALL BE PERFORMED ON EXST & NEW CONC SOG, SUCH AS CONC PATCH AREAS & ALONG TRENCH LINES. IF MOISTURE PERCENTAGES EXCEED THOSE ALLOWED BY THE MANUFACTURER OF THE FLOOR FINISH, THE CONTRACTOR SHALL INSTALL THE RECOMMENDED SEALER PRIOR TO FLOOR INSTALLATION.
33. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER REGARDING INFECTION CONTROL PRIOR TO CONSTRUCTION. SEE KONA COMMUNITY HOSPITAL'S INFECTION CONTROL RISK ASSESSMENT (ICRA) REQUIREMENTS FOR MORE INFORMATION.
34. WHERE APPLICABLE, THE CONTRACTOR SHALL FINISH ALL NEW SURFACE(S) TO MATCH EXISTING ADJACENT SURFACE(S).
35. UON, PAINT ALL EXPOSED NEW & EXST WALLS & COLUMNS THROUGHOUT LAB SPACES, OFFICE, ADMIN & BLOOD DRAW. PAINT ALL OTHER WALLS & SURFACES THAT ARE PATCHED/REPAIRED BOTH INTERIOR & EXTERIOR.
36. FOR FINISHES & MATERIALS, CONTRACTOR TO PROVIDE COLOR SAMPLES TO ARCHITECT FOR CONFIRMATION BEFORE ORDERING.
37. CONTRACTOR TO COORDINATE WITH DOOR SUPPLIER AND SECURITY CARD ACCESS VENDOR FOR HARDWARE AND WIRING REQUIREMENTS AT DOOR 5. CONTRACTOR TO REMOVE AND SALVAGE DOOR LEAFS, DOOR FRAME, RAIN GUARD, THRESHOLD, AND ANY OTHER ITEMS REQUIRED TO COMPLETE THE WORK.

DEMOLITION NOTES

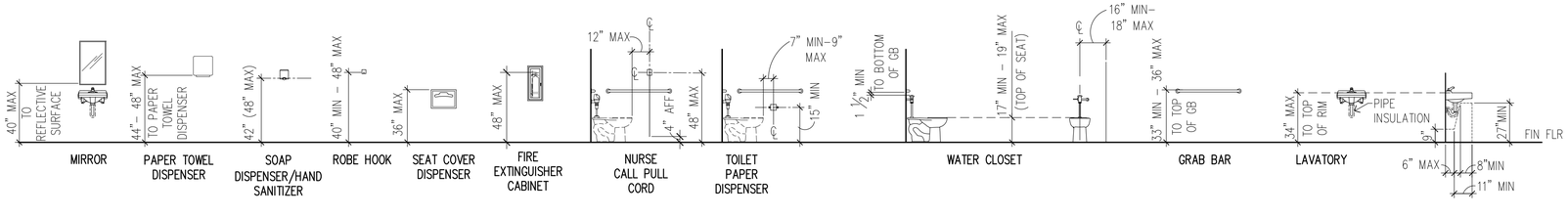
1. PERFORM ALL DEMOLITION SO THAT EXISTING CONSTRUCTION THAT WILL REMAIN IS UNDAMAGED.
2. EXTENT OF REMOVAL AS INDICATED IS APPROXIMATE. VERIFY THE EXTENT OF REMOVAL WORK TO PROPERLY ACCOMMODATE THE METHOD OF REQUIRED NEW CONSTRUCTION. ADDITIONAL REMOVAL & PATCHING REQUIRED TO ACCOMMODATE NEW CONSTRUCTION SHALL BE INCIDENTAL TO NEW WORK.
3. PROPERLY PREPARE ALL SURFACES THAT ARE TO BE RE-PAINTED AS NEEDED TO MEET PRODUCT & MANUFACTURER'S REQUIREMENTS & RECOMMENDATIONS FOR A COMPLETE, SOUND, & TIGHT JOB. ALLOW FOR CONSTRUCTION TOLERANCES IN ORDER TO MEET THE MINIMUM & MAXIMUM REQUIREMENTS AS SPECIFIED & INDICATED IN THE DRAWINGS & SPECIFICATIONS.
4. ALL DIMENSIONS SHOWN ARE APPROXIMATE & SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
5. SEE STRUCTURAL, FIRE PROTECTION, ELECTRICAL & MECHANICAL DRAWINGS FOR ADDITIONAL DEMOLITION REQUIREMENTS.
6. EXTENT OF EXACT SAWCUTTING OF THE CONCRETE SLAB ON GRADE & EXCAVATION IS NOT DEPICTED. THE CONTRACTOR SHALL DETERMINE THE ACTUAL EXTENT OF SAWCUTTING & EXCAVATION REQUIRED TO ACCOMMODATE THE WORK & INCLUDE IN BID PRICE.
7. CONTRACTOR SHALL TONE ALL AREAS AFFECTED BY THE WORK PRIOR TO SAWCUTTING, TRENCHING, EXCAVATION, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING INFRASTRUCTURE.
8. EXTENTS/LIMITS OF TRENCHING & EXCAVATION WORK IS NOT SHOWN. THE CONTRACTOR SHALL INCLUDE ALL COSTS FOR TRENCHING & EXCAVATION WORK TO RELOCATE BURIED INFRASTRUCTURE.
9. THE CONTRACTOR SHALL PROVIDE TEMPORARY BARRICADES AROUND WORK AREA DURING CONSTRUCTION.
10. FURNITURE & EQUIPMENT TO BE RELOCATED BY OWNER.
11. REMOVE PAINT FROM PERIMETER CONC WALL. SAND OR GRIND WALL SMOOTH & PREP FOR NEW PAINT FINISH.
12. REMOVE EXPANSION BOLTS FROM PERIMETER GYP BD WALL. PATCH & REPAIR ALL DAMAGED AREAS & PREP FOR NEW PAINT FINISH.
13. SEE FIRE PROTECTION DRWGS FOR FIRE SPRINKLER DEMO REQMTS.

ACCESSIBILITY NOTES

1. ALL NOTES & DIMENSIONS PROVIDED ARE FOR GENERAL CONFORMANCE PURPOSES ONLY. THE CONTRACTOR SHALL NOT RELY SOLELY UPON THIS DWG SHEET FOR MOUNTING, INSTALLATION & CLEARANCE REQUIREMENTS.
2. THE CONTRACTOR SHALL VERIFY ADA MOUNTING, INSTALLATION & CLEARANCE REQUIREMENTS W/ THE MANUFACTURER & OTHER REFERENCED ACCESSIBILITY GUIDES (ADAAG MIN.) PRIOR TO INSTALLATION.
3. WATER CLOSETS SHALL BE SENSOR ACTIVATED FLUSHING TYPE.
4. LAVATORY FAUCETS SHALL BE SENSOR ACTIVATED.
5. ULTRASOUND SINK FAUCETS SHALL BE MANUALLY OPERATED.
6. RESTROOM FIXTURES/ACCESSORIES ABBREVIATIONS:

GB	STAINLESS STEEL GRAB BAR
HS	HAND SANITIZER
LAV	LAVATORY
PTD	PAPER TOWEL DISPENSER
SND	SANITARY NAPKIN DISPENSER
SCD	TOILET SEAT COVER DISPENSER
SD	SOAP DISPENSER
TPD	TOILET PAPER DISPENSER
TSCD	TOILET SEAT COVER DISPENSER
WC	WATER CLOSET

7. ALL DIMENSIONS ARE TAKEN FROM THE FACE OF FIN & SHALL INDICATE A CLEAR DIMENSION, UNLESS OTHERWISE NOTED.



1 FIXTURE MOUNTING HEIGHTS

SCALE: NTS

HAWAII HEALTH SYSTEMS CORPORATION
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(808) 833-8891

KEYPLAN:





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SIGNATURE

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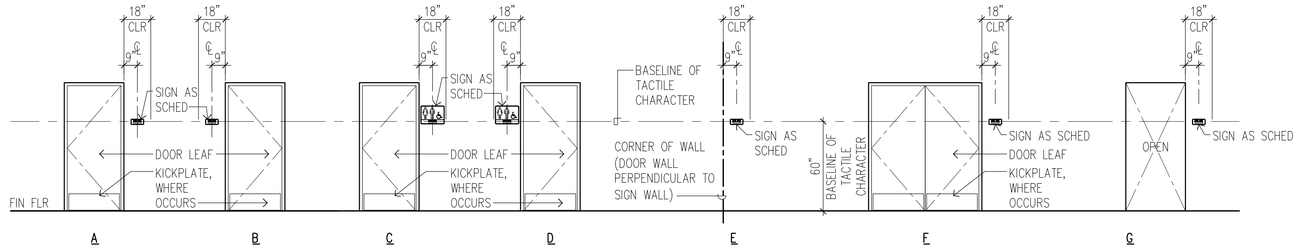
BUILDING: –

DRAWING		
PROJECT NO.		1916.04
	DRAWN BY:	KMA
	DATE:	OCTOBER 17, 2025
	SCALE:	AS SHOWN
	TITLE:	GENERAL NOTES, ADA MOUNTING HEIGHTS, & ACCESSIBILITY NOTES
	NUMBER:	A-002

SIGNAGE SCHEDULE

NO.	MTG	TYPE	SIGN TEXT	REMARKS
1	B	1	LABORATORY	1 LINE TEXT
2	A	1	EXIT	1 LINE TEXT
3	C	3	RESTROOM	1 LINE TEXT
4	G	2	OPEN LABORATORY	2 LINE TEXT
5	G	1	EXIT	1 LINE TEXT
6	B	1	OFFICE 1	1 LINE TEXT
7	A	1	OFFICE 2	1 LINE TEXT
8	E	1	EXIT	1 LINE TEXT
9	E	1	LABORATORY	1 LINE TEXT

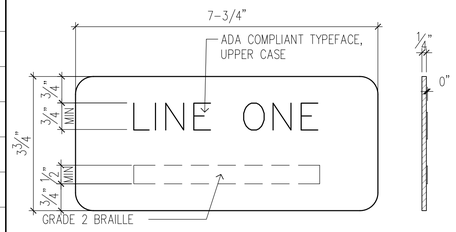
NOTES:
1. SIZES INDICATED ARE FOR DESIGN REFERENCE. CONTRACTOR SHALL VERIFY ON-SITE CONDITION DIMENSIONS TO DETERMINE ACTUAL SIZES TO BE ORDERED. CONFIRM FINAL SIZES W/ ARCHITECT BEFORE ORDERING.
2. PROVIDE ADAAG COMPLIANT SIGNAGE.



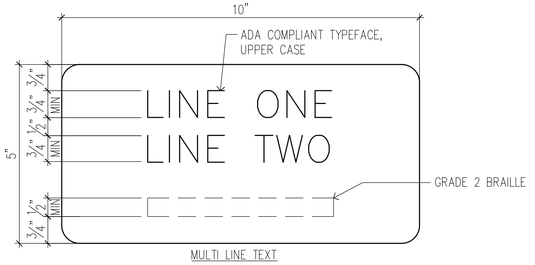
1 SIGN MOUNTING KEY

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

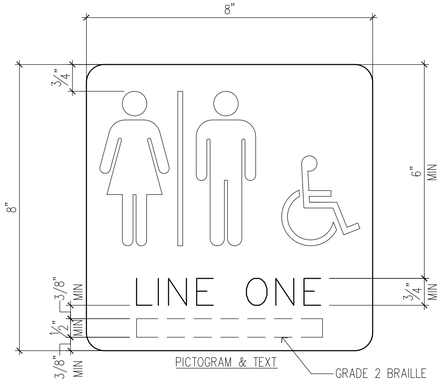
SCALE: 1/4" = 1'-0"



SINGLE LINE TEXT



MULTI LINE TEXT

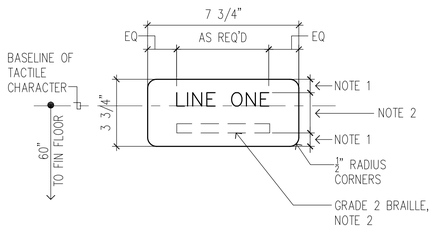


SIGNAGE MATERIAL:

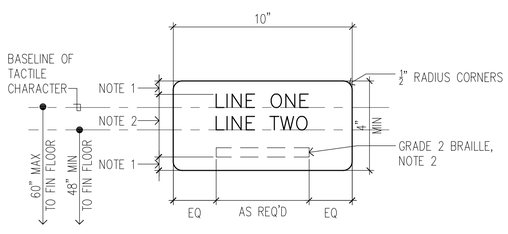
1. COMPLY WITH 2010 ADAAG SECTION 703 SIGNAGE.
2. MATERIAL: CAST-ACRYLIC SHEET: SUBMIT FULL RANGE OF MANUFACTURER'S STANDARD COLOR TO BE SELECTED BY ARCHITECT & OWNER.
3. TACTILE AND BRAILLE COPY: MANUFACTURER'S STANDARD PROCESS FOR PRODUCING COPY COMPLYING WITH ADA ACCESSIBILITY GUIDELINES AND ICC/ANSI A117.1. TEXT SHALL BE ACCOMPANIED BY GRADE 2 BRAILLE. PRODUCE PRECISELY FORMED CHARACTERS WITH SQUARE CUT EDGES FREE FROM BURRS AND CUT MARKS.
   A. PANEL MATERIAL: OPAQUE ACRYLIC SHEET PHOTOPOLYMER CLEAR ACRYLIC SHEET WITH OPAQUE COLOR COATING, SUBSURFACE APPLIED.
   B. RAISED-COPY THICKNESS: NOT LESS THAN 1/32 INCH (0.8 MM).
4. CHARACTERS MUST CONTRAST WITH BACKGROUND. LIGHT CHARACTERS ON DARK BACKGROUND.
5. MOUNTING: SIGNS SHALL BE MOUNTED WITH VANDAL-PROOF STAINLESS STEEL SCREW FASTENERS. NO DOUBLE-STICK TAPE OR ADHESIVES SHALL BE FOR SIGNS LOCATED ON EXTERIOR WALLS.
6. IF SIGN LENGTH EXCEEDS AVAILABLE WALL WIDTH, TEXT SHALL BE PLACED ON TWO OR MORE LINES, AS REQ'D.

2 SIGN DETAIL

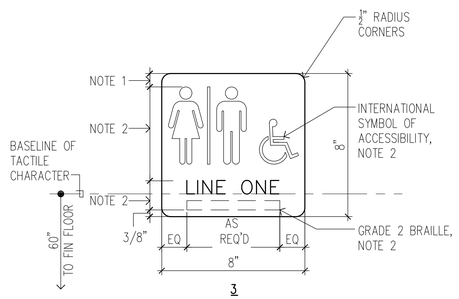
SCALE: NOT TO SCALE



1



2

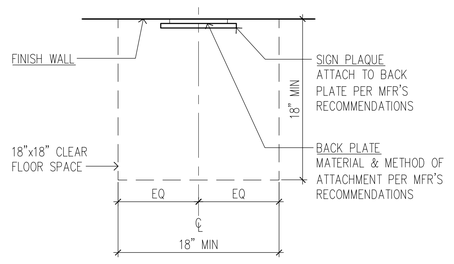


3

NOTES:
1. DIMENSION FROM TOP & BOTTOM OF TEXT TO SIGN EDGE SHALL BE 3/4" UON.
2. TEXT, BRAILLE & PICTORIAL SYMBOL SHALL COMPLY WITH THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN, SECTION 703.
3. IF SIGN LENGTH EXCEEDS AVAILABLE WALL WIDTH, TEXT SHALL BE PLACED ON TWO OR MORE LINES, AS REQ'D.
4. ALL SIGNAGE BY JOHN ALLEN SIGNS, NO EXCEPTIONS.

3 SIGN TYPES

SCALE: NOT TO SCALE



A

NOTES:
1. CONTRACTOR SHALL VERIFY SIZE OF PROPOSED SIGN W/ MOUNTING LOCATION SHOWN & NOTIFY ARCHITECT PRIOR TO SIGN FABRICATION OF ANY SIGN THAT EXCEED THE AVAILABLE WALL SPACE.
2. WHERE GLAZING OCCURS, CONTRACTOR SHALL MOUNT SIGN ACCORDING TO SIGN MANUFACTURER'S INSTRUCTIONS.

4 MOUNTING DETAIL

SCALE: NOT TO SCALE

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KEYPLAN:

FRED K. ERSKINE
LICENSED PROFESSIONAL ARCHITECT
No. 10192
HAWAII, U.S.A.

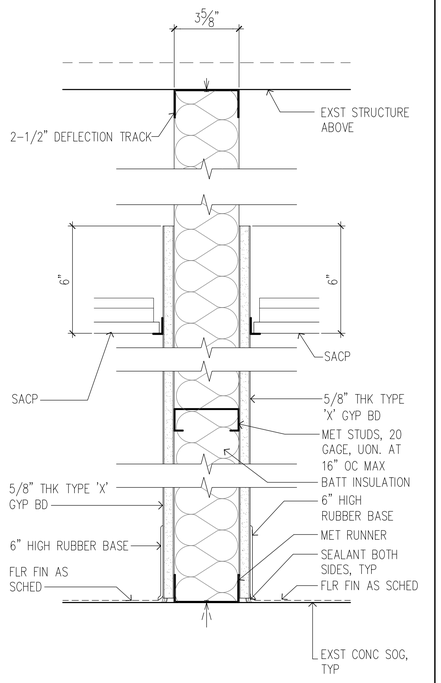
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SIGNATURE

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BUILDING: -

PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	SEPTEMBER 16, 2025
SCALE:	AS SHOWN
TITLE:	SIGN SCHEDULE & DETAILS
NUMBER:	A-003

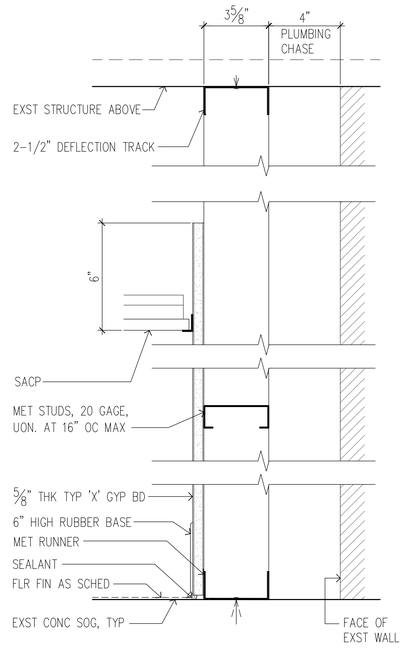


A FULL HEIGHT PARTITION

SCALE: 3" = 1'-0"

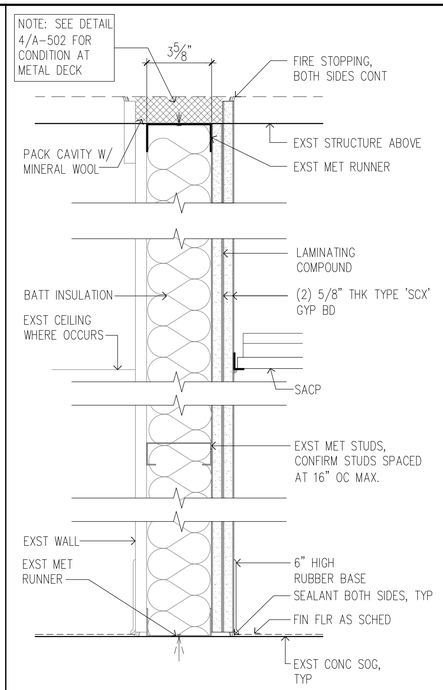
0 3" 6" 9" 1'

SCALE: 3" = 1'-0"



B FULL HEIGHT PARTITION

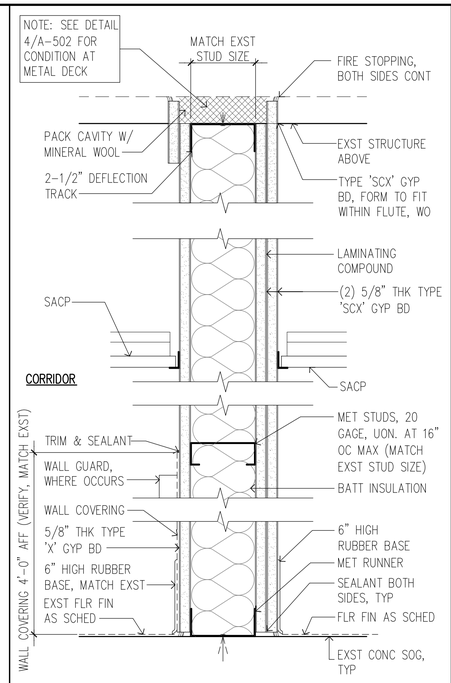
SCALE: 3" = 1'-0"



C 1-HR FIRE RATED PARTITION

SCALE: 3" = 1'-0"

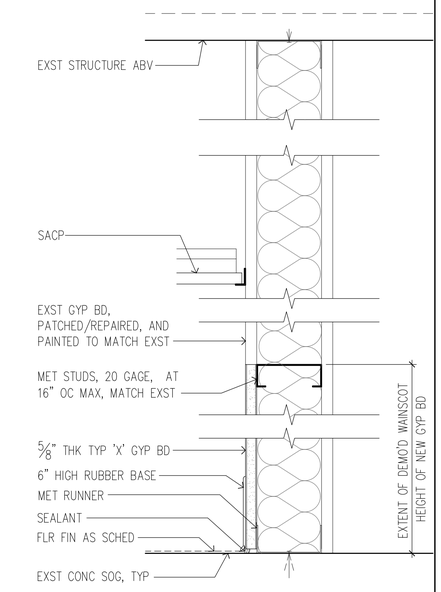
UL NO. V497



D 1-HR FIRE RATED PARTITION

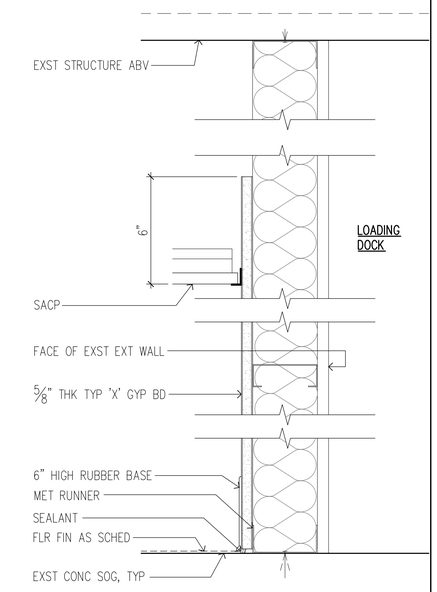
SCALE: 3" = 1'-0"

UL NO. V497



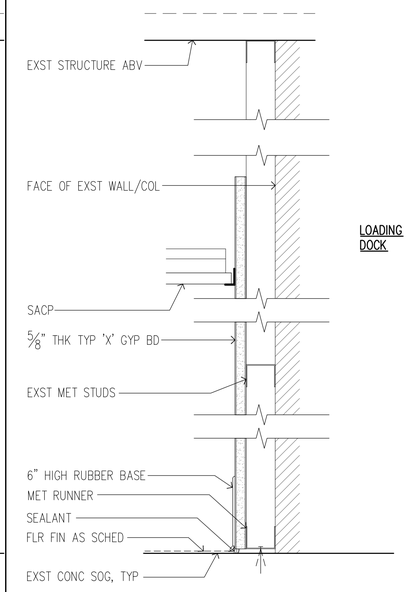
E FULL HEIGHT PARTITION

SCALE: 3" = 1'-0"



F FULL HEIGHT REPAIRED GYP BD

SCALE: 3" = 1'-0"

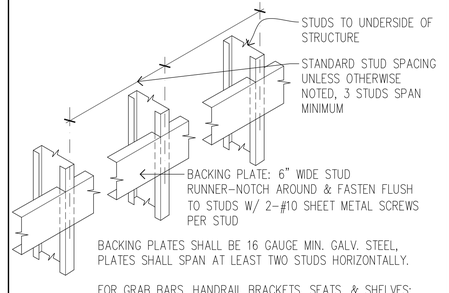


G FULL HEIGHT REPAIRED GYP BD

SCALE: 3" = 1'-0"

PARTITION SCHEDULE NOTES:

1. PARTITION TYPES INDICATE GENERIC PARTITION CONSTRUCTION, UON.
2. CONTRACTOR SHALL FIELD VERIFY REQUIRED FLOOR/CEILING CONNECTION AND INSTALL PARTITIONS TO MAINTAIN SPECIFIED FIRE RATING.
3. GYP. BD.: 5/8" THK. TYPE "X" U.O.N.
4. SEE DET 1/A-004 FOR BACKING PLATE REQUIREMENTS FOR EQUIPMENT, ARTWORK, TOILET ACCESSORIES, GRAB BARS, COUNTERS, CABINETRY AND SHELVING.
5. TYPICAL CONDITIONS (UON):
   - 5.1. TERMINATION: TERMINATE STUDS AT STRUCTURAL SOFFIT; ALLOW FOR DEFLECTION.
   - 5.2. PERIMETER RELIEF: WHERE PARTITIONS MEET STRUCTURE OR DISSIMILAR CONSTRUCTION, PROVIDE PERIMETER RELIEF.
6. FIRE RATED PARTITION FACE MATERIAL TERMINATIONS: CONTINUOUS FROM TOP OF FLOOR SLAB TO STRUCTURE ABOVE.
7. GYPSUM BOARD APPLICATION AND FINISHING SHALL BE PER GYPSUM ASSOCIATION PUBLICATIONS FOR USE AND INSTALLATION.
8. ACOUSTICAL PARTITION:
   - 8.1. TO BE INSTALLED PER ASTM E497, STANDARD PRACTICE FOR INSTALLING SOUND-ISOLATING GYPSUM BOARD PARTITIONS, AND ASTM C919, STANDARD PRACTICE FOR USE OF SEALANTS IN ACOUSTICAL APPLICATIONS.
   - 8.2. PARTITION SUBSTRATE MATERIAL TERMINATION IS CONTINUOUS FROM TOP OF FLOOR SLAB TO SOFFIT OF STRUCTURE ABOVE.



BACKING PLATES SHALL BE 16 GAUGE MIN. GALV. STEEL, PLATES SHALL SPAN AT LEAST TWO STUDS HORIZONTALLY.

FOR GRAB BARS, HANDRAIL BRACKETS, SEATS, & SHELVES: USE 18 GAUGE RUNNER (MIN.) UNLESS OTHERWISE NOTED

1 BACKING DETAIL

NTS

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KONA COMMUNITY HOSPITAL

79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750

ADDRESS

CLINICAL LAB REDESIGN FOR DIAGNOSTIC LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc

540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:

FRED K. ERSKINE
LICENSED PROFESSIONAL ARCHITECT
No. 10192
HAWAII, U.S.A.

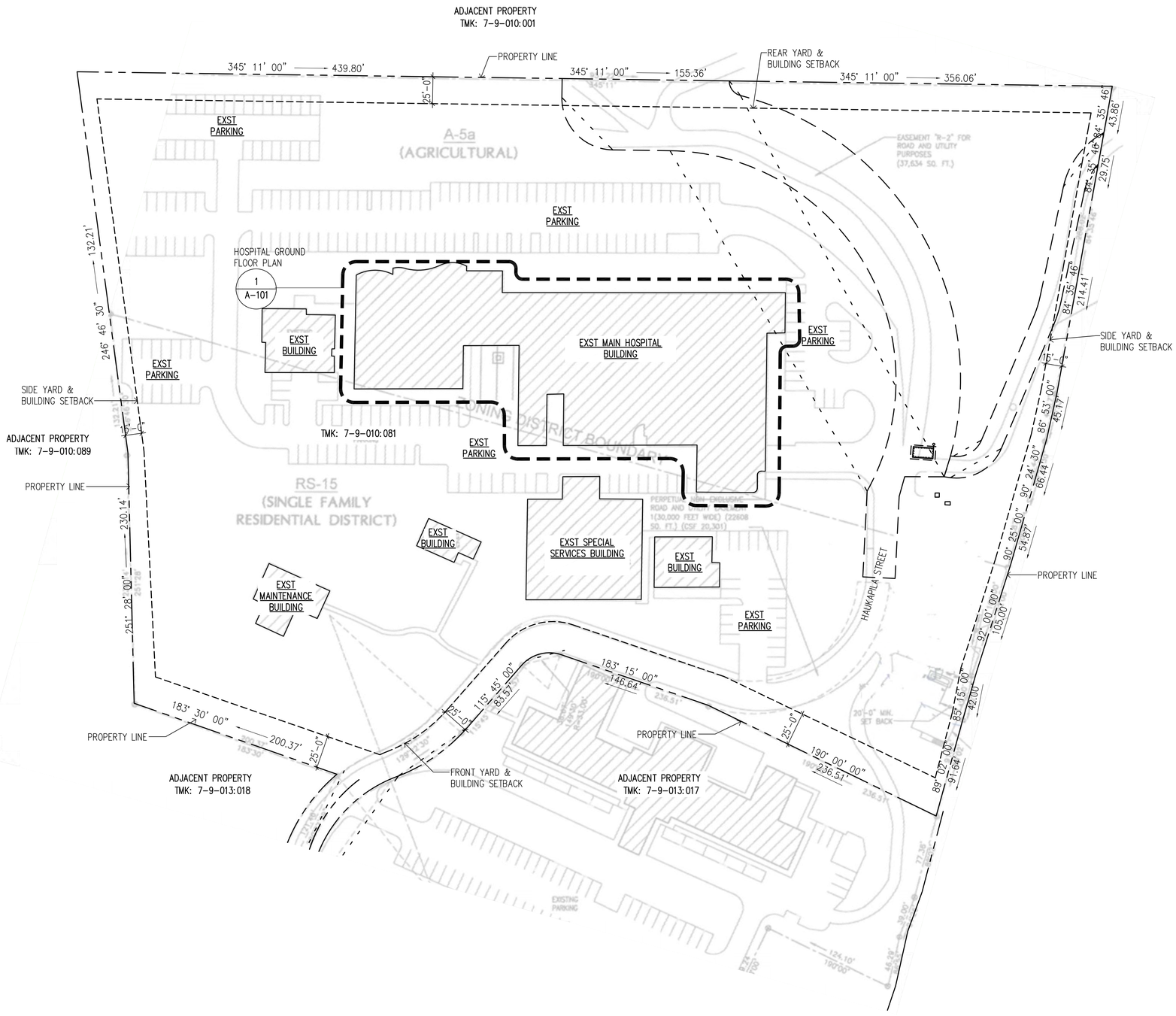
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BUILDING: -

DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		KMA
DATE:		SEPTEMBER 16, 2025
SCALE:		AS SHOWN
TITLE:		PARTITION TYPES
NUMBER:		A-004



1 OVERALL SITE PLAN
SCALE: 1" = 50'

0 50' 100'
SCALE: 1" = 50'-0"

EAST
NORTH
SOUTH
WEST

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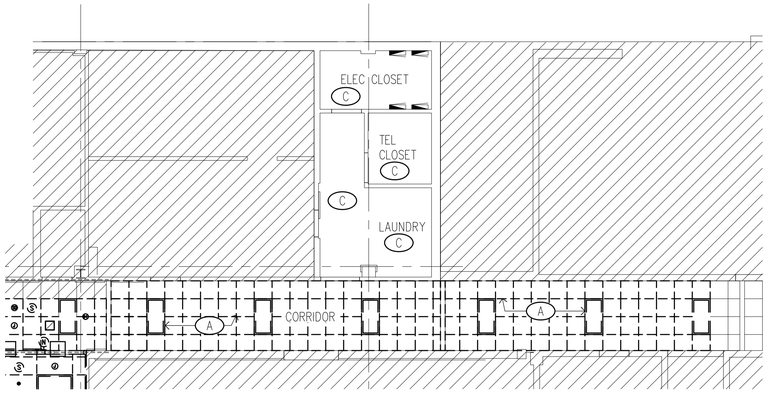
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BUILDING: –

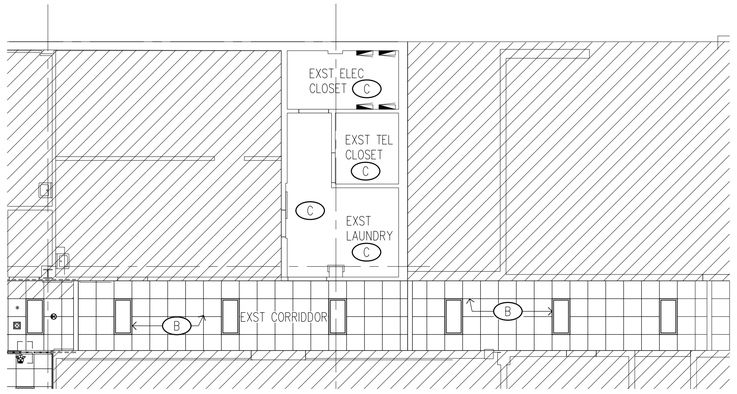
PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	SEPTEMBER 16, 2025
SCALE:	AS SHOWN
TITLE:	OVERALL SITE PLAN
NUMBER:	A-100



2 DEMO RCP – CORRIDOR

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

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



3 REPAIR RCP – CORRIDOR

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

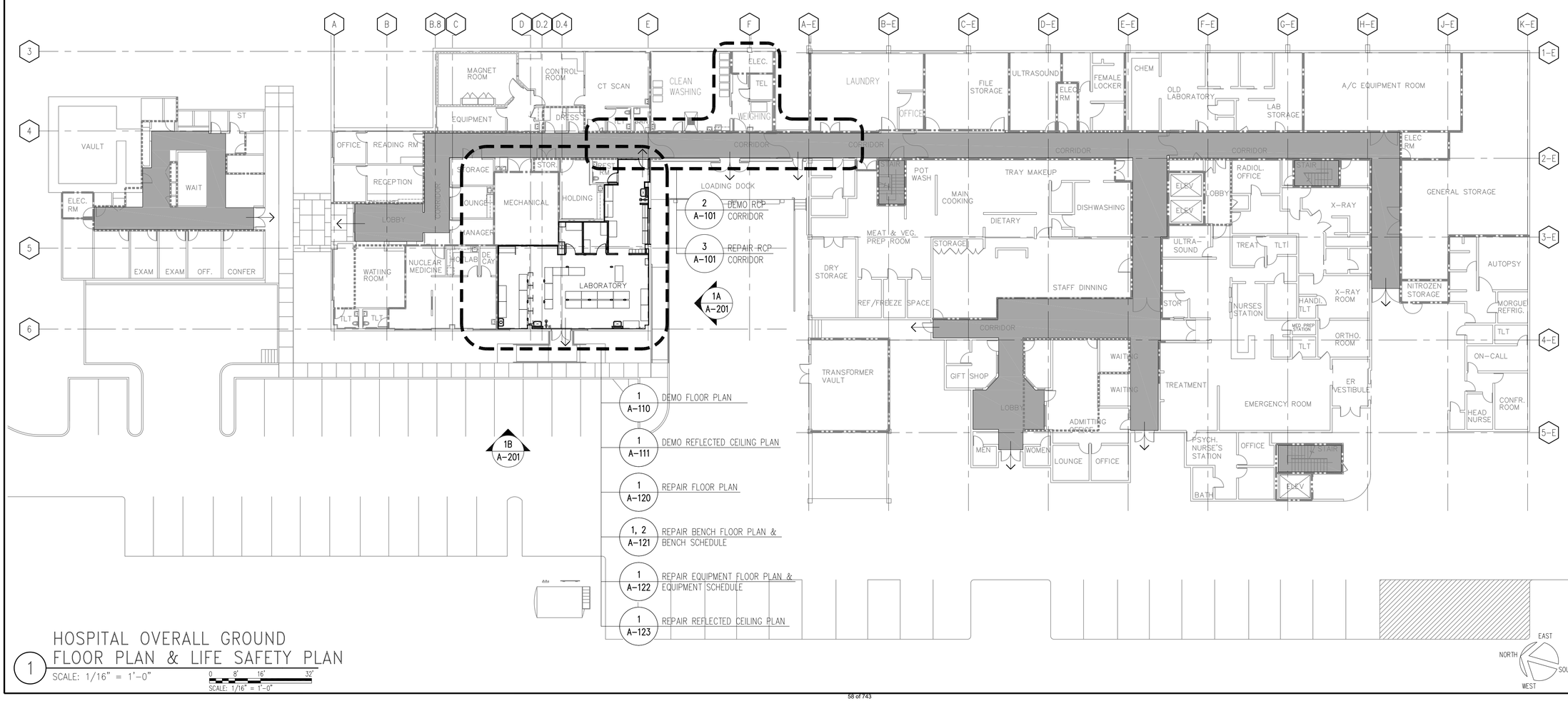
SCALE: 1/8" = 1'-0"

LEGEND

- 1-HOUR FIRE RATED WALL
- 2-HOUR FIRE RATED WALL
- EXST SMOKE RATED WALL
- EXST FIRE WALL BARRIER
- EXIT
- STAIRWELL
- EGRESS PATH

KEYNOTES (THIS SHEET)

KEYNOTE NO.	
A	TEMPORARILY REMOVE, DISCONNECT, AND/OR ADJUST CEILING GRID, SACP, LIGHT FIXTURES & OTHER CEILING MOUNTED DEVICES AS NECESSARY FOR THE WORK. SEE ELEC DWGS FOR INSTALLATION OF POWER, DATA, FIRE, AND FIBER CONDUITS.
B	REINSTALL & RECONNECT CEILING GRID, SACP, LIGHT FIXTURES, & OTHER CEILING MOUNTED DEVICES AS NECESSARY. SEE ELEC DWGS FOR ROUTING OF CONDUITS.
C	OPEN CEILING.



1 HOSPITAL OVERALL GROUND FLOOR PLAN & LIFE SAFETY PLAN

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

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

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KEYPLAN:





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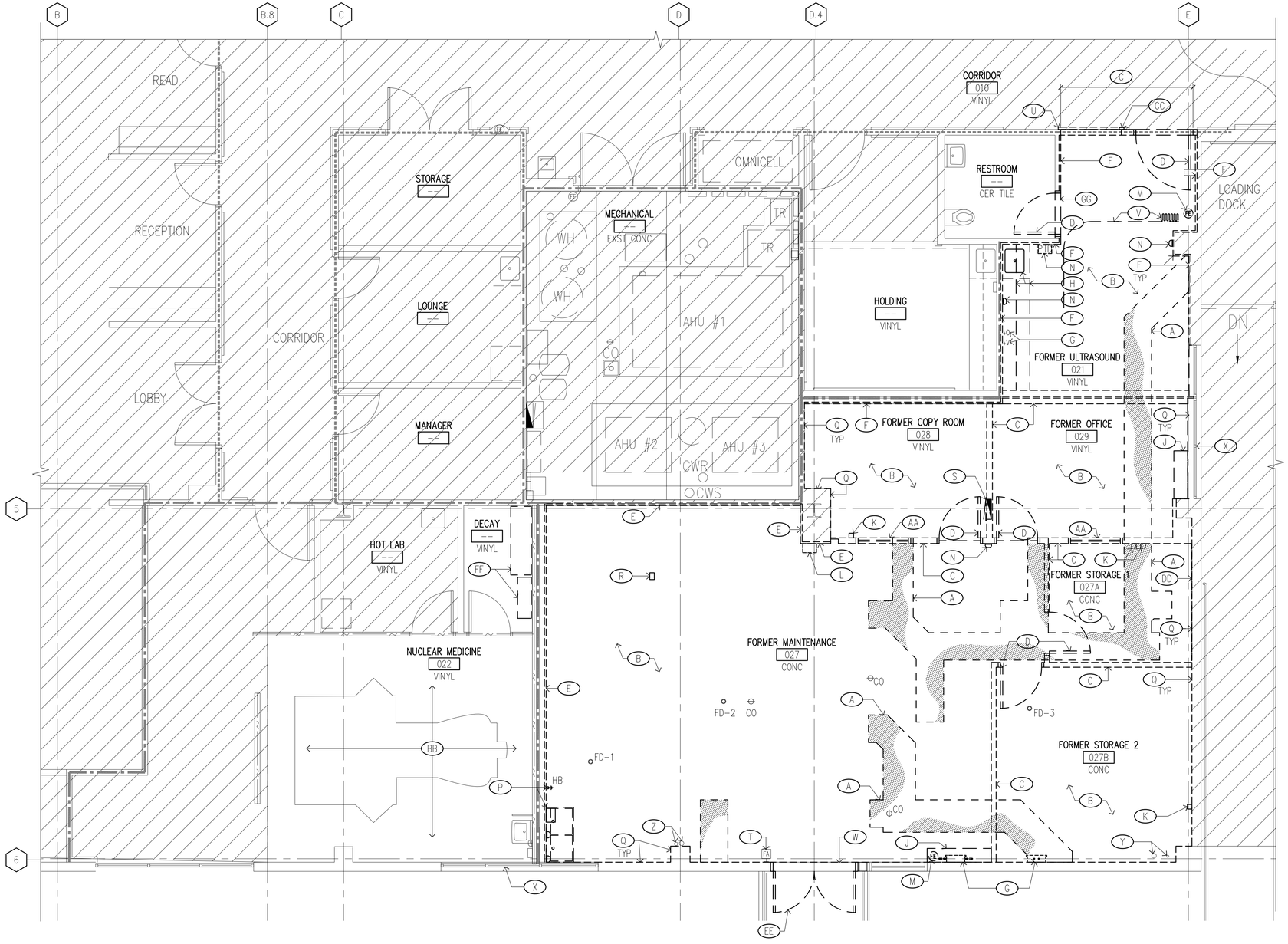
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BUILDING: –

DRAWING

PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	SEPTEMBER 16, 2025
SCALE:	AS SHOWN
TITLE:	OVERALL FLOOR PLAN & LIFE SAFETY PLAN
NUMBER:	A-101



1 DEMOLITION FLOOR PLAN

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

0 2' 4' 8'

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

EAST
NORTH
SOUTH
WEST

KEYNOTES (THIS SHEET)

KEYNOTE NO.	
A	SAW CUT CONC SOG & TRENCH AS REQ'D FOR NEW PLUMBING, SEE MECH & STRUCT DWGS.
B	DEMO ALL FLOOR FINISH, BASE BOARDS & UNDERLAYMENT COMPLETE, PREPARE CONC SOG AS REQUIRED FOR NEW FLOOR FINISH. SEE SPECS FOR MOISTURE TESTING REQMTS.
C	DEMO GYP BD WALL COMPLETE.
D	DEMO DOOR, THRESHOLD, & FRAME COMPLETE.
E	PATCH & REPAIR EXST GYP BD ABOVE WAINSCOT. DEMO WALL COVERING WAINSCOT & DEMO ASSOCIATED GYP BD TO EXPOSE STUD FRAMING.
F	DEMO GYP BD ON ONE SIDE COMPLETE TO EXPOSE STUD FRAMING. REMOVE, SALVAGE AND/OR PROTECT IN PLACE ELEC/TELCOM OUTLETS, CONDUITS, & OTHER SIM DEVICES ON WALL SURFACE.
G	DEMO MED GAS HOUSING/OUTLET. CUT & CAP MED GAS LINES, SEE MECH DWGS.
H	DEMO CASEWORK & SINK COMPLETE. REMOVE PLUMBING DEAD LEG(S) COMPLETE. SEE MECH DWGS FOR ADDITIONAL INFO.
J	DEMO SHELVING COMPLETE.
K	DEMO WALL MTD ELEC DEVICES/RECEPTACLES TYP. CUT & CAP WIRING, SEE ELEC DWGS.
L	REMOVE & SALVAGE FUEL MONITOR FOR OWNER. CUT & CAP CONDUITS. SEE MECH DWGS & ELEC DWGS FOR ADDITIONAL INFO. PATCH & REPAIR WALL AS REQ'D.
M	REMOVE & SALVAGE FIRE EXTINGUISHER FOR OWNER.
N	REMOVE & SALVAGE WALL MTD DEVICES/ACCESSORIES FOR OWNER.
P	DEMO SINK, EYE WASH, HOSE BIB & ASSOCIATED PLUMBING SYSTEM DEAD LEG(S) COMPLETE. SEE MECH DWGS FOR ADDITIONAL INFO.
Q	PATCH & REPAIR ALL WALL & COLUMN SURFACES. PREPARE FOR NEW PAINT FINISH.
R	CUT & CAP SUSPENDED J-BOX AND WIRING TO TERMINATE ABOVE CEILING. SEE ELEC DWGS.
S	DEMO ELEC PANEL, SEE ELEC DWGS.
T	FIRE ALARM PULL STATION TO REMAIN.
U	REMOVE & SALVAGE WALL GUARD.
V	DEMO CURTAIN & TRACK COMPLETE.
W	STOREFRONT TO REMAIN.
X	WINDOW TO REMAIN.
Y	FIRE RISER VALVE TO REMAIN, SEE FP DWGS.
Z	PIPES TO REMAIN.
AA	DEMO WINDOW ASSEMBLY COMPLETE.
BB	IF NECESSARY, COORD W/ OWNER FOR REMOVAL & SALVAGE, OR PROTECT IN PLACE EQPM IN NUCLEAR MEDICINE.
CC	REMOVE & SALVAGE ACCESS CONTROL READER.
DD	DEMO PLYWOOD.
EE	REMOVE & SALVAGE DOUBLE DOOR LEAFS & FRAME AS REQ'D FOR INSTALLATION OF ELECTRIC STRIKE & ELECTRIC POWER TRANSFER.
FF	IF NECESSARY, REMOVE & SALVAGE CASEWORK, STORAGE/SHELVING, SINK, & WALL MOUNTED DEVICES FOR FIRE DAMPER INSTALLATION, AS REQUIRED.
GG	DEMO THRESHOLD.

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KEALAKEKUA, HAWAII 96750
ADDRESS

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uchiyama erskine architects inc

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(808) 833-8891

KEYPLAN:

FRED K. ERSKINE
LICENSED PROFESSIONAL ARCHITECT
No. 10192
HAWAII, U.S.A.

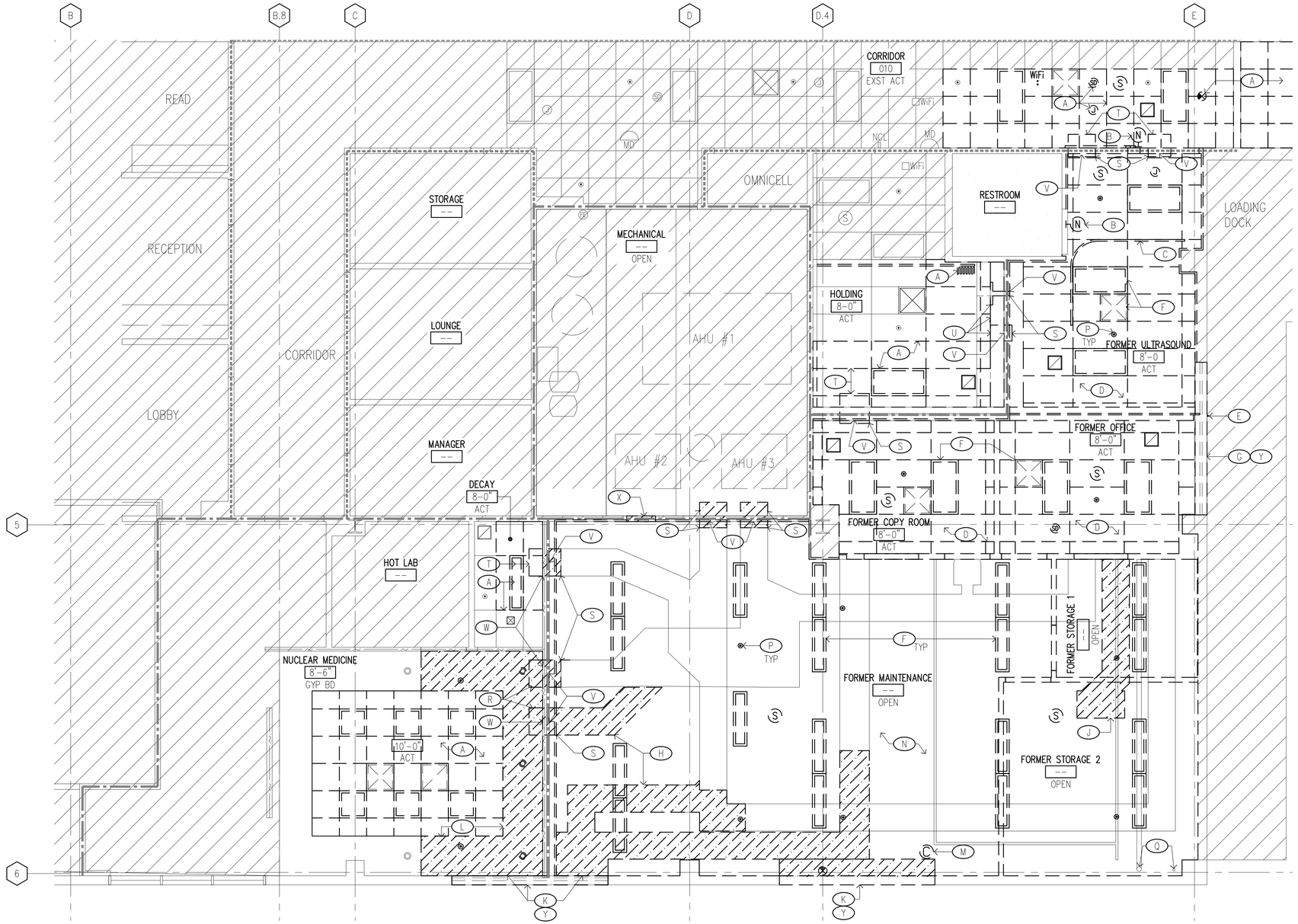
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BUILDING: -

PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	OCTOBER 17, 2025
SCALE:	AS SHOWN
TITLE:	DEMOLITION FLOOR PLAN
NUMBER:	A-110



1 DEMOLITION REFLECTED CEILING PLAN

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

0 2' 4' 8'

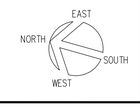
SCALE: 1/4" = 1'-0"

KEYNOTES (THIS SHEET)

KEYNOTE NO.	
A	TEMPORARILY REMOVE, DISCONNECT, AND/OR ADJUST CEILING GRID, SACP, LIGHT FIXTURES & OTHER CEILING MOUNTED DEVICES AS NECESSARY FOR THE WORK.
B	TEMPORARILY REMOVE & SALVAGE NURSE CALL LIGHTS.
C	DEMO CURTAIN TRACK COMPLETE.
D	DEMO SACP & GRID COMPLETE.
E	DEMO ANTENNA & CABLE COMPLETE, SEE ELEC DWGS.
F	DEMO LIGHT FIXTURES, SAD, RAR, FIRE SPRINKLERS & SMOKE DETECTORS, UON.
G	DEMO LOUVER COMPLETE REPAIR WATER DAMAGE TO WINDOW BELOW & SEAL AROUND WINDOW.
H	CUT & DEMO AC DUCTS, SEE MECH DWGS.
J	REMOVE & SALVAGE EXHAUST FAN & DUCT FOR OWNER, SEE MECH DWGS.
K	DEMO LOUVER & PLENUM COMPLETE, REPAIR WATER DAMAGE & SEAL AROUND WINDOW & STOREFRONT BELOW.
L	CUT & DEMO GYP BD SOFFIT, AS REQUIRED TO RELOCATE VAV BOX REHEAT COIL & REHEAT WATER LINES. SEE MECH DWGS.
M	TEMPORARILY REMOVE & SALVAGE SECURITY CAMERA, & SMOKE DETECTOR, SEE ELEC DWGS.
N	STRUCTURE, SEWER LINE, SPRINKLER MAIN LINE, AND CONDUIT ABOVE TO REMAIN, SEE MECH DWGS.
P	DEMO FIRE SPRINKLER HEADS, SEE FIRE PROTECTION DWGS.
Q	FIRE RISER VALVE TO REMAIN.
R	SEE FIRE DAMPER NOTES 1, 2, & 4.
S	SEE FIRE DAMPER NOTE 4.
T	SEE FIRE DAMPER NOTES 2, 3 & 4.
U	SEE FIRE DAMPER NOTES 2, 3, 4 & 5.
V	SEE FIRE DAMPER NOTE 6.
W	GC TO FIELD VERIFY LEAD LINING HEIGHT AND NOTIFY ARCHITECT IF IT IS GREATER THAN 8'-2". GC SHALL BE RESPONSIBLE FOR THE ABATEMENT OF LEAD LINED WALLS AFFECTED BY THE WORK. REFER TO SPECIFICATIONS FOR LEAD ABATEMENT PROCEDURES.
X	GC SHALL FIELD VERIFY IF PROPOSED REHEAT PIPES CAN BE ROUTED THROUGH THE MECHANICAL ROOM. SEE MECH DWGS. IF THERE IS NO CONFLICT OF THE PIPE RELOCATION, CUT & REMOVE PORTION OF GYP BD WALL FOR REHEAT PIPES PENETRATION.
Y	INSPECT EXTENT OF LEAKS AT WINDOWS & STOREFRONT. NOTIFY ARCHITECT & OWNER IF REPLACEMENT IS NECESSARY.

FIRE DAMPER NOTES (THIS SHEET)

1. CUT & DEMO PORTION OF CEILING TO ACCESS DUCT.
2. TEMPORARILY REMOVE & SALVAGE CEILING MOUNTED DEVICES AFFECTED BY FIRE DAMPER INSTALLATION.
3. TEMPORARILY REMOVE & SALVAGE SACP.
4. CUT & REMOVE PORTION OF DUCT INSULATION & DUCT. PREPARE FOR NEW FIRE DAMPER INSTALLATION.
5. TEMPORARILY REMOVE & SALVAGE CASEWORK & SINK AFFECTED BY FIRE DAMPER INSTALLATION, AS REQUIRED.
6. CUT & REMOVE PORTION OF GYP BD WALL AROUND DUCT PENETRATION FOR FIRE DAMPER INSTALLATION, AS REQ. SEE MECH DWGS.



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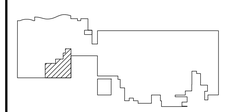
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ADDRESS

CLINICAL LAB REDESIGN FOR DIAGNOSTIC LABORATORY SERVICES

NO.	REVISION	DATE

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540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:





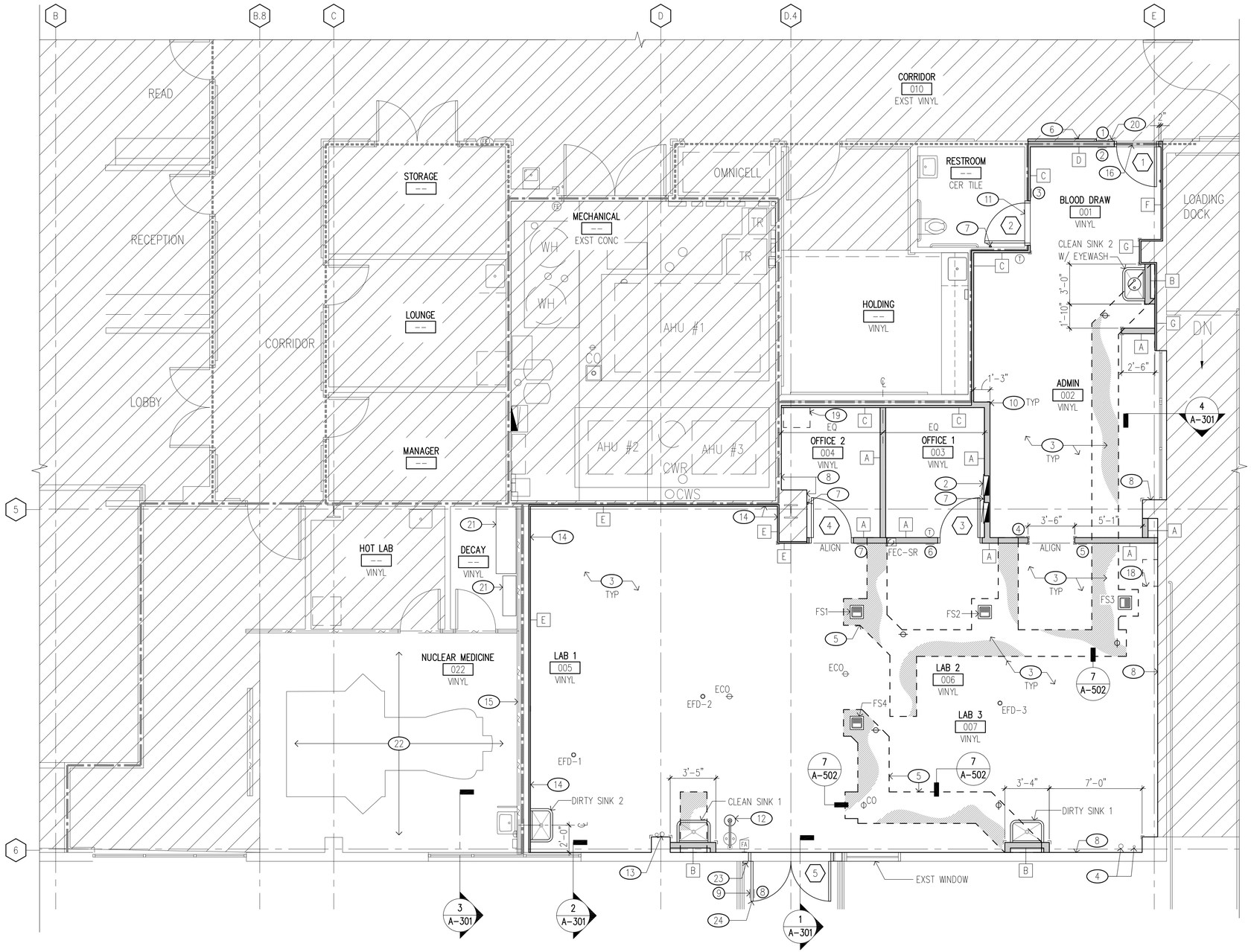
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BUILDING: -

DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		KMA
DATE:		OCTOBER 17, 2025
SCALE:		AS SHOWN
TITLE:		DEMOLITION REFLECTED CEILING PLAN
NUMBER:		A-111



1 REPAIR FLOOR PLAN

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

0 2' 4' 8'

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

KEYNOTES (THIS SHEET)

KEYNOTE NO.	
1	INTEGRAL BLACK EPOXY RESIN SINK, SEE MECH DWGS.
2	(2) ELEC PANELS, SEE ELEC DWGS.
3	PATCH & REPAIR TRENCHED AREAS OF SOG. LEVEL & PREP ENTIRE FLOOR. INSTALL FLOORING AND WALL BASE. SEE SPECS FOR MOISTURE TESTING REQMTS.
4	EXST FIRE RISER VALVE.
5	APPROX EXTENT OF REPAIRED CONC SOG BLW.
6	REINSTALL WALL GUARD.
7	DOOR STOP.
8	PATCH & REPAIR GYP BD/CONC WALL & COLUMN, AS REQUIRED.
9	REINSTALL CASEWORK AND STORAGE, AS REQUIRED FOR FIRE DAMPER INSTALLATION.
10	CORNER GUARD, AT ALL GYP BD PARTITION CORNERS & COL CORNERS UON.
11	STONE THRESHOLD.
12	EMERGENCY SHOWER & EYEWASH STATION.
13	EXST PLUMBING, SEE MECH DWGS.
14	INSTALL NEW GYP BD AT DEMOLISHED WAINSCOT HEIGHT. NEW GYP BD & EXST GYP BD TO BE FLUSH W/ NO VISIBLE SEAM. PRIME & PAINT FULL HEIGHT EXST & NEW GYP BD.
15	LEAD-LINED WALL, FIELD VERIFY HEIGHT OF LEAD LINING PRIOR TO FIRE DAMPER INSTALLATION.
16	VINYL TRANSITION STRIP.
17	ALIGN PARTITION W/ PARTITION AT BLOOD DRAW.
18	DEIONIZED WATER EQPM ABV.
19	NETWORK RACK ABOVE.
20	REINSTALL ACCESS CONTROL READER.
21	IF NECESSARY, REINSTALL CASEWORK, STORAGE/SHELVING, SINK & WALL MOUNTED DEVICES FOR FIRE DAMPER INSTALLATION AS REQ'D.
22	IF NECESSARY, COORD W/ OWNER FOR REINSTALLATION OF EQPM.
23	INSTALL NEW ACCESS CONTROL READER. COORD W/ OWNER TO INSTALL SAME MANUFACTURER AS EXST SYSTEM.
24	INSTALL ELECTRIC STRIKE & ELECTRIC POWER TRANSFER THROUGH SALVAGED FRAME & DOOR LEAF FOR CARD READER ACCESS. REINSTALL EXST FRAME & DOOR. COORDINATE WITH DOOR SUPPLIER FOR FOR COMPLIANT HARDWARE.

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KEALAKEKUA, HAWAII 96750
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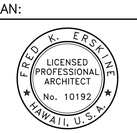
CLINICAL LAB REDESIGN FOR DIAGNOSTIC LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:





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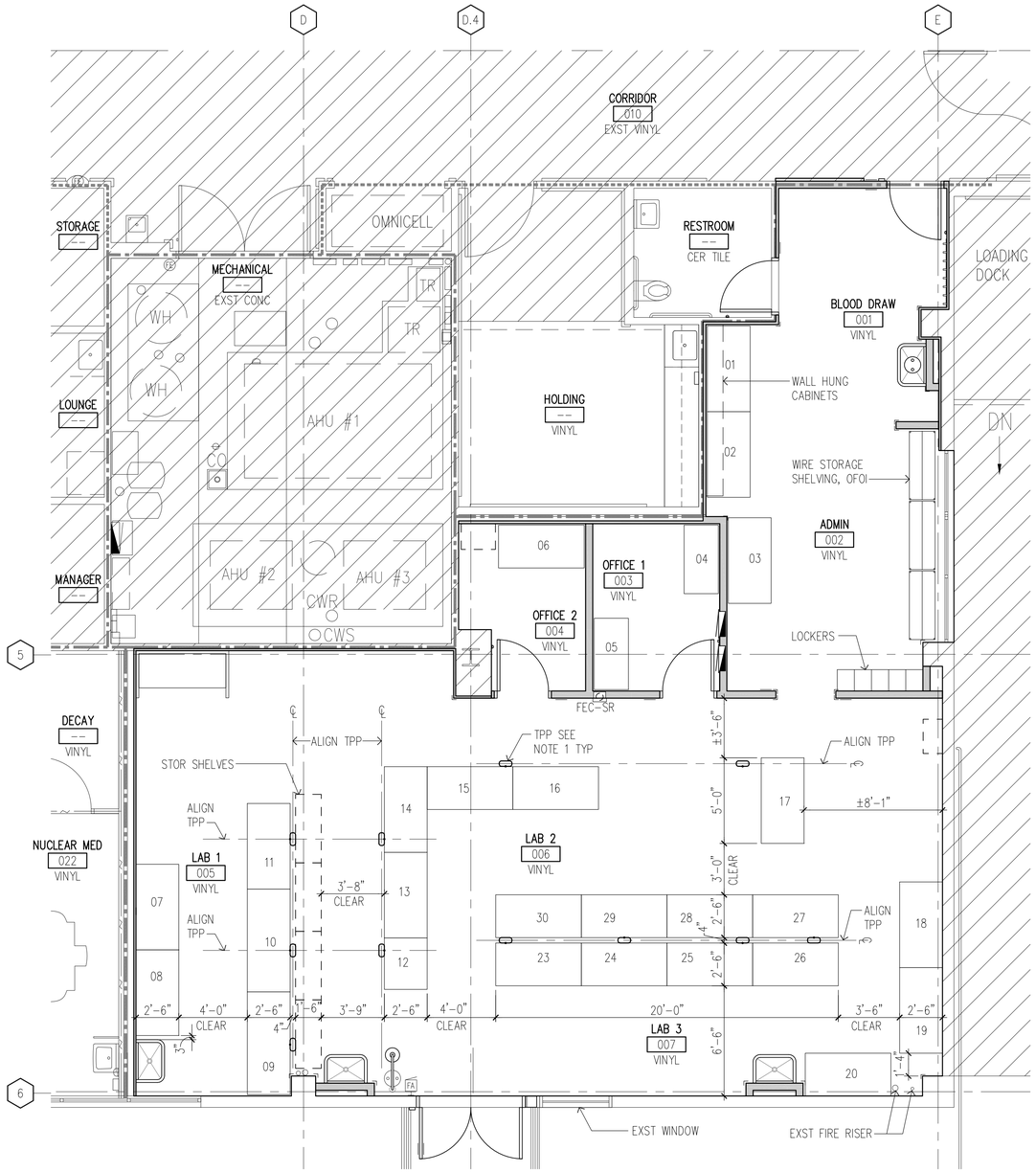
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BUILDING: -

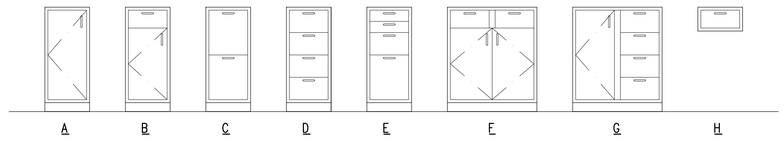
DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		KMA
DATE:		OCTOBER 17, 2025
SCALE:		AS SHOWN
TITLE:		REPAIR FLOOR PLAN
NUMBER:		A-120

NOTE 1:
ALIGN TPP'S AS INDICATED. CONFIRM LOCATION OF EACH TPP IN RELATION TO BENCHES, CEIILNG GRID, & CEIILNG APPURTENANCES PRIOR TO INSTALLATION. CONTRACTOR SHALL PREPARE A PLAN FOR ARCHITECT'S REVIEW & OWNER'S ACCEPTANCE PRIOR TO INSTALLATION OF TPP'S.



1 REPAIR BENCH FLOOR PLAN
SCALE: 1/4" = 1'-0"
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

BENCH DRAWER ORIENTATION



BENCH SCHEDULE

BENCH NO.	WORK AREA	DESCRIPTION	WIDTH	DEPTH	HEIGHT	LOCATION		BENCH DRAWER ORIENTATION		PROVIDED BY			COMMENTS
			INCHES	INCHES	INCHES	ROOM NO.	EXISTING LOCATION	LEFT SIDE	RIGHT SIDE	CFCI	OFCI	OFOI	
01	ADMIN	NEW PHLEBO DESK	60	30	36	002	–	–	–			X	
02	ADMIN	NEW PHLEBO DESK	60	30	36	002	–	–	–			X	
03	ADMIN	NEW	60	30	36	002	–	–	–			X	
04	OFFICE 1	NEW	48	24	36	003	–	–	–			X	
05	OFFICE 1	NEW	48	24	36	003	–	–	–			X	
06	OFFICE 2	NEW	60	30	36	004	–	–	–			X	
07	LAB 1	EXISTING	60	30	36	005	KOHALA – UA	B	D			X	
08	LAB 1	NEW	60	30	36	005	–	–	–			X	
09	LAB 1	EXISTING	72	30	36	005	KONA – MICRO	D	LEG			X	
10	LAB 1	EXISTING	72	30	36	005	KONA – MICRO	D	D			X	
11	LAB 1	EXISTING	60	30	36	005	KONA – SYSMEX	LEG	LEG			X	
12	LAB 2	NEW	36	30	36	006	–	–	–			X	
13	LAB 2	EXISTING	60	30	36	006	KOHALA – CEPHEAD	LEG	D			X	
14	LAB 2	EXISTING	60	30	36	006	KONA – UA	D	F			X	
15	LAB 2	EXISTING	60	30	36	006	KONA – ACCESS	B	B			X	
16	LAB 2	EXISTING	60	30	36	006	KONA – ACCESS	B	B			X	
17	LAB 2	EXISTING	60	30	36	006	KONA – CHEM PREP	OPEN	OPEN			X	
18	LAB 3	EXISTING	60	30	36	007	KONA – ECHO	H	B			X	
19	LAB 3	EXISTING	60	30	36	007	KOHALA – COAG	LEG	D			X	
20	LAB 3	EXISTING	60	30	36	007	KONA – BLOOD BANK	F	G			X	
21	NOT USED	–	–	–	–	–	–	–	–			–	
22	NOT USED	–	–	–	–	–	–	–	–			–	
23	LAB 3	EXISTING	60	30	36	007	KONA – BLOOD BANK	H	G			X	
24	LAB 3	EXISTING	60	30	36	007	KOHALA – MICROSCOPE	B	D			X	
25	LAB 3	EXISTING	60	30	36	007	KOHALA – ACCN	B	D			X	
26	LAB 3	EXISTING	60	30	36	007	KOHALA – COAG	D	D			X	
27	LAB 2	EXISTING	60	30	36	006	KONA – COAG	LEG	E			X	
28	LAB 2	EXISTING	60	30	36	006	KONA – COAG	D	LEG			X	
29	LAB 2	EXISTING	60	30	36	006	KONA – BLOOD CULTURES	E	LEG			X	
30	LAB 2	NEW	60	30	36	006	–	–	–			X	

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(808) 833-8891

KEYPLAN:



FRED K. ERSKINE
LICENSED PROFESSIONAL ARCHITECT
No. 10192
HAWAII, U.S.A.

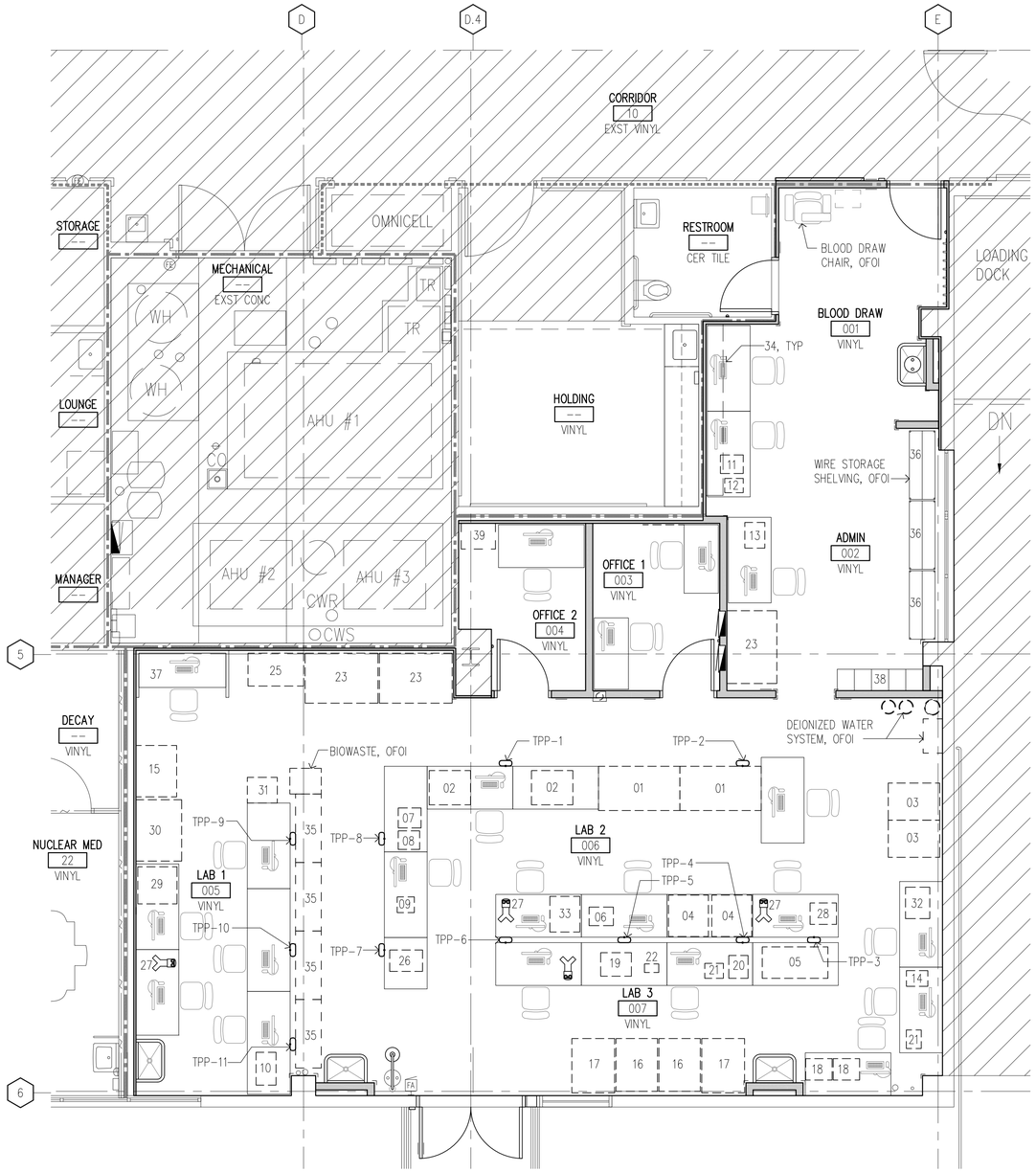
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BUILDING: –

DRAWING	
PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	OCTOBER 17, 2025
SCALE:	AS SHOWN
TITLE:	REPAIR BENCH FLOOR PLAN & BENCH SCHEDULE
NUMBER:	A-121

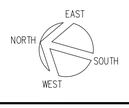


1 REPAIR EQUIPMENT FLOOR PLAN

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

0 2' 4' 8'

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



EQUIPMENT SCHEDULE

FFE NO.	DESCRIPTION	HEIGHT	WIDTH	DEPTH	LOCATION		NO.	ELECTRIC REQUIREMENTS				PROVIDED BY			DRAIN	
		INCHES	INCHES	INCHES	ROOM NO.	NAME		OUTLETS	AMPS	DATA	TELE	CFCI	OFCI	OFOI		
01	BECKMAN AU 480	48	57	31	006	CHEMISTRY	2	–	–					X	X	
02	ACCESS 2	19	29	24	006	CHEMISTRY	2	–	–					X	X	
03	SYSMEX XN2000	61	26	36	006	HEMOTOLOGY	2	2	20AX2					X	X	
04	COAG	38	28	29	006	COAGULATION	2	3	15AX2					X		
05	IMMUCOR ECHO	19	46	22	007	BLOOD BANK	1	3	5A					X		
06	CLINITEK ADVANTUS	14	17	13	006	URINALYSIS	1	1	1.2A					X		
07	RAPID POINT	22	14	16	006	BLOOD GAS	1	1	1.5A					X		
08	OSMOMETER	10	13	15	006	OSMO	1	1	0.5A					X		
09	ISED ELITE	15	11	12	006	SED RATE	1	1	2.5A					X		
10	CEPHEID 16-MODULE	26	23	14	005	PCR	1	3	7A					X		
11	STATSPIN4	8	13	16	001	CENTRIFUGE	1	1	2.5A					X		
12	STATSPIN3	7	10	13	001	CENTRIFUGE	1	1	3A					X		
13	SORAVAL CENTRIFUGE ST16	24	18	14	002	CENTRIFUGE	1	1	12A					X		
14	DRUCKER 642VFD/CLINIFUGE	10	11	15	007	CENTRIFUGE	1	1	3A					X		
15	BACT-ALERT	66	28.5	36	005	BLOOD CULTURE	1	1	20A					X		
16	BB REFRIGERATOR	79	29	37	007	BLOOD BANK	2	1	7A					X		
17	BB FREEZER	79	30	38	007	BLOOD BANK	2	1	8A					X		
18	BB THAWER	19	18.5	15	007	BLOOD BANK	2	1	10A					X		
19	BB INCUBATOR	25	21.5	16.5	007	BLOOD BANK	1	2	3A					X		
20	BB CELL WASH	12	13.5	16	007	BLOOD BANK	1	1	2.5A					X		
21	BB SEROSPIN	13	13	10.5	007	BLOOD BANK	2	1	5A					X		
22	BB DRY BATH	5	10	6	007	BLOOD BANK	1	1	2A					X		
23	BEVAIR MT49	83	51	35	005	–	2	1	50A					X		
24	NOT USED	–	–	–	–	–	1	–	–					–		
25	SANYO FREEZER	77	39	23	005	–	1	1	12.6A					X		
26	CYTOSPIN	9	15	23	007	MICRO	1	1	1.5A					X		
27	MICROSCOPES	24	12	15	MULTIPLE	MICRO	4	1	5A					X		
28	HEMATEK STAINER	8.5	18.5	15	006	MICRO	1	1	1A					X		
29	MICRO INCUBATOR	41	26	27.5	005	MICRO	1	1	5.2A					X		
30	MICRO HOOD	89	43	32	005	MICRO	1	1	12A					X		
31	MAUNAKEA COPIER/SCANNER	45	18	21	005	–	1	1	2A					X		
32	CELL-A-VISION	28	22	17	006	HEMETOLOGY	1	2	2.5A					X		
33	BECKMAN COULTER IRIS SYSTEM	23	21	25	006	URINALYSIS	1	4	10A	X	X			X	X	
34	COMPUTER, MONITOR, KEYBOARD, & CHAIR	–	–	–	MULTIPLE	–	23	2	–	X	X			X		
35	STORAGE 1, 2, 3, & 4	–	–	–	005	–	4	–	–					X		
36	WIRE SHELVING UNITS	–	–	–	002	LAB 2	3	–	–					X		
37	WORK DESK	–	–	–	005	ADMIN	1	–	–					X		
38	LOCKERS	–	–	–	002	ADMIN	1	–	–					X		
39	DATA RACK	–	–	–	004	OFFICE 2	1	–	–					X		

FINISH SCHEDULE

KEY NO.	LOCATION	DESCRIPTION	MANUFACTURER	MODEL/COLOR/STYLE/PATTERN/FINISH INFORMATION	ROOM	REMARKS
VF-1	FLOOR	VINYL FLOORING	ARMSTRONG	NATURAL CREATIONS ABBORART,/TP072/FRUITWOOD BUCKWHEAT	LABORATORY	RUN LENGTH OF ROOM, *NOTE 10
VF-2	FLOOR	VINYL FLOORING	ARMSTRONG	NATURAL CREATIONS ABBORART/TP071/FRUITWOOD NATURAL	CORRIDOR	AS REQ'D FOR REPAIR TO DAMAGED AREAS, 6" X 48", *NOTE 10
RB-1	WALL	RUBBER WALL BASE	BURKE	BURKEBASE TYPE TP/TUMBLEWEED 033	LABORATORY	6", 3.2 MM, *NOTE 10
RB-2	WALL	RUBBER WALL BASE	ARMSTRONG	01 MALT	CORRIDOR	6", *NOTE 10
WC-1	WALL	WALL COVERING	INPRO	405 PALLADIUM/0187 CRYSTAL JADE	CORRIDOR	4' X 4', 0.04" THICK, BUTT JOINT, PAINT ABOVE TO CEILING, *NOTE 10
TR-1	WALL	TRIM FOR WALL COVERING	INPRO	#407/MATCH WALL COVERING FINISH	CORRIDOR	8' LENGTH, MATCH WALL COVERING COLOR, *NOTE 10
TR-2	DOOR	PVC EDGE TRIM	WILSONART	7909/FUSION MAPLE	ALL WOOD DOORS	3 MM, AT ALL EXPOSED DOOR EDGES, *NOTE 10
PT-1	WALL, CEILING	INTERIOR PAINT – FIELD	BENJAMIN MOORE	OC-45 SWISS COFFEE/SATIN	LABORATORY, CORRIDOR	STANDARD WHITE, *NOTE 10
PT-2	WALL, CEILING	INTERIOR PAINT – FIELD	BENJAMIN MOORE	MATCH EXISTING	ELECTRICAL ROOM, NUCLEAR MEDICINE, HOLDING, DECAY, RESTROOM	
PT-3	DOOR FRAME	INTERIOR PAINT – TRIM	BENJAMIN MOORE	OC-45 SWISS COFFEE/SEMI-GLOSS	CORRIDOR & LABORATORY DOOR FRAME	*NOTE 10
PT-4	EXTERIOR TRIM	EXTERIOR PAINT – TRIM/ACCENT	BENJAMIN MOORE	MATCH EXISTING/SEMI-GLOSS	FLASHING, EXTERIOR WINDOW & DOOR FRAMES	DO NOT PAINT NEW LOUVERS
PT-5	EXTERIOR WALL	EXTERIOR PAINT – FIELD	BENJAMIN MOORE	MATCH EXISTING	EXTERIOR WALL FIELD	DO NOT PAINT NEW DEFS FINISH
PL-1	CASEWORK	PLASTIC LAMINATE	WILSONART	GENERAL PURPOSE (HGS) TYPE 107/ D327-60 PEPPERDUST/ PREMIUM	CABINETS	ALL CASEWORK EXTERIOR SURFACES, *NOTE 10
PL-2	DOOR	PLASTIC LAMINATE	WILSONART	7909/FUSION MAPLE	ALL WOOD DOORS	LAMINATE EDGES OF DOOR, MATCH FINISH, *NOTE 10

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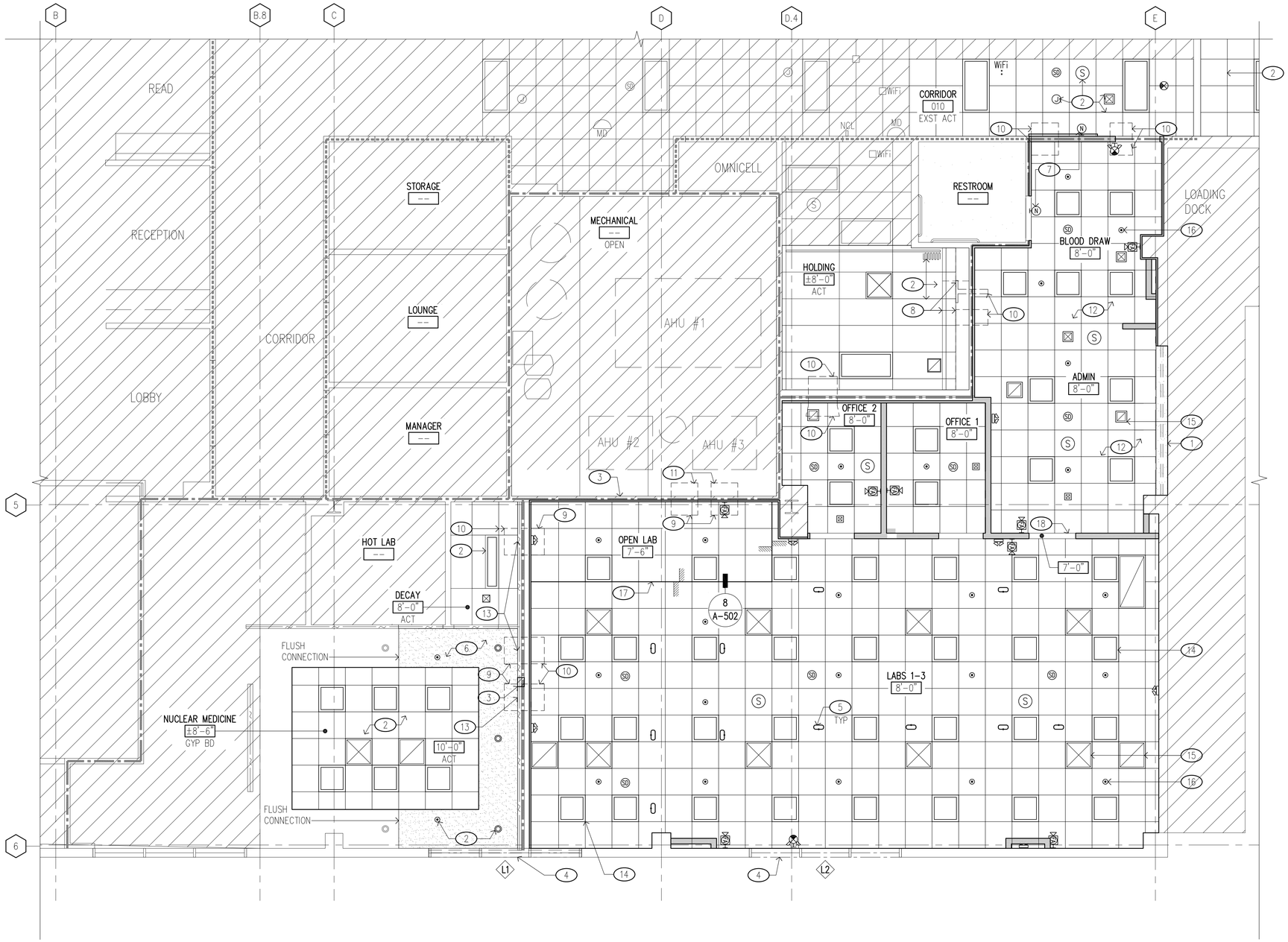
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BUILDING: –

DRAWING	
PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	OCTOBER 17, 2025
SCALE:	AS SHOWN
TITLE:	REPAIR EQUIPMENT PLAN & EQPM & FINISH SCHEDULE
NUMBER:	A-122



1 REPAIR REFLECTED CEILING PLAN

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

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

EAST
NORTH
SOUTH
WEST

KEYNOTE NO.	KEYNOTES (THIS SHEET)
1	GYP BD WINDOW HEADER W/ DEF'S FINISH, MATCH EXISTING.
2	REINSTALL & RECONNECT CEILING GRID, SACP, LIGHT FIXTURES, & OTHER CEILING MOUNTED DEVICES AS NECESSARY.
3	PATCH & REPAIR WALL PENETRATION FOR REHEAT PIPE PENETRATION SEE MECH DWGS.
4	LOUVER FOR OUTSIDE AIR INTAKE PLENUM, SEE MECH DWGS. TOUCH UP PAINT AROUND PERIMETER TO MATCH EXST.
5	TELE POWER POLE, TYP. SEE ELEC DRWGS & 1/A-121 FOR LOCATION REQMTS.
6	RECONSTRUCTED GYP BD SOFFIT TO MATCH EXST.
7	REINSTALL NURSE CALL LIGHT.
8	SEE FIRE DAMPER NOTES: 1, 2, 4, 5, 6, & 7.
9	SEE FIRE DAMPER NOTES: 1, 2, 3, 6, & 7.
10	SEE FIRE DAMPER NOTES: 1, 2, 5, 6, & 7.
11	SEE FIRE DAMPER NOTES: 1, 2, 6, & 7.
12	SACP CEILING, GRID, & CEILING MTD DEVICES/FIXTURES.
13	FIELD VERIFY IF WALL IS LEAD LINED. IF LEAD LINING EXISTS AND HEIGHT IS GREATER THAN 8'-2", NOTIFY THE ARCHITECT PRIOR TO THE START OF WORK. GC SHALL BE RESPONSIBLE FOR THE PROPER PATCH & REPAIR OF LEAD LINED WALLS AFFECTED BY THE WORK. REFER TO SPECIFICATIONS FOR LEAD ABATEMENT & HANDLING PROCEDURES.
14	LIGHT FIXTURE, SEE ELEC DWGS.
15	MECHANICAL REGISTER/DIFFUSER, SEE MECH DWGS.
16	FIRE SPRINKLER HEAD. SEE FIRE PROTECTION DWGS.
17	ALUM TRANSITION TRIM.
18	GYP BD SOFFIT.

FIRE DAMPER NOTES (THIS SHEET)

1. INSTALL FIRE DAMPER & CONNECT TO DUCT PER MANUFACTURER'S RECOMMENDATIONS. PATCH & REPAIR WALL AROUND FIRE DAMPER PENETRATION.
2. WRAP EXPOSED AREAS OF DUCT WITH INSULATION. WITHOUT AFFECTING CODE REQUIREMENTS FOR THE FIRE DAMPER INSTALLATION.
3. INSTALL/PATCH & REPAIR GYP BD CEILING. MATCH EXISTING FINISH.
4. REINSTALL CASEWORK, SINK, & WALL MOUNTED DEVICES, AS REQUIRED FOR FIRE DAMPER INSTALLATION. MATCH EXISTING FINISH.
5. INSTALL/REINSTALL SUSPENDED ACOUSTICAL CEILING TILE.
6. INSTALL/REINSTALL CEILING DEVICES & FIXTURES AFFECTED BY THE FIRE DAMPER INSTALLATION.
7. PATCH & REPAIR PORTION OF GYP BD WALL AROUND DUCT PENETRATION AFTER FIRE DAMPER INSTALLATION AS REQ. SEE MECH DWGS.

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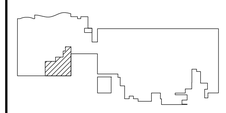
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KEYPLAN:





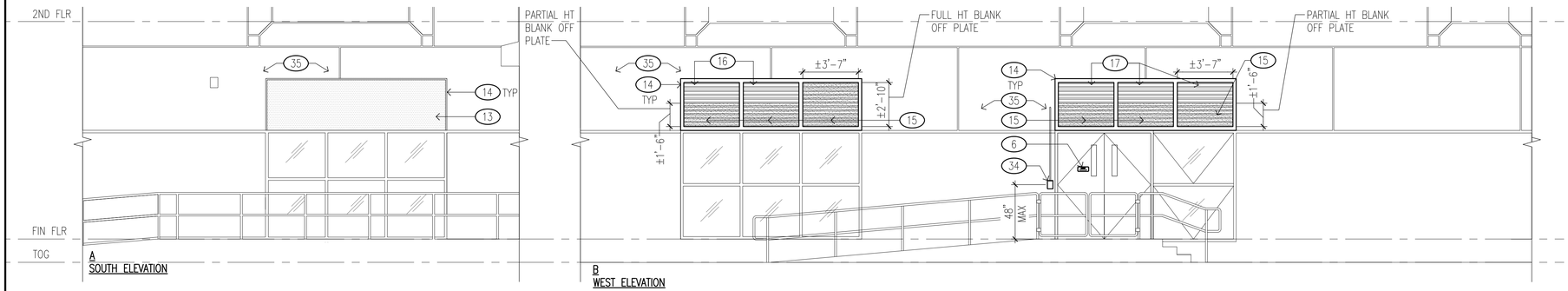
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BUILDING: -

DRAWING		
	PROJECT NO.	1916.04
	DRAWN BY:	KMA
	DATE:	OCTOBER 17, 2025
	SCALE:	AS SHOWN
	TITLE:	REPAIR REFLECTED CEILING PLAN
	NUMBER:	A-123

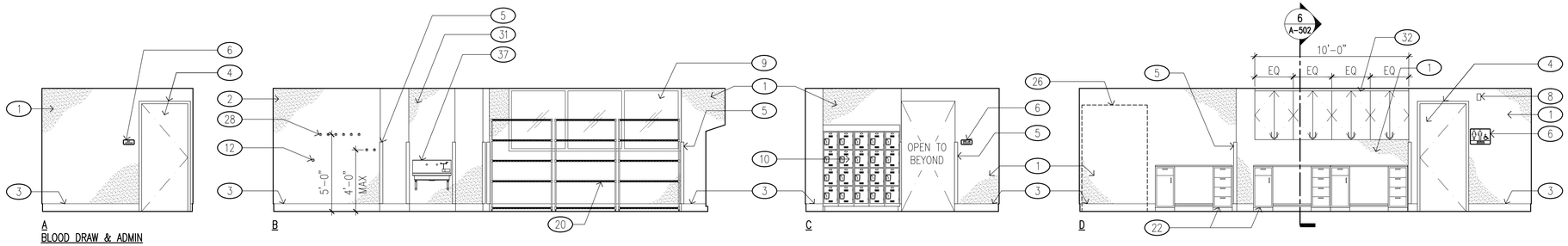


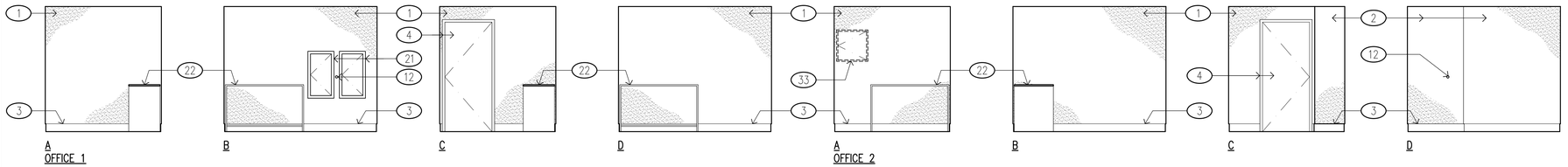
1 EXTERIOR ELEVATIONS – LABORATORY

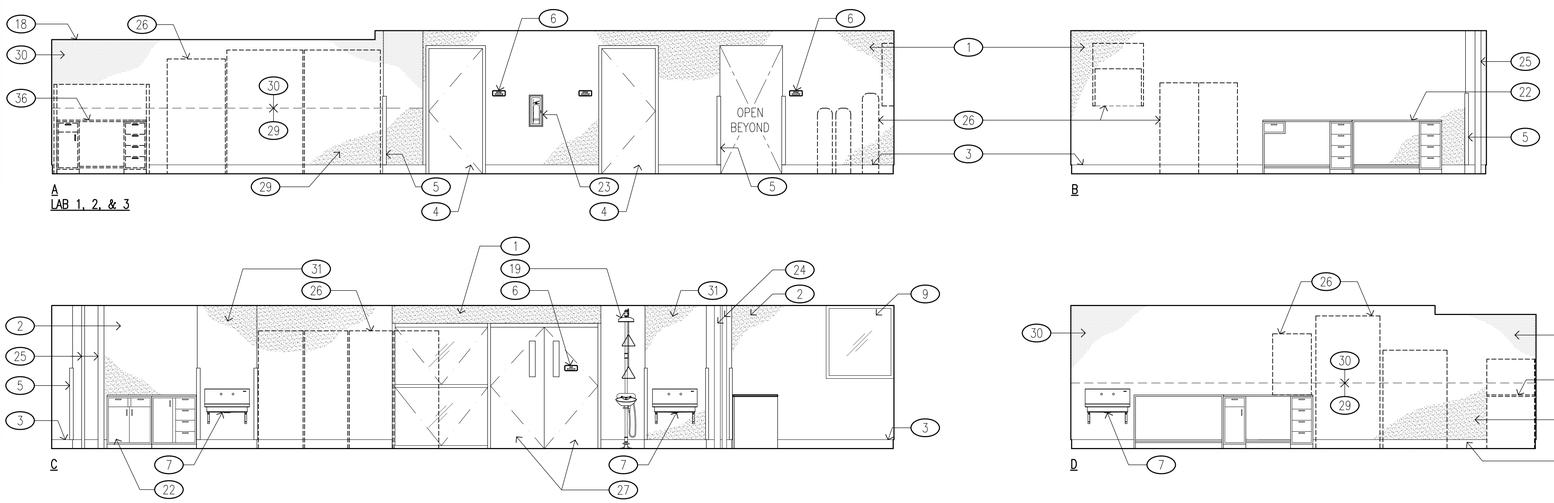
SCALE: 1/4" = 1'-0"

0 2' 4' 8'

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







2 INTERIOR & EXTERIOR ELEVATIONS

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

KEYNOTES (THIS SHEET)

KEYNOTE NO.	
1	GYP BD, PRIME & PAINT (PT-1)
2	PRIME & PAINT GYP BD / CONC CMU
3	RUBBER BASE AS SCHED (RB-1) (PT-1)
4	WD DOOR (PL-2) & MET FRAME (PT-3) – PRIME & PAINT
5	CORNER GUARD, TYP
6	SIGNAGE AS SCHED, TYP
7	CLEAN/DIRTY SINKS
8	REINSTALLED NURSE CALL LIGHT, SEE ELEC DWGS
9	EXST WDW, TYP
10	LOCKERS MOUNTED ON Z-BASE W/ SLOPE TOP
11	THERMOSTAT, SEE MECH DWGS
12	DOOR STOP
13	DEFS, MATCH EXST FINISH
14	TOUCH UP PAINT & SEAL AROUND PERIMETER
15	BLANK OFF PLATE INDICATED AS HATCHED AREA (PT-4) CONTRACTOR TO COORDINATE W/ MANUFACTURER
16	(3) PANEL WIND DRIVEN RAIN & WINDBORNE-DEBRIS IMPACT RESISTANT FIXED LOUVERS W/ (1) BLANK OFF PLATE FOR NUCLEAR MEDICINE OUTSIDE AIR INTAKE PLENUM. MATCH EXST LOUVER FINISH
17	(3) PANEL WIND DRIVEN RAIN & WINDBORNE-DEBRIS IMPACT RESISTANT FIXED LOUVERS W/ PARTIAL BLANK OFF PLATE AT BOTTOM FOR LABORATORY OUTSIDE AIR INTAKE PLENUM. MATCH EXST LOUVER FINISH
18	ACT LOWERED SOFFIT
19	EMERGENCY SHOWER W/ EYEWASH
20	WIRE RACK STORAGE, OFOI
21	ELEC PANEL, SEE ELEC DRWGS
22	LAB BENCH, OFOI
23	SEMI-RECESSED FIRE EXTINGUISHER CABINET, SEE FIRE PROTECTION DRWGS
24	EXST PLUMBING, SEE MECH DRWGS
25	EXST FIRE RISER VALVE
26	EQUIPMENT, OFOI
27	REINSTALLED DOOR LEAFS & FRAME.
28	LAB COAT WALL HOOKS W/ LOWER ADA COMPLIANT WALL HOOKS
29	SECTION OF REMOVED WALL COVERING & GYP BD, NEW GYP BD INSTALLATION, PRIME & PAINT
30	SECTION OF PATCHED & REPAIRED GYP BD PRIME & PAINT (PT-1) (PT-1)
31	PLUMBING CHASE WALL, GYP BD, PRIME & PAINT
32	WALL HUNG CABINETS (PL-1) (PT-1)
33	DATA RACK, SEE ELEC DRWGS
34	ACCESS CONTROL READER W/ CONDUIT, MATCH EXST KCH SYSTEM
35	PATCH, REPAIR, PRIME & PAINT AS REQ'D TO REPAIR DAMAGES TO WALL (PT-5)
36	WORK DESK
37	CLEAN SINK WITH EMERGENCY EYEWASH

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79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750
ADDRESS

CLINICAL LAB REDESIGN FOR DIAGNOSTIC LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:



FRED K. ERSKINE
LICENSED PROFESSIONAL ARCHITECT
No. 10192
HAWAII, U.S.A.

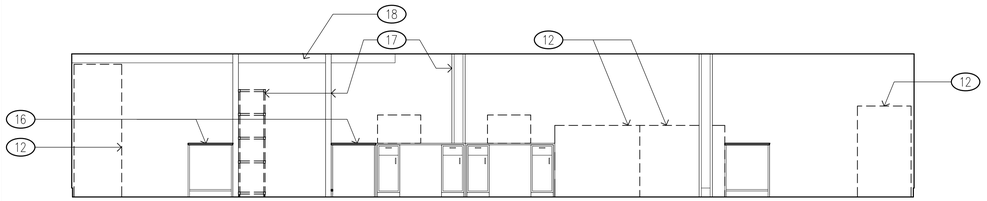
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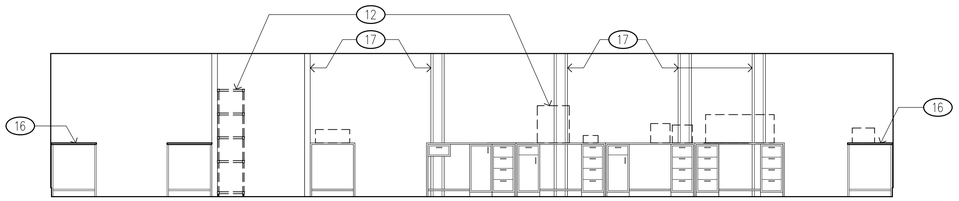
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BUILDING: –

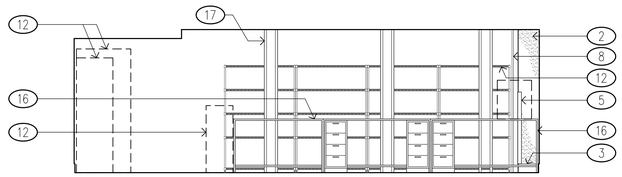
DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		KMA
DATE:		OCTOBER 17, 2025
SCALE:		AS SHOWN
TITLE:		EXTERIOR & INTERIOR ELEVATIONS– LABORATORY
NUMBER:		A-201



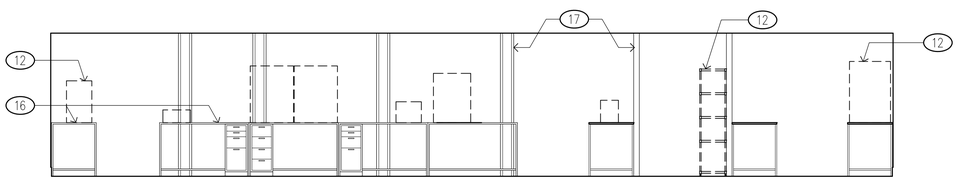
A1
LAB 1 & 2



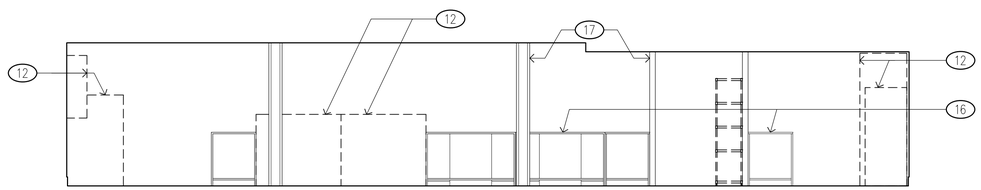
A2
LAB 1 & 3



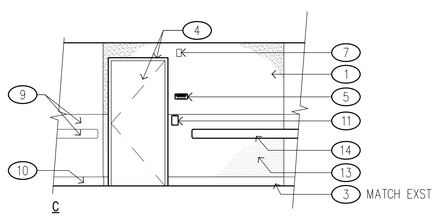
B1
LAB 1



C1
LAB 1 & 2



C2
LAB 2



C
CORRIDOR

1 INTERIOR ELEVATIONS

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

0 2' 4' 8'

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

KEYNOTES (THIS SHEET)

KEYNOTE NO.	
1	GYP BD, PRIME & PAINT PT-1
2	PATCHED & REPAIRED CONC COL, PRIME & PAINT PT-1
3	RUBBER BASE AS SCHED -CORRIDOR RB-2 -LABAROTORY RB-1
4	WD DOOR & MET FRAME PRIME & PAINT
5	CORNER GUARD, TYP
6	SIGNAGE AS SCHED, TYP
7	REINSTALLED NURSE CALL LIGHT, SEE ELEC DWGS
8	EXST PIPES TO REMAIN
9	EXST WALL GUARD & WALL COVERING
10	EXST RUBBER BASE
11	REINSTALLED ACCESS CONTROL READER
12	EQUIPMENT, OFOI
13	WALL COVERING TO MATCH EXST WC-1 TR-1
14	REINSTALL WALL GUARD
15	NOT USED
16	LAB BENCH, OFOI
17	TELE POWER POLE
18	ALUM TRANSITION TRIM BYND

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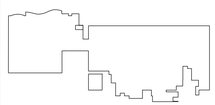
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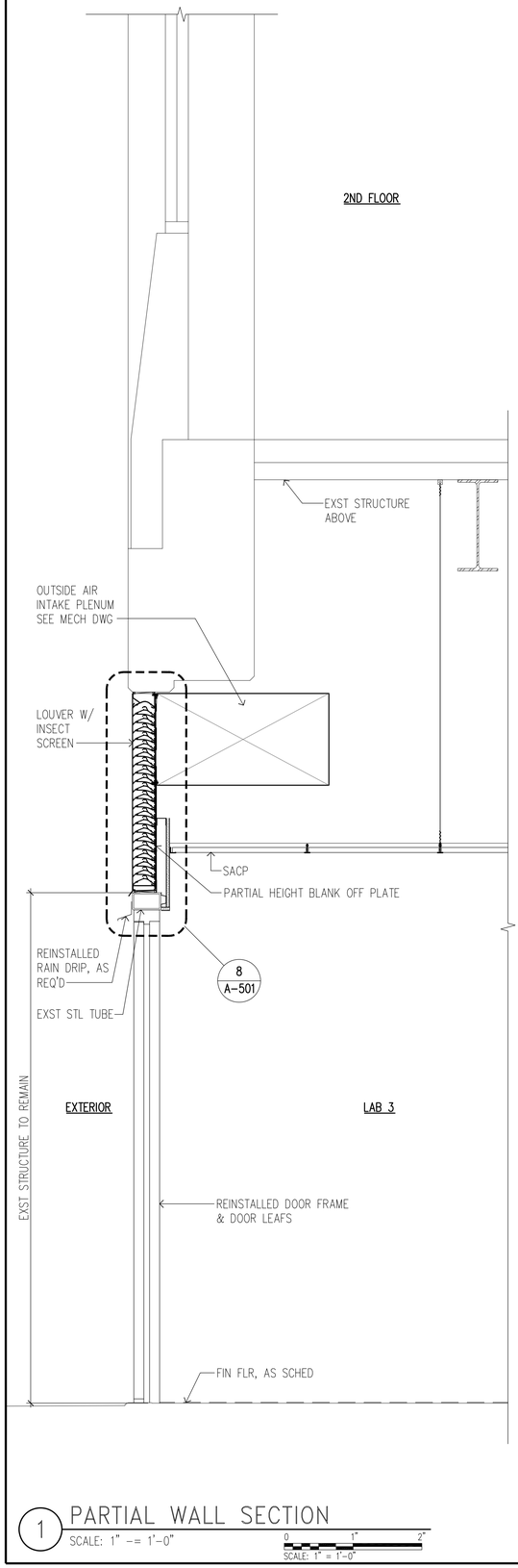
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BUILDING: -

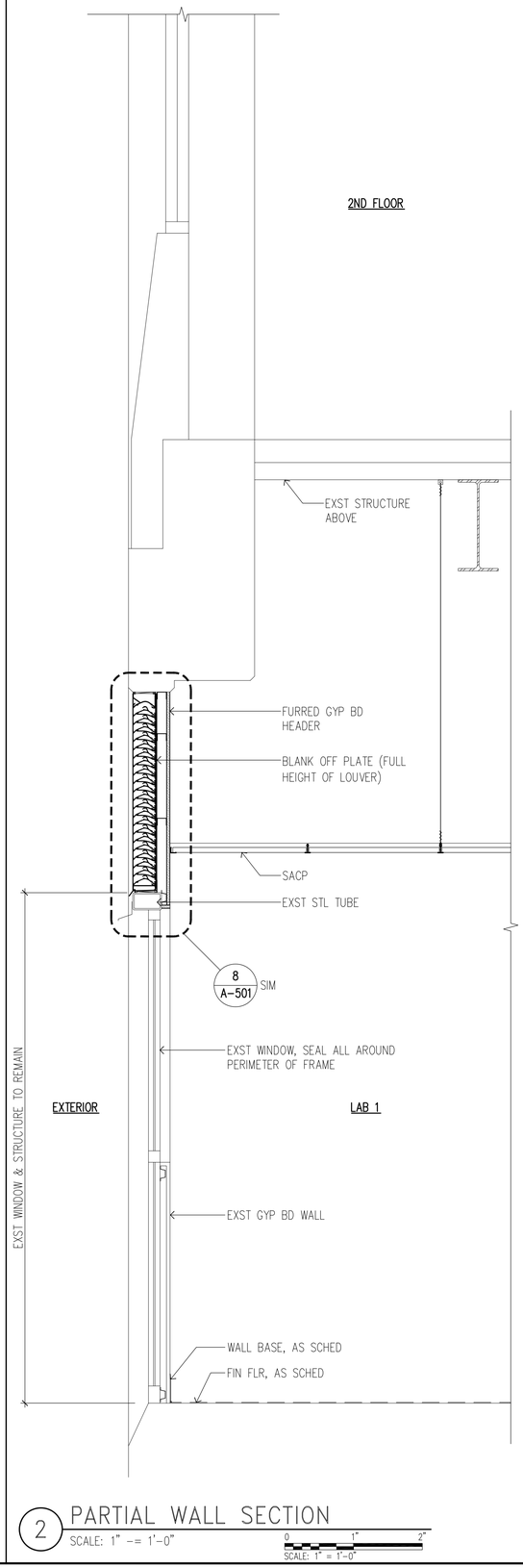
DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		KMA
DATE:		SEPTEMBER 16, 2025
SCALE:		AS SHOWN
TITLE:		INTERIOR ELEVATIONS
NUMBER:		A-202



1 PARTIAL WALL SECTION

SCALE: 1" -= 1'-0"

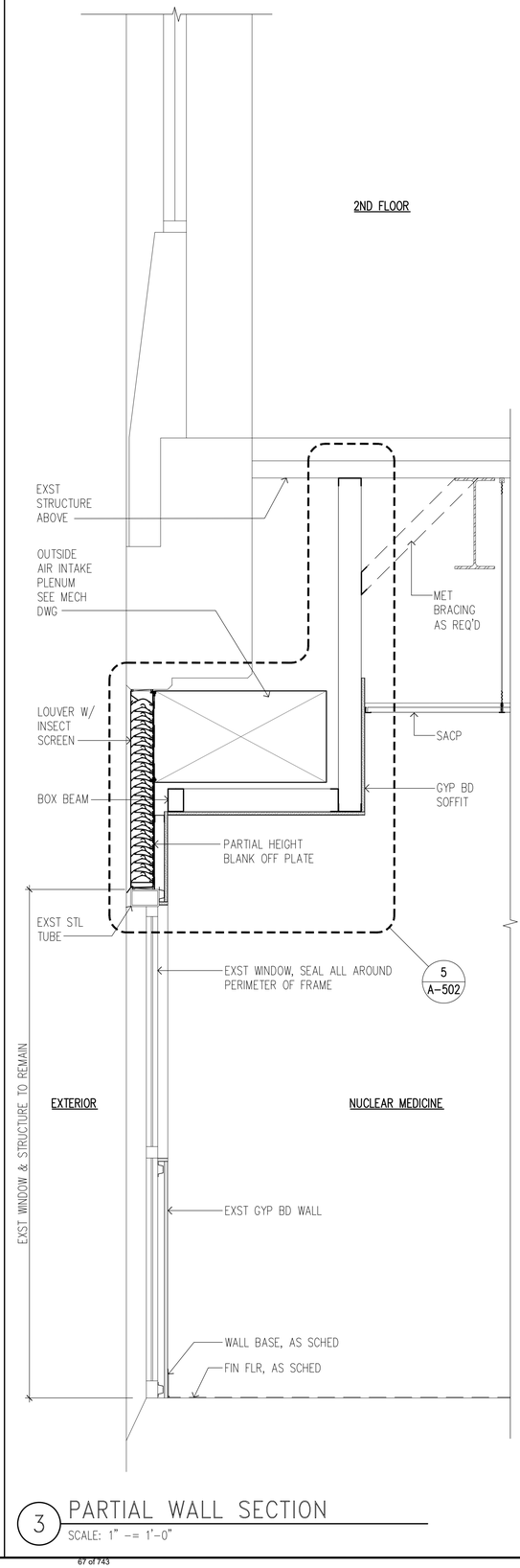
SCALE: 1" = 1'-0"



2 PARTIAL WALL SECTION

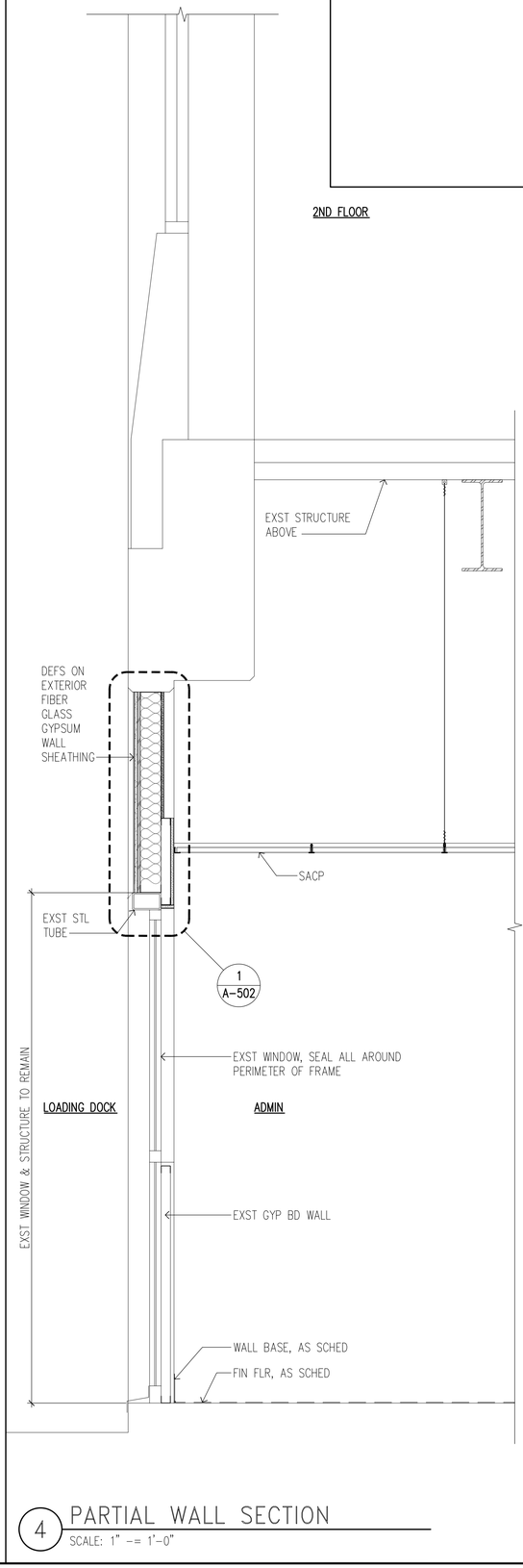
SCALE: 1" -= 1'-0"

SCALE: 1" = 1'-0"



3 PARTIAL WALL SECTION

SCALE: 1" -= 1'-0"



4 PARTIAL WALL SECTION

SCALE: 1" -= 1'-0"

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BUILDING: -

DRAWING

PROJECT NO.	1916.04
DRAWN BY:	KMA
DATE:	OCTOBER 17, 2025
SCALE:	AS SHOWN
TITLE:	WALL SECTIONS
NUMBER:	A-301

DOOR SCHEDULE

DOOR NO	ROOM NO	ROOM NAME	DR TYPE	FR TYPE	DOOR SIZE W	DOOR SIZE H	DOOR SIZE THK (IN)	CONSTRUCTION/FINISH MAT (NOTE 1)	CONSTRUCTION/FINISH GLAZ/LVR (NOTE 2)	CONSTRUCTION/FINISH FRAME (NOTE 3)	CONSTRUCTION/FINISH FINISH (NOTE 4)	FIRE RATING (MIN)	HDWR GROUP (NOTE 5)	DOOR DETAILS (SHEET A-400) HEAD	DOOR DETAILS (SHEET A-400) JAMB	DOOR DETAILS (SHEET A-400) THRESH	DOOR DETAILS (SHEET A-400) LOUVER	REMARKS
1	001	BLOOD DRAW	A	A	3'-0"	7'-0"	1 3/4"	SCWD	–	MET	PLAM	45	3	1	3	5	–	
2	--	RESTROOM	A	A	3'-0"	7'-0"	1 3/4"	SCWD	–	MET	PLAM	45	4	1	3	6	–	KICK PLATE
3	003	OFFICE 1	B	A	3'-0"	7'-0"	1 3/4"	SCWD	VP	MET	PLAM	–	2	2	2	5	–	VISION PANEL
4	004	OFFICE 2	B	A	3'-0"	7'-0"	1 3/4"	SCWD	VP	MET	PLAM	–	2	2	2	5	–	VISION PANEL
5	007	LAB 3	–	–	–	–	–	MET	–	MET	–	–	5	–	–	–	–	ESTRIKE AND EPT (DOOR NOTE 7)

NOTES:
1. SIZES INDICATED ARE FOR DESIGN REFERENCE ONLY. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS TO DETERMINE ACTUAL SIZES TO BE ORDERED. CONFIRM FINAL SIZES W/ARCHITECT BEFORE ORDERING.
2. PROVIDE ADAAG COMPLIANT HARDWARE ON ALL DOORS. OPERATING DEVICES ON DOORS SHALL HAVE A SHAPE THAT IS EASY TO GRASP W/ ONE HAND & DOES NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING, OR TWISTING OF THE WRIST TO OPERATE.
3. REFER TO INTERIOR ELEVATIONS FOR DOOR TYPE CONFIGURATIONS.
4. PLASTIC LAMINATE FINISH SHALL BE FACTORY APPLIED.

ABBREVIATIONS

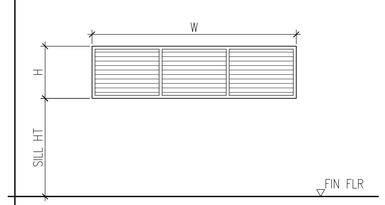
--	NONE OR NOT APPLICABLE	HDWE	HARDWARE "GROUP NO." (SEE DOOR NOTE 4)
DR NO	DOOR NUMBER. SEE FLOOR PLAN SHEETS		
EXST	EXISTING (SEE REMARKS FOR WORK)	MAT	MATERIAL (SEE DOOR NOTE 1)
EPT	ELECTRIC POWER TRANSFER	THK	DOOR PANEL THICKNESS
FRAME	DOOR FRAME (SEE DOOR NOTE 3)	TYPE	SEE DOOR TYPES SCHEDULE
GLZ	GLAZING TYPE (SEE DOOR NOTE 2)	W	DOOR WIDTH
H	DOOR HEIGHT		

DOOR NOTES:
1. DOOR CONSTRUCTION
   HM HOLLOW METAL
   SCWD SOLID CORE WOOD
2. GLAZING CONSTRUCTION
   -- NONE/ NOT APPLICABLE
   VP VISION PANEL
3. FRAME CONSTRUCTION
   MET METAL
4. FINISHES
   PLAM PLASTIC LAMINATE
   PT PAINTED
5. HDWR GROUP NO.
   (SEE SPECIFICATIONS)
6. SEE PRODUCT DATA PACKAGE FOR DOOR & FRAME DETAILS.
7. CONFIRM WITH HARDWARE SUPPLIER REGARDING HARDWARE FOR EXISTING DOOR 5.

IECC 2018 NOTE:

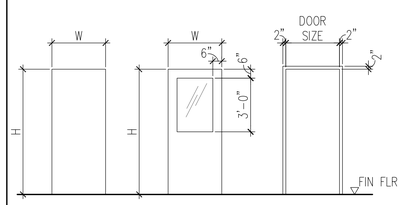
NO EXTERIOR WORK, ONLY EXTERIOR WORK ARE REPLACING LOUVERS AND INFILLING A FENESTRATION W/ GYP BD & DEFS.

LOUVER TYPE



L
MET LOUVER W/ BLANK OFF PLATE

DOOR TYPES & FRAME TYPES



A
FLUSH SCWD SINGLE DR

B
FLUSH SCWD SINGLE DR

A
MET FRAME

LOUVER SCHEDULE

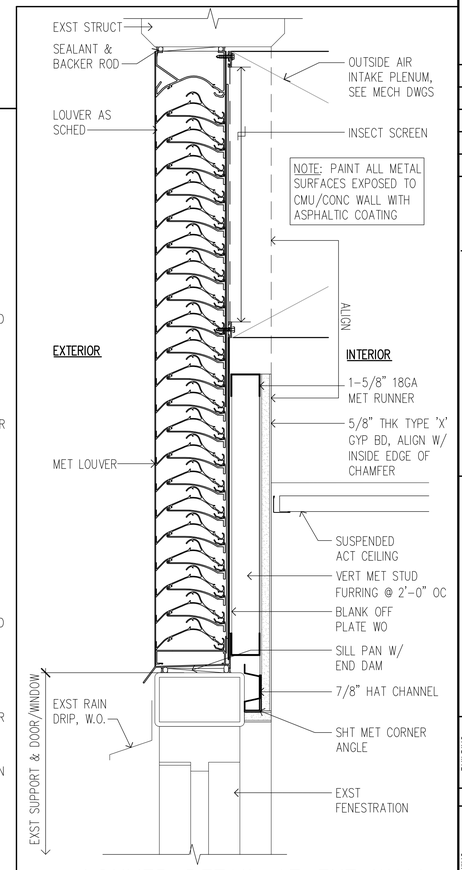
LOUVER NO	ROOM NO	ROOM NAME	LOUVER TYPE	LOUVER SIZE W	LOUVER SIZE H	SILL HT	CONSTRUCTION/FINISH LOUVER	CONSTRUCTION/FINISH FRAME	CONSTRUCTION/FINISH FINISH	FIRE RATING (MIN)	LOUVER DETAILS HEAD	LOUVER DETAILS JAMB	LOUVER DETAILS MULLION	LOUVER DETAILS SILL	REMARKS
L1	022	NUCLEAR MEDICINE	L	11'-6"	3'-2-1/2"	7'-0"	MET	MET	PT	–	8	8 SIM	–	8	
L2	008	LAB 2	L	11'-6"	3'-2-1/2"	7'-0"	MET	MET	PT	–	8	8 SIM	–	8	

NOTES:
1. PROVIDE INSECT SCREENS FOR ALL EXTERIOR LOUVERS
2. SEE EXTERIOR ELEVATIONS FOR LOUVER TYPE CONFIGURATIONS.
3. ESTIMATED LOUVER SIZES INDICATED ARE FOR DESIGN REFERENCE. CONTRACTOR SHALL VERIFY ON-SITE CONDITION DIMENSIONS TO DETERMINE ACTUAL SIZES TO BE ORDERED. CONFIRM FINAL SIZES W/ ARCHITECT BEFORE ORDERING.

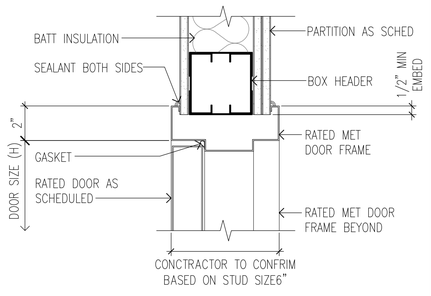
ABBREVIATIONS:

–	NONE/NOT APPLICABLE
LOUVER NO.	LOUVER NUMBER, SEE FLOOR PLAN SHEETS A-120 & 122
TYPE	SEE LOUVER TYPE SCHEDULE
W	LOUVER WIDTH
H	LOUVER HEIGHT

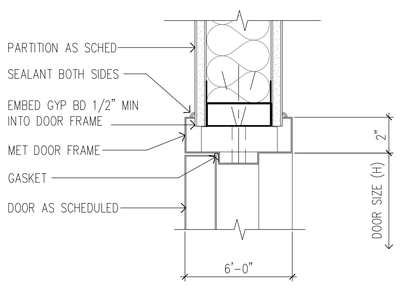
LOUVER NOTES:
1. LOUVER CONSTRUCTION (SEE SPEC SECTION 08900)
   MET METAL
2. FRAME CONSTRUCTION
   MET METAL
3. FINISHES
   PT PAINT
4. FINISHES
   PT PAINTED



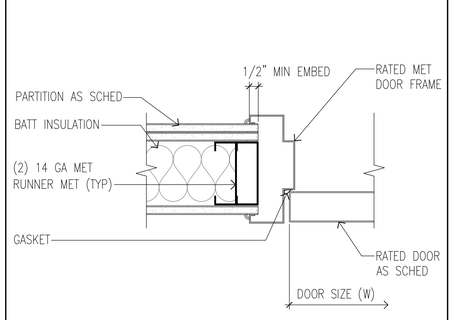
8 LOUVER DETAIL AT EXT WALL
SCALE: 3" = 1'-0"



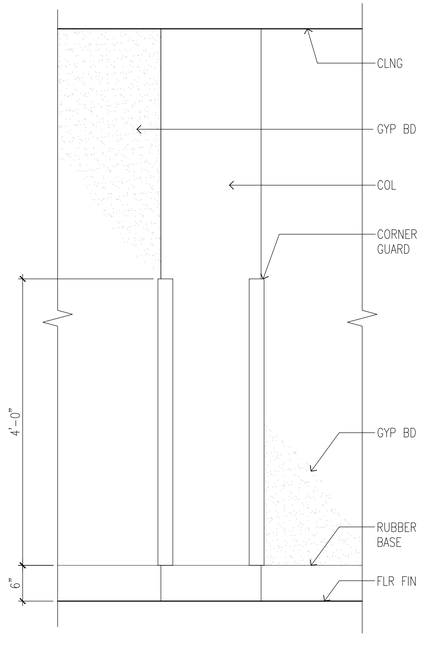
1 1-HOUR FIRE RATED WALL HEAD DETAIL
SCALE: 3"=1'-0" GA FILE NO. WP 1021



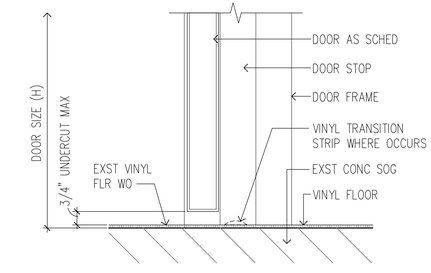
2 HEAD DETAIL (JAMB SIM)
SCALE: 3" = 1'-0"



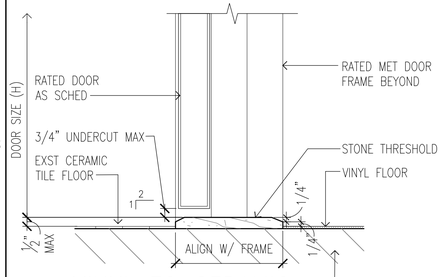
3 1-HOUR FIRE RATED WALL JAMB DETAIL
SCALE: 3" = 1'-0" GA FILE NO. WP 1021



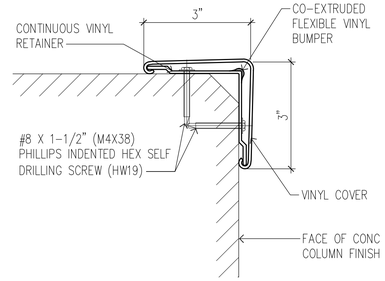
4 CORNER GUARD ELEVATION
SCALE: 6" = 1'-0"
0 2" 4"
SCALE: 6" = 1'-0"



5 VINYL TO VINYL THRESHOLD DETAIL
SCALE: 3" = 1'-0"



6 VINYL TO CERAMIC THRESHOLD DETAIL
SCALE: 3" = 1'-0"



7 CORNER GUARD DETAIL
SCALE: 6" = 1'-0"

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(808) 833-8891

KEYPLAN:



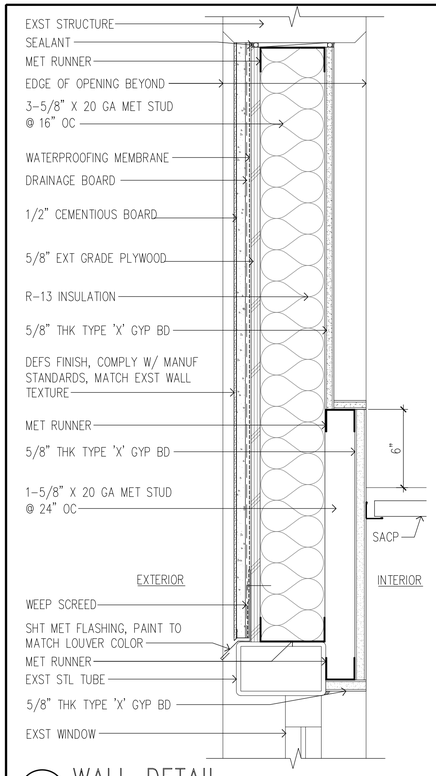


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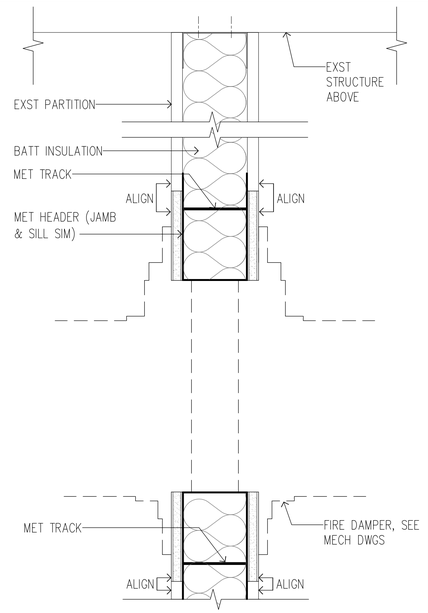
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BUILDING	–	
PROJECT NO.	1916.04	
DRAWING: DRAWN BY:	KMA	
DRAWING: DATE:	OCTOBER 17, 2025	
DRAWING: SCALE:	AS SHOWN	
DRAWING: TITLE:	DOOR & LOUVER SCHEDULE, TYPES, & DETAILS	
DRAWING: NUMBER:	A-501	



1 WALL DETAIL

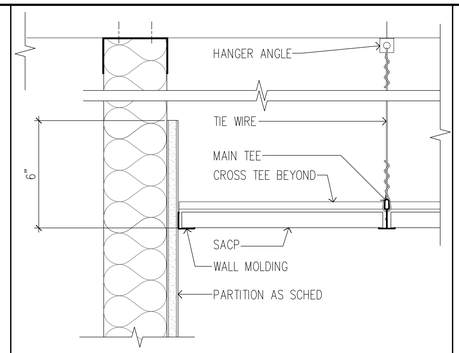
SCALE: 3" -= 1'-0"



NOTE: AT NUCLEAR MEDICINE AND DECAY, FIELD VERIFY AND NOTIFY ARCHITECT IF WALL CONTAINS A LEAD LINING ABOVE 8'-2" PRIOR TO THE START OF WORK.

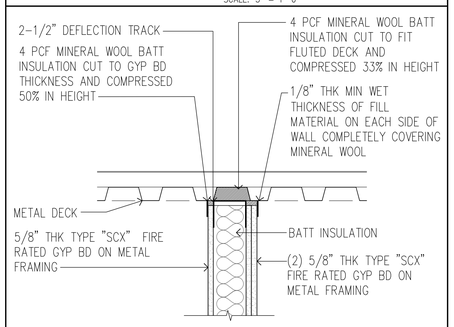
2 FIRE DAMPER DETAIL AT GYP BD WALL

SCALE: 1-1/2" = 1'-0"



3 SACP DETAIL

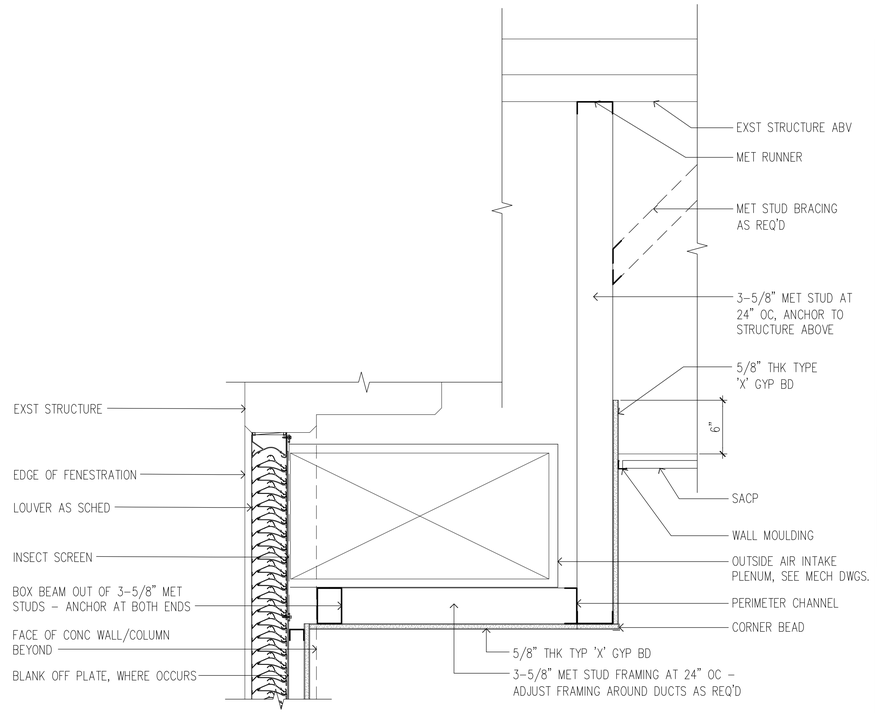
SCALE: 3" = 1'-0"



4 FIRE RATED PARTITION DETAIL AT METAL DECK, TYP

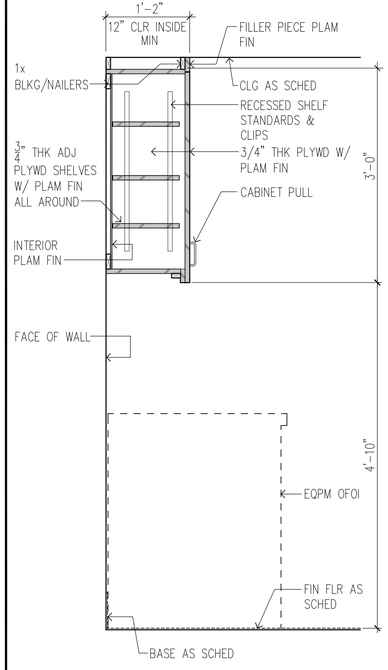
SCALE: 1-1/2" = 1'-0"

UL NO. HWD-D-0420



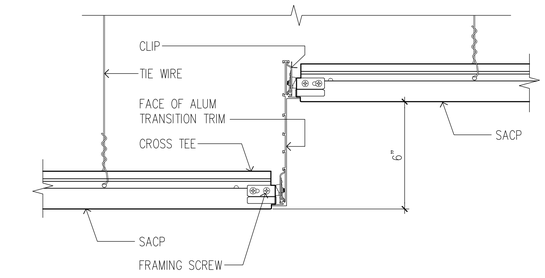
5 GYP BD SOFFIT DETAIL AT NUCLEAR MED

SCALE: 1-1/2" = 1'-0"



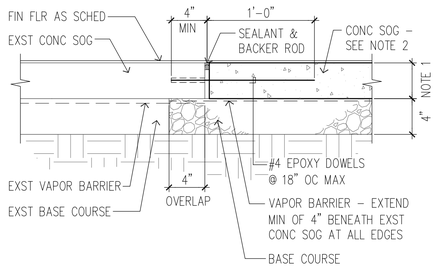
6 WALL HUNG CABINET DETAIL

SCALE: 1" = 1'-0"



8 SACP

SCALE: 3" = 1'-0"



NOTES:

1. MATCH THICKNESS OF EXST CONC SOG. 4" MIN THICKNESS.
2. SEE STRUCT DWGS FOR REINF.

7 CONC SOG DETAIL

SCALE: 1-1/2" = 1'-0"

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KONA COMMUNITY HOSPITAL
79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750
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NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:



FRED K. ERSKINE LICENSED PROFESSIONAL ARCHITECT No. 10192 HAWAII, U.S.A.

THIS LICENSE EXPIRES APRIL 30, 2026

SIGNATURE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115 OF THE HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS ENTITLED PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS).

BUILDING	-	
PROJECT NO.	1916.04	
DRAWING	DRAWN BY:	KMA
	DATE:	SEPTEMBER 16, 2025
	SCALE:	AS SHOWN
	TITLE:	DETAILS
	NUMBER:	A-502

STRUCTURAL GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE 2021 INTERNATIONAL BUILDING CODE AS AMENDED BY THE COUNTY OF HAWAII.

2. STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE, AND DO NOT SPECIFY THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEANS NECESSARY TO PROTECT THE STRUCTURE, AND ANY ADJACENT NEW OR EXISTING STRUCTURES DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO BRACING AND SHORING FOR LOADS ACTING ON THE STRUCTURE DURING CONSTRUCTION. OBSERVATION BY THE STRUCTURAL ENGINEER DURING CONSTRUCTION WILL NOT INCLUDE INSPECTION OF AFOREMENTIONED BRACING AND SHORING.

3. EXISTING CONDITIONS ARE SHOWN TO THE BEST OF OUR KNOWLEDGE. DISCREPANCIES SHALL PROMPTLY BE REPORTED TO THE ENGINEER AND BE RESOLVED BEFORE PROCEEDING WITH THE WORK.

4. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES, WHICH MAY BE AFFECTED BY ITS WORK. INTERFERENCES WITH THE STRUCTURE SHALL PROMPTLY BE REPORTED TO THE ENGINEER AND BE RESOLVED BEFORE PROCEEDING WITH THE WORK.

5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND VERIFYING ALL DIMENSIONS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL STRUCTURAL DISCREPANCIES, AND THESE DISCREPANCIES SHALL BE RESOLVED PRIOR TO PROCEEDING WITH THE WORK.

6. SHOULD A DISCREPANCY OCCUR ON THE DRAWINGS BETWEEN ANY PROJECT SPECIAL NOTES/SPECIAL DETAILS, AND THE TYPICAL SPECS/TYPICAL DETAILS, SAID SPECIAL NOTES/SPECIAL DETAILS SHALL TAKE PRECEDENCE. DETAILS NOTED AS TYPICAL SHALL APPLY IN ALL CONDITIONS UNLESS SPECIFICALLY SHOWN OR NOTED.

7. SEE ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS FOR DIMENSIONS AND LOCATIONS OF OPENINGS SHOWN ON THE STRUCTURAL DRAWINGS.

8. PENETRATIONS AND OPENINGS WITH ANY DIMENSION GREATER THAN 2" THAT ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS ARE PROHIBITED UNLESS APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. NO PENETRATION SHALL BE ALLOWED THROUGH ANY STRUCTURAL MEMBER WITHOUT THE APPROVAL OF THE ENGINEER.

9. ANY CONSTRUCTION MATERIAL THAT IS TEMPORARILY PLACED ON FLOOR AND/OR ROOF FRAMING SHALL BE DISTRIBUTED OVER THE FRAMING SYSTEM SUCH THAT THE CONSTRUCTION LOAD DOES NOT EXCEED THE LOAD THAT THE FRAMING SYSTEM WAS DESIGNED FOR.

10. DESIGN CRITERIA –

A. DESIGN DEAD LOADS (ADDITIONAL TO SELF WEIGHT)	
1. FLOOR	= 100 PSF
2. MECHANICAL & ELECTRICAL	= 5 PSF
B. WIND	
BASIC WIND SPEED	150 MPH
EXPOSURE CATEGORY	C
PRIMARY FRAME DESIGN METHOD	METHOD 2 (ANALYTICAL)
BUILDING CLASSIFICATION	ENCLOSED
C. SEISMIC	
OCCUPANCY CATEGORY	III
SITE CLASS	D
Sds	1.848 g
Sd1	1.19 g
SEISMIC DESIGN CATEGORY	D

11. THE GENERAL CONTRACTOR AND ITS SUBCONTRACTORS MUST SUBMIT IN WRITING ANY REQUESTS FOR MODIFICATIONS TO THE PLANS AND SPECIFICATIONS.

FOUNDATION NOTES

1. THE FOUNDATION DESIGN WAS BASED ON THE ASSUMPTIONS PRESENTED BELOW IN THE ABSENCE OF A SOILS REPORT:

ALLOWABLE SOIL BEARING PRESSURE	= 1500 PSF
ALLOWABLE PASSIVE EARTH RESISTANCE	= 150 PCF
FRICTIONAL RESISTANCE	= 0.4 x DEAD LOAD

2. FOOTING BACKFILL AND UTILITY TRENCH BACKFILL WITHIN THE BUILDING AREA SHALL BE MECHANICALLY COMPACTED IN LAYERS. FLOODING IS PROHIBITED.

3. CONTRACTOR SHALL PROVIDE FOR DE-WATERING OF EXCAVATIONS FROM EITHER SURFACE WATER, GROUND WATER, OR SEEPAGE.

CONCRETE NOTES

1. ALL CONCRETE UNLESS OTHERWISE NOTED SHALL BE REGULAR WEIGHT HARD ROCK TYPE (150#/CU.FT.).

2. ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318) WITH MODIFICATIONS AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.

3. SCHEDULE OF STRUCTURAL CONCRETE 28-DAY STRENGTH AND TYPES:

LOCATION OF STRUCTURE	STRENGTH
SLAB ON GRADE	4000 PSI
ALL OTHER CONCRETE	3000 PSI

4. PORTLAND CEMENT SHALL CONFORM TO ASTM C-150 TYPE II.

5. AGGREGATE FOR HARDROCK CONCRETE SHALL CONFORM TO ALL REQUIREMENTS AND TESTS OF ASTM C-33 AND PROJECT SPECIFICATIONS.

6. CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR HIS REVIEW 2 WEEKS PRIOR TO POUR.

7. CONCRETE MIXING OPERATION, ETC. SHALL CONFORM TO ASTM C-94.

8. PLACEMENT OF CONCRETE SHALL CONFORM TO ACI STANDARD 301 AND PROJECT SPECIFICATIONS.

9. UNLESS OTHERWISE NOTED ON THE PLANS, MINIMUM CLEAR COVERAGE OF NEW CONCRETE OVER OUTER REINFORCING BARS SHALL BE AS FOLLOWS:
   A. CONCRETE POURED DIRECTLY AGAINST EARTH.....3" CLEAR TO REINFORCING
   B. WALL FACES:
      EXPOSED TO EARTH WITH FORMED SURFACES OR EXPOSED TO WEATHER.....1-1/2" CLEAR FOR #5 BAR & SMALLER
      2" CLEAR FOR #6 BARS & LARGER
      INTERIOR FACES.....3/4 CLEAR
   C. BEAMS AND COLUMNS:
      NOT EXPOSED TO EARTH OR WEATHER.....1-1/2" CLEAR TO STIRRUPS & TIES
      FORMED AND EXPOSED TO EARTH OR WEATHER.....1 1/2" CLEAR TO STIRRUPS & TIES
      STRUCTURAL SLABS.....1" CLEAR AT TOP AND BOTTOM

10. ALL REINFORCING BARS, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO PLACING CONCRETE.

11. PROJECTING CORNERS OF BEAMS, WALLS, COLUMNS, EQUIPMENT PADS, ETC., SHALL BE FORMED WITH 3/4" CHAMFER, UNLESS OTHERWISE NOTED ON ARCHITECTURAL DRAWINGS.

12. PROVIDE SLEEVES FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT. CORING IN CONCRETE IS NOT PERMITTED EXCEPT AS SHOWN. NOTIFY THE STRUCTURAL ENGINEER IN ADVANCE OF CONDITIONS NOT SHOWN ON THE DRAWINGS.

13. CONDUIT OR PIPE SIZE (O.D.) THAT IS BURIED IN ANY CONCRETE SLABS SHALL NOT EXCEED 25 PERCENT OF SLAB THICKNESS AND SHALL BE PLACED BETWEEN THE TOP AND BOTTOM REINFORCING UNLESS SPECIFICALLY DETAILED OTHERWISE. CONCENTRATIONS OF CONDUITS OR PIPES SHALL BE AVOIDED EXCEPT WHERE DETAILED OPENINGS ARE PROVIDED.

14. DO NOT USE CONCRETE ADMIXTURES CONTAINING CHLORIDE OR CHLORIDE SALTS.

15. ALL ROUGHENED SURFACES IN CONCRETE SHALL BE MADE WITH A MINIMUM AMPLITUDE OF 1/4"

REINFORCING STEEL NOTES

1. ALL REINFORCING STEEL SHALL BE DETAILED AND PLACED IN CONFORMANCE WITH THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318), THE CRSI "MANUAL OF STANDARD PRACTICE," AND THE "ACI DETAILING MANUAL (SP-66) AS MODIFIED BY THE PROJECT DRAWINGS AND SPECIFICATIONS.

2. REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60 REQUIREMENTS. #4 AND SMALLER BARS MAY BE GRADE 40.

3. ANCHOR BOLTS, DOWELS AND OTHER EMBEDDED ITEMS ARE TO BE SECURELY TIED IN PLACE BEFORE CONCRETE IS POURED.

4. ALL REINFORCING BAR BENDS SHALL BE MADE COLD.

5. REINFORCING SPLICES SHALL BE MADE ONLY WHERE INDICATED ON THE DRAWINGS.

6. DOWELS BETWEEN FOOTING AND WALL OR COLUMNS SHALL BE THE SAME GRADE, SIZE, SPACING, AND NUMBER AS THE VERTICAL REINFORCING RESPECTIVELY, U.O.N.

7. WELDING OF REINFORCING STEEL IS NOT PERMITTED UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

9. REINFORCING BARS SHALL BE AS LONG AS PRACTICABLE AND AS DETAILED AND SHALL BE LAPPED AT SPLICES AND CORNERS NOT LESS THAN 32 BAR DIAMETER (24" MINIMUM), UNLESS OTHERWISE SHOWN. STAGGER HORIZONTAL WALL BAR SPLICES. IN GENERAL, BAR SPLICES SHALL BE MADE AT POINTS OF MINIMUM STRESS. IN BEAMS AND SLABS, SPLICE TOP BARS AT MID-SPAN, BOTTOM BARS OVER SUPPORTS, UNLESS OTHERWISE SHOWN.

10. EMBEDDED METAL COMPONENTS MADE UP OF ALLOYS THAT ARE DIS-SIMILAR TO THAT OF THE REINFORCING STEEL SHALL NOT BE ATTACHED DIRECTLY TO REINFORCING. MEASURES SHALL BE TAKEN TO ELECTRICALLY ISOLATE SAID COMPONENTS FROM ANY REINFORCING TO PREVENT CATHODIC EFFECTS.

ANCHORS

1. REINFORCING OR THREADED RODS DRILLED AND EXPOXIED INTO EXISTING CONCRETE AS DETAILED ON THE DRAWINGS SHALL BE ONE OF THE FOLLOWING OR APPROVED EQUIVALENT:

A. SIMPSON 'SET-XP'	ICC REPORT ESR-2508
B. HILTI 'RE-500 SD'	ICC REPORT ESR-2322
C. DEWALT 'PURE 110+'	ICC REPORT ESR-3298

2. INSTALLATION OF EPOXIED DOWELS SHALL FOLLOW THE STRICT RECOMMENDATIONS OF THE MANUFACTURER AND THE APPLICABLE ICC REPORT AND HAVE A MINIMUM OF 9 DIAMETERS EMBEDMENT.

3. INSTALLATION SHALL FOLLOW THE STRICT RECOMMENDATIONS OF THE MANUFACTURER AND THE APPLICABLE ICC ER REPORT. CONTRACTOR SHALL HAVE APPROPRIATE ICC ER REPORT ON-SITE DURING ALL INSTALLATIONS.

4. ANY ENGINEERING DESIGN PROVIDED BY CONTRACTOR OR OTHERS SHALL BE SUBMITTED FOR REVIEW BY THE INSURED AND REGISTERED STRUCTURAL ENGINEER WITH CONTINUOUS FIVE YEARS OF EXPERIENCE IN THE TYPE OF DESIGN SUBMITTED.

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(808) 833-8891

KEYPLAN:





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SIGNATURE

BUILDING: –

DRAWING		
	PROJECT NO.	1916.04
	DRAWN BY:	JC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	STUCTURAL NOTES
	NUMBER:	S-001

SPECIAL INSPECTION NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT SPECIAL INSPECTION OF PORTIONS OF THE WORK , AS REQUIRED BY THE BUILDING CODE OF THE COUNTY OF HAWAII, BE MADE AT THE APPROPRIATE TIME. THE CONTRACTOR SHALL GIVE TIMELY NOTICE OF WHEN AND WHERE INSPECTIONS ARE TO BE MADE AND PROVIDE ACCESS FOR THE INSPECTOR. THE CONTRACTOR SHALL CORRECT DEFECTIVE WORK AT NO ADDITIONAL COST TO THE OWNER AND THE CONTRACTOR SHALL PAY FOR RE-INSPECTION.

2. THE FOLLOWING IS A SUMMARY OF THE SPECIAL INSPECTION REQUIREMENTS:

CONCRETE REINFORCING STEEL & FORMWORK	YES, PER IBC TABLE 1705.3
ANCHOR BOLTS (RODS) IN CONCRETE	YES, PER IBC TABLE 1705.3
CONCRETE POUR	NO PER IBC 1705.3.2.3, DESIGN BASED ON 2,500 PSI CONCRETE ALTHOUGH 3,000 PSI IS SPECIFIED FOR CONSTRUCTION
CONCRETE CYLINDER TEST	NO, SUPPLIER TO PROVIDE IN-HOUSE TEST RESULTS
PERIODIC SPECIAL CASES:	EPOXY ANCHORS & DOWELS

ABBREVIATIONS

A.B.	ANCHOR BOLT
ALT.	ALTERNATE
APPROX.	APPROXIMATE
ARCH.	ARCHITECTURAL
(B)	BOTTOM (REINFORCEMENT)
BLDG.	BUILDING
BM.	BEAM
B.O.F.	BOTTOM OF FOOTING
BOT.	BOTTOM
C.I.P.	CAST-IN-PLACE
CL.	CENTERLINE
CLR.	CLEAR(ANCE)
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
CONC.	CONCRETE
CONN.	CONNECTION
CJP	COMPLETE JOINT PENETRATION
CONSTR.	CONSTRUCTION
CONT.	CONTINUOUS
CRM	CUT ROCK MASONRY
DBL.	DOUBLE
DET.	DETAIL
DIA.	DIAMETER
DIM.	DIMENSION
DWG.	DRAWING
EA.	EACH
E.F.	EACH FACE
E.J.	EXPANSION JOINT
EL.	ELEVATION
EQ.	EQUAL
EQUIPT.	EQUIPMENT
E.S.	EACH SIDE
E.W.	EACH WAY
EXP.	EXPANSION
EXT.	EXTERIOR
EXIST.	EXISTING
FDTN.	FOUNDATION
FLR.	FLOOR
F.O.P.	FACE OF CONCRETE
FIN.	FINISH
FIN. FLR.	FINISH FLOOR
FT.	FOOT OR FEET
FTG.	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
(H)	HORIZONTAL (REINFORCEMENT)
HK.	HOOK
HORIZ.	HORIZONTAL
I.D.	INSIDE DIAMETER (DIMENSION)
INFO.	INFORMATION
INT.	INTERIOR
INTERM.	INTERMEDIATE
JT.	JOINT
LLV.	LONG LEG VERTICAL
LONG.	LONGITUDINAL
MAX.	MAXIMUM
M.B.	MACHINE BOLT
MECH.	MECHANICAL
MIN.	MINIMUM
MISC.	MISCELLANEOUS
N.I.C.	NOT IN CONTRACT
NO. OR #	NUMBER
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER (DIMENSION)
O.F.	OUTSIDE FACE
O.H.	OPPOSITE HAND
OPNG.	OPENING
OPP.	OPPOSITE
PJP	PARTIAL JOINT PENTRATION
PL.	PLATE
PLWD.	PLYWOOD
PREFAB.	PREFABRICATION/PREFABRICATED
PT.	POINT
REF.	REFERENCE
R.U.	ROUGH OPENING
R.	RADIUS
REINF.	REINFORCEMENT
REQ.	REQUIRED/REQUIREMENT(S)
SCHED.	SCHEDULE
SECT.	SECTION
SHT.	SHEET
SIM.	SIMILAR
SL.	SLOPE
S..G.	SLAB-ON-GRADE
SPEC.	SPECIFICATION
SQ.	SQUARE
SST.	STAINLESS STEEL
STD.	STANDARD
STIFF.	STIFFENER
STRUCT.	STRUCTURAL
SYM.	SYMBOL
(T)	TOP (REINFORCEMENT)
T & B	TOP AND BOTTOM
T & G	TONGUE AND GROOVE
THRU	THROUGH
T.O.C.	TOP OF CURB
T.O.F.	TOP OF FOOTING
T.O.S.	TOP OF SLAB, TOP OF STEEL
T.O.W.	TOP OF WALL
TRANSV.	TRANSVERSE
TYP.	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
VERT.	VERTICAL
W/	WITH
WD.	WOOD
W.W.M.	WELDED WIRE MESH
LLH.	LONG LEG HORIZONTAL

NOTE:
NOT ALL ABBREVIATIONS ARE NECESSARILY USED

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KEYPLAN:

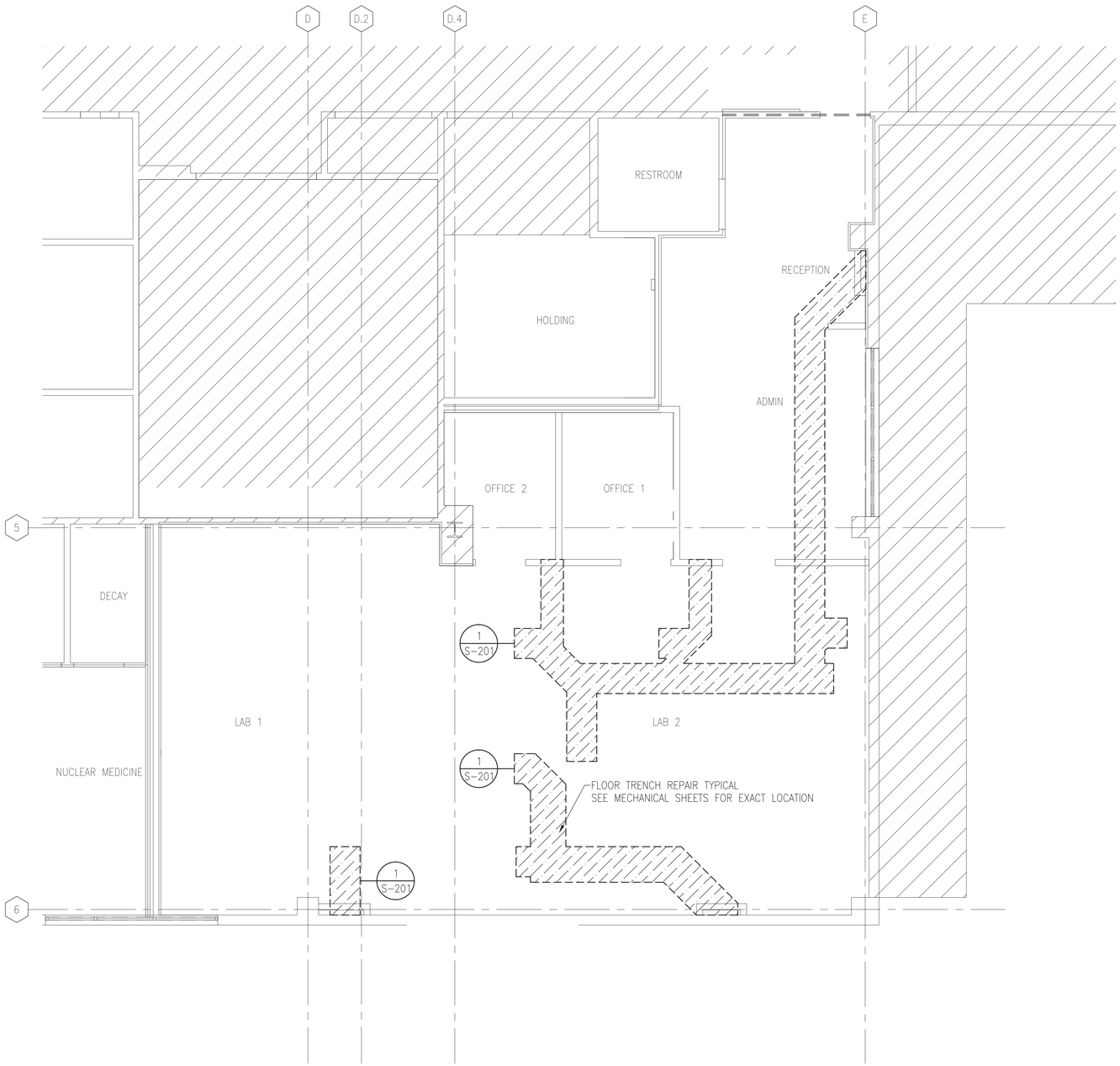
YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 9361-S
HAWAII, U.S.A.

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

SIGNATURE

BUILDING: -

DRAWING		
PROJECT NO.		1916.04
	DRAWN BY:	JC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	STUCTURAL NOTES AND ABBREVIATIONS
	NUMBER:	S-002



A CONC. REPAIR PLAN - LABORATORY

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

0 4' 8'

NOTE:

CONTRACTOR HAS OPTION OF CUTTING OUT MORE SLAB IF DESIRED, SEE ADDITIONAL DETAIL PROVIDED ON S-201.

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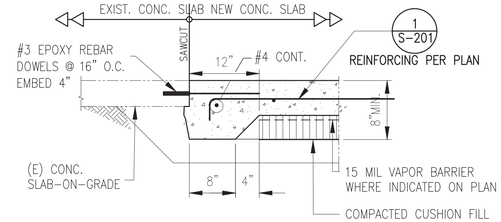
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SIGNATURE

BUILDING: –

DRAWING:	
PROJECT NO.	1916.04
DRAWN BY:	JC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	STRUCTURAL FLOOR PLAN
NUMBER:	S-101



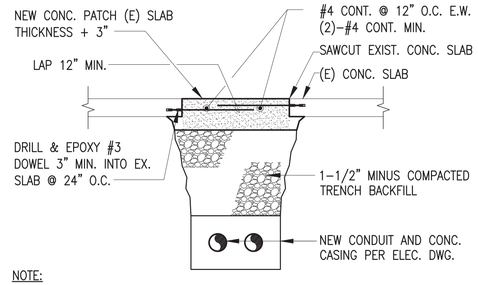
NOTES:

U.O.N. MINIMUM REQUIREMENTS SHALL BE:

1. CONCRETE SHALL BE CLASS "A". THICKNESS = 4" MIN.
2. AGGREGATE CUSHION FILL SHALL BE ASTM C33 NO. 67.
3. REINFORCING SHALL BE #3 BARS @ 16" O.C. BOTHWAYS

4 NEW CONC. TO EXIST. CONC.

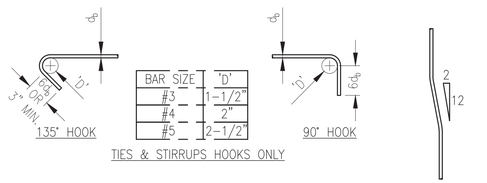
NO SCALE



NOTE:
WIDTH OF TRENCH TO BE FIELD DETERMINED AS NECESSARY TO PROPERLY INSTALL PROPOSED CONDUIT(S) & CASING

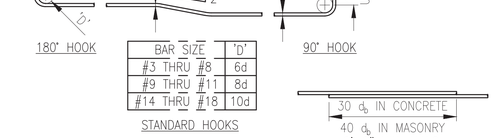
1 CONC. SLAB PATCH DETAIL

NO SCALE



BAR SIZE	'D'
#3	1-1/2"
#4	2"
#5	2-1/2"

TIES & STIRRUPS HOOKS ONLY



BAR SIZE	'D'
#3 THRU #8	6d
#9 THRU #11	8d
#14 THRU #18	10d

STANDARD HOOKS

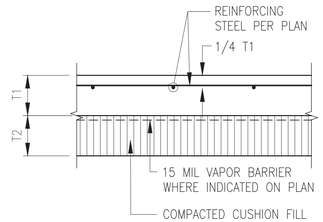


TYP. COMPRESSION LAP SPLICE

NOTE:
FOR TENSION
SPLICE SEE DETAIL

2 TYP. REINF. BENDING DETAIL

NO SCALE



NOTES:

1. SLAB-ON-GRADE THICKNESS (T1) AS PER PLAN.
2. CUSHION FILL THICKNESS (T2) AS PER PLAN. CUSHION FILL SHALL BE #3 FINE GRAVEL (ASTM NO. 67 GRAVEL)

3 SLAB-ON-GRADE DETAIL

NO SCALE

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NUMBER:	S-201

LEGEND & ABBREVIATIONS

SYMBOLS	ABBREVIATIONS	DESCRIPTIONS	SYMBOLS	ABBREVIATIONS	DESCRIPTIONS
	ABV	ABOVE		HZ	HERTZ
	AFF	ABOVE FINISHED FLOOR		IN	INCHES
	AP	ACCESS PANEL		IN WG	INCHES WATER GAUGE
	AHU	AIR HANDLING UNIT		LBS	POUNDS
	ARCH	ARCHITECTURAL		MAX	MAXIMUM
BD		BACKDRAFT DAMPER		MECH	MECHANICAL
		BALL VALVE		MIN	MINIMUM
	CLG	CEILING	M		MOTORIZED DAMPER
		CHECK VALVE			NEW WORK
	CHWR	CHILLED WATER RETURN		NO	NUMBER
	CHWS	CHILLED WATER SUPPLY		OC	ON CENTER
	CLR	CLEARANCE		ODP	OPEN DRIP PROOF
	CO	CLEAN OUT		OA	OUTSIDE AIR
	CONC	CONCRETE	VD	OBVD	OPPOSED BLADE VOLUME DAMPER
	CONN	CONNECTION		OFOI	OWNER FURNISH OWNER INSTALL
CD		CONCEALED OPERATOR VOLUME DAMPER		OL	OVERLOAD
	CONT	CONTINUATION	ø	PH	PHASE
	CW	COLD WATER		POC	POINT OF CONNECTION
	CC	COOLING COIL	P		PRESSURE SENSOR
	CFM	CUBIC FEET PER MINUTE		RA	RETURN AIR
CD	CD	CONDENSATE DRAIN		RAR	RETURN AIR REGISTER
	dB	DECIBELS		RHC	REHEATING COIL
ø	DIA	DIAMETER		S	SANITARY
	DN	DOWN		SCC	SENSIBLE COOLING CAPACITY
	DWGS	DRAWINGS		SK	SINK
SD		DUCT SMOKE DETECTOR		SD	SMOKE DAMPER
	EAT	ENTERING AIR TEMPERATURE		S.S.	STAINLESS STEEL
	ECWT	ENTERING CHILLED WATER TEMPERATURE		STRUCT	STRUCTURAL
	EXH	EXHAUST		SA	SUPPLY AIR
	EA	EXHAUST AIR		SAD	SUPPLY AIR DIFFUSER
	EAR	EXHAUST AIR REGISTER		SAR	SUPPLY AIR REGISTER
	EF	EXHAUST FAN	SP	SP	DUCT MOUNTED STATIC PRESSURE SENSOR
	ELEC	ELECTRICAL		ST	SOUND TRAP
	EXST	EXISTING			TO BE REMOVED OR DEMOLISHED
	FCU	FAN COIL UNIT		TEMP	TEMPERATURE
	FIN FLR	FINISHED FLOOR	TE		TEMPERATURE SENSOR
		FIRE DAMPER (HORIZONTAL)	T	T-STAT	THERMOSTAT
		FIRE DAMPER (VERTICAL)		THK	THICK
	FC	FLEXIBLE CONNECTION		TA	TRANSFER AIR
		FLEXIBLE DUCT		TYP	TYPICAL
	FCO	FLOOR CLEAN OUT			UNION
	FD	FLOOR DRAIN		V	VOLTS
G		GRAVITY DAMPER		VAV	VARIABLE AIR VOLUME
	GRND	GROUND		VFD	VARIABLE FREQUENCY DRIVE
	HC	HEATING COIL		WCO	WALL CLEAN OUT
	HP	HORSE POWER		W	WATTS
	HW	HOT WATER			WYE STRAINER
	HB	HOSE BIBB			

HAWAI'I COUNTY ENERGY CODE

2015 IECC, HAWAI'I REVISED STATUTES HRS 107-24 TO 28 & HAWAI'I ADMINISTRATIVE RULES HAR 3-181.1

I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THIS PROJECT DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE COMMERCIAL PROVISIONS FOR MECHANICAL SYSTEMS (C403, C404 & C405) OF THE 2015 IECC WITH AMENDMENTS PER HAR 3-181.1:

COMPLIANCE METHOD

- ☒ 2015 IECC as amended. Mandatory & Prescriptive
- ☐ 2015 IECC as amended. Mandatory & Total Building Performance
- ☒ ASHRAE Standard 90.1-2013. Mandatory & Prescriptive
- ☐ ASHRAE Standard 90.1-2013. Mandatory & Energy Cost Budget

INFORMATION IN CONSTRUCTION DOCUMENTS	**Yes**	**N/A**
HVAC Systems		
Equipment capacity and efficiency. C403.2.3	☒	☐
Thermostatic controls C403.2.4	☒	☐
Guest room door switches. C403.2.4.2.4	☐	☒
Ventilation rate C403.2.6	☒	☐
Demand control ventilation controls C403.2.6.1	☐	☒
Enclosed parking garage ventilation control. C403.2.6.2	☐	☒
Energy recovery ventilation system. C403.2.7	☐	☒
Kitchen exhaust systems. C403.2.8	☐	☒
Duct and plenum insulation thickness/R-value. C403.2.9	☒	☐
Duct and plenum sealing requirements. C403.2.9	☒	☐
Pipe insulation thickness/R-value. C403.2.10	☒	☐
Fan motor horsepower. C403.2.12	☒	☐
Fan efficiency. C403.2.12	☒	☐
Fan motor efficiency. C405.8	☒	☐
Pump motor efficiency. C405.8	☐	☒
Variable-flow fan control. C403.4.1	☐	☒
Static pressure sensor location. C403.4.1.2	☐	☒
Static pressure reset control. C403.4.1.3	☐	☒
Chilled water variable flow control. C403.4.2.4	☐	☒
Chiller isolation. C403.4.2.6	☐	☒
Cooling tower fan control. C403.4.3	☐	☒
Terminal unit minimum and maximum airflow. C403.4.4	☐	☒
Commissioning requirements. C408.2	☒	☐
Refrigeration		
Refrigeration equipment efficiency. C403.2.14	☐	☒
Walk-in coolers and freezers. C403.2.15, C403.2.16 & C403.5	☐	☒
Refrigerated warehouses. C403.2.15 & C403.5	☐	☒
Refrigerated display cases. C403.2.17 & C403.5	☐	☒
Service Water Heating		
Heat recovery for service water heating. C403.4.5	☐	☒
Equipment capacity and efficiency. C404.2	☐	☒
Pipe insulation. C404.4	☐	☒
Hot water pipe length/volume. C404.5	☐	☒
Hot water circulation controls. C404.6	☐	☒
Heated pool and spa covers. C404.9.3	☐	☒
Commissioning requirements. C408.2	☐	☒

NOTES

SIGNATURE: _____

DATE: OCTOBER 16, 2025

NAME: CAREY S. NAKAGAWA

TITLE: VICE-PRESIDENT

LICENSE NO.: 16319-M

HAWAII HEALTH SYSTEMS CORPORATION
Quality Healthcare for All

KONA COMMUNITY HOSPITAL

79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750

ADDRESS

CLINICAL LAB REDESIGN
FOR DIAGNOSTIC
LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama
erskine
architects inc

540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:

CAREY S. NAKAGAWA
LICENSED PROFESSIONAL ENGINEER
No. 16319-M
HAWAII, U.S.A.

THIS LICENSE EXPIRES APRIL 30, 2026

SIGNATURE

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

BUILDING: -

DRAWING	
PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	LEGEND ABBREVIATIONS NOTES
NUMBER:	M01

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MECHANICAL NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO DEMOLITION, FABRICATION, INSTALLATION AND COMMENCEMENT OF ALL WORK TO BE DONE. COORDINATE ALL WORK TO BE DONE WITH OTHER TRADES.
2. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ARCHITECT.
3. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES AND FIELD CONDITIONS AFFECTING OR AFFECTED BY THIS INSTALLATION. SHOULD CONFLICTS OCCUR, THE OWNER SHALL BE NOTIFIED IMMEDIATELY.
4. SCHEDULING OF ALL ON-SITE CONSTRUCTION WORK SHALL BE IN ACCORDANCE WITH THE APPROVED CONSTRUCTION SCHEDULE. SEQUENCE ON-SITE WORK TO MINIMIZE DISRUPTIONS (E.G. NOISE, DUST, ODORS, ETC.) TO THE NORMAL OPERATION OF THE TENANTS. PROVIDE BARRICADES, TEMPORARY BARRIERS, ETC. AS REQUIRED TO SEPARATE THE CONSTRUCTION WORK AREA FROM THE TENANT'S WORK AREAS AND PROVIDE SAFE WORKING CONDITIONS.
5. AIR CONDITIONING OUTAGES INCLUDING SHUTDOWN OF ANY PORTION OF OR THE COMPLETE AIR CONDITIONING SYSTEM, ETC. SHALL BE SUBMITTED FOR APPROVAL AND SHOWN ON THE CONSTRUCTION SCHEDULE BY THE CONTRACTOR. THE OWNER WILL LIMIT THE NUMBER OF OUTAGES AND THE DURATION OF EACH OUTAGE.
6. LOUD NOISE PRODUCING CONSTRUCTION ACTIVITIES SHALL ALSO BE SCHEDULED FOR WEEKEND OR AFTER NORMAL WORKING HOURS. CONTRACTOR SHALL COORDINATE WITH OWNER.
7. ALL ITEMS ARE NEW UNLESS OTHERWISE NOTED. ALL EXISTING EQUIPMENT AND OTHER ITEMS SHALL REMAIN UNLESS OTHERWISE NOTED.
8. ALL DUCT DIMENSIONS SHOWN NUMERICALLY ARE NET INSIDE DIMENSIONS AND DO NOT INCLUDE INSULATION THICKNESS. ALL SUPPLY AND RETURN AIR DUCTS SHALL BE WRAPPED WITH 1 1/2 INCH THICK RIGID INSULATION WITH 1 1/2 INCH FLEXIBLE INSULATION AT DUCT JOINTS. REMOVE EXISTING DUCT INSULATION IN THE EXISTING MAINTENANCE ROOM AND REPLACE WITH NEW RIGID INSULATION WITH 1 1/2 INCH FLEXIBLE INSULATION AT DUCT JOINTS.
9. PROVIDE DIELECTRIC CONNECTIONS AT ALL FERROUS TO COPPER CONNECTIONS.
10. CONTRACTOR SHALL COORDINATE LOCATION OF NEW DUCTWORK AND PIPING AND MAKE ADJUSTMENTS TO AVOID INTERFERENCE WITH EXISTING AND NEW DUCTWORK, PIPING, CONDUIT, BEAMS, FRAMING, CABLE TRAYS, AND LIGHTING.
11. UNLESS OTHERWISE INDICATED, MOUNT ALL WALL MOUNTED MECHANICAL DEVICES, PANELS, SWITCHES, ETC AT 48 INCHES AFF.
12. ALL ROOF, WALL, AND FLOOR PENETRATIONS SHALL BE VERIFIED AND COORDINATED WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
13. PROVIDE FIRE STOPPING AT ALL EXISTING AND NEW PIPE AND DUCT PENETRATIONS THRU FIRE RATED CEILING AND WALL ASSEMBLIES, SMOKE WALLS, AND FLOORS PENETRATIONS. SEE ARCHITECTURAL DRAWINGS FOR FIRE RATED WALL LOCATIONS. ALL FIRE STOP AT FLOOR PENETRATIONS SHALL BE RATED FOR 2-HOUR CONSTRUCTION.
14. ALL GAPS AT THE PENETRATIONS THROUGH FIRE RATED CEILING AND WALL ASSEMBLIES FOR PIPES, PIPE SUPPORTS, RODS, STRAPS, CONTROL CONDUITS, ETC. SHALL BE SEALED WITH APPROVED FIRE STOPPING MATERIAL AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS TO MAINTAIN THE FIRE RATING OF THE ASSEMBLY. SEE ARCH DRAWINGS FOR LOCATION OF FIRE RATED WALLS & CEILINGS.
15. ALL COSTS FOR PLANNING, QUALITY CONTROL, OVERTIME, INCLUDING EVENING AND WEEKEND WORK, USE OF SPECIAL CONTRACTORS AND OTHER ITEMS REQUIRED BY THIS PROJECT SHALL BE INCLUDED IN THE CONTRACT PRICE.
16. THE MECHANICAL PLANS WERE DRAWN USING VARIOUS REFERENCE DRAWINGS AND LIMITED FIELD VERIFICATION DUE TO EXISTING INTERFERENCES. CONTRACTOR SHALL VERIFY LAYOUT IN THE FIELD PRIOR TO STARTING WORK AND SHALL INDICATE CHANGES ON SHOP DRAWINGS. NOTIFY ENGINEER OF ANY AREAS WHERE EXISTING LAYOUT VARIES SIGNIFICANTLY FROM DRAWINGS. MINOR CHANGES (AS DETERMINED BY THE ENGINEER) IN LAYOUT AND PIPE SIZES DUE TO AS-BUILT CONDITIONS SHALL NOT BE THE BASIS FOR REQUESTING ADDITIONAL FUNDS FROM THE OWNER.
17. PATCH AND PAINT ALL SURFACES AFFECTED BY SELECTIVE DEMOLITION TO MATCH ADJACENT AND/OR EXISTING CONDITIONS. OBTAIN APPROVAL OF MATCHING MATERIAL.
18. CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT AND PIPING ARE INSTALLED WITH MANUFACTURER'S RECOMMENDED ACCESS SPACE FOR MAINTENANCE, OPERATION, AND IN ACCORDANCE WITH CODES.
19. FIRE SAFETY DURING CONSTRUCTION, ALTERATION, OR DEMOLITION SHALL BE IN ACCORDANCE WITH CHAPTER 16, NFPA 1 AS AMENDED.
20. ALL AIR CONDITIONING AND VENTILATION SYSTEMS SHALL COMPLY WITH TITLE 11, ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, CHAPTER 39, AIR CONDITIONING AND VENTILATION REQUIREMENTS.
21. A/C WORK WILL NOT AFFECT WATER DEMAND.
22. ALL SINKS, FLOOR DRAINS, FLOOR SINKS AND OTHER WASTE WATER CONNECTIONS WHICH ACCEPT PROCESS/WASHDOWN WATER, SHALL BE PROVIDED WITH 1/4 INCH SCREENED OPENING MAXIMUM.
23. WATER CONSERVATION – PROVIDE FLOW RESTRICTORS OR OTHER APPROVED FLOW CONTROL DEVICES TO LIMIT FLOW ON ALL LAVATORY FAUCETS TO A MAXIMUM OF 0.5 GPM, FOR ALL SHOWER HEADS AND SINKS TO 2.5 GPM AND FOR ALL URINALS TO 1.0 GALLON PER FLUSH AND FOR ALL WATER CLOSETS TO 1.6 GALLONS PER FLUSH.
24. FOR ADA FIXTURE MOUNTING HEIGHT, SEE ARCH DWGS.
25. THE FORCE TO ACTIVATE ANY FAUCET OR FLUSH VALVE CONTROL VALVE SHALL BE NO GREATER THEN 5 LBS.
26. DDC CONTROLS SHALL BE BY SETPOINT SYSTEM (WWW.SETPOINTSYSTEMS.COM).
27. OUTSIDE AIR DUCT IS MANIFOLDED TO MULTIPLE AHU'S. MAXIMUM DOWNTIME FOR THE OUTSIDE AIR SYSTEM SHALL BE 8 HOURS,

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KEALAKEKUA, HAWAII 96750
ADDRESS

CLINICAL LAB REDESIGN
FOR DIAGNOSTIC
LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:

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LICENSED PROFESSIONAL ENGINEER
No. 16319-M
HAWAII, U.S.A.

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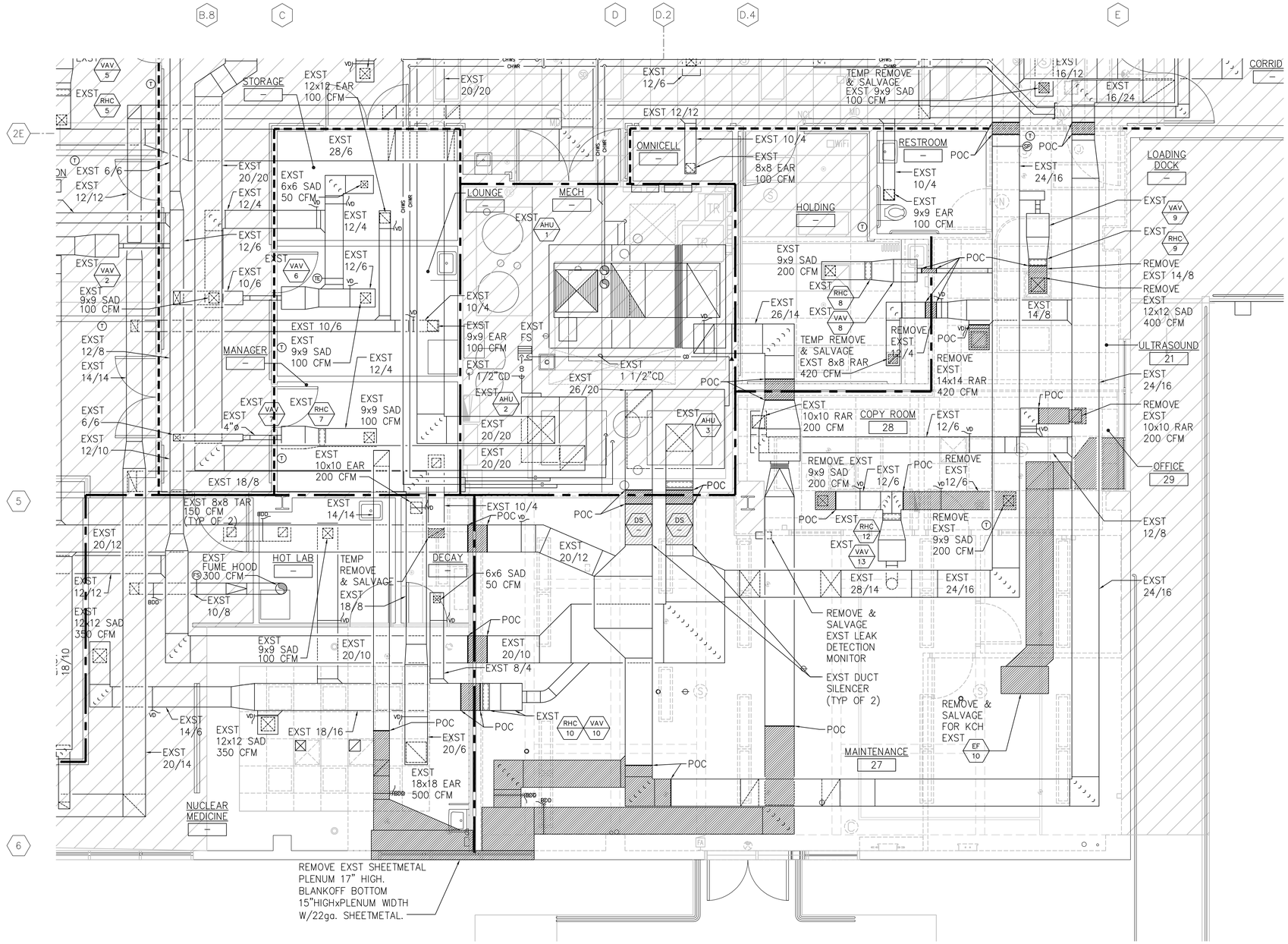
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BUILDING: –

PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	MECHANICAL NOTES
NUMBER:	**M02**

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PARTIAL FORMER MAINTENANCE DEMOLITION MECHANICAL PLAN

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

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
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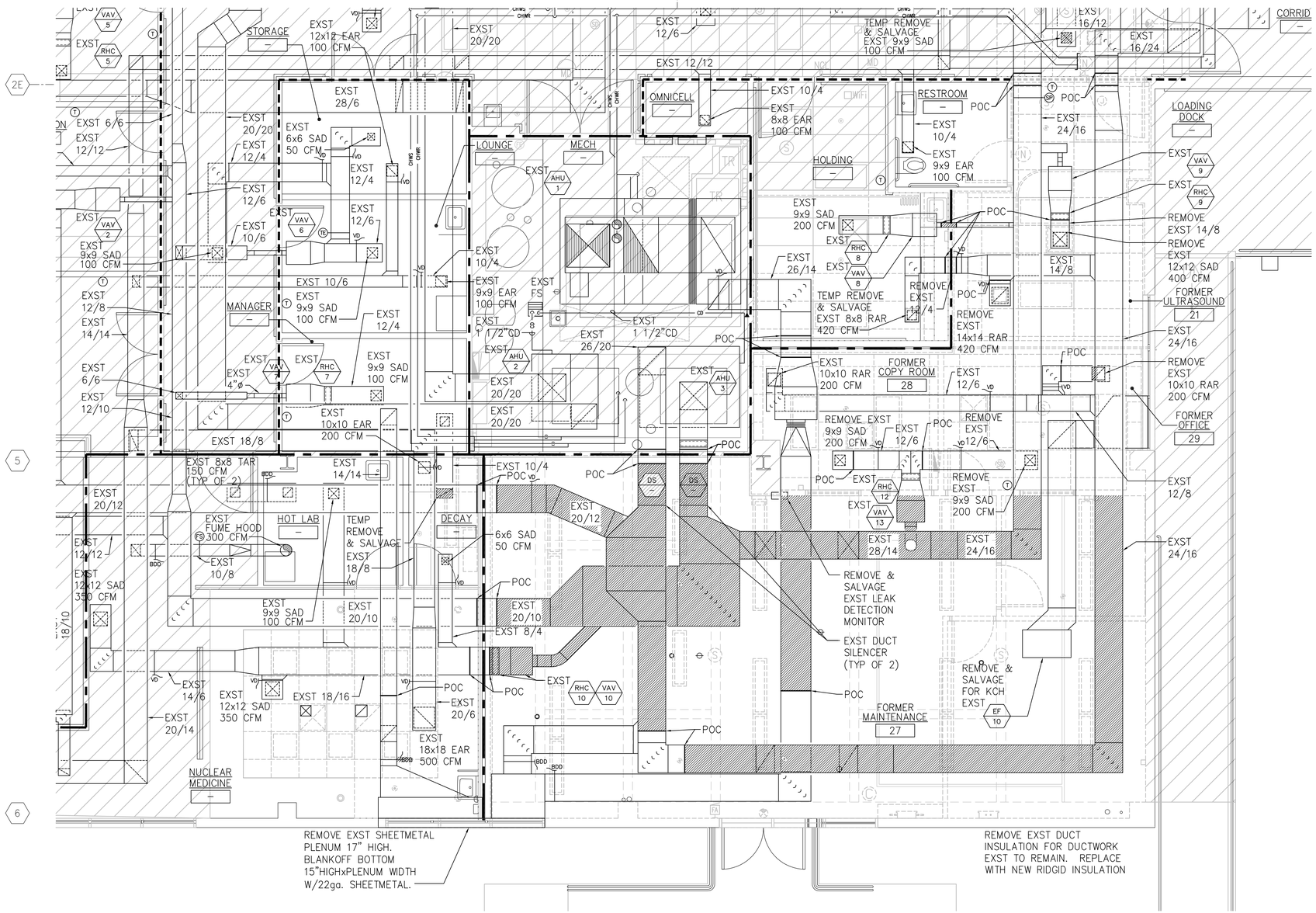
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BUILDING: -

PROJECT NO.		1916.04
DRAWING	DRAWN BY:	TEC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	PARTIAL FORMER MAINTENANCE DEMOLITION MECHANICAL PLAN
	NUMBER:	M03



PARTIAL FORMER MAINTENANCE DEMOLITION MECHANICAL PLAN

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

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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KEYPLAN:





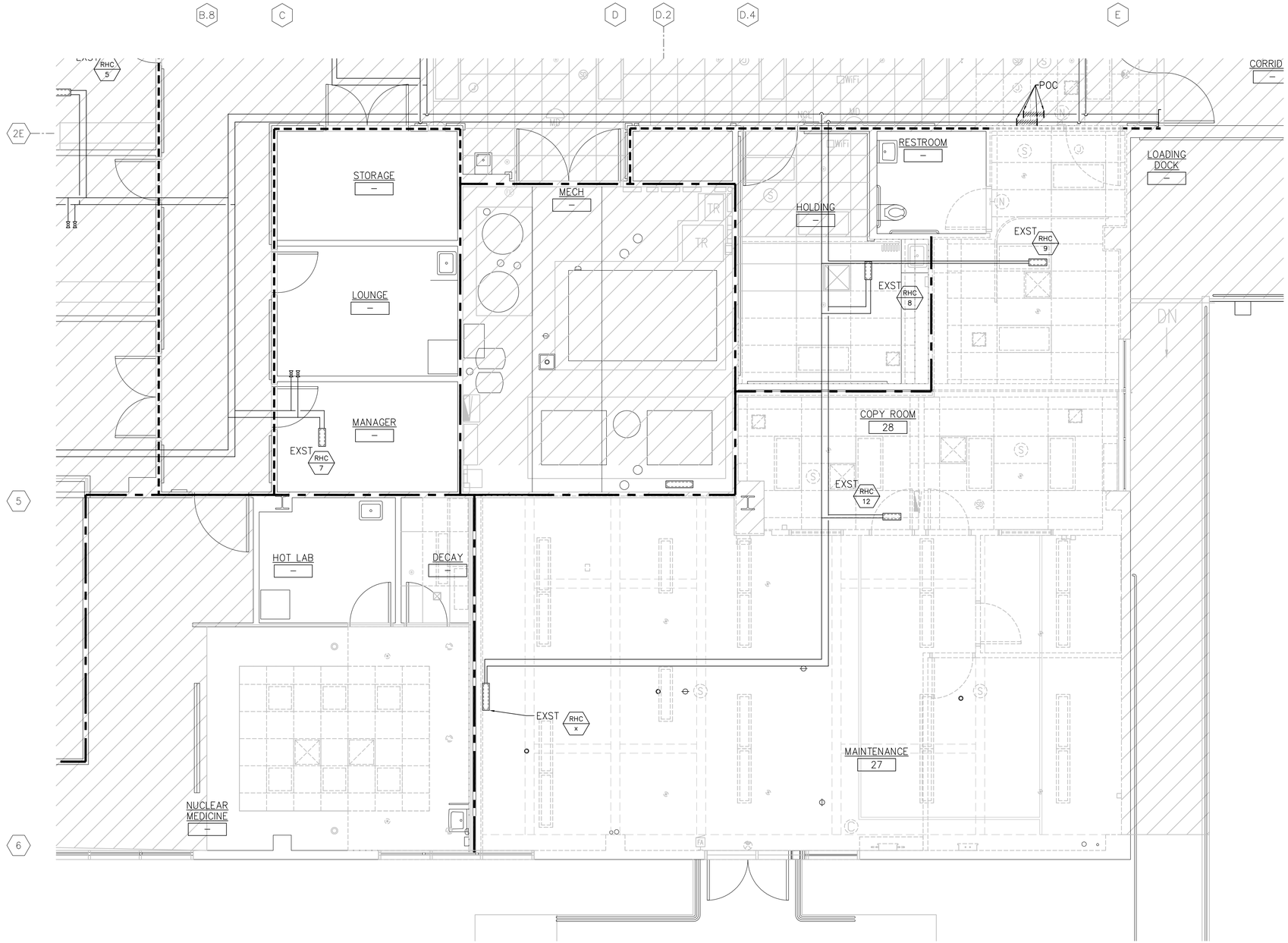
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PROJECT NO.	1916.04	
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	SCALE:	AS SHOWN
	TITLE:	PARTIAL FORMER MAINTENANCE DEMOLITION MECHANICAL PLAN
	NUMBER:	M04

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PARTIAL FORMER MAINTENANCE DEMOLITION REHEAT PLAN

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

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
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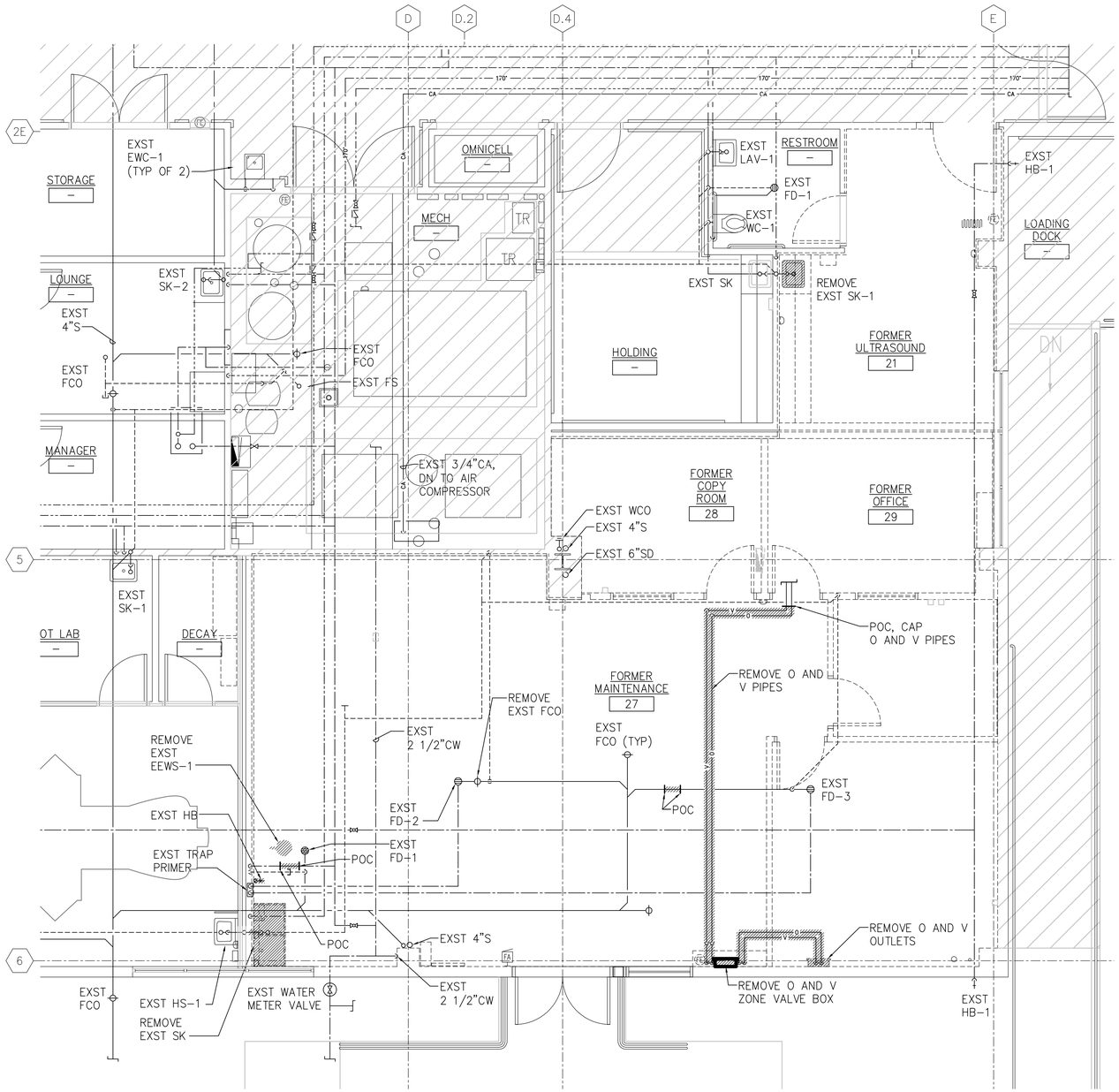
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BUILDING: -

PROJECT NO.	1916.04
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DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	PARTIAL FORMER MAINTENANCE DEMOLITION REHEAT PLAN
NUMBER:	**M05**

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NOTE:

1. FIXTURE REMOVAL SHALL MINIMIZE DEAD LEGS IN THE DOMESTIC WATER SYSTEM. CONTRACTOR SHALL REMOVE DOMESTIC WATER PIPE SERVICING THE DEMOLISHED FIXTURE TO THE CLOSEST TEE/BRANCH/MAIN.

PARTIAL FORMER MAINTENANCE DEMOLITION PLUMBING PLAN

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

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
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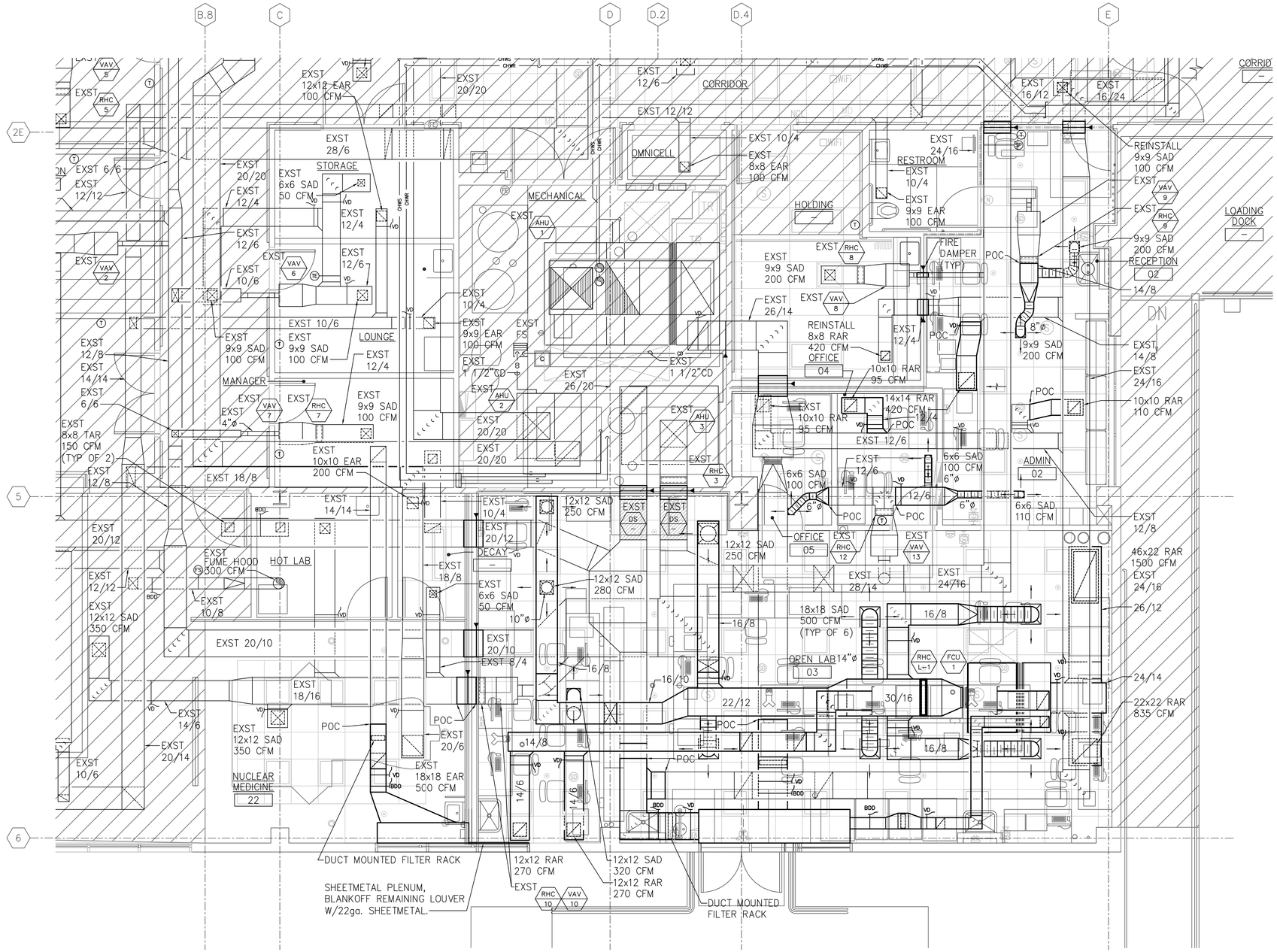
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BUILDING: -

PROJECT NO.	1916.04	
DRAWING	DRAWN BY:	TEC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	PARTIAL FORMER MAINTENANCE DEMOLITION PLUMBING PLAN
	NUMBER:	M06

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PARTIAL LABORATORY MECHANICAL PLAN

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

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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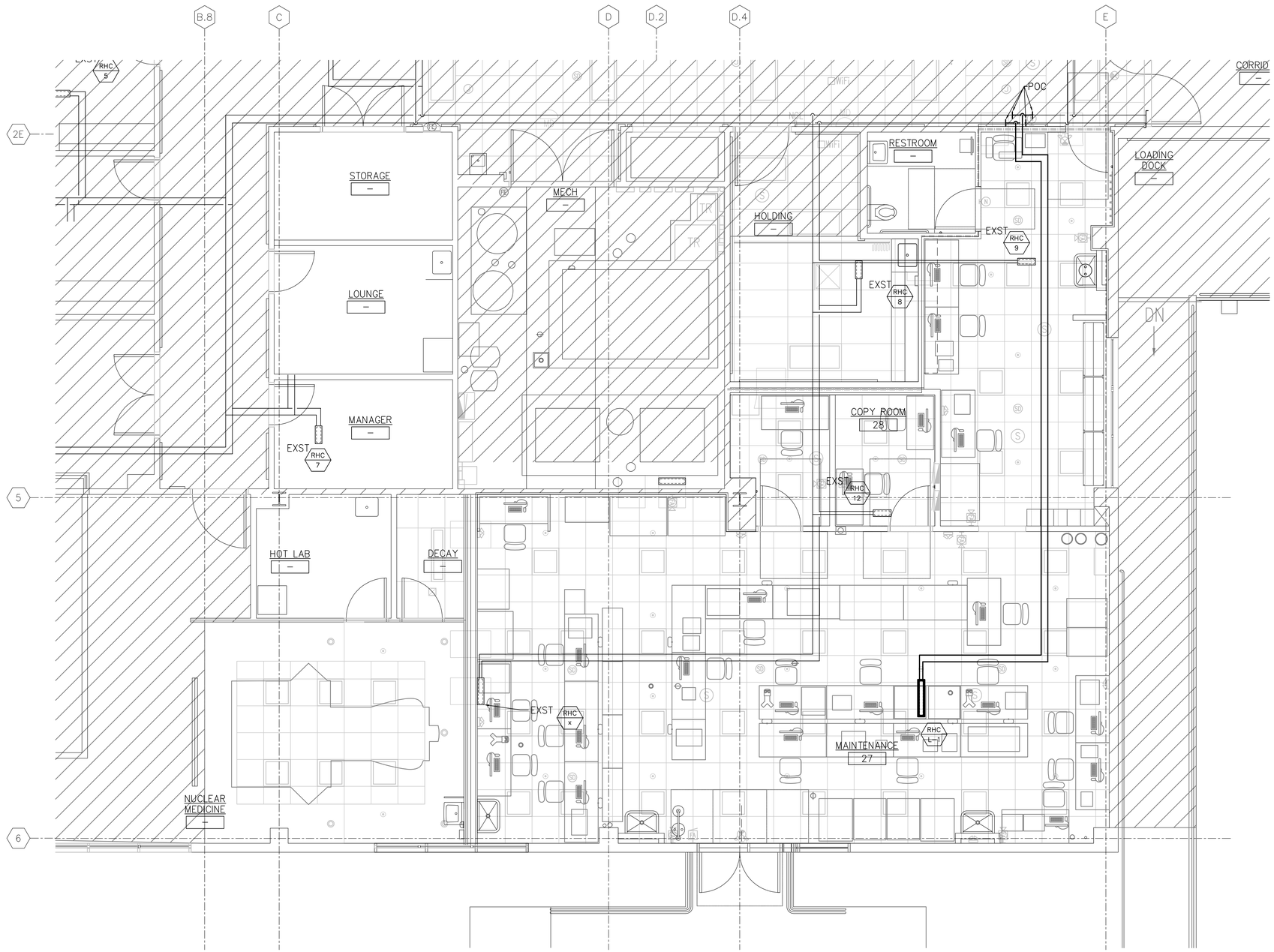
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BUILDING: -

DRAWING	
PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	PARTIAL LABORATORY MECHANICAL PLAN
NUMBER:	**M07**

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PARTIAL LABORATORY REHEAT PLAN

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

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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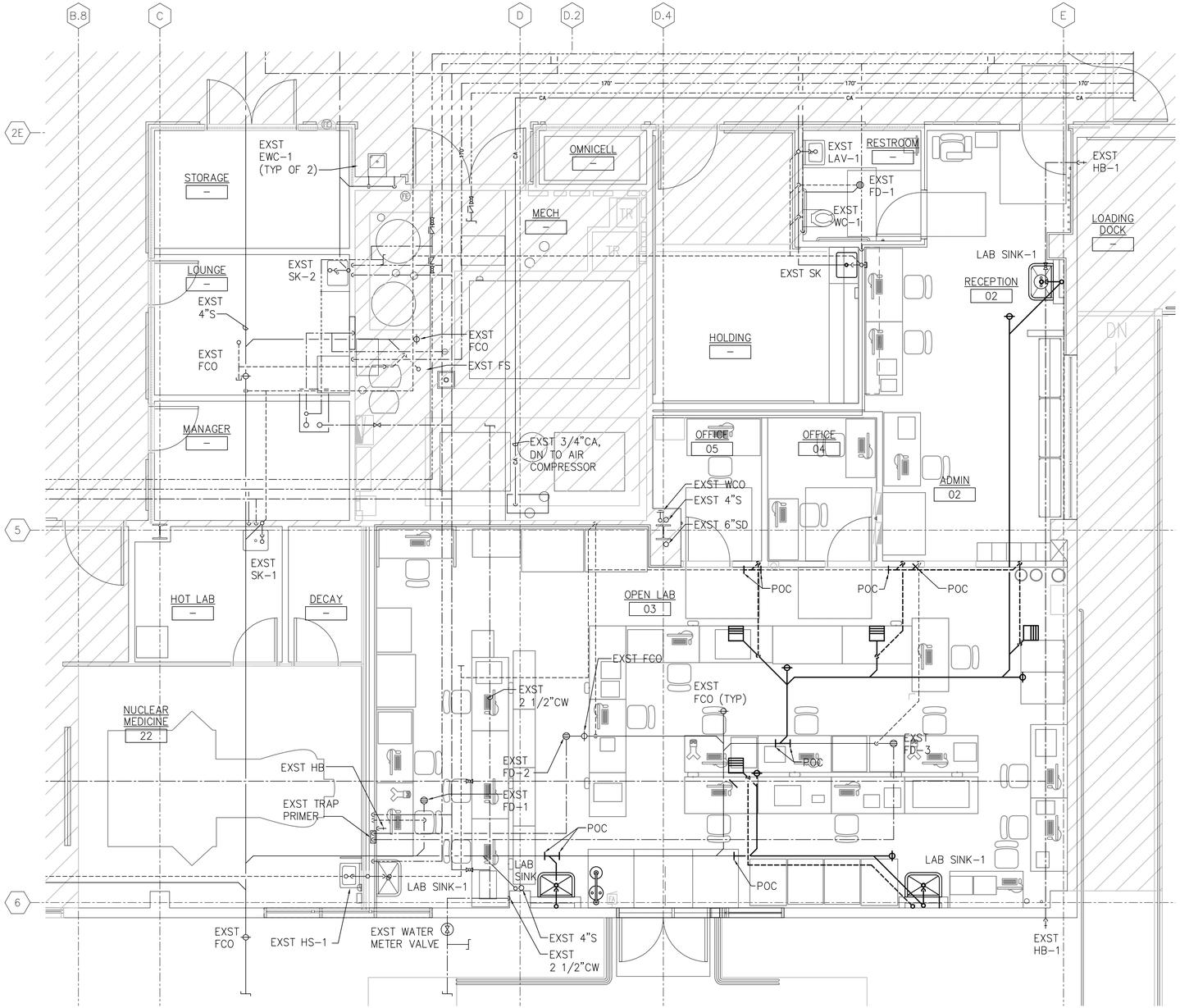
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BUILDING: -

PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	PARTIAL LABORATORY REHEAT PLAN
NUMBER:	M08

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PARTIAL LABORATORY PLUMBING PLAN

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

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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(808) 833-8891

KEYPLAN:

CAREY S. NAKAGAWA
LICENSED PROFESSIONAL ENGINEER
No. 16319-M
HAWAII, U.S.A.

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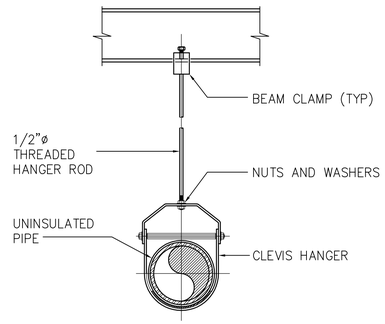
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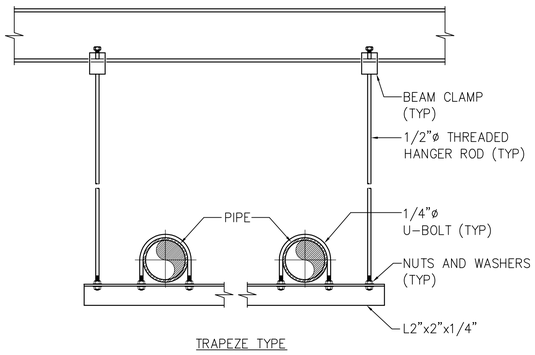
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PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	PARTIAL LABORATORY PLUMBING PLAN
NUMBER:	M09

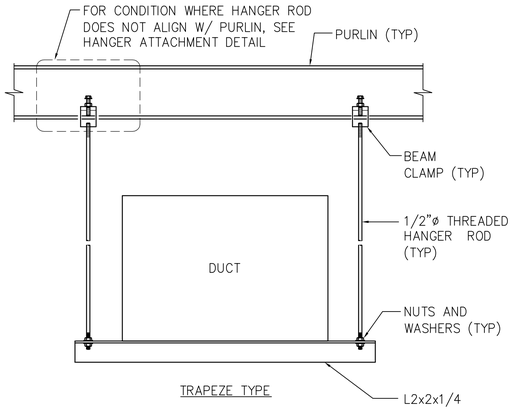
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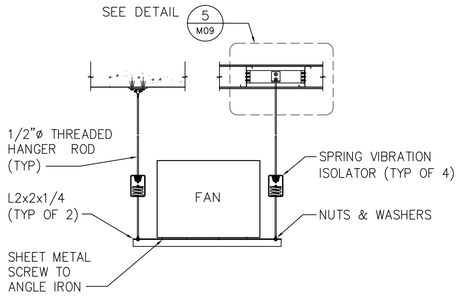
1 M10 PIPE HANGER DETAIL
SCALE: NONE



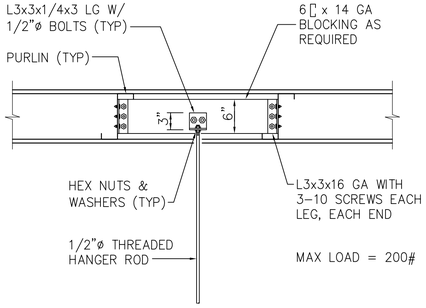
2 M10 PIPE HANGER DETAIL
SCALE: NONE



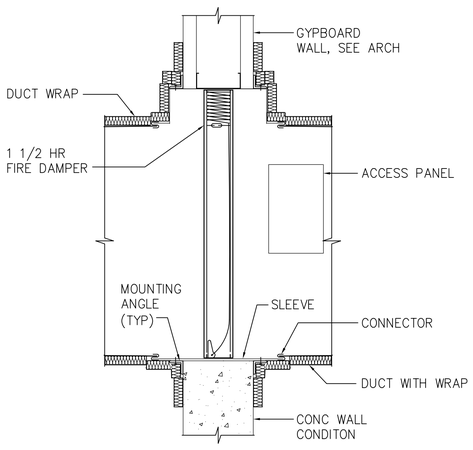
3 M10 TRAPEZE DUCT HANGER
SCALE: NONE



4 M10 EQUIPMENT HANGER DETAIL
SCALE: NONE

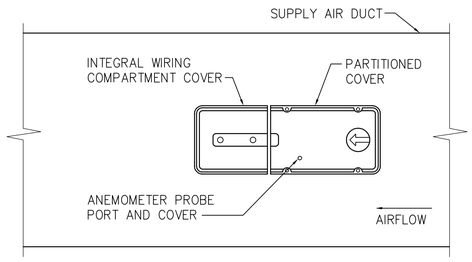


5 M10 ALTERNATE HANGER ATTACHMENT DETAIL
SCALE: NONE

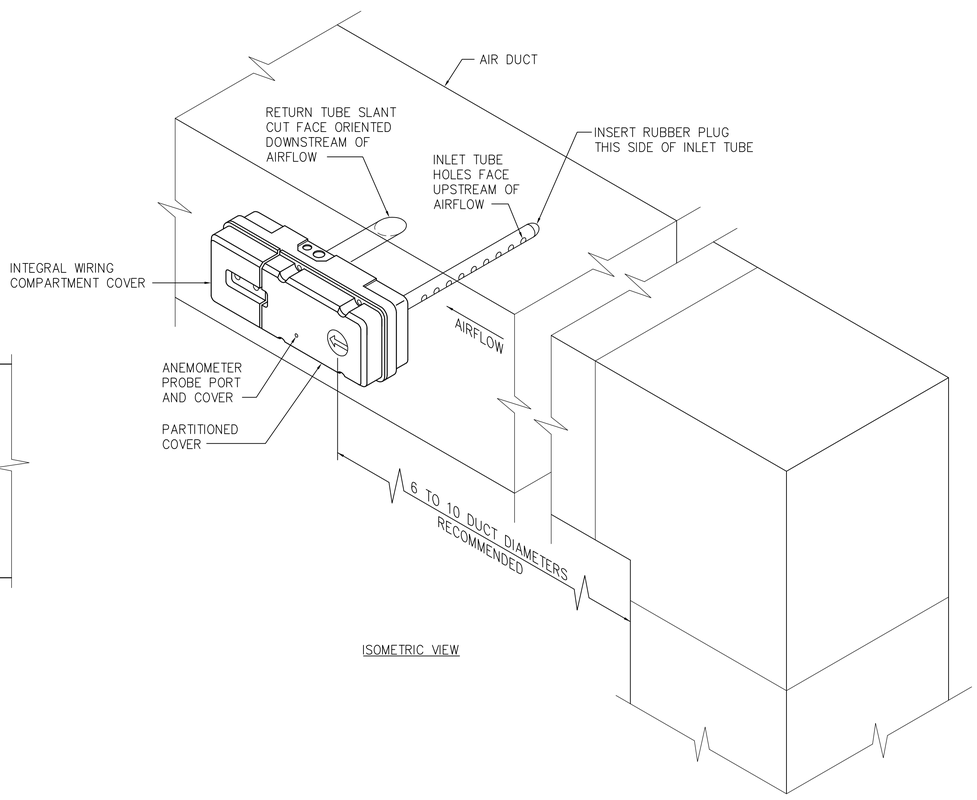


NOTE: TYPE 'A' DAMPER SIMILAR.

6 M10 VERTICAL FIRE DAMPER DETAIL
SCALE: NONE



7 M10 DUCT DETECTOR DETAIL
SCALE: NONE



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540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
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KEYPLAN:

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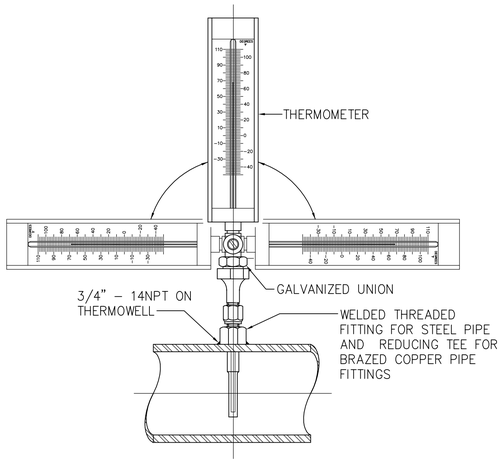
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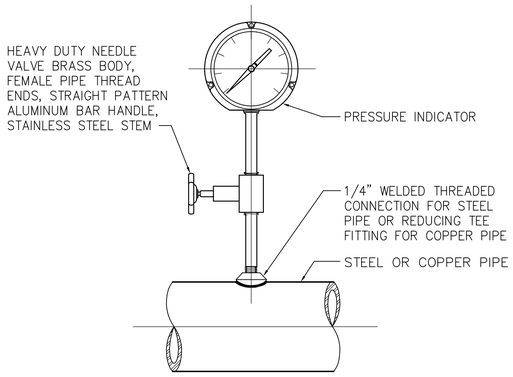
PROJECT NO.		1916.04
DRAWING	DRAWN BY:	TEC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	DETAILS
	NUMBER:	M10

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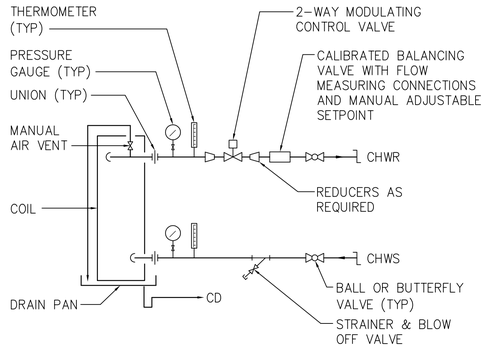
1 M11 ADJUSTABLE ANGLE THERMOMETER DETAIL

SCALE: NONE



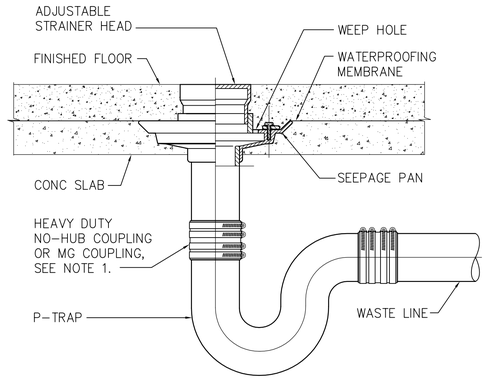
2 M11 ADJUSTABLE ANGLE PRESSURE GAUGE DETAIL

SCALE: NONE



3 M11 AHU AND FCU CONNECTION DETAIL

SCALE: NONE

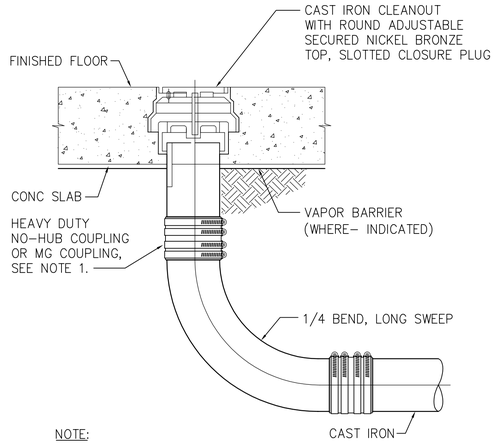


NOTE:

1. UNDERGROUND DWV PIPES ARE ABS PIPES & FITTING WITH SOLVENT JOINT CONNECTIONS.

4 M11 FLOOR DRAIN DETAIL

SCALE: NONE

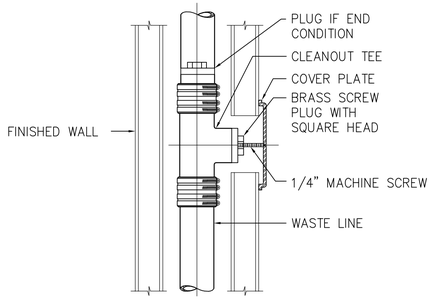


NOTE:

1. UNDERGROUND DWV PIPES ARE ABS PIPES & FITTING WITH SOLVENT JOINT CONNECTIONS.

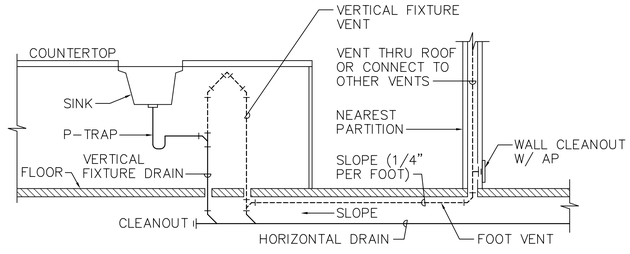
5 M11 FLOOR CLEANOUT DETAIL

SCALE: NONE



6 M11 WALL CLEANOUT DETAIL

SCALE: NONE



7 M11 ISLAND VENT SCHEMATIC

SCALE: NONE

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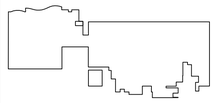
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KEYPLAN:





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PROJECT NO.	1916.04
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DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	DETAILS
NUMBER:	M11

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FAN COIL UNIT SCHEDULE

FAN COIL UNITS SHALL BE SINGLE ZONE, 1,800 RPM MAXIMUM MOTOR SPEED, FORWARD CURVED BLADES, WITH CAPACITIES TO MATCH CONDITIONS INDICATED. PROVIDE STARTERS.

NO	UNIT ORIENTATION	FAN SECTION						COOLING COIL SECTION								FILTER SECTION		ELECTRICAL POWER	WEIGHT (LBS)	REMARKS
		SA CFM	OA CFM	E.S.P. ("w.g.)	MIN HP	DRIVE	FAN SPEED	EAT (DB/WB)	ECHWT (°F)	LCHWT (°F)	MIN ROWS	TCC* (BTUH)	SCC* (BTUH)	CHW GPM	CHW ΔP (FT)	THICKNESS (in)	TYPE			
FCU 1	HORIZONTAL BELT DRIVEN	3,840	1,505	1.0	3	BELT	861	73.3/61.5	45	55	6	114,800	92,600	22.8	12.5	2	MERV 13	208V/3ø/60HZ	–	CARRIER 42BH, TRANE OR APPROVED EQUAL.

* MINIMUM NET COOLING CAPACITIES

REHEAT COIL SCHEDULE

NO	AREA SERVED	DUCT SIZE (WxH)	CFM	BTUH	GPM	EWT	LWT	MIN ROW	REMARKS
RHC L-1	LAB	30x16	3,840	31,000	3.1	120	100	2	CARRIER, TRANE OR APPROVED EQUAL

AIR CONDITIONING SYSTEM

BUILDING NO.

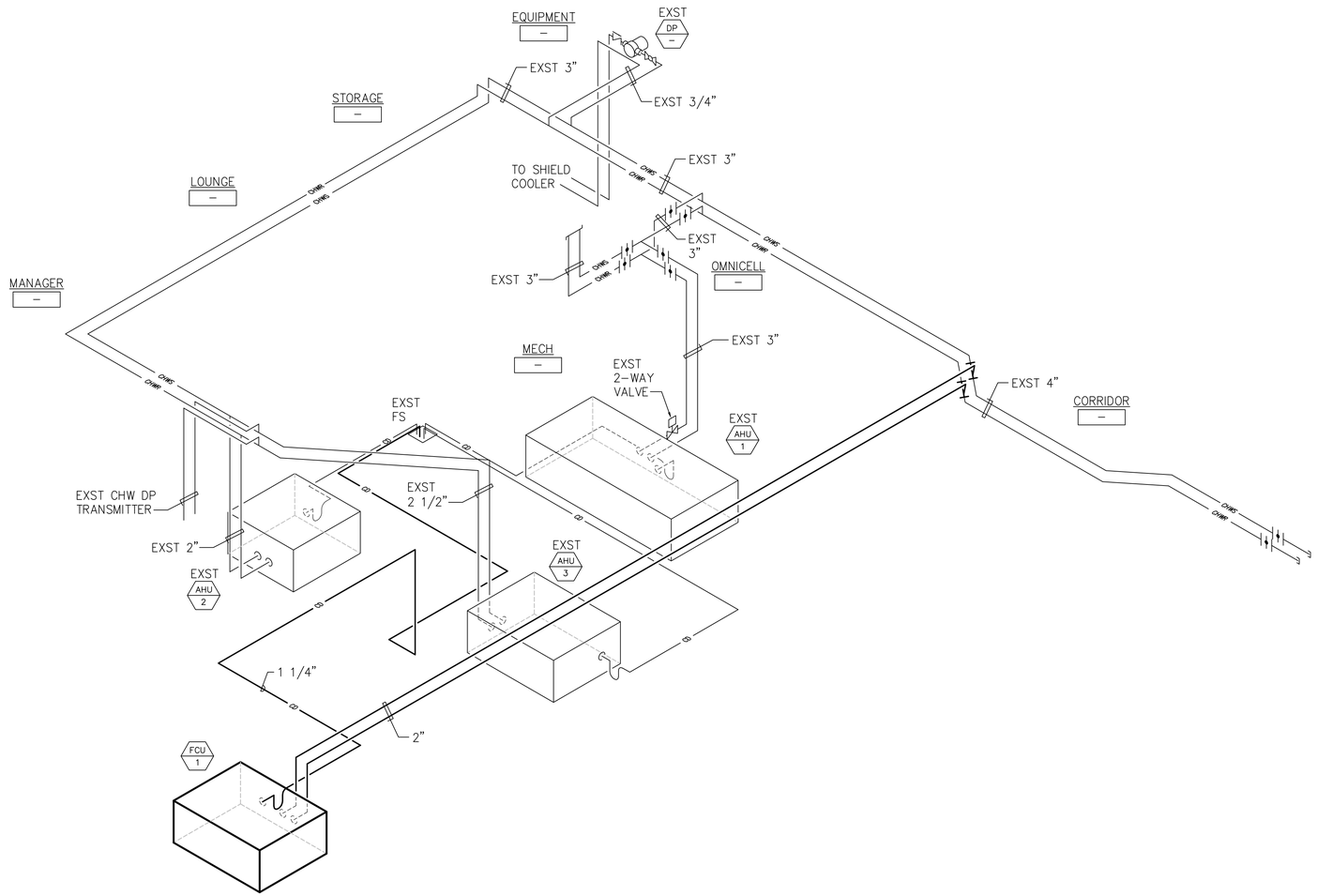
SYSTEM(S):

CONSTANT AIR VOLUME

PANEL DESCRIPTION:

FCU INDIVIDUAL CONTROLLER

| | HARDWARE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | SOFTWARE | | | | | | | | | | | | | | | | | | |



CHILLED WATER PIPING DIAGRAM

SCALE: NONE

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(808) 833-8891

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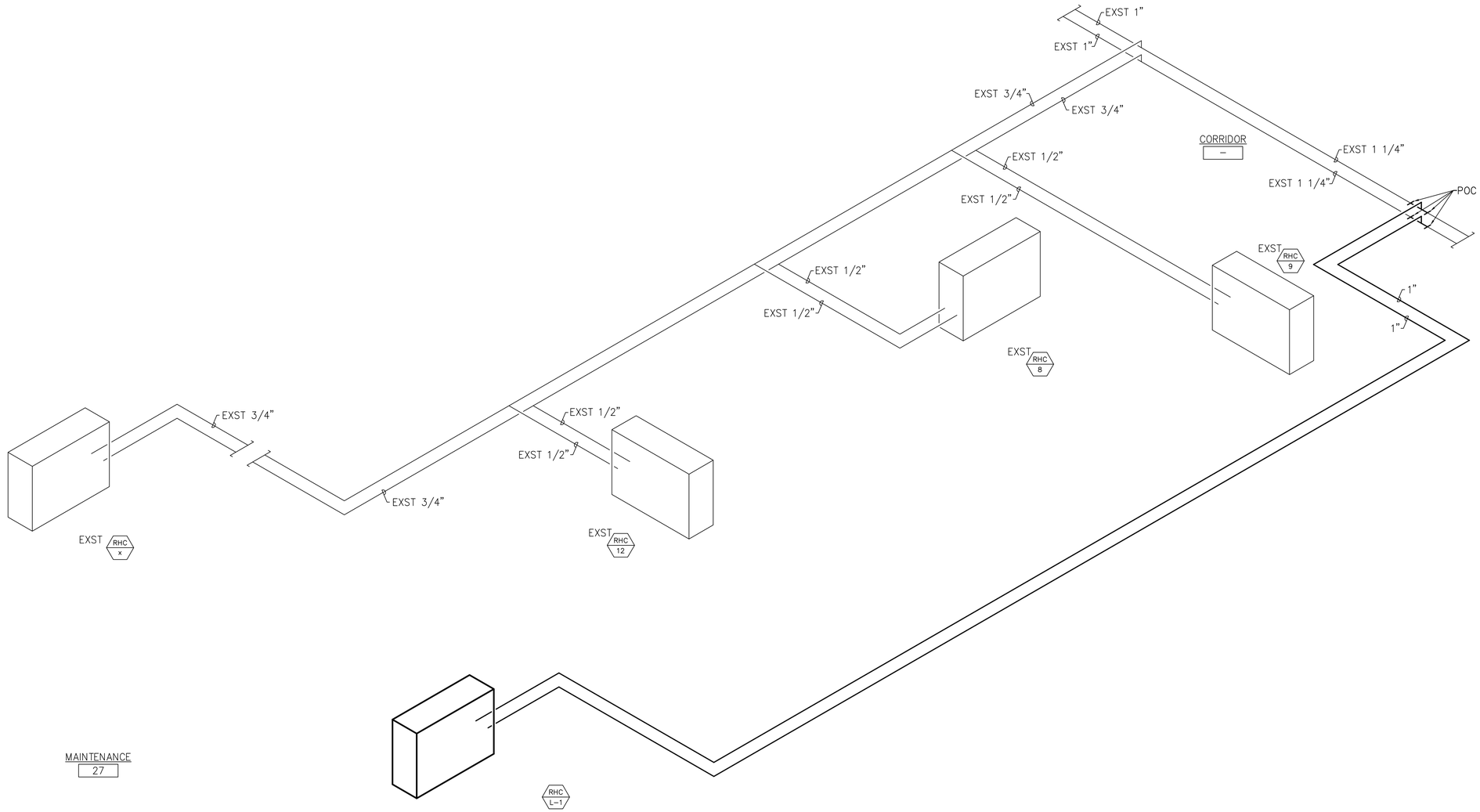
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BUILDING: —

PROJECT NO.		1916.04
DRAWING	DRAWN BY:	TEC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	CHILLED WATER PIPING DIAGRAM
	NUMBER:	**M13**

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REHEAT WATER PIPING DIAGRAM

SCALE: NONE

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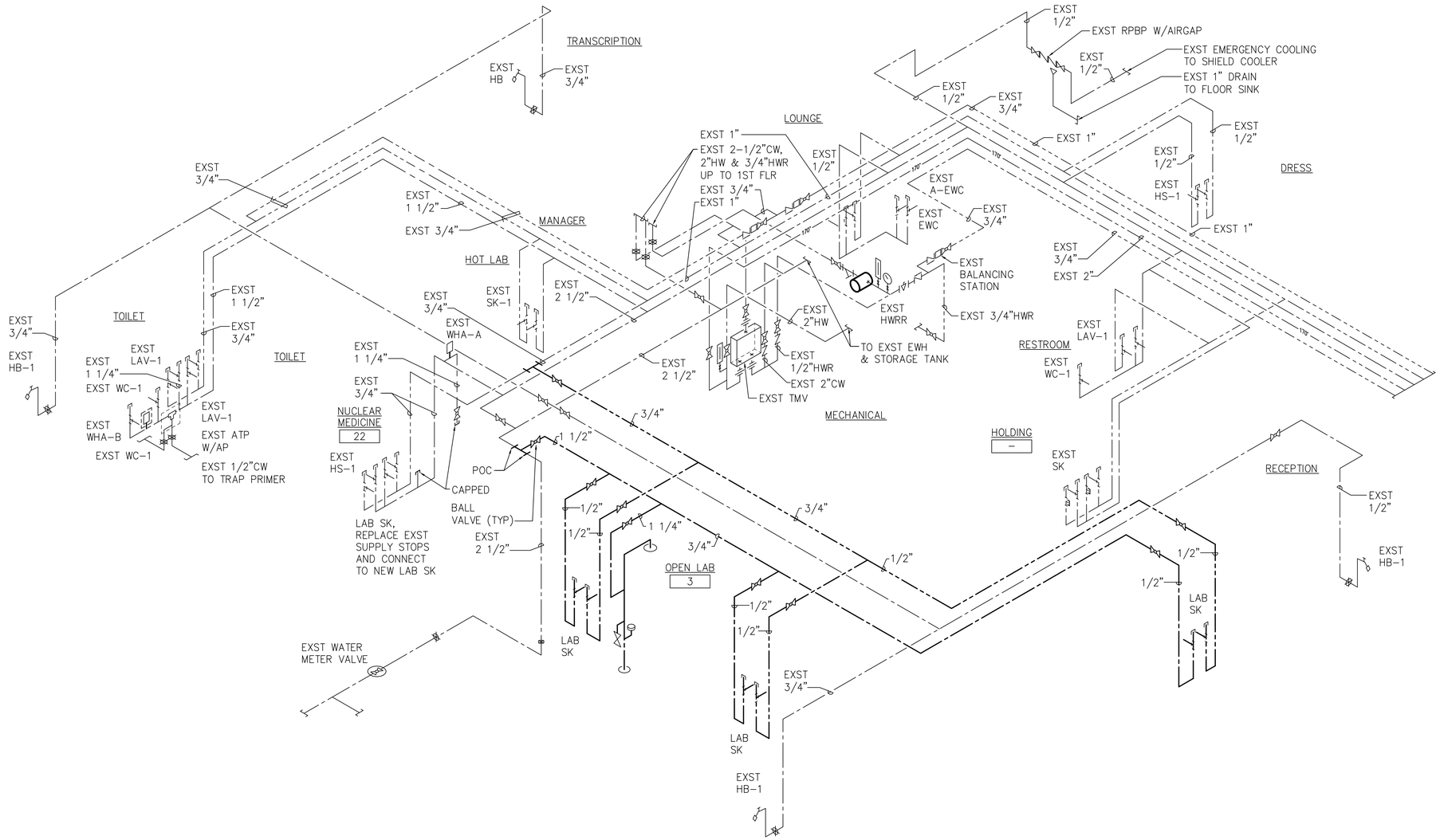
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BUILDING: —

DRAWING		
PROJECT NO.		1916.04
	DRAWN BY:	TEC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	REHEAT WATER PIPING DIAGRAM
	NUMBER:	M14

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NOTE:

1. FIXTURE REMOVAL SHALL MINIMIZE DEAD LEGS IN THE DOMESTIC WATER SYSTEM. CONTRACTOR SHALL REMOVE DOMESTIC WATER PIPE SERVICING THE DEMOLISHED FIXTURE TO THE CLOSEST TEE/BRANCH/MAIN.

WATER PIPING DIAGRAM – LABORATORY

SCALE: NONE

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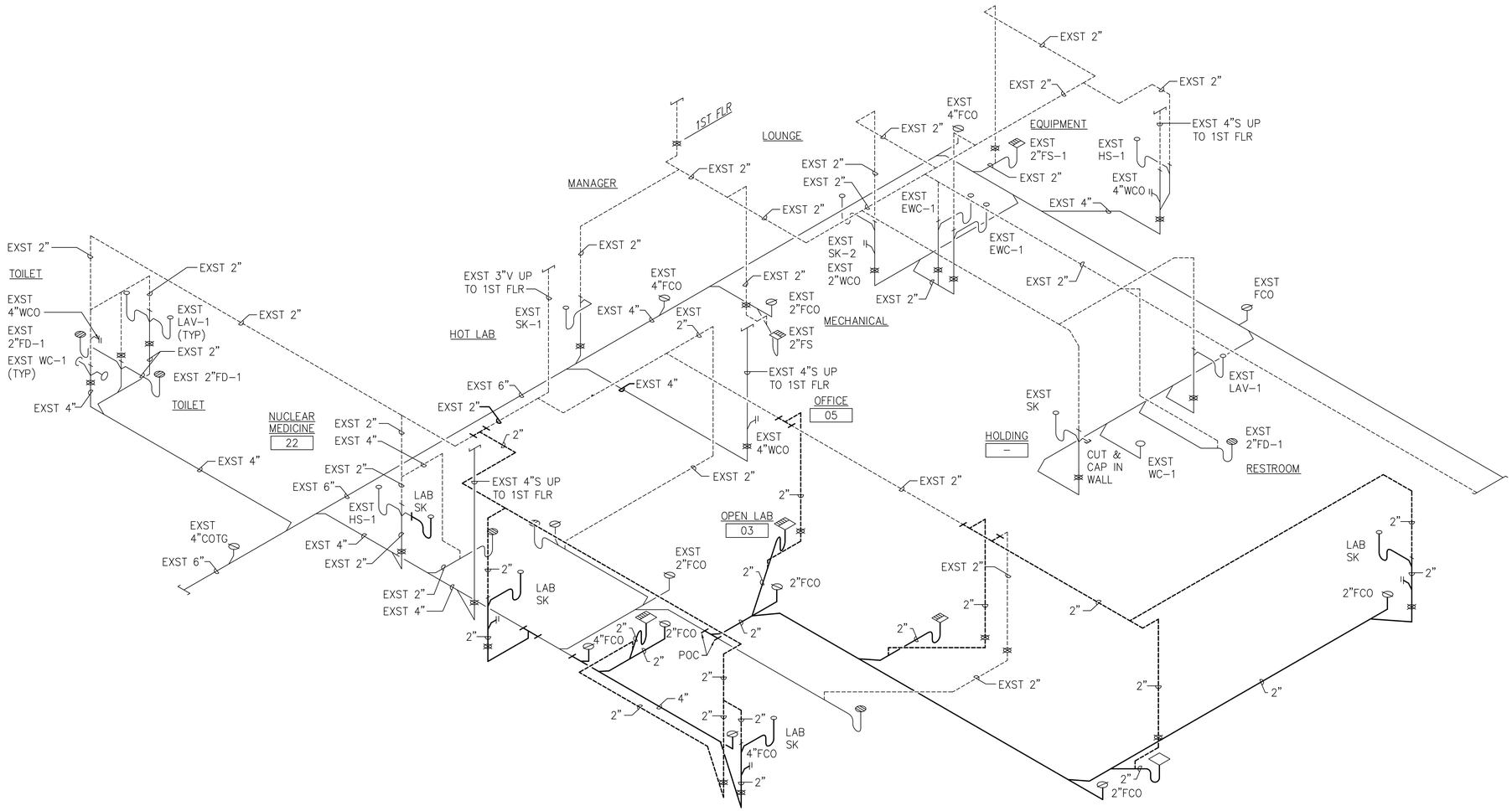
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BUILDING: –

DRAWING	
PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	WATER PIPING DIAGRAM – LABORATORY
NUMBER:	**M15**

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SANITARY PIPING DIAGRAM — LABORATORY

SCALE: NONE

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BUILDING: —

PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	SANITARY PIPING DIAGRAM — LABORATORY
NUMBER:	**M16**

FIRE SAFETY NOTES

1. FIRE SAFETY DURING CONSTRUCTION, ALTERATION OR DEMOLITION SHALL BE IN ACCORDANCE WITH CHAPTER 16, 2021 NFPA 1, AS AMENDED.
2. WHERE BUILDING ALTERATIONS REQUIRED MODIFICATIONS OF EXISTING FIRE SUPPRESSION SYSTEMS, THE CONTRACTOR SHALL IMPAIR ONLY SECTIONS OF THE SYSTEM WHERE THE WORK IS INVOLVED AND THE REMAINDER OF THE SYSTEM SHALL BE KEPT IN SERVICE. PRIOR TO IMPAIRING THE WATER SUPPLY TO ANY FIRE SUPPRESSION SYSTEM, THE CONTRACTOR SHALL COMPLY WITH ALL PROVISION OF NFPA 1, 2021, CHAPTER 16.
3. WHERE THE BUILDING IS PROTECTED BY FIRE PROTECTION SYSTEMS, SUCH SYSTEMS SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES DURING ALTERATION.
4. 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.
5. WHEN IT IS NECESSARY TO SHUT DOWN THE SYSTEM, THE AHJ SHALL HAVE THE AUTHORITY TO ENFORCE ALTERNATE MEASURES OF PROTECTION UNTIL THE SYSTEM IS RETURNED TO SERVICE.
6. 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 INOPERABLE OR INACCESSIBLE. A FIRE WATCH SHALL BE REQUIRED AS SPECIFIED IN NFPA 1, AS AMENDED, AT NO COST TO THE AHJ AND OWNER.
7. 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 CHAPTER 16, 2021 PER NFPA 1, AS AMENDED.
8. THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE THAT CONSTRUCTION DOCUMENTS FOR FIRE PROTECTION SYSTEMS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL AND A PERMIT BE ISSUED PRIOR TO THE INSTALLATION, REHABILITATION, OR MODIFICATION. FURTHER, THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE THAT ACCEPTANCE TESTS OF THE SYSTEMS BE PERFORMED IN THE AHJ'S PRESENCE PRIOR TO FINAL SYSTEM CERTIFICATION.
9. FIRE ALARM SYSTEMS, FIRE HYDRANT SYSTEMS, FIRE-EXTINGUISHERS, STANDPIPES, AND OTHER FIRE PROTECTION SYSTEMS AND APPURTENANCES REQUIRED BY THIS CODE SHALL BE APPROVED BY THE AHJ AS TO INSTALLATION AND LOCATION AND SHALL BE SUBJECT TO ACCEPTANCE TESTS REQUIRED BY THE APPROPRIATE COUNTY AGENCY. A COPY OF A SYSTEM'S UNSATISFACTORY INSPECTION AND MAINTENANCE TEST REPORT SHALL BE SUBMITTED TO THE AHJ BY TESTING COMPANY WITHIN (5) WORKING DAYS AFTER THE COMPLETION OF THE TEST. NFPA 1, CHAPTER 13 AS AMENDED.

FIRE PROTECTION GENERAL NOTES

1. FIRE PROTECTION SYSTEM DESIGN, INSTALLATION, MATERIALS, AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE, AS AMENDED. FIRE PROTECTION SYSTEM TESTING SHALL BE IN ACCORDANCE WITH THE 2021 NFPA 1 UNIFORM FIRE CODE, AS AMENDED.
2. PROVIDE APPROVED FIRESTOPPING MATERIALS FOR PIPE PENETRATIONS THROUGH FIRE RATED WALLS, PARTITIONS, AND FLOOR-CEILING ASSEMBLIES. SEE ARCHITECTURAL DRAWINGS FOR LOCATION OF RATED WALLS, PARTITIONS, AND FLOOR-CEILING ASSEMBLIES.
3. SEE ARCHITECTURAL DRAWINGS FOR LIMITS OF WORK AND CONSTRUCTION PHASING.

FIRE SPRINKLER NOTES

1. DEVICES AND EQUIPMENT SHALL BE UL LISTED OR FM APPROVED.
2. AUTOMATIC WET PIPE SPRINKLER PROTECTION SHALL BE PROVIDED THROUGHOUT THE INDICATED AREAS AS REQUIRED TO PROVIDE 100% COVERAGE.
3. THE SPRINKLER SYSTEM SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 13 AND AS FOLLOWS:

   ALL AREAS EXCEPT THOSE LISTED BELOW: LAB 1, LAB 2, OPEN LAB

OCCUPANCY CLASSIFICATION:	LIGHT HAZARD
SPRINKLER FINISH:	CHROME
SPRINKLER K-FACTOR:	K = 5.6
SPRINKLER TEMPERATURE RATING:	155 DEGREES F
SPRINKLER TYPE:	QUICK RESPONSE CONCEALED PENDENT WITH WHITE COVER PLATE

   PROVIDE PENDENT FIRE SPRINKLER WITH ADJUSTABLE ESCUTCHEONS IN AREAS WITH SURFACE MOUNTED LIGHT FIXTURES.

   LAB 1, LAB 2, OPEN LAB:

OCCUPANCY CLASSIFICATION:	ORDINARY HAZARD GROUP 1
SPRINKLER FINISH:	CHROME
SPRINKLER K-FACTOR:	K = 5.6
SPRINKLER TEMPERATURE RATING:	155 DEGREES F
SPRINKLER TYPE:	QUICK RESPONSE CONCEALED PENDENT WITH WHITE COVER PLATE

   PROVIDE PENDENT FIRE SPRINKLER WITH ADJUSTABLE ESCUTCHEONS IN AREAS WITH SURFACE MOUNTED LIGHT FIXTURES.

FIRE SPRINKLER NOTES (CONT.)

4. PROVIDE NEW MATERIALS AND EQUIPMENT. CONTRACTOR SHALL NOT RE-USE EXISTING SPRINKLER HEADS, PIPING, FITTINGS, ETC. FLEXIBLE FIRE SPRINKLER PIPE DROPS AND BRACKET ASSEMBLIES THAT ARE DISCONNECTED TO ACCOMMODATE CEILING TILE REMOVAL ARE PERMITTED TO BE REUSED. ANY DROPS OR BRACKETS FOUND TO BE DAMAGED SHALL BE REPLACED.
5. SPRINKLER PIPING SHALL COMPLY WITH NFPA 13 EXCEPT THAT PLASTIC PIPE AND COPPER TUBING SHALL NOT BE PERMITTED. PIPING SHALL BE STEEL. PIPE SIZES LESS THAN 2-1/2 INCHES SHALL BE SCHEDULE 40 STEEL. PIPE SIZES 2-1/2 INCHES AND LARGER SHALL BE SCHEDULE 10 OR 40 STEEL.
6. PROVIDE NEW SWAY BRACING ON ALL NEW AND EXISTING FIRE SPRINKLER RISERS, MAINS, AND BRANCH LINES 2-1/2 INCHES AND LARGER WITHIN THE AREA OF WORK IN ACCORDANCE WITH NFPA 13 AND ASCE/SEI 7.
7. PROVIDE NEW BRANCH LINE RESTRAINTS FOR NEW AND EXISTING PIPING WITHIN AREA OF WORK IN ACCORDANCE WITH NFPA 13 AND ASCE/SEI 7.
8. SPRINKLER PIPING IN FINISHED AREAS SHALL BE CONCEALED FROM VIEW.
9. SPRINKLER AND PIPING LAYOUTS ARE CONCEPTUAL. THE CONTRACTOR SHALL VERIFY THE QUANTITY AND ARRANGEMENT OF SPRINKLERS. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE LOCATION OF SPRINKLER COMPONENTS RELATIVE TO PARTITIONS, SOFFITS, LIGHT FIXTURES, MECHANICAL DUCTWORK, STRUCTURAL MEMBERS, ARCHITECTURAL FEATURES, ETC., AND COORDINATE WITH THE VARIOUS TRADES.
10. FIRE SPRINKLER PIPING AND HANGERS SHALL NOT TOUCH OR BE USED TO SUPPORT NON-SYSTEM COMPONENTS (CONDUITS, CABLES, MECHANICAL DUCTWORK, CEILING GRID, ETC.). NON-SYSTEM COMPONENTS TOUCHING OR SUPPORTED BY THE FIRE SPRINKLER SYSTEM SHALL BE REMOVED, REROUTED, AND/OR INDEPENDENTLY SUPPORTED.
11. PROVIDE APPROVED FIRESTOPPING MATERIAL IN PIPE PENETRATIONS THROUGH FIRE RATED WALLS AND FLOOR/CEILING ASSEMBLIES.
12. PROPER TYPES OF SPARE SPRINKLERS, STOPPERS, AND WRENCHES SHALL BE PROVIDED AND STORED IN A CABINET AT THE RISER AS FOLLOWS:

    A. SPRINKLERS:

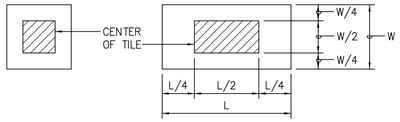
LESS THAN 300 SPRINKLERS	MINIMUM 6 SPARE SPRINKLERS
300 TO 1000 SPRINKLERS	MINIMUM 12 SPARE SPRINKLERS
MORE THAN 1000 SPRINKLERS	MINIMUM 24 SPARE SPRINKLERS

    B. THREE (3) SPRINKLER STOPPERS

    C. ONE (1) SPRINKLER WRENCH

    THE STOCK OF SPARE SPRINKLERS, STOPPERS AND WRENCHES SHALL INCLUDE TYPES, RATINGS AND SIZES INSTALLED IN THE SYSTEM.

13. FIRE SPRINKLERS SHALL BE PLACED APPROXIMATELY IN THE CENTER OF TILE UNLESS OTHERWISE INDICATED ON THE DRAWINGS. THE CENTER SHALL MEAN WITHIN THE CENTER 50% OF THE TILE AS SHOWN.

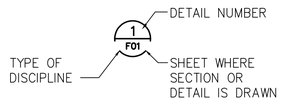


14. PROVIDE IN-SERVICE TESTING OF NEW AND EXISTING PIPING IN ACCORDANCE WITH NFPA 13.
15. FIRE SPRINKLER PIPING SHALL NOT BE ROUTED BELOW AIR HANDLING UNITS OR OBSTRUCT MAINTENANCE ACCESS. FIRE SPRINKLER PIPING NEAR ELECTRICAL EQUIPMENT SHALL BE LOCATED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
16. EXISTING FIRE SPRINKLER IS SUPERVISED BY THE EXISTING FIRE ALARM SYSTEM IN ACCORDANCE WITH 2021 IBC SECTION 903.4. NEW PRESSURE SWITCH AND VALVE TAMPER SWITCH SHALL BE CONNECTED TO THE EXISTING FIRE ALARM SYSTEM IN ACCORDANCE WITH IBC 2021, CHAPTER 9 AS AMENDED.
17. THE EXISTING WATER METER IS ADEQUATE TO SERVICE THE AUTOMATIC FIRE SPRINKLER SYSTEM, INCLUSIVE OF THIS PROJECT'S SCOPE OF WORK.
18. CONTRACTOR SHALL COORDINATE WITH SIMPLEX FOR MODIFICATIONS THAT IMPACT THE FIRE ALARM SYSTEM INSTALLATION.

FIRE EXTINGUISHER NOTES

1. INSTALL FIRE EXTINGUISHERS AND CABINETS IN ACCORDANCE WITH NFPA 10 AND NFPA 1 FIRE CODE.
2. FIRE EXTINGUISHERS SHALL BE PROVIDED IN THE AREA OF WORK TO PROVIDE 100% COVERAGE.

SYMBOL LEGEND:



SECTION AND DETAIL SYMBOL

FIRE PROTECTION LEGEND & ABBREVIATIONS

SYMBOLS	ABBREVIATIONS	DESCRIPTION
	AFF	ABOVE FINISHED FLOOR
	EXST	EXST
FDC	FDC	FIRE DEPARTMENT CONNECTION, EXST
		FIRE DEPARTMENT CONNECTION, CHECK VALVE, EXST
		FIRE EXTINGUISHER, BRACKET MOUNTED, MULTIPURPOSE DRY CHEMICAL, 4A:80B:C, EXST
FEC		FIRE EXTINGUISHER IN SEMI-RECESSED MOUNTED CABINET, MULTIPURPOSE DRY CHEMICAL, 2A:10B:C, NEW
●		FIRE SPRINKLER, CONCEALED PENDENT, QUICK RESPONSE, NEW
○		FIRE SPRINKLER, UPRIGHT, QUICK RESPONSE, EXST
		FIRE SPRINKLER SYSTEM, CONTROL VALVE, EXST
		FIRE SPRINKLER SYSTEM, OS&Y GATE VALVE, EXST
	FS	FIRE SPRINKLER SYSTEM, PIPING, EXST
	FS	FIRE SPRINKLER SYSTEM, PIPING, NEW
PS		FIRE SPRINKLER SYSTEM, PRESSURE SWITCH, EXST
	FSR	FIRE SPRINKLER SYSTEM, RISER, EXST
TS		FIRE SPRINKLER SYSTEM, TAMPER SWITCH, EXST
		MATERIALS TO BE DEMOLISHED
	NO/NC	NORMALLY OPEN/NORMALLY CLOSE
		PIPE CAP
		PIPE ELBOW DOWN
		PIPE PLUG
	CONT	PIPE CONTINUATION
	UP/DN	PIPE UP/DOWN
		PIPE TEE DOWN
	POC	POINT OF CONNECTION
	TYP	TYPICAL
— Wx —		WATER LINE WITH SIZE DESIGNATION, EXST

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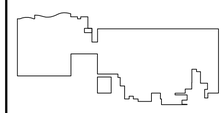
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uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:



CAREY S. NAKAGAWA
LICENSED PROFESSIONAL ENGINEER
No. 16319-M
HAWAII, U.S.A.

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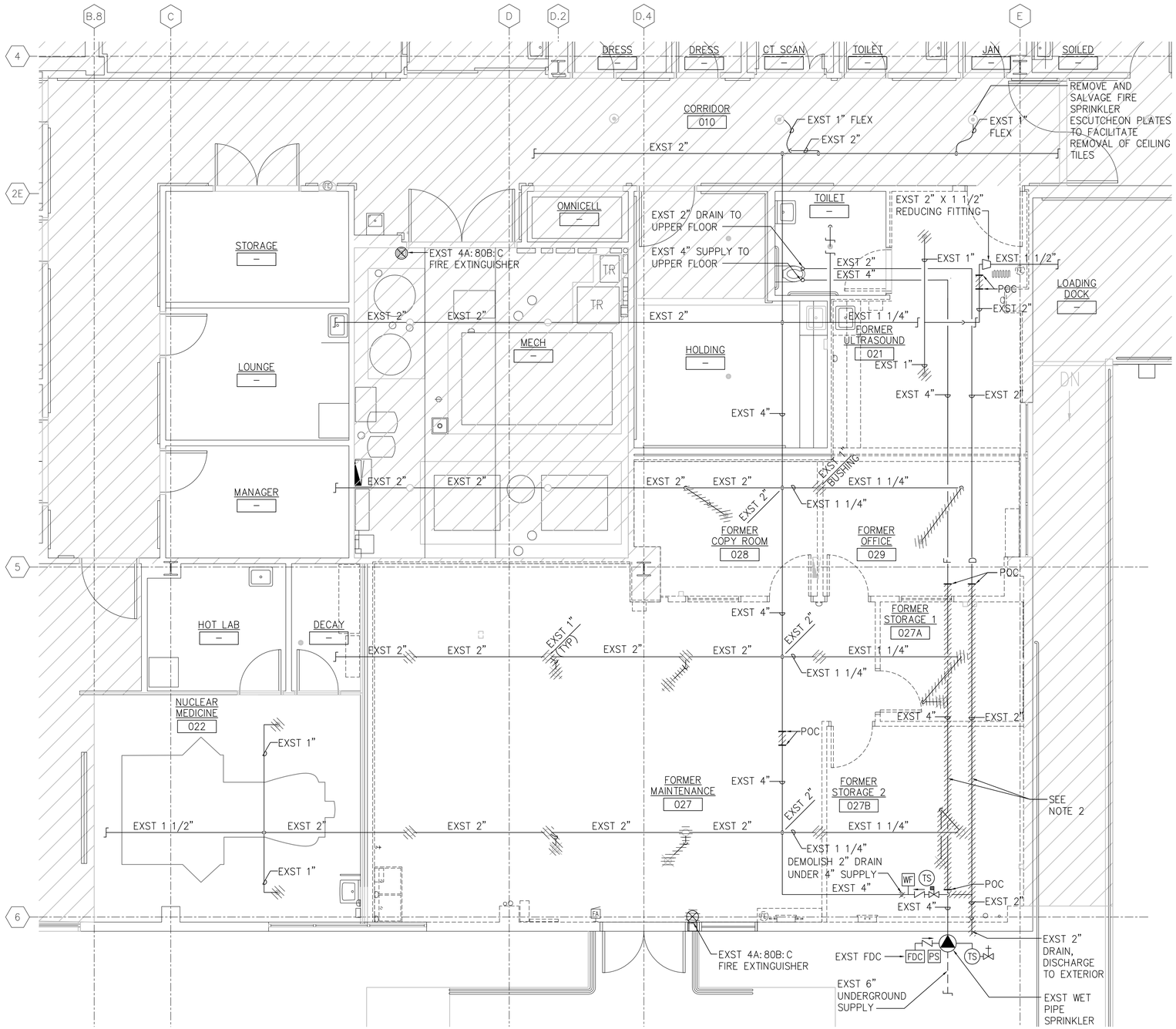
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BUILDING: -

DRAWING	
PROJECT NO.	1916.04
DRAWN BY:	TEC
DATE:	OCTOBER 2025
SCALE:	AS SHOWN
TITLE:	FIRE PROTECTION NOTES, LEGEND AND ABBREVIATIONS
NUMBER:	**F01**

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NOTES:

1. FIRE SPRINKLERS ONLY SHOWN IN AREA OF WORK.
2. COORDINATE WITH MECHANICAL CONTRACTOR TO DETERMINE IF EXISTING FIRE SPRINKLER MAIN AND DRAIN LINE MUST BE REROUTED TO ALLOW INSTALLATION OF NEW FAN COIL UNIT IN OPEN LAB 003.

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

FIRE AND SMOKE RATED CONSTRUCTION IS SHOWN FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS.

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

PARTIAL FORMER MAINTENANCE DEMOLITION FIRE PROTECTION PLAN

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

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uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:

CARET S. NAKAGAWA
LICENSED PROFESSIONAL ENGINEER
No. 16319-M
HAWAII, U.S.A.

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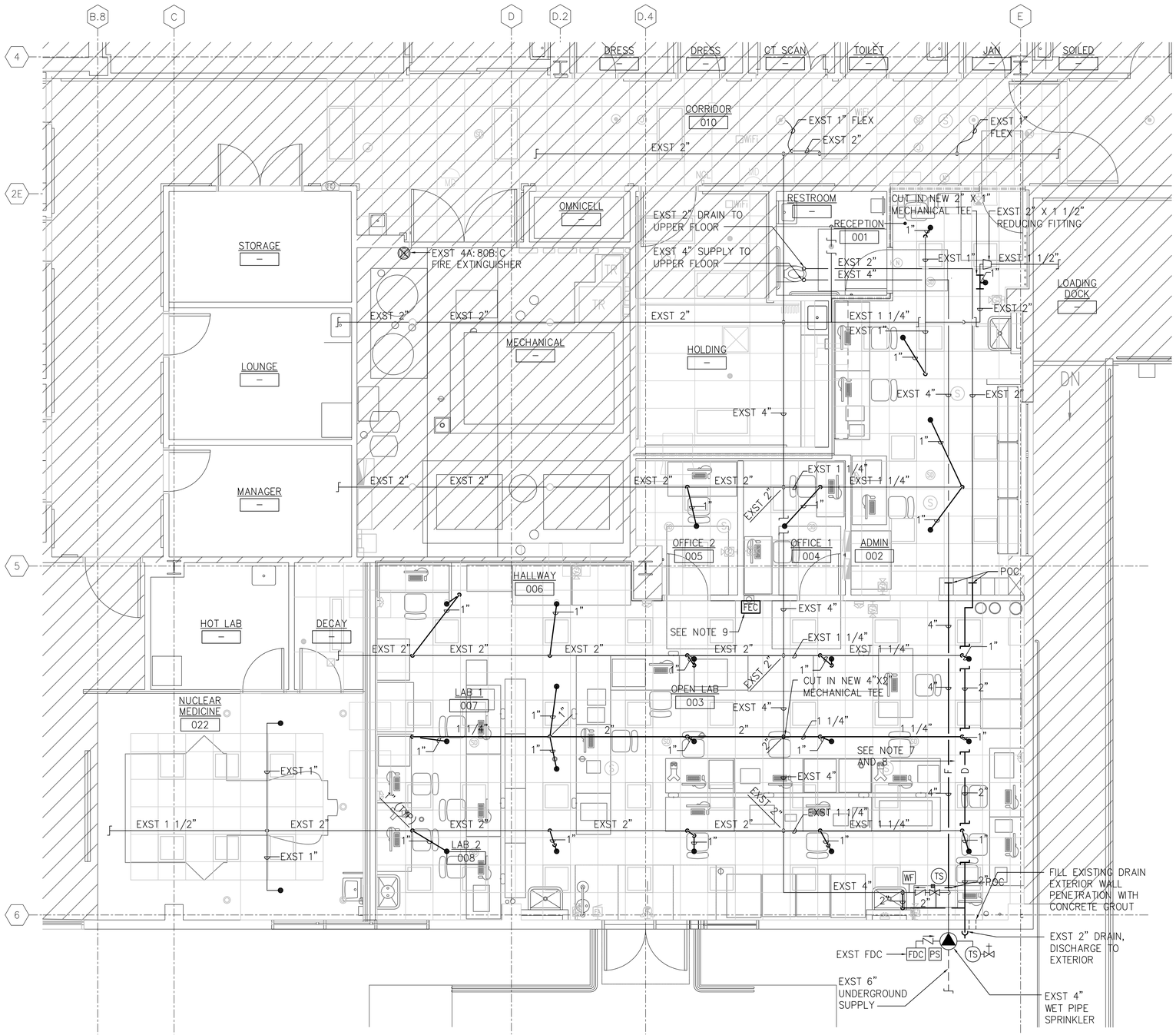
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PROJECT NO.	1916.04	
DRAWING	DRAWN BY:	TEC
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	PARTIAL FORMER MAINTENANCE DEMOLITION FIRE PROTECTION PLAN
	NUMBER:	F02

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PARTIAL LABORATORY FIRE PROTECTION PLAN

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

NOTES:

1. FIRE SPRINKLERS ONLY SHOWN IN AREA OF WORK.
2. PROVIDE HANGERS IN ACCORDANCE WITH NFPA 13, SEE DETAIL 1/F04
3. PROVIDE BRANCH LINE RESTRAINTS ON NEW AND EXISTING BRANCH LINES IN THE AREA OF WORK IN ACCORDANCE WITH NFPA 13, SEE DETAIL 2/F04
4. PROVIDE LATERAL AND LONGITUDINAL SWAY BRACING ON NEW AND EXISTING PIPING IN THE AREA OF WORK IN ACCORDANCE WITH NFPA 13, SEE DETAILS 3/F04 4/F04
5. PROVIDE CLEARANCE BENEATH EXISTING FLOOR CONTROL VALVE FOR MAINTENANCE ACCESS. PROVIDE SIGNAGE INDICATING SPRINKLER CONTROL VALVE ABOVE CEILING.
6. PROVIDE A UL LISTED THROUGH PENETRATION FIRE STOP SYSTEM FOR FIRE RATED WALLS. FOR ALL NEW AND EXISTING PENETRATIONS, SEE DETAIL 5/F04
7. EXISTING UPPER FLOOR FIRE SPRINKLER SUPPLY MAIN ROUTED THROUGH AREA OF WORK. NEW PIPING SHALL NOT CONNECT TO THE UPPER FLOOR SUPPLY MAIN.
8. COORDINATE WITH MECHANICAL CONTRACTOR TO DETERMINE IF EXISTING FIRE SPRINKLER MAIN AND DRAIN LINE MUST BE REROUTED TO ALLOW INSTALLATION OF NEW FAN COIL UNIT IN OPEN LAB 003.
9. INSTALL NEW FIRE EXTINGUISHER IN SEMI-RECESSED MOUNTED CABINET, SEE DETAIL 7/F04

LEGEND:

1 HOUR RATED WALL (EXST)

SMOKE RATED WALL (EXST)

FIRE AND SMOKE RATED CONSTRUCTION IS SHOWN FOR REFERENCE ONLY. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS.

GRAPHIC SCALE

1/4" = 1'-0" 4' 0' 4' 8' 12'

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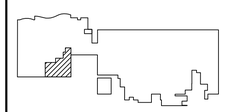
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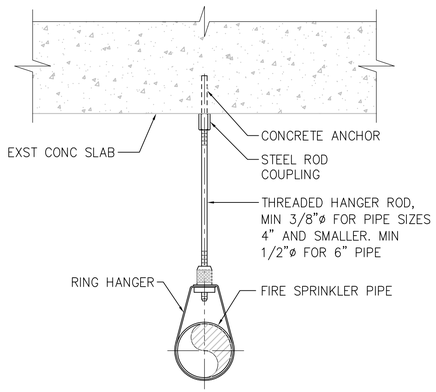
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DATE:	OCTOBER 2025	
SCALE:	AS SHOWN	
TITLE:	PARTIAL LABORATORY FIRE PROTECTION PLAN	
NUMBER:	**F03**	

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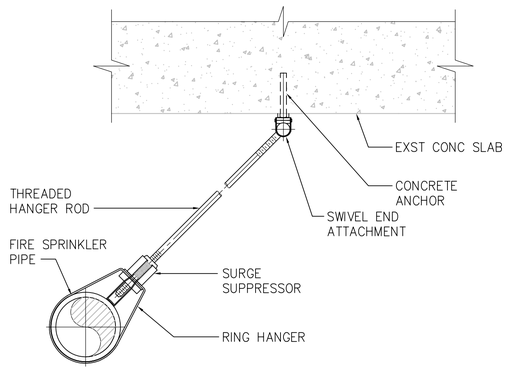


NOTES:

1. HANGER COMPONENTS, SIZING, AND SPACING SHALL BE IN ACCORDANCE WITH NFPA 13.
2. CONCRETE ANCHORS SHALL AVOID TENDONS, ANCHORAGES, AND/OR REINFORCEMENT AND SHALL NOT SPALL CONCRETE.

1 F04 TYPICAL ADJUSTABLE RING HANGER DETAIL

SCALE: NONE

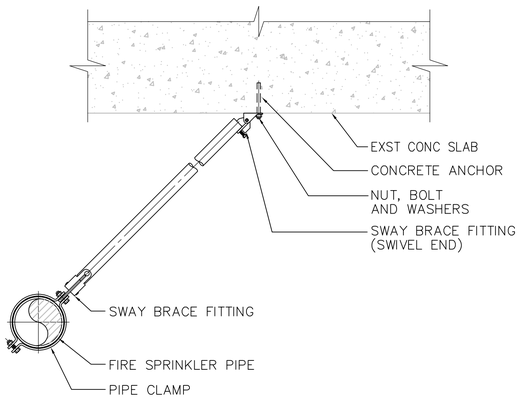


NOTES:

1. BRANCH LINE RESTRAINT COMPONENTS, SIZING, AND SPACING SHALL BE IN ACCORDANCE WITH NFPA 13.
2. CONCRETE ANCHORS SHALL AVOID TENDONS, ANCHORAGES, AND/OR REINFORCEMENT AND SHALL NOT SPALL CONCRETE.

2 F04 TYPICAL BRANCH LINE RESTRAINT DETAIL

SCALE: NONE

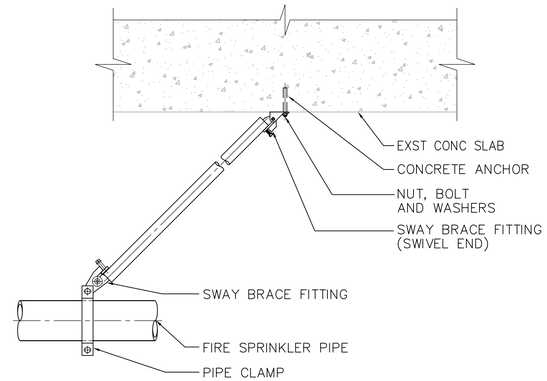


NOTES:

1. SWAY BRACING COMPONENTS, SIZING, AND SPACING SHALL BE IN ACCORDANCE WITH NFPA 13.
2. CONCRETE ANCHORS SHALL AVOID TENDONS, ANCHORAGES, AND/OR REINFORCEMENT AND SHALL NOT SPALL CONCRETE.
3. SWAY BRACING CALCULATIONS SHALL UTILIZE MINIMUM SEISMIC COEFFICIENT VALUE (Cp) OF 1.07 BASED ON A SPECTRAL RESPONSE (Ss) OF 2.31 PER NFPA 13 (2013) TABLE 9.3.5.9.3 AND PARAGRAPH 9.3.5.9.3.2

3 F04 TYPICAL LATERAL SWAY BRACE DETAIL

SCALE: NONE

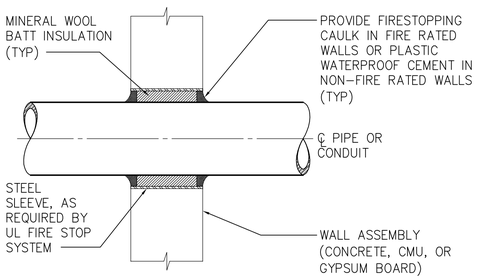


NOTES:

1. SWAY BRACING COMPONENTS, SIZING, AND SPACING SHALL BE IN ACCORDANCE WITH NFPA 13.
2. CONCRETE ANCHORS SHALL AVOID TENDONS, ANCHORAGES, AND/OR REINFORCEMENT AND SHALL NOT SPALL CONCRETE.
3. SWAY BRACING CALCULATIONS SHALL UTILIZE MINIMUM SEISMIC COEFFICIENT VALUE (Cp) OF 1.07 BASED ON A SPECTRAL RESPONSE (Ss) OF 2.31 PER NFPA 13 (2013) TABLE 9.3.5.9.3 AND PARAGRAPH 9.3.5.9.3.2

4 F04 TYPICAL LONGITUDINAL SWAY BRACE DETAIL

SCALE: NONE

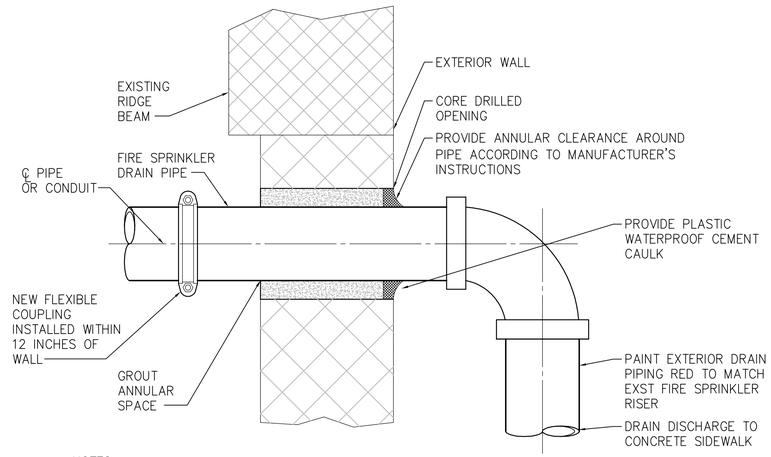


NOTES:

1. CONTRACTOR SHALL PROVIDE A UL LISTED THROUGH PENETRATION FIRE STOP SYSTEM FOR FIRE RATED WALLS.
2. PROVIDE SPRINKLER PIPE CLEARANCES IN ACCORDANCE WITH NFPA 13.
3. PROVIDE 2 INCH CLEARANCE AROUND WALL PENETRATION FOR PIPE SIZES LESS THAN 4 INCHES AND 4 INCH CLEARANCE FOR PIPE SIZES 4 INCHES AND LARGER IN ACCORDANCE WITH NFPA 13, UNLESS FLEXIBLE COUPLINGS ARE INSTALLED WITHIN 12 INCHES OF EACH SIDE OF THE WALL.

5 F04 TYPICAL PIPE AND CONDUIT THRU WALL DETAIL

SCALE: NONE

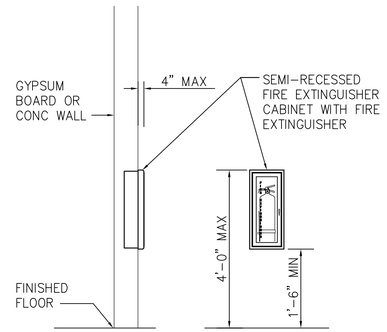


NOTES:

1. CONTRACTOR SHALL PROVIDE A UL LISTED THROUGH PENETRATION FIRE STOP SYSTEM OR BUILDING CODE EQUIVALENT FOR FIRE RATED BARRIERS, WHERE REQUIRED.
2. PROVIDE SPRINKLER PIPE CLEARANCES IN ACCORDANCE WITH NFPA 13.

6 F04 TYPICAL PIPE PENETRATION THROUGH EXTERIOR WALL DETAIL

SCALE: NONE



7 F04 FIRE EXTINGUISHER AND CABINET INSTALLATION DETAIL

SCALE: NONE

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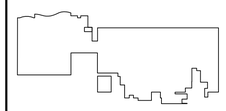
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540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:



CAREY S. NAKAGAWA — LICENSED PROFESSIONAL ENGINEER — No. 16319-M — HAWAII, U.S.A.

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SCALE:	AS SHOWN
TITLE:	FIRE PROTECTION DETAILS
NUMBER:	F04

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GENERAL ELECTRICAL SPECIFICATIONS

1. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK.
2. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE. INSTALL CONDUIT RUNS AS SPECIFIED WITH SCHEMATIC REPRESENTATION INDICATED ON THE DRAWINGS AND AS SPECIFIED.
3. WHERE CONDUITS ARE SHOWN AS "HOME RUNS" ON THE CONTRACT DRAWINGS, OR STATED TO BE FURNISHED, BUT NOT EXPLICITLY SHOWN AS PART OF THE SCOPE OF WORK, THE CONTRACTOR SHALL PROVIDE ALL CONDUITS, FITTINGS, BOXES, WIRING, CONDUIT SEALS, ETC., AS REQUIRED FOR COMPLETION OF THE RACEWAY SYSTEM IN COMPLIANCE WITH THE NEC AND THE CONTRACT DOCUMENTS.
4. MODIFY CONDUIT RUNS TO SUIT FIELD CONDITIONS, AS ACCEPTED BY WHFD AND/ OR PROJECT MANAGER.
5. FINAL CONNECTIONS & ROUGH-IN REQUIREMENTS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
6. CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL, MECHANICAL AND OTHER DRAWINGS PRIOR TO BID.
7. CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED. CONTRACTOR SHALL REPORT DISCREPANCIES TO THE ARCHITECT AND INCLUDE IN ITS BID ALL COSTS REQUIRED TO MAKE HIS WORK MEET EXISTING CONDITIONS.
8. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE WHFD AND/ OR PROJECT MANAGER.
9. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES AND ORDINANCES.
10. ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.
11. PROVIDE PERMITS AND INSPECTIONS REQUIRED.
12. GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USAGE FOR A PERIOD OF ONE YEAR AFTER WHFD AND/ OR PROJECT MANAGER'S ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO WHFD AND/ OR PROJECT MANAGER.
13. PROVIDE RECORD DRAWINGS TO THE WHFD AND/ OR PROJECT MANAGER. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.
14. VERIFY EXACT LOCATION AND ELECTRICAL CHARACTERISTICS OF EQUIPMENT TO BE FURNISHED BY OTHER DISCIPLINES PRIOR TO ROUGH-IN.
15. SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO COST TO WHFD AND/ OR PROJECT MANAGER.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
17. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS OR EQUIPMENT.
18. SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION. LIGHTS, SWITCHES, RECEPTACLES, MOTORS, ETC., SHALL BE CONNECTED AND OPERABLE.
19. PRESENT SUBMITTAL DATA AT ONE TIME BOUND IN PDF FORMAT OR PER WHFD AND/OR PROJECT MANAGER'S REQUIREMENTS. SUBMITTALS SHALL BE INDEXED IN A NEAT AND ORDERLY MANNER. PARTIAL SUBMITTALS WILL NOT BE ACCEPTED. SUBMITTALS SHALL INCLUDE ALL EQUIPMENT SPECIFIED UNDER THIS PROJECT. SHOULD CONTRACTOR FAIL TO PROVIDE SUBMITTALS, CONTRACTOR PROCEEDS AT ITS OWN RISK AND ANY COST FOR CORRECTIVE WORK WILL BE BORNE BY THE CONTRACTOR.
20. PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. FIRESTOP ALL PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE. ALL NEW AND EXISTING PENETRATIONS THROUGH FIRE RATED CONSTRUCTION WITHIN THE LIMITS OF THIS PROJECT SHALL BE FIRE STOPPED. ALL NEW AND EXISTING PENETRATIONS THROUGH FIRE RATED CONSTRUCTION WITHIN THE LIMITS OF THIS PROJECT SHALL BE FIRE STOPPED.
21. COMMISSION REPORT ON LIGHTING SYSTEMS PER 2015 IECC C408.3.

ELECTRICAL SYMBOLS

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

HOMERUN CONDUIT 3/4" MIN. – STROKES INDICATE QUANTITY OF CONDUCTORS

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

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

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

CONDUIT STUB OUT

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

IF b:

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

SINGLE RECEPTACLE @ +18" TO CENTER UNLESS NOTED

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

FLOOR MOUNT RECEPTACLE

CEILING MOUNT RECEPTACLE

SPECIAL RECEPTACLE @ +18" TO CENTER UNLESS NOTED

SD SMOKE DETECTOR

KR KEYPAD CARD READER

DR DOOR RELEASE MODULE

$\square_A^a$ LUMINAIRE IDENTIFICATION
A = LUMINAIRE DESIGNATION (UPPERCASE)
a = SWITCH DESIGNATION (LOWERCASE)

2x2 LAY-IN/RECESSED TROFFER REFER TO LUMINAIRE SCHEDULE

DOWNLIGHT LUMINAIRE

EMERGENCY BATTERY LIGHTING UNIT WITH TWIN HEADS

EMERGENCY BATTERY LIGHTING UNIT WITH TWIN HEADS AND EXIT SIGN

SURFACE MOUNTED PANELBOARD

FLUSH MOUNTED PANELBOARD

METER

N NON-FUSED DISCONNECT SWITCH

J^a JUNCTION BOX

P PATIENT NURSE CALL

C CALL SYSTEM

CB CODE BLUE

N NURSE CALL LIGHT

NURSE CALL PULL CORD

$\blacktriangledown^X$ TELEPHONE/DATA OUTLET
(X) 4-PAIR CAT-6 CABLES (TYPE 'H')
PROVIDE CORRESPONDING FACEPLATE WITH QTY OF PORTS AS REQUIRED, WHERE "X" INDICATED NUMBER OF PORTS.
IF QUANTITY IS NOT IDENTIFIED, PROVIDE 2 PORTS WITH CORRESPONDING CABLING

FIRE ALARM MANUAL PULLSTATION @ +48" AFF TO TOP

FIRE ALARM HORN WITH ADA/ANSI STROBE – WALL MOUNTED. ENTIRE LENS TO BE NOT LESS THAN 80" AND NOT GREATER THAN 96" AFF TO TOP.
X= CANDELLA RATING

FIRE ALARM ADA/ANSI STROBE – WALL MOUNTED. ENTIRE LENS TO BE NOT LESS THAN 80" AND NOT GREATER THAN 96" AFF TO TOP

AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES

1. ALL WORK INCLUDED HEREIN SHALL BE INSTALLED IN ACCORDANCE WITH THE MOST RECENT VERSION OF AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG). ALL OPERABLE DEVICES SUCH AS, BUT NOT LIMITED TO, SWITCHES, PULLSTATIONS, AND THE THERMOSTAT'S SHALL BE INSTALLED AT +48" A.F.F. TO THE TOP MOST OPERABLE PORTION OF THE CONTROL IN ACCORDANCE WITH SECTION 309–OPERABLE PARTS. RECEPTACLES, TELEPHONE/DATA OUTLETS, AND SIMILAR DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 308 – REACH RANGES, AND THESE DEVICES SHALL BE INSTALLED AT A MINIMUM OF 15" TO THE BOTTOM OF THE DEVICE.

ELECTRICAL ABBREVIATIONS

+18"	INDICATES MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE AFF OR AFG
AF	AMP FUSE (FOR FUSES), AMP FRAME (FOR CIRCUIT BREAKERS)
AFF	ABOVE FINISHED FLOOR
AT	AMP TRIP
C	CONDUIT
CONT	CONTINUATION
CU	COPPER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL
GFP	GROUND FAULT PROTECTION
GND	GROUND
HELCO	ELECTRICAL UTILITY COMPANY
LO	LUGS ONLY (SEE ALSO MLO)
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
NEC	NATIONAL ELECTRICAL CODE, AS ADOPTED BY THE AHJ
P	POLE
PH	PHASE
PNL	INDICATES PANEL
S/N	SOLID NEUTRAL
TYP	TYPICAL
WP	WEATHER-PROOF (NEMA 3R)
XFMR	TRANSFORMER
UNO	UNLESS NOTED OTHERWISE
(D)	DEMOLITION
(E)	EXISTING
(N)	NEW
(R)	RELOCATE/RELOCATED

HAWAII COUNTY ENERGY CODE

2021 IECC, HAWAII REVISED STATUTES HRS 107-24 TO 28 & HAWAII ADMINISTRATIVE RULES CHAPTER HAR 3-181.1

COMMERCIAL BUILDING ENERGY EFFICIENCY STANDARDS

I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THIS PROJECTS DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE COMMERCIAL PROVISIONS FOR ELECTRICAL & LIGHTING SYSTEMS (C405, & C408) OF THE 2015 IECC WITH AMENDMENTS PER HAR 3-181.1:

	COMPLIANCE METHOD			
X	2021 IECC AS AMENDED. MANDATORY AND PRESCRIPTIVE			
	2021 IECC AS AMENDED. MANDATORY AND TOTAL BUILDING PERFORMANCE			
	ASHRAE STANDARD 90.1–2013. MANDATORY AND PRESCRIPTIVE			
	ASHRAE STANDARD 90.1–2013. MANDATORY AND TOTAL BUILDING PERFORMANCE			
	INFORMATION IN CONSTRUCTION DOCUMENTS		YES	N/A
	INTERIOR LIGHTING			
	OCCUPANT SENSOR CONTROLS	C405.2.1		X
	TIME SWITCH CONTROLS	C405.2.2		X
	DAYLIGHT RESPONSIVE CONTROLS	C405.2.3		X
	DAYLIGHT ZONES ON PLANS	C405.2.3.2 & C405.2.3.3		X
	GUEST ROOM CONTROLS	C405.2.4		X
	INTERIOR LIGHTING FIXTURE SCHEDULE		X	
	INPUT POWER FOR INTERIOR LIGHTING FIXTURES	C405.4.1	X	
	INTERIOR LIGHTING FIXTURE LOCATIONS	C403.2.8	X	
	LIGHTING CONTROL FUNCTIONAL PERFORMANCE			
	TESTING REQUIREMENT	C408.3	X	
	EXTERIOR LIGHTING			
	EXTERIOR LIGHTING CONTROLS	C405.2.5		X
	EXTERIOR LIGHTING FIXTURE SCHEDULE			X
	INPUT POWER FOR EXTERIOR LIGHTING FIXTURES			X
	EXTERIOR LIGHTING FIXTURE LOCATIONS			X
	ELECTRICAL			
	ELECTRICAL TRANSFORMER EFFICIENCY	C405.7		X
	TENANT SUBMETERING	C405.10		X

NOTES:

SIGNATURE:
DATE: 03/06/2025
NAME: ELI B. WALTZ
TITLE: ELECTRICAL ENGINEER
LICENSE NO.:18572-E

HAWAII HEALTH SYSTEMS CORPORATION
Quality Healthcare for All

KONA COMMUNITY HOSPITAL
79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750
ADDRESS

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FOR DIAGNOSTIC
LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

BUILDING: –

DRAWING		
	PROJECT NO.	1916.04
	DRAWN BY:	KD
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	ELECTRICAL SYMBOLS, IECC & ABBREVIATIONS
	NUMBER:	E-001

NOTICES

1. PROVIDE FIRE STOPPING TO PRESERVE FIRE RATING OF STRUCTURE AS REQUIRED. SEE ARCH DRAWINGS FOR FIRE RATED CONSTRUCTION.

NOTES

1. EXISTING CONDUIT HAS BEEN CAPPED AND ABANDONED.
2. STUB NEW 1-1/4"C INTO EXISTING TELECOM ROOM FOR CONNECTION OF NEW DATA CABLING TO EXISTING COMMUNICATIONS RACK.
3. VERIFY EXACT CONDUIT SIZE AND INTERCONNECTION WITH FIRE ALARM VENDOR.
4. VERIFY LOCATION OF EXISTING JUNCTION BOX AND CONDUIT FOR FIBER CABLE. COORDINATE FIBER INSTALLATION WITH ENVISION AND KCH.

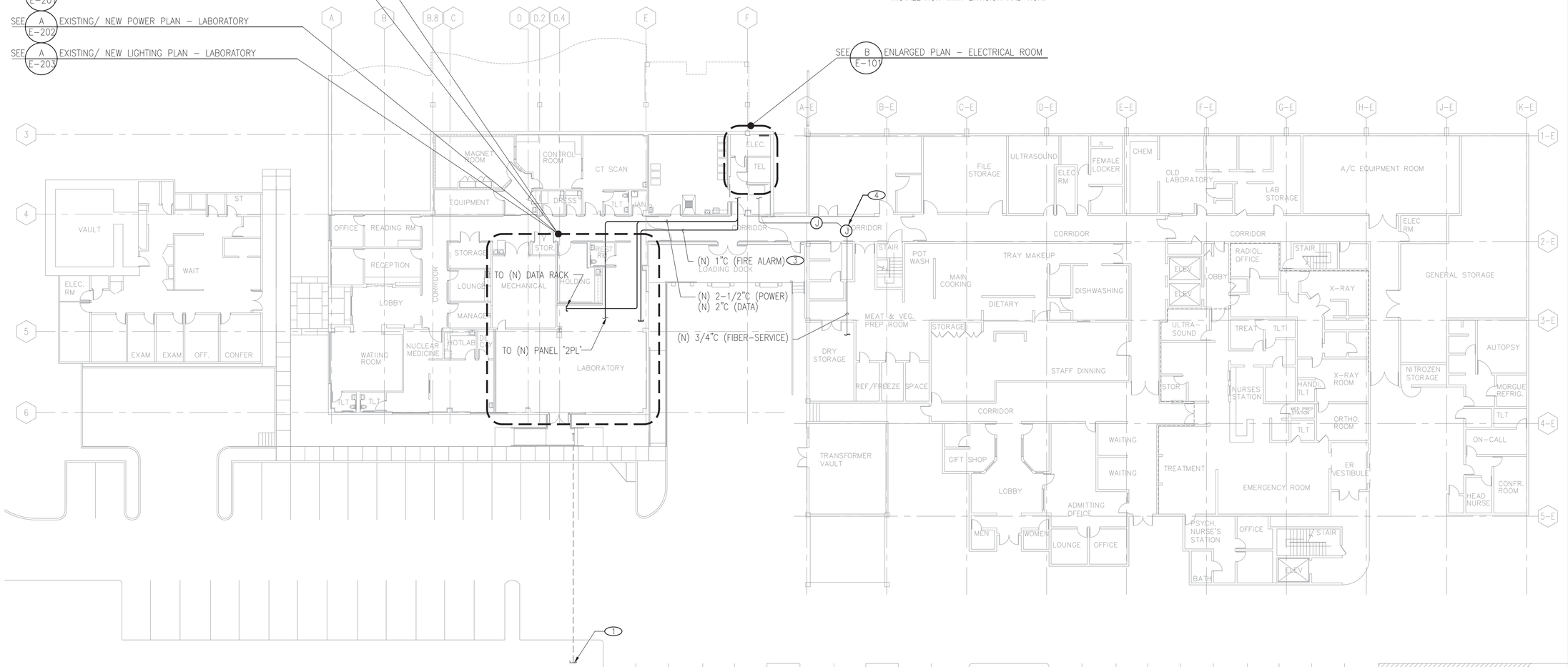
SEE A/E-201 EXISTING/ DEMOLITION POWER PLAN – FORMER MAINTENANCE ROOM

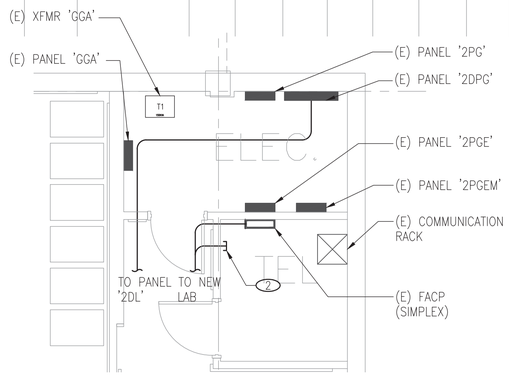
SEE B/E-201 EXISTING/ DEMOLITION LIGHTING PLAN – FORMER MAINTENANCE ROOM

SEE A/E-202 EXISTING/ NEW POWER PLAN – LABORATORY

SEE A/E-203 EXISTING/ NEW LIGHTING PLAN – LABORATORY

SEE B/E-101 ENLARGED PLAN – ELECTRICAL ROOM





A OVERALL ELECTRICAL PLAN
SCALE: 1/16" = 1'-0"
0 16' 32'
N

B ENLARGED PLAN - ELECTRICAL ROOM
SCALE: 1/4" = 1'-0"
0 4' 8'
N

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uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 18572-E
HAWAII, U.S.A.

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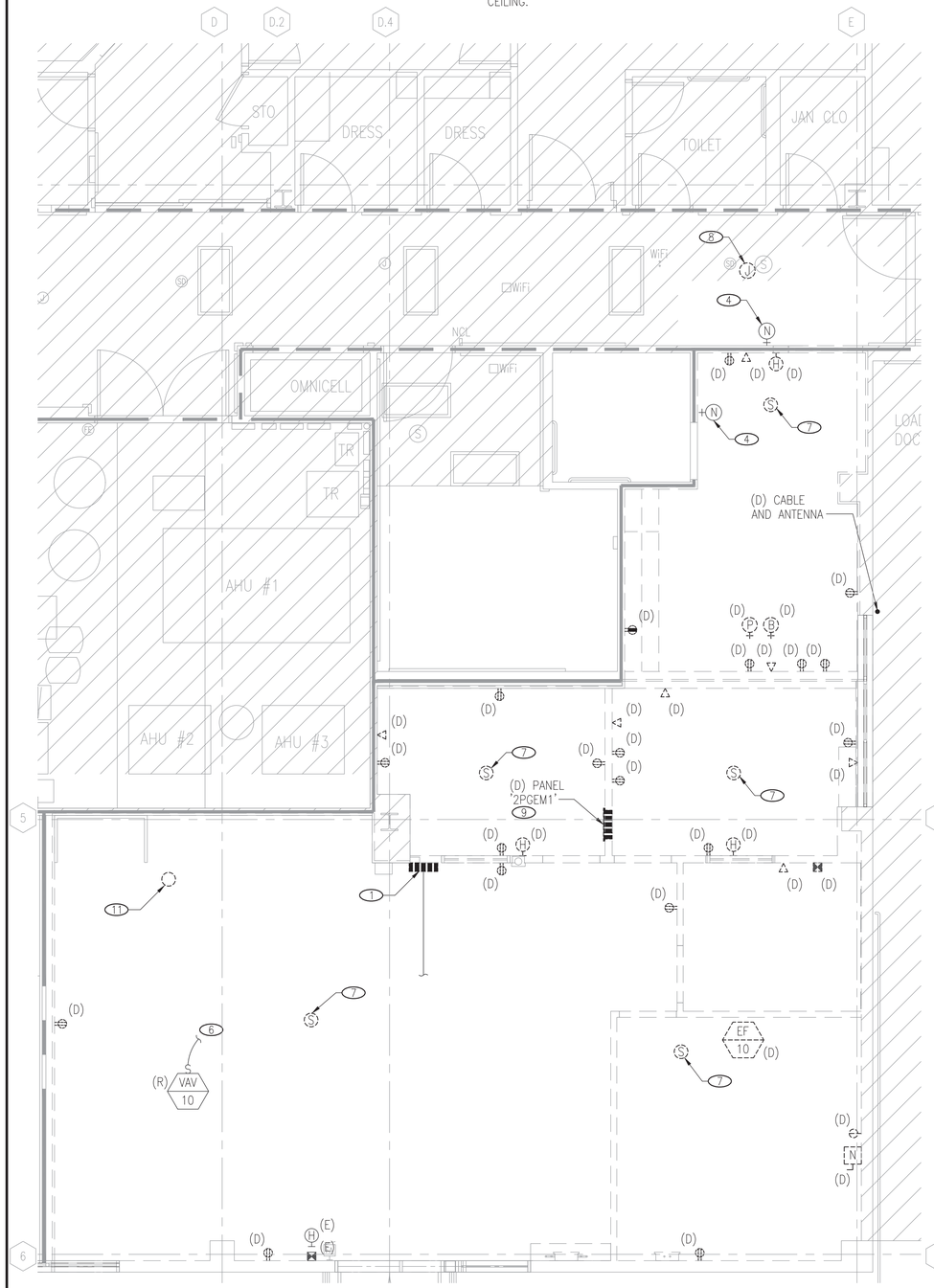
DRAWING		
PROJECT NO.		1916.04
	DRAWN BY:	KD
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	OVERALL ELECTRICAL PLAN
	NUMBER:	E-101

NOTICES

1. HATCHED AREAS NOT IN CONTRACT.
2. REMOVE ALL POWER, LIGHTING, COMMUNICATIONS, AND FIRE ALARM SYSTEMS WITHIN PROJECT SCOPE BACK TO SOURCE, UNLESS NOTED OTHERWISE.

NOTES

1. REMOVE CONNECTIONS TO FUEL MONITOR. CUT AND CAP CONDUIT AS NECESSARY.
2. REMOVE EXISTING LIGHT FIXTURE AND ALL CONDUIT/ WIRING BACK TO SOURCE.
3. REMOVE AND REINSTALL EXISTING LIGHT FIXTURE.
4. REMOVE AND REINSTALL NURSE CALL DEVICE.
5. REMOVE AND REINSTALL EXIT SIGN FOR REMOVAL OF CEILING.
6. RELOCATE EXISTING VAV EXTEND CIRCUIT TO NEW EQUIPMENT LOCATION.
7. REMOVE AND REINSTALL SPEAKERS.
8. REMOVE AND REINSTALL J-BOX AT CEILING.
9. REMOVE PANEL '2PGEM1', ALL BRANCH CIRCUITS AND CONDUCTOR BACK TO PANEL "2PGEM". SPARE EXISTING BREAKER IN PANEL '2PGEM'. CAP EXISTING CONDUIT ABOVE CEILING AND LABEL AS 'SPARE'.
10. NO FIRE ALARM SCOPE IN EXISTING AREAS, EXISTING CANDELLA AND DB TO REMAIN PER NFPA 72.
11. REMOVE ABANDONED POWER AND DATA CABLES IN THIS AREA BACK TO SOURCE.
12. LOCATE AND REMOVE EXISTING DOOR CARD ACCESS READER DEVICE. SALVAGE DEVICE FOR REINSTALLATION.



A EXISTING/ DEMOLITION POWER PLAN - FORMER MAINTENANCE

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



B EXISTING/ DEMOLITION LIGHTING PLAN - FORMER MAINTENANCE

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

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uchiyama erskine architects inc

540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8841

KEYPLAN:



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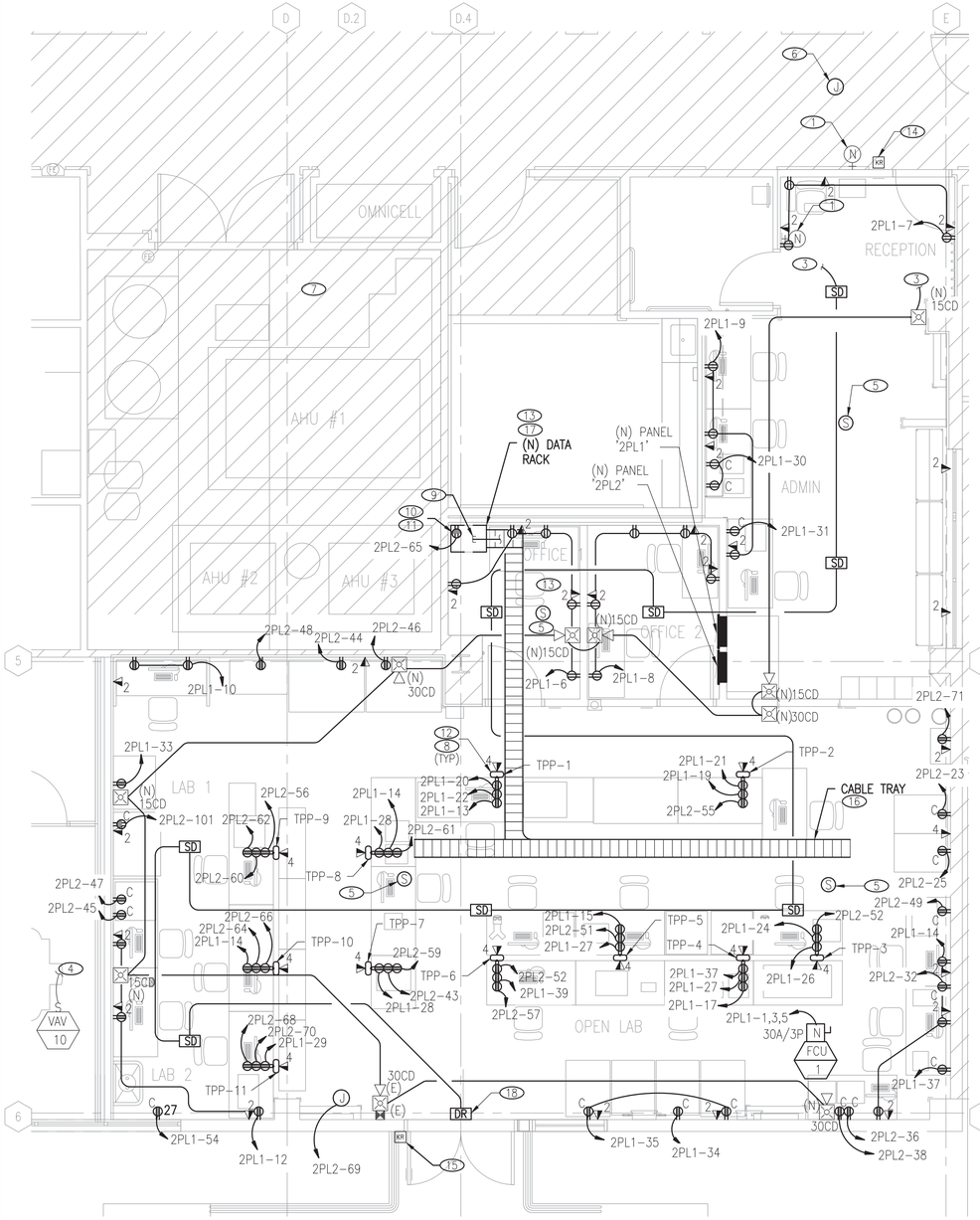
SIGNATURE

BUILDING: –

DRAWING:		
PROJECT NO.		1916.04
DRAWN BY:		KD
DATE:		OCTOBER 2025
SCALE:		AS SHOWN
TITLE:		EXISTING/ DEMOLITION POWER & LIGHTING PLANS-FORMER MAINT
NUMBER:		E-201

NOTICES

1. PROVIDE FIRE STOPPING TO PRESERVE FIRE RATING OF STRUCTURE AS REQUIRED. SEE ARCH DRAWINGS FOR FIRE RATED CONSTRUCTION.
2. PROVIDE A MINIMUM OF (1) 3/4"C CONDUIT STUBBED UP 6" ABOVE RECESSED PANELS FOR EVERY (3) SPARE CIRCUITS IN PANELBOARDS.
3. HATCHED AREAS NOT IN CONTRACT.
4. STUB DATA CONDUITS TO A POINT 6" ABOVE CEILING. ROUTE NEW DATA CABLING ABOVE CEILING USING J-HOOKS TO CABLE TRAY
5. ALL WORK REQUIRED FOR PREPARATION OF SHOP DRAWINGS AND INTEGRATION OF NEW DEVICES INTO EXISTING SYSTEM SHALL BE INCLUDED IN THE CONTRACTOR'S BID.
6. COORDINATE ALL NURSE CALL SYSTEM REQUIREMENTS WITH HOSPITAL VENDOR (HILL-ROM) AS REQUIRED FOR REINSTALLATION OF EXISTING DEVICES, AND INSTALLATION OF NEW DEVICES.
7. AUDIO INDICATING APPLIANCE: D.C. VIBRATING HORN, 24 VDC, 0.38 AMPERES, 87 dbA AT 10 FEET. SOUND LEVEL SHALL BE MINIMUM 15 dbA OVER PREVAILING SOUND LEVEL OR 5 dbA FOR 60 SECONDS OVER MAXIMUM SOUND LEVEL, EXCEPT THAT THE MAXIMUM ALLOWABLE SOUND LEVEL OF AUDIBLE NOTIFICATION APPLIANCES COMPLYING WITH NFPA 72 SHALL HAVE A SOUND LEBEL OF NO MORE THAN 110 dbA AT THE MINIMUM HEARING DISTANCE FROM THE AUDIBLE APPLIANCE. RED HOUSING, APPROXIMATE 4-3/4"x4-3/4", FLUSH MOUNTING OUTLET BOX. (FURNISH "MINI-HORN" WHERE INDICATED.)
8. FOR DEDICATED RECEPTACLES SERVING EQUIPMENT, PROVIDE ENGRAVED LAMICOID TO IDENTIFY EQUIPMENT AND CIRCUIT DESIGNATION. SEE SHEET A-500 FOR EQUIPMENT DETAILS AND DETAIL 2/E-401 FOR MORE INFORMATION. PROVIDE IDENTIFICATION SCHEDULE FOR HOSPITAL REVIEW.
9. VISUAL INDICATING APPLIANCE: 24 VDC, XENON FLASHER, INTESITY 75 CANDELA MINIMUM, ADJUSTABLE TO 110, FLASH RATE MINIMUM 1 HZ MAXIMUM 3 HZ, MAXIMUM DURATION 0.2 SECONDS AT MAXIMUM DUTY CYCLE 40 PERCENT, CLEAR LENS, RED HOUSING WITH WHITE "FIRE" LABEL, FLUSH MOUNTING OUTLET BOX.
10. ALL ELECTRICAL HOMERUNS SHALL BE 3/4" C MINIMUM.
11. ALL GFCI DEVICES SHALL BE READILY ACCESSIBLE AND SHALL NOT BE CONCEALED BY EQUIPMENT. WHERE GFCI RECEPTACLES ARE SHOWN. BEHIND EQUIPMENT, CONTRACTOR SHALL VERIFY FINAL LAYOUT OF EQUIPMENT AND FURNISH GFCI BREAKERS INSTEAD OF GFCI RECEPTACLES. IF EQUIPMENT WILL OBSTRUCT ACCESS TO THE WIRING DEVICE.

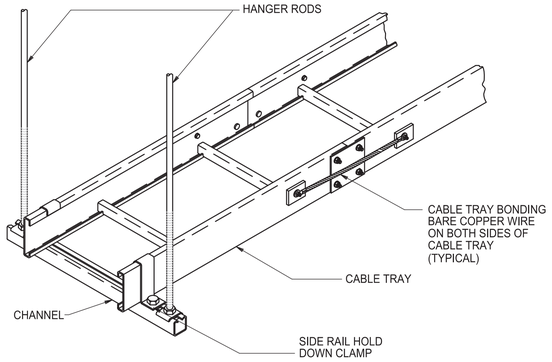


NOTES

1. REMOVE AND REINSTALL EXISTING NURSE CALL.
2. PROVIDE TELE-POWER POLE HEIGHT AS REQUIRED. COORDINATE LOCATION AND INSTALLATION WITH ARCH FURNITURE PLAN. LEGRAND WIREMOLD VISTA-LARGE ARCHITECTURE COLUMN OR APPROVE EQUAL.
3. INTERCONNECT WITH EXISTING FIRE ALARM SYSTEM. PROVIDE NEW INITIATING CIRCUIT FROM EXISTING FACP FOR NEW SMOKE DETECTORS.
4. RELOCATE EXISTING VAV EXTEND CIRCUIT TO NEW EQUIPMENT LOCATION
5. REINSTALL EXISTING SPEAKERS AT NEW CEILING. EXTEND WIRING FROM EXISTING AUDIO SYSTEM AS REQUIRED.
6. NEW J-BOX AT CEILING.
7. NO FIRE ALARM SCOPE IN EXISTING AREAS, EXISTING CANDELLA AND DB TO REMAIN PER NFPA72.
8. (N) POWER POLE. LEGRAND VISTA LARGE ARCHITECTURAL COLUMN OR APPROVED EQUAL. SEE DETAIL 2/E-401.
9. 2" STUB OUT FOR SERVER CABLES. VERIFY CONDUIT LOCATION WITH KCH. FIBER CABLES INSTALLED BY ENVISION.
10. DEDICATED QUAD RECEPTACLE FOR DATA RACK. VERIFY MOUNTING HEIGHT WITH KCH.
11. 24"X24" WALL MOUNT DATA CABINET NEAR CEILING.
12. KCH TO PROVIDE QUAD WHIPS FOR ADDITIONAL POWER POLE EQUIPMENT.
13. VERIFY EXACT LOCATION WITH HOSPITAL FOR POWER AND DATA CONNECTION COORDINATION PRIOR TO INSTALLATION. INSTALL GROUNDING BUS BAR AT DATA RACK LOCATION.
14. REINSTALL EXISTING DOOR CARD ACCESS READER DEVICE. MATCH MOUNTING HEIGHT OF EXISTING CARD READERS. EXTEND EXISTING CONDUIT AND CONDUCTORS TO PROVIDE POWER TO DEVICE AS NECESSARY.
15. INSTALL NEW DOOR CARD ACCESS READER DEVICE. MATCH MOUNTING HEIGHT OF EXISTING CARD READERS. CONTRACTOR IS REQUIRED TO FURNISH THE CARD READER AND ALL WIRING. COORDINATE WITH HOSPITAL VENDOR.
16. FIELD VERIFY CABLE TRAY DIMENSIONS BASED ON FINAL FIELD CONDITIONS. COORDINATE WITH MECHANICAL CONTRACTOR FOR CLEARANCES.
17. PROVIDE DATA CONNECTIONS PER MANUFACTURER.
18. PROVIDE DOOR RELEASE MODULE SUCH THAT ACTIVATION OF FIRE ALARM SYSTEM AUTOMATICALLY RELEASES DOOR ELECTRIFIED HARDWARE.

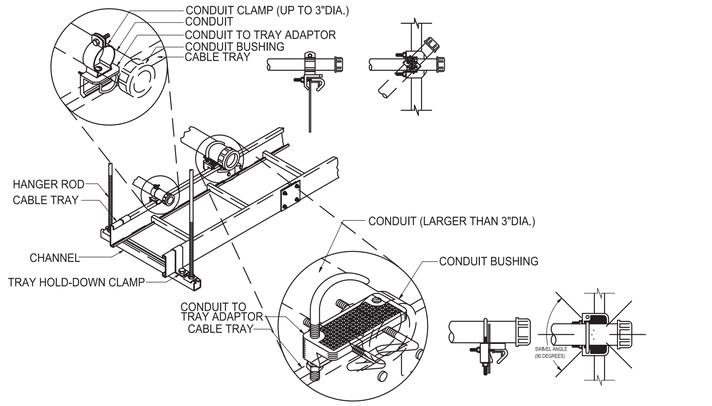
A EXISTING/ NEW POWER PLAN - LABORATORY

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



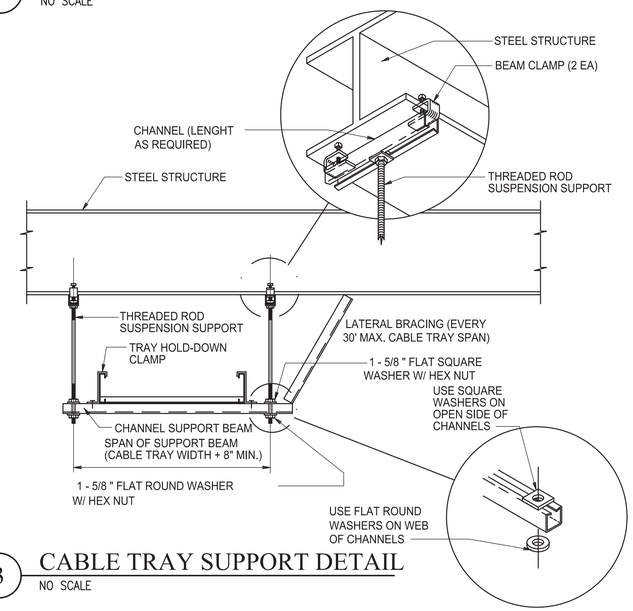
1 CABLE TRAY BONDING

NO SCALE



2 CABLE TRAY & CONDUIT INSTALLATION

NO SCALE



3 CABLE TRAY SUPPORT DETAIL

NO SCALE

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KEYPLAN:

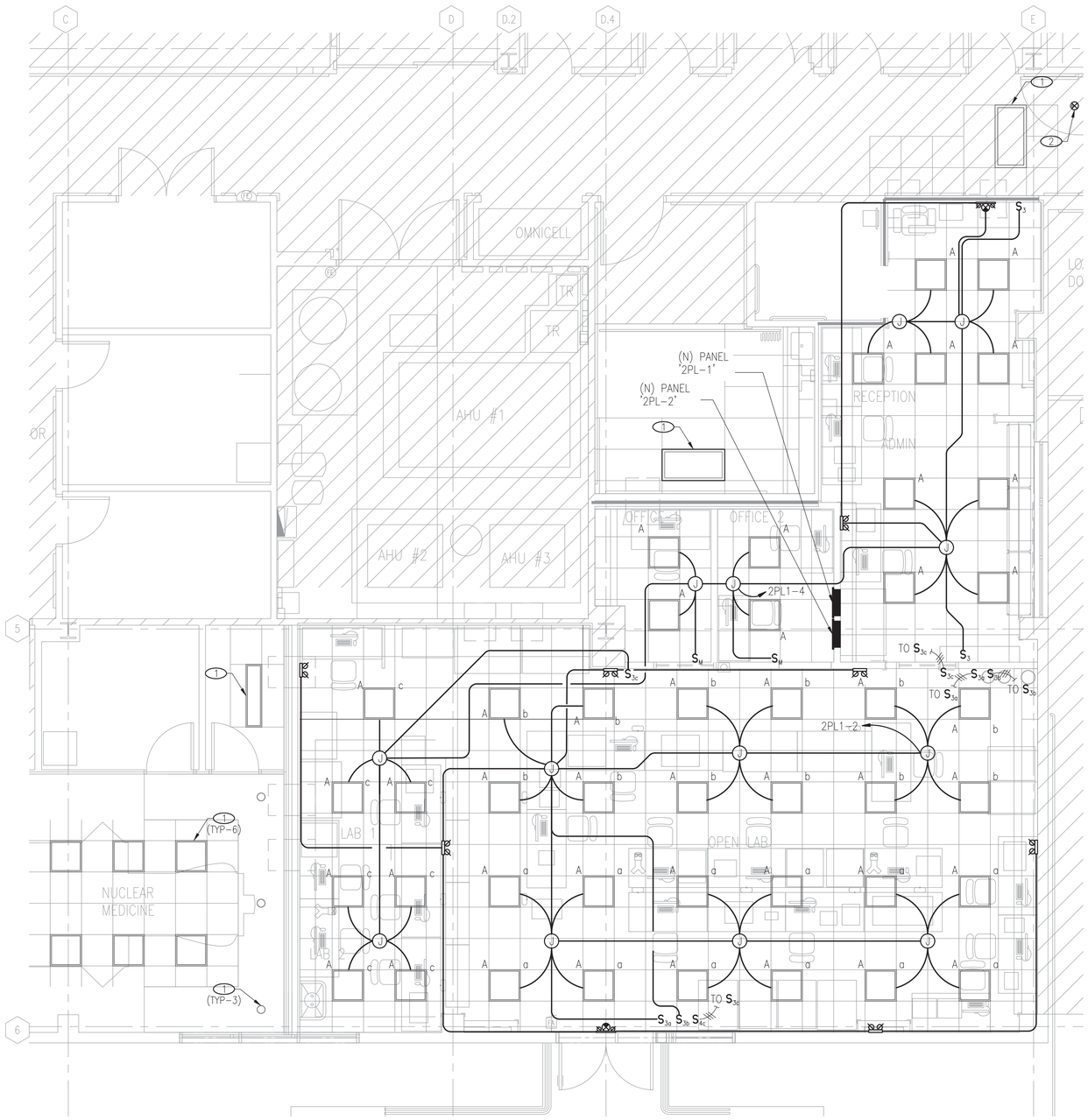
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SIGNATURE

BUILDING: –

DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		MY
DATE:		OCTOBER 2025
SCALE:		AS SHOWN
TITLE:		EXISTING/ NEW POWER PLAN–LABORATORY
NUMBER:		E-202



A EXISTING/ NEW LIGHTING PLAN - LABORATORY

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

0 4' 8'

N

NOTES

1. REMOVE AND REINSTALL EXISTING LIGHT FIXTURES AS NECESSARY.
2. REMOVE AND REINSTALL EXIT SIGN FOR REMOVAL OF CEILING.

NOTICES

1. PROVIDE FIRE STOPPING TO PRESERVE FIRE RATING OF STRUCTURE AS REQUIRED. SEE ARCH DRAWINGS FOR FIRE RATED CONSTRUCTION.
2. HATCHED AREAS NOT IN CONTRACT.
3. STUB DATA CONDUITS TO A POINT 6" ABOVE CEILING. ROUTE NEW DATA CABLING ABOVE CEILING USING J-HOOKS TO CABLE TRAY
4. ALL WORK REQUIRED FOR PREPARATION OF SHOP DRAWINGS AND INTEGRATION OF NEW DEVICES INTO EXISTING SYSTEM SHALL BE INCLUDED IN THE CONTRACTOR'S BID.

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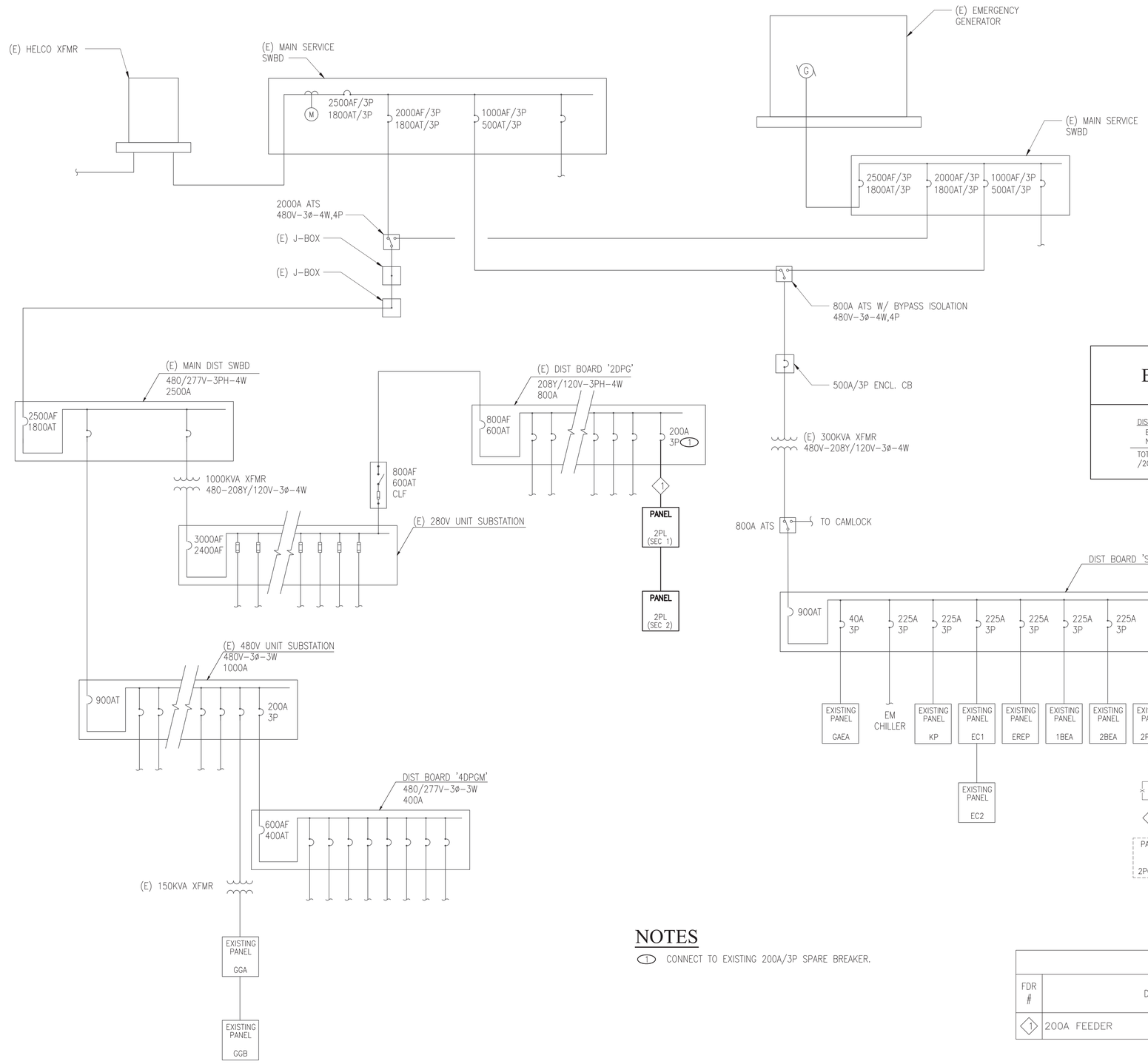
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SIGNATURE

BUILDING: –

DRAWING:		
PROJECT NO.		1916.04
	DRAWN BY:	MY
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	EXISTING/ NEW LIGHTING PLAN-LABORATORY
	NUMBER:	E-203



ELECTRICAL LOAD CALCULATIONS

DIST BOARD '2DPG'		
EXISTING LOAD (x1.25 PER NEC 220.87):	=	81.0 KVA
NEW LOAD (PANEL '2PL')	=	47.3 KVA
TOTAL PANEL '2DPG' /208V, 3ø	=	128.3 KVA 356.5

NOTES

1. CONNECT TO EXISTING 200A/3P SPARE BREAKER.

FEEDER SCHEDULE

FDR #	DESCRIPTION	CONDUIT & WIRE SIZE
1	200A FEEDER	2-1/2"C 4 #250KCMIL & #4 GND

A ONE LINE DIAGRAM
NO SCALE

HAWAII HEALTH SYSTEMS CORPORATION
Quality Healthcare for All

KONA COMMUNITY HOSPITAL
79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750
ADDRESS

CLINICAL LAB REDESIGN
FOR DIAGNOSTIC
LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8841

KEYPLAN:



ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/26
No. 18572-E
HAWAII, U.S.A.

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

SIGNATURE

BUILDING: –

DRAWING		
PROJECT NO.		1916.04
DRAWN BY:		KD
DATE:		OCTOBER 2025
SCALE:		AS SHOWN
TITLE:		ELECTRICAL ONE LINE DIAGRAM
NUMBER:		E-301

NEW

PANEL: 2PL(SEC 1) VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or N: NON-CONTINUOUS
BUS: 225A L: LONG-CONTINUOUS
DATE: 8/19/25 1:59 PM MAINS: 200A LOCATION: OFFICE R: DEMANDABLE RECEPTACLES
JOB: 14005-19-02 AIC RATING: 22 KAIC MOUNTING: FLUSH K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION (NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	LOAD DESIGNATION ØA	ØB	ØC	L	R	M	(NOTE) DESCRIPTION	TRIP	POLE	CODE	CKT NO
1		20	1	FCU-1				-			•			1080						OPEN LAB LIGHTS	20	1		2
3				--					-		•				840					ADMIN/ OFFICE LIGHTS	20	1		4
5			3	--						-	•					900				OFFICE 1 PC RECEPT	20	1		6
7		20	1	RECEPTION PC RECEPT				540			•			900						OFFICE 2 PC RECEPT	20	1		8
9		20	1	ADMIN PC RECEPT 1					540		•				540					LAB 1 PC RECEPT	20	1		10
11		20	1	ADMIN PC RECEPT 2						360	•					540				LAB 2 PC RECEPT 1	20	1		12
13		20	1	OPEN LAB PP PC RECEPT 1				1080			•			540						LAB 2 PC RECEPT 2	20	1		14
15		20	1	OPEN LAB PP PC RECEPT 2					1080		•				1750					BECKMAN AU 480-2(01)	20			16
17		20	1	OPEN LAB PP PC RECEPT 3						1080	•					1750						2		18
19		20		BECKMAN AU 480-1(01)				1750			•			1500						ACCESS 2-1(02)	20	1		20
21			2	--					1750		•				1500					ACCESS 2-2(02)	20	1		22
23		20	1	SYMEX XN2000-1(03)						1000	•					1200				COAG-1(04)	15	1		24
25		20	1	SYMEX XN2000-2(03)				1000			•			1200						COAG-2(04)	15	1		26
27		20	1	IMMUCOR/AVANTUS(05/06)					800		•				540					RAPID/OSMTR/ISED(07/08/09)	20	1		28
29		20	1	CEPHEID 16 (10)						700	•					700				STATSPIN3/4 (11/12)	20	1		30
31		20	1	SORVAL CENTRI ST16(13)				1500			•			360						DRUCKER 642/CLINFUGE (14)	20	1		32
33		20	1	BACT ALERT(15)					700		•				900					BB REFER(16)	20	1		34
35		20	1	BB FREEZER(17)						1000	•					1200				BB THAWER 1(18)	20	1		36
37		20	1	BB SERO/CELLWASH(20/21)				900			•			-						SPARE	20	1		38
39		20	1	BB INCU/BATH (19/22)					900		•				-					SPARE	20	1		40
41		20	1	BB THAWER 2 (18)						1200	•			-						SPARE	20	1		42

PANEL NOTES: PHASE TOTALS ØA: 12350 ØB: 11840 ØC: 11630

TOTAL CONNECTED VA	35820
CONNECTED VA (CODE N)	35820
CONNECTED VA (CODE L)	0
CONNECTED VA (CODE R)	0
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	35.8
PANEL DEMAND KVA	35.8
PANEL DEMAND AMPS	99.4
HIGH Ø AMPS w/ DEMAND	102.8

PROVIDE FEED THROUGH LUGS
SECTION 1 OF 2

NEW

PANEL: 2PL(SEC 2) VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or N: NON-CONTINUOUS
BUS: 225A L: LONG-CONTINUOUS
DATE: 8/19/25 1:59 PM MAINS: M.L.O. LOCATION: OFFICE R: DEMANDABLE RECEPTACLES
JOB: 14005-19-02 AIC RATING: 22 KAIC MOUNTING: FLUSH K: KITCHEN NO. OF EQUIPMENT: 0

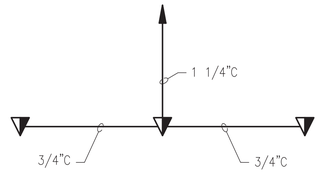
CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION (NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	LOAD DESIGNATION ØA	ØB	ØC	L	R	M	(NOTE) DESCRIPTION	TRIP	POLE	CODE	CKT NO
43		20	1	CYTOSPIN(26)				180			•			1000						BEVAIR MT49-1(23)	20	1		44
45		20	1	MICRO INCUBATOR (29)					700		•				1000					BEVAIR MT49-2(23)	20	1		46
47		20	1	MICRO HOOD (30)						1500	•					1500				SANYO REFER(25)	20	1		48
49		20	1	CELLAVISION(32)				300			•			-						SPARE	20	1		50
51		20	1	BECKMAN IRIS SYS(33)					1200		•				800					MICROSCP-1/HEMATEK(27/28)	20	1		52
53		20	1	SPARE						-	•					-				SPARE	20	1		54
55		20	1	OPEN LAB GEN 1				180			•			300						MX COPIER/SCANNER(31)	20	1		56
57		20	1	OPEN LAB GEN 2					180		•				180					SPARE	20	1		58
59		20	1	OPEN LAB GEN 3						180	•					180				LAB 1 GEN 1	20	1		60
61		20	1	OPEN LAB GEN 4				180			•			180						LAB 1 GEN 2	20	1		62
63		20	1	SPARE					-		•				180					LAB 2 GEN 1	20	1		64
65		20	1	DATA RACK						360	•					180				LAB 2 GEN 2	20	1		66
67		20	1	SPARE				-			•			180						LAB 2 GEN 3	20	1		68
69		20	1	DOOR ACCESS					200		•				180					LAB 2 GEN 4	20	1		70
71		20	1	WATER SYS						500	•					-				SPARE	20	1		72
73				PFFB				-			•			-						PFFB				74
75				PFFB					-		•				-					PFFB				76
77				PFFB						-	•					-				PFFB				78
79				PFFB				-			•			-						PFFB				80
81				PFFB					-		•				-					PFFB				82
83				PFFB						-	•					-				PFFB				84

PANEL NOTES: PHASE TOTALS ØA: 2500 ØB: 4620 ØC: 4400

TOTAL CONNECTED VA	11520
CONNECTED VA (CODE N)	11520
CONNECTED VA (CODE L)	0
CONNECTED VA (CODE R)	0
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	11.5
PANEL DEMAND KVA	11.5
PANEL DEMAND AMPS	32.0
HIGH Ø AMPS w/ DEMAND	38.5

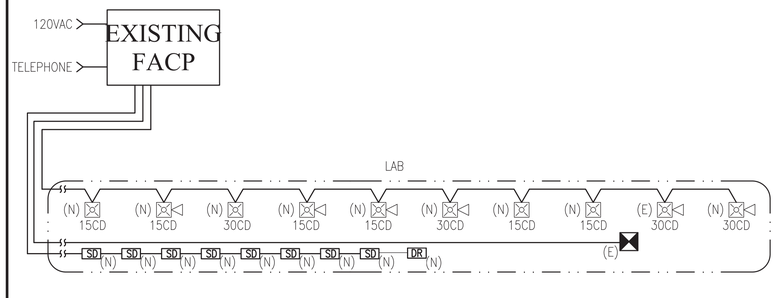
SECTION 2 OF 2

RUN CONDUIT TO A POINT 6" ABOVE CEILING
HOME RUN CABLES TO CABLE TRAY
SHOWN ON DRAWINGS



NOTES:
1. DATA ONLY OUTLETS ARE SIMILAR.
2. THEORETICAL DRAWING. INSTALL BOXES PER EIA/TIA & BICSI GUIDELINES.

1 TYP. CONDUIT INSTALLATION DIAGRAM
NO SCALE



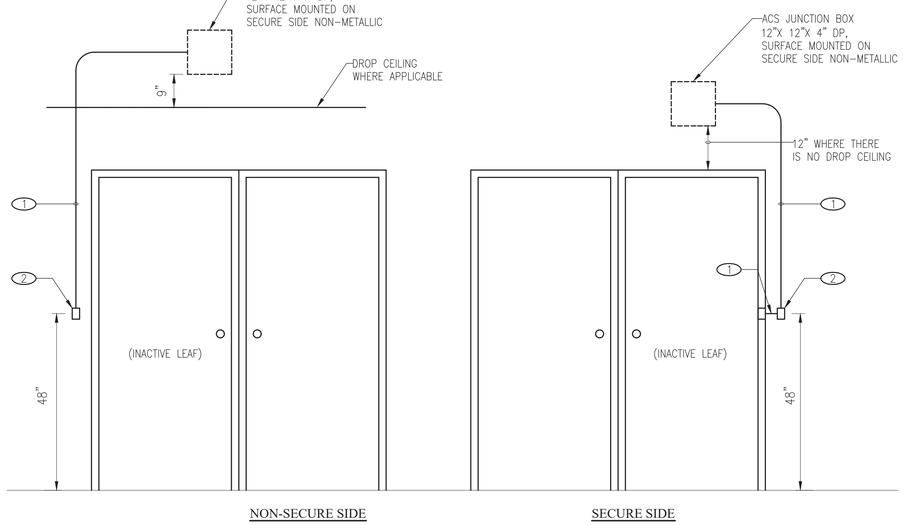
4 FIRE RISER DIAGRAM
NO SCALE

NOTICES

1. ROUTE POWER FOR ELECTRIFIED DOOR HARDWARE VIA ELECTRIC POWER TRANSFER. VERIFY EXISTING CONDITIONS AND COORDINATE FINAL ROUTING WITH HOSPITAL VENDOR (IPD), HOSPITAL, AND ARCHITECT.

NOTES

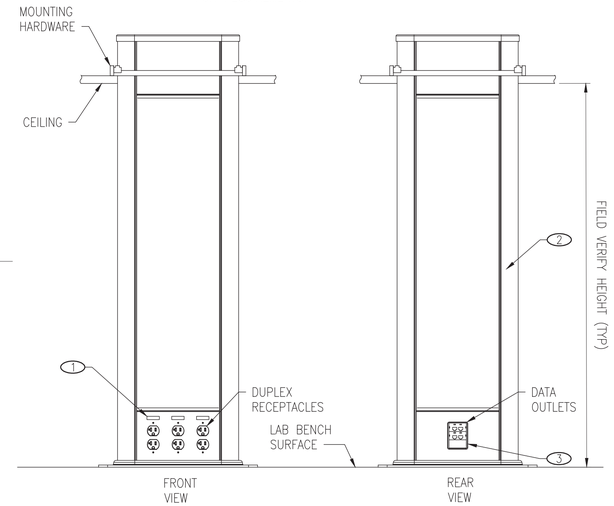
1. 3/4"C WITH PULLSTRING CONCEALED IN WALL
2. ACS OUTLET BOX (FOR COMBINATION KEYPAD/ CARD READER), 2"X 4" FLUSH MOUNTED ON NON-SECURE SIDE, +48" AFF.
3. ACS OUTLET BOX (FOR DOOR STRIKE CONNECTION), 2"X 4" FLUSH MOUNTED ON SECURE SIDE. COORDINATE LOCATION WITH DOOR INSTALLATION.
4. CONTRACTOR IS REQUIRED TO FURNISH THE CARD READER AND ALL WIRING. COORDINATE WITH HOSPITAL VENDOR.



3 EXTERIOR DOOR ACS CONDUIT DIAGRAM
NO SCALE

NOTES

1. PROVIDE ENGRAVED LAMICOID IDENTIFYING CIRCUIT NUMBER AND EQUIPMENT DESIGNATION PER SHEET A-500 EQUIPMENT SCHEDULE (TYP.).
2. POWER/DATA COLUMN LARGER SIZE, ROUND END CHANNEL, ANODIZED ALUMINUM. LEGRAND VISTA LARGE ARCHITECTURAL COLUMN OR APPROVED EQUAL.
3. PROVIDE LABELING AND KEYSTONE JACK COLORS PER KCH REQUIREMENTS.



NOTE: PROVIDE DEVICE PLATES, MOUNTING HARDWARE AND ACCESSORIES AS REQUIRED.

2 TYP. POWER/DATA COLUMN DETAIL
NO SCALE

LUMINAIRE SCHEDULE

FIXTURE TYPE	MANUFACTURER NAME	MANUFACTURER CATALOG NUMBER	VOLT AMPS	MOUNTING	LAMP TYPE	REMARKS	VOLT
A	LEDVANCE	PANELF7A035UNVD84022GWH	35	GRID	LED	2'X2' COLOR 4000K FLAT PANEL, 110 LPW, 80+ CRI.	120/277
	LITHONIA	ELM2L-SDRT	5	UNIVERSAL	LED	EMERGENCY BUGEYE FIXTURE WITH 90 MINUTE BATTERY BACKUP	120/277
	LITHONIA	LHQM-LED-R	5	UNIVERSAL	LED	EXIT SIGN WITH LED COMBO AND EMERGENCY BATTERY BACKUP	120/277

HAWAII HEALTH SYSTEMS CORPORATION
Quality Healthcare for All

KONA COMMUNITY HOSPITAL
79-1019 HAUKAPILA STREET
KEALAKEKUA, HAWAII 96750
ADDRESS

CLINICAL LAB REDESIGN
FOR DIAGNOSTIC
LABORATORY SERVICES

NO.	REVISION	DATE

uchiyama erskine architects inc
540 LAGOON DR., SUITE 4 HONOLULU, HI. 96819
(808) 833-8891

KEYPLAN:





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

SIGNATURE

BUILDING: -

DRAWING		
PROJECT NO.		1916.04
	DRAWN BY:	MY
	DATE:	OCTOBER 2025
	SCALE:	AS SHOWN
	TITLE:	ELECTRICAL SCHEDULES
	NUMBER:	E-401

APPENDIX K

SPECIFICATIONS/PROJECT MANUAL

See following pages

KONA COMMUNITY HOSPITAL

Clinical Lab Redesign for Diagnostic Laboratory Services

Kealakekua, Hawaii

HAWAII HEALTH SYSTEMS CORPORATION
Kona Community Hospital
79-1019 Haukapila Street
Kealakekua, HI 96750
TMK: 7-9-010: 081

SPECIFICATIONS

BID SET

October 2025

KONA COMMUNITY HOSPITAL

Clinical Lab Redesign for Diagnostic Laboratory Services
Kealakekua, Island of Hawaii, Hawaii

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Section 00500 Substitution Request Form
Section 00700 General Conditions

DIVISION 1 - GENERAL REQUIREMENTS

Section 01100 Summary of Work
Section 01120 Alteration Project Procedures
Section 01230 Alternates
Section 01260 Contract Considerations
Section 01270 Variable Quantities Unit Prices
Section 01290 Payment Procedures
Section 01310 Project Management and Coordination
Section 01330 Submittal Procedures
Section 01400 Quality Requirements
Section 01450 Moisture Vapor and Alkalinity Testing
Section 01500 Temporary Facilities and Controls
Section 01600 Product Requirements
Section 01715 Existing Conditions – Hazardous Materials Survey
Section 01730 Execution Requirements
Section 01732 Cutting and Patching
Section 01770 Closeout Procedures
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DIVISION 2 – SITE WORK

Section 02070 Selective Demolition

DIVISION 3 – CONCRETE

Section 03300 Cast-In-Place Concrete

DIVISION 4 – MASONRY (NOT USED)

DIVISION 5 – METALS

Section 05120 Structural Steel Framing

DIVISION 6 – WOOD AND PLASTICS

Section 06160 Sheathing
Section 06400 Architectural Woodwork

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07213 Building Insulation
Section 07242 Direct-Applied Finish System
Section 07620 Sheet Metal Flashing and Trim
Section 07841 Penetration Firestopping
Section 07920 Joint Sealants

DIVISION 8 – DOORS AND WINDOWS

Section 08100 Hollow Metal Door Frames
Section 08210 Wood Doors
Section 08710 Door Hardware
Section 08900 Louvers

DIVISION 9 - FINISHES

Section 09110 Non-Load Bearing Wall Framing
Section 09265 Gypsum Board Assemblies
Section 09511 Acoustical Panel Ceiling
Section 09651 Resilient Flooring
Section 09720 Wall Covering
Section 09900 Painting

DIVISION 10 – SPECIALTIES

Section 10260 Corner Guards
Section 10400 Signage
Section 10511 Metal Lockers
Section 10520 Fire Extinguishers and Cabinets

DIVISION 11 – EQUIPMENT (NOT USED)

DIVISION 12 – FURNISHINGS (NOT USED)

DIVISION 13 – SPECIAL CONSTRUCTION (NOT USED)

DIVISION 14 – CONVEYING SYSTEMS (NOT USED)

DIVISION 15 – MECHANICAL

Section 15000	General Mechanical Requirements
Section 15070	Mechanical Sound, Vibration and Seismic Control
Section 15080	Mechanical Insulation
Section 15181	Chilled Water Piping
Section 15300	Wet Pipe Fire Sprinkler System
Section 15400	Plumbing
Section 15720	Air Handling Units
Section 15810	Ductwork and Ductwork Accessories
Section 15910	Direct Digital Control Systems
Section 15950	HVAC Testing/Adjusting/Balancing

DIVISION 16 – ELECTRICAL

Section 16010	Basic Electrical Requirements
Section 16047	Electrical Demolition
Section 16060	Grounding and Bonding
Section 16073	Hangers and Supports for Electrical Systems
Section 16075	Electrical Identification
Section 16120	Conductors and Cables
Section 16130	Raceways and Boxes
Section 16140	Wiring Devices
Section 16410	Enclosed Switches
Section 16442	Panelboards
Section 16511	Lighting
Section 16700	Communications
Section 16721	Fire Alarm System
Section 16762	Nurse Call System

ATTACHMENTS

- ICRA Policy #125-54

DIVISION 0 – PROCUREMENT & CONTRACTING REQUIREMENTS

SECTION 00400 – BID PROPOSAL FORM

Hawaii Health Systems Corporation
Kona Community Hospital (Owner)
79-1019 Haukapila Street
Kealakekua, Hawai'i 96750

Attn: Yvonne S. Taylor, Senior Contracts Manager

Dear Yvonne:

The undersigned has carefully examined the attached plans and specifications marked "NEW CLINICAL LAB & MISCELLANEOUS ALTERATIONS" and hereby proposes to furnish at his/her own expense all labor, materials, tools, and equipment necessary to construct in place complete, all the work and construction as shown and called for, all in accordance with the true intent and meaning of the plans and specifications, general conditions, contract and bonds, as follows:

BASE BID - LUMP SUM PRICING

All work and construction as shown and called for to complete the Work for the lump sum of {all taxes shall be included in the lump sum amount(s)}:

		New Clinical Lab
1.	Division 1: General Requirements	$_____
2.	Division 2: Site Work	$_____
3.	Division 3: Concrete	$_____
4.	Division 5: Metals	$_____
5.	Division 6: Wood and Plastics	$_____
6.	Division 7: Thermal and Moisture Protection	$_____
7.	Division 8: Doors and Windows	$_____
8.	Division 9: Finishes	$_____
9.	Division 10: Specialties	$_____

11. Division 15: Mechanical $_____

12. Division 16: Electrical $_____

SUBTOTALS (Items 1 – 12) $_____

COMBINED BASE BID LUMP SUM SUBTOTAL: $_____

VARIABLE QUANTITIES UNIT PRICES (VQUP)

(See Section 01270 for detailed explanation)

Item No.	Description	Quantity	Unit	Unit Price	Subtotal Cost
1.	Firestopping	100	LF	$	$

VQUP SUBTOTAL: $_____

TOTAL LUMP SUM BASE BID:
(BASE BID LUMP SUM SUBTOTAL+VQUP SUBTOTAL): $_____

Total in Words

_____

ALTERNATE NO. 1

(See Section 01230)

Rigid Insulation for ducts and flexible insulation at duct joints:

ALTERNATE NO. 1 TOTAL: $_____

ALTERNATE NO. 2

(See Section 01230)

Patch and repairs at ceilings and walls affected by the reheat supply and return lines:

ALTERNATE NO. 2 TOTAL: $_____

The Contractor further agrees to complete the work as noted under the TOTAL LUMP SUM BASE BID above on or before the scheduled date and/or time frame as noted in the Request for Proposals (Competitive Sealed Proposals).

It is understood that the award of contract will be made as noted in the Request for Proposals.

It is understood and agreed that the Owner reserves the right to reject any and/or all bids and waive any defect when, in his/her opinion, such rejection or waiver will be for the best interest of the Owner.

The undersigned hereby agrees that the award of this Contract shall be conditioned upon funds being made available for this project and further upon the right of the Owner to **hold all bids received for a period of ninety (90) days of the opening thereof, during which time no bid may be withdrawn.**

Upon acceptance of the proposal by the Owner, the undersigned hereby agrees to enter into and execute a contract for the same.

The Contractor shall acknowledge receipt of any and all addenda issued by the Architect by recording the date of receipt of the respective addenda in the space provided as follows:

ADDENDUM NO. 1	_____	ADDENDUM NO. 2	_____
ADDENDUM NO. 3	_____	ADDENDUM NO. 4	_____
ADDENDUM NO. 5	_____	ADDENDUM NO. 6	_____

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

Submit your bid proposal as noted in the Request for Proposals.

Enclosed are:

1. Current (within the last 30 days) Certificate of Vendor Compliance.

2. Current (within the last 30 days) Certificate of Good Standing.

3. Evidence of the authority of the signing officer to submit bids on behalf of the Company.

4. KCH Require Documentation/Compliance Documents:
   - W-9
   - Vendor Terms and Conditions (If any)
   - Confidentiality Agreement (Exhibit H)
   - General Excise License (Copy)
   - General Contractor License (Copy)
   - Letter from Surety Committing to Provide the Required Bonds

(CORPORATE SEAL)

Respectfully submitted,

_____
Name of Company

By _____
Signature

Title _____

Contractor's License _____

RME: _____

Federal ID: _____

G.E.T License _____

Date: _____

Address: _____

_____

_____

Telephone: _____

The following shall be added to and be considered a part of the proposal:

All Bidders shall include in his bid on this form the names of each person or firm to be engaged by the Bidder on the Project as joint contractor or subcontractor and shall also indicate the name and scope of the work to be performed by such joint contractor or subcontractor. This list shall not be added to or altered without the written consent of the Architect. Failure to comply with the above shall be sufficient cause for rejection of the bid. If no joint contractor or subcontractor is to be engaged, indicate "NONE".

Name, Address, Telephone No. of Joint Contractor or Subcontractor (Complete Firm Name)	Nature and Scope of Work

END OF SECTION

SUBSTITUTION REQUEST FORM

SUBSTITUTION REQUESTS WILL BE CONSIDERED NO LATER THAN 10 DAYS PRIOR TO BID SUBMITTAL

TO: Erskine Architects, Inc.

SECTION NUMBER: _____ PARAGRAPH: _____

SPECIFIED ITEM: _____

PROPOSED SUBSTITUTE: _____

Attach description, designation, catalog number, data sheets, other technical data, laboratory tests and samples as applicable for evaluation of proposed substitution. List features which are at variance with bidding document requirements. See page 3 for instructions.

If there is an engineered substitution, submit the engineered calculations and certification(s) that they have met or exceeded the contract requirements. Failure to provide this information may result in a rejection of the substitution request.

State below why substitution should be considered for this project and indicate in detail how substitution will affect guarantees, other trades, products, dimensions, etc. Attach additional pages as required to describe any change to project. Use of acceptable substitutions is subject to the requirements of Section 01600 – Product Requirements.

_____

_____

_____

_____

SUBMITTED BY: _____
(Firm Name)

_____
(Address, City, State, Zip Code)

_____ _____ _____ _____
(Telephone) (Name) (Signature) (Date)

ARCHITECT'S REVIEW/COMMENTS

Remarks:

_____

_____

☐ Accepted

☐ Accepted as noted

☐ Not accepted

☐ Received too late

BY: _____

INSTRUCTIONS FOR SUBMITTING SUBSTITUTION

1. Submit a separate substitution request for each type of product or equipment.
2. For substitution requests which include a number of individual related items, such as hardware, paint, fixtures, etc., submit one request for the broad category of related items.

   Attach a summary sheet listing each individual item covered by the request, the item specified and its proposed substitution.

   Identify the accompanying supporting data for each item by the letter or numeral designation used on the summary sheet.
3. Submit substitution requests with attached supporting data as follows:

   Four (4) copies for products relating to Structural, Mechanical or Electrical.

   Three (3) copies for other products.
4. Mark the words “Substitution Request” conspicuously on the outside of the envelope when submitting the request.
5. Substitution Requests submitted by other than the General Contractor will not be considered.
6. Substitution Requests not submitted on a copy of this form will not be considered.
7. Substitution Requests submitted by facsimile machine will not be accepted nor responded to.

END OF SECTION

SECTION 00700 – GENERAL CONDITIONS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. The publication by the Public Works Division, Department of Accounting and General Services, State of Hawaii, titled "INTERIM GENERAL CONDITIONS 1999 Edition," known as the "GENERAL CONDITIONS", forms part of the State of Hawaii Contract between the Contractor and the State of Hawaii. The GENERAL CONDITIONS are not physically included with these specifications, but are included by reference. Copies of the GENERAL CONDITIONS may be obtained from the Department of Accounting and General Services, Public Works Division, Oahu Office, State of Hawaii, fourth floor of the Kalanimoku Building, Room 422, 1151 Punchbowl Street, Honolulu, Hawaii or at the DAGS District Offices on Kauai, Maui and Hawaii.

B. The GENERAL CONDITIONS and SECTION 00800 - SPECIAL CONDITIONS shall govern the Work specified in all DIVISIONS and SECTIONS.

C. Wherever the term 'Interim General Conditions' appears in the Contract Documents, it shall be replaced with the term "GENERAL CONDITIONS."

1.02 REVISIONS TO THE GENERAL CONDITIONS - The following changes shall govern over the respective items in the published "INTERIM GENERAL CONDITIONS, 1999 Edition."

A. Under ARTICLE 1 - DEFINITIONS, replace existing sections (1.5, 1.9, 1.11, 1.12, 1.24, 1.37, 1.43, 1.44, 1.49 and 1.50 respectively) and add new sections (1.65 through 1.75 respectively):

"**1.5 ADVERTISEMENT** - A public announcement soliciting bids or offers.

1.9 BID - See Offer.

1.11 BIDDER - See Offeror.

1.12 BIDDING DOCUMENTS (or SOLICITATION DOCUMENTS) - The advertisement solicitation notice and instructions, Offer requirements, Offer forms, and the proposed contract documents including all addenda, and clarifications issued prior to receipt of the Offer.

1.24 CONTRACT TIME (or CONTRACT DURATION) - The number of calendar (or working) days provided for completion of the contract, inclusive of authorized time extensions. The number of days shall begin running on the effective date in the Notice to Proceed. If in lieu of providing a number of calendar (or working) days, the contract requires completion by a certain date, the work shall be completed by that date.

1.37 INSPECTOR - The person assigned by the Contracting Officer to inspect and monitor construction operations.

1.43 NOTICE TO CONTRACTORS - See Solicitation.

1.44 NOTICE TO PROCEED - A written notice from the Department to the Contractor establishing the applicable Contract Duration, Project Start Date, Jobsite Start Date, Jobsite Completion Date, and Contract Completion Date.

1.49 PROPOSAL (Bid) - See Offer (or Bid).

1.50 PROPOSAL FORM - See Offer Form (or Bid Form).

1.65 CONTRACTING OFFICER - See Engineer.

1.66 JOBSITE START DATE - The date when on-site construction may start.

1.67 JOBSITE COMPLETION DATE - The date when on-site construction must be completed.

1.68 OFFER (or BID) - The executed document submitted by an Offeror in response to a solicitation request, to perform the work required by the proposed contract documents, for the price quoted and within the time allotted.

1.69 OFFEROR (or BIDDER) - Any individual, partnership, firm, corporation, joint venture or other legal entity submitting directly or through a duly authorized representative or agent, an Offer for the work or construction contemplated.

1.70 OFFER FORM (or BID FORM) - The form prepared by the Department on which the Offeror submits the written offer or bid. By submitting an offer or bid, the Offeror adopts the language on the form as its own.

1.71 PROJECT CONTROL BUDGET -The amount of funds set aside for the construction of the Project.

1.72 PROJECT START DATE - The date established in the Notice to Proceed when the Contractor shall begin prosecution of the work and the start of contract time.

1.73 RESIDENT – A person who is physically present in the State of Hawaii at the time the person claims to have established the person's domicile in the State of Hawaii and shows the person's intent is to make Hawaii the person's primary residence.

1.74 SHORTAGE TRADE – A construction trade in which there is a shortage of Hawaii residents qualified to work in the trade as determined by the Department of Labor and Industrial Relations.

1.75 SOLICITATION - An Invitation to Bid or Request for Proposals or any other document issued by the Department to solicit bids or offers to perform a contract. The solicitation may indicate the time and place to

receive the bids or offers and the location, nature and character of the work, construction or materials to be provided."

B. Under ARTICLE 2 – PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.1 – QUALIFICATION OF BIDDERS, by deleting 2.1.1, through 2.1.2.8 and substitute the following 2.1.1 through 2.1.2:

"**2.1.1 Notice of Intention to Bid**

2.1.1.1 In accordance with section 103D-310, Hawaii Revised Statutes, and Section 3-122-111, Hawaii Administrative Rules, a written notice of intention to bid need not be filed for construction of any public building or public work. A written notice of intention to bid need not be filed for mere furnishing and installing of furniture, equipment, appliances, material and any combination of these items when a Contractor's license is not required under Chapter 444 of the Hawaii Revised Statutes, as amended, and the rules and regulations of the Contractor's License Board.

2.1.1.2 If two (2) or more prospective bidders desire to bid jointly as a joint venture on a single project, they must file an affidavit of joint venture. Such affidavit of joint venture will be valid only for the specific project for which it is filed. No further license is required when all parties to the joint venture possess current and appropriate contractor's licenses. Joint ventures are required to be licensed in accordance with Chapter 444 of the Hawaii Revised Statutes, as amended, and the rules and regulations of the Contractor's License Board when any party to the joint venture agreement does not hold a current or appropriate contractor's license. The joint venture must register with the office of the Director of Commerce and Consumer Affairs in accordance Chapter 425 of the Hawaii Revised Statutes, as amended.

2.1.1.3 No persons, firm or corporation may bid where (1) the person, firm, or corporation, or (2) a corporation owned substantially by the person, firm, or corporation, or (3) a substantial stockholder or an officer of the corporation, or (4) a partner or substantial investor in the firm is in arrears in any payment owned to the State of Hawaii or any of its political subdivisions or is in default of any obligation to the State of Hawaii or to all or to any of its political subdivisions, including default as a surety or failure to perform faithfully and diligently any previous contract with the Department.

2.1.2 Compliance Certificate 103D-310(c), Hawaii Revised Statutes – The Contractors are required to provide proof of compliance in order to receive a contract of $25,000 or more. To meet this requirement, Bidders may apply and register at the "Hawaii Compliance Express" website: http://vendors.ehawaii.gov/hce/splash/welcome.html

C. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.6 - SUBSTITUTION OF MATERIALS AND EQUIPMENT BEFORE BID OPENING, by renaming section 2.6 SUBSTITUTION BEFORE CONTRACT AWARD and deleting subsections 2.6.1, through 2.6.6 and substitute the following three new subsections and related paragraphs 2.6.1 through 2.6.3:

"**2.6.1** For Substitutions after the Letter of Award is issued; refer to Section 6.3 SUBSTITUTION AFTER CONTRACT AWARD.

2.6.2 Unless specifically required otherwise in the contract documents, Offerors shall not submit products, materials, equipment, articles or systems for review or approval prior to submitting their Offers.

2.6.3 Offerors shall prepare their Offer forms based on the performance requirements of the materials, equipment, articles or systems noted on the drawings and specifications. If trade names, makes, catalog numbers or brand names are specified, Offerors shall infer that these items indicate the quality, style, appearance or performance of the material, equipment, article, or systems to be used in the project."

D. Under ARTICLE 2 – PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.7 – PREPARATION OF PROPOSAL, by deleting subsection 2.7.3 and substituting the following 2.7.3:

"**2.7.3** Pursuant to the requirements of Section 103D-302, HRS, each Bidder shall include in its bid the name of each person or firm to be engaged by the Bidder on the project as joint contractor or subcontractor indicating also the nature and scope of work to be performed by such joint contractor and/or subcontractor. If the Bidder fails to list a joint contractor or subcontractor, the State may accept the bid if it is in the State's best interest and the value of the work to be performed by the joint contractor or subcontractor is equal to or less than one percent of the total bid amount. The Bidder shall be solely responsible for verifying that their joint contractor or subcontractor has the proper license at the time of the submitted bid."

E. Under ARTICLE 2 – PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.13 – PROTEST, by deleting subsections 2.13.2 and 2.13.3 and substituting the following 2.13.2 & 2.13.3:

"2.13.2 No Protest based upon the contents of the solicitation shall be considered unless it is submitted in writing to the Public Works Administrator prior to the date set for the receipt of proposals.

2.13.3 A protest of an award or proposed award pursuant to §103D-302 or §103D-303, HRS, shall be submitted in writing to the Public Works Administrator within five (5) working days after the posting of the award of the Contract."

F. Under ARTICLE 3 – AWARD AND EXECUTION OF CONTRACT, modify section 3.3 CORRECTION OF BIDS AND WITHDRAWAL OF BIDS 3-122-31 HAR, by deleting subsection 3.3.1.2(b) and substituting the following 3.3.1.2(b):

"(b) Transposition errors;"

G. Under ARTICLE 3 – AWARD AND EXECUTION OF CONTRACT, modify section 3.3 CORRECTION OF BIDS AND WITHDRAWAL OF BIDS §3-122-31 HAR, by deleting subsection 3.3.2 and substituting the following 3.3.2:

"**3.3.2** Withdrawal of bids after bid opening but prior to award may be made when the bid contains a mistake attributable to an obvious error which affects price, quantity, quality, delivery, or contractual conditions, and the bidder requests withdrawal in writing by submitting proof of evidentiary value which demonstrates that a mistake was made. The Comptroller shall prepare a written approval or denial in response to this request."

H. Under ARTICLE 3 – AWARD AND EXECUTION OF CONTRACT, modify section 3.4 AWARD OF CONTRACT, by deleting subsection 3.4.4 and substituting the following 3.4.4:

"**3.4.4** The contract will be drawn on the offer forms and accepted by the Comptroller. The contract will not be binding upon the Department until all required signatures have been affixed thereto and written certification that funds are available for the work has been made."

I. Under ARTICLE 3 – AWARD AND EXECUTION OF CONTRACT, add new Section 3.8 as follows:

"**3.8 CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS** - Contractors are hereby notified of the applicability of Section 11-355 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."

J. Under ARTICLE 3 – AWARD AND EXECUTION OF CONTRACT, modify section 3.8 EXECUTION OF THE CONTRACT, by renumbering the section number to 3.9, related subsection numbers to 3.9.1, 3.9.2 , by deleting former subsection 3.8.1 and substituting the following new 3.9.1:

"**3.9.1** Upon acceptance of the successful bidder's offer by the Comptroller, the Contractor shall provide satisfactory performance and payment bonds within ten (10) calendar days after award of the contract or within such further time as granted by the Comptroller. No proposal or contract shall be considered binding upon the State until the contract has been fully and properly executed by all parties thereto and the Comptroller has endorsed thereon its certificate, as required by Section 103D-309, HRS, that there is an available unexpended appropriation or balance of an appropriation over and above all outstanding contracts sufficient to cover the State's amount required by such contract."

K. Under ARTICLE 3 – AWARD AND EXECUTION OF CONTRACT, modify section 3.9 FAILURE TO EXECUTE THE CONTRACT, by renumbering the section number to 3.10, related subsection numbers to 3.10.1, 3.10.2, 3.10.3, by deleting former subsection 3.9.2 and substituting the following new 3.10.2:

"**3.10.2 After the Award** – If the Bidder to whom contract is awarded shall fail or neglect to furnish satisfactory security within ten (10) calendar days after such award or within such further time as the Comptroller may allow, the State shall be entitled to recover from such Bidder its actual damages, including but not limited to the difference between the bid and the next lowest responsive bid, as well as personnel and administrative costs, consulting and legal fees and other

expenses incurred in arranging a contract with the next low responsive bidder or calling for new bids. The State may apply all or part of the amount of the bid security to reduce damages. If upon determination by the State of the amount of its damages the bid security exceeds that amount, it shall release or return the excess to the person who provided same."

L. Under ARTICLE 3 – AWARD AND EXECUTION OF CONTRACT, renumber Section 3.10 NOTICE TO PROCEED and related subsection numbers to 3.11, 3.11.1, 3.11.2, 3.11.3 and 3.11.4.

M. Under ARTICLE 4 - SCOPE OF WORK, modify Section 4.2 CHANGES, by deleting subsection 4.2.4.3 and substituting the following two new subsections:

"4.2.4.3 Upon receipt of a change order, that the Contractor does not agree with any of the terms or conditions or the adjustments or non adjustments of the contract price or contract time; the Contractor shall not execute or sign the change order, but shall return the unsigned change order, along with a written notification of the conditions or items that are in dispute.

4.2.4.4 If the Contractor signs or executes the change order, this constitutes an agreement on the part of the Contractor with the terms and conditions of the change order. A change order that is mutually agreed to and signed by the parties of the contract constitutes a contract modification."

N. Under ARTICLE 4 - SCOPE OF WORK, modify section 4.2 CHANGES, by adding the following three new subsections 4.2.5 through 4.2.7:

"**4.2.5 Claim Notification** - The Contractor shall file a notice of intent to claim for a disputed change order within 30 calendar days after receipt of the written order. Failure to file the protest within the time specified constitutes an agreement on the part of the Contractor with the terms, conditions, amounts and adjustment or non-adjustment to contract price or contract time set forth in the disputed change order. The requirement for timely written notice shall be a condition precedent to the assertion of a claim.

4.2.6 Proceeding with Directed Work - Upon receipt of a contract modification, change order, or field order, the Contractor shall proceed with the directed changes and instructions. The Contractor's right to make a claim for additional compensation or an extension of time for completion is not affected by proceeding with the changes and instructions described in a change order and field order.

4.2.7 Pricing or Negotiating Costs Not Allowed - The Contractor's cost of responding to requests for price or time adjustments is included in the contract price. No additional compensation will be allowed unless authorized by the Contracting Officer."

O. Under ARTICLE 4 - SCOPE OF WORK, modify section 4.3 Duty of Contractor to Provide Proposal for Changes, by deleting subsection 4.3.4.

P. Under ARTICLE 4 - SCOPE OF WORK, modify section 4.4 PRICE ADJUSTMENT, by deleting subsection 4.4.1 and substituting subsection 4.4.1

and adding a new subsection 4.4.2 and modify section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT, by deleting subsections 4.5.1, 4.5.2 and 4.5.3 and substituting subsections 4.5.1, 4.5.2 and 4.5.3 as follows:

"4.4 PRICE ADJUSTMENT HRS 103D-501

4.4.1 A fully executed change order or other document permitting billing for the adjustment in price under any method listed in paragraphs (4.4.1.1) through (4.4.1.5) shall be issued within ten days after agreement on the price adjustment. Any adjustment in the contract price pursuant to a change or claim in this contract shall be made in one or more of the following ways:

4.4.1.1 By agreement to a fixed price adjustment before commencement of the pertinent performance;

4.4.1.2 By unit prices specified in the contract or subsequently agreed upon before commencement of the pertinent performance;

4.4.1.3 Whenever there is a variation in quantity for any work covered by any line item in the schedule of costs submitted as required by Section 7.2 COMMENCEMENT REQUIREMENTS, by the Department at its discretion, adjusting the lump sum price proportionately;

4.4.1.4 FORCE ACCOUNT METHOD. At the sole option of the Contracting Officer, by the costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as specified in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT and the force account provision of Section 8.3 PAYMENT FOR ADDITIONAL WORK before commencement of the pertinent performance;

4.4.1.5 In such other manner as the parties may mutually agree upon before commencement of the pertinent performance; or

4.4.1.6 In the absence of an agreement between the two parties:

4.4.1.6.a For change orders with value not exceeding $50,000 by documented actual costs of the work, allowing for overhead and profit as set forth in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. A change order shall be issued within fifteen days of submission by the contractor of proper documentation of completed force account work, whether periodic (conforming to the applicable billing cycle) or final. The procurement officer shall return any documentation that is defective to the contractor within fifteen days after receipt, with a statement identifying the defect; or

4.4.1.6.b For change orders with value exceeding $50,000 by a unilateral determination by the Contracting Officer of the reasonable and necessary costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as computed by the Contracting Officer in accordance with applicable sections of Chapters 3-123 and 3-126 of the Hawaii Administrative Rules, and Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. When a unilateral determination has been made, a unilateral change order shall be issued within ten days. Upon receipt of the

unilateral change order, if the contractor does not agree with any of the terms or conditions, or the adjustment or nonadjustment of the contract time or contract price, the contractor shall file a notice of intent to claim within thirty days after the receipt of the written unilateral change order. Failure to file a protest within the time specified shall constitute agreement on the part of the contractor with the terms, conditions, amounts, and adjustment or nonadjustment of the contract time or the contract price set forth in the unilateral change order.

4.4.2 Cost or Pricing Data - Contractor shall provide and certify cost or pricing data for any price adjustment to a contract involving aggregate increases and decreases in costs plus applicable profits expected to exceed $100,000. The certified cost or pricing data shall be subject to the provisions of HAR chapter 3-122, subchapter 15.

4.5 ALLOWANCES FOR OVERHEAD AND PROFIT HRS103D-501

4.5.1 In determining the cost or credit to the Department resulting from a change, the allowances for all overhead, including, extended overhead resulting from adjustments to contract time (including home office, branch office and field overhead, and related delay impact costs) and profit combined, shall not exceed the percentages set forth below:

4.5.1.1 For the Contractor, for any work performed by its own labor forces, twenty percent (20%) of the direct cost;

4.5.1.2 For each subcontractor involved, for any work performed by its own forces, twenty percent (20%) of the direct cost;

4.5.1.3 For the Contractor or any subcontractor, for work performed by their subcontractors, ten percent (10%) of the amount due the performing subcontractor.

4.5.2 Not more than three markup allowance line item additions not exceeding the maximum percentage shown above will be allowed for profit and overhead, regardless of the number of tier subcontractors.

4.5.3 The allowance percentages will be applied to all credits and to the net increase of direct costs where work is added and deleted by the changes."

Q. Under ARTICLE 5 - CONTROL OF THE WORK, modify section 5.4 SHOP DRAWINGS AND OTHER SUBMITTALS, by deleting subsection 5.4.14 and 5.4.15 and substitute the following new subsections:

"5.4.1.4 Descriptive Sheets and Other Submittals - When a submittal is required by the contract, the Contractor shall submit to the Contracting Officer eight (8) complete sets of descriptive sheets such as shop drawings, brochures, catalogs, illustrations, calculation, material safety data sheets (MSDS), certificates, reports, warranty, etc., which will completely describe the material, product, equipment, furniture or appliance to be used in the project as shown in the drawings and specifications and how it will be

integrated into adjoining construction. When submittals are specified to be submitted under Web Based Construction Management System, the number of complete sets will be as specified or as directed by the Contracting Officer. Prior to the submittal, the Contractor shall review and check all submittal sheets for conformity to the contract requirements and indicate such conformity by marking or stamping and signing each sheet. Where descriptive sheets include materials, systems, options, accessories, etc. that do not apply to this contract, non-relevant items shall be crossed out so that all remaining information will be considered applicable to this contract. It is the responsibility of the Contractor to submit descriptive sheets for review and acceptance by the Contracting Officer as required at the earliest possible date after the date of award in order to meet the Contract Duration. Delays caused by the failure of the Contractor to submit descriptive sheets as required will not be considered as justification for contract time extension.

5.4.1.5 Material Samples and Color Samples - When material and color sample submittals are required by the contract, the Contractor shall submit to the Contracting Officer no less than three (3) samples conforming to Section 6.6 MATERIAL SAMPLES. One sample will be retained by the Consultant, one sample will be retained by the State, and the remaining sample(s) will be returned to the Contractor. Prior to the material and color submittal, the Contractor shall review and check all samples for conformity to the contract requirements and indicate such conformity by marking or stamping and signing each sample. It is the responsibility of the Contractor to submit samples for review and acceptance by the Contracting Officer as required at the earliest possible date after the date of award in order to meet the Contract Duration. Delays caused by the failure of the Contractor to submit material and color samples as required will not be considered as justification for contract time extension.

5.4.1.6 Unless the technical sections (Divisions 2 - 16) specifically require the Contractor furnish a greater quantity of shop drawings and other submittals, the Contractor shall furnish the quantities required by this section."

R. Under ARTICLE 5 - CONTROL OF THE WORK, modify section 5.8 COOPERATION BETWEEN THE CONTRACTOR AND THE DEPARTMENT, by deleting the subsection 5.8.1 and substitute the following new subsection 5.8.1:

"**5.8.1 Furnishing Drawings and Specifications** - DAGS will not furnish hard copies of contract plans and specifications to Contractors. Contractors who receive award for projects shall download the files of drawings and specifications from the DAGS website: http://www.hawaii.gov/pwd/pwd_db/construction_bids/view_db_previous, and make their own hard copies. Contractor shall have and maintain at least one hard copy of the Contract Drawings and Specifications on the work site, at all times."

S. Under ARTICLE 5 - CONTROL OF THE WORK, modify section 5.12 SUBCONTRACTS, by deleting the subsection 5.12 and related paragraphs and substitute the following new subsection 5.12 and related paragraphs:

"**5.12 SUBCONTRACTS -** Nothing contained in the contract documents shall create a contractual relationship between the State and any subcontractor. The contractor may subcontract a portion of the work but the contractor shall remain responsible for the work that is subcontracted.

5.12.1 Replacing Subcontractors - Contractors may enter into subcontracts only with subcontractors listed in the offer form. The contractor will be allowed to replace a listed subcontractor if the subcontractor:

5.12.1.1 Fails, refuses or is unable to enter into a subcontract consistent with the terms and conditions of the subcontractor's offer presented to the contractor; or

5.12.1.2 Becomes insolvent; or

5.12.1.3 Has any license or certification necessary for performance of the work suspended or revoked; or

5.12.1.4 Has defaulted or has otherwise breached the subcontract in connection with the subcontracted work; or

5.12.1.5 Agrees to be substituted by providing a written release; or

5.12.1.6 Is unable or refuses to comply with other requirements of law applicable to contractors, subcontractors, and public works projects.

5.12.2 Notice of Replacing Subcontractor - The Contractor shall provide a written notice to the Contracting Officer when it replaces a subcontractor, including in the notice, the reasons for replacement. The Contractor agrees to defend, hold harmless, and indemnify the State against all claims, liabilities, or damages whatsoever, including attorney's fees, arising out of or related to the replacement of a subcontractor.

5.12.3 Adding Subcontractors - The Contractor may enter into a subcontract with a subcontractor that is not listed in the offer form only after this contract becomes enforceable.

5.12.4 Subcontracting - Contractor shall perform with its own organization, work amounting to not less than twenty (20%) of the total contract cost, exclusive of costs for materials and equipment the Contractor purchases for installation by its subcontractors, except that any items designated by the State in the contract as "specialty items" may be performed by a subcontract and the cost of any such specialty items so performed by the subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the Contractor with its own organization."

T. Under ARTICLE 6 - CONTROL OF MATERIALS AND EQUIPMENT, Modify Section 6.3 SUBSTITUTION OF MATERIALS AND EQUIPMENT AFTER BID OPENINGS, by renaming section 6.3 SUBSTITUTION AFTER CONTRACT AWARD and by deleting subsections 6.3.1 through 6.3.3 and related paragraphs, and substitute the following two new subsections 6.3.1 and 6.3.2 and related paragraphs:

"**6.3.1** Materials, equipment, articles and systems noted on the drawings and specifications, establish a standard of quality, function, performance or design requirements and shall not be interpreted to limit competition. Should trade names, makes, catalog numbers or brand names be specified, the contractor shall infer that these items indicate the quality, style, appearance or performance of the material, equipment, article, or systems to be used in the project. The contractor is responsible to use materials, equipment, articles or systems that meet the project requirements. Unless specifically provided otherwise in the contract documents, the contractor may, at its option, use any material, equipment, article or system that, in the judgment of the Contracting Officer, is equal to that required by the contract documents.

6.3.1.1 If after installing a material, equipment, article or system a variance is discovered, the contractor shall immediately replace the material, equipment, article or system with one that meets the requirements of the contract documents.

6.3.2 Substitution After Contract Award - Subject to the Contracting Officer's determination; material, equipment, article or system with a variant feature(s) may be allowed as a substitution, provided it is in the State's best interest. The State may deny a substitution; and if a substitution is denied, the contractor is not entitled to any additional compensation or time extension.

6.3.2.1 The Contractor shall include with the submittal, a notification that identifies all deviations or variances from the contract documents. The notice shall be in a written form separate from the submittal. The variances shall be clearly shown on the shop drawing, descriptive sheet, and material sample or color sample; and the Contractor shall certify that the substitution has no other variant features. Failures to identify the variances are grounds to reject the related work or materials, notwithstanding that the Contracting Officer accepted the submittal. If the variances are not acceptable to the Contracting Officer, the contractor will be required to furnish the item as specified on the contract documents at no additional cost or time.

6.3.2.2 Acceptance of a variance shall not justify a contract price or time adjustment unless the Contractor requests an adjustment at the time of submittal and the adjustments are explicitly agreed to in writing by the Contracting Officer. Any request shall include price details and proposed scheduling modifications. Acceptance of a variance is subject to all contract terms, and is without prejudice to all rights under the surety bond.

6.3.2.3 The Contractor can recommend improvements to the project, for materials, equipment, articles, or systems by means of a substitution request, even if the improvements are at an additional cost. The Contracting Officer shall make the final determination to accept or reject theContractor's proposed improvements. If the proposed material, equipment, article or system cost less than the specified item, the Department will require a sharing of cost similar to value engineering be implemented. State reserves its right to deny a substitution; and if a substitution is denied, the contractor is not entitled to additional compensation or time extension."

U. Under Article 7 - PROSECUTION AND PROGRESS, modify section 7.2 SCHEDULE OF PRICES by deleting paragraph 7.2.4.1 and substitute the following paragraph 7.2.4.1:

"7.2.4.1. The Contractor shall estimate at the close of each month the percentage of work completed under each of the various construction items during such month and submit the Monthly Payment Application to the Contracting Officer for review and approval. The Contractor shall be paid the approved percentage of the price established for each item less the retention provided in Section 8.4 PROGRESS PAYMENTS."

V. Under Article 7 - PROSECUTION AND PROGRESS, add the following paragraph 7.2.4A:

"**7.2.4A Subcontracts.** Upon award of a contract and prior to starting any construction work, the Contractor shall submit to the Contracting Officer a list of all subcontractors and the actual subcontracted dollar amount for each of its subcontractors regardless of the amount of the subcontract. See section 7.39 – Employment of State Residents Requirements."

W. Under ARTICLE 7 – PROSECUTION AND PROGRESS, modify section 7.2.5 PROOF OF INSURANCE COVERAGE, by deleting subsection 7.2.5 and substitute the following:

"**7.2.5 Proof of Insurance Coverage** - Certificate of Insurance or other documentary evidence satisfactory to the Contracting Officer that the Contractor has in place all insurance coverage required by the contract. The Certificate of Insurance shall contain wording which identifies the Project number and Project title for which the certificate of insurance is issued. Refer to Section 7.3 INSURANCE REQUIREMENTS."

X. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.7 PREVAILING WAGES, by deleting subsection 7.7.4.

Y. Under Article 7 – PROSECUTION AND PROGRESS, add the following section 7.9A – APPRENTICESHIP AGREEMENT CERTIFICATION

"7.9A APPRENTICESHIP AGREEMENT CERTIFICATION (HRS §103-55.6)

7.9A.1 For the duration of a contract awarded and executed utilizing the apprenticeship agreement preference the Contractor shall certify, for each month that work is being conducted on the project, that it continues to be a participant in the relevant registered apprenticeship program for each trade it employs.

7.9A.2 Monthly certification shall be made by completing the *Monthly Report of Contractor's Participation - Form 2* made available by the State Department of Labor and Industrial Relations, the original to be signed by the respective apprenticeship program sponsors authorized official, and submitted by the Contractor to the Engineer with its monthly payment requests. The *Monthly Report of Contractor's Participation - Form 2* available on the DLIR website at: http://labor.hawaii.gov/wdd/files/2012/12/Form-2-Monthly-Report-of-Contractors-Participation.pdf.

7.9A.3 Should the Contractor fail or refuse to submit its Monthly *Report of Contractor's Participation – Form 2*, or at any time during the duration of the contract, cease to be a party to a registered apprenticeship agreement for any of the apprenticeable trades the Contractor employs, or will employ, the Contractor will be subject to the following sanctions:

7.9A.3.1 Withholding of the requested payment until all of the required *Monthly report of Contractor's Participation – Form 2s* are properly completed and submitted.

7.9A.3.2 Temporary or permanent cessation of work on the project, without recourse to breach of contract claims by the Contractor; provided the Department shall be entitled to restitution for nonperformance or liquidated damages claims; or

7.9A.3.3 Proceedings to debar or suspend pursuant to HRS §103D-702.

7.9A.4 If events such as "acts of God," acts of a public enemy, acts of the State or any other governmental body in its sovereign or contractual capacity, fires, floods, epidemics, freight embargoes, unusually severe weather, or strikes or other labor disputes prevent the Contractor from submitting the *Monthly Report of Contractor's Participation – Form 2*, the Contractor shall not be penalized as provided herein, provided the Contractor completely and expeditiously complies with the certification process when the event is over."

Z. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.10 OVERTIME AND NIGHT WORK, by deleting subsection 7.10.2 and substitute the following:

"**7.10.2** Contractor shall notify the Contracting Officer two working days prior to doing overtime and night work, to insure proper inspection will be available. The notification shall address the specific work to be done. A notification is not required when overtime work and night work are included as normal working hours in the contract and in the contractor's construction schedule."

AA. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.11 - OVERTIME AND NIGHT PAYMENT FOR STATE INSPECTION SERVICES, by adding new subsection 7.11.1 and renumbering the existing subsections 7.11.1, 7.11.1.1, 7.11.1.2, 7.11.1.3 and 7.11.2 to read 7.11.2, 7.11.2.1, 7.11.2.2, 7.11.2.3 and 7.11.3 respectively. Change subsection reference number (7.11.1) in subsection 7.11.3 - Payment for Inspection Services to read 7.11.2:

"**7.11.1** The Department is responsible for overtime or night time payments for Department's inspection services, including Department's Inspector, State staff personnel and the Department's Consultant(s) engaged on the project, when overtime and night work are included as normal working hours in the contract and in the contractor's construction schedule."

BB. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.25 - DISPUTES AND CLAIMS, by deleting subsection 7.25.10 and paragraph 7.25.10.1 and substitute the following:

"**7.25.10 Decision on Claim or Appeal** - The Contracting Officer shall decide all controversies between the State and the Contractor which arise under, or are by virtue of, this contract and which are not resolved by mutual agreement. The decision of the Contracting Officer on the claim shall be final and conclusive, unless fraudulent or unless the contractor delivers to the Comptroller a written appeal of the Contracting Officer's decision no later than 30 days after the date of the Contracting Officer's decision. The Comptroller's decision shall be final and conclusive, unless fraudulent or unless the Contractor brings an action seeking judicial review of the Comptroller's decision in an appropriate circuit court of this State within six months from the date of the Comptroller's decision.

7.25.10.1 If the contractor delivers a written request for a final decision concerning the controversy, the Comptroller shall issue a final decision within 90 days after receipt of such a request; provided that if the Comptroller does not issue a written decision within 90 days, or within such longer period as may be agreed upon by the parties, then the contractor may proceed as if an adverse decision had been received. Both parties to this contract agree that the period of up to 30 days to appeal the Contracting Officer's decision to the Comptroller shall not be included in the 90 day period to issue a final decision."

CC. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.25 - DISPUTES AND CLAIMS, by deleting subsection 7.25.13 Waiver of Attorney's Fees.

DD. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.31 - SUBSTANTIAL COMPLETION, AND FINAL INSPECTION, by deleting paragraph 7.31.2.1 and substitute the following:

"7.31.2.1 The Contracting Officer shall confirm the list of deficiencies noted by the contractor's punchlist(s) and will notify the contractor of any other deficiencies that must be corrected."

EE. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.32 - PROJECT ACCEPTANCE DATE, by adding new paragraph 7.32.4.1 as follows:

"7.32.4.1 Punchlist corrective work shall be completed prior to Contract Completion Date, or extension thereof."

FF. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.32 - PROJECT ACCEPTANCE DATE, by deleting subsection 7.32.7 and substitute the following:

"**7.32.7** If the contractor fails to correct the deficiencies within the time established in paragraph 7.32.4.1, the Contracting Officer shall assess liquidated damages as required by section 7.26 - FAILURE TO COMPLETE THE WORK ON TIME."

GG. Under ARTICLE 7 - PROSECUTION AND PROGRESS, add new section 7.39 as follows:

"**7.39 EMPLOYMENT OF STATE RESIDENTS REQUIREMENTS HRS 103B**

7.39.1 A Contractor awarded a contract shall ensure that Hawaii residents comprise not less than 80% of the workforce employed to perform the contract. The 80% requirement shall be determined by dividing the total number of hours worked on the contract by Hawaii residents, by the total number of hours worked on the contract by all employees of the contractor in the performance of the contract. The hours worked by any subcontractor of the Contractor shall count towards the calculation for purposes of this section. The hours worked by employees within shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

7.39.2 The requirements of this section shall apply to any subcontract of $50,000 or more in connection with the Contractor, that is, such subcontractors must also ensure that Hawaii residents comprise not less than 80% of the subcontractor's workforce used to perform the subcontract. See also, section 7.2 - Commencement Requirements.

7.39.3 The Contractor, and any subcontractor whose subcontract is $50,000 or more, shall comply with the requirements of this section.

7.39.3.1 Certification of compliance shall be made in writing under oath by an officer of the Contractor and applicable subcontractors and submitted with the final payment request.

7.39.3.2 The certification of compliance shall be made under oath by an officer of the company by completing a Certification of Compliance for Employment of State Residents form and executing the Certificate before a licensed notary public. See attached form at the end of Section 00700 – General Conditions.

7.39.3.3 In addition to the certification of compliance as indicated above, the Contractor and any subcontractors shall maintain records such as certified payrolls for laborers and mechanics who performed work at the site and timesheets for all other employees who performed work on the project. These records shall include the names, addresses and number of hours worked on the project by all employees of the Contractor and subcontractors who performed work on the project to validate compliance with this section. The Contractor and Subcontractors shall maintain, retain, and provide access to these records in accordance with Section 7.38 – RECORDS MAINTENANCE, RETENTION AND ACCESS, except that these provisions shall apply to all contracts, regardless of the value of the contract.

7.39.4 A Contractor or applicable subcontractor who fails to comply with this section shall be subject to any of the following sanctions:

7.39.4.1 With respect to the General Contactor, withholding of payment on the contract until the Contractor or its subcontractor complies with this section; or

7.39.4.2 Proceedings for debarment or suspension of the Contractor or subcontractor under Hawaii Revised Statues §103D-702.

7.39.5 Conflict with Federal Law - This section shall not apply if the application of this section is in conflict with any federal law, or if the application of this section will disqualify the State from receiving Federal funds or aid. See Section 00800 - Special Conditionsto determine if this section does not apply."

HH. Under ARTICLE 8 – MEASUREMENT AND PAYMENT, Section 8.3 PAYMENT FOR ADDITIONAL WORK, modify clause 8.3.4.5(h) by changing the replacement value from 'five hundred dollars ($500)' to read "$1,000."

II. Under ARTICLE 8 - MEASUREMENT AND PAYMENT, Modify section 8.3 PAYMENT FOR ADDITIONAL WORK, by deleting subsection 8.3.1 and substitute the following new subsections and paragraph:

"**8.3.1 Payment for Changed Conditions** - A contract modification or change order complying with section 4.4 PRICE ADJUSTMENT and section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT shall be issued for all changes that are directed under Section 4.2 CHANGES. No payment for any change including work performed under the force account provisions will be made until a change order is issued or contract modification is executed.

8.3.1.1 At the completion of the force account work or at an intermediate interval approved by the Contracting Officer, the contractor shall submit its force account cost proposal, including; approved daily force account records with any attached invoices or receipt, to the Department for processing a contract modification or change order."

JJ. Under Article 8 - MEASUREMENT AND PAYMENT, modify section 8.4 PROGRESS AND/OR PARTIAL PAYMENTS, by deleting section and related subsections 8.4.1 thru 8.4.4.4 and substitute the following new section 8.4 and related subsections 8.4.1 thru 8.4.4.4:

"8.4 PROGRESS PAYMENTS

8.4.1 Progress Payments - The Contractor will be allowed progress payments on a monthly basis upon preparing the Monthly Payment Application forms and submitting them to the Contracting Officer. The monthly payment shall be based on the items of work satisfactorily completed and the value thereof at unit prices and/or lump sum prices set forth in the contract as determined by the Contracting Officer and will be subject to compliance with Section 7.9 PAYROLLS AND PAYROLL RECORDS.

8.4.2 In the event the Contractor or any Subcontractor fails to submit certified copies of payrolls in accordance with the requirements of Section 7.9 PAYROLLS AND PAYROLL RECORDS, the Contracting Officer may retain the amount due for items of work for which payroll affidavits have not been submitted on a timely basis notwithstanding satisfactory completion of the work until such records have been duly

submitted. The Contractor shall not be due any interest payment for any amount thus withheld.

8.4.3 Payment for Materials - The Contractor will also be allowed payments of the manufacturer's, supplier's, distributor's or fabricator's invoice cost of accepted materials to be incorporated in the work on the following conditions:

8.4.3.1 The materials are delivered and properly stored at the site of Work; or

8.4.3.2 For special items of materials accepted by the Contracting Officer, the materials are delivered to the Contractor or subcontractor(s) and properly stored in an acceptable location within a reasonable distance to the site of Work.

8.4.4 Payments shall be made only if the Contracting Officer finds that:

8.4.4.1 The Contractor has submitted bills of sale for the materials or otherwise demonstrates clear title to such materials.

8.4.4.2 The materials are insured for their full replacement value to the benefit of the Department against theft, fire, damages incurred in transportation to the site, and other hazards.

8.4.4.3 The materials are not subject to deterioration.

8.4.4.4 In case of materials stored off the project site, the materials are not commingled with other materials not to be incorporated into the project."

KK. Under ARTICLE 8 - MEASUREMENT AND PAYMENT, Modify section 8.5 PROMPT PAYMENT, by deleting section 8.5 and related subsections 8.5.1 thru 8.5.6 and substitute the following new section 8.5 and related subsections 8.5.1 thru 8.5.9:

"8.5.1 Any money paid to a Contractor for work performed by a subcontractor shall be disbursed to such subcontractor within ten (10) days after receipt of the money in accordance with the terms of the subcontract; provided that the subcontractor has met all the terms and conditions of the subcontract and there are no bona fide disputes on which the Contracting Officer has withheld payment.

8.5.2 Upon final payment to the Contractor, full payment to all subcontractors shall be made within ten (10) days after receipt of the money, provided there are no bona fide disputes over the subcontractor's performance under the subcontract.

8.5.3 All sums retained or withheld from a subcontractor and otherwise due to the subcontractor for satisfactory performance under the subcontract shall be paid by the contracting officer to the contractor and subsequently, upon receipt from the contracting officer, by the contractor to the subcontractor within the applicable time periods specified in subsection 8.5.2 and section 103-10 HRS:

8.5.3.1 Where a subcontractor has provided evidence to the contractor of satisfactorily completing all work under their subcontract and has provided a properly documented final payment request as described in subsection (8.5.5) of this section, and:

8.5.3.1.a Has provided to the contractor an acceptable performance and payment bond for the project executed by a surety company authorized to do business in the State, as provided in section 8.6 RETAINAGE; or

8.5.3.1.b The following has occurred:

8.5.3.1.b.1 A period of ninety days after the day on which the last of the labor was done or performed and the last of the material was furnished or supplied has elapsed without written notice of a claim given to contractor and the surety, as provided for in section 103D-324 HRS; and

8.5.3.1.b.2 The subcontractor has provided to the contractor:

8.5.3.1.b.2.1 An acceptable release of retainage bond, executed by a surety company authorized to do business in the State, in an amount of not more than two times the amount being retained or withheld by the contractor;

8.5.3.1.b.2.2 Any other bond acceptable to the contractor; or

8.5.3.1.b.2.3 Any other form of mutually acceptable collateral.

8.5.4 If the contracting officer or the contractor fails to pay in accordance with this section, a penalty of one and one-half per cent per month shall be imposed upon the outstanding amounts due that were not timely paid by the responsible party. The penalty may be withheld from future payment due to the contractor, if the contractor was the responsible party. If a contractor has violated subsection 8.5.2 three or more times within two years of the first violation, the contractor shall be referred by the contracting officer to the contractor license board for action under section 444-17(14) HRS.

8.5.5 Final Payment Request. A properly documented final payment request from a subcontractor, as required by subsection 8.5.3, shall include:

8.5.5.1 Substantiation of the amounts requested;

8.5.5.2 A certification by the subcontractor, to the best of the subcontractor's knowledge and belief, that:

8.5.5.2.a The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the subcontract;

8.5.5.2.b The subcontractor has made payments due to its subcontractors and suppliers from previous payments received under the subcontract and will make timely payments from the proceeds of the payment covered by the certification, in accordance with their subcontract agreements and the requirements of this section; and

8.5.5.2.c The payment request does not include any amounts that the subcontractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of their subcontract; and

8.5.5.2.d The submission of documentation confirming that all other terms and conditions required under the subcontract agreement have been fully satisfied.

8.5.6 The contracting officer shall return any final payment request that is defective to the contractor within seven days after receipt, with a statement identifying the defect.

8.5.7 A payment request made by a contractor to the Contracting Officer that includes a request for sums that were withheld or retained from a subcontractor and are due to a subcontractor may not be approved under subsection 8.5.3 unless the payment request includes:

8.5.7.1 Substantiation of the amounts requested; and

8.5.7.2 A certification by the contractor, to the best of the contractor's knowledge and belief, that:

8.5.7.2.a The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

8.5.7.2.b The subcontractor has made payments due to its subcontractors and suppliers from previous payments received under the contract and will make timely payments from the proceeds of the payment covered by the certification, in accordance with their subcontract agreements and the requirements of this section; and

8.5.7.2.c The payment request does not include any amounts that the contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of their subcontract.

8.5.8 This section shall not be construed to impair the right of a contractor or a subcontractor at any tier to negotiate and to include in their respective subcontracts provisions that provide for additional terms and conditions that are requested to be met before the subcontractor shall be entitled to receive final payment under subsection 8.5.3 of this section; provided that any such payments withheld shall be withheld by the contracting officer."

LL. Under ARTICLE 8 - MEASUREMENT AND PAYMENT, modify section 8.6 RETAINAGE, by deleting section 8.6 and related subsections 8.6.1 thru 8.6.3 and substituting the following new section 8.6 and related subsections:

"8.6 RETAINAGE - The Department will retain a portion of the amount due under the contract to the contractor, to ensure the proper performance of the contract.

8.6.1 The sum withheld by the Department from the contractor shall not exceed five per cent of the total amount due the contractor and that after fifty per cent of the contract is completed and progress is satisfactory, no additional sum shall be

withheld; provided further that if progress is not satisfactory, the contracting officer may continue to withhold as retainage, sums not exceeding five per cent of the amount due the contractor

8.6.2 The retainage shall not include sums deducted as liquidated damages from moneys due or that may become due the contractor under the contract.

8.6.3 General Obligation Bonds - The contractor may withdraw retainage monies in whole or in part by providing a general obligation bond of the State or its political subdivisions suitable to the Department. The contractor shall endorse over to the Department and deposit with the Department any general obligation bond suitable to the Department, but in no case with a face value less than the value established by law, of the amount to be withdrawn. The Department may sell the bond and use the proceeds in the same way as it may use monies directly retained from progress payments or the final payment.

8.6.4 Any retainage provided for in this section or requested to be withheld by the contractor shall be held by the contracting officer.

8.6.5 A dispute between a contractor and subcontractor of any tier shall not constitute a dispute to which the State or any county is a party, and there is no right of action against the State or any county. The State and a county may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

8.6.6 The retention amount withheld by the contractor from its subcontractor shall be not more than the same percentage of retainage as that of the contractor (also applies to subcontractors who subcontract work to other subcontractors) where a subcontractor has provided evidence to the contractor of:

8.6.6.1 A valid performance and a payment bond for the project that is acceptable to the contractor and executed by a surety company authorized to do business in this State;

8.6.6.2 Any other bond acceptable to the contractor; or

8.6.6.3 Any other form of collateral acceptable to the contractor.

8.6.7 A written notice of any withholding shall be issued to a subcontractor, with a copy to the procurement officer, specifying the following:

8.6.7.1 The amount to be withheld;

8.6.7.2 The specific causes for the withholding under the terms of the subcontract; and

8.6.7.3 The remedial actions to be taken by the subcontractor to receive payment of the amounts withheld.

8.6.8 The provisions of this section shall not be construed to require payment to subcontractors of retainage released to a contractor pursuant to an agreement entered into with the contracting officer meeting the requirements of subsection 8.6.3."

MM. Under Article 8 – MEASUREMENT AND PAYMENT, modify section 8.7 WARRANTY OF CLEAR TITLE, by deleting section and substitute the following new section 8.7:

"8.7 WARRANTY OF CLEAR TITLE - The Contractor warrants and guarantees that all work and materials covered by progress payments made thereon shall be free and clear of all liens, claims, security interests or encumbrances, and shall become the sole property of the Department. This provision shall not, however, be construed as an acceptance of the work nor shall it be construed as relieving the Contractor from the sole responsibility for all materials and work upon which payments have been made or the restoration of any damaged work, or as waiving the right of the Department to require the fulfillment of all the items of the contract."

NN. Under Article 8 – MEASUREMENT AND PAYMENT, modify section 8.8 – FINAL PAYMENT, by deleting subsection 8.8.1 and substitute the following new subsection 8.8.1:

8.8.1 Upon final settlement, the final payment amount, less all previous payments and less any sums that may have been deducted in accordance with the provisions of the contract, will be paid to the contractor, provided the contractor has submitted the following documents with the request for final payment: a) a current "Certificate of Vendor Compliance" issued by the Hawaii Compliance Express (HCE); and b) an originally notarized Certificate of Compliance for Employment of State Residents signed under oath by an officer of the Contractor and applicable subcontractors pursuant to chapter 103B HRS. The Certificate of Vendor Compliance is used to certify the Contractor's compliance with: a) Section 103D-328, HRS (for all contracts $25,000 or more) which requires a current tax clearance certificate issued by the Hawaii State Department of Taxation and the Internal Revenue Service; b) Chapters 383, 386, 392, and 393, HRS; and c) Subsection 103D-310(c), HRS. The State reserves the right to verify that compliance is current prior to the issuance of final payment. Contractors are advised that non-compliance status will result in final payment being withheld until compliance is attained.

OO. Under Article 8 – MEASUREMENT AND PAYMENT, modify section 8.9 – CLAIMS ARISING OUT OF PAYMENT FOR REQUIRED WORK, by deleting section and substitute the following new section 8.9:

"8.9 CLAIMS ARISING OUT OF PAYMENT FOR REQUIRED WORK - If the Contractor disputes any determination made by the Contracting Officer regarding the amount of work satisfactorily completed, or the value thereof, or the manner in which payment therefore is made or calculated, it shall notify the Contracting Officer in writing of the specific facts supporting the Contractor's position. Such notice shall be delivered to the Contracting Officer no later than thirty (30) days after the Contractor has been tendered payment for the subject work, or, if no payment has been tendered, not later than fifty (50) days after it has submitted the Monthly Payment Application required under Section 8.4 PROGRESS PAYMENTS herein to the Contracting Officer for the work that is the subject of the dispute. The delivery of the written notice cannot be waived and shall be a condition precedent to the filing of the claim. No claim for

additional compensation for extra work or change work shall be allowed under this provision, unless the notice requirements of Article 4 SCOPE OF WORK have been followed. Acceptance of partial payment of a Monthly Payment Application amount shall not be deemed a waiver of the right to make a claim described herein provided the notice provisions are followed. The existence of or filing of a payment claim herein shall not relieve the Contractor of its duty to continue with the performance of the contract in full compliance with the directions of the Contracting Officer. Any notice of claim disputing the final payment made pursuant to Section 8.8 FINAL PAYMENT must be submitted in writing not later than thirty (30) days after final payment that is identified as such has been tendered to the Contractor."

PP. Add the attached Certification of Compliance for Employment of State Residents form to the Appendix.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

Attachment 1

CERTIFICATION OF COMPLIANCE
FOR
EMPLOYMENT OF STATE RESIDENTS
HRS 103B

Project Title: _____

Agency Project No: _____

Contract No.: _____

As required by Hawaii Revised Statutes 103B – Employment of State Residents on Construction Procurement Contracts, I hereby certify under oath, that I am an officer of _____ and for the Project Contract indicated
(Name of Contractor or Subcontractor Company)
above, _____ was in compliance with
(Name of Contractor or Subcontractor Company)
HRS 103B by employing a workforce of which not less than eighty percent are Hawaii residents, as calculated according to the formula in the solicitation, to perform this Contract.

☐ I am an officer of the **Contractor** for this contract.

☐ I am an officer of a **Subcontractor** to this contract.

CORPORATE SEAL

_____
(Name of Company)

_____
(Signature)

_____
(Print Name)

_____
(Print Title)

Subscribed and sworn to me before this
_____ day of _____, 2010.

_____
Notary Public, 1st Circuit, State of Hawaii
My commission expires: _____

Doc. Date: _____ # of Pages ___ 1st Circuit
Notary Name: _____
Doc. Description: _____
_____
_____

_____
Notary Signature Date
NOTARY CERTIFICATION

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01100 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Contract description.

B. Contract use of premises.

C. WEST HAWAII FACILITIES DIRECTOR (WHFD) AND/OR PROJECT MANAGER furnished/WHFD AND/OR PROJECT MANAGER installed products.

D. WHFD AND/OR PROJECT MANAGER furnished/contractor installed products.

E. Hospital occupancy.

1.02 RELATED SECTIONS

A. Section 01260 – Contract Considerations.

B. Section 01732 – Cutting and Patching.

1.03 CONTRACT DESCRIPTION

A. The project involves the renovation of the Former Maintenance Space and adjacent spaces to a new Clinical Laboratory. Also included are miscellaneous alterations, repairs and/or improvements to adjacent spaces such as the Electric Room and Corridor, Nuclear Medicine, etc.

B. The Work of the contract generally includes, but is not limited to the following:

1. Renovation of the new Clinical Laboratory (old Maintenance Space):

a. Selective demolition of interior and exterior components.

b. Sawcutting, trenching, and patching of concrete floors.

c. Alteration of associated HVAC, electrical, communications, lighting, plumbing and fire sprinkler systems.

d. Replacement of exterior louvers and providing air intake plenums.

e. Removing an exterior louver and infilling the wall penetration.

f. Adding fire dampers for all duct penetrations through fire rated walls.

g. Firestopping all new and/or existing penetrations through fire rated walls.

h. Replacing non-rated doors with rated doors at fire rated walls.

i. New partitions, doors, acoustical ceiling tiles, gyp board ceiling, flooring, wall protection, paint, lighting, AC supply/registers, fire sprinklers, plumbing stub outs, and electrical work.

2. Miscellaneous Alterations:

a. Selective demolition and repairs of the adjacent spaces interior affected by the work.

b. Temporary removal and replacement of existing elements (such as, finishes, materials, devices, items, equipment, casework, ceiling, etc.) in the adjacent spaces affected by the work.

1.04 CONTRACTOR USE OF PREMISES

A. Limit the use of premises to allow for continued Hospital occupancy.

B. Emergency Building Exits During Construction: Must remain open and unblocked at all times. Maintain access for staff, patients, and public. Egress must be maintained and way finding signage during construction.

C. Construction Operations: Limited to areas noted on Drawings.

D. Staging and Parking

1. Staging area and limited contractor employee parking will be made available on site. Contractor and vendor parking is designated. Any new parking arrangements require prior approval by the WHFD AND/OR PROJECT MANAGER.

E. Time Restrictions for Performing Work:

1. See Request for Proposal and coordinate w/ WHFD AND/OR PROJECT MANAGER. Submit written notice a minimum three days in advance to confirm working hours. Any work performed outside of the normal working hours shall be pre-approved by the WHFD and/or Project Manager.

F. Cooperate with Hospital to minimize conflict and to facilitate Hospital's operations. Coordinate operations with WHFD AND/OR PROJECT MANAGER.

G. Access to adjacent floors must be approved in advance by the WHFD AND/OR PROJECT MANAGER. Submit written notice not less than seven days in advance of intended work on adjacent floors.

H. Do not close or obstruct roadways without first consulting with the WHFD AND/OR PROJECT MANAGER. Conduct operations with minimum interference to public or private roadways.

I. Maintain vital services (as defined by the WHFD AND/OR PROJECT MANAGER) with the minimum of interruption. Outages and interruptions must be approved in advance by the WHFD AND/OR PROJECT MANAGER. Submit written notices of outages and interruptions not less than seven days in advance.

J. Contractor's personnel:

1. It is preferred that contractors park off site and carpool to hospital.
2. Contractor's personnel may use the hospital cafeteria.
3. Smoking is not permitted anywhere on KCH property. Consumption of food and beverages will not be permitted on the premises except in designated areas.
4. Playing of radios will not be permitted.
5. Shall be properly attired for work. (No tank tops, cut-off jeans, slippers, etc.)
6. Shall conduct themselves with decorum and courtesy toward staff, patients, and public.
7. Shall not use loud and offensive language.
8. Shall read and sign the Contractor's Guidelines Handbook.

K. Construction Zone Accessibility Requirements

1. General: Hawaii Revised Statutes (HRS) 103-05 requires this project to conform to the requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAG).
2. Ensure accessible routes to emergency entrances and exits to and from accessible parking public pedestrian routes during the construction period as required by ADAAG 4.1.1(4).
3. Temporary buildings and facilities that are not of permanent construction but

are extensively used or are essential for public use for a period of time shall be accessible. Egress must be maintained and way finding signage during construction.

4. Provide temporary safe pedestrian passageway around a construction site.

    a. Areas that are used only as work areas shall be designed and constructed so that individuals with disabilities can approach, enter, and exit the areas.

    b. These guidelines do not require that any areas used only as work areas be constructed to permit maneuvering within the work area or be constructed or equipped (i.e., with racks or shelves) to be accessible.

    c. Follow OSHA guidelines concerning scaffolding and debris and dust protection.

1.05 WHFD AND/OR PROJECT MANAGER FURNISHED/WHFD AND/OR PROJECT MANAGER INSTALLED PRODUCTS

A. Items noted “OFOI” (WHFD AND/OR PROJECT MANAGER Furnished/WHFD AND/OR PROJECT MANAGER Installed) will be furnished and installed by the WHFD AND/OR PROJECT MANAGER, including but not limited to:

1. Select medical equipment as noted on the drawings.
2. Select toilet accessories as noted on the drawings.
3. Movable furniture.

B. Hospital’s Responsibilities:

1. Return Hospital reviewed shop drawings, product, data and samples, to Contractor.
2. If requested by the Contractor, assist the Contractor with inspection of select equipment and/or accessories prior to installation.

C. Contractor’s Responsibilities:

1. Review WHFD AND/OR PROJECT MANAGER’s provided shop drawings, product data, and samples.
2. Provide any necessary utility roughs and backing, and install in accordance with manufacturer’s instructions.

3. Arrange and pay for product delivery to site.
4. Submit claims for transportation damage and replace damaged, defective or deficient items.
5. Arrange for manufacturers' warranties, inspections and service.

1.06 HOSPITAL OCCUPANCY

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

B. The Contractor is to coordinate the work and details within each phase, to minimize disruption to WHFD AND/OR PROJECT MANAGER's operation. Advanced notification of a minimum of one week for disruption due to noise and other construction activity is required as well as posting of signage in advance to advise occupants of such disruption.

C. Provide dust and noise barriers where specified under other portions of the contract documents. Follow ICRA procedures during construction, i.e., ICRA policy is attached. Walk off mats at site entrance shall be changed as needed. HEPA filtration units are to be utilized 24 hours per day throughout the construction process. Complete ISLM check sheet daily.

D. Schedule the Work, and cooperate with Hospital to minimize conflict with work involving dust and noise and odor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01120 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.01 RELATED SECTIONS

A. 01732 – Cutting and Patching.

PART 2 - PRODUCTS

2.01 SALVAGED MATERIALS

A. Salvage sufficient quantities of cut or removed material to replace damaged work of existing construction, when materials not readily obtainable on current market.

B. Incorporate salvaged or used material only as indicated or with permission of the Hospital.

2.02 PRODUCTS FOR PATCHING AND EXTENDING WORK

A. New Materials: Match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that demolition is complete, and areas are ready for installation of new Work.

B. Beginning of restoration Work means acceptance of existing conditions.

3.02 PREPARATION

A. Cut, move or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specific for finished Work.

C. Remove debris and abandoned items from area and from concealed spaces.

D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.

E. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate duct work and piping to prevent condensation in exposed areas.

F. Do not demolish, chip, or penetrate existing structural members without the expressed approval of the Prime Consultant.

G. Perform cutting and removal work to remove minimum necessary, and in a manner to avoid damage to adjacent work and provide proper surfaces to receive installation of repair and new Work.

3.03 INSTALLATION

A. Coordinate work of alterations and renovations to expedite completion and to accommodate Owner occupancy.

B. Project areas and Finishes: Complete in all respects including operational, carpentry, casework, mechanical and electrical work.

C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition as appropriate.

D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.

E. In addition to specified replacement of equipment and fixtures, restore existing plumbing, ventilation, air conditioning, air balancing and electrical systems to full operational condition.

3.04 TRANSITIONS

A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.

B. Cut finish surfaces such as masonry, tile, plaster, or metals by methods to terminate surfaces in a straight line at a natural point of division.

C. When finished surfaces are cut so that a smooth transition with new Work is possible, terminate existing surface along a straight line at a natural line of division. If a straight line cannot be achieved, install a reveal or other joint to create a straight line. Provide trim appropriate to finished surface subject to approval of Hospital's Representative.

3.05 ADJUSTMENTS

A. Where removal of partitions or walls result in adjacent spaces becoming one, rework floors, walls and ceiling to a smooth plane without breaks, steps or bulkheads.

B. Where a change of plane 1/4 inch or more occurs, submit recommendation for providing a smooth transition for the WHFD AND/OR PROJECT MANAGER review.

C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

D. At penetrations of fire-rated wall, ceiling or floor construction, completely seal voids with fire rated, fire resistant material, full thickness of the construction element. All remaining small gaps shall be properly sealed with firestopping.

3.06 REPAIR OF DAMAGED SURFACES

A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

B. Repair substrate prior to patching finish.

3.07 FINISHES

A. Finish surfaces as specified in individual Product Sections.

B. Finish patches to product uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersection with written approval of the WHFD AND/OR PROJECT MANAGER.

3.08 CLEANING

A. In addition to cleaning as specified in this specifications. Wet mop owner-occupied areas daily utilizing hospital's EPA approved disinfectant. Remove and replace soiled walk off (sticky) mats daily.

B. Clean spillage, over-spray, and dust in Owner- occupied areas immediately.

END OF SECTION

SECTION 01230 - ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

B. The description of alternates is not intended to give a detailed description of all additional or deductive work required by the alternate item(s), as only the principal features of such additional or deductive work are listed.

C. Should any one or all of the alternates become a part of the contract, the cost of all additional incidental work required by the alternate item(s), even though not specifically mentioned herein, shall be deemed to already be included in the alternate price amount.

1.02 DEFINITIONS

A. Alternate: An amount proposed by Bidders (Offerors) and stated on the Bid Form for certain work defined herein that may be added to the Total Lump Sum Bid Price amount if State decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost for each alternate is the net addition to the Contract Sum to incorporate the alternate into the Work. No other adjustments are made to the Total Lump Sum Bid Price.

1.03 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into the Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: If the alternate(s) are accepted by the Hospital, immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. Alternate No. 1 Additive: Removal of existing flexible insulation from ducts and replacement with new rigid insulation for all straight ducts and new flexible insulation at all duct joints as depicted on drawing sheets A-113 and A-123.

B. Alternate No. 2 Additive:

1. Repair portions of the ceilings affected by the relocation of the reheat supply and return lines. For gypsum board ceilings, patch, repair and paint. For acoustical ceiling tiles, reinstall. See mechanical drawings.

2. Patch and repair portions of gypsum board walls affected by reheat supply and return line penetrations. Apply sealant around all penetrations and fire stopping at penetrations that occur through fire-rated wall assemblies. See mechanical drawings.

3. Reinstall ceiling mounted devices affected by the relocation of the reheat supply and return lines. See mechanical drawings.

END OF SECTION

SECTION 01260 - CONTRACT CONSIDERATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Schedule of values.

B. Application for payment.

C. Change procedures.

1.02 RELATED SECTIONS

A. Section 01100 – Summary of Work.

B. Section 01290 – Payment Procedures.

C. Section 01310 – Project Management and Coordination.

D. Section 01770 – Closeout Procedures.

1.03 SCHEDULE OF VALUES

A. Submit a printed schedule of AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be acceptable.

B. Submit Schedule of Values in duplicate within 15 days after date of Owner Contractor Agreement.

C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section. Identify site mobilization and bonds and insurance.

D. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

E. Include within each line item, a direct proportional amount of Contractor's overhead and profit.

F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.04 APPLICATIONS FOR PAYMENT

A. Submit each application electronically on AIA Form G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Payment Period: Invoice to be submitted to Hospital Technical Representative for the preceding month's work by the 5th day of the month that follows. (The State of Hawaii does its best to pay within 30 days).

D. Waiver of Liens: Provide unconditional waiver of liens. Use contractor's form.

1.05 CHANGE PROCEDURES

A. The following documents will be used. Sample forms are attached.

B. Request for Information: Standard Contractor form. A request for information shall be used by the Contractor to the Prime Consultant to request solutions to problems which are discovered during construction, to request drawings and cost and/or schedule impacts in the Request for Information.

C. Instruction Notice: Attachment 1, standard form.

1. Instruction Notice will be issued by the Prime Consultant for instructions to the Contractor which do not involve a change in the Contract Sum or construction period.

2. Instruction Notice authorizes the Contractor to proceed at once with the instruction included therein.

3. Instruction Notice which does affect the Contract Sum or construction period must have written authorization by the Owner's Project Manager. Such instruction shall have the note "Change Order to Follow" and then be followed with a Quotation Request, cross referenced to the Field Order.

4. Instruction Notice will be distributed as follows:

   a. Two copies to Contractor

   b. One copy to the Prime Consultant

   c. One copy to each appropriate Consultant

d. One copy to WHFD AND/OR PROJECT MANAGER

D. Quotation Requests: Attachment 2, standard Prime Consultant form.

1. Proposed changes to the Contract will be initiated by the Prime Consultant in the form of a Quotation Request.
2. A Quotation Request, indicating the party suggesting the change, will clearly describe the proposed Contract variation, accompanied by the required drawings, if necessary.
3. Construction work shall not proceed on the strength of a Quotation Request only.
4. Quotation Requests will be distributed as follows:
   a. Two copies to Contractor.
   b. One copy to Prime Consultant
   c. One copy to each appropriate Consultant
   d. One copy to Owner's Project Management
5. The Contractor shall respond to the Quotation Request within the time stated on the form.

E. Change Proposal. Standard Contract Form.

1. This form shall be issued by the Contractor for any claims he may have and in response to a Quotation Request.
2. The Change proposal shall include a description of the work and the requested change to the Contract sum and construction time.
3. All supporting documents, materials and subcontract quotations, time sheets, labor estimates, etc., shall be itemized and attached to the Change Proposal as necessary for proper checking by the Prime Consultant, Consultants and Owner's Project Manager.
4. Change proposals, if acceptable, will be signed by the WHFD AND/OR PROJECT MANAGER and Prime Consultant with one executed copy returned to Contractor. The Contractor shall thus have the authority to proceed with the work and Change Order will follow.

F. Change Order. Attachment 3, standard form.

1. This document is issued to the Contractor as an instruction for him to make a change to the work of the contract Documents.

2. Change Order documents are prepared by the Prime Consultant and countersigned by the Owner and Contractor.

3. Approved Change orders record the following information:

   a. Cross-reference to Change Proposal.

   b. Summarized description of change in work required.

   c. Change in completion date.

   d. Change in Contract sum.

   e. Identification of party/individual initiating change.

G. Record of Variations: Variations in construction from the plans and specifications shall be recorded by the Contractor as required in Division 1. These variations shall be brought to the attention of the Prime Consultant and WHFD ANS/OR PROJECT MANAGER by the Contractor.

H. Timeliness of Processing: Instruction notices, Quotation Requests and Change Proposals will be processed and one copy provided the WHFD AND/OR PROJECT MANAGER the same day the document is prepared.

I. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract Time as provided in the Contract Documents.

J. Maintained detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

OPTIONAL

INSTRUCTION NOTICE

INSTRUCTION NOTICE NO:
DATE: **PROJECT NO:**
PROJECT: Kona Community Hospital
New Clinical Laboratory & Misc. Alterations
CONTRACTOR:

Reference:
☐ **Specifications:**
☐ **Drawings:**
☐ **Other:**

YOU ARE HEREBY DIRECTED TO PROMPTLY EXECUTE THIS INSTRUCTION NOTICE WHICH REPRESENTS THE CONTRACT DOCUMENTS OR ORDERS MINOR CHANGES IN THE WORK.
If you consider that a change in Contract Sum or Contract Time is required, submit your itemized proposal to the Prime Consultant immediately and before proceeding with the work. If your proposal is found to be satisfactory and in proper order, this Instruction Notice will be superseded by a Change Order.

COPIES TO:
☐ **WHFD AND/OR PROJECT MANAGER**
☐ **Contractor**
☐ **Prime Consultant**
☐ **Structural**
☐ **Mechanical**
☐ **Electrical**
☐ **Civil**

☐ **Landscape**
☐ **Others**

Attachment 1
Attachment 2

OPTIONAL

QUOTATION REQUEST

QUOTATION REQUEST NO:
DATE: **PROJECT NO:**
PROJECT: Kona Community Hospital
New Clinical Laboratory & Misc. Alterations
CONTRACTOR:

Submit a fully itemized quotation for the inclusion of the following changes into the contract. This is not a Change Order, a Construction Change Directive, nor an Instruction to proceed with the work herein.

REQUEST ORIGINATED BY:

DATE QUOTATION REQUIRED BY:
COPIES TO:
☐ **WHFD AND/OR PROJECT MANAGER**

☐ **Contractor**
☐ **Others**

Attachment 2
Attachment 3

CHANGE ORDER

CHANGE ORDER NO:
DATE: **PROJECT NO:**
PROJECT: Kona Community Hospital
New Clinical Laboratory & Misc. Alterations
CONTRACTOR:

Original Contract Sum was:
Net changes by previously authorized Change Orders: $
Contract Sum prior to this Change Order was: $
Contract sum will be (increased) (decreased) (unchanged) by this Change Order $
New Contract Sum including this Change Order will be: $
The Contract Time will be (increased) (decreased) (unchanged) by days
The date of Substantial Completion as of the date of this Change Order is:

PRIME CONSULTANT: **WHFD AND/OR PROJECT MANAGER:**
CONTRACTOR:

By:_____ **Date:_____**
Approved by:_____ **Date:_____**
Accepted by:_____ **Date:_____**

SECTION 01270 - VARIABLE QUANTITIES UNIT PRICES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

1.02 DEFINITIONS

A. Unit price is an amount proposed by the Bidder (or Offeror) as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.03 RELATED DOCUMENTS

A. Variations in estimated quantities are governed by this Section, Section 00400 - Bid Proposal Form, the Drawings and the General Requirements.

B. Measurement and payment for unit price items are governed by the General Requirements.

1.04 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, coordination overhead, and profit.

B. List of Unit Prices: A list of unit prices is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

1. The description of Variable Quantities Unit Price items is not intended to give a detailed description of all work required, as only principal features of such work are listed.

2. Detailed descriptions are given in the appropriate Specification Sections or Drawings named in the general description below.

C. Include Variable Quantities Unit Price costs on the Bid Proposal form.

D. All computations of the Variable Quantities Unit Prices shall use the unit prices noted in the Bid Proposal Form. Measurements will be to the nearest estimated

unit quantity. Payment will be made for quantities actually installed at the applicable price, measured by the Offeror, concurred by the WHFD AND/OR PROJECT MANAGER, and acceptably completed.

E. The Variable Quantities Unit Prices are estimated quantities. Where the quantity of a pay item vary more than fifteen percent (15%) above or below the estimated quantity stated in the contract, an adjustment in the contract price shall be made upon demand by either the State or Contractor. The adjustment shall be based upon any increase or decrease in costs due solely to the variation above one hundred fifteen percent (115%) or below eighty-five percent (85%) of the estimated quantity.

F. Do not proceed with work exceeding the estimated quantities written in the Bid/Offer/Proposal Form until receipt of written approval by the WHFD AND/OR PROJECT MANAGER.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 LIST OF VARIABLE QUANTITIES

Unit Price No. 1: Firestopping - Provide firestopping around all penetrations through fire rated walls at the New Clinical Lab.

END OF SECTION

SECTION 01290 - PAYMENT PROCEDURES

PART 1 - PRODUCTS

1.01 GENERAL CONDITIONS

A. As specified in the Request for Proposals and the General Requirements.

1.02 RELATED SELECTIONS

A. Section 01260 - Contract Considerations.

B. Section 01770 – Closeout Procedures.

1.03 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Application for Payment.

1.04 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

    a. Application for Payment forms with continuation sheets.

    b. Submittal schedule.

    c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to the Prime Consultant through the Hospital's Construction Management Representative at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: include the following Project identification on the schedule of

values:

a. Project name and location.

b. Name of Prime Consultant.

c. Prime Consultant's project number.

d. Contractor's name and address.

e. Date if submittal.

2. Arrange schedule of values using AIA Document G703.

3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each items listed:

   a. Related Specification Section or Division.

   b. Description of the Work

   c. Name of subcontractor

   d. Name of manufacturer or fabricator.

   e. Name of supplier.

   f. Change Orders (numbers) that affected value.

   g. Dollar value of the following, as percentage of the Contract Sum to nearest on-hundredth percent, adjusted to total 100 percent.

      i. Labor.

      ii. Materials.

      iii. Equipment.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of two percent of the Contract Sum.

   a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling two percent of the Contract Sum and subcontract amount.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
7. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
8. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
9. Each item in the schedule of values and Application for Payments shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.05 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as approved by the Hospital Construction Project Manager.
    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
B. Payment Application Times: Each progress payment shall be submitted monthly.
C. Payment Application Times: Submit Application for Payment to the Prime Consultant by the 5th day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
D. Application for Payment Forms: Use AIA G702 and Document AIA G703.

E. Application Preparation: Complete every entry on form. Contract number must be on every application for payment. The Prime Consultant will return incomplete applications, including those without the contract number, without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide supporting documentation that verifies amount requested, such as paid invoices and/or photographs. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

G. Transmittal: submit signed Application for Payment to Hospital Construction Project Manager (electronically or by hand delivery). Include waivers of lien and other similar required attachments.

H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

2. When application shows completion of an item, submit conditional final or full waivers.

3. WHFD AND/OR PROJECT MANAGER reserves the right to designate which entities involved in the Work must submit waivers.

4. Waiver forms: Submit executed waivers of lien on forms acceptable to Owner.

I. Waiver of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-contractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. WHFD AND/OR PROJECT MANAGER reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or proceeded by conditional final waivers from every entity involved with performance of the work covered by the application who is lawfully entitled to a lien.
5. Waiver forms: Submit executed waivers of lien forms, acceptable to Owner.

J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Schedule of unit prices.
6. Submittal schedule (preliminary of not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal's consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire Owner's insurance.

K. Application for Payment at Substantial Completion: After Prime Consultant issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for potion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
5. AIA Document G706A, "Contractor's Affidavit of Releases of Liens".
6. AIA Document G707, "Consent of Surety to Final Payment".
7. Evidence that claims have been settled.
8. Final liquidated damages settlement statement.
9. Alternate forms may be utilized with approval from the WHFD AND/OR PROJECT MANAGER & Contracts Manager

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. General Coordination procedures.

B. Coordination drawings.

C. Requests for information (RFI's).

D. Project Web site.

E. Project Meetings.

1.02 RELATED SECTIONS

A. Section 01260 - Contract Considerations.

B. Section 01330 - Submittal Procedures.

C. Section 01770 – Closeout Procedures.

1.03 DEFINITIONS

A. RFI: (Request for Information), the Prime Consultant for seeking information required by or clarifications of the Contract Documents.

1.04 INFORMATION SUBMITTALS

A. Subcontract List: Prepare a written summary (provided in the Bid Proposal Form) identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Included the following information in tabular form:

1. Name, address and telephone number of each company performing subcontract or supplying products.

2. The particular work to be performed by subcontractor.

B. Key personnel Names: Within 7 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office

and cellular telephone numbers and e-mail addresses. Provide names, addresses and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office and by each temporary telephone. Keep list current at all times.

1.05 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operations.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors of coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and (activities of other contractors) to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation of conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designed as Owner's property.

1.06 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

    a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.

    b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contracts in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.

    c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.

    d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.

    e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.

    f. Indicate required installation sequences.

    g. Indicate dimensions and show on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Prime Consultant indicating proposed resolution of such conflicts. Minor dimensions changes and difficulty installations will not be considered changes to the Contract.

B. Coordinating Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements and mechanical, plumbing, fire-protection, fire-alarm and electrical work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.

2. Plenum Space: indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment, and related work. Locate components

within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas conflict between light fixtures and other components. All work to be seismically anchored utilizing TOLCO system.

3. Mechanical rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges and support systems. All work to be seismically anchored using TOLCO system.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire –rated enclosures around ductwork.
7. Electrical Work: Show the following:
    a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:

a. Locations of standpipes, main piping, branch lines, pipe drops and sprinkler heads.

9. Review: Prime Consultant will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Prime Consultant determines that coordination drawings are not being prepared in sufficient scope or details, or are otherwise deficient, Prime Consultant will so inform Contractor, who shall make changes as direct and resubmit.

10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements on Section 013300 - Submittal Procedures.

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.

2. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.

3. Prime Consultant will furnish Contractor one set of digital data files of Drawings for use in preparing coordinated digital data files.

a. Digital Data Software Program: Drawings are available in AutoCAD 2010.

b. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to WHFD AND/OR PROJECT MANAGER and Prime Consultant, if required by either party.

1.07 REQUESTS FOR INFORMATION (RFI'S)

A. General: Immediately of discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified to WHFD AND/OR PROJECT MANAGER.

1. All RFIs must be submitted directly by the Contractor of record. Prime Consultant will return RFI submitted to Prime Consultant by other entities controlled by Contractor with no response.

2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in

Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Project Engineer.
6. RFI number; number sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, description, measures, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    a. Include dimensions, thickness, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
14. Response turnaround time needed.

C. RFI Forms: Contractor's form

1. Attachment shall be electronic files preferably in Adobe Acrobat PDF format.

D. Project Prime Consultant's Action: Project Prime Consultant will review each RFI, determine action required and respond within requested response time, typically 3 working days unless quicker response is needed as to not delay the project.

1. The following Contract-generated RFIs will be returned without action:
    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's mean and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustment in the Contract Time or Contract Sum.
    f. Requests for interpretation of Prime Consultant's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.
2. The Prime Consultant's action may include a request for additional information, in which case the time for response will date from time of receipt of additional information.
3. The Project Prime Consultant's action on RFIs that may result in a change to the Contract Time or the Contract sum may be eligible for Contractor to submit Change Proposal according to Section 01260 - Contract Considerations.
    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify the WHFD AND/OR PROJECT MANAGER in writing within 3 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly to Prime Consultant.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Project Prime Consultant.
4. RFI numbering including RFIs that were returned without action or withdrawn.

5. RFI description.

6. Date when the RFI was submitted.

7. Date when the Prime Consultant's response was received.

1.08 PROJECT MEETINGS

A. General: When applicable, schedule and conduct meetings at the Project site and other meetings to occur by teleconference and/or video conference (collectively referred to as "meetings").

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify WHFD AND/OR PROJECT MANAGER and Prime Consultant of scheduled meeting dates and times. It is preferred that a standing meeting day/time is planned at the commencement of the project.

2. Agenda: Contractor shall prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Sign in Sheet: Furnish and supply a copy of completed sheet to KCH.

4. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to all meeting attendees within five business days of the meeting.

B. Preconstruction Conference: the WHFD AND/OR PROJECT MANAGER will schedule and conduct a preconstruction conference before starting construction, at a time convenient to the Hospital, Contractor, and Prime Consultant, but no later than 15 days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.

2. Attendees: Authorized representatives of WHFD AND/OR PROJECT MANAGER, the Prime Consultant and their consultants; Contractor and its superintendent; major subcontractors; suppliers and other concerned parties. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items if significance that could affect progress, including the

following:

a. Tentative construction schedule.

b. Critical work sequencing and long-lead items.

c. Designation of key personnel and their duties.

d. Lines if communications.

e. Procedures for processing field decisions and Change Orders.

f. Procedures for RFIs

g. Procedures for testing and inspecting.

h. Procedures for processing Application for Payment.

i. Distribution of the Contract Documents.

j. Submittal procedures.

k. Use of the premises.

l. Work restrictions.

m. Working hours.

n. Owner's occupancy requirements.

o. Responsibility for temporary facilities and controls.

p. Procedures for moisture and mold

q. Procedures for disruption and shutdowns.

r. Parking availability.

s. Office, work, and storage areas.

t. Equipment deliveries and properties.

u. Security.

4. Minutes: The Contractor will be responsible for conduction of the meeting, will record and distribute meeting minutes.

C. Preinstall Conferences: Conduct a pre-installation conference at Project Site before each construction activity that requires coordination with other construction trades and/or installers.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installation that have preceded or will follow, shall attend the meeting. Advise the WHFD AND/OR PROJECT MANAGER, Prime Consultant of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements to the following:
    a. Contract Documents.
    b. Options.
    c. Related RFIs.
    d. Related Change Orders.
    e. Purchases.
    f. Deliveries.
    g. Submittals.
    h. Possible conflicts.
    i. Compatibility requirements.
    j. Time schedules.
    k. Weather limitations.
    l. Manufacturer’s written instructions.
    m. Warranty requirements.
    n. Compatibility of materials.
    o. Acceptability of substrates.
    p. Temporary facilities and controls.
    q. Space and access limitations.
    r. Regulations of authorities having jurisdiction.
    s. Testing and inspecting requirements.

t. Installation procedures.

u. Coordination with other work.

v. Required performance results.

w. Protection of adjacent work.

x. Protection of construction and personnel.

3. Record significant conference discussions, agreement, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date

D. Progress Meetings: Conduct weekly progress meetings, or at intervals necessary to the orderly progress of the Work.

1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: Representatives of the WHFD AND/OR PROJECT MANAGER, and the Contractor. The Project Prime Consultant will call in by telephone. The Prime Consultant will attend meetings in person when necessary. The Prime Consultant's subconsultants and Contractor's subcontractors may attend upon request.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will

be completed within the Contract Time.

i. Review schedule for next period

b. Review present and future needs of each entity present, including the following:

i. Interface requirements.

ii. Sequence of operations.

iii. Owner operation issues/security.

iv. Status of submittals.

v. Deliveries.

vi. Off-site fabrication.

vii. Access

viii. Temporary facilities and controls.

ix. Status of RFIs.

x. Status of proposed requests.

xi. Pending changes.

xii. Status of change Orders.

xiii. Pending claims and disputes.

4. Minutes: The Contractor that is responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01330 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed Products list.

D. Shop Drawings.

E. Product Data.

F. Samples.

G. Manufacturer's installation instructions.

H. Manufacturer's certificates.

1.02 RELATED SECTIONS

A. Section 01310 – Project Management and Coordination.

B. Section 01400 - Quality Requirements.

C. Section 01500 – Temporary Facilities and Controls.

D. Section 01600 – Product Requirements.

E. Section 01730 – Execution Requirements.

F. Section 01732 – Cutting and Patching.

1.03 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Prime Consultant's responsive action.

B. Informational Submittals: Written information that does not require Prime Consultant's approval. Submittals may be rejected for not complying with requirements.

1.04 SUBMITTAL PROCEDURES

A. Transmit each submittal with AIA Form G810 or project Prime Consultant's accepted transmittal form.

1. Identify whether submittal is an action submittal or informational submittal.
2. Submit the number of duplicate documents and samples schedule in Part 3 below.

B. Sequentially number the transmittal form. Reverse submittals with original number and a sequential alphabetical suffix.

C. Identify Project Contractor, Subcontractor or supplier, pertinent drawing and detail number, and specification section number, as appropriate.

D. Apply Contractor's wax seal, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project, and deliver to Prime Consultant at business address. Coordinate submission of related items.

F. For each submittal for review, allow 5 days excluding delivery time and from the contractor.

G. Identify variations from Contract Documents and Product of system limitations which may be detrimental to successful performance of the completed Work.

H. Submit all items relating to color selection at one time. Color selections will not be made until all color related submittals have been received.

I. Provide space for Contractor, Prime Consultant, and Consultants review stamps or initials.

J. Review and Resubmission of Submittals

1. The Prime Consultant will review the submittal and stamp or initial it with indication of action as appropriate. Prime Consultant will retain one copy or and furnish one copy to Contractor. Consultants will retain one copy.
2. Submittals returned marked "resubmit" or "rejected". Make corrections and resubmit.
    a. Direct specific attention on resubmittals to revision other than those requested by the Prime Consultant on previous submittals.
    b. Make shop drawing corrections on the original drawing and print.

3. Submittals returned with markings or comments and marked “confirm”. Submit a letter indicating acceptance of comments and stating that Contractor will comply with marks and comments.

4. Submittals returned marked “No Exceptions Taken”. Submit number of copies mechanical and electrical items with Contractor.

K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.

L. Submittal is not requested will not be recognized or processed.

1.05 CONSTRUCTION PROGRESS SCHEDULES

A. Submit as part of the Monthly Report required by the Owner-Contractor Agreement.

1.06 PROPOSED PRODUCTS LIST

A. Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.07 SHOP DRAWINGS

A. Present in a clear and thorough manner, accurately and at a scale sufficient to show pertinent aspects. Indicate fabrication, layout, anchorage and installation details.

B. Title each drawing. Identify details by reference to Contract Drawing and detail numbers.

C. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Drawing Size: Minimum 8-1/2 inches by 11 inches and maximum 30 inches by 42 inches.

E. Shop Drawings: Submit review. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article above.

1.08 PRODUCT DATA

A. Clearly mark each copy to identify each applicable product, model, option, and pertinent data for the products or systems to be provided. Supplement manufacturers' standard data to provide information unique to this Project.

B. Highlighting will not be acceptable.

C. Indicate Product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. After review distribute in accordance with the Submittal Procedures article above.

1.09 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Prime Consultant selection.

1. Provide custom color samples where requested.

C. Reviewed samples which may be used in the Work are indicated in individual specification sections.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SCHEDULE OF SUBMITTALS

A. Product Data, Schedules, Shop Drawings and Other Printed Materials: Submit the number of copies which the Contractor requires, plus copies for the following:

1. One copy: Prime Consultant.
2. One copy: WHFD AND/OR PROJECT MANAGER.
3. One copy: Hospital Construction Project Manager.
4. Copies as required from consultants.

B. Samples: Submit the number of samples which the Contractor requires plus one for WHFD AND/OR PROJECT MANAGER and Contracts Manager.

Section No. - Title	Shop Drawings & Diagrams	Samples	Certifications (Materials, Treatment, Applicator, etc.)	Product Data, Manufacturer's Technical Literature	MSDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-built Drawings	Others	Guaranty or Warranty	Manufacturer's Guaranty or Warranty (Greater than one year)
01290 – Payment Procedures														■		
01310 – Project Management & Coordination														■		
1450 - Moisture Vapor Test			■				■	■								
01600 – Product Requirements														■		
01770 – Closeout Procedures	■	■	■	■			■		■			■	■	■	■	■
01783 – Project Record Documents				■						■	■		■	■		
03300 – Cast-In-Place Concrete	■		■	■			■							■		
05120 – Structural Steel Framing	■			■												
06160 – Sheathing				■			■									
06400 – Architectural Woodwork	■	■	■	■										■	■	
07213 – Building Insulation				■	■											
07242 – Direct-Applied Finish System	■	■		■	■										■	
07620 – Sheet Metal Flashing & Trim		■		■					■						■	
07841 – Penetration Firestopping			■	■			■							■	■	
07920 – Joint Sealants		■		■												
08113 – Hollow Metal Door Frames	■			■											■	
08210 – Wood Doors	■	■		■					■		■				■	■
08700 – Door Hardware	■		■	■			■		■		■			■	■	■

Section No. - Title	Shop Drawings & Diagrams	Samples	Certifications (Materials, Treatment, Applicator, etc.)	Product Data, Manufacturer's Technical Literature	MSDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-built Drawings	Others	Guaranty or Warranty	Manufacturer's Guaranty or Warranty (Greater than one year)
08900 - Louvers	■	■	■	■		■	■				■				■	
09110 – Non-Load Bearing Wall Framing				■												
09265 – Gypsum Board Assemblies				■	■											
09511 – Acoustical Panel Ceiling		■		■					■						■	
09651 – Resilient Flooring		■		■					■		■			■	■	■
09720 – Wall Covering		■	■	■										■	■	
09900 - Painting		■	■	■	■						■			■		
10260 – Corner Guards		■		■	■				■		■			■	■	
10400 - Signage	■	■		■												
10511 – Metal Lockers	■	■	■	■										■	■	■
10520 – Portable Fire Extinguisher & Cabinet				■						■					■	
10400 - Signage	■	■		■												
10810 – Toilet Accessories			■	■							■			■		
12345 – Laboratory Counter Tops & Sinks	■	■	■	■	■		■		■					■	■	
15000 – General Mechanical Requirements	■	■	■	■		■	■		■	■	■	■		■	■	■
15070 – Mechanical Sound, Vibration and Seismic Control	■			■						■	■			■	■	
15080 – Mechanical Insulation			■	■						■					■	
15181 – Chilled Water Piping	■			■			■		■		■			■	■	
15300 – Wet Pipe Fire	■			■		■									■	

Section No. - Title	Shop Drawings & Diagrams	Samples	Certifications (Materials, Treatment, Applicator, etc.)	Product Data, Manufacturer's Technical Literature	MSDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-built Drawings	Others	Guaranty or Warranty	Manufacturer's Guaranty or Warranty (Greater than one year)
Sprinkler System																
15400 – Plumbing	■		■	■					■			■		■	■	
15720 – Air Handling Units	■		■	■		■	■		■		■			■	■	
15810 – Ductwork & Ductwork Accessories	■		■	■			■		■		■	■		■	■	
15910 – Direct Digital Control Systems	■		■	■		■	■		■	■	■			■	■	
15950 – HVAC Testing/ Adjusting/ Balancing			■				■	■		■				■		
16010 – Basic Electrical Requirements	■			■										■		
16060 – Grounding & Bonding				■												
16073 – Hangers & Support for Electrical Systems				■												
16075 – Electrical Identification				■												
16120 – Conductors & Cables				■			■									
16130 – Raceways & Boxes	■			■												
16140 – Wiring Devices				■												
16410 – Enclosed Switches				■												
16442 - Panelboards				■							■			■		
16511 – Interior Lighting				■					■						■	
16700 – Communications				■										■		

Section No. - Title	Shop Drawings & Diagrams	Samples	Certifications (Materials, Treatment, Applicator, etc.)	Product Data, Manufacturer's Technical Literature	MSDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-built Drawings	Others	Guaranty or Warranty	Manufacturer's Guaranty or Warranty (Greater than one year)
16721 – Fire Alarm System	■		■	■						■				■	■	
16762 – Nurse Call System				■												

END OF SECTION

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

B. Reference.

C. Inspection and testing laboratory services.

D. Special inspections.

E. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

A. Section 01330 – Submittal Procedures.

B. Section 01600 – Product Requirements.

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step-in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Prime Consultant before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

A. Conform to reference standard by date of issue current on date for receiving bids.

B. Obtain copies of standards when required by Contract Documents.

C. Should specified reference standards conflict with Contract Documents, request clarification from Prime Consultant before proceeding.

D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 INSPECTION AND TESTING LABORATORY SERVICES

A. When the individual specifications sections require it, the Contractor shall appoint, employ, and pay for services of an independent firm to perform inspection and testing. Seismic testing will need to be performed by a special inspector. Contractor to coordinate inspection, but KCH will pay for said inspection directly. TAB to be arranged and paid for by the contractor at substantial completion or other date agreed upon by all parties.

B. Services will be performed in accordance with requirements of governing authorities and with specified standards.

C. Reports will be submitted by the independent firm to the Prime Consultant, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.

1. Notify WHFD AND/OR PROJECT MANAGER and independent firm 24 hours prior to expected time for operations required services.

2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by WHFD AND/OR PROJECT MANAGER and shall be paid by the Contractor.

1.06 SPECIAL INSPECTIONS

A. Owner will employ Special Inspectors acceptable to Hawaii County to perform inspection on certain elements of the work as required by the Building Code and its Amendments. During the course of the Work under inspection, each Special Inspector will submit detailed reports relative to progress and conditions of the

work including deviations from specified requirements and stipulating dates, times, and locations. Special inspector will submit a final report to the County, the Contractor and Prime Consultant. The Contractor shall cooperate fully with the Special Inspectors. The Contractor shall be responsible for scheduling of all inspections, including special inspections. The special inspector will send invoices directly to WHFD AND/OR PROJECT MANAGER.

B. The Hospital will perform and/or pay the fees for the following Special Inspections:

1. Seismic Inspection (if necessary).
2. Structural Inspection.
3. Fire stopping inspection.

C. All other Inspections shall be paid for by the Contractor.

1.07 MANUFACTURER'S FIELD SERVICES AND REPORTS

A. Submit qualification of observer to the WHFD AND/OR PROJECT MANAGER 30 days in advance of required observations. Observer subject to approval of the Prime Consultant and the WHFD AND/OR PROJECT MANAGER.

B. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment or to test, adjust, and balance of equipment as applicable, and to initiate instruction when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written constructions.

D. Submit two (2) copies of report written by representative, both to the Owner and to the Project Engineer listing observations and recommendations, within five (5) days of observation.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01450 - MOISTURE VAPOR AND ALKALINITY TESTING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes additional administrative and procedural requirements for quality assurance.

B. Scope of Work

1. Provide concrete moisture vapor emission and alkalinity testing of all concrete scheduled to receive floor coverings, Portland cement toppings, Portland cement underlayments or resinous coatings.

2. Review each floor finish manufacturer's instructions for additional requirements pertaining to testing, tolerances, scheduling and distribution of test sites.

3. Test concrete placed below, on and above grade, and in accordance with the manufacturer's requirements.

4. Test ALL CONCRETE and/or CMU SURFACES scheduled to receive new floor finish, paint or coatings.

   a. Test existing concrete and/or CMU surfaces.

   b. Test new concrete and/or CMU surfaces, including patch areas such as concrete placed over trenches.

1.02 RELATED SECTIONS

A. Section 03300 - Cast-In-Place-Concrete.

B. Section 09651 - Resilient Flooring.

C. Section 09900 - Painting.

1.03 REFERENCES

A. ASTM F 1869 - Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

B. ASTM F 710 - Standard Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.

1.04 SUBMITTALS

A. Testing Agency qualifications.

B. Report all test results in chart form listing test dates, start/stop time, start/stop weight, weight gain in grams, moisture vapor emission value and alkalinity levels.

C. List test locations on chart and show same on a site map, floor plan or other plan materials so that test locations are accurately known.

D. Deliver test results to the WHFD AND/OR PROJECT MANAGER and Prime Consultant.

1.05 QUALITY ASSURANCE

A. Independent Testing Agency or Manufacturer's Approved Contractor

1. Certified by Test Kit Manufacturer for product use.

2. Other agency with verifiable experience.

B. Commercially produced Moisture Vapor Emission Test Kits

1. Test dish including calcium chloride must be commercially packaged and delivered to test site in sealed factory wrapping.

2. Test done from same source as dish.

3. Test kit must comply with ASTM standards of size and weight.

C. Wide range pH paper, and distilled or de-ionized water.

1.06 ENVIRONMENTAL CONDITIONS

A. Testing shall take place after allowing concrete to dry for a minimum of 90 days. Testing to be scheduled no less than 1 nor more than 3 weeks prior to scheduled flooring installation.

B. Testing shall be in accordance with the manufacturer's requirements for each floor finish.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Calcium Chloride Test as manufactured by Vaprecision (800) 449-6194, or equal.

B. Alkalinity test paper as manufactured by Micro Essential Laboratory, or equal.

PART 3 - EXECUTION

3.01 QUANTIFICATION OF CONCRETE MOISTURE VAPOR EMISSION

A. Test concrete floors in accordance with ASTM F 1869.

B. The test site shall be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy. These temperatures and humidity levels shall be maintained for 48 hours prior and during test period. If meeting this criteria is not possible, then minimum conditions shall be 75+ 10 degrees F and 50+ 10 percent relative humidity. When a building is not under HVAC control, a recording hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be included with the test report.

C. The number of vapor emission test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to 3 in the first 600 square feet and one per each additional 200 square feet. For slabs on grade, locate additional tests adjacent to penetrations and through slab joints at the rate of one per 200 square feet.

D. Tests sites are to be cleaned of all adhesive residue, curing compounds, paints, sealers, floor coverings, and similar materials 24 hours prior to the placement of test kits.

E. Weigh test dish on site prior to start of test. Scale must report weight to 0.1 gram. Record weight and start time.

F. Expose Calcium Chloride and set dish on concrete surface.

G. Install test containment dome and allow test to proceed for 60 - 72 hours.

H. Retrieve test dish by carefully cutting through containment dome. Close and reseal test dish.

I. Weigh test dish on site recording weight and stop time.

J. Calculate and report results as “pounds of emission per 1,000 square feet per 24 hours”.

3.02 QUANTIFYING ALKALINITY LEVEL

A. Test concrete floors in accordance with ASTM F 710.

B. At each vapor emission test site, after removal of test containment dome, perform alkalinity test.

1. Place several drops of water onto the concrete surface to form a puddle approximately one-inch in diameter.

2. Allow the water to set for approximately 60 seconds.

3. Dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine alkalinity reading.

C. Record and report all results.

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

B. Temporary utilities may include, but not limited to, the following:

1. Sewers and drainage.
2. Water service and distribution.
3. Sanitary facilities, including toilets, wash facilities and drinking water facilities.
4. Electric power service.
5. Lighting.
6. Telephone service.

C. Support facilities include, but are not limited to, the following:

1. Project identification and temporary signs.
2. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities may include, but are not limited to, the following:

1. Environmental protection.
2. Storm water control.
3. Tree and plant protection.
4. Pest control.
5. Site enclosure fence.
6. Security enclosure and lockup.
7. Barricade, warning signs, and lights.
8. Fire protection.

1.02 RELATED DOCUMENTS

A. Refer to Drawings for additional requirements for temporary protection.

B. Refer to the Attachment ICRA Policy #125-54 for infection control barriers, closures and other requirements.

1.03 RELATED SECTIONS

A. Section 01330 – Submittal Procedures.

B. Attachment ICRA Policy #125-54.

1.04 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to WHFD AND/OR PROJECT MANAGER. Manager change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.

2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

B. Water: Potable

2.02 EQUIPMENT

A. Fire Extinguishers: Hospital will provide fire extinguishers. Hand carried, portable, UL rated. Provide class and extinguishing agents as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

B. Self-Contained Toilet units, if necessary Single occupant units of chemical, aerated recirculation or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar non-absorbent material.

C. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

D. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V AC, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service or connect to serve connections provided under the Work of the Project. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked0in services.

2. Obtain easements to bring temporary utilities to Project site where Owner’s easements cannot be used for that purpose.

3. Install 50 amp 125/250v job box, if necessary.

4. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully.

B. Water Service: Connect to existing water source for construction operations.

C. Sanitary Facilities: Existing designated facilities may be used during construction operations. Maintain daily in clean and sanitary condition,

D. Electric Power Service: Connect to existing power service. Power consumption shall not disrupt hospital's need for continuous service.

E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.

3.03 SUPPORT FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulation and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Cooperate and comply with hospital's Environmental Management Plan.

B. Noise Control:

1. Obtain noise permit or permit as required by Chapter 43 State of Hawaii Department of Health regulations.

2. Muffle internal combustion engine powered equipment to minimize noise and properly maintain to reduce noise to acceptable levels.

3. Blasting and use of explosives will be not permitted.

4. Activities of severe and prolonged noise and vibration must be approved in advance by WHFD AND/OR PROJECT MANAGER. Submit written notice not less than seven days in advance of intended noise producing activity.

C. Dust Control:

1. Keep dust within acceptable levels at all times, including non-working hours, weekends and holidays, in conformance with Chapter 31 – Air Pollution of State Departments of Health, Public Health Regulations, latest editions.

2. Only wet grinding or cutting of concrete will be allowed on exterior surfaces.
3. Mechanical dry sweeping not permitted. Vacuuming, wet mopping, approved limited dry hand, wet or damp sweeping is acceptable utilizing the hospital's EPA approved disinfectant.
4. During loading operations, water down debris and waste materials to allay dust.
5. Air scrubbers utilized for dust control costs incurred are the responsibility of the Contractor.
6. Use wet/sticky mats at all entrances to work area to control dust. Replace daily at a minimum.
7. The Contractor is responsible for damage claims.
8. ICRA – during construction/renovation – KCH Policy 125.54 must be adhered to.

D. Hazardous materials:

1. Asbestos, urea formaldehyde and other hazardous materials are not expected but may be present in the existing structures subject to alteration. Observe the applicable requirements of Hawaii Occupational Safety and health Standards and the Environmental Protection Agency.
2. If the presence of toxic substances is determined, notify the WHFD AND/OR PROJECT MANAGER immediately to determine the next course of action.
3. Do not begin demolition when toxic substances are present until occupants of the building are moved to other facilities or are separated from the exposure by assured means.
4. In removing and disposing of toxic substances, observe the following requirements:
    a. Provide air-tight compartments within which the toxic substances may be removed.
    b. In lieu of air0tight compartments, provide competent controlled misting or dust settling agent.

c. Place toxic substances in properly labeled sacks of at least 8 mil polypropylene.

5. Must adhere to KCH Hazmat Material and Waste Management Program Policy 122-6 and Cleanup of Spills, Hazardous and Infectious Policy 122-6-2. (If any differences are discovered between RFP and KCH policies, KCH policies shall prevail.)

E. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Hospital will provide fire extinguishers.

a. Field Offices: Class A stored-pressure water-type extinguishers.

b. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposed areas.

4. Supervise welding operations, and similar sources of fire ignition.

5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedure to be followed. Instruct personnel in methods and procedures. Post warnings and information.

F. Barriers

1. Follow ICRA. Provide barriers to prevent unauthorized entry to construction

areas, to allow for hospital's use of premises, and to protect existing facilities and adjacent properties from damage from construction operations.

2. Provide barricades and covered walkways required by governing authorities.
3. Protect non-owned vehicular traffic, store materials, site and structures from damage.
4. Barriers that will be used on project are to be approved by the project manager before starting work.

G. Interior Enclosures

1. Provide temporary partitions as required to separate work areas from hospital occupied areas, to prevent penetration of dust and moisture into hospital occupied areas, and to prevent damage to existing materials and equipment.
2. Construction: Framing and sheet materials must be noncombustible, with closed joints and sealed edges at intersections with existing surfaces and all other areas to provide a smoke tight area; STC rating of 35 in accordance with ASTM E90 and maximum Flame Spread Rating of 75 in accordance with ASTM E84. This information must be posted on the containment.
3. Paint surfaces exposed to view from hospital occupied areas.
4. Enclosures that will be used on the project are to be approved by the WHFD AND/OR PROJECT MANAGER before starting work.

H. Infection Control

1. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with hospital's infection control regulation and minimize undesirable effects.
    a. For ICRA. Cooperate and comply with Owner's Infection Control Plan (KCH Infection Control, Policy 125-54, to be adhered to during construction and renovation.).

3.04 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended use.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

END OF SECTION

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Selection of products for use in project

B. Product delivery, storage, and handling

C. Manufacturers standard warranties on products; special warranties

D. Product substitutions

E. Comparable products

1.02 RELATED SECTIONS

A. Section 01330 – Submittal Procedures.

B. Section 01400 – Quality Requirements.

C. Section 01770 – Closeout Procedures.

D. Section 01732 – Cutting and Patching.

1.03 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term “product” includes the terms “material,” “equipment,” system,” and terms of similar intent.

1. Named Products: Items identified by manufacturer’s product name, including make or model number or other designation, shown or listed in manufacturer’s published product literature that is current as of date of the Contract Documents.

2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled- content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.

3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service

performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design." including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Hospital.

E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Hospital.

1.04 SUBMITTALS

A. Product List: Submit a list, in tabular from (preferably in Microsoft Excel), showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.

2. Form: Tabulate information for each product under the following column headings:

a. Specification Section number and title.

b. Generic name used in the Contract Documents.

c. Proprietary name, model number, and similar designations.

d. Manufacturer's name and address.

e. Supplier's name and address.

f. Installer's name and address.

g. Projected delivery date or time span of delivery period.

h. Identification of items that require early submittal approval for scheduled delivery date.

3. Initial Submittal: Within 20 days after date of commencement of the Work, submit electronically the initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.

   a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.

4. Completed List: Within 30 days after date of commencement of the Work, submit electronically the completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.

5. Project Prime Consultant's or WHFD AND/OR PROJECT MANAGER's Action: The Project Prime Consultant or WHFD AND/OR PROJECT MANAGER will respond in writing to Contractor within 15 days of receipt of completed product list. The Project Prime Consultant's or WHFD AND/OR PROJECT MANAGER's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Project Prime Consultants or WHFD AND/OR PROJECT MANAGERs response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01330 - Submittal Procedures. Show compliance with requirements.

1.05 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.

2. If a dispute arises between contractors over concurrently selectable but incompatible products, the WHFD AND/OR PROJECT MANAGER will determine which products shall be used.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturers written instructions.

1. Schedule delivery to minimize storage at Project site and to prevent overcrowding of construction spaces. Long term storage onsite is not permitted unless approved by WHFD AND/OR PROJECT MANAGER.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

5. Store products to allow for inspection and measurement of quantity or counting of units.

6. Store materials in a manner that will not endanger Project structure.

7. Store products that are subject to damage by the elements, under cover in a weather-tight enclosure above ground, with ventilation adequate to prevent condensation.

8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.

9. Protect stored products from damage

B. Storage: Provide a secure location and enclosure at Project site for temporary storage of materials and equipment. Coordinate location with WHFD AND/OR

PROJECT MANAGER. Long term storage onsite is not permitted unless approved by WHFD AND/OR PROJECT MANAGER.

1.07 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.

2. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.

3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01770 - Closeout Procedures.

PART 2 - PRODUCTS

2.01 PRODUCT OPTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents that are undamaged, and unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Hospital reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

4. Where products are accompanied by the term “match sample,” sample to be matched is Prime Consultant’s.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics” of products.
6. Or Equal: Where products are specified by name and accompanied by the term “or equal” or “or approved equal” or “or approved,” comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled “Product” name a single product and manufacturer, provide the product named.
    a. Substitutions may be considered, unless otherwise indicated.
2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled “Manufacturer” or “Source” name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
    a. Substitutions may be considered, unless otherwise indicated.
3. Products: Where Specification paragraphs or subparagraphs titled “Products” introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
    a. Substitutions may be considered, unless otherwise indicated.
4. Manufacturers: Where Specification paragraphs or subparagraphs titled “Manufacturers” introduce a list of manufacturers’ names, provide a product by one of the manufacturers listed that complies with requirements.
    a. Substitutions may be considered, unless otherwise indicated.
5. Available Products: Where Specification paragraphs or subparagraphs titled “Available Products” introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.

6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled “Available Manufacturers” introduce a list of manufacturer names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.
7. Product Options: Where Specification paragraphs titled “Product Options” indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in “Product Substitutions” Article.
8. Basis-of-Design Products: Where Specification paragraphs or
9. subparagraphs titled “Basis-of-Design Product[s] are included and also introduce or refer to a list of manufacturers’ names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.
    a. Substitutions may be considered, unless otherwise indicated.
10. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Prime Consultant’s sample. WHFD AND/OR PROJECT MANAGER’s or Contract Manager’s decision will be final on whether a proposed product matches satisfactorily.
    a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on “substitutions” for selection of a matching product.
11. Visual Selection Specification: Where Specifications include the phrase “as selected from manufacturer’s colors, patterns, textures” or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

a. Standard Range: Where Specifications include the phrase “standard range of colors, patterns, textures” or similar phrase, WHFD AND/OR PROJECT MANAGER and Contracts Manager will select color, pattern, or texture from manufacturer’s product line that does not include premium items.

b. Full Range: Where Specifications include the phrase “full range of colors, patterns, textures or similar phrase. WHFD AND/OR PROJECT MANAGER and Contracts Manager will select color, pattern, or texture from manufacturer’s product line that includes both standard and premium items.

12. Allowances: Refer to individual Specification Sections and “Allowance” provisions in Division I for allowances that control product selection and for procedures required for processing such selections.

2.02 PRODUCT SUBSTITUTIONS

A. Follow the procedures as described in Hawaii Health Systems Corporation General Conditions for Construction.

2.03 COMPARABLE PRODUCTS

A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:

1. Provide evidence that the proposed product does not require extensive revisions to the Contract Documents.

2. Provide evidence that the proposed product is consistent with the intent of the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.

3. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

4. Provide evidence that proposed product provides specified warranty.

5. List of similar installations for completed projects with project names and addresses and names and addresses of Prime Consultants and owners, if

requested.

6. Samples, if requested.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01715 - EXISTING CONDITIONS – HAZARDOUS MATERIALS SURVEY

PART 1 - GENERAL

1.01 SUMMARY

A. The Hospital commissioned a Report titled "*Limited Hazardous Materials Survey Kona Community Hospital"* – located at 79-1019 Haukapila Street, Kealakekua, Hawaii Island, Hawaii, dated December 16, 2019. The survey area was limited to the electrical room wall that will be affected by the Ultrasound project. The Report was prepared by EnviroServices & Training Center, LLC.

B. Related Sections include the following:

1. Section 13281 – Removal and Disposal of Asbestos-Containing Materials.
2. Section 13282 – Lead-Containing Paint Control Measures.
3. Section 13288 – Testing/Air Monitoring.

1.02 ASBESTOS-CONTAINING MATERIALS

A. The structure to be modified under this contract was surveyed for the presence of asbestos-containing materials (ACM). A copy of the initial survey report, as well as any subsequent supplemental survey reports, if performed, is included in the Section.

1. The Contractor may perform further surveys at its own expense if ACM not shown in the reports is suspected in the areas in which work will be performed. If ACM is found, notify the Prime Consultant immediately.
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, the Contractor shall notify his/her employees, subcontractors and all other persons engaged in the demolition and abatement work of the presence of asbestos in accordance with the requirements of Chapter 110, Article 12-110-2 (f) (1) (B) of the Occupational Safety and Health Standards, State of Hawaii.

C. In the event that work is required in any area on the site other than those designated in the project scope, the Contractor shall request copies of the

asbestos survey reports for each such area from the Engineer. Based on the information contained in the additional survey(s), notify all persons on the project as indicated in paragraph 1.2 B.

1.03 LEAD-CONTAINING PAINT

A. Inform employees, Subcontractors and all other persons engaged in the project that lead containing paint (LCP) is present in the existing building and at the job site. Follow the requirements of Title 12 (Department of Labor and Industrial Relations), Subtitle 8 (Division of Occupational Safety and Health), Chapter 148 (Lead Exposure in Construction), Hawaii Administrative Rules.

B. Review the attached lead testing data which identifies the locations LCP was found. Lead testing was for design purposes only and the results **do not satisfy** any of the requirements of HIOSH Chapter 12-148.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SURVEY (ATTACHED)

A. Limited Hazardous Materials Survey Report, Kona Community Hospital located at 79-1019 Haukapila Street, Kealakekua, Hawaii Island, Hawaii, dated December 16, 2019, prepared by EnviroServices & Training Center, LLC.

END OF SECTION

SECTION 01730 – EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Construction layout.

B. Field engineering and surveying.

C. Progress cleaning.

1.02 RELATED SECTIONS

A. Section 01330 – Submittal Procedures.

B. Section 01770 – Closeout Procedures.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Acceptance of Conditions: Examine substrates, areas, and conditions, with General Contractor and Subcontractor present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

    a. Description of the Work.

    b. List of detrimental conditions, including substrates.

    c. List of unacceptable installation tolerances.

    d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of Items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Prime Consultant. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.03 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, wet mop or vacuum the entire work area, as appropriate, utilizing the hospital's EPA approved disinfectant.

D. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

E. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION

SECTION 01732 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements and limitations for cutting and patching of Work.

1.02 RELATED SECTIONS

A. Section 01100 - Summary of Work.

B. Section 01120 – Alteration Project Procedures.

C. Section 01330 – Submittal Procedures.

D. Section 01600 – Product Requirements.

E. Section 07841 – Penetration Firestopping.

F. Individual Product Specification Sections:

1. Cutting and patching incidental to work of the Section.

2. Advance notification to other Sections of openings required in work of those Sections.

3. Limitations on cutting structural members.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Primary Products: Those required for original installation.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.

B. After uncovering existing work, inspect conditions affecting performance of work.

C. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.

B. Provide protection from elements for areas that may be exposed by uncovering work.

C. Maintain excavations free of water.

3.03 CUTTING AND PATCHING

A. Execute cutting, fitting, and patching to complete work.

B. Fit products together to integrate with other work.

C. Uncover work to install ill-timed work.

D. Remove and replace defective or non-conforming work.

E. Remove samples of installed work for testing when requested.

F. Provide openings in the work for penetration of mechanical and electrical work.

3.04 PERFORMANCE

A. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.

B. Cut rigid materials using masonry saw or core drill. Pneumatic tools are allowed with WHFD's prior approval.

C. Restore work with new products in accordance with requirements of Contract Documents.

D. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

E. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids, fire stopping, to full thickness of the penetrated element. See Section 07841 – Penetration Firestopping.

F. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

END OF SECTION

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

1.02 RELATED SECTIONS

A. Section 01260 - Contract Considerations.

B. Section 01290 - Payment Procedures.

C. Section 01310 – Project Management and Coordination.

D. Section 01600 – Product Requirements.

E. Section 01730 - Execution Requirements.

F. Section 01783 – Project Record Documents.

G. Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.03 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Hospital Risk Manager of pending insurance changeover requirements, if necessary.
3. Obtain and submit releases permitting Hospital unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating

certificates, and similar releases.

4. Prepare and submit Project Record Documents, marked-up hardcopy of the Record Drawings, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
5. Complete startup testing of systems.
6. Submit test/adjust/balance, including TAB, records.
7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
8. Advise WHFD AND/OR PROJECT MANAGER of changeover in heat and other utilities.
9. Submit changeover information related to Hospital's occupancy, use, operation, and maintenance.
10. Complete final cleaning requirements, including touchup painting.
11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, the WHFD AND/OR PROJECT MANAGER will either advise the Prime Consultant to proceed with inspection or notify Contractor of unfulfilled requirements. Upon request from the WHFD AND/OR PROJECT MANAGER, the Prime Consultant will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by the WHFD AND/OR PROJECT MANAGER that must be completed or corrected before the certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.04 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Section 01290 - Payment Procedures.

2. Submit warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents. To be submitted in 3 ring binder.

3. Submit operation and maintenance manuals. To be submitted in a 3 ring binder.

4. Deliver tools, spare parts, extra materials, and similar items to location designated by WHFD AND/OR PROJECT MANAGER. Label with manufacturer's name and model number where applicable.

5. Make final changeover of permanent locks and deliver keys to WHFD AND/OR PROJECT MANAGER. Advise Hospital's personnel of changeover in security provisions.

6. Submit copy of WHFD AND/OR PROJECT MANAGER's Substantial Completion inspection list of items to be completed or corrected. The copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

8. Instruct Hospital's personnel in the operation, adjustment, and maintenance of products, equipment, and systems. Document attendance and discussion topics presented to WHFD AND/OR PROJECT MANAGER's personnel.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, the Prime Consultant and WHFD AND/OR PROJECT MANAGER will either proceed with inspection or notify Contractor of unfulfilled requirements.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.05 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit electronic copy of punch list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use Contractor's form.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3. Include the following information at the top of each page:

a. Project name.

b. Date.

c. Name of Contractor.

d. Page number.

1.06 WARRANTIES

A. Submittal Time: Submit written warranties on request of WHFD AND/OR PROJECT MANAGER for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 10 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-I 1-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate

warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Cleaning agents must be approved WHFD AND/OR PROJECT MANAGER. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions as well as utilize hospital approved disinfectants.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

   a. Clean Project site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.

e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

g. Sweep concrete floors broom clean in unoccupied spaces. Mop using quaternary ammonium disinfectants.

h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

i. Clean transparent materials, including mirrors and glass in doors and windows, Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

j. Remove labels that are not permanent.

k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

    i. Do not paint over “UL” and similar labels on doors, door frames, windows and window frames, including mechanical and electrical nameplates. If “UL” and similar labels are painted over, the Contractor will need to replace the assemblies.

l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and

mortar droppings, and other foreign substances.

m. Replace parts subject to unusual operating conditions.

n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

p. Clean ducts, blowers, and coils if units were operated without filters during construction.

q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

r. Leave Project clean and ready for occupancy.

C. Pest Control: To be determined by WHFD AND/OR PROJECT MANAGER.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Hospital's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully. Follow County of Hawaii waste guidelines.

END OF SECTION

SECTION 01783 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

1.02 RELATED SECTIONS

A. Section 01770 - Closeout Procedures.

B. Related sections of the work in this Specification for Project Record Documents.

1.03 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Initial Submittal: Submit one set of marked-up Record Prints. Prime Consultant will initial and date each plot and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Prime Consultant will return plots and prints for organizing into sets, printing, binding, and final submittal.

b. Final Submittal: Submit one set of marked-up Record Prints and print each Drawing, whether or not changes and additional information were recorded.

i. E-mail: PDF formats

c. Record Specifications: Submit one electronic copy of Project's Specifications, including addenda and contract modifications.

PART 2 - PRODUCTS

2.01 RECORD DRAWINGS

A. Record Prints: Maintain one set of black-line prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Accurately record information in an understandable drawing technique.

b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.

b. Revisions to details shown on Drawings.

c. Depths of foundations below first floor.

d. Locations and depths of underground utilities.

e. Revisions to routing of piping and conduits.

f. Revisions to electrical circuitry.

g. Actual equipment locations.

h. Duct size and routing.

i. Locations of concealed internal utilities.

j. Changes made by Change Order or Construction Change Directive.

k. Changes made following Prime Consultant’s written orders.

l. Details not on the original Contract Drawings.

m. Field records for variable and concealed conditions.

n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING' in a prominent location.

1. Record Prints: Organize Record Prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Identification: As follows:

a. Project name.

b. Date.

c. Designation "PROJECT RECORD DRAWINGS."

d. Name of Contractor.

2.02 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3. Record the name of manufacturer, supplier, Installer, and other information

necessary to provide a record of selections made.

4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.03 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders. Record Specifications, arid Record Drawings where applicable.

2.04 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.01 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes.

Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Prime Consultant's and Owner's reference during normal working hours.

END OF SECTION

DIVISION 2 – SITE WORK

SECTION 02070 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the following:

1. Demolition and removal of selected portions of a building or structure.

2. Repair procedures for selective demolition operations.

1.02 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Hospital ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.03 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reuse, salvaged, reinstalled, or otherwise indicated to remain on the Hospital's property, demolished materials shall become Contractor's property and shall be removed from Project site and properly disposed of.

1.04 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and County adopted editions and their amendments of NFPA 1, Fire Code.

1.05 PROJECT CONDITIONS

A. The Hospital will occupy portions of site immediately adjacent to selective demolition area. Conduct selective demolition so Hospital's operations will not be disrupted. Provide not less than 72 hours' notice to the WHFD AND/OR PROJECT MANAGER of activities that will affect Hospital's operations.

B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, corridors or other occupied facilities or facilities in use without written permission from authorities having jurisdiction.

C. The Hospital assumes no responsibility for condition of areas to be selectively demolished.

1. The Hospital will maintain conditions existing at time of inspection for bidding purpose as far as practical.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.01 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

2. Use materials whose installed performance equal or surpasses that of existing materials.

B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected, capped, or relocated.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to the WHFD AND/OR PROJECT MANAGER.

D. Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by the WHFD AND/OR PROJECT MANAGER. Provide temporary services during interruptions to existing utilities, as acceptable to the WHFD AND/OR PROJECT MANAGER and to authorities having jurisdiction.

1. Provide at least 72 hours' notice to WHFD AND/OR PROJECT MANAGER if shutdown of service is required during changeover.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.

2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass

area of selective demolition and that maintain continuity of service to other parts of building.

3.03 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with other adjacent occupied and used facilities.

1. Do not close or obstruct other adjacent occupied or used facilities without permission from the WHFD AND/OR PROJECT MANAGER and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways as required by governing regulations.

2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.

3. Protect existing site improvements, appurtenances, and landscaping to remain.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior to prevent water leakage and damage to structure and interior areas.

3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

4. Cover and protect furniture, furnishings, and equipment that have not been removed.

C. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather-tight enclosure for building exterior.

3.04 POLLUTION CONTROLS

A. Dust Control: Use temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as flooding and pollution.

2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.05 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new work and as indicated. Use methods required to complete the work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level.

2. 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, Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches.

5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

6. Dispose of demolished items and materials promptly.
7. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

B. Removed and Salvaged Items: Comply with the following:
1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Contracting Officer.
4. Transport items to storage area designated by Contracting Officer.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items: Comply with the following:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the WHFD AND/OR PROJECT MANAGER, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

E. Sealants: Remove no more existing sealants in joints that can be resealed by new sealant in one day by new sealant, including substrate preparation. Prepare no more new joints that can be sealed in one day.

3.06 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

1. Completely fill holes and depressions in existing walls that are to remain with an approved patching material applied according to manufacturer's written recommendations.

C. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction to the nearest break in the surface, change in material, or as approved by the WHFD AND/OR PROJECT MANAGER in order to eliminate evidence of patching and refinishing.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Hospital's property and legally dispose of them.

END OF SECTION

DIVISION 3 – CONCRETE

SECTION 03300 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Slabs-on-grade and curbs.

B. Related Section:

1. Section 01450 – Moisture Vapor & Alkalinity Testing.
2. Section 07920 – Joint Sealants.
3. Section 09651 – Resilient Flooring.

1.02 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and

laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturer, and testing agency.

B. Welding certificates.

C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Steel reinforcement and accessories.
4. Curing compounds.
5. Floor and slab treatments.
6. Semirigid joint filler.
7. Joint-filler strips.
8. Repair materials.

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

E. Field quality-control reports.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete."

2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch minimum.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.

2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.

2.02 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Plain-Steel Wire: ASTM A 82, as drawn.

2.03 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete

according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.04 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I or Type II.

B. Pozzolans: Fly Ash – ASTM C 618, Class C or F.

C. Silica Fume: ASTM C 1240, amorphous silica.

D. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

E. Water: ASTM C 94 and potable.

2.05 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494, Type A.

2. Retarding Admixture: ASTM C 494, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

2.06 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.07 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

C. Bonding agent in first paragraph below may be used directly from container or as an admixture in cement or sand-cement slurries and rubbing grout.

D. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

E. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements.

F. Reglets: Fabricate reglets of not less than 0.022-inch thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

G. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.08 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.09 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

C. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Slabs-on-Grade and Curbs: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.50.

3. Slump Limit: 4 inches plus or minus 1 inch.

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

2. For mixer capacity larger than 1 cu. Yd., increase mixing time by 15 seconds for each additional 1 cu. yd.

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.01 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.

2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3. Install dovetail anchor slots in concrete structures as indicated.

3.03 REMOVING AND REUSING FORMS

A. General: Formwork for sides of footings, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by WHFD AND/OR PROJECT MANAGER.

3.04 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches and seal with manufacturer's recommended tape.

B. Granular Course: Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.

3.05 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.06 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by WHFD AND/OR PROJECT MANAGER.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least 1 inch of concrete thickness as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 07920 - Joint Sealants, are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than

one length is required, lace or clip sections together.

3.07 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by WHFD AND/OR PROJECT MANAGER.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F at 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. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.08 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes.
1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

3.09 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive hot temperatures. Comply with ACI 301 for hot-weather protection during curing.

B. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.

   b. Continuous water-fog spray.

   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

   c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

   a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on the project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to

manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least six month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by WHFD AND/OR PROJECT MANAGER. Remove and replace concrete that cannot be repaired and patched to WHFD AND/OR PROJECT MANAGER's approval.

B. 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.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding

agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by WHFD AND/OR PROJECT MANAGER.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. 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.

6. Repair defective areas, except random cracks and single holes 1 inch or less

in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. 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.

E. Perform structural repairs of concrete, subject to WHFD AND/OR PROJECT MANAGER's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to WHFD AND/OR PROJECT MANAGER's approval.

3.13 FIELD QUALITY CONTROL

A. Testing and Inspecting: WHFD AND/OR PROJECT MANAGER will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Headed bolts and studs.
3. Verification of use of required design mixture.
4. Concrete placement, including conveying and depositing.
5. Curing procedures and maintenance of curing temperature.
6. Verification of concrete strength before removal of shores and forms from

beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
3. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 80 deg F and above, and one test for each composite sample.
6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31.
    a. Field-cured specimens in first subparagraph below may be required to verify adequacy of curing and protection of concrete, to verify strength for tilt-up concrete and post-tensioning concrete, or to verify strength for removal of shoring and reshoring in multistory construction. Revise number of test specimens if required.

b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C 39; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
   a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
   b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
11. Test results shall be reported in writing to WHFD AND/OR PROJECT MANAGER, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by WHFD AND/OR PROJECT MANAGER but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by WHFD AND/OR PROJECT MANAGER. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders

complying with ASTM C 42/C 42M or by other methods as directed by WHFD AND/OR PROJECT MANAGER.

14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.14 PROTECTION OF LIQUID FLOOR TREATMENTS

A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

DIVISION 5 – METALS

SECTION 05120 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Structural steel.
2. Grout.

B. Related Requirements:

1. Section 09900 – Painting.

1.02 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.03 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.04 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate type, size, and length of bolts, distinguishing between shop and field

bolts.

1.05 QUALITY ASSURANCE

A. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint to SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

   1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

   1. Fasteners may be repackaged provided WHFD AND/OR PROJECT MANAGER's testing and inspecting agency observes repackaging and seals containers.

   2. Clean and relubricate bolts and nuts that become dry or rusty before use.

   3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.01 STRUCTURAL-STEEL MATERIALS

A. Channels, Angles Shapes: ASTM A 36.

   Plate and Bar: ASTM A 36.

2.02 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

   1. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with plain finish.

B. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers with plain finish.

   1. Retain "Direct-Tension Indicators" Subparagraph below if applicable. If using corrosion-resisting (weathering) steel, revise Type 490 to Type 490-3; ASTM F 959M does not include a designation for corrosion-resistant steel.

   2. Direct-Tension Indicators: ASTM F 959, Type 490, compressible-washer type with plain finish.

C. Unheaded Anchor Rods: ASTM F 1554, Grade 36.

   1. Configuration: As indicated on drawings.

   2. Nuts: ASTM A 563 heavy-hex carbon steel.

   3. Plate Washers: ASTM A 36/A 36M carbon steel.

   4. Washers: ASTM F 436, Type 1, hardened carbon steel.

   5. Finish: Hot-dip zinc coating, ASTM A 153, Class C.

D. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.

   1. Nuts: ASTM A 563 heavy-hex carbon steel.

   2. Plate Washers: ASTM A 36/A 36M carbon steel.

   3. Washers: ASTM F 436, Type 1, hardened carbon steel.

   4. Finish: Hot-dip zinc coating, ASTM A 153, Class C.

E. Threaded Rods: ASTM A 36.

   1. Nuts: ASTM A 563 heavy-hex carbon steel.

   2. Washers: ASTM F 436, Type 1, hardened carbon steel.

3. Finish: Hot-dip zinc coating, ASTM A 153, Class C.

F. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

G. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

H. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.03 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. Galvanizing Repair Paint: SSPC-Paint 20.

2.04 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.05 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.

2. Fabricate beams with rolling camber up.

3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.

4. Mark and match-mark materials for field assembly.

5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."

F. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural-steel frame. Straighten as required to provide uniform, square, and true members in completed wall framing. Build up welded framing, weld exposed joints continuously, and grind smooth.

G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.06 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 3, "Power Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

D. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils.

2.07 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

   1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.03 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Splice members only where indicated.

C. Do not use thermal cutting during erection unless approved by WHFD AND/OR PROJECT MANAGER. Finish thermally cut sections within smoothness limits in AWS D1.1.

D. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.04 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

   1. Joint Type: As indicated on drawings.

3.05 FIELD QUALITY CONTROL

A. Special Inspections: WHFD AND/OR PROJECT MANAGER will engage a qualified special inspector to perform the following special inspections:

   1. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: WHFD AND/OR PROJECT MANAGER will engage a qualified testing agency to perform tests and inspections.

C. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

3.06 REPAIRS AND PROTECTION

A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

B. Touchup Painting: Cleaning and touchup painting are specified in Section 09901 - Painting.

END OF SECTION

DIVISION 6 – WOOD AND PLASTICS

SECTION 06160 - SHEATHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Plywood sheathing, backing and substrate.
2. Building paper.

B. Related Sections include the following:

1. Section 06400 – Architectural Woodwork.
2. Section 07242 – Direct-Applied Finish System.
3. Section 12345 – Laboratory Counter Tops and Sinks.

1.03 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments specified to be High-Temperature (HT) type, include physical properties of treated plywood both before and after exposure

to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.

4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Preservative-treated plywood.

2. Fire-retardant-treated plywood.

1.04 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory," or GA-600, "Fire Resistance Design Manual."

1.05 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.01 WOOD PANEL PRODUCTS, GENERAL

A. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.

B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

C. Factory mark panels to indicate compliance with applicable standard.

2.02 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA C9.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing].

2.03 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Comply with performance requirements in AWPA C27.

1. Use treatment that does not promote corrosion of metal fasteners.

2. Use Exterior type for exterior locations and where indicated.

3. Use Interior Type A, unless otherwise indicated.

B. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Identify fire-retardant-treated plywood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

D. Application: Treat plywood indicated on Drawings.

2.04 WALL SHEATHING

A. Plywood Wall Sheathing: Exterior sheathing.

1. Span Rating: Not less than **16/0**.

2. Nominal Thickness: See Drawings for thickness. No plywood shall be less than 1/2 inch (13 mm) thick, unless otherwise noted.

2.05 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. For wall sheathing, provide fasteners of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

1. For wall sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

F. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

1. For steel framing less than 0.0329 inch (0.835 mm) thick, attach sheathing to comply with ASTM C 1002.

2. For steel framing from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick, attach sheathing to comply with ASTM C 954.

2.06 WEATHER-RESISTANT SHEATHING PAPER

A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.

2.07 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with [APA AFG-01] [ASTM D 3498] that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Use adhesives that have a VOC content of [70] <Insert limit> g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Adhesive/vapor barrier: Urethane adhesive and moisture vapor control for adhering plywood sheathing to concrete.

1. Manufacturer: Bostick, Inc or approved equal.
2. Model: Bostick's Best.
3. Apply adhesive per manufacturer's instructions.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
3. Table 2305.2, "Fastening Schedule," in BOCA's "BOCA National Building Code."
4. Table 2306.1, "Fastening Schedule," in SBCCI's "Standard Building Code."

D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.02 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

5. Wall Sheathing:

a. Screw to cold-formed metal framing.

b. Unless otherwise noted, space panels 1/8 inch apart at edges and ends.

END OF SECTION

SECTION 06400 - ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Specifications, Special Provisions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Interior frames and jambs.
2. Plastic-laminate faced cabinets and casework.
3. Quartz-material countertops.
4. Shop finishing of interior woodwork.

B. Related Sections include the following:

1. Section 06160 – Sheathing.
2. Section 07920 - Joint Sealants.
3. Section 12345 – Laboratory Counter Tops and Sinks.

1.03 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.04 SUBMITTALS

A. Product Data: For high-pressure decorative laminate, adhesive for bonding plastic laminate, solid-surfacing material, fire-retardant-treated materials, cabinet hardware and accessories and finishing materials and processes.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details at a minimum scale of 1-1/2” = 1’-0”.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets and other items installed in architectural woodwork.
4. Apply WI-certified compliance label to first page of Shop Drawings.

C. Samples for Initial Selection:

1. Shop-applied opaque finishes.
2. Plastic laminates.
3. PVC edge material.
4. Quartz countertop material.

D. Samples for Verification:

1. Plastic laminates, 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish.
2. Edge banding: 6” strip for each type, color and pattern.
3. Quartz material, 6 inches (150 mm) square.
4. Exposed cabinet hardware and accessories, one unit for each type and finish.

E. Product Certificates: For each type of product, signed by product manufacturer.

F. Woodwork Quality Standard Compliance Certificates: WI-certified compliance certificates.

G. Qualification Data: For fabricator.

H. Manufacturer’s Warranty.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products

have a record of successful in-service performance. Shop is a licensee of WI's Certified Compliance Program.

B. Installer Qualifications: Fabricator of products.

C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork.

D. Quality Standard: Unless otherwise indicated, comply with WI's "Manual of Millwork" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1. Provide WI-certified compliance certificates indicating that woodwork complies with requirements of grades specified.

E. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication,

and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.08 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

B. Hardware Coordination: Distribute copies of approved hardware to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that comply with requirements of WI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Products: Comply with the following:

1. Hardboard: AHA A135.4.

2. Softwood Plywood: DOC PS 1.

C. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high-pressure decorative laminates that may be incorporated into the Work include the following:

2. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by the following:

    a. Wilsonart International; Div. of Premark International, Inc.

    b. Type: Premium HPL 107

D. Quartz Countertop Material: Combination of natural quartz and small amounts of glass or metallic. Durable and non-porous material with texture that does not allow bacteria to grow and is resistant to stains.

1. Basis-of-Design Product: The design for counter top is based on product indicated. Subject to compliance with requirements by the following

    a. SileStone.

    b. No substitutions.

2. Type: Polished.

3. Colors and Patterns: Blanco Maple14.

2.02 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this Article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified.

1. Do not use treated materials that do not comply with requirements of referenced woodworking standard or that are warped, discolored, or otherwise defective.

2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.

3. Identify fire-retardant-treated materials with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with performance requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Use the following treatment type:

1. Type: Organic-resin-based formulation thermally set in wood by kiln drying.

2. Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking plant certified by testing and inspecting agency.

3. Kiln-dry materials before and after treatment to levels required for untreated materials.

2.03 CABINET HARDWARE AND ACCESSORIES

A. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening and self-closing.

B. Back-Mounted Pulls: BHMA A156.9, B02011.

C. Wire Pulls: Back mounted, solid metal, 4 inches (100 mm) long, 5/16 inch (8 mm) in diameter.

D. Catches: Magnetic catches, BHMA A156.9, B03141.

E. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip. Installed in holes drilled in cabinet sides and partitions.

F. Drawer Slides: BHMA A156.9, B05091.

1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-overtravel-extension type; zinc-plated steel ball-bearing slides.

2. Box Drawer Slides: Grade 1HD-100; for drawers not more than 6 inches (150 mm) high and 24 inches (600 mm) wide.

3. File Drawer Slides: Grade 1HD-200; for drawers more than 6 inches (150 mm) high or 24 inches (600 mm) wide.

G. Door Locks: BHMA A156.11, E07121.

H. Drawer Locks: BHMA A156.11, E07041.

I. Grommets for Cable Passage through Countertops: 2-inch (51-mm), black, molded-plastic grommets and matching plastic caps with slot for wire passage.

1. Product: Subject to compliance with requirements, provide "SG series" by Doug Mockett & Company, Inc.

J. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Satin Stainless Steel: BHMA 630.

K. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.04 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

C. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

D. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Wood Glues: 30 g/L.

2. Contact Adhesive: 250 g/L.

E. Adhesive for Bonding Plastic Laminate: Un-pigmented contact cement.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.05 FABRICATION, GENERAL

A. Interior Woodwork Grade: Unless otherwise indicated, provide Custom-grade interior woodwork complying with referenced quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

D. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).

E. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

F. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of openings in countertops with a coat of varnish.

2.06 PLASTIC-LAMINATE CABINETS

A. Grade: Custom.

B. WI Construction Style: Style A, Frameless.

C. WI Construction Type: II, single-length sections to fit access openings.

D. WI Door and Drawer Front Style: Flush overlay.

E. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:

1. Horizontal Surfaces Other Than Tops: Grade HGS.
2. Postformed Surfaces: Grade HGP.
3. Vertical Surfaces: Grade HGS.
4. Edges: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.

F. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.

a. Edges of Plastic-Laminate Shelves: PVC edge banding, 0.12 inch (3

mm) thick, matching laminate in color, pattern, and finish.

b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade VGS.

2. Drawer Sides and Backs: Solid-hardwood lumber.

3. Drawer Bottoms: Hardwood plywood.

G. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

H. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. See drawings for material and color.

2.07 QUARTZ MATERIAL COUNTERTOPS

A. Grade: Custom.

B. Quartz Material Thickness: 1/2 inch (13 mm).

C. Colors, Patterns, and Finishes: See drawings for selected color and pattern. Fabricate tops in one piece, unless otherwise indicated. Comply with quartz material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

D. Fabricate tops with shop-applied edges of materials and configuration indicated.

E. Fabricate tops with integral backsplashes and sidesplashes.

F. If required, install integral sink bowls in countertops in shop.

G. Drill holes in countertops for plumbing fittings in shop.

2.08 SHOP FINISHING

A. General: Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

PART 3 - EXECUTION

3.01 PREPARATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.02 INSTALLATION

A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for

exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

G. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches (900 mm) long, except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.

1. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).

H. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.

2. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

I. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

1. Install countertop support brackets as indicated on the drawings and comply with manufacturer’s instructions.
2. Align adjacent quartz material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface
3. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
4. Secure integral backsplashes/sidesplashes to walls with adhesive.
5. Caulk space between backsplash/sidesplash and wall with sealant specified in Section 07920 - Joint Sealants.

J. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

3.03 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07210 – BUILDING INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes: The extent of building insulation work is shown on the drawings, by the generic name.

B. The type of building insulation specified in this section include, but are not limited to, the following:

1. Acoustical batt insulation for partitions and ceilings.

1.02 RELATED SECTIONS

A. Section 09110 – Non-Load Bearing Wall Framing.

B. Section 09265 – Gypsum Board Assemblies

1.03 QUALITY ASSURANCE

A. Fire and Insurance Ratings: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

1. Surface Burning Characteristics: ASTM E 84.

2. Fire Resistance Ratings: ASTM E 119.

3. Combustion Characteristics: ASTM E 136.

1.04 SUBMITTALS

A. Submit under the provisions of Section 01330 – Submittal Procedures.

B. Manufacturer’s Data: Submit manufacturer’s specifications and installation instructions for types of insulation required. Include data substantiating that materials comply with specified requirements.

C. Material Safety Data Sheets (MSDS): Submit MSDS for each material.

1.05 SAFETY PRECAUTIONS

A. Respirators and Other Concerns: Comply with OSHA 29 CFR 1910.134, “Respiratory Protection, ASTM C 930, Potential Health and Safety Concerns Associated with Thermal Insulation Materials and Accessories”, and other Federal, State and local regulations governing safety. Provide workers with dust/mist respirators, training in their use, and protective clothing as approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA).

B. Smoking: Do not smoke during installation of blanket insulation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in original sealed wrapping bearing manufacturer’s name and brand designation, specification number, type, grade, R-value, and class. Store and handle to protect from damage. Do not allow insulation materials to become wet, soiled or crushed. Comply with manufacturer’s recommendations for handling, storing, and protecting of materials before and during installation.

B. Storage: Inspect materials delivered to the site for damage; unload and store out of weather in manufacturer’s original packaging. Store only in dry locations, not subject to open flames or sparks, and easily accessible for inspection and handling.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. CertainTeed Corporation
2. Johns Manville
3. Owens-Corning
4. Or approved equal.

B. Substitutions: Only under provisions set forth in applicable specifications sections. Other manufacturers may be submitted for evaluation by the WHFD AND/OR PROJECT MANAGER by following the conditions of the substitutions clause. The WHFD AND/OR PROJECT MANAGER shall be the sole judge as to the acceptability of all products submitted for substitution.

2.02 MATERIALS

A. Acoustical Wall Insulation: ASTM C 665, Type I, unfaced, except a flame spread of 25 or less and a smoke developed rating of 50 or less when tested in accordance with the procedures of ASTM E 84 fiberglass insulation batt for noise control in partitions where shown; friction fit, sized to fit framing spacing. Noise Reduction Coefficient (NRC) shall be not less than 0.90 for 2-1/2 inch metal stud wall, and not less than 1.05 for 3-5/8 inch metal stud wall unless partitions ratings indicated otherwise. NRC values as determined in accordance with ASTM C 423.

B. Recycled Materials: Provide insulation containing recycled materials to the extent practicable, provided the materials meet all other requirements of this section. The minimum required recycled materials content by weight are:

1. Rock Wool: 75 percent slag
2. Fiberglass:Minimum 25 percent glass cullet

2.03 ACCESSORIES

A. Mechanical Fasteners: Corrosion resistant fasteners as recommended by the insulation manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specified recommendations before proceeding with the work.
2. Extend wall insulation full thickness as shown over entire area to be

insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

3. Apply a single layer of insulation of the required thickness, unless otherwise shown of required to make up the total thickness.
4. Insulation shall be installed after construction has advanced to a point that the installed insulation will not be damaged by remaining work.
5. Space insulation from heat producing devices as recommended by the manufacturer, but not closer than 3 inches.
6. Electrical Wiring: Do not install insulation in a manner that would sandwich electrical wiring between two layers of insulation.

3.02 PROTECTION

A. Protect installed insulation and facing from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

SECTION 07242 - DIRECT-APPLIED FINISH SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes materials and installation of exterior direct-applied cement board stucco backed with drainage mat and fluid applied air/moisture barrier, for frame walls.

1.02 RELATED SECTIONS

A. Section 06160 - Sheathing.

B. Section 07620 - Sheet Metal Flashing and Trim.

C. Section 07920 - Joint Sealants.

D. Section 09900 - Painting.

1.03 REFERENCED DOCUMENTS

A. ASTM International (ASTM)

1. C 150 Specification for Portland Cement
2. C 297 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
3. C 1177 Specification for Glass Mat Gypsum for Use as Sheathing
4. C 1325 Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets
5. D 4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
6. E 84 Test Method for Surface Burning Characteristics of Building Materials
7. E 96 Standard Test Methods for Water Vapor Transmission of Materials
8. E 283 Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
9. E 330 Test Method for Structural Performance of Windows, Curtain Walls,

and Doors by Uniform Static Air Pressure Difference

10. E 331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
11. E 779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
12. E 2178 Standard Test Method for Air Permeance of Building Materials
13. E 2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

B. APA Engineered Wood Association.

1. PS 1 Voluntary Product Standard, Structural Plywood.
2. PS 2 Performance Standard for Wood-Based Structural-Use Panels.
3. E 30 APA Engineered Wood Construction Guide.

C. ICC (International Code Council).

1. 2006 and 2012 IBC (International Building Code).

D. ICC ES (International Code Council Evaluation Service).

1. AC 59 Acceptance Criteria for Direct Applied Exterior Finish Systems (DEFS).
2. ICC ESR 1233 StoGuard with Gold Coat, StoGuard with EmeraldCoat, and StoGuard VaporSeal Water-Resistive Barriers and StoEnergy Guard (StoGuard with Continuous Insulation).
3. ICC ESR 1510 PermaBase Brand Cement Board.
4. ICC ESR 2536 StoQuik Silver I, StoQuik Silver II, and StoQuik Silver NExT Cement Board Stucco Systems.

E. National Fire Protection Association (NFPA) Standards

1. NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus.
2. NFPA 268 Standard Test Method for Determining Ignitability of Exterior Wall

Assemblies Using a Radiant Heat Energy Source

F. South Coast Air Quality Management District (SCAQMD)

1. Rule 1113 (2007) Architectural Coatings

G. USEPA (United States Environmental Protection Agency)

1. 40 CFR Part 59 (Code of Federal Regulations Title 40 Part 59 – National Volatile Organic Compound Emission Standards for Consumer and Commercial Products)

1.04 DESIGN REQUIREMENTS

A. Structural (wind and axial loads)

1. Design for maximum allowable deflection, normal to the plane of the wall of L/360
2. Design for wind load in conformance with code requirements using framing members designed to comply with the standards, strength, and stiffness requirements of the applicable code.
3. Maximum stud spacing: 16 inches (406 mm) on center
4. Sheathing: minimum ½ inch (13 mm) Exposure I plywood sheathing in compliance with US DOC PS-2
5. Drainage mat: maximum ¼ or 3/8 inch (6 or 10 mm) thick tangled filament nylon core with fabric facing.
6. Screw fasteners for cement board:
    a. Steel framing – minimum #8 Type S-12 corrosion resistant screws with minimum 0.395 inch (10 mm) wafer head diameter and minimum 3/8 inch (9.5 mm) and three thread penetration into framing
        i. Cement board fastener spacing: maximum 8 inches (203 mm) vertically along studs
        ii. Ultimate wind load resistance capabilities:
            a) Metal framing capable of achieving+166 psf, -94 psf (+7.94 kPa, -4.50 kPa): minimum 16 gage or heavier, minimum 6 inch (152 mm) depth and 2 inch (50.8 mm) flange width, cold formed C-

shaped steel stud framing spaced 16 inches (406 mm) on center maximum.

B. Moisture Control

1. Prevent the accumulation of water into or behind the cement board stucco, either by condensation or leakage into the wall construction, in the design and detailing of the wall assembly:

   a. Provide corrosion resistant flashing to protect exposed elements and to direct water to the exterior, including, above window and door heads, beneath window and door sills, at floor lines, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.

   b. Vapor Diffusion and Condensation – perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.

   c. Provide StoGuard Air & Moisture Barrier and Sto DrainScreen over sheathing.

   d. At through wall expansion joints and at joints formed with back-to-back casing beads, back joints with StoGuard Transition Membrane. Refer to Sto Guide Details at www.stocorp.com.

   e. Seal cement board stucco accessory butt joints with appropriate sealant. Seal all cement board stucco terminations and penetrations through the cement board stucco wall assembly with appropriate sealant, or backer rod and sealant, as dictated by joint type.

C. Grade Condition

1. Do not specify cement board stucco for use below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 6 inch (150 mm) clearance above grade. Provide increased clearance in freeze/thaw climate zones.

D. Joints and Accessories

1. Provide back-to-back casing beads in the cement board stucco assembly where building movement is anticipated: at joints in the substrate or supporting construction, where the system is to be installed over dissimilar construction or substrates, at changes in building height, at floor lines, at columns and cantilevered areas. Back the joint with StoGuard Transition Membrane.
2. Provide one piece control joints at no greater than 25 ft (7.6 m) intervals and 625 ft^2 (58 m^2) for light colors (LRV $\geq$ 70), and at no greater than 16 ft (4.68 m) and every 256 ft^2 (23.5 m^2) for dark colors (LRV < 70 and $\geq$ 30). Do not exceed length to width ratio of 2-1/2:1 in expansion joint layout.
3. Provide one piece control joints at through wall penetrations, for example, at corners above and below windows, above doors, and similar penetrations through the wall. Alternatively use minimum 9 inch (229 mm) wide diagonal mesh reinforcement at corners over cement board sheathing that is cut in an "L" shape around the corner of the opening.
4. Provide minimum 3/8 inch (9 mm) wide joints where the system abuts windows, doors and other through wall penetrations.
5. Provide appropriate accessories at cement board stucco terminations and joints.
6. Avoid the use of channel reveal accessories which can interfere with proper drainage and proper stress relief.
7. Provide appropriate sealant at cement board stucco terminations and at stucco accessory butt joints.
8. Indicate location of joints, accessories and accessory type on architectural drawings.

E. Color Limitations

1. Select colors with a lightness reflectance value (LRV) of $\geq$ 30 and as dictated by allowable joint spacing (1.04 E2). Refer to Sto Color Chart for LRVs.

1.05 PERFORMANCE REQUIREMENTS

A. Air & Moisture Barrier

1. Compliant with ICC ES Acceptance Criteria AC 212 (refer to ICC ESR 1233)
2. Water Vapor Permeance, ASTM E 96, Method B: greater than 10 perms [573 ng/(Pa·s·m^2)]
3. Surface Burning, ASTM E 84: Flame Spread less than 25, Smoke Developed less than 450, Class A Building Material
4. Tensile Adhesion, ASTM C 297:
5. Gypsum Sheathing, exceeds strength of substrate
6. Plywood, > 85 psi (590 kPa)
7. OSB, > 30 psi (206 kPa)
8. VOC, calculation:
    a. Less than 100 g/L
    b. Compliant with US EPA 40 CFR 59 for waterproofing/sealer
    c. Compliant with South Coast AQMD Rule 1113 for waterproofing/sealer

B. Drainage Mat

1. Surface Burning, ASTM E 84: Flame Spread less than 25, Smoke Developed less than 450, Class A Building Material
2. Flame Propagation, NFPA 285: meets requirements for use on noncombustible (Types I, II, III, and IV) construction. Refer to ICC ESR 1233

C. Direct-Applied Cement Board Stucco Finish System and Components

1. Compliant with ICC ES AC 59.
2. Surface Burning, ASTM E 84: Flame Spread less than 25, Smoke Developed less than 450, Class A building material
3. VOC: less than 50 g/L, compliant with South Coast AQMD Rule 1113 for architectural coatings

1.06 SUBMITTALS

A. Manufacturer's specifications, details, installation instructions and product data

B. Manufacturer’s code compliance report for air barrier and water-resistive barrier

C. Manufacturer’s code compliance report for cement board stucco

D. Manufacturer's standard warranty

E. Samples for approval as directed by the Hospital.

F. Fastener manufacturer’s pull-out or withdrawal capacity testing for frame construction

G. Prepare and submit project-specific details (when required by contract documents)

1.07 QUALITY ASSURANCE

A. Manufacturer Requirements

1. Cement board stucco and air barrier products manufacturer for a minimum of twenty five (25) years.

2. Cement board stucco finish products and air/moisture barrier products manufactured under ISO 9001:2008 Quality System and 14001:2004 Environmental Management System.

B. Contractor Requirements

1. Licensed, insured and engaged in application of stucco for a minimum of three (3) years.

2. Knowledgeable in the proper use and handling of Sto materials.

3. Employ skilled mechanics who are experienced and knowledgeable in stucco application, and familiar with the requirements of the specified work.

4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.

5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.

C. Cement Board Manufacturer Requirements

1. Manufacturer of ASTM C 1325 compliant cement board

2. Cement board listed in a current ICC ES evaluation report

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Store cement board materials inside and protect from damage by the elements. Protect ends, edges, and faces of cement boards from damage.

C. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.

D. Protect portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

E. Handle and store all products as directed on labeling.

1.09 PROJECT/SITE CONDITIONS

A. Maintain ambient and surface temperatures above 40°F (4°C) during application and for 24 hours after application of air/moisture barrier and cement board stucco finish materials.

B. Provide supplementary heat for installation in temperatures less than 40°F (4°C) such that material temperatures are maintained as in 1.09A. Prevent concentration of heat on wet cement board stucco finish materials and vent fumes and other products of combustion to the outside to prevent contact with materials.

C. Prevent uneven or excessive evaporation of moisture from base coat during hot, dry or windy weather. Do not install base coat or finish coat if ambient temperatures are expected to rise above 100ºF (38ºC) within a 24 hour period.

D. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.10 COORDINATION/SCHEDULING

A. Protect sheathing from climatic conditions to prevent weather damage.

B. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air barrier and continuous moisture protection. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing. Coordinate installation of air/moisture barrier components with window and door installation to provide weather proofing of the structure and to prevent moisture infiltration and excess air infiltration.

C. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.

D. Install window head flashing prior to DEFS installation.

E. Splice-in head flashing, floor line flashing, diverter flashing, and similar flashing with air/moisture barrier detail component to provide a shingle lap that directs water to the exterior.

F. Protect air/moisture barrier with cement board stucco cladding assembly within 180 days of installation.

G. Protect drainage mat with cement board or other protection within 30 days of installation.

H. Commence the cement board stucco installation after completion of all construction that imposes dead loads on the walls to prevent excessive deflection (and potential cracking) of the cement board stucco.

I. Sequence interior work such as drywall installation prior to cement board stucco installation to prevent stud distortion (and potential cracking) of the cement board stucco.

J. Install sealant immediately after installation of the cement board stucco finishes and when finish coatings are dry.

K. Attach penetrations through cement board stucco to structural support and provide air tight and water tight seals at penetrations.

1.11 WARRANTY

A. Provide manufacturer's standard warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Air/Moisture Barrier, Drainage Mat, Cement Board Stucco Base Coat, Primers, Finishes.

1. Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120. Atlanta, GA 30331.

2. Approved equal.

B. Cement Board.

1. National Gypsum Company, Inc., 2001 Rexford Road, Charlotte, NC 28211.

2. Georgia-Pacific Gypsum, LLC., 133 Peachtree Street, NE, Atlanta, GA 30303.

3. Approved equal.

C. Cement Board Stucco Accessories.

1. Plastic Components, Inc., 9051 NW 97th Terrace, Miami, Florida 33178.

2. Approved equal.

2.02 AIR/MOISTURE BARRIER

A. StoGuard-- fluid applied air/moisture barrier for sheathing, concrete, and concrete masonry substrates consisting of multiple compatible components, or approved equal:

1. Sto Gold Fill -- ready mixed acrylic based flexible joint treatment for rough opening protection, joint treatment of wall sheathing, CMU crack repair, and detail component for shiplap connections with flashing, starter track, and similar ship lap details.

2. Sto EmeraldCoat -- ready mixed flexible waterproof coating for wall sheathing, concrete and CMU wall surfaces

3. StoGuard Mesh-- nominal 4.2 oz/yd^2 (142 g/m^2), self-adhesive, flexible, symmetrical, interlaced glass fiber mesh, with alkaline resistant coating for compatibility with Sto materials, used with Sto Gold Fill to reinforce rough openings, inside and outside corners, sheathing joints, and shiplap

connections with flashing, starter track, and similar ship lap details

4. StoGuard Fabric – nonwoven cloth reinforcement used with Sto EmeraldCoat for rough opening protection, joint treatment of wall sheathing, and detail component for shiplap connections with flashing, starter track, and similar ship lap details
5. StoGuard RediCorner – a preformed fabric piece used in the corners of rough openings in tandem with StoGuard Fabric for quicker installation
6. StoGuard Transition Membrane – flexible air barrier membrane for continuity at transitions: sheathing to foundation, dissimilar materials (CMU to frame wall), wall to balcony floor slab or ceiling, flashing shingle lap transitions, floor line deflection joints, masonry control joints, and through wall joints in masonry or frame construction.
7. Sto RapidGuard - one component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle lap over flashing, wall to balcony floor slab or ceiling, and through wall penetrations – pipes, electrical boxes, and scupper penetrations

2.03 ACCESSORIES FOR CEMENT BOARD STUCCO

A. Starter Track – Starter Track Drip Edge (Product No. STDE-xx) or i Drip Track (Product No. iDT-xx), rigid PVC (polyvinyl chloride) plastic tracks with weepholes as furnished by Plastic Components, Inc., for use at terminations such as base of wall, floor lines, roof lines, and similar weep termination lines, or approved equal.

B. Casing Bead – Starter Trac (Product No. ST-xx), a rigid PVC (polyvinyl chloride) plastic accessory as furnished by Plastic Components, Inc., for use at terminations such as windows, doors, and similar through wall penetrations, and used back-to-back at movement joints such as dissimilar materials, through wall expansion joints, and floor line deflection joints. May also be used back-to-back in lieu of a single piece control joint, or approved equal.

C. Outside Corners – Sto-Mesh Corner Bead Standard, one component PVC (polyvinyl chloride) accessory with integral reinforcing mesh for outside corner reinforcement, or approved equal.

D. Drip Edge - Sto Drip Edge Profile, one component PVC (polyvinyl chloride) accessory with integral reinforcing mesh that creates a drip edge and plaster return, or approved equal.

E. Control Joint – "V" Control Joint (Product No. PL 093), rigid PVC (polyvinyl chloride) plastic single piece control joint as furnished by Plastic Components, Inc., for use at intervals in the field of the wall, and at corners of penetrations such as windows, doors, and similar through wall penetrations, or approved equal.

2.04 DRAINAGE MAT

A. Sto DrainScreen 6mm – nominal ¼" (6 mm) tangled filament nylon core drainage mat with fabric facing, or approved equal.

2.05 CEMENT BOARD

A. Cement Board – minimum ½ inch (13 mm) thick cement board in Compliance with ASTM C 1325

2.06 MECHANICAL FASTENERS FOR CEMENT BOARD

A. Corrosion resistant screw fasteners:

1. Steel Framing – minimum #8 Type S-12 corrosion resistant wafer head fasteners with minimum 3/8 inch (9.5 mm) and three thread penetration into framing and minimum 0.395 inch (10 mm) head diameter

2.07 JOB MIXED INGREDIENTS

A. Water: clean and potable.

B. Portland cement: Type 1 in compliance with ASTM C 150

2.08 CEMENT BOARD STUCCO JOINT REINFORCEMENT

A. StoGuard Mesh with Sto base coat, or approved equal.

2.09 CEMENT BOARD STUCCO BASE COAT

A. Base Coat (select one)

1. Sto BTS Xtra – one component high build lightweight polymer modified portland cement-based base coat material, or approved equal.

2.10 CEMENT BOARD STUCCO REINFORCING MESH

A. Sto Mesh--nominal 4.5 oz./yd2 (153 g/m2), symmetrical, interlaced open-weave glass fiber mesh treated with alkaline resistant coating for compatibility with Sto materials (achieves Standard Impact Classification over foam insulation board) , or approved equal.

2.11 PRIMER

A. StoPrime Sand—acrylic based tinted, sanded primer for base coat surfaces, or approved equal.

NOTE: Priming is recommended to provide uniform substrate absorption and finish color, to improve adhesion and water resistance, and to retard efflorescence.

2.12 FINISH COAT

A. Stolit Finish – integrally colored, factory blended, acrylic textured wall finish with graded marble aggregate, or approved equal.

2.13 MIXING

A. StoGuard, or approved equal.

1. Sto Gold Fill – mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with water.
2. Sto EmeraldCoat – mix with a clean, rust-free electric drill and paddle to a uniform consistency. Do not thin, or dilute with waterh.

B. Adhesive and Base Coats for Cement Board Stucco and Foam Build-outs:

1. Refer to applicable Sto Product Bulletin for selected adhesive/base coat material(s).

C. Primer--mix with a clean, rust-free high speed mixer to a uniform consistency.

D. Finish--mix with a clean, rust-free high speed mixer to a uniform consistency. A small amount of water (up to 12 ounces [0.4 L]) may be added to adjust workability. Limit addition of water to amount needed to achieve the finish texture.

E. Mix only as much material as can readily be used.

F. Do not add lime, anti-freeze compounds, or other additives to any of the materials.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. Pre-qualify under Quality Assurance requirements of this specification (section 1.h7.B).

3.02 EXAMINATION

A. Inspect sheathing surfaces for:

1. Damage and deterioration.

2. Moisture damage – record any areas of moisture damage.

B. Inspect sheathing application for compliance with applicable requirement:

1. Exterior Grade and Exposure 1 wood based sheathing – APA Engineered Wood Association E 30.

C. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air/moisture barrier, or cement board stucco installation to the General Contractor. Do not proceed with air/moisture barrier, or cement board stucco installation until deviations are corrected.

3.03 SURFACE PREPARATION

A. Sheathing

1. Remove surface contaminants and replace damaged sheathing.

2. All sheathing must be handled and installed in compliance with applicable building code and/or manufacturer requirements. Installed sheathing must be clean, dry and free from damage, frost, and all bond-inhibiting materials. Abut gypsum sheathing joints. Gap wood sheathing 1/8 inch (3 mm) at joints. Should gaps exceed ⅛ inch (3 mm) up to 1/2 inch (13 mm) wide, use StoGuard RapidGuard to fill joints, or apply low expanding urethane foam into joints and rasp or shave flush with sheathing surface in preparation for installation of StoGuard joint treatment.

3. Spot surface defects in sheathing with joint treatment (Sto Gold Fill, StoGuard RapidGuard, StoGuard RapidGuard, or Sto EmeraldCoat).

3.04 AIR/MOISTURE BARRIER INSTALLATION

A. The following instructions are applicable to:

1. Exterior or Exposure I Plywood in compliance with PS-1

B. Transition Detailing

1. Detail transition areas with Sto RapidGuard or StoGuard Transition Membrane, or approved equal to achieve air barrier continuity. For illustrations of installation, refer to Sto Guide Details and Sto RapidGuard Installation Guide or StoGuard Transition Membrane Installation Guide (www.stocorp.com).

C. Rough Opening Protection (select 1, 2, 3, or 4 for frame construction; for concrete or concrete masonry rough openings with wood bucks and similar openings with complex 3-dimensional geometry, select no. 3 or 4, Sto RapidGuard or StoGuard RapidGuard):

1. Sto Gold Fill with StoGuard Mesh, or approved equal: apply 9 inch (229 mm) wide StoGuard Mesh at rough openings. Immediately apply Sto Gold Fill by spray or trowel over the mesh and spread smooth with a trowel to completely cover the mesh. For deep section studs use minimum 4 inch (102 mm) wide strips of StoGuard Mesh to seal sill and head to jamb corners. Crease and center the mesh at the sill/head to jamb intersection, press into place and apply Sto Gold Fill over the mesh (refer to Sto Detail 20.20M).

2. Sto EmeraldCoat with StoGuard Fabric, or approved equal: apply Sto EmeraldCoat liberally by spray or roller to corners of openings, immediately place StoGuard RediCorners in the wet coating, and apply additional coating over the RediCorners to completely embed them. For deep section studs cut minimum 4 inch (102 mm) strips of StoGuard Fabric to seal sill and head to jamb corners. Crease and center the fabric strips at the sill/head to jamb intersection and embed the fabric strips in Sto EmeraldCoat. After all corners have been completed apply Sto EmeraldCoat liberally to the entire rough opening, immediately place StoGuard Fabric in the wet coating, smooth any

wrinkles with a brush or roller, and apply additional coating over the fabric to completely embed it. Overlap all seams minimum 2 inches (51 mm). Once completed, top coat with additional coating as needed to completely seal the surface. Allow to dry and inspect for pinholes or voids. If pinholes or voids are present, seal with additional coating or Sto RapidGuard.

3. Sto RapidGuard, or approved equal: apply a fillet bead of material with a caulking gun at interior corners inside the opening to seal jamb/sill and jamb/head seams. Apply material in a zig-zag pattern along sill, jambs, and head to form a generous bead of material along the surface to be covered. Use a 6 inch (152 mm) wide plastic drywall knife to spread the material to a uniform thickness of 12-20 mils (0.3-0.5 mm) before the material skins. Treat the entire rough opening surface in this manner and overlap onto the face of the sheathing 2 inches (51 mm) minimum all the way around
4. StoGuard RapidGuard, or approved equal: apply a generous bead of StoGuard RapidGuard with a caulking gun in a zig-zag pattern along the inside and outside surface of the rough opening. Spread with a 6 inch (152 mm) wide plastic spreader all the way around the opening

D. Sheathing Joint Treatment

1. Sto Gold Fill with StoGuard Mesh, or approved equal: place 4 inch (102 mm) wide mesh centered along sheathing joints and minimum 9 inch (229 mm) wide mesh centered and folded at inside and outside corners. Immediately apply Sto Gold Fill by spray or trowel and spread smooth with a trowel to completely cover the mesh.

E. Air/Moisture Barrier Coating Installation

1. Plywood Sheathing: apply waterproof coating by spray or roller over sheathing surface, including the dry joint treatment, rough opening protection, and transition areas, to a uniform wet mil thickness of 10 mils in one coat. Use ½ inch (13 mm) nap roller. Inspect surface and touch up areas (such as where OSB wood strands are raised) with a second coat of Sto EmeraldCoat, or approved equal to completely seal the surface. Protect from rain and freezing until completely dry.

F. Air /Moisture Barrier Connections and Shingle Laps

1. Coordinate installation of connecting air barrier components with other trades to provide a continuous air tight membrane.
2. Coordinate installation of flashing and other moisture protection components with other trades to achieve complete moisture protection such that water is directed to the exterior, not into the wall assembly, and drained to the exterior at sources of leaks (windows, doors and similar penetrations through the wall assembly).
3. Splice-in head flashings above windows, doors, floor lines, roof/sidewall step flashing, and similar locations with StoGuard detail component, or approved equal to achieve shingle lap of the air/moisture barrier such that water is directed to the exterior.

3.05 STARTER TRACK AND BACK MOUNT CASING BEAD ACCESSORY INSTALLATION

A. Strike a level line at the base of the wall to mark where the top of the starter track terminates.

B. Attach the starter track even with the line onto the structure a maximum of 16 inches (406 mm) on center with the proper fastener: Type S-12 corrosion resistant screws for steel framing with minimum 3/8 inch (9 mm) penetration, and galvanized or zinc coated nails for wood framing with minimum 3/4 inch (19 mm) penetration. Blocking installed between the studs may be necessary to secure the track flat against the wall surface. For solid sheathing attach directly into sheathing at 12 inches (305 mm) on center maximum.

C. Butt sections of starter track together. Miter cut outside corners and abut. Snip front flange of one inside corner piece (to allow the cement board to be seated inside of track) and abut.

D. Install Starter Track at other cement board system terminations as designated on detail drawings: above windows and doors, at floor lines, above roof along dormers or gable end walls, and beneath window sills with concealed flashing.

E. Install casing beads similarly at cement board stucco termination points—window and door jambs and other through wall penetrations. Install back-to-back casing beads at building expansion joints, thru-wall joints, where the cement board

stucco abuts dissimilar construction or substrates, at changes in building height, at floor lines, columns, and cantilevered areas. Install full accessory pieces where possible and avoid small pieces. Where casing bead is used back-to-back as an expansion joint back the membrane with StoGuard Transition Membrane, or approved equal.

F. Splice-in starter track at base of wall, above windows, doors, floor lines, roof/sidewall step flashing, and similar locations with StoGuard detail component, or approved equal to achieve shingle lap of the air/moisture barrier such that water is directed to the exterior.

3.06 DRAINAGE MAT INSTALLATION

A. Place drainage mat against the wall surface and unroll horizontally with the fabric facing out. Staple into place with corrosion-resistant fasteners. Use as few fasteners as needed to hold the mat in place, starting from the bottom of the wall at the starter track and working up. Do not fasten through flashing. Shingle lap fabric at horizontal courses. Shingle lap drainage mat over starter track and flashing at floor lines, decks, roof lines, window heads, and other areas where flashing is required, to direct water to the exterior. Butt ends of rolls and vertical seams. Trim at accessories around windows, doors, vents, or other penetrations through the wall. Do not install behind window nail flanges or accessories. Lap over back leg of installed accessories. Immediately follow installation of drainage mat with cement board stucco installation. Where cement board stucco installation will not immediately follow installation of drainage mat, use corrosion-resistant cap nails, cap staples, or cap screws every 16 inches (406 mm) on center along framing for more secure attachment. Cover drainage mat with cement board within 30 days of installation.

3.07 CEMENT BOARD STUCCO INSTALLATION

A. After satisfactory inspection of surfaces and correction of any deviations from specification requirements commence the cement board stucco installation as described below. Ensure the installed cement board surface is straight and true within ¼ inch in 10 feet (2 mm/m), and is clean, dry and free from damage, frost, and all bond-inhibiting materials before application of coatings or accessories to cement board surface. Ensure the installed base coat or primed base coat

surface is clean, dry, free from damage, frost, and all bond inhibiting materials, including dust, dirt, salts, oil, grease, or laitance, before application of finish.

B. Cement Board Installation

1. Install cement board horizontally or vertically. Offset joints from sheathing joints by minimum six inches (152 mm). Insert bottom edge of board into the starter track, and then attach the board through the sheathing to studs/framing members with fasteners spaced 8 inches (203mm) on center maximum at the perimeter and in the field of the board, making sure that the fasteners seat flush with the surface of the cement board and do not penetrate the surface of the cement board.
2. Install cement boards with vertical joints staggered and with ends and edges closely butted but not forced together and flush at the surface. Cut boards in an “L” shape around openings such as windows, doors, and similar penetrations.
3. Provide for expansion joints and control joints in cement board layout (see Design Requirements, Section 1.04).
4. Install one piece control joints at wall penetrations, for example, above and below windows and doors. Refer to Sto Tech Hotline No. 0307-S. Install control joints in accordance with the following guidelines:
    a. Light colors (LRV $\geq$ 70) – at no greater than 25 ft (7.6 m) intervals and 625 ft2 (58 m^2)
    b. Dark colors (LRV < 70 and $\geq$ 30) – at no greater than 16 ft (4.68 m) intervals and every 256 ft^2 (23.5 m^2)
    c. Do not exceed length to width ratio of 2-1/2:1 in expansion joint layout.
5. Inside Corners: install corner bead accessory at inside corners adhesively or mechanically. Refer to Sto Tech Hotline No. 0307-S.
6. Outside Corners: install corner bead accessory adhesively by completely embedding the accessory in the base coat material. Refer to Sto Tech Hotline No. 0307-S
7. Drip Edge: install drip edge accessory by completely embedding the

accessory in the base coat material. Refer to Sto Tech Hotline No. 0307-S.

C. Cement Board Joint Reinforcement, Accessory Overlaps, and Corners of Wall Penetrations

1. Install StoGuard Mesh, or approved equal centered over cement board joints. After placing mesh over joints skim coat the surface with base coat to completely cover the mesh.

2. Install StoGuard Mesh, or approved equal over perforated accessory flanges up to the “stop bead” on the accessory – starter tracks, casing beads, corner beads, and control joints. After placing mesh over flanges skim coat the surface up to the “stop bead” on the accessory with base coat to completely cover the mesh.

3. At corners of wall penetrations where no control joint is used embed 9 x 12 inch (230 x 305 mm) detail mesh diagonally in base coat.

D. Reinforced Base Coat Installation

1. Apply base coat over the cement board, with a stainless steel trowel to a uniform thickness of approximately 1/8 inch (3 mm). Work horizontally or vertically in strips of 40 inches (1016mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than 2-½ inches (64 mm) at mesh seams and fully overlap mesh at accessories to the accessory “stop bead.” Feather seams and edges. Double wrap all inside and outside corners with minimum 8 inch (203 mm) overlap in each direction where mesh is used in lieu of a corner bead accessory. Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible or if necessary to correct planar irregularities in the wall surface. Allow base coat to thoroughly dry before applying primer or finish.

2. Sloped Surfaces: for reveals, aesthetic bands, cornice profiles, sills or other architectural features that project beyond the vertical wall plane more than 2 inches (51 mm) apply waterproof base coat with a stainless steel trowel to the weather exposed sloped surface and minimum four inches (100 mm) above and below it. Embed standard mesh or detail mesh in the waterproof base

coat and overlap mesh seams a minimum of 2-½ inches (65 mm). Allow base coat to thoroughly dry before applying primer or finish.

E. Primer Installation

1. Apply primer evenly by brush or roller to the dry base coat surface

F. Finish Installation

1. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified, to the dry base coat (or primed base coat) surface. Follow these general rules for application of finish:

   a. Avoid application in direct sunlight.

   b. Apply finish in a continuous application, and work a wet edge towards the unfinished wall area. Work to an architectural break in the wall before stopping to avoid cold joints.

   c. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.

   d. Float “R” (rilled or swirl texture) finishes with a plastic float to achieve their rilled texture

   e. Do not install separate batches of finish side-by-side.

   f. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.

   g. Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.

3.08 PROTECTION

A. Provide protection of installed materials from water infiltration into or behind them.

B. Provide protection of installed materials from dust, dirt, precipitation, and freezing.

C. Provide protection of installed primer and finish from dust, dirt, precipitation, freezing and continuous high humidity until fully dry.

D. Provide sealant and backer material at cement board stucco terminations and at fixture penetrations through the cement board stucco to protect against air, water and insect infiltration. Provide weeps at floor lines, window and door heads, and other areas to conduct water to the exterior.

3.09 CLEANING, REPAIR AND MAINTENANCE

A. Clean and maintain the cement board stucco finish for a fresh appearance and to prevent water entry into and behind the assembly. Repair cracks, impact damage, spalls or delamination promptly.

B. Maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into the wall assembly.

C. Refer to Sto reStore Repair and Maintenance Guide (reStore Program) for detailed information on restoration – cleaning, repairs, recoating, resurfacing and refinishing, or re-cladding.

END OF SECTION

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Formed Products:

a. Metal Flashing

b. Liquid flashing.

B. Related Sections:

1. Section 07242 – Direct-Applied Finish System
2. Section 07920 – Joint Sealants.
3. Section 08900 – Louvers.
4. Section 09900 – Painting.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 – General Requirements apply to this Section.

1.03 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:

1. Identification of material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
4. Details of termination points and assemblies, including fixed points.
5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
6. Details of special conditions.
7. Details of connections to adjoining work.
8. Detail formed flashing at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing (if requested): 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications (if requested): 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
3. Accessories and Miscellaneous Materials (if requested): Full-size Sample.

E. Qualification Data: For qualified fabricator.

F. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

G. Warranty.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.07 WARRANTY

A. When warranties are required, verify with Owner's counsel that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

B. The warranty provisions and number of years for the warrantee by this article shall take precedence over the standard provisions in the GENERAL CONDITIONS.

C. Project Warranty: Submit Contractor’s warranty, signed jointly by Installer covering work of this section for the following warranty period and conditions

1. Warranty Period: Two years from the Project Acceptance Date.

2. Warranty shall cover repairs or replacement of damages to the building and its finishes due to leaks.

PART 2 - PRODUCTS

2.01 SHEET METALS

A. General: Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; structural quality.

2. Surface: Smooth, flat and with manufacturer's standard clear acrylic coating on both sides.

3. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

i. Color: Match existing.

2.02 LIQUID FLASHING

A. Available products but not limited to, APOC liquid flash permanent detail sealant, AP 515.

B. Color: To be determined.

C. Elongation: 500%.

2.03 UNDERLAYMENT MATERIALS

A. Inorganic SBS, ASTM D 226, minimum weight 37 lbs per 100 square feet.

2.04 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and

recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.

b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

F. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.05 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for

each application and metal.

2. Obtain field measurements for accurate fit before shop fabrication.

3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

C. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.

D. Liquid Flashing: MB Technology Liquid flashing for flashing details, or approved equal.

E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

F. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

H. Do not use graphite pencils to mark metal surfaces.

2.06 WALL SHEET METAL FABRICATIONS

A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend beyond wall openings as indicated on the Drawings. Form head and sill flashing with end dams as indicated on the Drawings. Fabricate from the following materials.

1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.

1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 UNDERLAYMENT INSTALLATION

A. General: Install underlayment as indicated on Drawings or if required by the manufacturer.

B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 4 inches (100 mm).

C. Polyethylene Sheet: Install polyethylene sheet with adhesive for anchorage. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches (50 mm).

3.03 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.
7. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
1. Coat back side of sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

E. Seal joints as shown and as required for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
2. Prepare joints and apply sealants to comply with requirements in Section 07920 - Joint Sealants.

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.04 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.05 LIQUID FLASHING INSTALLATION

A. Cleaning: Area of application must be dry, clean and free from grease and oils. Metals must be degreased with a suitable solvent.

B. Apply with brush or trowel to 125 mills. Comply with manufacturer’s instructions.

3.06 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.07 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07841 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

1.03 RELATED SECTIONS

A. Section 09265 – Gypsum Board Assemblies.

B. Division 15 – Mechanical.

C. Section 15300 – Wet Pipe Fire Sprinkler System.

D. Section 15400 – Plumbing.

E. Division 16 – Electrical.

1.04 PERFORMANCE REQUIREMENTS

A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

1. Fire-resistance-rated walls including fire walls, and fire partitions.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479:

1. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems

protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

a. Penetrations located outside wall cavities.

b. Penetrations located outside fire-resistance-rated shaft enclosures.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.

2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For Installer.

C. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

D. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

E. Manufacturer’s Warranty.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."

B. Installation Responsibility: Assign installation of through-penetration firestop systems in Project to a single qualified installer.

C. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

D. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.

2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:

a. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:

i. UL in its "Fire Resistance Directory."

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-

penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.09 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Notify Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by the WHFD AND/OR PROJECT MANAGER and building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application on Drawings that are produced by one of the following manufacturers:

1. A/D Fire Protection Systems Inc.
2. Grace, W. R. & Co. - Conn.
3. Hilti, Inc.
4. Johns Manville.
5. Nelson Firestop Products.
6. NUCO Inc.

7. RectorSeal Corporation (The).
8. Specified Technologies Inc.
9. 3M; Fire Protection Products Division.
10. Tremco; Sealant/Weatherproofing Division.
11. USG Corporation.

2.02 FIRESTOPPING, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials, including the following:
    a. Slag-/rock-wool-fiber insulation.
    b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    c. Fire-rated form board.
    d. Fillers for sealants.
2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.03 FILL MATERIALS

A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.

B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

2.04 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.

2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.03 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's

written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.04 IDENTIFICATION

A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:

1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."

2. Contractor's name, address, and phone number.

3. Through-penetration firestop system designation of applicable testing and

inspecting agency.

4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

3.05 FIELD QUALITY CONTROL

A. Inspecting Agency: If required by the authorities having jurisdiction over the project, and/or required by the County adopted building code and its amendments, the Hospital will engage a qualified, independent inspecting agency to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.

B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.06 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION

SECTION 07920 – JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Conditions and Special Conditions preceding these specifications shall apply to the work specified in this section.

B. Related Sections:

1. Section 03300 – Cast-In-Place Concrete.
2. Section 06400 – Architectural Woodwork.
3. Section 07242 – Direct-Applied Finish System.
4. Section 07620 – Sheet Metal Flashing and Trim.
5. Section 08710 – Door Hardware.
6. Section 08900 – Louvers.
7. Section 09265 – Gypsum Board Assemblies.
8. Section 09720 – Wall Covering.

1.02 GENERAL REQUIREMENTS

A. Work Included: Completely close with sealants all joints indicated or specified to be sealed to a watertight condition.

1.03 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures.

B. Manufacturer's Data: Submit copies of manufacturer's product data and specifications for type of sealant required.

C. Color Samples: If applicable, submit color finish samples of sealants exposed to view.

1.04 JOB CONDITIONS

A. Examine joint surfaces and backing, and their anchorage to the structure, and conditions under which joint sealer work is to be performed, and notify the WHFD AND/OR PROJECT MANAGER in writing of conditions detrimental to proper

completion of the work and performance of sealers. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.

1.05 PRODUCT HANDLING

A. Delivery: Deliver sealants to the job site in sealed containers labeled to show the designated name, formula, or specification number, lot number, color, date of manufacture, shelf life, curing time, manufacturer's directions, and name of manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene-jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer to control the joint for sealant placement, to break bond of sealant at bottom of joint, to form optimum shape of sealant bead on back side, and to provide a highly compressible which will minimize the possibility of sealant extrusion when joint is compressed.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer.

C. Primer for Sealants: Non-staining, as recommended by the sealant manufacturer.

D. Sealant:

1. At Exterior Vertical and Overhead Joints: One-part polyurethane-based sealant, conforming to ASTM C 920, Type S, Grade NS, Use NT, Class 25 as applicable. Provide one of the following, or approved equal.

   a. Dymonic; Tremco

b. Chem-Calk 900; Bostic Construction Products Div.

c. Sikaflex Ia; Sika Corp.

2. At Interior Vertical and Overhead Joints: Non-Elastomeric Sealant; acrylic-emulsion type, conforming to ASTM C 834. Provide one of the following, or approved equal:

   a. Rubber Calk 280; PRC.

   b. Acrylic Latex Caulk; Tremco

   c. Chem-Calk 600; Bostik Construction Products Div.

3. At Horizontal Joints: Two-part polyurethane-based sealant, conforming to ASTM C 920, Type M, Grade P, Use T, Class 25. Provide one of the following, or an approved equal:

   a. THC-900; Tremco

   b. Sikaflex 2c SL; Sika Corp.

4. Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints; complying with ASTM C 834. Provide one of the following or approved equal.

   a. BA-98; Pecora Corp.

   b. Tremco Acoustical Sealant; Tremco

   c. “Sheetrock” Acoustical Sealant; U.S. Gypsum Co.

5. Silicone Sealant: Mildew-resistant; Type S; Grade NS; Class 25; Use NT, formulated with fungicide; intended for sealing interior joints between plumbing fixtures and wall surfaces. Provide one of the following or approved equal:

   a. Dow Corning 786; Dow Corning Corp.

   b. SCS 1702 Sanitary; General Electric Co.

   c. Proglaze White; Tremco

   d. Omni Plus; Sonneborn

PART 3 - EXECUTION

3.01 INSTALLATION

A. Examine joints indicated to receive joint sealer, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealers until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; water; and surface dirt.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form release agents from concrete.

4. Clean metal, glass; and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint surfaces.

B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or

damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturer's printed installation instructions applicable to products and application indicated, except where more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations or ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions indicated.

C. Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.

D. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 19 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

E. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant move capability.

    a. Do not leave gaps between ends of joint fillers.

    b. Do not stretch, twist, puncture, or tear joint fillers.

    c. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.

3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

F. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant applications and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

2. Provide flush joint configuration per Figure 5B in ASTM C 1193, where indicated.

3.04 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers by joint sealers and of products in which joint occur.

3.05 PROTECTION

A. Protect joint sealers during and after curing period from contact with contaminating substances or form damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Project Acceptance. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new material to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION

DIVISION 8 – DOORS AND WINDOWS

SECTION 08100 – HOLLOW METAL DOOR FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal frames.
2. Fire rated door frames.

B. Related Sections:

1. Section 08210 - Wood Doors.
2. Section 08710 - Door Hardware.
3. Section 09110 – Non-Load Bearing Wall Framing.
4. Sections 09900 - Painting.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.

6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
10. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
11. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
12. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
13. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
14. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
15. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door frame design.
2. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
3. Locations of reinforcement and preparations for hardware.
4. Details of anchorages, joints, field splices, and connections.
5. Details of conduit and preparations for power, signal, and control systems.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal door frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

   1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.

   2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than above ambient after 30 minutes of standard fire-test exposure.

   3. Smoke Control Door Assemblies: Comply with NFPA 105.

D. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 1 – General Requirements with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal door frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door frames to be stacked in a vertical upright position.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.07 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.08 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace door frames that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective door frames.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel door frames from a SDI Certified manufacturer:

1. CECO Door Products (C).
2. Curries Company (CU).
3. Pioneer Industries (PI).

2.02 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.03 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.

2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.

3. Manufacturers Basis of Design:

C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.04 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.

2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.05 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.

4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.

5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

6. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        i. Two anchors per jamb up to 60 inches high.

        ii. Three anchors per jamb from 60 to 90 inches high.

iii. Four anchors per jamb from 90 to 120 inches high.

iv. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

i. Three anchors per jamb up to 60 inches high.

ii. Four anchors per jamb from 60 to 90 inches high.

iii. Five anchors per jamb from 90 to 96 inches high.

iv. Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

v. Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

7. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Section 08710 - Door Hardware.

D. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section - Door Hardware.

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.

3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 16 Sections.

2.06 STEEL FINISHES

A. Prime Finishes: Door frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap door frames to receive non-template, mortised, and surface-mounted door hardware.

3.03 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. At fire-protection-rated openings, install frames according to NFPA 80.
2. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
3. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
5. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
6. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Doors: Fit doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Doors:
    a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
    b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
    c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.

d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3.04 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION

SECTION 08210 – WOOD DOORS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Interior flush wood doors.
2. Acoustic (STC) rated wood doors.
3. Fire-rated flush wood doors.

B. Related Requirements:

1. Section 06400 – Architectural Woodwork.
2. Section 08100 – Hollow Metal Door Frames.
3. Section 08710 - Door Hardware.

1.02 REFERENCES

A. Reference Standards: See other applicable sections. Comply with version year adopted by the Authority Having Jurisdiction. In addition to requirements shown or specified, comply with application provisions of following for design, materials, fabrication, and installation of component parts:

1. ANSI A117.1 – Accessible and Usable Buildings and Facilities.
2. ANSI A208.1 – Wood Particleboard.
3. WDMA I.S.1-A Window and Door Manufacturer's Association Architectural Wood Flush Doors.

1.03 COORDINATION

A. STC-Rated Doors: Where installed in hollow metal frames, fill frames with compressed mineral wool insulation.

1.04 PREINSTALLATION MEETINGS

A. Conduct pre-installation meeting at Project site.

B. Discussion Topics:

1. Delivery, storage, and handling.

2. Coordination with hardware and access control installers.

3. Protection of installed doors.

1.05 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures.

B. Product Data: Each type of door and finish.

1. Core and edge construction.

2. WDMA I.S.1-A classification.

3. Fire rated doors.

4. Factory finish specifications.

C. Shop Drawings and Schedule:

1. Use same unit designations used in Contract Documents.

2. Hardware and wiring chase preparation.

3. Indicate location, size, and hand of each door.

4. Indicate dimensions and locations for mortises and holes for hardware.

5. Indicate dimensions and locations of cutouts.

6. Indicate location and extent of hardware blocking.

7. Indicate construction details not covered in Product Data.

8. Indicate door finish requirements.

9. Indicate fire protection ratings for fire rated doors.

D. Samples for Verification:

1. Selected HPL finish; minimum 8 by 10 inches (200 by 250 mm).

E. Warranty:

1. Provide sample of manufacturer’s warranty.

F. Closeout Submittal

1. Maintenance data.

2. Manufacturer warranties transferrable to Owner.

1.06 QUALITY ASSURANCE

A. Obtain flush wood doors through one single source from a single manufacturer wherever possible.

B. In addition to requirements specified, comply with WDMA I.S.1-A, latest edition "Industry Standard for Architectural Wood Flush Doors".

C. The top of each door shall bear a label from the manufacturer indicating the door construction, face veneer finish, cut and grade. If the doors are factory finished the label shall also have the finishing information.

D. The Door Manufacturer shall provide a letter, signed by an authorized company representative, to the WHFD AND/OR PROJECT MANAGER stating that the doors have been manufactured in compliance with this specification.

1.07 COORDINATION

A. Contractor shall be responsible for coordination and acquiring of all necessary information from hardware manufacturers. Door manufacturer shall be responsible for coordinating all necessary information received by Contractor from hardware manufacturers, in order that doors shall be properly prepared to receive hinges and hardware. Contractor shall provide his supplier with two copies of approved frame schedule, two copies of hardware schedule, and all necessary hardware templates. All the above information shall be in the possession of door supplier 120 days prior to desired delivery date of doors.

1.08 DELIVERY, STORAGE, AND HANDLING

A. No doors shall be delivered to the building until weatherproof storage space is available. Store and install doors in a dry space having controlled temperature between 60 deg F and 90 deg F (16 deg C and 32 deg C) and humidity range between 30 and 60 percent during the remainder of the construction period. Stack doors flat and off the floor, supported to prevent warpage. Protect doors from damage and direct exposure to sunlight.

B. Factory finish doors shall be individually wrapped in manufacturer’s standard plastic/polybags, stretch wrap, or cardboard cartons to protect the finish from damage and contact with other doors.

C. Do not walk or place other material on top of stacked doors. Do not drag doors across one another.

D. Contractor shall use all means necessary to protect doors from damage prior to, during, and after installation. All damaged doors shall be repaired or replaced by the contractor at no cost to the Owner.

E. Doors shall be palletized at factory in stacks of no more than 30 doors per pallet. Door edges shall be protected with heavy corner guards.

F. Mark each door on top rail with opening number used on Shop Drawings.

1.09 WARRANTY

A. Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch (6 mm) in 42-by-84-inch (1065-by-2130-mm) section.

b. Telegraphing of core construction in face veneers exceeding 0.01 inch in 3-inch (0.25 mm in 76-mm) span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

B. Warranty Periods:

1. Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Products of Aspiro™ Series | Marshfield-Algoma by Masonite Architectural are specified to indicate requirements for quality and appearance.

1. Website: masonite.com/architectural/products/aspiro-series.

2. Phone: 877.332.4484

B. Or approved equal.

C. Source Control: Supply all wood doors from a single manufacturer.

2.02 MANUFACTURING STANDARDS

A. Interior Flush Wood Doors: Window & Door Manufacturers Association publication ANSI/WDMA I.S. 1A “Industry Standard for Interior Architectural Wood Flush Doors”.

B. Fire-Rated Wood Doors: Conforming to NFPA 80; listed and labeled for required ratings based on testing at positive pressure NFPA 252 or UL 10C by UL or other testing agency acceptable to authorities having jurisdiction

1. Temperature-Rise Limit: Where indicated and at vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 250 deg F (121 deg C) above ambient after 30 minutes of standard fire-test exposure.

2. Blocking: Provide composite blocking approved for use in doors of fire-protection ratings indicated as needed to maintain WDMA performance level and eliminate through-bolting hardware.

3. Vertical Edge Construction:

a. Category B Positive Pressure: Intumescent seals applied to door frame per requirements of Section 08710 - Door Hardware where required.

C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control based on testing per UL 1784.

D. Acoustical Rating for Solid Core Doors: Where indicated in door schedule on Drawings, provide STC between 40 and 47 doors supplied with seals and gaskets tested by manufacturer.

2.03 LAMINATE FINISH WOOD DOORS INTERIOR SOLID CORE LAMINATE-FACED (HPDL) DOORS – CHOICE LAMINATE

A. Basis of Design: Aspiro™ Series | Marshfield-Algoma™ by Masonite Architectural.

B. Solid Core Choice Laminate (HPDL) Flush Doors:

1. WDMA Quality grade: Custom.

2. WDMA Performance Level: Heavy Duty, standard. Except Restrooms are Extra Heavy Duty

3. Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS. Vertical and post formable grade laminates are not acceptable.

   a. Colors, Patterns: Wilsonart, 7090 Fusion Maple.

4. Vertical Edges: Matching HPDL Edge Band applied after faces over Structural Composite Lumber. Matching **1/8 inch** (3.2mm) high impact edge bonded to structural composite lumber.

5. Horizontal Edges: Structural composite lumber. HPDL edge band (top rail only).

6. Core: Structural composite lumber.

7. Construction: Five Plies; stiles and rails bonded to core, and entire unit is abrasive planed. High pressure decorative laminate with high density fiberboard (HDF) crossbands.

8. Thickness: 1-3/4 inch.

C. Fire-Rated Choice Laminate (HPDL) Flush Doors.

1. Match appearance grade and applicable construction and performance requirements of other laminate finish flush wood doors.

2. Ratings: Category B positive pressure.

   a. 45-Minute Doors: Provide options.

3. Vertical Edges: High pressure decorative laminate over hardwood composite fire stile.

2.10 ACOUSTIC (STC) RATED INTERIOR FLUSH WOOD DOORS

A. Acoustic Rated Interior Flush Wood Doors.

1. Match appearance grade and applicable construction and performance requirements of laminate finish flush wood doors.

2. STC Ratings: Certified by manufacturer on basis of testing per ASTM E90 and E413. Rating requirements are stated in the door schedule on the Drawings.

3. Provide gasketing and door shoe as required to meet manufacturers tested acoustic rating.

2.11 DOOR CORE MATERIALS

A. Particleboard: Wood-based particleboard; ANSI A208.4, Grade LD-2 as required to meet WDMA Performance Duty level specified without added blocking..

B. Structural Composite Lumber: WDMA T.M.10.

2.12 FABRICATION

A. Factory Fitting: Fit to frame openings with clearances specified in WDMA I.S. 1A.

1. Undercut: Unless otherwise noted, maximum 3/8 inch (10 mm) above thresholds or floor finish.

2. Fire-Rated Doors: Comply with NFPA 80.

B. Factory Machining: Machine doors for hardware that is not surface applied.

1. Verify dimensions for hardware mortises in metal frames before machining.

C. Contractor Option: Doors supplied with wood frames may have hardware installed at factory.

2.13 FINISHES

A. Finish Grade: Match grade of door.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Inspect each door before installation for damage and defects per WDMA Section F-6.

3.02 INSTALLATION

A. Hardware installation is conforming to Section 08700 – Door Hardware.

B. Reference Standards:

1. Wood Doors: WDMA I.S. 1A.

2. Fire-Rated Doors: NFPA 80.

3. Smoke-and Draft-Control Doors: NFPA 105.

C. Align doors with uniform vertical and top edge clearance.

3.03 REPAIR

A. Repair of damage or defects is subject to Architect's acceptance, including removal of soiling. Provide new replacement doors for doors that cannot be satisfactorily repaired.

3.04 PROTECTING AND CLEANING

A. Protect installed doors from damage and soiling.

B. Clean doors shortly before inspection for Substantial Completion.

END OF SECTION

SECTION 08710 – DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Section 01310 Project Management and Coordination.
2. Section 01770 - Closeout Procedures.
3. Section 07920 – Joint Sealants.
4. Section 08100 - Hollow Metal Door Frames.
5. Section 08210 - Wood Doors.
6. Division 16 – Electrical.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.

4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.03 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:
    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.

d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.

e. Explanation of abbreviations, symbols, and codes contained in schedule.

f. Mounting locations for door hardware.

g. Door and frame sizes and materials.

h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.

b. Complete (risers, point-to-point) access control system block wiring diagrams.

c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Proof of Certification: Provide copy of manufacturer(s) official certification or accreditation document indicating proof of status as a qualified and authorized provider of the primary Integrated Wiegand Access Control Products.

E. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

F. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

G. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.04 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Section 01310 Project Management and Coordination keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.

2. Plans for existing and future key system expansion.

3. Requirements for key control storage and software.

4. Installation of permanent keys, cylinder cores and software.

5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Section 01310 Project Management and Coordination with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.

3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.06 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

D. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.07 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Twenty five years for manual surface door closer bodies.
3. Two years for electromechanical door hardware.

1.08 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Section 00500 – Substitution Request Form and Division 1 – General Requirements. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.02 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.

b. Three Hinges: For doors with heights 61 to 90 inches.

c. Four Hinges: For doors with heights 91 to 120 inches.

d. For doors with heights more than 120 inches, provide 4 hinges, plus 1

hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
    b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.
3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
    a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
    b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
    a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
5. Manufacturers:
    a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.

2.03 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
    1. Manufacturers:
        a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires.

Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
    a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.
2. Manufacturers:
    a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.

2.04 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years of experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

C. Cylinders: Original manufacturer cylinders complying with the following:
    1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
    2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
    3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
    4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
    5. Keyway: Match Facility Standard.

D. Permanent Cores: Match standard. Reference Division 01 for material required under project. Installation to be included under Division 08 "Door Hardware" base bid package.

1. Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.

2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.

3. Existing System: Field verify and key locks to match Owner's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)

2. Master Keys (per Master Key Level/Group): Five (5).

3. Construction Keys (where required): Ten (10).

G. Construction Keying: Provide construction master keyed cylinders.

H. Construction Keying: Provide temporary keyed construction cores.

I. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.

2. Provide transcript list in writing or electronic file as directed by the Owner.

2.05 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Mortise locks to be certified Security Grade 1.

2. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.13 requirements to 10 million cycles.

3. Provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.
4. Manufacturers:
    a. Sargent Manufacturing (SA) – 8200 Series.
    b. No Substitution.

2.06 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
    1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
    2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
    3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
    4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
B. Standards: Comply with the following:
    1. Strikes for Mortise Locks and Latches: BHMA A156.13.
    2. Strikes for Bored Locks and Latches: BHMA A156.2.
    3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
    4. Dustproof Strikes: BHMA A156.16.

2.07 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:
    1. General: Door closers to be from one manufacturer, matching in design and

style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Manufacturers:

a. Sargent Manufacturing (SA) - 281 Series.

b. No Substitution.

2.08 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
    a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
    a. Hiawatha, Inc. (HI).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

2.09 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

a. Hiawatha, Inc. (HI).

b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

c. Trimco (TC).

2.10 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).

2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

3. Reese Enterprises, Inc. (RE).

2.11 ELECTRONIC ACCESSORIES

A. Switching Power Supplies: Provide switching power supplies that are dual voltage, UL listed, supervised units. Units shall be field selectable with a dedicated battery charging circuit that provide 4 Amp at 12VDC or 24VDC continuous, with up to 16 independently controlled power limited outputs. Units shall tolerate brownout or overvoltage input ± 15% of nominal voltage and have thermal shutdown protection with auto restart. Circuit breaker shall protect against overcurrent and reverse battery faults and units shall be available with a single relay fire trigger or individually triggered relayed outputs. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw plus 50% for the specified electrified hardware and access control equipment.

1. Manufacturers:

    a. Securitron (SU) - AQ Series.

2.12 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.02 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.03 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."

4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in

another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Section 07920 - Joint Sealants.

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.04 FIELD QUALITY CONTROL

A. Field Inspection (Punch-Out Report): Reference Section 01770 - Closeout Procedures. Final inspect installed door hardware and state in report whether work complies with or deviates from specification requirements, including whether door hardware is properly installed, operating and adjusted.

3.05 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.06 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.07 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.08 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer’s Abbreviations:

1. AR – Adams Rite Manufacturing Co.
2. MK – McKinney.
3. SA – Sargent.
4. OT – Other.
5. RO – Rockwood.
6. PE – Pemko.

Hardware Sets

Set: 2.0

Doors: 3, 4, 5

3	Hinge, Full Mortise	TA2714	US26D MK
1	Office/Entry Lock	21 8205 LNL	US26D SA
1	Final Core	By Owner	626 OT
1	Wall Stop	406/409 as required	US26D RO
1	Gasketing	S88BL Width x Height	PE

Set: 3.0

Doors: 1

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Office/Entry Lock	21 8205 LNL	US26D	SA
1	Final Core	By Owner	626	OT
1	Surface Closer	281 O/P9 to suit location	EN	SA
1	Kick Plate	K1050 10" high BEV CSK	US32D	RO
1	Wall Stop	406/409 as required	US26D	RO
1	Gasketing	S88BL Width x Height		PE

Set: 4.0

Doors: 2

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Privacy Lock	V21 8265 VN1L	US26D	SA
1	Surface Closer	281 O/P9 to suit location	EN	SA
1	Kick Plate	K1050 10" high BEV CSK	US32D	RO
1	Mop Plate	K1050 6" high BEV CSK	US32D	RO
1	Wall Stop	406/409 as required	US26D	RO
1	Gasketing	S88BL Width x Height		PE

Set: 5.0

Doors: 6

1	Electric Strike	Confirm with supplier for compliant model that works with existing door latch.	7170	AR
1	Electric Power Transfer	Confirm with supplier for compliant model that works with existing door.	EPT	SU

END OF SECTION

SECTION 08900 - LOUVERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Extruded aluminum, wind driven rain resistant and wind-borne debris resistant stationary louver with horizontally mounted sight proof blades.

B. Related Sections:

1. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.
2. Section 07620 – Sheet Metal Flashing and Trim.
3. Section 07920 – Joint Sealants.
4. Section 09900 – Painting.
5. Division 15 – Mechanical.
6. Section 15810 – Ductwork and Ductwork Accessories.

1.02 REFERENCES

A. AAMA 611 – Voluntary Specification for Anodized Architectural Aluminum.

B. AMCA 500 - Test Methods for Louvers, Dampers and Shutters.

C. AMCA 511 - Certified Ratings Program for Air Control Devices.

D. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

G. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

H. ASTM D2244 - Standard Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates.

1.03 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.

B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.

C. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

D. Rain-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.04 PERFORMANCE REQUIREMENTS

A. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.

1. Wind Loads: Determine loads based on pressures as indicated on Drawings.

B. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.

1. Design earthquake spectral response acceleration, short period (Sds) for Project is 1.0.

2. Component Importance Factor is 1.0.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes, without buckling, opening of joints, overstressing of components, failure of connections, or other detrimental effects.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.05 SUBMITTALS

A. Submit under the provisions of Section 01330 – Submittal Procedures.

B. Product Data: For each type of product indicated.

1. Manufacturer's product data including performance data.

2. Preparation instructions and recommendations.

3. Storage and handling requirements and recommendations.

4. Installation methods.

5. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

C. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.

2. Show mullion profiles and locations.

3. Show materials, construction, dimensions, accessories, and installation details.

D. Product Schedule: Use same designations indicated on Drawings.

E. Samples: Submit sample of louver material, finish, and color.

F. Delegated-Design Submittal: Comply with structural and seismic performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

G. Qualification Data: For manufacturer and Installer.

H. Product Test Reports: For each type of louver for tests performed by a qualified testing agency indicating compliance with specified performance requirements.

I. Field quality control reports.

J. Manufacturer’s written warranty.

1.06 QUALITY ASSURANCE

A. Source Limitations: Obtain louvers and vents from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

B. Manufacturer Qualifications:

1. The manufacturer shall have implemented the management of quality objectives, continual improvement, and monitoring of customer satisfaction to assure that customer needs and expectations are met.

2. Manufacturer shall be International Organization for Standardization (ISO) 9001 accredited.

C. Product Qualifications:

1. Louvers licensed to bear AMCA Certified Ratings Seal. Ratings based on tests and procedures performed in accordance with AMCA 511 and comply with AMCA Certified Ratings Program. AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

2. Louvers shall be factory engineered to withstand the specified seismic loads.

a. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction (AHJ).

D. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

2. AWS D1.3, "Structural Welding Code - Sheet Steel."

3. AWS D1.6, "Structural Welding Code - Stainless Steel."

E. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.

C. Handling: Protect materials and finishes during handling and installation to prevent damage.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction

1.08 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.09 WARRANTY

A. Manufacturer shall provide standard limited warranty for louver systems for a period of five years (60 months) from date of installation, no more than 60 months after shipment from manufacturing plant. When notified in writing from the Owner of a manufacturing defect, manufacturer shall promptly correct deficiencies without cost to the Owner.

B. Manufacturer shall provide 20 year limited warranty for fluoropolymer-based finish on extruded aluminum substrates.

1. Finish coating shall not peel, blister, chip, crack or check.
2. Chalking, fading or erosion of finish when measured by the following tests:
3. Finish coating shall not chalk in excess of 8 numerical ratings when measured in accordance with ASTM D4214.
4. Finish coating shall not change color or fade in excess of 5 NBS units as determined by ASTM D2244 and ASTM D822.
5. Finish coating shall not erode at a rate in excess of 10%/ 5 year as determined by Florida test sample.

C. Manufacturer shall provide a 5 year limited warranty for Class I and a 3 year limited warranty for Class II anodized finish on extruded aluminum substrates.

1. Seller warrants the Finish under normal atmospheric conditions.

a. Will not crack, craze, flake or blister

b. Will not change or fade more than (5) Delta-E Hunter units as determined by ASTM method D-2244

c. Will not chalk in excess of ASTM D-4214-07 number (8) rating, determined by the procedure outlined in ASTMD-4214-07 specification test.

2. Any forming or welding must be done prior to finishing. Post forming or welding will void the warranty.

3. This Warranty applies only if the anodized aluminum product is installed in strict accordance with Seller's recommended practices and maintained in accordance with AAMA (American Architectural Manufacturers Association) publication number 609 and 610-09 ("Cleaning and Maintenance Guide for Architecturally Finished Aluminum").

PART 2 - PRODUCTS

2.01 MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T5, T-52, or T6.

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Aluminum Castings: ASTM B 26/B 26M, Alloy 319.

D. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.

2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.

3. For color-finished louvers, use fasteners with heads that match color of louvers.

E. Post-installed Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to

sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.02 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing, to produce uniform appearance.

C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

D. Include supports, anchorages, and accessories required for complete assembly.

1. Exterior Corners: Prefabricated corner units with mitered and welded blades at corners.

E. Provide subsills made of same material as louvers for recessed louvers.

F. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.03 MANUFACTURER

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Ruskin Company; 3900 Dr. Greaves Road, Kansas City, Missouri 64030. Tel: (816) 761-7476.

2. Requests for substitutions will be considered in accordance with provisions of Section 01600 – Product Requirements.

2.04 STATIONARY BLADE LOUVER:

A. Model: EME420DD.

B. Fabrication: Extruded Aluminum stationary horizontal chevron louver style.

1. Design: Double drainable blades shall be contained within the frame with double downspouts in jambs and mullions. Louver design shall limit span between visible mullions to 120 inches (3048 mm).

2. Frame:

   a. Frame Depth: 4 inches (100 mm).

   b. Material: Extruded aluminum, Alloy 6063-T6.

   c. Wall Thickness: 0.081 inch (2.1 mm), nominal.

3. Blades:

   a. Style: Horizontal.

   b. Material: Extruded aluminum, Alloy 6063-T6.

   c. Exterior Wall Thickness: 0.063 inch (1.6 mm), nominal.

4. Fabrication:

   a. Mullion Style – Visible mullions or frames are utilized at the perimeter of the louver with continuous blade appearance up to 120 inches (3048 mm) wide. Louvers wider than 120 inches (3048 mm) shall incorporate visible mullions at certain intervals vertically within the louver perimeter to support the louver blades. Intermediate rear-mounted blade supports may be utilized between mullions but shall not interrupt blade appearance from exterior.

5. Assembly:

   a. Factory assembled louver components. Mechanically fastened construction.

6. Minimum assembly size: 12 inches wide by 6 inches high (305 mm x 102 mm).

7. Recycled Content: 18% post-consumer. 55% pre-consumer, post-industrial, total 73% by weight.

C. Performance Data:

1. Performance Ratings: AMCA licensed.

a. Based on testing 48 inch by 48 inch (1219 mm by 1219 mm) size unit in accordance with AMCA 500.

2. Free Area: 40 percent, nominal.

3. Free Area Size: 6.33 sf (.59 sm).

4. Maximum Recommended Air Flow through Free Area: 1250 feet per minute (6.4 m/s).

5. Air Flow: 7913 cubic feet per minute (136 cu. m/min).

D. Wind Driven Water Penetration Performance:

1. Based on testing 39 inches x 39 inches (1 m x 1 m) core area, 41 inches x 44 inches (1.04 m x 1.12 m) nominal size unit in accordance with AMCA 500-L.

2. Wind Velocity: 29 mph (47 kph).

a. Rainfall Rate: 3 inches/hour (76 mm/hour).

b. Free Area Velocity: 1190 feet per minute (362.7 m/sec).

c. Water Resistance Effectiveness: 99.% (AMCA Class A).

3. Wind Velocity: 50 mph (80 kph).

a. Rainfall Rate: 8 inches/hour (203 mm/hour).

b. Free Area Velocity: 759 feet per minute (231.3 m/sec).

c. Water Resistance Effectiveness: 99.3% (AMCA Class A).

E. Design Wind load: Per Code.

F. Louvers shall be factory engineered to withstand the specified seismic loads.

1. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction (AHJ).

2.05 ACCESSORIES

A. Insulated Aluminum Blank-Off Panels: 0.040 (1 mm) aluminum sheet, 2 inch (51 mm) aluminum skin insulated core, factory installed with removable fasteners and neoprene gaskets.

B. Aluminum Filter Racks: Formed channel racks to accept standard thick filters. Unused bottom portion blanked off with 0.040 inch (1 mm) aluminum sheet.

1. Coordinate with Division 15 - Mechanical

C. Extended Sills:

1. Extruded aluminum, Alloy 6063-T6. Minimum nominal thickness 0.060 inch (1.5 mm).

2. Formed Aluminum, Alloy 3003. Minimum nominal thickness 0.081 inch (2.1 mm).

D. Visible Mullions: Manufacturer's standard vertical visible mullions for architectural accent as indicated on drawings.

2.06 LOUVER SCREENS

A. Insect Screens:

1. Aluminum: 18-16 mesh, mill finish, .011 inch (0.3 mm) wire.

2. Frame: Aluminum.

3. Location: Interior. Confirm with manufacturer recommendations.

B. General: Provide screen at each exterior louver.

C. Secure screen frames to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches (150 mm) from each corner and at 12 inches (300 mm) o.c.

D. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.

2. Finish: Same finish as louver frames to which louver screens are attached.

3. Type: Rewirable frames with a driven spline or insert.

2.07 ALUMINUM FINISHES

A. Anodized Finish:

1. Class I Color Anodized.

a. Comply with Aluminum Association AA-C21A44.

b. Apply finish following chemical etching and pretreatment.

c. Minimum Thickness: 0.7 mils (0.018 mm), 60 minute anodizing process.

d. Class I Color Anodized: Match existing Hospital louver color.

B. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean opening thoroughly prior to installation.

B. Prepare surfaces using methods recommended by the manufacture for achieving the best result for the substrate under the project conditions.

C. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.03 INSTALLATION

A. Install louvers at locations indicated on the drawings and in accordance with manufacturer’s instructions.

B. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.

C. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

D. Form closely fitted joints with exposed connections accurately located and secured.

E. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

F. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

G. Protect unpainted galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

H. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 07920 - Joint Sealants for sealants applied during louver installation.

3.04 ADJUSTING AND CLEANING

A. Test operation of louvers and adjust as needed to produce fully functioning units that comply with requirements.

B. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

C. Before final inspection, clean louver surfaces in accordance with manufacturer's instructions. Thoroughly clean and dry surfaces.

D. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION

DIVISION 9 – FINISHES

SECTION 09110 – NON-LOAD BEARING WALL FRAMING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Non-load bearing metal studs for wall assemblies and related items necessary to complete the Project as indicated on the Drawings and specified herein.

B. Related Sections:

1. Section 07242 – Direct-Applied Finish System.
2. Section 08100 – Hollow Metal Door Frames.
3. Section 08830 – Mirrors.
4. Section 09265 – Gypsum Board Assemblies.
5. Section 09511 – Acoustical Panel Ceiling.
6. Section 10260 – Corner Guards.
7. Section 10400 – Signage.
8. Section 10810 – Toilet Accessories.

1.02 REFERENCES

A. The latest editions of the following references, codes and standards are hereby made a part of this Section and installation work shall conform to applicable requirements therein except as otherwise specified herein or shown on the Drawings. Nothing contained herein shall be construed as permitting work that is contrary to code requirements. In case of conflicts among references, codes, standards and this Section, the most stringent shall apply.

B. ASTM A 780 - Standard Practice for Repair of Damaged and Uncoated areas of Hot-Dip Galvanized Coatings; 2000.

C. ASTM A 1003 - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2001.

D. ASTM B 633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 1998.

E. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members, 2000.

F. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products, 2000.

G. ASTM C 1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

H. AISI Specification for the Design of Cold-Formed Structural Members; 1996.

I. AISI – Standard for Cold-Formed Steel Framing General Provisions

1.03 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures.

B. Product Data: Submit manufacturer's data sheets on each product specified, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

B. Pre-installation Meetings: If requested by the WHFD AND/OR PROJECT MANAGER, conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer’s installation instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation per requirements of ASTM C645.

1.06 ENVIRONMENTAL CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Dietrich Metal Framing; 500 Grant Street, Suite 2226, Pittsburgh, PA 15219. ASD. Tel: (412) 281-2805. Fax: (412) 281-2965. E-mail: askforhelp@dietrichindustries.com. www.dietrichmetalframing.com.

1. Dietrich Metal Framing; 91-300 Hanua Street, Kapolei, HI (808) 682-5747.

B. Substitutions: Other manufacturers of equal quality may be substituted if approved by the WHFD AND/OR PROJECT MANAGER. The burden of proof of equality shall be borne by the Contractor.

C. All metal framing components and accessories shall be the product of a single manufacturer.

2.02 COMPONENTS

A. Studs: Cold-formed galvanized steel C-studs, in conformance with AISI Specifications for Design of Cold-formed Steel Structural Members; Dietrich Big “D” drywall studs.

1. Designation and size as indicated on the drawings.

   a. Minimum Delivered Thickness: Designation: STE-20 gauge, 0.0297 inches (0.75 mm) steel thickness, drywall stud.

   b. Minimum Delivered Thickness: Designation: STH-22 gauge, 0.0269 inches (0.68 mm) steel thickness, drywall stud.

   c. Minimum Delivered Thickness: Designation: STN-25 gauge, 0.0179 inches (0.45 mm) steel thickness, drywall stud.

   d. Minimum Delivered Thickness: Designation: STX-20 gauge, 0.0329 inches (0.84 mm) steel thickness, drywall stud.

2. Web Sizes: As indicated on drawings.

3. Flanges: Equal lengths 1-1/4 inches (.32 mm).

4. Section Properties: Manufacturer's standard section properties.

B. Runner Track: Cold-formed galvanized steel in conformance with AISI Specifications for Design of Cold-formed Steel Structural Members; Dietrich Big "D" drywall runner track.

1. Thickness equal to stud thickness minimum or heavier per design requirements.

a. Designation and size as indicated on the drawings.

b. Section Properties: Manufacturer's standard section properties.

C. Deflection Track: Cold-formed galvanized steel in conformance with AISI Specifications for Design of Cold-formed Steel Members.

1. Designation and size as indicated on the drawings.

2. Minimum Delivered Thickness: As indicated on the drawings.

3. Standard leg 2-1/2 inches.

4. Standard Vertical Slot of 1-1/2 inches in leg.

5. Minimum yield strength of 50 k.s.i. in 16 gauge and heavier and minimum yield strength of 33 k.s.i. in 18 gauge and lighter.

D. Hemmed Runner Track: Cold-formed galvanized steel sheet in conformance with AISI Specifications for Design of Cold-formed Steel Structural Members, Dietrich Big "D" drywall hemmed runner track:

1. Designation and size as indicated on the drawings.

2. Track Sizes: As indicated on the drawings.

3. Section Properties: Manufacturer's standard section properties.

E. Furring Channel: Cold-formed galvanized steel in conformance with AISI Specifications for Design of Cold-formed Steel Structural Members; Dietrich Big "D" furring channel:

1. Designation and size as indicated on the drawings.

F. U Channel: Cold-formed galvanized steel; Dietrich Big "D" U channel:

1. Designation and size as indicated on the drawings.

G. Metal Trims: Cold-formed galvanized steel.

1. Type and size as indicated on the drawings.

H. Framing Component Accessories: Provide the following accessories as required for a complete system.

1. EasyClip® Clip Angle or approved equal.

2. Angles.

3. Backing Strip.

I. Fasteners: Self-drilling, self-tapping screws; steel, complying with ASTM C 1513; galvanized coating, plated or oil-phosphate coated complying with ASTM B 633 as needed for required corrosion resistance.

J. Non-Hardening, Flexible Sealant: Latex acrylic.

2.03 MATERIALS

A. Cold-Formed Steel: Complying with ASTM A 1003/A 1003M; unless indicated otherwise.

B. Galvanized Coating: G40 coating weight minimum, complying with ASTM C 645.

2.04 FABRICATION

A. General: Framing components may be preassembled into panels prior to erecting.

B. Fabricate panels square, with components attached in a manner so as to prevent racking or distortion.

C. Cut all framing components squarely for attachment to perpendicular members, or as required for an angular fit against abutting members. Hold members positively in place until properly fastened.

D. Fasteners: Fasten components using self-tapping screws or welding.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation, inspect previous work of all other trades. Verify that all work is complete and accurate to the point where this installation may properly proceed in strict accordance with framing shop drawings.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 ERECTION

A. Install in accordance with requirements of ASTM C 754 standards and manufacturer’s instructions.

B. Framing Installation:

1. Erect framing and panels plumb, level and square in strict accordance with approved drawings.
2. Handle and lift prefabricated panels in a manner to not cause distortion in any member.
3. Anchor runner track securely to the supporting structure. Install concrete anchors only after full compressive strength has been achieved.
4. Butt all track joints. Securely anchor abutting pieces of track to a common structural element, or splice them together.
5. Align and plumb studs, and securely attach to the flanges or webs of both upper and lower tracks.
6. Attach wall stud bridging in a manner to prevent stud rotation. Space bridging rows according to manufacturer's recommendations.
7. Provided temporary bracing until erection is completed.
8. Where indicated in the drawings, provide for structural vertical movement using means in accordance with manufacturer's recommendations.

3.03 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09265 – GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Gypsum board and related items necessary to complete the Project as indicated on the Drawings and specified herein. This Section also includes but is not limited to:

1. Gypsum board and accessories.
2. Gypsum board finishing.
3. Trim and accessories.

B. Related Sections:

1. Section 07213 – Building Insulation.
2. Section 07841 – Penetration Firestopping.
3. Section 07920 – Joint Sealants.
4. Section 09110 – Non-Load Bearing Wall Framing.
5. Section 09511 – Acoustical Panel Ceiling.
6. Section 09651 – Resilient Flooring.
7. Section 09720 – Wall Covering.
8. Section 09900 - Painting.
9. Section 10260 – Corner Guards.
10. Section 10400 – Signage.
11. Section 10810 –Toilet Accessories.

1.02 REFERENCES

A. The latest editions of the following references, codes and standards are hereby made a part of this Section and gypsum installation work shall conform to applicable requirements therein except as otherwise specified herein or shown on the Drawings. Nothing contained herein shall be construed as permitting work

that is contrary to code requirements. In case of conflicts among references, codes, standards and this Section, the most stringent shall apply:

B. Gypsum Association GA216, “Recommended Specifications for the Application and Finishing of Gypsum Board”.

1.03 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures.

B. Product Data: Submit manufacturer's specifications and installation instructions with Project conditions and materials clearly identified or detailed for each required system.

C. Material Safety Data: Submit MSDS sheets.

1.04 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Deliver material to site promptly without undue exposure to weather.
2. Deliver materials in manufacturer's original sealed containers or bundles with labels legible and intact identifying brand name and contents.

B. Storage:

1. Store above ground in dry, ventilated space.
2. Protect materials from soiling, rusting and damage.
3. Store board to be directly applied to masonry walls at 70 degrees Fahrenheit for 24 hours prior to installation.

1.05 ENVIRONMENTAL CONDITIONS

A. Do not install gypsum board when ambient temperature is below 40 degrees Fahrenheit.

B. For adhesive attachment of gypsum board, and for finishing of gypsum board maintain ambient temperature above 50 degrees Fahrenheit for one week prior to attachment or joint treatment until joint treatment is complete and dry.

1.06 PROTECTION

A. Protect adjacent finishes and surfaces from damage or stains during installation.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All gypsum board and accessories shall be the product of a single manufacturer. Materials listed herein, unless otherwise designated, are United States Gypsum Company (USG) and require no further approval as to manufacturer or catalog number. Other manufacturers of equal quality may be substituted if approved by the WHFD AND/OR PROJECT MANAGER. The burden of proof of equality shall be borne by the Contractor.

2.02 BOARD MATERIALS

A. Gypsum Board:

1. ASTM C36 or ASTM C1396/C1396M, Type X, unless otherwise indicated on drawings.
2. For Fire Rated Assemblies, UL Type Designation: SCX or C, unless otherwise indicated on drawings.
3. Edges: Tapered.
4. Thickness: 5/8” unless otherwise indicated on drawings.

B. Ceiling Board:

1. ASTM C36 or ASTM C1396/C1396M, Type X non-sag type.
2. For Fire Rated Assemblies, UL Type Designation: SCX or C.
3. Thickness: 5/8”.

C. Water-Resistant Gypsum Board:

1. ASTM C630 or ASTM C1396/C1396M, Type X, water-resistant gypsum wallboard and exterior gypsum soffit board.
2. For Fire Rated Assemblies, UL Type Designation: SCX or C.
3. Edges: Tapered.
4. Thickness: 5/8”, unless otherwise indicated.

2.03 ACCESSORIES

A. Metal Trim for Gypsum Board:

1. Conform to profiles and dimensions indicated.
2. Material for interior Work: Galvanized steel, 26 gage minimum.
3. Corner beads: Dur-A-Bead No. 103 by USG or equal.
4. Casing beads: 200A by USG or equal.
5. Control joints:
    a. Roll-formed zinc with perforated flanges.
    b. Size: 1 ¾” wide with ¼” wide center channel.
    c. Provide with removable tape strip over channel.
    d. Acceptable product: USG No. 093 or equal.

B. Adhesive and Joint Treatment Materials:
1. Conform to requirements of ASTM C475.
2. Joint compounds:
    a. Drying-type (ready mixed): Sheetrock taping joint compound and topping joint compound, Sheetrock all purpose joint compound or equal.
    b. Setting type (chemically hardening): Sheetrock setting type joint compound or equal.
    c. Select Joint compound with laminating capabilities and the ability to withstand moisture.
3. Reinforcing joint tape:
    a. ASTM C475, 2” nominal width.
    b. For water-resistant gypsum board, backer board and veneer base, provide fiberglass tape as recommended by board manufacturer and ceramic tile setting material manufacturer.

C. Gypsum Board Screws:
1. Comply with ASTM C1002.
2. For non-rated systems, 1-1/4” or 1-3/8” nails are acceptable.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Prior to starting any work under this Section, carefully examine all substrates and adjoining construction and conditions under which Work is to be installed. Do not proceed with installation until conditions are suitable.

3.02 GENERAL INSTALLATION

A. Install in accordance with reference standards and manufacturer's instructions.

B. Install framing to comply with ASTM C840 requirements that apply to framing installation.

C. Install supplementary framing, blocking and bracing at terminations in gypsum board assemblies to support fixtures, equipment, heavy trim, grab bars, toilet accessories, furnishings or similar construction.

3.03 BOARD INSTALLATION

A. Single Layer Gypsum Board on Metal Framing:

1. Loosely butt gypsum board joints together and neatly fit.
2. Do not place butt ends against tapered edges.
3. Maximum allowable gap at end joints: 1/8".
4. Stagger joints on opposite sides of partitions.
5. Apply ceiling boards first where gypsum board ceilings and wall occur.
6. Cut openings in gypsum board to fit electrical outlets, plumbing, light fixtures and piping snugly and small enough to be covered by plates and escutcheons. Cut both face and back paper.
7. Screw or nail board in place securely with fasteners spaced according to manufacturer's recommendations.

B. Direct Gypsum Board Adhesive Application:

1. Apply adhesive with manufacturer's recommended spreader to backs of gypsum boards in band of four (4) beads each to center of each board and along edges.
2. Position boards vertically and press firmly in place to insure good bond.

3. Fasten top and bottom of board if required.

C. Water Resistant Gypsum Board:

1. Complete plumbing rough-in before gypsum board panels are erected.
2. Separate gypsum panels from rough-in and fixtures by ¼" space.
3. Make necessary cut-outs and seal cut or exposed panel edges with thinned down ceramic tile adhesive or with waterproof flexible sealant, as recommended by gypsum board manufacturer.
4. Install water-resistant board horizontally.
5. Do not install water-resistant board directly over vapor retarder.
6. Prior to tile application, fill openings around pipes, fittings, fixtures, interior angles and other penetrations with waterproof flexible sealant, as recommended by gypsum board manufacturer. Do not fill ¼" gap at bottom of panels.

D. Ceilings:

1. Install gypsum base sheets with long direction at right angles to furring with end joints occurring over joists or furring.
2. Stagger end joints.
3. Install ceiling boards prior to adjoining partition boards where feasible.
4. Fasten at not less than 12" on center.

3.04 ACCESSORY INSTALLATION

A. Trim:

1. Use same fasteners to anchor trim accessory flanges as required to fasten gypsum board to supports, unless otherwise recommended by trim manufacturer.
2. Install metal corner beads at external corners.
3. Install metal casing bead trim whenever edge of gypsum board would otherwise be exposed or semi-exposed.

B. Control Joints:

1. Install control joints at junction of gypsum board partitions with walls or partitions of other finish material.
2. Install control joints within long runs of partitions, ceilings or soffits at approximately 30'-0" on center or as indicated.
3. Where gypsum board is vertically continuous, as at stairwells, provide horizontal control joints at each floor level.

C. Special Trim: Install as indicated on Drawings and in accordance with manufacturer's instructions.

3.05 FINISHING

A. Provide levels of gypsum board finish for locations as follows, in accordance with Gypsum Association GA 214, "Recommended Specification: Levels of Gypsum Board Finish".

1. Level 1: Ceiling plenum areas and concealed areas, except provide higher level of finish as required to comply with fire resistance ratings and acoustical ratings.
2. Level 2: Gypsum board substrate at tile or stone, except remove tool marks and ridges.
3. Level 3: Gypsum board surfaces, except where another finish level is indicated.
4. Level 4 & 5: Gypsum board surfaces in public access and patient areas.

B. Interior Gypsum Board:

1. Pre-fill:
    a. Use setting-type joint compound. Mix joint compound according to manufacturer's directions.
    b. Fill joints between boards flush to top of eased or beveled edge.
    c. Wipe off excess compound and allow compound to harden.
2. Taping (Level 1):
    a. Butter taping compound into inside corners and joints.
    b. Center tape over joints and press down into fresh compound.

c. Remove excess compound.

d. Tape joints of gypsum board above suspended ceilings.

3. First coat (Level 2):

a. Use taping or all-purpose drying-type compound.

b. Immediately after bedding tape, apply skim coat of compound and allow to dry completely in accordance with manufacturer's instructions.

c. Apply first coat of compound over flanges of trim and accessories, and over exposed fastener heads and finish level with board surface.

4. Second coat (Level 3): After first coat treatment is dried, apply second coat of compound over tape and trim, feathering compound 2" beyond edge of first coat.

5. Third coat (Level 4):

a. After second coat has dried, sand surface lightly and apply thin finish coat to joints, fasteners and trim, feathering compound 2" beyond edge of second coat.

b. Allow third coat to dry. Apply additional compound, and touch-up and sand, to provide surface free of visual defects, tool marks, and ridges, and ready for application of finish.

6. Skim coat (Level 5):

a. Apply skim coat of topping or all-purpose drying-type compound over exposed surfaces of gypsum board according to manufacturer's directions.

b. After skim coat has dried, touch-up and sand to provide surface free of visual defects, tool marks, and ridges, and ready for application of finish.

C. Water-Resistant Gypsum Board: Treat fastener heads and joints with setting-type joint compound.

1. For joint to be covered with tile, apply tape and joint compound bedding coat and skim coat only; do not apply finish coats.

2. Do not crown joint or leave excess compound on panels.

3. Remove tool marks and ridges.

4. For fastener heads to be covered with tile, apply one coat of joint compound.

3.06 ADJUSTING

Correct damage and defects which may telegraph through finish work. Leave Work smooth and uniform.

END OF SECTION

SECTION 09511 - ACOUSTICAL PANEL CEILING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes acoustical panels, aluminum transitions, and exposed suspension systems for ceilings.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices.

C. Related Sections include the following:

1. Section 09110 - Non-Load Bearing Wall Framing.
2. Section 09265 - Gypsum Board Assemblies.

1.03 RELATED REQUIREMENTS:

1. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
2. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
3. ASTM E84 - Standard Method for Surface Burning Characteristics of Building Materials.
4. ASTM E580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
5. 2018 International Building Code - Section 1613, 1704, 1705, & 1706.
6. ASCE/SEI American Society of Civil Engineers 7-10: Minimum Design Loads for Buildings and Other Structures.

7. CISCA Ceilings & Interior Systems Construction Association.
    a. Ceiling Systems Handbook
    b. Seismic Construction Handbook
8. International Code Council ICC-ES Evaluation Report ESR-1222 issued December 2016

1.04 DEFINITIONS

A. AC: Articulation Class.

B. CAC: Ceiling Attenuation Class.

C. LR: Light Reflectance coefficient.

D. NRC: Noise Reduction Coefficient.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Ceiling suspension system members.
2. Method of attaching hangers to building structure.
    a. Furnish layouts for clips, and other ceiling attachment devices whose installation is specified in other Sections.
3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
4. Minimum Drawing Scale: 1/8 inch = 1 foot.

C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Panel: Set of 6-inch- (150-mm-) square samples of each type, color, pattern, and texture.
2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- (300-mm-) long Samples of each type, finish, and color.

D. Manufacturers' product data for sealants, including printed statement of VOC content and material safety data sheets.

E. Maintenance Data: For finishes to include in maintenance manuals.

F. Manufacturer’s Warranty.

1.06 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.

1. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:

B. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:

1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E 580.

2. CISCA's Recommendations for Acoustical Ceilings: Comply with CISCA's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings--Seismic Zones 0-2."

C. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 – General Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.09 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full-size panels equal to 10 percent of quantity installed.
2. Suspension System Components: Quantity of each exposed component equal to 10 percent of quantity installed.
3. Hold-Down Clips: Equal to 10 percent of quantity installed.

PART 2 - PRODUCTS

2.01 ACOUSTICAL PANELS, GENERAL

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.

B. Acoustical Panel Colors and Patterns: Match or closely resemble existing appearance characteristics of the predominant panel used in the Hospital.

1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Prime Consultant from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

C. Antimicrobial Fungicide Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.02 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

A. Basis-of-Design Product: Subject to compliance with requirements, provide Eclipse as manufactured by USG Interiors, LLC.

1. See drawings for material and color.

2. Classification: Provide ceiling panels complying with ASTM E 1264 for type, form and pattern as follows:

   a. Type: III, mineral base with painted finish

   b. Form: 1, Nodular

   c. Pattern: EI, light texture embossed

3. Color: Flat White 050.

4. LR: Not less than 0.86, ASTM E 1477.

5. NRC: Not less than 0.75, ASTM C 423.

6. CAC: Not less than 35.

7. Edge/Joint Detail: SQ Square.

8. Suspension Grid Width: DX/DXL, 15/16 inch (24 mm).

9. Panel Thickness: 7/8 inch (22 mm).

10. Modular Size: 24 by 24 inches (610 by 610 mm).

11. VOC Emissions: Third party (GREENGUARD Gold) certified for low-emitting performance, meets California Department of Department of Public Health's (CDPH) Standard Method v1.1-2010 (CA Section 01350). 'Certificates of Compliance' for Low VOC Emissions are available on usg.com and at productguide.ulenvironment.com.

12. ClimaPlus™ 30 year limited system warranty. Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.

2.03 SEISMIC PERFORMANCE REQUIREMENTS

A. Seismic Performance: Suspended grids and ceiling panels shall be installed in accordance to ASTM C636, ASTM E580 (including approved alternate methods).

B. Ceiling design shall comply with ASCE/SEI American Society of Civil Engineers 7-10: Minimum Design Loads for Buildings and Other Structures

2.04 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted

by a qualified testing and inspecting agency.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

E. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.

F. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

G. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

H. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in-place

2.05 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

A. Narrow Face, Capped, Double Web, Cold Rolled Steel Suspension System: Main and Cross Tees as defined by ASTM C635, commercial quality pretreated and painted hot-dipped galvanized cold-rolled steel, exposed surfaces prefinished in manufacturer's standard corrosion resistant enamel paint finish.

1. Basis of Design: Subject to compliance with project requirements, the design is based on the following: USG Interiors, LLC**, "**USG DONN® Brand DX/DXL™ 15/16" Acoustical Suspension System**".**

2. Structural Classification: heavy duty.

3. Tee Profile: Narrow Face 15/16" (22 mm) wide.

4. Tee Height: 1.64" (42 mm).

5. Grid Module: As noted on drawings.

6. Fire Rating: [Class A].
7. Color: standard flat white 050.
8. Seismic Criteria:
    a. Reference Seismic standards per ASTM E580 and CISCA guidelines.
    b. Seismic Design Category as defined by the IBC (International Building Code): D.

B. Accessories.

1. Wall molding: Inside Corner: Field-mitered joints at wall molding. Prefabricated corner cap; formed to 90° angle; hemmed edge; size and finish to match wall molding. Outside Corner: Prefabricated corner cap; formed to 90° angle; hemmed edge; size and finish to match wall molding.
    a. Angle shape; 2 in. mounting flange by 1 in. vertical flange; hemmed edges; exposed surface pre-finished to match suspension system components.
2. Shadow Molding: Formed steel section; exposed surfaces prefinished to match suspension system components.
    a. 1 1/4” exposed flange; 9/32” x 3/4” reveal; 7/8” vertical flange; Available Product: MS274.
3. Seismic Attachment Clip: Used to attach tees ends to perimeter angle for seismic design C D E F categories.
    a. Available products: ACM7.
4. Molding Attachment Clip: 2 in. thick x 1/2 in. thick x 1-5/8 in.; for Fineline Suspension System. Used to attach cross tees and main tees to walls/ wall molding.
    a. Molding Attachment Clip: 9/16 in. thick for SQ panels or FL panels, Available products: MAC2
5. Stabilizer bars:
    a. Panels with a length equal to or greater than 60” shall require stabilizer bars at the midpoint to secure suspension grid to the ceiling panel. Reference USG ceiling literature for more information.

6. Seismic Separation joint accessories: Tee sleeves to accommodate movement: Snap fit sleeve, prefinished to match suspension system components.
    a. For 15/16” DX/DXL Suspension System; Available products: TFS-1.
7. Four way Seismic Separation joint clip: Connects 4 way intersection: Snap fit sleeve with optional screw/fixing holes.
    a. Available products: DH4.
8. Compression Posts for bracing of ceiling applications:
    a. Available products: Provide telescoping sizes as required, i.e. Adjustable 18” to 30” [VSA 18/30], Adjustable 30” to 48” [VSA 30/48], Adjustable 48” to 84” [VSA 48/84], Adjustable 84” to 102” [VSA 84/102], Adjustable 102” to 120” [VSA 102/120], Adjustable 120” to 144” [VSA 102/144].

C. Suspension System Attachment devices.
1. Hanger Wire: Galvanized carbon steel; soft temper; pre-stretched; yield stress load at least three times the design load but not less than 12-gauge.
    a. Spacing and gauge per IBC, UL and CISCA design.
    b. Supplied and installed by ceilings subcontractor.

D. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

E. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least time three design load, but not less than 0.106-inch- (2.69-mm-) diameter wire.

F. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
1. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from

sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

a. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners, unless otherwise indicated.

b. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.06 ACOUSTICAL SEALANT

A. Products: Subject to compliance with requirements, provide one of the following:

1. Acoustical Sealant for Exposed and Concealed Joints:

a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.

b. USG Corporation; SHEETROCK Acoustical Sealant.

2. Acoustical Sealant for Concealed Joints:

a. OSI Sealants, Inc.; Pro-Series SC-175 Rubber Base Sound Sealant.

b. Pecora Corporation; BA-98.

c. Tremco, Inc.; Tremco Acoustical Sealant.

B. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), recommended for sealing interior concealed joints to reduce airborne sound transmission.

2.07 METAL EDGE ACOUSTICAL TO ACOUSTUCAL TILE TRIM

A. Provide extruded aluminum edge moldings and trim where indicated on drawings. The aluminum trim will feature a smooth visible face. The non-visible

face shall include extruded bosses to accommodate attachment clips that attach trim to adjacent ceiling grid. At vertical butt joints between adjacent trim pieces, Prefabricated corner pieces accommodate inwards and outwards 90 degree corners.

B. Acoustical to Acoustical transition trim basis of design: Subject to compliance with project requirements, the design is based on the following: USG Interiors, LLC, **"**USG COMPÄSSO™ ELITE AAS ALUMINUM TRIM".

1. Trim Height: 6" - ALSFTACAC610
2. Trim Depth: 0.68".
3. Trim Length: 10'-0".
4. Color: Standard flat white 050.

C. Accessories:

1. Attachment Clip; attaches grid to backside bosses on trim.
2. 90° corner trim pieces: to match Compässo™™ Elite AAS Suspension Trim.
    a. 90 degree Outside Corner: 6" **flat white**.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.03 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.

4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors.

6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

7. Do not attach hangers to steel deck tabs.

8. Do not attach hangers to steel roof deck. Attach hangers to structural members.

9. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers

not more than 8 inches (200 mm) from ends of each member.

10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of ` (3.2 mm in 3.6 m). Miter corners accurately and connect securely.

3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.04 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and

replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09651 – RESILIENT FLOORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Luxury Vinyl Tile Flooring.
2. Rubber Flooring.
3. Resilient Base.
4. Moisture Mitigation System.

1.03 RELATED SECTIONS

A. Section 01450 – Moisture Vapor and Alkalinity Testing.

B. Section 03300 – Cast-In-Place Concrete

C. Section 09265 – Gypsum Board Assemblies.

D. Section 09720 – Wall Covering.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification:

1. Flooring: Full-size units of each color and pattern of flooring required. If flooring specified is not a unit size, provide minimum 12” square sample.
2. For each type of base product indicated, in manufacturer's standard-size Samples but not less than 12 inches (300 mm) long, of each resilient product color, texture, and pattern required.

C. Safety Data Sheets (SDS) available for adhesives, moisture mitigation systems, primers, patching/leveling compounds, floor finishes (polishes), and cleaning agents.

D. Product Schedule: For flooring and resilient base.

E. Qualification Data: For qualified Installer.

F. Maintenance Data: For each type of flooring to include in maintenance manuals.

G. Manufacturer's Warranty.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for flooring installation indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.

B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store flooring material on flat surfaces.

1.07 PROJECT CONDITIONS

A. For Luxury Vinyl Tile Flooring: Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C), in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.

2. During installation.

3. 48 hours after installation.

B. For Rubber Sheet Flooring: The installation area must be fully enclosed, weather tight, and climate controlled between 63 deg F and 75 deg F and 40% to 60%

ambient relative humidity (RH). Dew point must be avoided. The substrate must be at least 5°F above dew point to be considered acceptable:

1. 48 hours before installation.
2. During installation.
3. 72 hours after installation (Do not use gas fueled blowers).

C. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

D. Close spaces to traffic during flooring installation.

E. Close spaces to traffic for 48 hours after flooring installation.

F. Install flooring after other finishing operations, including painting, have been completed.

1.08 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Flooring: Furnish quantity of flooring units equal to 5% of amount installed of each type, color, and pattern of flooring.
2. Resilient Base: Furnish not less than 10 linear feet (3 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.01 LUXURY VINYL TILE FLOORING

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following:

1. Armstrong Flooring, Inc.
   a. Natural Creations Classics: Arborart
   b. ASTM F1700: Class III, Type B – Embossed Surface.
2. No substitutions.

B. See drawings for material and color.

2.02 RUBBER SHEET FLOORING

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include the following:

1. Nora Systems, Inc.

a. Noraplan Valua 3.0 mm, Articles 173A & 175A

b. ASTM F1859: Type 1

c. Limited Wear Warranty: 5 years

2. No substitutions.

B. See drawings for material and color.

2.03 RESILIENT BASE:

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following:

1. Armstrong Flooring, Inc.

a. Color-Integrated Wall Base with Matte Finish.

b. Type: TP – Thermoplastic Rubber.

c. Group: 1 – Solid.

d. Style: B – Cove.

e. Size: 1/8” (3.2 mm) thick, 6 in (15.24 cm) high.

2. Mannington Commercial

a. Burkebase (Non-Ortho Phthalate) with Matte Finish.

b. Type: TP – Thermoplastic Rubber.

c. Group: 1.

d. Style: Coved.

e. Size: 1/8” (3.2 mm) thick, 6 in (15.24 cm) high No substitutions.

B. Resilient Base Standard: ASTM F 1861.

C. See drawings for material and color.

2.04 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Moisture Mitigation System

1. Manufacturer: Armstrong Flooring Inc., 2500 Columbia Avenue, Lancaster, PA 17603, www.armstrongflooring.com/commercial, for Armstrong Flooring.

2. Product: S-452 Seal Strong, Solvent free two component liquid epoxy to ASTM F3010.

a. Permeance to ASTM E96: <0.1 perm.

b. VOC content: <100 g/L (A and B combined); calculated, SCAQMD 1113.

3. Manufacturer: Aquafin Inc., 505 Blue Ball Rd. #160, Elkton, MD 21921, www.aquafin.net, for Nora Flooring.

a. Product: Vaportight Coat – SG2, Oil & Water Vapor Barrier Coating, two component epoxy.

i. Permeance to ASTM E96: .83 perms.

ii. VOC content: 47 g/L.

b. Product: Vaportight Coat – SG3, 100% Solids, Moisture Mitigation and pH Barrier Coating, two component clear epoxy.

i. Permeance to ASTM E96: 0.10 @ 16 mils.

ii. VOC content: 0 g/L.

C. Adhesives:

1. Flooring: Water-resistant type recommended by manufacturer to suit flooring and substrate conditions indicated.

a. Verify with manufacturer, compatibility of surface applied vapor reduction system with adhesive.

b. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

i. Luxury Vinyl Tile Adhesives: Not more than 50 g/L.

ii. Rubber Sheet Flooring Adhesives: Not more than 60 g/L.

2. Resilient Base: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

a. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

D. Heat Welds:

1. Description: EVA-copolymer with pigments for sealing continuous floor coverings.

2. Product: Nora Heat Weld, Article 946

3. Color: Match Flooring.

4. VOC: <12 g/L, in compliance with SCAQMD Rule 1168.

E. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of flooring.

C. Substrate Moisture: Measure and confirm Substrate Moisture Content, Ambient Relative Humidity, Ambient and Surface Temperature and Dew Point comply with manufacturer's recommendations. Test substrate moisture content beneath new and existing concrete surfaces.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Moisture, Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

a. Moisture tests shall be performed on all new and existing concrete surfaces. Flooring shall not be installed until tests meet thresholds recommended by the manufacturer.

4. Moisture Mitigation System: Apply vapor barrier (2-component epoxy) to substrate when moisture content exceeds manufacturer’s recommendations for installing resilient flooring.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install flooring until they are same temperature as space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.03 LUXURY VINYL TILE INSTALLATION

A. Comply with the latest edition of the manufacturer's written instructions for installing the floor tiles.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis in pattern indicated.

C. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

D. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

F. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.04 RUBBER SHEET FLOORING INSTALLATION

A. Supply a safe, climate controlled building and subfloor as detailed in the manufacturer's installation guide.

B. A subfloor that meets the requirements of ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring is required, or as detailed in the manufacturer's installation guide.

C. A secure storage area that is fully enclosed, weather tight, and climate controlled between 63°F and 75°F and 40% to 60% ambient relative humidity (RH) for at least 48-hours prior and during the installation, so the flooring contractor can acclimate all materials.

D. An installation area that is fully enclosed, weather tight, and climate controlled between 63°F and 75° and 40% to 60% ambient relative humidity (RH) for at least 48-hours prior, during, and 72-hours after installation (do not use gas fueled blowers).

E. Areas with direct prolonged exposure to sunlight should be protected with the use of Low E glass doors, windows or facades that reduce the UV transmissions to less than 1%.

F. Areas of the flooring subjected to direct sunlight, for example through doors or windows, must be covered using blind, curtains, cardboard or similar materials for 24-hours before, during, and for a period of 72-hours after the installation to allow “wet” adhesives to cure. Do not allow traffic when using wet set adhesives for a minimum of 12-hours and prohibit rolling loads for 72-hours. When using a dry adhesive method, the flooring can be trafficked immediately with no restrictions, consult with manufacturer. All flooring must be protected from damage during construction operations using Masonite, plywood or a similar product. Before laying the panels the flooring surface must be free of all debris. Lay panels so that they are edge to edge and tape the joints to prevent movement and debris entrapment. Inspect the flooring before covering and after removal for final acceptance.

G. Conduct post-installation cleaning after 72-hours for wet set adhesives. Conduct post-installation cleaning immediately for installations using dry adhesive methods. Refer to the manufacturer’s maintenance guide for product specific details.

H. Provide trained installers that have at least one of the following:

1. Approved by the manufacturer or INSTALL (International Standards & Training Alliance) certified for the requirements of the project.

2. An effective installation manager to manage the project, installers, and ensure that all of the required procedures are followed as detailed in the manufacturer’s installation guide.

I. Follow all requirements in the manufacturer’s installation guide.

3.05 RESILIENT BASE INSTALLATION

A. Comply with latest edition of the manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, wall coverings, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams, with tops of adjacent pieces aligned, and with inside corners fabricated from base materials that are mitered or coped.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible.

3.06 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of flooring.

B. Perform the following operations immediately after completing flooring installation:

1. Remove adhesive and other blemishes from exposed surfaces.

2. Sweep and vacuum surfaces thoroughly.

3. Damp-mop surfaces to remove marks and soil.

C. Protect flooring products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from flooring surfaces before applying liquid floor polish.

1. Apply two coats.

END OF SECTION

SECTION 09720 – WALL COVERING

PART 1 - GENERAL

1.01 SUMMARY

A. Rigid vinyl sheet for wall protection and decoration.

B. Related Sections:

1. Section 07920 – Joint Sealants.
2. Section 08830 – Mirrors.
3. Section 09265 – Gypsum Board Assemblies.
4. Section 09651 – Resilient Flooring.
5. Section 10260 – Corner Guards.
6. Section 10400 – Signage.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

B. National Fire Protection Association (NFPA)

C. Underwriters Laboratory (UL)

D. International Building Code (IBC)

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide Rigid Vinyl Sheet systems that conform to the following requirements of regulatory agencies and the quality control of the manufacturer.

1. Fire Performance Characteristics: Provide UL Classified Rigid Vinyl Sheet conforming with the NFPA Class A fire rating. Surface burning characteristics as determined by UL-723 (ASTM E-84) for Rigid Vinyl Sheet and adhesive.
    a. Adhesive shall be a maximum flame spread of 20 and a maximum smoke developed of 350 for .060" (1.5mm) thick material.
2. Self-Extinguishing: Provide Rigid Vinyl Sheet with a CC1 classification, as tested in accordance with the procedures specified in ASTM D-635-74,

Standard Test Method for Rate of Burning.

3. Impact Strength: Provide Rigid Vinyl Sheet that has an Impact Strength of 30.4 ft-lbs/ inch of thickness as tested in accordance with the procedures specified in ASTM D-256-90b, Impact Resistance of Plastics.
4. Chemical and Stain Resistance: Provide Rigid Vinyl Sheet that shows resistance to stain when tested in accordance with applicable provisions of ASTM D-543.
5. GREENGUARD Certified: Provide GREENGUARD Certified material. Profiles shall meet the requirements of GREENGUARD Certification Standards for Low-Emitting Products.
6. Fungal and Bacterial Resistance: Provide rigid vinyl that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.
7. Color Consistency: Provide components matched in accordance with SAE J-1545 - (Delta E) with a color difference no greater than 1.0 units using CIE Lab, CIE CMC, CIE LCh, Hunter Lab or similar color space scale systems.

1.04 SUBMITTALS

A. Product Data: Manufacturer's printed product data for each type of Rigid Vinyl Sheet specified.

B. Samples: Verification samples, 8" (203mm) square, of each type and color indicated.

C. Manufacturer's Installation Instruction: Manufacturer’s printed installation instructions for Rigid Vinyl Sheet.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in unopened factory packaging to the jobsite

B. Inspect materials at delivery to assure that specified products have been received.

C. Store in original packaging in a climate controlled location away from direct sunlight.

1.06 PROJECT CONDITIONS

A. Environmental Requirements: Products must be installed in an interior climate controlled environment.

1.07 WARRANTY

A. Standard manufacturer's Limited Lifetime Warranty against material and manufacturing defects.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. IPC Door and Wall Protection Systems, InPro Corporation, PO Box 406 Muskego, WI 53150 USA; Telephone: 800.222.5556, Fax: 888.715.8407, www.inprocorp.com

B. Provide all Rigid Vinyl Sheet and wall protection accessories from a single source.

2.02 MANUFACTURED UNITS

A. Rigid Vinyl Sheet

1. Palladium® Rigid Vinyl Sheet Options
    a. Item #: 405
    b. Dimensions: 4'x8' (1.22m x 2.44m)
    c. Thickness: .040" = 3/64" (1mm), standard
    d. Backing - unbacked
2. Accessories:
    a. Vinyl
        i. 407 Top Cap; Length: 8' (2.44m) standard, 10' (3.04m) available
    b. Color Matched Caulk

2.03 MATERIALS

A. Vinyl: Rigid Vinyl Sheet shall be manufactured from chemical and stain resistant polyvinyl chloride with the addition of impact modifiers. No plasticizers shall be added (plasticizers may aid in bacterial growth).

2.04 ACCESSORIES

A. Top caps shall be made of extruded PVC.

2.05 FINISHES

A. Color or pattern of Rigid Vinyl Sheet to be selected by the architect from the manufacturer's finish selection. Surface shall have a velvet texture.

B. Vinyl Accessories: Top caps shall be of a color matching Rigid Vinyl Sheet.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions in which the rigid vinyl sheet will be installed.

   1. Complete all finishing operations, including painting, before beginning installation of rigid vinyl sheet materials.

B. Wall surface shall be dry and free from dirt, grease and loose paint.

3.02 PREPARATION

A. General: Prior to installation, clean substrate to remove dust, debris and loose particles.

3.03 INSTALLATION

A. General: Locate the rigid vinyl sheet as indicated on the drawings for the appropriate substrate and in compliance with the manufacturer's installation instructions. Install level and plumb at the height indicated on the drawings.

B. Installation of rigid vinyl sheet

   1. Adhere to substrate with manufacturer recommended freeze-thaw stable, nonflammable, high strength, water based adhesive that trowels on and allows approximately 20 minutes working time before firming.

3.04 CLEANING

A. At completion of the installation, clean surfaces in accordance with the manufacturer's maintenance instructions.

END OF SECTION

SECTION 09900 – PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, DOE representative will select from standard colors and finishes available.

1. Interior and Exterior surfaces scheduled to be finished.

2. Non Ferrous metals, plated or factory finished items specifically noted to be painted or when such items occur as accessories and appurtenance to surfaces required to be painted.

C. Surfaces not to be finished, unless otherwise indicated.

1. Concrete floors, paving walks stairs and textured concrete. Other concrete surfaces scheduled not to be painted.

2. Finish hardware, unless prime coated.

3. Glass, plastic laminate, and ceramic tile.

4. Acoustical ceilings, unless scheduled to be painted.

5. Integrally colored plaster or EIFS systems.

6. Flooring and floor coverings.

7. Plumbing and lighting fixtures, and electrical device plates.

8. Movable furniture such as portable bookshelves, cubicles and cabinets.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:
    a. Architectural woodwork.
    b. Acoustical wall panels.
    c. Metal, phenolic, or plastic toilet enclosures.
    d. Metal, phenolic, or plastic lockers.
    e. Elevator entrance doors and frames.
    f. Elevator equipment.
    g. Finished mechanical and electrical equipment.
    h. Light fixtures.
2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
    a. Foundation spaces.
    b. Furred areas.
    c. Ceiling plenums.
    d. Utility tunnels.
    e. Pipe spaces.
    f. Duct shafts.
    g. Elevator shafts.
3. Finished metal surfaces include the following:
    a. Anodized aluminum.
    b. Stainless steel.
    c. Chromium plate.
    d. Copper and copper alloys.
    e. Bronze and brass.
4. Operating parts include moving parts of operating equipment and the following:
    a. Valve and damper operators.

b. Linkages.

c. Sensing devices.

d. Motor and fan shafts.

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.02 RELATED SECTIONS

A. Section 01450 – Moisture Vapor and Alkalinity Testing.

B. Section 05120 – Structural Steel Framing.

C. Section 07242 – Direct-Applied Finish System.

D. Section 07620 – Sheet Metal Flashing and Trim.

E. Section 08100 – Hollow Metal Door Frames.

F. Section 08900 – Louvers.

G. Section 09265 – Gypsum Board Assemblies.

H. Division 15 – Mechanical.

I. Division 16 – Electrical.

1.03 REFERENCES

A. ASTM D16 - Definition of terms relating to Paint, Varnish, Lacquer and Related Products.

B. ASTM D2016 - Test Method for Moisture Content of Wood.

C. MPI (Master Painter's Institute) - Approved Product List.

D. PCDA (Painting and Decorating Contractors of America - Painting - Architectural Specification Manual.

E. PCA (Portland Cement Association) - Painting Concrete.

F. SSPC (Steel Structures Painting Council - Steel Structures Painting Manual)

1.04 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1.05 SUBMITTALS

A. Submit under the provisions of Section 001330 – Submittal Procedures.

B. Product Data:

1. Materials List: Provide an inclusive list of required patching and coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's name, product name and/or catalog number and general product classification.

   a. For products with premixed colors, provide manufacturer's standard color chips for selection by the WHFD AND/OR PROJECT MANAGER.

2. Manufacturer's Information: Provide data on all listed materials, including:

   a. Thinning and mixing instructions

   b. Application instructions and required mil film thicknesses.

   c. Manufacturer's Material Safety Data Sheets.

C. Certifications: Provide a letter certifying paints and coatings are free of asbestos, lead, zinc-chromate, strontium chromate, cadmium, and mercury and mercury compounds. Provide a letter certifying the amounts of mildewcide added by both the paint manufacturer and paint supplier. Provide a letter certifying that abrasive blast media are free of crystalline silica.

D. Schedule of Finishes: Provide finish schedule including paint spread rates required to achieve final dry film thickness indicated in the schedule.

E. Schedule of Operations: Provide a work schedule showing sequence of operation and installation dates.

F. Samples:

1. Match existing color and submit paint finish samples, 8.5" x 11" in size illustrating selected colors and textures for each selection. Divide sample in horizontal strips showing prime and overlapping second and finish coats. Show coat tinting. Prepare transparent finish samples on same material as that on which coating will be applied. Identify each sample.

G. Manufacturer's Instructions: Indicate special surface preparation procedures, and substrate conditions requiring special attention. Refer to Section 3.01.

H. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

I. Qualification Data: For Applicator.

J. Delivery Receipts: Provide 3 copies of the delivery receipt, signed by the user's representative, attesting to delivery of extra paint as required under 1.10.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.

B. Applicator Qualifications: A firm or individual with experienced (a minimum of five years) in surface preparation and applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

1.07 REGULATORY REQUIREMENTS

A. Comply with State OSHL (Occupational Safety and Health Law) and pollution control regulations of the State Department of Health and EPA.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's brand name and lot number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions and coverage.
7. Color name and number.
8. VOC content.

B. Storage

1. Non-flammable Materials: Store materials not in use in tightly covered containers in a well-ventilated area. Maintain storage containers in a clean condition, free of foreign materials and residue.

2. Flammable Materials:

    a. Store in such a manner as to prevent damage. No paint material, empty cans, paint brushes and rollers may be stored in the building(s). Store these items in separate storage facilities away from the building(s). Contractor may furnish a separate job site storage structure, if the structure complies with the requirements of the local Fire Department. Keep the storage area shall clean. Lock any storage structures when not in use or when no visual supervision is possible.

    b. All rejected materials shall be removed from the job site immediately.

1.09 PROJECT CONDITIONS

A. Do not apply materials when surfaces and ambient temperatures are outside the ranges required by the paint product manufacturer. Do not apply exterior coatings during rain or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

B. Protect public, pedestrians and tenants from injury. Provided, erect and maintain safety barricades around scaffolds, hoists and where constriction operations create hazardous conditions.

C. Completed Work: Provide necessary protection for wet paint surfaces.

D. Protective Covering and Enclosures: Provide and install clean sanitary drop cloth or plastic sheets to protect furniture, equipment, floor and other areas that are not scheduled for treatment. Remove any paint applied to surfaces not scheduled for treatment.

E. Fire Safety: Contractor and its employees shall not to smoke in the vicinity of the paint storage area. Exercise precautions against fire at all times and remove waste rags, plastic (polyester sheets), empty cans, etc. from the site at the end of each day.

F. Safeguarding Property: Safeguard the work and also the property of the Hospital and other individuals in the vicinity of Contractor’s work. Make good on any

damages and for losses to work or property caused by Contractor or its employee's negligence. Where damaged property cannot be cleaned and restored to its original condition (i.e. prior to being damaged) replace it with a new product of equal quality. No prorating or use of "used" products will be permitted.

1.10 EXTRA MATERIALS

A. Provide extra paint in each of the different colors, types and surface textures of exterior and interior paint to the user / school upon completion of the project. Paint shall be in unopened one gallon containers and labeled with color, type, texture, room locations, and date in addition to manufacturer's label.

1. Provide 5 gallons of each color for paint used over large areas, such as the exterior of the building and in the Laboratory.
2. Provide 1 gallon of each color for all other areas.
3. At project closeout, provide the color mixture name and code to the WHFD AND/OR PROJECT MANAGER for accurate future color matching.

1.11 WARRANTY

A. Provide a two year guarantee that the work performed under this section conforms to the contract requirements and is free of any defect of material or workmanship.

PART 2 - PRODUCTS

2.01 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Mildewcide

1. Except for metal primers, provide primer and finish coats with suitable chemical mildewcide to the maximum amount of mildewcide per gallon of paint permitted by the mildewcide manufacturer without adversely affecting the quality of the paint, but not less than one ounce per gallon.

C. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names in the Paint Systems Schedule in Part 3 below to designate colors or materials, is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed products to be used.

2. Equivalency: Equivalent products to the specified products are listed in the Master Painter's Institute's "Architectural Painting Specification Manual."

3. Substitution: Requests for substitution of a product or product if a manufacturer is not on the "Approved Product List" will be evaluated for equivalency based on product test results per the test criteria of the Master Painter's Institute.

D. Colors: See the drawings.

E. Hazard Materials: Do not use paint or paint products containing asbestos, lead, mercury and mercury compounds, zinc chromates, strontium-chromate, and cadmium. Do not use abrasive blast media that contain crystalline silica.

2.02 MANUFACTURERS

A. Basis of Design: Benjamin Moore and Co., 101 Paragon Drive, Montvale, NJ 07645; Tel: 866-708-9181; Email: info@benjaminmoore.com; Web: www.benjaminmoore.com.

B. No Substitutions.

2.03 MISCELLANEOUS MATERIALS

A. Provide patching and repair materials. Compatible with paint finishes and substrates. Use weather resistant materials for exterior surfaces and surfaces exposed to moisture.

B. Accessories

1. General: Provide other materials not specifically indicated but required to

achieve the finishes specified, of commercial quality.

2. Thinners: Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's requirements. Do not use compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline for thinning.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

2. Ensure that concrete and masonry surfaces are cured and dried to meet paint manufacturer's recommendations.

3. Start of painting will be construed as Applicator’s acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify WHFD AND/OR PROJECT MANAGER about anticipated problems when using the materials specified over substrates primed by others.

3.02 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove dust, oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.

D. Surface Preparation Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

1. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
2. Determine alkalinity and moisture content of surfaces by performing appropriate tests. Submit test results to WHFD AND/OR PROJECT MANAGER.
    a. Prior to painting, concrete and masonry surfaces shall be allowed to cure and dry in accordance with the paint manufacturer's instructions and recommendations.
    b. Efflorescence and laitance shall be removed from the surface.
    c. Prior to paint application, interior and exterior concrete and masonry (including grout joints) scheduled to receive paint shall be tested to determine the alkalinity level of the surface. Testing shall be performed in strict accordance with the test kit manufacturer's instructions. Submit test results to the WHFD AND/OR PROJECT MANAGER.
    d. Where the alkalinity level exceeds the pH level limit of the primer take one of the following three remedies at no additional cost to the Hospital:
        i. If new concrete or masonry, wait until alkaline level has dropped

below the limit.

ii. Substitute a primer that is able to resist the measured alkalinity and that is compatible with the paint finish. Alkyd based primers and top-coats or epoxy ester primers shall not be used. Submit the substitute primer to the WHFD AND/OR PROJECT MANAGER for review.

iii. Neutralize the surface in accordance with the primer manufacturer's instructions to reduce the alkaline level. However, acid washing is not permitted where the surface has been finished with a cementitious coating.

E. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3. Use only thinners approved by paint manufacturer and only within recommended limits.

F. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

1. Except where specifically noted in this section, all paint shall be ready-mixed and pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.

2. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.

3.03 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The term “exposed surfaces” includes areas visible when permanent or built-in fixtures, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only unless otherwise noted.
6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
10. Sand lightly between each succeeding enamel or varnish coat.
11. Ensure primers are top coated within the times required by the paint manufacturers. Top coats not applied within the recoating window may be rejected.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a

smooth, even surface according to manufacturer's written instructions, sand between applications.

2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

3. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

4. Be aware of the requirements for, and restrictions on, spray painting contained in PROJECT CONDITIONS Paragraph.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.

2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

F. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

2. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.04 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.05 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by WHFD AND/OR PROJECT MANAGER.

B. Provide “Wet Paint” signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.06 EXTERIOR PAINT SCHEDULE

A. Concrete Unit Masonry: Provide the following finish systems over exterior concrete unit masonry:

1. Acrylic Finish: Two finish coats over a block filler.

a. Block Filler: Concrete unit masonry block filler: MPI #3.

b. Finish Coats: 2 coats exterior acrylic paint. MPI #15.

c. Finish Coat Gloss Level: match existing gloss level.

B. Exterior Gypsum Soffit Board: Provide the following finish systems over exterior gypsum soffit board:

1. Acrylic Finish: Two finish coats over a primer.

a. Primer: Exterior gypsum soffit board primer. MPI #17.

b. Finish Coats: 2 coats exterior acrylic paint. MPI #81.

c. Finish Coat Gloss Level: match existing gloss level.

C. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

1. Acrylic Finish: Two finish coats over a rust-inhibitive primer.

a. Primer: Exterior ferrous-metal primer. MPI #134.

b. Finish Coat: Exterior acrylic paint. MPI #11.

c. Finish Coat Gloss Level: match existing gloss level.

3.07 INTERIOR PAINT SCHEDULE

A. Concrete Unit Masonry Previously Painted: Provide the following finish systems over interior concrete masonry:

1. Acrylic Finish: Two finish coats over a block filler.

a. Block Filler: Primer MPI #45; mils DFT.

b. Finish Coats: 2 coats interior acrylic paint. MPI #47

c. Finish Coat Gloss Level: match existing gloss level.

B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:

1. Acrylic Finish: Two finish coats over a primer.

a. Primer: Interior gypsum board primer. MPI #45; mils DFT.

b. Finish Coats: 2 coats interior acrylic paint. MPI #47

c. Finish Coat Gloss Level: match existing gloss level.

C. Ferrous Metal: Provide the following finish systems over interior ferrous metal. Primer is not required on shop-primed items.

1. Acrylic Finish: Two finish coats over a rust-inhibitive primer.

   a. Primer: Exterior ferrous-metal primer. MPI #134.

   b. Finish Coat: Exterior acrylic paint. MPI #54.

   c. Finish Coat Gloss Level: match existing gloss level.

END OF SECTION

DIVISION 10 – SPECIALTIES

SECTION 10260 – CORNER GUARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Corner guard system for wall protection.

B. Related Sections:

1. Section 09110 – Non-Load Bearing Wall Framing.
2. Section 09265 – Gypsum Board Assemblies.
3. Section 09720 – Wall Covering.

1.02 SECTION INCLUDES

A. High Impact Surface Mount Corner Guard System.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

B. National Fire Protection Association (NFPA)

C. Underwriters Laboratory (UL)

D. International Building Code (IBC)

1.04 SYSTEM DESCRIPTION

A. Performance Requirements: Provide corner guard system that conform to the following requirements of regulatory agencies and the quality control of the manufacturer's door and wall protection systems.

1. Fire Performance Characteristics: Provide UL Classified corner guards conforming with NFPA Class A fire rating. Surface burning characteristics, as determined by UL-723 (ASTM E-84), shall be flame spread of 10 and smoke development of 350 - 450.
2. Self-Extinguishing: Provide corner guards with a CC1 classification, as tested in accordance with the procedures specified in ASTM D-635-74, Standard Test Method for Rate of Burning.

3. Impact Strength: Provide rigid vinyl profile materials that have an Impact Strength of 30.2 ft-lbs/inch of thickness as tested in accordance with the procedures specified in ASTM D-256-90b, Impact Resistance of Plastics.

4. System Impact Resistance: Provide a corner guard system that resists an impact of 153.9 ft-lbs while producing no visual blemishes upon the vinyl cover surface and no deformations in the vinyl retainers, as tested in accordance with the applicable provisions of ASTM F 476-84, paragraph 18, Impact Test.

5. GREENGUARD Certified: Provide GREENGUARD Certified material. Profiles shall meet the requirements of GREENGUARD Certification Standards for Low-Emitting Products.

6. Chemical and Stain Resistance: Provide corner guards that show resistance to stain when tested in accordance with applicable provisions of ASTM D-543.

7. Fungal and Bacterial Resistance: Provide rigid vinyl that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.

8. Color Consistency: Provide components matched in accordance with SAE J-1545 - (Delta E) with a color difference no greater than 1.0 units using CIE Lab, CIE CMC, CIE LCh, Hunter Lab or similar color space scale systems.

1.05 SUBMITTALS

A. Product Data: Manufacturer’s printed product data for each type of corner guard specified.

B. Samples: Verification samples of corner guard, 8" (203mm) long, in full size profiles of each type and color indicated.

C. Manufacturer’s Installation Instruction: Printed installation instructions for each corner guard.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in unopened factory packaging to the jobsite

B. Inspect materials at delivery to assure that specified products have been received.

C. Store in original packaging in a climate controlled location away from direct sunlight.

1.07 PROJECT CONDITIONS

A. Environmental Requirements: Products must be installed in an interior climate controlled environment.

1.08 WARRANTY

A. Standard Manufacturer's Limited Lifetime Warranty against material and manufacturing defects.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Acceptable Manufacturer:

1. IPC Door and Wall Protection Systems,

   InPro Corporation, PO Box 406 Muskego, WI 53150 USA;

   Telephone: 800-222-5556, Fax: 888-715-8407,

   Internet address: http://www.inprocorp.com

B. Substitutions: Not permitted

C. Provide all corner guards and wall protection from a single source.

2.02 MANUFACTURED UNITS

A. Corner Guard System

1. 150BN BluNose High Impact Corner Guard Profile
2. 3" (76mm) x 3" (76mm), 90 degree
3. 9' (2.74m) standard height (cut in half for 4.5' H corner guard)
4. Custom Angles – Provide vinyl covers and retainers with custom angles. Custom angles shall be between 112.5° and 157.5°. Provide flexible top caps to bend to retainer angle.

2.03 MATERIALS

A. Vinyl Covers: Snap on cover of .080" (2mm) thickness shall be extruded from chemical and stain resistant polyvinyl chloride with the addition of impact modifiers. No plasticizers shall be added (plasticizers may aid in bacterial growth).

B. Vinyl Retainers: Continuous vinyl retainers of .070" (1.8mm) thickness with a co-extruded Biopolymer Flex PVC apex shall be fabricated from polyvinyl chloride with the addition of impact modifiers.

2.04 COMPONENTS

A. Top caps and bottom caps shall be made of injection molded thermoplastics.

B. Fasteners: All mounting system accessories appropriate for substrates indicated on the drawings shall be provided.

C. Optional flexible top caps shall be made of injection molded Biopolymer Flex PVC.

2.05 FINISHES

A. Vinyl Covers: Colors of the corner guard to be selected by the architect from the manufacturer’s finish selection. Surface shall have a pebblette texture.

B. Molded Components: Top caps and bottom caps shall be of a color matching the corner guards. Surface shall have a pebblette texture.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions in which the corner guard systems will be installed.

1. Complete all finishing operations, including painting, before beginning installation of corner guard system materials.

B. Wall surface shall be dry and free from dirt, grease and loose paint.

3.02 PREPARATION

A. General: Prior to installation, clean substrate to remove dust, debris and loose particles.

3.03 INSTALLATION

A. General: Locate corner guard as indicated on the approved detail drawings for the appropriate substrate and in compliance with the manufacturer's installation instructions. Install corner guard level and plumb at the height indicated on drawings.

B. Installation of 150BN BluNose High Impact Surface Mount Corner Guard:

1. Retainer Installation

a. Position the vinyl retainer against the wall, allowing 5/16" (8mm) from the bottom of the retainer to the top of the cove base or baseboard for the bottom cap.

b. Drywall: Secure the retainer to the wall using #8 x 1-1/4" Phillips round head, self-tapping screws. Stagger the fasteners on each wing of the retainer. Use 6 screws per 4' (1.22m) length, 10 screws per 8' (2.44m) length, or 12 screws per 9' (2.74m) length.

c. Concrete: Drill 1/4" (6.5mm) holes into the ends of the retainer for the top and bottom caps. Stagger the holes on each wing of the retainer. Use the slotted tabs on the top and bottom cap to transfer hole location to the retainer. Drill 1/4" (6.5mm) holes on the two wings of the retainer. Stagger the fasteners on each wing of the retainer. Drill 6 holes per 4' (1.22m) length, 10 holes per 8' (2.44m) length, or 12 holes per 9' (2.74m) length. Transfer the location of all mounting holes to the wall. Drill 1/4" (6.5mm) holes and position ALLIGATOR anchors into the holes on the wall. Mount the retainer with #10 x 1-3/4" phillips pan head screws and tighten to secure the retainer to the wall.

2. Top and Bottom Cap Installation:

a. Drywall: Overlap the retainer with the mounting tabs of the top and bottom caps and attach them to the retainer using two, #8 x 1-1/4" phillips flat head, self tapping screws per cap. Stagger the fasteners on each wing of the cap.

b. Concrete: Overlap the retainer with the mounting tabs of the top and bottom caps and attach them to the retainer and into the ALLIGATOR anchors using two, #8 x 1-1/2" phillips flat head screws per cap. When

installing flexible top caps on custom angle corner guards, use cup washers and flat head screws to fasten the top caps to the retainer.

3. Position the vinyl cover on the retainer to check the fit. Adjust the top cap on the retainer to obtain a tight fit with the vinyl cover. Starting at the top, push the vinyl cover over the retainer pressing over the entire length until the cover snaps securely into place.
4. INSTALLATION NOTE: Vinyl retainers can be field bent to angles 10° wider or 10° tighter than 90°. When doing so use flexible top and bottom caps or the installation should be full height from floor to ceiling.

3.04 CLEANING

A. At completion of the installation, clean surfaces in accordance with the manufacturer's clean-up and maintenance instructions.

END OF SECTION

SECTION 10400 – SIGNAGE

PART 1 - GENERAL

1.01 SUMMARY

A. Furnish all labor, materials and equipment necessary to construct and install Room Signs as specified hereinafter.

B. Related Sections:

1. Section 09110 – Non-Load Bearing Wall Framing
2. Section 09265 – Gypsum Board Assemblies.
3. Section 09720 – Wall Covering.

1.02 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures.

B. Manufacturer's Data: Submit manufacturer's descriptive literature and specifications, including color samples of material for selection, as applicable, to the WHFD AND/OR PROJECT MANAGER for approval.

C. Shop Drawings: Submit shop drawings, indicating types of materials, details, dimensions, thickness, method of fabrication, signage location with corresponding text for each sign and installation, to the WHFD AND/OR PROJECT MANAGER for approval.

D. Samples: Submit (1) full size sample of each sign type. Include sign face, backing and fasteners.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Signs shall be fiberglass or melamine plastic signs to match existing building signage.

1. Fiberglass Signs: non-corrosive, 3-ply laminate, approximately 3/16" to 1/4" thick with contrasting core color.
2. Plastic Signs: Melamine plastic laminate, 1/8" thick, with contrasting core

color, non-static, fire-retardant and self-extinguishing. Plastic laminate shall have a contrasting core color and shall be impervious to acids, alkalies, alcohol, solvents, abrasives and boiling water.

3. Color: KCH Teal.

4. Font: Avante Garde MD. If existing signs have different font, match existing signs.

B. Letters, symbols, and borders shall be raised. Individual cutout letters and symbols applied to the sign plaque shall not be used.

C. Interior signs shall be mounted with vandal-proof screw fasteners. No double-stick tape or adhesives shall be allowed. Exterior signs shall be mounted with vandal-proof screw fasteners & expansion shields.

D. Acceptable Manufacturer's:

1. John Allen Sign Company

a. 61-3788 Maluokalani Place #2A, Kamuela, HI 96743; (808) 882-8244; jasc@bigisland.com; https://johnallensigncompany.com.

2. No Substitutions.

2.02 REQUIREMENTS

A. Message configurations and dimensions for signs shall match existing building sign design as indicated. Contractor to verify existing.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Room Signs shall be installed at locations as indicated on the drawings. Install signs plumb, level and at heights indicated and in accordance with ADA Architectural Guidelines.

3.02 CLEAN-UP

A. Remove all debris and unused materials from jobsite. Repair any damage caused by sign mounting and removal. Protect signs from damage until acceptance by the WHFD AND/OR PROJECT MANAGER.

END OF SECTION

SECTION 10511 – METAL LOCKERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Conditions and Special Conditions preceding these specifications shall apply to the work specified in this section.

1.02 SUMMARY

A. This Section includes the following:

1. All-welded or knock-down, corridor metal lockers.

B. Related Sections include the following:

1. Section 07920 - Joint Sealants for sealing along perimeter of lockers.

1.03 DEFINITIONS

A. Uncoated Steel Sheet Thicknesses: Indicated as the minimum thicknesses.

1.04 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures.

B. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Show base, sloping tops, and other accessories.

2. Include locker identification system.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Samples for Verification: For metal lockers, in manufacturer's standard sizes.

F. Qualification Data: For Installer.

G. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

H. Warranty: Special warranty specified in this Section.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative of metal locker manufacturer for installation and maintenance of units required for this Project.

B. Source Limitations: Obtain metal lockers and accessories through one source from a single manufacturer.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal lockers and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."

1. Do not modify intended aesthetic effects, as judged solely by Contracting Officer, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Contracting Officer for review.

D. Regulatory Requirements: Where metal lockers are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Provide hardware that does not require tight grasping, pinching, or twisting of the wrist, and that operates with a force of not more than 5 lbf (22.2 N).

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.06 DELIVERY, STORAGE AND HANDLING

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for metal locker installation.

1.07 PROJECT CONDITIONS

A. Field Measurements: Verify the following by field measurements before fabrication and indicate measurements on Shop Drawings:

1. Concealed framing, blocking, and reinforcements that support metal lockers before they are enclosed.

2. Recessed openings.

1.08 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.09 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Structural failures.
    b. Faulty operation of latches and other door hardware.
2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for All-Welded Metal Lockers: 10 years from date of Substantial Completion.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below, before construction begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Full-size units of the following metal locker hardware items equal to **10** percent of amount installed for each type and finish installed, but no fewer than **5** units:
    a. Identification plates.
    b. Hooks.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2. Products: Subject to compliance with requirements, provide one of the products specified.

3. Basis-of-Design Product: The design for each metal locker specified is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.02 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008, Commercial Steel (CS) Type B, suitable for exposed applications.

B. Stainless-Steel Sheet: ASTM A 666, Type 304.

C. Fasteners: Zinc- or nickel-plated steel, slotless-type exposed bolt heads, and self-locking nuts or lock washers for nuts on moving parts.

D. Anchors: Select material, type, size, and finish required for secure anchorage to each substrate.

1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls for corrosion resistance.

2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.03 ALL-WELDED, CORRIDOR METAL LOCKERS

A. Basis-of-Design Product: Republic Storage Products, LLC, Single Point II, or an approved comparable product of one of the following:

1. Art Metal Products, Div. of Fort Knox Storage Co.; Bulldog Corridor Lockers.

2. DeBourgh Mfg. Co.; All American Corridor Lockers.

3. List Industries Inc.; Marquis Protector Single-Point Latch Corridor Lockers.

4. Lyon Workspace Products; All-Welded Lockers.

5. Penco Products, Inc., Subsidiary of Vesper Corporation; All-Welded Lockers.

B. Locker Arrangement: As indicated on Drawings.

C. Body: Assembled by welding body components together. Fabricate from unperforated, cold-rolled steel sheet with thicknesses as follows:

1. Tops, Bottoms, and Sides: 0.06 inch (1.52 mm).
2. Backs: 0.0428 inch (1.1 mm) thick.
3. Shelves: 0.06 inch (1.52 mm), with double bend at front and single bend at sides and back.

D. Frames: Channel formed; fabricated from 0.06 inch (1.52 mm), 16 GA thick, cold-rolled steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral door strike full height on vertical main frames.

1. Cross Frames between Tiers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.

E. Locker Base: Structural channels, formed from 0.0528-inch- (1.35-mm-) thick, cold-rolled steel sheet; welded to front and rear of side-panel frames.

F. Doors: One-piece; fabricated from 0.075-inch- (1.97-mm-), thick, cold-rolled steel sheet; formed into channel shape with double bend at vertical edges, and with right-angle single bend at horizontal edges.

1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
2. Door Style: Door perimeter vents.

G. Hinges: Self-closing; welded to door and attached to door frame with not less than 2 factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

1. Continuous Hinges: Manufacturer's standard, steel continuous hinge.

H. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond face of door; pry resistant.

1. Single-Point Latching: Nonmoving latch hook with steel padlock loop that projects through recessed cup and is finished to match metal locker body.
   a. Latch Hook: Equip each door with 1 latch hook, fabricated from minimum 0.1116-inch- (2.8-mm-) thick steel; welded midway up full-

height door strike; with resilient silencer.

I. Combination Padlocks: Provided by Owner.

J. Equipment: Equip each metal locker with identification plate and the following, unless otherwise indicated:

1. Triple-Tier Units: One double-prong ceiling hook.

K. Accessories:

1. Continuous Sloping Tops: Fabricated from minimum 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet; approximately 20-degree pitch.

a. Closures: Vertical-end type.

L. Finish: Powder coat.

1. Anti-microbial coating.

2. Color(s): As indicated by manufacturer's designations.

2.04 FABRICATION

A. General: Fabricate metal lockers square, rigid, and without warp; with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch.

1. Form body panels, doors, shelves, and accessories from one-piece steel sheet, unless otherwise indicated.

2. Provide fasteners, filler plates, supports, clips, and closures as required for a complete installation.

B. Unit Principle: Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments.

C. All-Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections, with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds flush.

D. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.

E. Identification Plates: Manufacturer's standard etched, embossed, or stamped **aluminum** plates; with numbers and letters at least 3/8 inch (9 mm) high.

F. Legs: Formed by extending vertical frame members or by attaching gusset-type legs to locker body; with provision for fastening to floor; finished to match lockers.

G. Continuous Sloping Tops: Fabricated in lengths as long as practicable, without visible fasteners at splice locations; finished to match lockers.

H. Finished End Panels: Designed for concealing unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.

I. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

2.05 STEEL SHEET FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Factory finish steel surfaces and accessories except stainless-steel and chrome- plated surfaces.

C. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond. Use manufacturer's standard methods.

D. Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard baked-polymer thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install level, plumb, and true; shim as required, using concealed shims.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion, using concealed fasteners.

2. Anchor single rows of metal lockers to walls near top and bottom of lockers.

B. All-Welded Metal Lockers: Connect groups of all-welded metal lockers together with standard fasteners, with no exposed fasteners on face frames.

C. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

1. Attach hooks with at least two fasteners.

2. Attach door locks on doors using security-type fasteners.

3. Identification Plates: Identify metal lockers with identification indicated on Drawings.

   a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.

4. Attach sloping top units to metal lockers, with closures at exposed ends.

5. Attach finished end panels with fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.

3.03 ADJUSTING, CLEANING AND PROTECTION

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not

permit metal locker use during construction.

C. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal locker manufacturer.

END OF SECTION

DIVISION 10 – SPECIALTIES

SECTION 10520 – PORTABLE FIRE EXTINGUISHER AND CABINET

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The work includes providing portable fire extinguishers to afford 100% complete fire protection coverage throughout the indicated areas. The design, equipment, materials, installation, and workmanship shall be in strict accordance with the required and advisory provisions of NFPA 10, except as modified herein.

B. The fire extinguisher installation shall include all materials, accessories, and equipment necessary to provide a system complete and ready for use. Design and installation of the system shall be with full consideration physical obstructions, furniture, and equipment. Portable fire extinguishers shall be listed by the Underwriters' Laboratories, Inc. (UL) or approved by FM Approvals (FM). In the National Fire Protection Association (NFPA) publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word “shall” had been substituted for “should” wherever it appears; reference to the “authority having jurisdiction” shall be interpreted to mean the Building Department and Fire Department. Reference to the “Building Department” on the contract drawings and herein shall be interpreted to mean the County of Hawaii Public Works Building Division; reference to the “Fire Department” shall be interpreted to mean the Hawaii County Fire Department. “Provide” shall mean “furnish and install” when used herein. The work shall begin at the points indicated.

1.02 CODES, STANDARDS, AND REGULATIONS

A. The latest publications listed below form a part of this specification. The publications are referred to in the text by the basic designation only.

B. Installation of all work in this section shall be made in accordance with State Department of Health Regulations, the National Fire Protection Association, the International Building Code, and the Uniform Fire Code.

C. All applicable codes, regulations and ordinances of public bodies having jurisdiction are considered a part of these specifications. All work installed and

materials provided must comply with the current edition of such codes, regulations, and ordinances.

D. Factory Mutual (FM) Global, FM Approval Guide, Updated online.

E. National Fire Protection Association (NFPA) 10, Portable Fire Extinguishers, 2010.

F. Underwriters Laboratories (UL), Inc, UL Fire Protection Equipment Directory (UL FPED), Updated online.

1.03 CONTRACT DRAWINGS

A. Contract drawings are essentially diagrammatic, indicating general layout and approximate locations toward establishing the scope for a uniform estimating basis for all bidders. They are not intended to be detailed construction working drawings. Reasonable modifications to indicated locations and arrangement to suit job conditions shall not constitute basis for requesting additional funds from the Owner.

B. Verification of Dimensions: The Contractor shall be responsible for the coordination and proper relation of his or her work to the structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself or herself with all details of the work and notify the Architect of any discrepancy before performing any work.

1.04 SUBMITTALS

A. General: Partial submittals will not be acceptable. The Architect will review and approve all submittals. Contractor shall check the submittals and shop drawings and certify that they are correct and in compliance with the contract drawings and specifications. Submit 6 copies for approval.

B. Manufacturer's Published Data:

1. As soon as practicable and before installation of any materials or equipment is begun, the Contractor shall submit a complete list of materials and equipment together with names and addresses of manufacturers, catalog numbers, and trade names to the Architect for approval.

2. Annotate descriptive data to show the specific model, type, and size of each item the Contractor proposes to provide.

a. Fire extinguishers

b. Fire extinguisher cabinets

3. Approval of materials will be based on manufacturer's published rating. Any materials and equipment that are not in accordance with these specifications may be rejected.

4. UL FPED or FM AG sheets showing the manufacturer and specific model of fire extinguisher the Contractor proposes to provide.

1.05 OMISSIONS

A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions, the Contractor shall call the attention of the Architect to such omissions 15 days in advance of the date of bid opening so that the necessary corrections can be made.

1.06 DELIVERY, STORAGE AND HANDLING

A. Furnish new equipment, materials and accessories bearing the manufacturer's identification. Coordinate deliveries to avoid interference or construction delays. Protect products during delivery, storage, installation and the remainder of the contract period after installation.

1.07 GUARANTEE AND CERTIFICATE

A. Contractor and Installer shall guarantee and certify in writing all work in this section for a period of one year. Contractor shall be responsible for all damages to any part of premises during equipment installation work under this section.

B. The entire fire extinguisher installation described hereinafter shall be guaranteed as a complete working unit for a period of one year. In the event of failure due to faulty workmanship or materials during this period, all said failures shall be corrected to the satisfaction of the Architect at no additional cost to the Owner for labor and material.

C. The above guarantee shall not be interpreted as voiding, limiting, or reducing any equipment manufacturer's warranty or any guarantee permitted by law.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Asbestos-containing materials or equipment shall not be used under this section. The Contractor shall insure that all materials and equipment incorporated in the project are asbestos-free.

B. All materials shall be new, of equal or better quality of materials specified. For ease of maintenance and parts replacement, select equipment from a single manufacturer as much as possible.

2.02 EQUIPMENT

C. Portable fire extinguishers: Provide UL rated 2A:10B:C, nominal 5 lb, multipurpose dry chemical fire extinguisher with red powder coated steel cylinder. Provide Potter Roemer 3005 or approved equal. Provide with completed inspection tags.

D. Semi-recessed fire extinguisher cabinet: Provide-semi-recessed steel cabinet with clear tempered safety glass panel sized to accommodate the selected portable fire extinguisher. Cabinet trim shall not project more than 3 inches from the face of the wall. Provide Potter Roemer 7008-A or approved equal where installed in non-fire rated walls and Potter Roemer FRC-7008-A or approved equal where installed in fire-rated walls.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install fire extinguisher cabinet such that the fire extinguisher handle does not exceed 48 inches above finished floor. Bottom of cabinet shall not be less than 18 inches above finished floor.

B. Install portable fire extinguisher with operating instructions facing outward.

C. Install portable fire extinguisher with pressure gauge facing outward.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15000 – GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 WORK DESCRIPTION

A. The Contractor shall furnish all labor, materials, tools and equipment, and perform all work and services necessary for complete and properly operating mechanical systems, as shown on the drawings and as specified, in accordance with provisions of the contract documents and completely coordinate his work with that of all other trades.

B. The Contractor shall completely examine the contract documents and shall report to the WHFD AND/OR PROJECT MANAGER any error, inconsistency or omission he discovers. Bidders are cautioned to review the technical specifications carefully and thoroughly. The submittal of a bid shall be considered an acceptance of the specifications as published. Protests concerning the technical specifications lodged after bid opening shall not be considered.

C. The Contractor shall visit the site and examine the conditions affecting his work before submitting his proposal. The submission of the proposal shall be considered evidence that the Contractor has visited the site and no extra payments will be allowed to the Contractor for extra work made necessary by his failure to visit the site.

D. Provide all supplementary or miscellaneous items, hangers, supports, details, appurtenances and devices incidental to or necessary for a sound, secure, complete and operating mechanical system where work required is not specifically indicated.

E. Drawings and specifications shall be taken together. Provide work specified or stated in one or the other document as though mentioned in both documents.

F. Substitution of another manufacturer's product for materials or equipment specified and for items with “approved equal” after the brand name requires approval in accordance with the SPECIAL PROVISIONS. Equal products are acceptable in lieu of those specified hereinafter by specific manufacturer and model number if approved.

G. The Contractor shall warrant that all materials and equipment furnished under this contract will be new and that all work will be good quality, free from faults and defects and in conformance with the contract documents for a guarantee period of one year.

H. The Contractor shall maintain at the site one copy of all drawings, specifications, addenda, approved shop drawings, change orders and other modifications, in good order and marked to record all changes made during construction. These documents shall be made available to the WHFD AND/OR PROJECT MANAGER upon request.

I. The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the work, he shall remove all his waste materials and rubbish from and about the project as well as all his tools, construction equipment, machinery and surplus materials and shall clean all new equipment, materials, items and accessories.

J. The Contractor shall give the WHFD AND/OR PROJECT MANAGER timely notice of his readiness for testing any work including the scheduling of agencies with the jurisdiction over the work, test equipment and personnel, and all other data and arrangements for the WHFD AND/OR PROJECT MANAGER to observe the testing. The Contractor shall bear all cost of such tests.

K. Workmanship and Materials:

1. Workmanship shall be of the best quality and none but competent mechanical workers skilled in their trades and thoroughly familiar with the work involved shall be employed. The Contractor shall furnish the services of an experienced superintendent, who will be constantly in charge of the work, until the project is completed and accepted.

2. References to standards are intended to be the latest revision of the standard specified.

3. Unless otherwise specified later in this section, each article of its kind shall be the standard product of a single manufacturer.

4. Whenever the words “or approved equal” or other words of similar intent or meaning are used, implying that judgment is to be exercised, it is understood that it is the judgment of the WHFD AND/OR PROJECT MANAGER.

5. The WHFD AND/OR PROJECT MANAGER shall have the right to accept or reject material, equipment and/or workmanship and determine when the Contractor has complied with the requirements specified in this section and all technical sections that refer to this section.

6. All manufactured materials shall be delivered and stored in their original containers. Equipment shall be clearly marked or stamped with the manufacturer’s name and rating. Equipment and materials shall be carefully handled, properly stored and adequately protected to prevent damage before and during installation, in accordance with the manufacturer’s recommendations and as approved by the WHFD AND/OR PROJECT MANAGER. Damaged or defective items, in the opinion of the WHFD AND/OR PROJECT MANAGER, shall be replaced.

1.03 CONTRACT DRAWINGS

A. Contract drawings are essentially diagrammatic, indicating general layout and approximate locations toward establishing the scope for uniform estimating basis for all bidders. They are not intended to be detailed construction working drawings. Equipment, ductwork and piping arrangements shall fit into space allotted and shall allow adequate clearances for servicing and maintenance. Reasonable modifications to indicated locations and arrangement to suit job conditions shall not constitute basis for requesting additional funds from the WHFD AND/OR PROJECT MANAGER.

B. Because of the small scale of drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. Contractor shall carefully investigate structural and finish conditions affecting his work and arrange such work accordingly, furnishing such fittings, traps, valves, ductwork, piping, supports, and accessories as may be required to meet such conditions.

C. Verification of Dimensions: The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, to verify all dimensions in the field, and to advise the WHFD AND/OR PROJECT MANAGER of any discrepancy before performing any work.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. The general requirements for submittals are specified in this section and shall apply to all mechanical sections. Additional submittal requirements are specified in each mechanical section.

C. Within 20 days after award of contract and before installation of any materials or equipment is begun, Contractor shall submit to the WHFD AND/OR PROJECT MANAGER for approval a complete list of materials and equipment together with names and addresses of manufacturers and local Hawaii based manufacturer's representatives, catalog numbers, and trade names; and, annotated descriptive data showing the specific model, type, and size of each item the Contractor proposes to furnish. No consideration shall be given to partial lists submitted from time to time. Prepare working drawings on sheets not smaller than 24 inches by 36 inches, and include data essential to the proper installation of the system. Do not commence work until the design of the system and the various components have been approved.

D. Approval of materials and equipment will be based on manufacturer's published rating. Any materials which are not in accordance with these specifications may be rejected. Contractor shall not order materials and equipment without the submittal first being approved. Ordering of material and equipment without prior approval may be rejected by the WHFD AND/OR PROJECT MANAGER.

E. Prior to start of any field work, required copies of to scale shop drawings of equipment, ductwork, piping and controls shall be submitted for review. No work shall be started without approval from the WHFD AND/OR PROJECT MANAGER. Where apparatus and equipment have been indicated on the contract drawings, dimensions have been taken from typical equipment of the class indicated. The

shop drawings shall show the details of construction and installation of the particular equipment being furnished. The shop drawings shall be fully dimensioned to show the equipment, materials and connections fit the space provided.

1. Contractor shall check the submittals and shop drawings and certify they are correct and in compliance with the contract drawings and specifications.

2. Review of shop drawings by the WHFD AND/OR PROJECT MANAGER's representatives is confined to arrangement of equipment and fixtures only and does not relieve the Contractor from responsibility for proper fit, performance and construction. Any deviation from the contract drawings and specifications shall be clearly noted on the shop drawings. Since manufacturing methods vary, reasonable variations from the contract documents are acceptable; however, performance and material requirements indicated are the minimum acceptable and the WHFD AND/OR PROJECT MANAGER retains the right to judge the equality of any variation.

F. Unless otherwise specified here, submit 6 copies of each submittal required for approval:

1. Shop drawings: Submit prints of dimensioned shop drawings, indicating equipment layout, piping, hangers, equipment bases, support details, wiring diagrams for control, and locations and sizes of pipe sleeves and duct openings. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices and components. Coordinate drawings with other trades to avoid interferences. Drawings shall be minimum 24 inches by 36 inches in size, except as specified elsewhere. Provide one set of reproducible transparencies and 6 sets of bond prints. Approval of shop drawings does not relieve the Contractor from responsibility of a complete installation or proper performance. No work shall commence until shop drawings are approved by the WHFD AND/OR PROJECT MANAGER.

a. The Contractor shall review, stamp with his approval, and submit all shop drawings required by the contract documents.

b. At the time of submission, the Contractor shall inform the WHFD

AND/OR PROJECT MANAGER in writing of any deviations in the shop drawings from the requirements of the contract documents.

c. By approving and submitting shop drawings, the Contractor certifies that he has determined and verified all field measurements and obstructions, field construction criteria, materials, catalog numbers and similar data, that he has checked and coordinated each shop drawing with the requirements of the work and of the contract documents and that all equipment fits within designated spaces.

2. Samples: Submit samples of materials which accurately represent if not identical to the materials to be used. Where samples are specified to demonstrate method of installation, furnish all materials, labor, ingredients and tools. Samples shall also be furnished when materials are proposed as substitutions for those specified. Materials used in the work shall be identical to samples that have been approved by the WHFD AND/OR PROJECT MANAGER.

3. Certificates of conformance or compliance:

a. Submit certification from the manufacturer attesting that materials and equipment to be furnished for this project comply with the requirements of this specification and of the reference publications. Preprinted certifications will not be acceptable; certifications shall be in the original. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as “as good as”, “achieve the same end use and result as materials formulated in accordance with the referenced publication”, “equal or exceed the service and performance of the specified material”. The certification shall simply state that the product conforms to the requirements specified.

b. Standards compliance: When materials or equipment are specified to conform to the standards of organizations such as the American National Standards Institute (ANSI), Air Conditioning and Refrigeration Institute (ARI), Air Movement and Control Association (AMCA), American Society for Testing and Materials (ASTM), Factory Mutual Engineering and Research Corporation (FMERC or FM), National Electrical Manufacturers

Association (NEMA), National Fire Protection Association (NFPA), and Underwriters Laboratories (UL), proof of such conformance shall be submitted to the WHFD AND/OR PROJECT MANAGER for approval. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor may submit a certificate from an independent testing organization, which is competent to perform acceptable test and is approved by the WHFD AND/OR PROJECT MANAGER. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards of specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for approval. The certificate shall identify the manufacturer, the product and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.

4. Product data: Submit data of equipment showing manufacturer's name, trade name, catalog model or number, project specification and paragraph reference, material specifications, performance data, certified dimensions and motor sizes. Performance data shall meet the criteria and standards specified in the technical sections for the model being furnished. Submit 8 complete sets. Equipment and material shall not be ordered without prior approval of the submittal from the WHFD AND/OR PROJECT MANAGER.

5. Reports: Submit as required by individual technical sections.

6. Operation and maintenance manual: Submit one bound copy and 3 electronic copies on CD of the Operation and Maintenance Manual on all equipment and the system as a whole as required by individual technical sections.

7. Equipment or fixture listing: Submit a complete list of equipment and fixtures together with names and addresses of manufacturers and the Hawaii

based authorized representative, catalog numbers, and trade names.

8. Maintenance service contract: Submit copies of the Maintenance Service Contract, countersigned by the Contractor, which will validate the guarantee as required by individual technical sections.

9. As-built drawings: Record changes from the contract drawings of all concealed piping. Show exact locations and sizes, as actually installed, of mechanical equipment, piping, isolating valves and items requiring maintenance or inspection. Dimension underground piping from a visible point on structure. Keep at the job site a complete, accurate record of all approved deviations from the contract drawings, shop drawings and specifications. Keep these changes on reproducible prints of the drawings affected and submit to the WHFD AND/OR PROJECT MANAGER at the completion of the project.

10. Guaranty or warranty: Submit a written guaranty on all equipment, piping, accessories and material furnished against all defects in material and workmanship as required by individual technical sections.

1.05 LAWS, REGULATIONS AND CODES

A. The following shall govern where applicable; the Plumbing Code, State of Hawaii Department of Health Regulations, Uniform Building Code, OSHA Rules and Regulations and all other codes and standards referenced in these specifications and as adopted by the Hawaii County. Where requirements differ in these codes and standards, the more stringent shall apply.

1.06 PERMITS AND INSPECTIONS

A. Obtain and pay for all fees, permits, licenses, assessments, connection charges and inspections required for this project.

B. The Contractor shall apply and pay for all necessary inspections required by any public authority having jurisdiction.

1.07 MANUFACTURER'S RECOMMENDATIONS

A. Fixtures installed under this division of the specifications shall be installed according to the manufacturer's recommendations, unless otherwise shown on the drawings or specified in this section. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the

manufacturer of the equipment being installed, printed copies of these recommendations shall be furnished to the WHFD AND/OR PROJECT MANAGER, prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause or rejection of the fixture.

B. Certain specified construction and details may not be regularly included in the manufacturer's catalogued product. The Contractor shall provide the material or equipment complete as specified.

1.08 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Bound Instructions: Unless otherwise indicated, furnish one hard copy and 3 electronic copies on CD of an operation, maintenance, and troubleshooting manual for each item of equipment and the system as a whole. Furnish the manual bound in hardback binders or an approved equivalent. Furnish one complete manual prior to the time that equipment tests are performed and furnish the remaining manuals before the contract is completed. Inscribe the following identification on the cover; the words OPERATION AND MAINTENANCE MANUAL, the name and location of the building, the name of the Contractor, the name of the Consultant, date, and the contract number. The manual shall include the names, addresses and telephone numbers of each subcontractor installing equipment and of the local representative for each item of equipment. Also include a list of equipment by manufacturer, with the model number and serial number, tag number, quantity of each unit, location of unit, and area served. When standard manufacturer's brochures are used, adequately indicate (highlight, arrow, etc.) the project related information and delete (X or cross-out) the non-applicable information. Flysheet or divider sheet shall be placed before instructions covering each subject. The instruction sheets shall be approximately 8 1/2 by 11 inches, with large sheets of drawings folded in. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include:

1. System layout showing equipment, ductwork, piping, controls, etc.;
2. Wiring and control diagrams with data to explain detailed operation and

control of each item of equipment;

3. Description of the function of each principal item of equipment;

4. The procedure for operating;

5. Shutdown instructions;

6. Maintenance instructions;

7. Lubrication schedule including type, grade, temperature range and frequency;

8. Manufacturer's bulletins, cuts and descriptive data;

9. Safety precautions, test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts and the service organization that is reasonably convenient to the project site.

B. The manual shall be complete in all respects for equipment, controls, accessories and associated appurtenances provided.

1.09 SPARE-PARTS DATA

A. After approval of materials and equipment and one month prior to the date of beneficial occupancy, the Contractor shall furnish a complete list of parts and supplies, with current source of supply.

1.10 SUBSTITUTION OF EQUIPMENT OR MATERIAL

A. Design is based on fixtures and material as described in drawings. Any changes in equipment, bases, piping, connections, controls, electrical equipment specified and required by the approved substitutions shall be made by Contractor at no additional cost to the WHFD AND/OR PROJECT MANAGER. Contractor shall ensure proper fit, clearances, compatibility with other trades (e.g., electrical, ceiling, etc.), compatibility with controls and communication with the controls system, operation and maintainability for any equipment or material that is substituted for that indicated.

1.11 DISCREPANCIES

A. The drawings and specifications are intended to be cooperative. Any materials, equipment or system related to this division and exhibited on the electrical or mechanical drawings but not mentioned in the specifications are to be executed to the intent and meaning thereof, as if it were both mentioned in the specifications and set forth on the drawings.

B. In case of differences between the drawings and specifications, the specifications shall govern first, and then the drawings. Large-scale details shall take precedence over small-scale drawings as to the shape and details of construction. Specifications shall govern as to materials.

C. Drawings and specifications are intended to be fully cooperative and to agree, but should any discrepancy or apparent difference occur between drawings and specifications or should errors occur in the work of others affecting the work, the Contractor shall notify the WHFD AND/OR PROJECT MANAGER at once. If the Contractor proceeds with the work affected without instructions from the WHFD AND/OR PROJECT MANAGER, he is responsible for that change and shall correct any resultant damage, rework, extra work or defect at no additional cost to the WHFD AND/OR PROJECT MANAGER. All interpretations of drawings and specifications shall be clarified by the WHFD AND/OR PROJECT MANAGER.

1.12 OMISSIONS

A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions, the Contractor shall call the attention of the WHFD AND/OR PROJECT MANAGER to such omissions in 15 days advance of the date of bid opening so the necessary corrections can be made.

1.13 GUARANTEE AND CERTIFICATE

A. The Contractor shall guarantee and certify in writing the following items:

1. All equipment, piping, accessories and material furnished for a period of one year commencing after 30 consecutive days of trouble-free operation from date of final acceptance against all defects in material and workmanship. If any equipment, piping or material fails, does not operate satisfactorily or shows undue wear, the Contractor will be notified, and shall be required to correct the defect and damage to other work caused by such defect, immediately and at no additional cost to the WHFD AND/OR PROJECT MANAGER. If the above

period of warranty does not coincide with the manufacturer's standard warranty period, the Contractor shall include all costs for extending the warranty for the period specified above in his bid.

2. All equipment, piping and materials to provide the results specified or shown.

3. All equipment to be properly installed in strict accordance with manufacturer's recommendations and to be free of vibration or objectionable noise.

4. All piping to be drip free and properly installed to be free of vibration, pounding or objectionable noise.

B. The above guarantee shall not be interpreted as voiding, limiting or reducing any equipment manufacturer's warranty or any guarantee permitted by law.

C. The WHFD AND/OR PROJECT MANAGER shall have the right to require a written certificate, dated and signed by a responsible employee of the Contractor, evidencing the performance of any portion of the work, or any testing; as a condition precedent to the acceptance of any work or the result of any test. Whenever a regulatory agency performs inspections or tests of any portion of the work, a certificate shall be furnished by the Contractor that the inspection or test was satisfactorily passed.

D. The Contractor shall provide a written guarantee that all work is as specified, and shall be bound to reinstall material or equipment defective due to workmanship or materials for a period of one year from the date of final acceptance of the installation by the WHFD AND/OR PROJECT MANAGER. Contractor shall not be responsible, however, for defects proven to the WHFD AND/OR PROJECT MANAGER satisfaction to be due to misuse, accident or negligence by other parties.

E. Further, the Contractor shall be held responsible for all damages to any part of the premises, building or contents caused by leaks or other defects in pipe, equipment or materials provided under this specification, of a period of one year from the date of final acceptance of the installation by the WHFD AND/OR PROJECT MANAGER.

F. Terms of this guarantee are in addition to other guarantee provisions of the specifications, and do not substitute for other more stringent terms, if any.

1.14 ELECTRICAL WORK

A. All power wiring, including final hookup to all mechanical equipment will be provided under the Division 16 – ELECTRICAL of this specification. The power wiring, conduits and appurtenant work including connection to the mechanical equipment and control devices shall be provided by the Electrical Subcontractor.

B. Electrical work under Division 16 – ELECTRICAL of the specifications is based on the electrical rating of equipment indicated on the mechanical drawings. Additional electrical work caused by any deviation under the requirements of the Division 15 – MECHANICAL drawings and specifications shall be paid for by the Mechanical Subcontractor.

C. All control wiring for communication, signals and control power less than 100 volts are included under mechanical work and shall be in accordance with Division 16 – ELECTRICAL requirements, except where specified otherwise in Division 15 – MECHANICAL.

D. The Mechanical Subcontractor shall furnish all control transformers, motor controllers, any disconnect devices specified as part of the mechanical equipment and any other electrically powered devices for installation by the Electrical Subcontractor. The Mechanical Subcontractor shall turn over these items to the Electrical Subcontractor at the site after receipt of notice from the Electrical Subcontractor that he is ready to install said items. The Electrical Subcontractor shall install these devices and provide the labor and materials to connect to the power system.

1.15 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Furnish new equipment, materials and accessories bearing the manufacturer's identification. Coordinate deliveries to avoid interference or construction delays. Protect products during delivery, storage, installation, and the remainder of the contract period after installation.

1.16 CONTINUITY OF SERVICES, PHASING

A. The facility will be in use during construction of this project. It is intended that interruption of utilities be kept to a minimum. Notice of service interruptions shall be submitted to the WHFD AND/OR PROJECT MANAGER for approval at least 2 weeks before intended date of service interruptions. Exact date and time of interruption allowed shall be determined by the WHFD AND/OR PROJECT MANAGER. Provide temporary valves, connections, piping, etc., as necessary to assure this continuity of service; they shall be furnished under this section without additional charge to the WHFD AND/OR PROJECT MANAGER and shall be removed when no longer necessary. Air conditioning shall be operational at 6:30 a.m. every morning after an evening service interruption, to support normal office operations.

B. Work shall be done outside of regular working hours (5:00 p.m. to 6:30 a.m.) and on weekends, except where otherwise arranged with the project coordinator.

C. The Contractor shall submit to the WHFD AND/OR PROJECT MANAGER a copy of his work schedule indicating the date and area to be affected by his work. This schedule shall be updated weekly during on-site work and submitted.

D. Execute work using such methods, techniques, connections and tie-ins which will cause least interference with, and interruptions of, existing utilities and services. Keep roads clear of materials, debris. etc. to the maximum extent possible. Schedule all arrangement for work that will cause interferences or interruptions, in advance with the WHFD AND/OR PROJECT MANAGER, all other affected trades and authorities having jurisdiction.

E. Examine site and become familiar with existing local conditions affecting work.

F. Examine all drawings and specifications, including electrical, and become familiar with the types and systems of construction to be used. Determine how such types and systems will affect the installation of mechanical work.

G. Investigate, determine and verify locations of any overhead utilities on or near site. Determine such locations in conjunction with all public and private utility companies and with all authorities having jurisdiction.

1.17 OPENINGS, CUTTING AND REPAIRING

A. The Mechanical Contractor shall cooperate with the work to be done under other sections in providing information as to openings required in walls and slabs for all piping including sleeves where required.

B. Any drilling or cutting required for the performance of work under this section shall be the responsibility of the Contractor and the cost there shall be borne by him.

C. Holes in Concrete: The Mechanical Contractor shall pay all costs for cutting holes. All holes through existing concrete shall be either core drilled or saw cut. All holes required shall have the approval of the WHFD AND/OR PROJECT MANAGER prior to cutting and drilling. Contractor is responsible for protection of lower floors or adjacent spaces during core drilling or saw cutting, including protecting from water and slurry damage to existing surfaces and equipment.

D. It shall be the responsibility of the Contractor to determine that all openings are properly located.

PART 2 - PART 2 – PRODUCTS

2.01 MATERIALS AND FIXTURES

A. As specified in all sections of Division 15 – MECHANICAL.

B. Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that complies with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use at least 2 years prior to bid opening. Where 2 or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer except where specified. Each item of equipment shall have the manufacturer's nameplate. Name of the distributing agent in lieu of the manufacturer's nameplate will not be acceptable.

C. All materials shall be new, of equivalent or better quality than of materials specified. For ease of maintenance and parts replacement, select equipment from a single manufacturer as much as possible. Substitutions require pre-bid approval.

2.02 NAMEPLATES

A. Each item of equipment shall have manufacturer's nameplate of corrosion resisting metal attached in a conspicuous location. Nameplate data shall include manufacturer's name, address, model number, serial number, capacity, rating and such other performance data as required to completely identify the item. In addition, the manufacturer shall provide a separate corrosion resisting metal tag or plastic, unless specified otherwise, to carry the equipment designation as shown on drawings. Except as otherwise specified nameplate lettering shall be stamped or engraved on the nameplate. Nameplates shall be fastened by means of corrosion resisting metal screws, rivets or wire, 14-gauge. In addition, each piece of equipment shall be provided an identification tag in accordance with the paragraph entitled “Identification Tags for Mechanical Equipment and Devices”.

2.03 TOOLS AND SUPPLIES

A. Special tools and supplies shall be provided if required to maintain equipment provided for this project. The items shall be packaged or boxed to provide protection in storage, and shall be identified as to use. Tools and supplies shall be accompanied by information as to source of supply.

2.04 FACTORY-APPLIED PAINT

A. Ferrous surfaces of equipment shall have baked enamel finish painting as standard with the manufacturer. Special coating shall be applied when specified in the technical sections, and in such cases the coating used shall be certified in compliance with the certificates paragraph in this section.

PART 3 - EXECUTION

3.01 VERIFICATION OF DIMENSIONS

A. The Contractor shall check all dimensions at the site and shall establish all lines and levels. The Contractor shall be responsible for correctness of all dimensions and fitting of equipment, ductwork, fixtures and piping into the available space. Should field measurements show conditions that require relocation of any work, such conditions shall be reported to the WHFD AND/OR PROJECT MANAGER in advance of installation, and the work shall proceed in accordance with his decisions.

3.02 PROTECTION OF WORK IN PROGRESS

A. Ducts, conduits (if provided by Division 15 – MECHANICAL technical specifications) and pipe openings shall be closed with caps or plugs until connections are made. Equipment shall be securely covered for protection against physical or chemical damage. In areas exposed to weather, materials unused at the end of each day's work shall be stored in weather-protected locations. Damage to materials or equipment due to the Contractor's neglect shall be repaired or replaced to the satisfaction of the WHFD AND/OR PROJECT MANAGER by, and at the expense of the Contractor.

3.03 LOCAL TECHNICAL SUPPORT

A. The mechanical equipment suppliers that furnish equipment for this project shall have a local Hawaii sales and service office, staffed with factory trained representatives fully capable of providing instruction, routine maintenance and emergency maintenance service on all system components supplied for this project. If the maintenance service is provided by a separate company, that company shall be specifically trained by manufacturer and authorized to perform maintenance on the equipment furnished for this project.

3.04 SAFETY REQUIREMENTS

A. Belts, pulley, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified in other mechanical sections. Items such as catwalks, ladders and guardrails shall be provided where required for safe operation and maintenance of equipment.

3.05 PAINTING

A. Unless specified in other mechanical specification sections, the Contractor shall be responsible for complete coverage in painting all exposed ferrous metal that has not been factory finish coated.

3.06 PIPING IDENTIFICATION

A. Identification of all new pipe lines shall be by means of paint and colored, waterproof, all temperature, self-adhering labels and directional arrow. Color coding shall be as follows:

TEXT	PAINTED PIPE COLOR	SNAP ON BACKGROUND COLOR	TEXT & ARROW COLOR
Potable Water	Green	Green	White
Chilled Water	Insulated White	Green	White

B. All exposed pipes, whether insulated or not shall be identified. Labels may be omitted from piping where the use is obvious, due to its connection to equipment and where the appearance would be objectionable in finished rooms, as approved by direction.

C. Identification labels shall be placed as follows:

1. Near each valve and branch connection.

2. Wherever piping merges or disappears from view from the floor of the room in which it is installed.

3. Labels shall not be more than 50 feet apart.

3.07 VALVE INDEX

A. The Mechanical Contractor shall provide brass tags on all valves with letters stamped thereon designating service of each valve.

B. Provide a valve identification index in the Operation and Maintenance Manual which includes the tag number, the type of valve, the service and the location.

3.08 IDENTIFICATION TAGS FOR MECHANICAL EQUIPMENT AND DEVICES

A. All mechanical equipment, panels, control devices such as temperature sensors, pressure transmitters, pressure gauges and other devices shall be provided with an identification tag that indicates the name of the item. The name shall coincide with the Operation and Maintenance Manual and the as-built drawings.

B. The tag shall be plastic nameplate, 1" x 3" minimum size, engraved laminated phenolic, white with black core. The tags shall be fastened to the equipment or device with metal screws or fastened with a brass jack chain if it cannot be mounted with screws.

C. Provide an equipment index in the Operation and Maintenance Manual that includes the tag number, the type of equipment, the service, and the location.

3.09 CLEAN UP AND WORK PRACTICES

A. The Contractor shall keep the job site free of debris, litter, discarded parts, etc. and shall clean all oil drippings during the daily progress of work. The Contractor shall remove all tools, parts and equipment from the service areas upon completion of the work.

B. The Contractor shall exercise caution during the progress of his maintenance and repair work to prevent damage to the ceilings, roofing and other building structure. The Contractor shall restore all damages, caused by his negligence, to its original condition at his own expense.

3.10 INSTRUCTION TO PERSONNEL

A. The Contractor shall furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation and maintenance, including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of man-days (8 hours) of instruction furnished shall be as specified in other sections. When more than 4 man-days of instruction are specified, approximately half of the time shall be used for classroom instruction. All other times shall be used for instruction with the equipment or system. When significant changes or modifications in the equipment or systems are made under the term of the contract, additional instruction shall be provided to acquaint the operating personnel with the changes or modifications.

END OF SECTION

SECTION 15070 – MECHANICAL SOUND, VIBRATION AND SEISMIC CONTROL

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 DESCRIPTION OF WORK

A. This section covers the furnishing, fabrication, delivery and installation of the sound, vibration and seismic control system complete, including but not limited to the following:

1. Spring vibration isolators
2. Seismic protection components
3. Flexible duct connectors

B. Design Criteria:

1. Equipment, ductwork, piping and conduit shall not be installed which makes rigid contact with the structure unless otherwise allowed by this specification.
2. Pipe anchors and supports: Piping supports and anchors shall not interfere with the free operation of vibration isolation systems.
3. Isolation/absorption products: Provide vibration isolators for mechanical and associated piping and ductwork, to minimize transmission of vibrations and structure borne noise to the building structure or spaces or from the building structure to the machinery. Systems, equipment, or parts which vibrate or generate vibration unduly, or which generate or emit undue noise while in operation, shall: (1) be adjusted, repaired, or replaced as appropriate to obtain acceptable levels of vibration or noise; or (2) be supported on, or fitted with, suppression or absorption devices, or other means, which effectively prevent the transmission of vibration or noise beyond the offending item.
4. Resilient wall, ceiling, and floor penetrations: Provide resilient wall and ceiling penetrations for all piping, conduit, ductwork, etc. supported on suspension isolators or spring isolators.

5. Seismic protection criteria: Use a Horizontal Force Factor minimum 60% of the equipment weight considered passing through the equipment center of gravity in any horizontal direction. Unless vibration isolation is required to protect equipment against unacceptable structure transmitted noise or vibration, protect the structure or equipment from earthquakes by rigid structurally sound attachment to the load-supporting structure. Protect each piece of vibration-isolated equipment with protected spring isolators or separate seismic restraint devices. Determine by calculations the number and size of seismic restraints needed for each equipment, duct or pipe. Verify seismic restraint vendor's calculations by a registered professional engineer. Provide seismic snubbers and protected spring isolators rated in three principle axes. Verify ratings by independent laboratory testing.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS unless specified otherwise in other sections of Division 15 – MECHANICAL.

B. Painting work specified in Division 9 – FINISHES.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS and Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

B. Shop Drawings: Submit shop drawings of plans, performance data and details showing locations and installation including, but not limited to, the following: Piping isolation at wall, slab and beam penetrations.

C. Product Data: Submit product data for the following:

1. Isolators
2. Flexible Connectors
3. Flexible duct connectors
4. Pipe guides

D. Spring Isolator Data: For each type and size of spring isolator, submit the spring outside diameter, deflection, operating spring height, unloaded spring height,

solid spring height, the ratio of the outside diameter to the operating spring height, the load to deflection ratio of the springs, and weight and sizes of structural steel members.

E. Machinery: For each item of machinery, compare spring static deflections with the specified minimum static deflection, to show that the calculated spring static deflections are not less than the minimum static deflections specified. Rated spring static deflections are not acceptable in lieu of calculated spring static deflections.

F. Instructions:

1. Vibration and noise isolation components

2. Seismic protection components

G. Seismic Protection Rating: Submit in 3 principal axes certified by an independent laboratory or analyzed by an independent licensed structural engineer.

H. Schedules:

1. Schedule of equipment listing name and addresses of manufacturers; manufacturer's local supplier's name, address and phone number; catalog numbers and trade names in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

2. An itemized list showing items to be isolated, the isolator type, model number, isolator loading and deflection, and reference to specific drawing showing frame construction where applicable.

I. As-Built Drawings: Submit drawings in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

J. Guarantee and Certificate: Submit one-year guarantee and certificate in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

1.05 QUALITY ASSURANCE

A. Vibration Isolator Procurement: For each piece of machinery to be isolated from vibration, supply the vibration isolators, and other associated materials and equipment as a coordinated package by a single manufacturer. Select isolators that provide uniform deflection even when machinery weight is not evenly

distributed. This requirement does not include the flexible connectors or the hangers for the associated piping and ductwork.

B. Unitized Machinery Assemblies: Mounting of unitized assemblies directly on vibration isolation springs is acceptable if machinery manufacturer certifies that the end supports of the assemblies have been designed for such installation.

PART 2 - PRODUCTS

2.01 CORROSION PROTECTION FOR STEEL PARTS

A. ASTM A 123/A 123M hot-dipped galvanized, or equivalent manufacturer standard coatings. Where steel parts are exposed to the weather, provide galvanized coating of at least 2 ounces of zinc per square foot of surface. Coat springs with neoprene.

2.02 NEOPRENE

A. ASTM D 471 and ASTM D 2240, Grade Durometer 40, 50, or 60, and oil resistant.

2.03 SPRING ISOLATORS

A. Provide minimum 2-inch deflection, or as indicated, spring isolators, seismic restraint type with vertical stops, that are adjustable and laterally stable with free-standing springs of horizontal stiffness at minimum 80% of the vertical (axial) stiffness. For machine-attached and floor-attached restraining elements, separate from metal-to-metal contact by neoprene cushions 1/8" thick minimum. Provide neoprene acoustic friction pads at least 1/4" thick. For outdoor locations, provide neoprene coated springs and galvanized housings or comparable corrosion resistant coating. Mounting shall be as manufactured by Mason Industries, Inc., M. W. Sausse, Amberbooth, Caldyn or approved equal.

1. Springs: Provide springs with base and compression plates, to keep spring ends parallel during and after deflection to operating height. Provide outside coil diameters at least 0.8 of the operating height. At operating height, springs shall have additional travel to complete (solid) compression equal to at least 50% of the operating deflection. The spring element in the isolator shall either be set in a neoprene cup and have a steel washer to distribute the load

evenly over the neoprene, or each isolator shall be mounted on a unit Double Neoprene Pad isolator. If the Double Neoprene Pad isolator is used, a rectangular bearing plate of appropriate size to load the pad uniformly in the range of 40 to 50 psi shall be provided. If the spring isolator is supplied with a neoprene friction pad, a stainless steel, aluminum, or galvanized steel plate shall be used between the friction pad and the Double Neoprene Pad isolator. The Double Neoprene Pad isolator, steel plate, and friction pad shall be permanently adhered to one another and to the bottom of the bearing plate.

2. Mounting and adjustment: Provide base and compression plates with mounting holes or threaded fittings. Bolt leveling adjustment bolts to machinery or base. If the isolator is to be fastened to the building structure and a Double Neoprene Pad isolator is used under the bearing plate, neoprene grommets shall be provided for each bolthole in the base plate. Boltholes shall be properly sized to allow for grommets.

2.04 FLEXIBLE CONNECTORS FOR PIPING

A. Straight or elbow flexible connectors rated for temperatures, pressures, and fluids to be conveyed. Provide flexible connectors with the strength 4 times operating pressure at highest system operating temperature. Provide elbow flexible connectors with a permanently set angle.

B. Elastomeric Flexible Connectors: Provide flexible EPDM connectors with Kevlar tire cord reinforcement in all water piping connections to air handling units where pipe is greater than 2-inch nominal diameter. Connectors shall be of EPDM, single sphere, with ductile iron Class 150 flanged connections. Flanged assemblies shall be equipped with limit bolt to restrict maximum travel and resist pressure thrusts. Connectors shall have a minimum rating of 250 psi at 170ºF operating temperature. All materials shall be suitable for use in chilled water systems and outdoor environments. Connectors shall be Mason Industries, Inc., Type SFEJ, Mercer Rubber or approved equal.

C. Metal Flexible Connectors: Provide metallic braided hose in all water piping to pumps, air handling units and fan coil units where pipe is 2-inch or less nominal diameter. Provided threaded ends. Lengths shall be 6 times the nominal diameter with a maximum of 36 inches. Hoses shall be installed on equipment

side of shut-off valves and horizontally wherever possible. Fabricated of Grade E phosphor bronze, Monel or corrugated stainless steel tube covered with comparable bronze or stainless steel braid restraining and pressure cover. Provide Mercer BBF, Metraflex or approved equal.

2.05 FLEXIBLE DUCT CONNECTORS

A. Provide flexible duct connectors fabricated in accordance with SMACNA DCS.

2.06 SEISMIC PROTECTION COMPONENTS FOR PIPING AND DUCTWORK

A. Provide in accordance with SMACNA SRM and the National Uniform Seismic Installation Guidelines (NUSIG).

2.07 DOUBLE NEOPRENE PAD

A. Neoprene pad isolators shall be formed by two layers of 1/4" to 5/16" thick ribbed or waffled neoprene, separated by a stainless steel or aluminum plate. These layers shall be permanently adhered together. Neoprene shall be as specified. The pads shall be sized so that they will be loaded within the manufacturer's recommended range. Double neoprene pad isolators shall be formed from products from Mason Industries, Inc., M.W. Sausse or approved equal.

PART 3 – EXECUTION

3.01 GENERAL

A. The Contractor shall obtain inspection from the WHFD AND/OR PROJECT MANAGER of any installation to be covered or enclosed prior to such closure.

B. The Contractor shall obtain and follow written instructions from the vibration isolation manufacturer as to the proper installation and adjustment of vibration isolation devices.

3.02 ISOLATOR INSTALLATION

A. General: The installation or use of vibration isolators must not cause any change of position of equipment, conduit, piping or ducting, which would result in stresses in connections or misalignment of shafts or bearings. In order to meet this objective, equipment and attached systems shall be maintained in a rigid position during installation. The load shall not be transferred to the isolator until

the installation is complete and under full operational load. All plumbing, piping and ducting at mechanical equipment connections is to be fully supported by hangers. Mechanical equipment and vibration mounts shall not carry plumbing, piping or ducting loads.

B. Equipment Isolator Installation: The minimum clearance between the underside of the frame or inertia base and the pad or floor shall be one inch. Space saver brackets shall be used for equipment supported on spring isolators. The frame shall be placed in position and supported temporarily by shims prior to the installation of the machine or isolators. After the entire system installation is completed and under full operational load, the isolators shall be adjusted so that the load is transferred from the shims to the isolators. When all isolators are properly adjusted, the shims will be barely free and shall be removed.

C. Vibration Isolation Components: Install vibration isolation materials and equipment as indicated and in accordance with machinery manufacturer's instructions.

D. Flexible Pipe and Duct Connectors: Install flexible connectors in accordance with the manufacturer's instructions. When liquid pulsation dampening is required, flexible connectors with spherical configuration may be used. Provide restraints for pipe connectors at pumps to prevent connector failure upon pump startup.

3.03 EQUIPMENT ISOLATION

A. Provide vibration isolators and flexible connectors in accordance with manufacturer's recommendations. Machinery with spring isolators or protected spring isolators shall rock or move freely within limits of stops.

B. Stability: Isolators shall be stable during starting and stopping of machinery without traverse and eccentric movement of machinery that would damage or adversely affect the machinery or attachments.

C. Lateral Motion: The installed vibration isolation system for each piece of floor or ceiling mounted machinery shall have a maximum lateral motion under machinery start up and shut down conditions of not more than 1/4". Restrain motions in excess by approved spring mountings.

D. Unbalanced Machinery: Provide foundation suspension systems specifically designed to resist horizontal forces for machinery with large unbalanced horizontal forces. Vibration isolator systems shall conform to the machinery manufacturer's recommendations.

E. Non-rotating Machinery: Mount non-rotating machinery in systems which includes rotating or vibrating machinery on isolators having the same deflection as the hangers and supports for the pipe connected to.

3.04 PIPING ISOLATION

A. General:

1. Provide vibration isolation for piping. The isolator deflections shall be equal to or greater than the static deflection of the vibration isolators provided for the connected machinery.

2. Where lateral support of pipe risers is required, this shall be accomplished by the use of resilient lateral supports.

3. Pipes penetrating the building structure shall be isolated from the structure by the use of resilient penetration sleeve/seals.

4. Drain piping connected to vibration-isolated equipment shall be installed so that it does not contact the building structure or other non-isolated system unless it is resiliently mounted.

5. Piping connected to vibration-isolated equipment shall be installed so that it does not strain or force out of alignment pipe flexes or vibration isolators supporting either the equipment or the piping.

B. Piping Connected to Vibration Isolated Machinery: Provide isolation for piping, 2 inches diameter or greater, for a distance of 25 feet or 50 pipe diameters, whichever is greater.

C. Chilled Water Piping: Provide isolation for risers from pumps and for the first 20 feet of the branch connection of the main supply and return piping at each floor.

D. Water Distribution Piping Application: Resiliently support piping with combination spring and neoprene isolation hangers. Provide spring elements with 5/8" static

deflection; install the hanger with spacing so that the first harmonic natural frequency is not less than 360 Hz. Provide double-deflection neoprene elements. For the first 2 isolation hangers from the rotating equipment of 3 inches and smaller piping systems, ensure a deflection equal to the equipment-isolation static deflection. For the first 4 piping isolation hanger supports from rotating equipment of 4 inch and larger piping systems, use resilient hanger-rod isolators at a fixed elevation regardless of load changes. Incorporate an adjustable preloading device to transfer the load to the spring element within the hanger mounting after the piping system has been filled with water.

3.05 PIPE HANGER AND SUPPORT INSTALLATION

A. Pipe Hangers: Provide eyebolts or swivel joints for pipe hangers to permit pipe thermal or mechanical movement without angular misalignment of hanger vibration isolator.

B. High Temperatures: Where neoprene elements of vibration isolator may be subjected to high pipe temperatures, above 160ºF, provide metal heat shields or thermal isolators.

C. Valves: Provide vibration isolation hangers and supports at modulating, pressure reducing, or control valves that will induce fluid pulsations. When required or indicated, isolate valves with flexible connectors.

D. Machinery Without Flexible Connections: When piping is not connected to vibrating machinery with flexible connectors, provide the first 4 hangers with isolation elements designed for deflections equal to equipment vibration isolator deflections (including static, operating, and start-up).

E. Twelve Inch and Larger Pipe: Suspend 12-inch and larger pipe vibration hangers from resilient hanger rod isolators. Resilient hanger rod isolators shall be capable of supporting pipe during installation at a fixed elevation regardless of load changes. Provide an adjustable preloading device to transfer the load to isolation element after operational load is applied. Provide 12-inch and larger pipe supports with unrestrained stable springs for one-inch deflection and with built-in leveling device and resilient vertical limit stops to prevent spring elongation when partial load is removed. Provide isolators capable of providing rigid anchoring during erection of piping so that it can be erected at a fixed elevation.

F. Pipe Risers: Provide pipe riser supports with bearing plates and two layers of 1/4" thick ribbed or waffled neoprene pad loaded to not more than 50 psi. Separate isolation pads with 1/4" steel plate. Weld pipe riser clamps at anchor points to the pipe and to pairs of vertical acoustical pipe anchor mountings which shall be rigidly fastened to the steel framing.

G. Supports at Base of Pipe Risers: Piping isolation supports at the base of risers shall be two layers of 1/2" thick heavy-duty neoprene pad separated by 1/4" thick steel plate. Use bearing plates sized to provide a pad loading of not more than 500 psi. Weld the stanchion between the pipe and isolation support to the pipe and weld or bolt to the isolation support. Bolt isolation support to the floor slab with resilient sleeves and washers. Where supplementary steel is required to support piping, provide a maximum deflection of 0.08" at the mid-span of this steel under the load. Rigidly support piping from the supplementary steel with the supplementary steel isolated from the building structure with isolators.

H. Pipe Anchors: Attach each end of the pipe anchor to an omni-directional pipe isolator which in turn shall be rigidly fastened to the steel framing or structural concrete. Provide a telescoping pipe isolator of 2 sizes of steel tubing separated by a minimum 1/2" thick pad of heavy-duty neoprene or heavy-duty neoprene and canvas. Provide vertical restraints by similar material to prevent vertical travel in either direction. The load on the isolation material shall not exceed 500 psi.

3.06 SEISMIC RESTRAINT FOR PIPING AND DUCTWORK

A. Provide seismic restraints in accordance with SMACNA SRM and the National Uniform Seismic Installation Guidelines (NUSIG).

3.07 ELECTRICAL CONNECTIONS

A. Provide flexible conduit or multiple conductor cable connections for machinery with sufficient extra length to permit 2-inch minimum displacement in any direction without damage.

3.08 SYSTEMS NOT TO BE VIBRATION ISOLATED

A. Do not provide vibration isolation for electrical raceways and conduits or for fire protection, storm, sanitary, and domestic water piping systems that do not

include pumps or other vibrating, rotating, or pulsating equipment including control and pressure reducing valves.

3.09 FIELD QUALITY CONTROL

A. Provide equipment and apparatus required for performing inspections and tests. Notify WHFD AND/OR PROJECT MANAGER 14 days prior to machinery vibration testing. Rebalance, adjust, or replace machinery with noise or vibration levels in excess of those given in the machinery specifications, or machinery manufacturer's data.

B. Field Inspections: Prior to initial operation, inspect the vibration isolators for conformance to drawings, specifications, and manufacturer's data and instructions. Check for vibration and noise transmission through connections, piping, ductwork, foundations, and walls. Check connector alignment before and after filling of system and during operation. Correct misalignment without damage to connector and in accordance with manufacturer's recommendations.

C. Spring Isolator Inspection: After installation of spring isolators or protected spring isolators, and seismic restraint devices, the machinery shall rock freely on its spring isolators within limits of stops or seismic restraint devices. Eliminate or correct interferences.

D. Tests: Adjust, repair, or replace isolators as required to reduce vibration and noise transmissions to specified levels.

END OF SECTION

SECTION 15080 – MECHANICAL INSULATION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 WORK DESCRIPTION

A. This section covers the furnishing, fabrication, delivery and installation of the insulation for air conditioning and ventilation, and plumbing systems complete, including, but not limited to, the following:

1. Sheet metal duct insulation.
2. Pipe Insulation.
3. Equipment Insulation.
4. Manufacturer's literature, shop drawings and record drawings.
5. Inspection, test and guarantee.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS unless specified otherwise in other sections of Division 15 – MECHANICAL.

B. Ductwork specified in Section 15810 – DUCTWORK AND DUCTWORK ACCESSORIES.

C. Painting work specified in Section 09900 – PAINTING.

D. Hot water pipes specified in Section 15400 – PLUMBING.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS and Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

B. Shop Drawings: None.

C. Product Data: Submit product data for the following:

1. Duct insulation.

2. Pipe insulation.

3. Equipment insulation that is not factory installed.

4. Insulation accessories including vapor barrier, tape, jacket and other items.

D. Schedules: Schedule of materials listing name and addresses of manufacturers; manufacturer's local supplier's name, address and phone number; catalog numbers and trade names in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

E. Reports: None.

F. Certificates of Conformance or Compliance: Submit certificates of conformance for performance and characteristics specified, the listed standards and in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS for the following:

1. Duct insulation.

2. Pipe insulation.

G. As-Built Drawings: None.

H. Guarantee and Certificate: Submit one-year guarantee and certificate in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General:

1. Provide materials complying with NFPA Bulletin 90-A, as determined by UL method NFPA 225-ASTM E 84 or UL 181, with flame spread rating 25 and under and smoke developed rating 50 and under.

2. Where vapor barriers are used, provide intact and continuous throughout.

2.02 DUCT INSULATION

A. Air conditioning ducts and plenums shall be insulated. Ventilation ducts (i.e., outside air and exhaust) in conditioned spaces or in spaces above air-conditioned rooms shall be insulated.

1. Unless otherwise indicated, insulate all interior supply and return ducts with 1 1/2" thick fiberglass, 1.5 lbs per cu ft density, foil faced duct wrap. Provide Owens-Corning Fiberglass commercial grade faced duct wrap insulation Type 150, Schuller, Certainteed or approved equal. Duct wrap insulation shall conform to the requirements of Federal Specification HH-I-558B, Form B, Type I, Class 6, B-4 and NFPA 90 with the reinforced foil-Kraft vapor barrier facing conforming to Federal Specification HH-I-100B, Type II.

2.03 PIPE INSULATION

A. All above grade indoor reheat, hot water and hot water return piping shall be insulated with Johns-Manville Micro-Lok with Vapor Barrier Jacket or approved equal by Owens Corning and Certainteed, having minimum density of 3.5 lbs per cu ft and a maximum "K" factor of .22 BTU at 50ºF mean. Thickness of insulation shall be as follows:

Thickness	Pipe Size
1 inch	Up to 2 inches
1-1/2"	2-1/2" and over

B. All above grade indoor chilled water piping shall be insulated with Pittsburgh Corning Foamglass cellular glass insulation conforming to ASTM C552 or approved equal. Above grade indoor insulation shall be finished with butlyl sealant and kraft paper laminate jacketing as recommended by the manufacturer. Thickness of insulation shall be as follows:

Thickness	Pipe Size
1 inch	Up to 2 inches
1-1/2"	2-1/2" and over

C. The insulation shall be applied over clean, dry pipe with all joints firmly butted together. Longitudinal laps shall be sealed with vapor barrier adhesive. Butt joints shall be wrapped with a 4-inch strip of the vapor barrier jacket cemented with vapor barrier adhesive. Each 3 ft section of insulation and each butt strip shall be additionally secured with 3/4" wide white tape as approved by the insulation manufacturer.

D. Valves shall be insulated with fiberglass insulation with water resistant vapor barrier, similar to adjacent piping. Insulation shall be applied to allow full operational travel of valve handles.

E. Clamps or hangers in contact with pipe shall be insulated separately in the same manner as fitting. The insulation shall be applied upward along the vertical hanger rod to a point not less than 6 inches and sealed off.

F. Protect pipe insulation at all hanger and support points. Where one-inch thick insulation is used, it shall be protected by 12 inches long galvanized metal shield. Where 1-1/2" insulation is used, cellular glass with vapor barrier jacket shall be installed at the hanger point and protected with a 16-gauge galvanized metal shield on the outside of the jacket.

2.04 OTHER MECHANICAL EQUIPMENT REQUIRING INSULATION

A. Pipe hangers and supports for insulated pipes that contact the pipe surface directly shall be insulated with same insulation system as the pipe insulation.

B. Strainers that are connected to insulated pipes. Insulate strainers with 1-1/2" thick cellular glass insulation. Finish insulation with ASJ vapor barrier.

C. Flow devices installed in insulated pipes. Insulate with same insulation system as adjacent pipe insulation. Provide removable insulation covers for test connections (e.g., connections to install portable flow meter) of the same material as the pipe insulation.

D. Parts of air handling equipment that are not factory insulated such as mixing boxes, return air plenums, etc. Insulate with same duct insulation system as connecting ductwork.

E. Equipment, pipes and related appurtenances that are indicated or specified to be insulated but were not factory insulated shall be insulated to match the thickness of the pipe insulation specified herein.

PART 3 - EXECUTION

3.01 COOPERATION WITH OTHER TRADES AND CONFLICT IN WORK

A. Contractor shall examine all drawings of proposed work and coordinate his work with other trades. Work conflicts shall be brought to attention of the WHFD AND/OR PROJECT MANAGER and work rearranged or modified in accordance with his decision.

B. If changes in indicated locations or arrangements of work are required, they shall be made by Contractor without additional charge to the WHFD AND/OR PROJECT MANAGER provided that these changes were ordered before work is installed and no extra material or labor is required.

C. Should Contractor determine that extra material and labor will be required to accommodate any rearrangement, he shall first submit detailed estimate of cost for required changes and proceed with work only upon written authority of the WHFD AND/OR PROJECT MANAGER.

3.02 EQUIPMENT INSTALLATION

A. Equipment shall be installed as indicated and in accordance with manufacturer's recommendations and instructions.

B. All necessary supports shall be provided for equipment, appurtenances and duct as required. This work shall include any additional steel purlins, brackets, seismic restraints or supports.

3.03 WORKMANSHIP AND FABRICATION

A. Ductwork, Plenums, Casings and Accessories Insulation:

1. Provide field-applied insulation to exterior of supply ducts, return ducts, outside air intake ducts, duct plenums, and casings of HVAC units. Ensure full range of motion of equipment actuators. Modify insulation to avoid obstruction with valve handles, damper handles and other such items. Install insulation with jackets drawn tight and cement down on longitudinal and end laps. Do not use scrap pieces where a full-length section will fit.

2. Rigid insulation: Secure rigid insulation by impaling over pins or anchors located not more than 3 inches from joint edges of boards, spaced not more than 12 inches on center and secure with washers and clips. Spot weld anchor pins or attach with a waterproof adhesive especially designed for use on metal surfaces. Apply insulation with joints tightly butted. Neatly bevel insulation around nameplates and access plates and doors. Each pin or anchor shall be capable of supporting a 20 lbs load. Cut off protruding ends of pins, after clips are sealed with coating compound for inside work or manufacturer's recommended weatherproof coating for outside work, and reinforced with open weave glass membrane.

3. Flexible blanket insulation: Apply insulation with joints tightly butted. Secure insulation to ductwork with adhesive in 6-inch wide strips on 12-inch centers. Staple laps of jacket with outward clinching staples on 4-inch centers. Provide pins, washers and clips at 18 inches on center and not more than 4 inches from duct edge for duct surfaces greater than 24 inches across except for top surfaces of horizontal ducts. For vertical ducts with surfaces less than 24 inches across, provide pins no more than 4 inches from duct edge at 18 inches on center. Carry insulation over standing seams and trapeze-type hangers. Install speed washers with pins and pin trimmed to washer. Sagging of flexible duct insulation shall not be permitted. Cut off protruding ends of pins after securing and sealing clips with coating compound for inside work. In cold air ducts, vapor seal joints and staple as specified.

B. Pipe Insulation:

1. Fiberglass insulation: Apply insulation over clean, dry pipe with all joints firmly butted together. Longitudinal laps shall be sealed with Johns-Manville vapor barrier adhesive. Butt joints shall be wrapped with a 4-inch strip of the vapor barrier jacket cemented with vapor barrier adhesive. Each 3 feet section of insulation and each butt strip shall be additionally secured with 3/4" wide Johns-Manville white tape.

3.04 PAINTING AND IDENTIFYING OF PIPING

A. General: The following items furnished under this section are to be painted under Section 09900 – PAINTING. Do not paint over nameplates or other identifying labels.

1. Exposed pipe insulation.
2. Exposed duct insulation.
3. Exposed equipment insulation that is unfinished.

3.05 ADJUSTING AND CLEANING

A. Pipes, equipment and ducts shall be cleaned free of scale and thoroughly flushed of all foreign matter prior to field insulation. Equipment shall be wiped clean, with all traces of oil, dust, dirt, or paint spots removed. Pipe hangers and supports that

were temporarily loosened to allow installation of the insulation and jacket, shall be repositioned and adjusted to carry the load without crushing the insulation.

END OF SECTION

SECTION 15181 – CHILLED WATER PIPING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 DESCRIPTION OF WORK

A. This section covers the furnishing, fabrication, delivery and installation of the chilled water piping systems complete, including but not limited to the following:

1. Piping and fittings.
2. Valves and accessories.
3. Manufacturer's literature, shop drawings and record drawings.
4. Testing and guarantee.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS unless specified otherwise in other sections of Division 15 – MECHANICAL.

B. Painting work specified in Section 09900 – PAINTING.

C. Seismic restraints for Chilled Water Piping and equipment specified in Section 15070 – MECHANICAL SOUND, VIBRATION AND SEISMIC CONTROL.

D. Insulation specified in Section 15080 – MECHANICAL INSULATION.

E. Testing, adjusting and balancing of air and chilled water systems specified in Section 15950 – HVAC TESTING/ADJUSTING/BALANCING.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS and Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

B. Shop Drawings: Submit shop drawings of plans, performance data and details showing locations and installation including, but not limited to, the following (note: shop drawing of these items can be combined with the shop drawing for the air conditioning equipment shop drawings): Chilled water piping.

C. Product Data: Submit product data for the following: Piping and valves.

D. Schedules: Schedule of equipment listing name and addresses of manufacturers; manufacturer's local supplier's name, address and phone number; catalog numbers and trade names in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

E. Reports: Testing, adjusting and balancing of chilled water systems specified in Section 15950 – HVAC TESTING/ADJUSTING/BALANCING.

F. Certificates of Conformance or Compliance:

1. Submit certificates of conformance for performance and characteristics specified, the listed standards and in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS for the following: Piping and valves.

2. Submit certificates of qualifications for manufacturers' representatives: None.

G. As-Built Drawings: Submit drawings in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

H. Operations and Maintenance Manuals: None.

I. Guarantee and Certificate: Submit one-year guarantee and certificate in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. The manufacturer must have other piping systems of comparable type and size installed and operating satisfactorily in the State of Hawaii for a minimum of 2 years prior to bid opening.

2.02 PIPING AND FITTINGS

A. General: All pipe and pipe fittings shall be suitable for 125 psi minimum working pressure, in accordance with the latest edition of ASTM and ANSI specifications as indicated.

B. Service: Aboveground chilled water.

Item	Size	Description
Pipe	2" and smaller	Hard drawn copper tubing, Type L, conforming to ASTM B 88.
	2-1/2" and larger	Standard weight, black steel, ASTM A 53, beveled ends. Alternate: Grooved ends, Victaulic or approved equal.
Fittings	2" and smaller	Wrought copper soldered joint type conforming to ANSI B16.18 and soldered joints with 95-5 tin antimony alloy or brazed.
	2-1/2" and larger	Black steel, standard weight, butt-weld type, ASTM A 234, ANSI B16.9. Use standard weight weld rings at joints of piping if required by approved welding procedure. Alternative: Grooved fittings, Victaulic or approved equal.
Unions	2 1/2" and smaller	For copper tubing and shall be cast bronze with soldered ends.
Flanges	2"	Cast bronze, 150-lb soldered joint type flanges, ANSI B16.24.
	2-1/2" and larger	Forged steel, 150-lb weld neck, flat-faced or raised face to match flange on valves or equipment, ASTM A 181, ANSI B16.5. Alternate: Grooved ends, Victaulic or approved equal.

C. Hot Water Reheat piping and fittings: Provide similar types of piping and fittings as chilled water piping.

D. Condensate Drain piping and fittings: Schedule 40, Type PVC with solvent joint DWV fittings. Insulate with 3/4" thick elastomeric pipe insulation, conforming to ASTM C 534, Type 1.

E. Service: Aboveground chilled water: In lieu of welded steel fittings for 2-1/2" and larger pipe sizes, grooved fittings may be used. The Contractor shall submit shop drawings based on the grooved fittings for approval and to meet the original intent of the drawings. All changes to use the grooved system shall be the Contactor's

responsibility and shall be part of the original contract amount. Grooved system shall be Victaulic or approved equal.

2.03 VALVES

Item	Size	Description
Globe Valves	3" and smaller	125-lb S.W.P., bronze body, rising stem, inside screw, composition disc, threaded ends. Provide NIBCO T-211 or approved equal.
Check Valves	1-1/2" and smaller	125-lb S.W.P., bronze body, swing check valve, bronze disc, bronze hinge pin, Buna-N resilient seat, threaded ends. Provide NIBCO T-413 or approved equal.
	2" and larger	125-lb S.W.P., double door check valve, steel or cast-iron body, aluminum bronze doors, stainless steel spring and pins, Buna-N resilient seat, non-slam closure, lug body style. Provide Apco Series 9000-L or approved equal.
Ball Valves	2" and smaller	125-lb S.W.P., bronze body, Type 316 stainless steel ball and stem, PTFE seat, full port, lever handle with integral stop, threaded ends. Provide NIBCO T-585-70-66 or approved equal.
Plug Valves	2-1/2" and smaller	150-lb S.W.P, bronze body, eccentric resilient chloroprene faced plug, lever handle with integral stop, threaded ends. Provide Dezurik Fig. 120 or approved equal.
	3" and larger	125-lb S.W.P., cast iron body, resilient chloroprene faced eccentric plug, flanged ends and manual operator with handwheel actuator and right angle gear drive. Provide DeZurik Fig. 118 or approved equal.

Item	Size	Description
Butterfly Valves	2" and larger	MSS-SP67, Type I tight shutoff valve, ductile iron lug body, stainless steel stem, aluminum bronze disc, EPDM seal, positive latching lever actuator with memory stop. For sizes 4-inch and larger, provide worm gear drive with handwheel. For valves located more than 5 feet above finished floor, provide chain wheel operator and chain. Provide NIBCO LD-2000 or approved equal.

2.04 PIPE HANGERS AND SUPPORT

A. Hangers and supports shall be of manufacturer and type specified or as indicated or approved equal. Pipe supports and hangers in contact with copper piping shall be copper or plastic coated.

B. Shields: Provide protection shields at hanger points of insulated piping. Shields shall be Crawford Fig. 25, Elcen Fig. 219, or Fee and Mason Fig. 81 or Grinnell Fig. 167.

C. Supports:

1. Piping shall be supported from structural steel, grouted CMU walls, or concrete slab only; piping shall not be supported in any manner from the roofing.

2. Drilled-in threaded inserts: Where supports in slabs are required after concrete has been poured, Phillips “Redhead” drilled in threaded inserts shall be provided, installed in accordance with manufacturer's recommendations.

3. Expansion anchors and power-actuated fasteners and devices: Install lead shield anchors or power actuated sleeves, fasteners and devices in accordance with manufacturer's recommendations. Powder actuated pins are not allowed to be “shot” into the concrete structure.

D. Schedules:

1. Pipe support spacing shall conform to the following table, except support spacing for copper tubing shall not exceed 6 feet on centers:

Pipe Size	Support Spacing
1/2" and 3/4"	Not over 6'–6"
1" and 1-1/4"	Not over 8'–6
1-1/2"	Not over 10'–0"
2" and 2 1/2"	Not over 12'–0"
3"	Not over 12'–0"
4"	Not over 14'–0"
6"	Not over 17'–0"
8" to 12"	Not over 21'–0"
14" to 18"	Not over 25'–0"

2. Sizes of pipe hanging suspension rods shall be sized to carry the intended load based on manufacturer's data.

E. Supplementary Steel: Provide all necessary supplementary steel for proper support or attachment of hangers. Steel shall be painted with one coat of rust inhibiting primer.

F. Single Hangers: Unless otherwise indicated, support single pipe runs as follows: Clevis hanger, conforming to MSS SP-69, Type 1, with insulation protection shield.

G. Riser Clamps: Carbon steel conforming to MSS SP-69 Type 8. Grinnell Fig. 261, Fee and Mason Fig. 241.

2.05 STRAINERS

A. Provide wye ("Y") type strainer ahead of all flow control valves and as indicated, bronze body (2-inch and smaller) or cast iron body (2-1/2" and larger) with stainless steel strainer screens with no larger than 0.033" perforations and threaded ends (2-inch and smaller) or flanged ends (2-1/2" and larger). Provide valved flushing line from bottom of each strainer. Provide Nibco T-221-A or F-721-A, or approved equal.

2.06 THERMOMETERS

A. Organic blue liquid filled lens tube type with separable socket. Provide adjustable, 9-inch scale, 0ºF to 100º F range for chilled water application with 2ºF maximum scale divisions, enameled die-cast aluminum adjustable angle case. Provide stainless steel wells for steel pipes and brass wells for copper pipe and of suitable length to accommodate pipe size and thickness of insulation.

2.07 PRESSURE GAUGES

A. Pressure gauges shall be Grade A, accurate within 1% of full scale, phosphor bronze Bourdon tube, spring type, with 4-1/2" diameter dials unless otherwise indicated, with recalibrating screws. Socket shall be 1/4" NPT forged brass, bottom outlet. Gauges shall have plain cast aluminum cases with screwed rings finished in black enamel or chromed and shall be installed with necessary piping, including heavy-duty needle valve.

B. Pressure gauges ranges shall be such that the position of the pointer during normal operation will be 50% of dial range.

2.08 CHILLED WATER AUTOMATIC FLOW CONTROL DEVICES

A. Automatic Flow Control Valves: Provided individually selected and factory calibrated by the flow control valve manufacturer for the service specified. The valves shall automatically limit the rate of flow of the system to the required design capacity regardless of system fluctuations. Valves shall regulate flow within 5% of their tag rating over an operating pressure differential of at least 14 times the minimum required for control. Provide tamper-proof valves with body tappings suitable for connecting instruments for verifying flow control performance. Provide the self-cleaning, cartridge-piston type with stainless steel or Monel, variable area orifices. Valves shall be copper or bronze body and designed for a minimum service pressure of 125 psig. Valve bodies shall have threaded or flanged connections. Furnish each automatic flow control valve with a valve kit located outside of insulation, and hose fittings suitable for use with the measuring instruments as specified. Provide a metal identification tag fastened to each of the flow control valves with a chain. The tag shall include manufacturer's name, model number, rated flowrate in gallons per minute, and operating pressure differential range. Provide a portable meter with a direct reading gauge, hoses, shutoff valves, vent valves, “psi” to “gpm” conversion chart, and carrying case that is compatible with the flow control valves provided. Portable flow meter shall be turned over to the WHFD AND/OR PROJECT MANAGER at the end of the project. Provide Griswold Controls, copper sweat type or threaded flange type with dual hose meter KVT #3429A, Autoflow or approved equal.

B. Manual Flow Control Valve: Copper alloy body up to 2-inch size, Y-pattern ductile iron body for 2-1/2" and larger sizes, 300 psi working pressure, differential

pressure read out ports across valve seat, memory stop, calibrated nameplate, threaded or grooved end, leak tight full rated working pressure and portable meter and hoses to read flowrate or differential pressure and flowrate calibration curve. Victaulic TA Hydronic Circuit Balancing Valve or approved equal.

2.09 CONTROL VALVES

A. 2-Way Motor Actuated Control Valves: Provide direct acting for use with chilled water service, modulating control. The valves shall be rated for 150 lbs and be designed for maximum pressure drop of 8 psi but not less than 2 psi unless the flow coefficient (Cv) is specified. Direction of flow shall be indicated on the body. Provide bodies, stems, and plugs of a material that will not corrode or pit when used in the water systems. Provide 2-way modulating type valve with bronze body with threaded ends, reinforced TFE seat and stuffing box ring, bronze bushing, insulation around the bracket, stainless steel stem. Provide electric motor designed for use as valve actuator and with sufficient torque for shutoff duty at system pressure. Actuator shall respond to proportional electronic or digital signal from the temperature control system and designed for modulating or on-off service as indicated. Provide control transformer and linkages as required 120 volts or less, slow closing (minimum 60 seconds from fully open to fully closed position), manual override button and mechanism.

PART 3 - EXECUTION

3.01 COOPERATION WITH OTHER TRADES AND CONFLICT IN WORK

A. Contractor shall examine all drawings of proposed work and coordinate his work with other trades. Work conflicts shall be brought to attention of WHFD AND/OR PROJECT MANAGER and work rearranged or modified in accordance with his decision.

B. If changes in indicated locations or arrangements of work are required, they shall be made by Contractor without additional charge to the WHFD AND/OR PROJECT MANAGER provided that these changes were ordered before work is installed and no extra material or labor are required.

C. Should Contractor determine that extra material and labor will be required to accommodate any rearrangement, he shall first submit detailed estimate of cost

for required changes and proceed with work only upon written authority of the WHFD AND/OR PROJECT MANAGER.

3.02 EQUIPMENT INSTALLATION

A. Equipment shall be installed as indicated and in accordance with manufacturer's recommendation and instructions.

B. All necessary supports shall be provided for equipment, appurtenances and pipe as required. This work shall include any additional steel purlins, brackets, seismic restraints or supports.

C. Provide controls as indicated for proper operation of the equipment. Provide all necessary relays, contactors, enclosures and transformers to ensure proper system operation.

3.03 WORKMANSHIP AND FABRICATION

A. Pipe Installation:

1. Pipe shall be cut accurately to measurements established at the job site and worked into place without springing or forcing, properly clearing all windows, doors and other openings. Cutting or weakening of the building structure to facilitate piping installation will not be permitted.

2. Pipes shall be cut square, shall have burrs removed by reaming, and shall be so installed as to permit free expansion and contraction without damage to joints or hangers. Install special swing and expansion joints in pipe lines where required to accommodate specified movement. Filings, dust, or dirt shall be wiped from interior of the pipe before connections are made.

3. Changes in direction shall be made with fittings. All piping shall be installed with sufficient pitch to insure adequate drainage.

4. Screw joints shall be made with tapered threads properly cut conforming to requirements of NBS handbook H28. Joints shall be made perfectly tight with a stiff mixture of litharge and glycerin or other approved threaded joint compound applied with a brush to the male threads only. Not more than three threads shall show after the joint is made up.

5. Welded joints shall conform as to workmanship, testing, qualification of welders and general requirements, with welding section of ANSI B31.9. The

WHFD AND/OR PROJECT MANAGER reserves the right to require qualifying demonstration of any welder assigned to job by Contractor at no additional cost.

6. Flanges shall be suitable for the required operating pressures and temperature conditions. Gaskets shall be fiber plastic or synthetic material suitable for water service. All nuts, bolts and washers used shall be galvanized for ferrous flanges and brass for copper or bronze flanges.

7. Pipes passing through walls or concrete floors shall be provided with pipe sleeves fitted into place at time of construction. Sleeves shall not be installed in structural members. Each sleeve shall extend through its respective wall or floor and shall be cut flush with each surface. Unless otherwise indicated, sleeves shall be of such size as to provide a minimum of 1/4" all around clearance between jacket over insulation and sleeves. Space between sleeve and piping shall be packed with twisted jute packing and then sealed with waterproof sealant. Where pipes pass through fire rated walls or floors, seal both ends of sleeve with Underwriter's Laboratories listed thermal barrier material to maintain fire rating.

3.04 PIPE HANGERS AND SUPPORTS

A. Provide adjustable hangers, clamps, supplementary steel, etc., as required for proper support of all piping.

B. Supports shall secure pipes or conduits in place, shall prevent pipe vibration, maintain required grading by proper adjustment, provide for expansion and contraction, and shall make neat appearance.

C. Design supports of strength and rigidity to suit loading, service, and in a manner which will not stress unduly the building construction.

D. Where support is from concrete construction, take care not to weaken concrete or penetrate waterproofing.

E. Provide seismic restraints for all above ground piping to meet the requirements of the IBC as adopted by the Hawaii County.

3.05 EQUIPMENT SUPPORT

A. Refer to drawings for type of construction from which equipment is to be supported. Structural metal supports shall be provided as indicated.

3.06 PAINTING AND IDENTIFYING OF PIPING

A. General:

1. The following items furnished under this section are to be painted and identified under Section 09900 – PAINTING. Do not paint over nameplates or other identifying labels.

   a. Insulated piping.

2. Paint exposed black iron work including structural steel members used for equipment, pipe, and other supports, iron body valves, pipe hangers, etc., with 2 coats of zinc rich paint.

B. Identification of Piping: Provide identification of all new pipe lines in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

C. Identification of Valves: Provide valve I.D. tags for all valves shown on the drawings in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

D. Identification of Equipment and Devices: Provide equipment identification tags for all equipment and devices shown on the drawings in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

3.07 CLEANING AND FLUSHING PIPES

A. Pipes shall be cleaned free of scale and thoroughly flushed of all foreign matter. Provide vents and drains connections and nipples as required to allow flushing the pipes thoroughly.

3.08 TESTING, ADJUSTING AND BALANCING

A. Notify the WHFD AND/OR PROJECT MANAGER 14 days before flushing and testing to allow scheduling to observe the flushing and testing activities.

B. After satisfactory completion of testing, all openings to the piping shall be protected from entrance of foreign objects, dirt, etc. and accelerated corrosion of the interior of the piping.

C. Test, adjust and balance each piece of equipment as required to assure proper operation. See Section 15950 – HVAC TESTING/ADJUSTING/BALANCING for further requirements.

3.09 CALIBRATION AND ADJUSTMENTS

A. After completion of the installation, perform final calibrations and adjustments of the equipment provided under this contract and supply services incidental to the proper performance of the unit control panels under warranty.

3.10 ACCEPTANCE PROCEDURE

A. Upon completion of the calibration, Contractor shall perform all necessary testing and run diagnostic tests to ensure proper operation. Contractor shall be responsible for generating all software and entering all database information necessary to perform the sequence of control and specified software routines. An acceptance test in the presence of the WHFD AND/OR PROJECT MANAGER shall be performed.

B. Provide operational acceptance tests. The tests shall be performed during a normal day of operation after the air conditioning system has been completely installed and made operable. Results of the tests shall be indicated on the Operational Performance Test form attached and shall be part of the submittal for the testing and balancing report.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15300 – WET PIPE FIRE SPRINKLER SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The work includes modification of an existing automatic wet pipe sprinkler system to afford 100% complete fire protection coverage throughout the indicated areas. The design, equipment, materials, installation, and workmanship of the sprinkler system shall be in strict accordance with the required and advisory provisions of NFPA 13, except as modified herein.

B. The sprinkler system shall include all materials, accessories, and equipment necessary to provide a system complete and ready for use. Design and installation of the system shall be with full consideration to blind spaces, piping, electrical equipment, ductwork, and all other construction and equipment to afford complete coverage. Devices and equipment for fire protection service shall be listed by the Underwriters' Laboratories, Inc. (UL) or approved by FM Approvals (FM). In the National Fire Protection Association (NFPA) publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word “shall” had been substituted for “should” wherever it appears; reference to the “authority having jurisdiction” shall be interpreted to mean the Building Department and Fire Department. Reference to the “Building Department” on the contract drawings and herein shall be interpreted to mean the County of Hawaii Public Works Building Division; reference to the “Fire Department” shall be interpreted to mean the Hawaii County Fire Department. “Provide” shall mean “furnish and install” when used herein. The work shall begin at the points indicated.

1.02 CODES, STANDARDS, AND REGULATIONS

A. The latest publications listed below form a part of this specification. The publications are referred to in the text by the basic designation only.

B. Installation of all work in this section shall be made in accordance with State Department of Health Regulations, the National Fire Protection Association, the International Building Code, and the Uniform Fire Code, as adopted by Hawaii County.

C. All applicable codes, regulations and ordinances of public bodies having jurisdiction are considered a part of these specifications. All work installed and materials provided must comply with the current edition of such codes, regulations, and ordinances.

D. ASTM International, A 53 – Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

E. ASTM International, A 135 – Electric-Resistance-Welded Steel Pipe.

F. ASTM International, A 795 – Black and Hot-Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use.

G. FM Approvals, FM Approval Guide, Updated online.

H. National Fire Protection Association, NFPA 1, Fire Code, 2021 Edition, as amended.

I. National Fire Protection Association, NFPA 13, Installation of Sprinkler Systems, 2019 Edition.

J. National Fire Protection Association, NFPA 70, National Electrical Code, 2017 Edition.

K. State of Hawaii Department of Accounting and General Services, Public Works Division, Design Consultant Criteria Manual, Updated online.

L. Underwriters Laboratories, Inc, UL Fire Protection Equipment Directory, Updated online.

M. Underwriters Laboratories, Inc, UL Fire Resistance Directory, Updated online.

1.03 CONTRACT DRAWINGS

A. Contract drawings are essentially diagrammatic, indicating general layout and approximate locations toward establishing the scope for a uniform estimating basis for all bidders. They are not intended to be detailed construction working drawings.

B. Piping arrangements shall fit into space allotted. Reasonable modifications to indicated locations and arrangement to suit job conditions shall not constitute basis for requesting additional funds from the Owner.

C. Verification of Dimensions: The Contractor shall be responsible for the coordination and proper relation of his or her work to the structure and to the work

of all trades. The Contractor shall visit the premises and thoroughly familiarize himself or herself with all details of the work and notify the WHFD AND/OR PROJECT MANAGER of any discrepancy before performing any work.

1.04 SUBMITTALS

D. Manufacturer's Published Data:

1. As soon as practicable and before installation of any materials or equipment is begun, the Contractor shall submit a complete list of materials and equipment together with names and addresses of manufacturers, catalog numbers, and trade names to the WHFD AND/OR PROJECT MANAGER for approval.
2. Annotate descriptive data to show the specific model, type, and size of each item the Contractor proposes to furnish.
3. Approval of materials will be based on manufacturer's published rating. Any materials and equipment that are not in accordance with these specifications may be rejected.

E. Shop Drawings:

1. Provide a soft copy set or two (2) hard copy sets of the shop drawings showing the fire sprinkler systems to be installed by the Contractor. Prepare shop drawings on sheets 24 inches by 36 inches using a drawing scale not less than 1/8" = 1'-0". Shop drawings shall be prepared in accordance with NFPA 13 and include all data essential to the proper installation of the system. Do not commence work until the design of the systems and the various components have been approved.
2. Prior to start of any construction, required copies of to-scale shop drawings of fire sprinkler piping, sprinkler heads, sprinkler valves, shall be submitted for review. No work shall be started without approval of the WHFD AND/OR PROJECT MANAGER. Shop drawings shall be fully dimensioned to show that the equipment and connections thereto fit within the space provided.
3. Review of shop drawings is confined to arrangement of equipment only and does not relieve the Contractor from responsibility for proper fit, performance, and construction. Any deviation from the contract drawings and/or specifications shall be clearly noted on the shop drawings. Since manufacturing methods vary, reasonable variations from the Contract

Documents are acceptable; however, performance and material requirements are a minimum and the WHFD AND/OR PROJECT MANAGER retains the right to judge the equality of any variation.

4. Record Drawings: Upon completion of work, submit accurate as-built shop drawings to the WHFD AND/OR PROJECT MANAGER. As-built shop drawings shall be stamped by a professional engineer registered in the State of Hawaii. Show exact locations and sizes, as actually installed, of the fire sprinkler systems on these record “as-built” drawings.

1.05 OMISSIONS

A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions, the Contractor shall call the attention of the WHFD AND/OR PROJECT MANAGER to such omissions 15 days in advance of the date of bid opening so that the necessary corrections can be made.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Furnish new equipment, materials and accessories bearing the manufacturer's identification. Coordinate deliveries to avoid interference or construction delays. Protect products during delivery, storage, installation and the remainder of the contract period after installation.

B. Pipe and fittings shall be stored on pallets or blocks a minimum 2 inches above the ground to prevent foreign material from entering piping prior to installation. Pipe ends shall be capped to prevent dirt, water, or other residue from entering.

1.07 GUARANTEE AND CERTIFICATE

A. Contractor and Installer shall guarantee and certify in writing all work in this section for a period of one year. Contractor shall be responsible for all damages to any part of premises during equipment installation work under this section.

B. The entire fire protection installation described hereinafter shall be guaranteed as a complete working unit for a period of one year. In the event of failure due to faulty workmanship or materials during this period, all said failures shall be corrected to the satisfaction of the WHFD AND/OR PROJECT MANAGER at no additional cost to the Tenant for labor and material.

C. The one-year guarantee shall start at the end of 30 consecutive days of trouble-free operation after acceptance by the Owner.

D. The above guarantee shall not be interpreted as voiding, limiting, or reducing any equipment manufacturer's warranty or any guarantee permitted by law.

PART 2 - PRODUCTS

2.01 MATERIAL AND EQUIPMENT

A. Asbestos-containing materials or equipment shall not be used under this section. The Contractor shall insure that all materials and equipment incorporated in the project are asbestos-free.

B. All materials shall be new, of equal or better quality of materials specified. For ease of maintenance and parts replacement, select equipment from a single manufacturer as much as possible.

C. All devices and equipment for fire protection service shall be UL listed or FM approved.

2.02 DESIGN OF SPRINKLER SYSTEM

A. Hazard Classification shall be in accordance with NFPA 13 and as indicated on contract drawings.

B. Location and spacing of sprinklers shall be in accordance with NFPA 13. Sprinklers shall be spaced uniformly on branch lines.

C. Provide components to provide availability for testing and maintenance of the overhead wet pipe automatic sprinkler system, in accordance with NFPA 13.

D. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the WHFD AND/OR PROJECT MANAGER.

E. Sprinkler spacing and pipe sizes shall follow existing piping. Contractor shall submit hydraulic calculations if greater sprinkler spacing or smaller pipe sizes are installed. Reasonable modification to the fire sprinkler pipe routing may be permitted without requiring to submit hydraulic calculations, subject to the approval of WHFD AND/OR PROJECT MANAGER.

2.03 MATERIAL AND EQUIPMENT

A. Provide automatic closed head sprinklers as indicated on contract drawings. New sprinkler shall not be equipped with O-ring seals. Sprinklers shall be UL listed or FM approved.

B. Provide a metal cabinet with spare sprinkler heads, 3 sprinkler stoppers, and one sprinkler head wrench near the fire sprinkler riser or as indicated by Kona Community Hospital maintenance. The quantity and types of spare sprinkler heads shall be provided as specified in NFPA 13. Label spare cabinet with location(s) fire sprinklers are installed.

C. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the WHFD AND/OR PROJECT MANAGER.

2.04 ABOVEGROUND PIPING SYSTEM

A. Sprinkler System Piping and Fittings: Steel Piping and Fittings: Provide steel piping for fire sprinkler piping in accordance with NFPA 13. Pipe sizes less than 2 1/2" in diameter shall be Schedule 40. Pipe sizes 2 1/2" and larger shall be Schedule 10 or 40. Plastic piping shall not be permitted. Fittings shall be welded, threaded, or grooved-end type, UL listed or FM approved for use in sprinkler systems. Fittings for pipe sizes 2 inches in diameter and smaller shall be threaded. Make changes in pipe sizes through standard tapered reducing pipe fittings. Use of bushings will not be permitted. Press-fit fittings, snap-fit fittings, and plain-end fittings that utilize steel gripping devices to bite into pipe when pressure is applied will not be permitted. Jointing compound for pipe threads shall be polytetrafluoroethylene (PTFE) pipe thread tape or pipe cement; apply only on male threads. Welding shall be performed in the shop; field welding will not be permitted.

B. Pipe Hangers: Provide hangers, supports, inserts, earthquake sway bracing, branch line restraint, and associated items to properly support fire sprinkler system piping in accordance with pertinent provisions of NFPA 13. Listed fasteners shall be used to secure hanger, earthquake sway bracing, and restraint assemblies to wooden building structural members, such as beams, trusses, and purlins. Provide retaining straps for all beam clamps to metal building structural members. Provide additional hangers to support the concentrated loads in piping between hangers, such as for flanged valves.

C. Sway Bracing and Branch Line Restraints: Provide on new and existing piping within area of work in accordance with NFPA 13. Provide branch line restraint for armovers that require hangers.

D. Drain Piping: Provide auxiliary drains as required by NFPA 13.

E. Pipe Penetrations: For penetrations through non-fire rated walls, firmly pack space with insulation and caulk at both ends of sleeve with a flexible, waterproof cement. For penetrations through fire rated walls, floor/ceiling, or roof assemblies, provide approved UL listed through-penetration fire stop system. Provide UL fire stop assembly information on wall near fire stop penetration. Penetrations shall be sized to provide clearance in accordance with NFPA 13.

F. Escutcheon Plates: Provide approved one piece or split hinge type plates for piping passing through floors, walls, and ceilings in both exposed and concealed areas. Provide chromium plated metal plates where pipe passes through finished ceilings. Provide other plates of steel or cast iron with aluminum paint finish. Securely anchor plates in place with set screws or other approved positive means.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of work. Do not proceed until unsatisfactory conditions are corrected.

3.02 SPRINKLER SYSTEM IMPAIRMENT

A. The Contractor shall impair only sections of the sprinkler system where work is involved and the remainder of the system shall be kept in service. Prior to impairing the water supply to the existing sprinkler system, the Contractor shall comply with all provisions of Chapter 16, NFPA 1 and notify the Building Manager to receive instructions on any additional fire safety precautions that must be observed during the sprinkler system impairment. The Contractor is responsible for following these precautions during the entire impairment. When the system is restored to normal working order, the Contractor shall verify that all control valves are fully open. The maximum duration of sprinkler system impairment for areas

impacted by this work shall be 8 hours or as directed by the Building Manager or Fire Department.

3.03 INSTALLATION

A. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this section.

B. Install the work of this section in strict accordance with the approved shop drawings and the requirements of the Fire Department, Building Department, and applicable governmental agencies.

C. Equipment, material, installation, and workmanship shall be in accordance with NFPA 13 except as modified herein. Install piping straight and true to bear evenly on hangers. Keep the interior of new piping and existing piping affected by the Contractor's operations thoroughly clean of water and foreign matter. Keep piping systems clean during installation by means of plugs or other approved methods. When work is not in progress, securely close open ends of piping and fittings so that water and foreign matter will not enter the pipes or fittings. Inspect piping before placing into position. Piping shall be inspected, tested, and approved before covering or concealing. Seal both ends of penetrations through fire rated walls, floor/ceiling assemblies, and roof assemblies to maintain fire resistive integrity with UL listed through-penetration fire stop assembly. Sprinkler piping shall be supported from the building structure; sprinkler piping shall not be supported from sprinkler piping. Piping shall be inspected, tested, and approved before covering or concealing.

D. Contractor shall center sprinkler heads in ceiling tiles as indicated on contract drawings.

E. Provide sway bracing branch line restraint on new and existing piping in accordance with NFPA 13.

F. Welding, Soldering, and Brazing: Prior to welding, soldering, or brazing of copper tube, the Contractor shall comply with all provisions of Chapter 41, 2012 NFPA 1 as amended by the Hawaii County and notify the Building Manager to receive instructions on any additional fire safety precautions which must be observed during all hot work operations. All welded outlets shall be examined and accepted

by the WHFD AND/OR PROJECT MANAGER prior to installation. The Contractor is responsible for following these precautions at all times.

G. Fire sprinkler piping shall not be routed directly over electrical equipment, panel boxes, controls, switches, and other energized electrical devices, per NFPA 70.

3.04 FIELD TESTING OF FIRE SPRINKLER SYSTEMS

A. Preliminary Testing and Inspections: Field testing and inspections shall be witnessed by the WHFD AND/OR PROJECT MANAGER. Testing shall be performed in accordance with NFPA 13 and this specification. Contractor shall furnish appliances, equipment, instruments, connecting devices, two-way radios, and personnel for tests. Fire Sprinkler Contractor shall be present for all testing and inspections.

1. Perform in-service leak testing for new and existing piping in the area of work as indicated on contract drawings. Piping above suspended ceilings shall be tested before installation of ceilings. Furnish test report to the WHFD AND/OR PROJECT MANAGER.

2. Perform visual observation of fire sprinkler and piping installation to verify compliance with the contract documents and NFPA 13. Schedule observation walkthrough before piping is concealed.

3. When tests have been completed and corrections made, submit signed and dated certificates, similar to those specified in NFPA 13 with a request for formal inspection and tests.

B. Formal Inspection and Tests: The General Contractor shall submit the request for formal inspection at least 15 days prior to the date the formal inspection is to take place. Experienced technicians regularly employed by the fire sprinkler contractor shall be present for the entire duration of the inspection. At this inspection, the installing contractor shall repeat any or all of the required tests as directed. Correct defects in the work provided by the installing contractors and perform additional tests until it has been demonstrated that systems comply with all contract requirements. Contractor shall furnish appliances, equipment, instruments, connecting devices, 2-way radios, and personnel for tests.

END OF SECTION

SECTION 15400 – PLUMBING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 DESCRIPTION OF WORK

A. Provide complete interior water, plumbing and sanitary sewer systems. “Provide” shall mean “furnish and install” when used herein. Connect to utility systems at the 5 feet building line and as shown on drawings.

B. Connect to the plumbing system, all fixtures and equipment, which may be furnished by the Architect under another section of these specifications.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. General mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

B. Painting work specified in Section 09900 – PAINTING.

C. Electrical work specified in Division 16 – ELECTRICAL.

D. Pipe insulation specified in Section 15080 – MECHANICAL INSULATION for all piping specified in this section.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS and Section 15000 – GENERAL MECHANICAL REQUIREMENTS:

B. Drawings: At minimum, plan view and isometric piping diagrams of plumbing system piping and equipment including connection points to the site utilities. Inverts of buried piping shall be shown on the shop drawings.

C. Samples: None

D. Product Data:

1. Spare parts.

2. Plumbing fixtures.

3. Pipe and fittings.
4. Valves.
5. Specialties.
6. Piping identification.
7. Valve identification.

E. Schedule: Maintenance Service Contract.

F. Certificates of Conformance or Compliance:

1. Chlorination test results.
2. Plumbing inspection completed.

G. As-Built Drawings: Submit as-built drawings for the plumbing system that conform to the general requirements in Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

H. Operations and Maintenance Manuals: Plumbing Fixtures

I. Guarantee and Certificate: Submit one-year guarantee for all plumbing work in accordance with the general requirements in Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

1.05 QUALITY ASSURANCE

A. Obtain and pay for all fees, permits, licenses, assessments, connection charges and inspections required for this work.

B. Accessible fixtures, other than those specified herein, require pre-bid approval to ensure compliance with the Commission on Persons with Disabilities of the State of Hawaii. No substitutions will be considered after the bid opening. Equal products are acceptable in lieu of those specified hereinafter by specific manufacturer and model number.

1. Valves: Nibco, Crane, Walworth, Dezurik, or Stockham.
2. Fixtures and equipment: Kohler.
3. Drainage system specialties: Josam, Zurn or Smith.
4. Flush valves: Sloan or Delany.

5. Pipe supports: Elcen, Tolco, Grinnell, Fee and Mason or Unistrut.
6. Stainless steel sinks: Elkay, Just, or Moen.
7. Fixture trim: American Standard, Delta, Symmons, Sloan, Chicago, Elkay, Kohler or T&S.

C. Comply with the recommendations and requirements of the codes and standards listed hereinafter in addition to detailed requirements of this specification. In the event of conflicting requirements, this specification shall prevail.

1. American Society for Testing and Materials (ASTM) Publications:

A 53	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
A 74	Cast Iron Soil Pipe and Fittings
A 616	Standard Specification for Rail Steel Deformed and Plain Bars for Concrete Reinforcement
B 88	Standard Specification for Seamless Copper Water Tube
B 306	Copper Drainage Tube (DWV)
C 564	Rubber Gaskets for Cast Iron Soil Pipe and Fittings
C 150	Standard Specification for Portland Cement
D 1785	Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120
D 2661	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste and Vent Pipe
D 2665	Poly Vinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
D 2466	Poly Vinyl Chloride (PVC) Plastic Pipe Fittings (Schedule 40)
D 2467	Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
D 2564	Solvent Cements For Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
D 4101	Propylene Plastic Injection and Extrusion Materials

F 656	Primers For Use In Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
F 1412	Polyolefin Pipe and Fittings For Corrosive Waste Drainage Systems

2. American National Standards Institute (ANSI) Publications:

B16.18	Cast Copper Alloy Solder-Joint Pressure Fittings
B16.22	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
B16.23	Cast Copper Alloy Solder Joint Drainage Fittings DWV
B16.26	Cast Copper Alloy Fittings for Flared Copper Tubes
B31.9	Building Services Piping. (Same as ASME B31.9-96)
C2	National Electrical Safety Code

3. Cast Iron Soil Pipe Institute (CISPI) Publications:

301	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications
310	Coupling For Use In Connection With Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications
Pamphlet 100	Installation Suggestion for “No-Hub” Pipe and Fittings

4. Plumbing and Drainage Institute (PDI) Standards:

WH-201	Water Hammer Arrester Standard

PART 2 - PRODUCTS

2.01 MATERIALS

A. See general requirements for materials and equipment in Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

2.02 PLUMBING FIXTURES

A. Accessible fixtures, other than those specified herein, require pre-bid approval to ensure compliance with the Commission on Persons with Disabilities of the State of Hawaii. Provide chrome plated brass one quarter turn angle stops, chrome plated brass tube risers, chrome plated brass P-traps, trap arms, adapters, escutcheons and cover plates. Provide connecting fittings, china bolt caps, wall support brackets as required. Provide flow restrictors or other approved flow control devices to limit flow for all lavatory faucets to maximum 1.5 gpm and showers and sink faucets to a maximum of 2.0 gpm.

B. Lab Sink:

1. Sink will be wall mounted, 14 gauge stainless steel, backsplash, 30 inch length, 16-1/2 inch width, 5-1/2" bowl depth and ADA compliant. Provide Just JADA3020-2-J or approved equal.

2. Provide dual handle brass faucet, 1.5 gallons per minute (GPM) flow, ADA compliant. Provide solid tube connection between supply stop and faucet.

C. Lab Sink-1:

3. Sink will be wall mounted, 14 gauge stainless steel, backsplash, 30 inch length, 16-1/2 inch width, 5-1/2" bowl depth and ADA compliant. Provide Just JADA3020-2-J or approved equal.

4. Provide dual handle brass faucet, 1.5 gallons per minute (GPM) flow, ADA compliant. Provide Denios M341207W faucet mounted eyewash station. Provide solid tube connection between supply stop and faucet.

D. Emergency Eyewash/Shower – EEWS: Provide free-standing combination deluge shower and eyewash, complete with 8-inch minimum diameter ABS or other corrosion resistant material, self-cleaning, non-clogging deluge shower head; 1-inch full flow brass, stay-open ball valve actuated by stainless steel pull rod, stainless steel chain and ring or handle; hand operated aerated eye/face wash with 2-inch stay-open brass ball valve, in-line strainer, and stainless steel or ABS bowl; stanchion; floor flange for mounting to concrete floor, ANSI test kit consisting of curtains, telescoping pole and 5 gallon bucket with lid; and interconnecting fittings. Eyewash and shower assembly shall meet the

requirements of ADA and ANSI Z358.1, Emergency Eyewash and Shower Equipment." Provide Haws 8300, Bradley S19-314BF or approved equal.

2.03 PIPE AND FITTINGS

A. Drainage, Waste and Vent Piping Below Grade: Poly Vinyl Chloride (PVC) and fittings, conforming to ASTM D2665.

B. Drain, Waste and Vent Piping Above Grade: Poly Vinyl Chloride (PVC) and fittings, conforming to ASTM D2665.

C. Potable Water Piping: Type “L” hard-drawn copper tube, conforming to ASTM B 88, “Standard Specification for Seamless Copper Water Tube,” with soldered (95-5) joint wrought copper pressure fittings conforming to ANSI 16.22. Use long radius elbows wherever possible. Pro-press fittings are acceptable for above ground use only. Use Type “K” hard-drawn copper tube with brazing alloy on joints and pipes below grade.

D. Pipe Sleeves: Schedule 40 steel pipe, ASTM A 53.

2.04 VALVES

A. Ball Valves 3 Inches and Smaller: 600 psi W.O.G., bronze, 2-piece body, 316 stainless steel ball, reinforced TFE seat and seals, full port, threaded ends, 316 stainless steel stem, lever handle with integral stop. Provide NIBCO T-585-66-LF, Watts LFB6080G2 or approved equal.

2.05 PLUMBING SYSTEM SPECIALTIES

A. Cleanouts:

1. Cleanout – CO: Provide Smith No. 4470, Josam or approved equal, bronze countersunk plug.

2. Floor cleanout – FCO: Provide Smith No. 4105, Josam or approved equal cast iron cleanout with round heavy duty scoriated nickel-bronze top, ABS plug and flashing flange.

3. Wall cleanout – WCO: Provide Smith No. 4472, Josam or approved equal with polished stainless-steel access plate and screw.

B. P-Traps Installed Below Floor: Deep-seal cast-iron p-trap.

C. Water Hammer Arresters: Provide Smith Series 5000, Josam or approved equal. Provide on water supplies and locate as close as practical to each faucet, control valve or flush valve except hose faucets. Air chambers shall consist of a 12-inch length of pipe of the same diameter as the branch supply, capped on one end. Commercial type arresters, tested and certified in accordance with PDI WH-201, “Water Hammer Arresters,” shall be provided where indicated. Installation of these arresters shall be accessible and include access panels when concealed. Size of the arresters shall conform to the PDI symbols and shall be selected in accordance with the recommendations of PDI:

PDI Symbol	Fixture Unit Rating
A	1-11
B	12-32
C	33-60
D	61-113

D. Access Panels – AP: Provide Milcor, Karp or approved equal access doors with Allen wrench lock and concealed hinges; style K for plaster walls, style A for acoustical tile surfaces, style M for masonry and other surfaces. 8" x 8" minimum size in walls and partitions for single items (e.g., WHA), 12" x 12" for more than one item (e.g., 2 adjacent valves) and either 12" x 12" or 24" x 24" for ceiling access and as indicated. For access panels in fire rated walls and ceilings, provide fire rated access panels to match or exceed the rating of the wall or ceiling. Unless otherwise noted, provide access panels with primer painted surfaces and field painted to match the color of the adjacent surface.

E. Floor Sink - FS: Provide Smith No. 335-Y03, Josam or approved equal with Duco cast iron body and half grate, porcelain enamel, acid resistant, dome strainer and No-Hub outlet.

PART 3 EXECUTION

3.01 PREPARATION

A. Determine the exact route of each pipe and check for interferences with the building structure, foundation, electrical work and other work in the area. Make offsets and changes in direction required to maintain proper head room and pitch

or to accommodate the structure and the work of other trades. Furnish other trades with information to properly locate and size openings in the structure required for this work. Furnish anchor bolts, sleeves, inserts and supports required for this work. Coordinate and schedule plumbing work with Contractor to allow construction to proceed without delays. Install rough-in piping for fixtures, equipment and specialties according to the schedule when the structure is ready (e.g., hose bibbs located in CMU walls before walls are grouted).

3.02 INSTALLATION AND REQUIREMENTS

A. Provide guard or insulation around high-temperature equipment and materials to protect personnel. When exposed to weather, provide a weather-protected enclosure around electrical equipment, controls and other items that are not satisfactorily protected. All required demolition including saw cutting and chipping of concrete and masonry to remove or install fixtures and piping shall be provided as well as patching, repair and painting at no additional cost to the WHFD AND/OR PROJECT MANAGER.

3.03 CUTTING AND PATCHING

A. Cut all holes necessary for installation of work under this section.

B. Patching of all holes, etc., will be done under other sections of specification. Patch any holes cut unnecessarily.

3.04 ACCESS TO EQUIPMENT

A. Install all control devices, specialties, valves and related items to provide easy access for operation, inspection, repair and maintenance. If these items are concealed behind walls or ceilings of non-removable type construction, provide access panels of proper size for easy access at no additional cost to the WHFD AND/OR PROJECT MANAGER.

3.05 FIXTURE INSTALLATION

A. Set fixtures in an approved workmanlike manner. Point up all edges against building structure with white grout. Provide adequate wall carriers or supports for all wall-mounted fixtures. Provide water supplies for all fixtures; Brasscraft or equivalent, compression joint type with chromium plated brass escutcheon and cover tube, loose-key angle stop valve and drawn copper tube riser even if details are not shown on the plans. Provide chromium plated brass P-trap, waste

fittings, wax rings, gaskets, fasteners and escutcheon as required for all fixtures even if not detailed on the drawings. Exposed metal including pipe shall be polished chromium plated. Provide a 1/4" x 6" x 32" steel plate for support of wall-hung lavatories if carriers are not specified. Secure plate to studs and bolt to fixtures. Point-of-connections indicated are suggested locations. Contractor may, at his option, relocate the point-of-connection (POC) to a more convenient location if the existing piping is deemed to be inaccessible. All extra piping, fittings and valves for relocated POC's shall be provided at no additional cost to the WHFD AND/OR PROJECT MANAGER. Sinks with multiple compartments and trough sinks, provide multiple faucets, angle supplies and stops to match the number of faucet locations specified or indicated at no additional cost to the WHFD AND/OR PROJECT MANAGER.

3.06 PIPING INSTALLATION

A. Conform to the requirements of the current Uniform Plumbing Code as adopted by the Hawaii County. Inspect all pipe inside and outside. Remove interior obstructions and ream out pipe ends. Tool markings on polished fittings are not acceptable. Cut pipe accurately so that it can be worked into place without springing or forcing. Install pipes parallel to the wall of the structure and plumb. Make changes in direction with fittings. Bushings are not permitted. Install valves with stems above horizontal. Provide proper support and adequate provisions for expansion, contraction, slope and anchorage. Provide dielectric unions where copper tubing connects to steel pipe. Wrap pipe or tubing with 1/4" thick felt, secure with tape, where it contacts other materials. Have piping tested, inspected and approved before it is furred in, buried or otherwise hidden. Provide standard weight galvanized steel pipe sleeves where pipes pass through structure, sufficiently large to provide 1/4" minimum clearance around pipe. Caulk watertight around pipes passing through sleeves. Wrap pipe with polyethylene tape where it passes through sleeve and when it contacts concrete or masonry. Grout with fireproof material around all pipe penetrations through slabs and walls full length of penetrations. Where pipes pass through firewalls or floors, seal both ends of sleeve with Underwriters Laboratories listed thermal barrier material to maintain fire rating. Provide chrome-plated brass escutcheons, set tight on the pipe and to the wall where pipes are exposed in finished areas. Provide clamping collar or membrane flange where pipe or drains penetrate waterproof

membrane. Perform all welding using qualified welders in accordance with American National Standards Institute's Code B31.9 and American Welding Society Standard B3.0. Insulate piping specified in accordance with the manufacturer's recommendations.

3.07 PIPING SYSTEM SUPPORTS

A. Pipe Supports: For above ground piping, see details on drawings. Support copper pipe at maximum spacing of 4 feet for pipes 1-1/2" and smaller, 7 feet for pipes 2-inch through 4-inch.

B. Pipe Hangers: Steel clevis hanger with adjustable hanger rod; 3/8" for pipe 2 inch and smaller. 2-inch for pipe 2-1/2" through 3-1/2" and 5/8" for pipe 4 inch and larger. For copper pipes, provide copper hangers, plastic coated steel or other commonly used protective surfaces to prevent contact of dissimilar materials used for the piping and hangers. Groups of lines shall be supported as detailed on drawings. Provide trapeze type hangers for groups of pipes routed at the same elevation. Hanger rods shall not be supported from other pipe and conduit hangers or supports unless specifically designed for this application.

C. Supplemental Steel: Provide supplemental structural steel piping supports as required to support piping from structure. Supplemental structural and supporting steel shall be hot-dipped after fabrication and, if exposed, painted with a final coat to match adjacent area.

3.08 DRAINAGE, WASTE AND VENT PIPE SYSTEMS

A. Coordinate point of connection locations and material compatibility with the site utilities contractor's work and schedule. Slope drain lines at 1/4" per foot unless otherwise indicated. Install hub cast-iron pipe in accordance with CISPI & Fittings Handbook 1990. Install no-hub cast-iron pipe in accordance with CISPI pamphlet 301. Provide cast-iron and neoprene gasketed hub coupling below grade. Above grade MG stainless steel clamps and cast-iron no-hub couplings shall be installed in accordance with manufacturer's written instructions. On roof vents and where other drains occur above the ground floor, provide clamping device with drain. Provide a 4 lbs. lead flashing sheet extending 8 inches out around

drain body for flat roof areas and secure with clamp device or factory fabricated flashing with rubber gasket designed for sheet metal roofs. Coordinate point of connections, locations and materials, with site utilities.

3.09 WATER PIPING SYSTEM

A. Coordinate point of connection locations and material compatibility with the site utilities contractor's work and schedule. Secure each water line where it penetrates partitions to serve fixtures, and similar items. Wrap all lines passing through concrete with polyethylene tape. Install unions or flanges at all valves, equipment and system specialties. Install dielectric unions at connections of copper and ferrous pipes. Coordinate point of connections, locations and materials, with site utilities.

3.10 DIELECTRIC CONNECTIONS

A. Copper pipe shall be insulated from direct contact with ferrous piping connections by approved insulating (dielectric) unions or couplings or flanges.

3.11 FIELD QUALITY CONTROL

A. Test plumbing systems in accordance with the Uniform Plumbing Code. Perform tests in the presence of, and to the satisfaction of inspectors having jurisdiction over the work. Ask for final inspection by the WHFD AND/OR PROJECT MANAGER after all tests, adjustments and balancing have been performed.

1. Test drainage systems in accordance with Section 712 of the Plumbing Code.
2. Hydrostatically test the domestic water piping system at 100 psi. Inspect the entire system while under pressure and correct all deficiencies.
3. Test equipment to demonstrate its operations and compliance with the specification.

B. All drainage piping systems, which show signs of obstructed flow, no flow or slow flow shall be thoroughly snaked until all obstructions are cleared and water drains freely.

3.12 TESTING AND INSPECTION

A. Contractor shall furnish all equipment for tests and any required retests and pay for all cost of repairing any damage resulting from such tests. Contractor shall repair and adjust systems until they are approved. Tests shall be performed in presence of, and to satisfaction of, inspector of official agency involved.

B. Defective Work: If inspection or test shows defects, such defective work or material shall be replaced and inspection and tests repeated. Repairs to piping shall be made with new material. No caulking of screwed joints or holes will be accepted.

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

D. Removal and capping of existing plumbing lines as required is included in this section to isolate existing pipes.

E. Chlorination: Domestic water lines shall be sterilized with chlorine before acceptance of work. Sterilize water system for 24 hours with 100 ppm chlorine introduced into the lines in an approved manner. Operate all valves during contact period. Flush system until chlorine is less than 0.2 ppm. All valves in lines being sterilized shall be opened and closed several times during contact period. Certificate shall be furnished to WHFD AND/OR PROJECT MANAGER evidencing proper performance of sterilization.

3.13 ADJUST AND CLEAN

A. Clean up work areas and fixtures: Adjust system for proper operation, ready for use. Touch up with matching paint all damaged factory finishes. Provide valve tags, and a list, which includes the type of valve tag, size, location, and area served. Clean diaphragms for the flush valves per the manufacturer's recommendations. Bleed all air from lines.

3.14 PAINTING AND IDENTIFYING OF PIPING

A. General:

1. All non-factory finished (i.e., finish painted) items furnished under this section are to be painted including exposed piping, insulation and fittings. See Section 09900 – PAINTING. Do not paint over nameplates or other identifying labels.

2. Paint exposed black iron work including pipe, fittings, iron body valves, pipe hangers, etc., with 2 coats of zinc rich paint and finish coat to match adjacent surfaces.

B. Identification of Piping: Provide piping identification for all above ground plumbing system piping in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

C. Identification of Valves: Provide valve tags for all plumbing system valves in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

D. Identification of Equipment: Provide equipment tags in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS. Plumbing fixtures and underground equipment do not require equipment tags.

3.15 ONE YEAR MAINTENANCE SERVICE CONTRACT

A. Provide maintenance service for all plumbing system components as specified in and in accordance with the requirements and schedule of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

3.16 OPERATIONS AND MAINTENANCE MANUAL

A. Shall be provided as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

END OF SECTION

SECTION 15720 – AIR HANDLING UNITS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 DESCRIPTION OF WORK

A. This section covers the furnishing, fabrication, delivery and installation of the air conditioning and ventilation system complete, including, but not limited to, the following:

1. Air handling units.
2. UVC emitters.
3. Variable frequency drive.
4. Operation and maintenance instructions and manuals.
5. Manufacturer's literature, shop drawings and record drawings.
6. Inspection, test and guarantee.
7. Reheat Coil

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS unless specified otherwise in other sections of Division 15 – MECHANICAL.

B. Painting work specified in Section 09900 – PAINTING.

C. Electrical work specified in Division 16 – ELECTRICAL.

D. Chilled water piping specified in Section 15181 – CHILLED WATER PIPING.

E. Ductwork and accessories specified in Section 15810 – DUCTWORK AND DUCTWORK ACCESSORIES.

F. Air conditioning and ventilation system controls specified in Section 15910 – DIRECT DIGITAL CONTROL SYSTEMS.

G. Testing, adjusting and balancing of air and chilled water systems specified in Section 15950 – HVAC TESTING/ADJUSTING/BALANCING.

1.04 SUBMITTALS

A. Submit the following in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

B. Shop Drawings: Submit shop drawings of plans, performance data and details showing locations and installation including, but not limited to, the following (Note: The shop drawing of the following items can be combined with the shop drawing for the ductwork shop drawings in Section 15810 – DUCTWORK AND DUCTWORK ACCESSORIES):

1. Air handling units
2. UVC emitters
3. Reheat Coil

C. Product Data: Submit product data for the following:

1. Air handling units
2. UVC emitters
3. Variable frequency drives and starters
4. Reheat Coil

D. Schedules:

1. Schedule of equipment listing name and addresses of manufacturers; manufacturer's local supplier's name, address and phone number; catalog numbers and trade names in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.
2. Maintenance service contract and schedule.

E. Reports: Testing, adjusting and balancing of air and chilled water systems specified in Section 15950 – HVAC TESTING/ADJUSTING/BALANCING.

F. Certificates of Conformance or Compliance:

1. Submit certificates of conformance for performance and characteristics specified, the listed standards and in accordance with Section 15000 –

GENERAL MECHANICAL REQUIREMENTS for the following:

a. Air handling units and fan coil units per ARI Standards 430, 440 and 410.

b. Variable frequency drives.

2. Submit certificates of qualifications for manufacturers' representatives: None.

G. As-Built Drawings: Submit drawings in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

H. Operations and Maintenance Manuals: Submit manuals in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

I. Guarantee and Certificate: Submit one-year guarantee and certificate in accordance with Section 15000 - GENERAL MECHANICAL REQUIREMENTS.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Air conditioning and ventilation equipment to be considered for bid purposes shall be from a manufacturer that has locally stocked spare parts, representation, and support of a factory authorized service organization within 500 miles of the site of installation and has serviced manufacturer's units of comparable type, size and capacity as those specified herein. The manufacturer must have other units of comparable type, size and capacity installed and operating satisfactorily in the State of Hawaii for a minimum of 2 years prior to bid opening.

2.02 FAN COIL UNITS

A. Casing: Chassis shall be galvanized steel construction, designed to mount concealed above finished ceiling. Cold surfaces are covered externally with insulating material. Factory installed condensate drain pan shall be double sloped, removable, cleanable, stainless steel with anti-corrosion coating, and externally insulated. Provide hanger brackets to support the unit weigh on four corners.

B. Fan Assembly: Blower style fan shall be belt-drive, statically and dynamically balances with permanently lubricated and sealed ball bearings. The fan/motor assembly is mounted on vibration attenuating rubber grommets. Fan speed is controlled through variable frequency drive.

C. Air Filter: Mixed air is filtered with a replaceable 4-inch thick, pleated media, MERV-13 filter. Provide mixing box and slide-in filter rack section.

D. Evaporator Coil: Coil shall be nonferrous construction with copper tubes and aluminum fins. Coil shall be factory pressure tested.

2.03 ULTRAVIOLET-C EMITTERS

A. Provide ultraviolet-C (UV-C) emitters listed for use in HVAC applications and damp locations. Component assembly shall consist of stainless-steel housing, power source, emitter sockets, emitter and reflector as applicable. Provide emitters with 115 VAC power source. UV-C lights shall be installed as indicated and shall be sized for coil face area. UV-C lights for AHU shall mount inside module casing. Provide required mounting brackets. Provide interlock with AHU with on-off switch mounted on unit casing. Provide warning sign to read, “DANGER – UV LIGHT INSIDE. TURN OFF BEFORE OPENING OR SERVICING UNIT”. Provide Steril-Aire, Sanuvox or approved equal.

2.04 VARIABLE FREQUENCY DRIVE

A. Variable frequency drive (VFD) shall consist of solid-state adjustable frequency controller (AFC) and performance-matched energy efficient motor matched by the controller manufacturer and matched to the requirements of the specified pumps. Provide all accessories for a completely operational system to meet the requirements and sequence of operation specified herein. Provide Reliance VTAC 7 Drive, XE motor, bypass contactor complete with cabinet and accessories specified unless otherwise noted, Magnetek, Graham, Danfoss, Yasakawa or approved equal.

B. The Adjustable Frequency Controller (AFC) shall be a fully digital Pulse Width Modulator (PWM) using very large-scale integration techniques as well as surface-mount technology for increased reliability. The AFC shall use a 16-bit micro-processor with a 12-bit resolution to allow stepless motor control from 1% to 110% of maximum motor base speed.

1. All programmable settings shall be held in non-volatile memory and shall not be affected by power outages, brownouts, power dips, etc. The AFC shall have initial programmable settings intact from the factory without the need for battery backup. The AFC shall not need to be programmed at the job site

prior to running the motor but shall be ready to run a motor as soon as power connections are made.

2. Programming at the job site to accommodate specific local application requirements such as frequency avoidance and preset speeds shall be available to the user. Complete motor and drive package efficiency versus load and speed shall be submitted prior to purchase and coordinated with the requirements of the pumps.
3. All high voltage components within the enclosure shall be isolated with steel or polycarbonate covers.
4. The AFC and options shall be UL listed and CSA certified. The AFC and options shall comply with the applicable requirements of the latest standards of ANSI, IEEE and the National Electric Code.
5. The AFC shall be functionally tested under motor load and then cycled. This assures that if the AFC is started up according to the instruction manual provided, the unit will run reliable.
6. The AFC shall have the following features:
    a. Remote start-stop.
    b. Speed selection.
    c. Timed acceleration and deceleration.
    d. Current limit and voltage limit.
    e. 6-60 Hz controlled speed range.
7. The AFC shall include the following features:
    a. Operators control shall be mounted on the door of the wall mounted steel cabinet and consist of a membrane command center which allows manual stop/start, speed control, local/remote status indication, manual or automatic speed control selection, run/jog selection and forward reverse selection. In addition, the command center will serve as a means to configure controller parameters such as minimum speed, maximum speed, acceleration and deceleration times, volts/hertz ratio, torque boost, slip compensation, over frequency limit, frequency agreement, current limit, and job frequency. Potentiometers will not be allowed for

these settings. The controller shall have an internal means of deactivating keypad parameter adjustments to eliminate unauthorized data entry. A slip compensation circuit for accurate 1% speed regulation without the need of a tachometer.

b. Adjustable D-C braking that is programmable from the command center adjustable in both amplitude and duration.

c. An electronic overload circuit designed to protect an A-C motor operated by the AFC output from extended overload operation on an inverse time basis.

d. Automatic and manual torque boosts that are adjustable within the control to accelerate hard-to-start applications.

e. An LED display mounted on the door of the cabinet that digitally indicates:

   i. Frequency output

   ii. Voltage output

   iii. Current output

   iv. First fault indication

f. The capability of starting into a rotating load without the need of a time delay upon a start command.

g. Relay contacts for remote indication of drive fault and motor running for interwiring to another device.

h. An automatic restart circuit which is adjustable by number of restart attempts and the interval between restarts.

i. Three critical frequency avoidance bands, which can be programmed in the field, enable the controller to avoid resonate frequencies of the driven equipment. Each critical frequency avoidance band shall have a band width adjustable via keypad entry of up to 10 Hertz.

j. Three programmable preset speeds which will force the AFC to preset speed upon a user contact closure. This feature shall be set digitally by entering data via the door mounted membrane command center.

k. The AFC shall have the capability to ride through power dips up to

500 msec without a controller trip depending on load and operating conditions.

l. Multiple volts/hertz patterns adjustable in one hertz increments from 30 hertz to maximum hertz for maximum flexibility and control.

m. Jog speed selection.

n. Two frequency agreement speeds adjustable in the field and interconnected to on-board dry relay contacts.

o. An isolated electrical following capability and control interface shall enable the AFC to follow a 0-20 Ma, 4-20 Ma, 0-4 volt, 0-8 volt, or 0-10 volt DC grounded or ungrounded speed signal from an external source. In addition, the drive shall be able to follow a pulse train speed signal input.

p. For smooth acceleration and deceleration capabilities, the drive shall have a pre-programmed ramp curve which can be activated locally.

q. Two auxiliary selectable contacts (DPDT) which can be activated by 2 of the following with the actual setpoint adjustable:

i. Zero speed.

ii. Reverse rotation.

iii. Output current.

iv. Output speed.

v. Run.

vi. Line dip in excess of 15 msec.

8. The AFC shall include the following protective circuits and features:

a. Instantaneous electronic trip for the following faults:

i. Motor current exceeds 150% for longer than one minute of controller maximum sine wave current rating.

ii. Output phase-to-phase short circuit condition.

iii. Total ground fault under any operating condition.

iv. High input line voltage.

v. Low input line voltage.

vi. Loss of input phase.

vii. External fault. (This protective circuit shall permit wiring of remote normally close safety contact to shut down the drive.)

b. DV/DT and DI/DT protection for semiconductors.

c. All live power equipment shall be covered by protective shields to ensure the safety of operating personnel.

d. Metal oxide varistors.

9. The AFC shall have the following separate adjustments available:

a. Maximum frequency: 66 Hz.

b. Minimum frequency: 0 to 5 Hz.

c. Acceleration: 0.1 to 360 seconds standard.

d. Deceleration: 0.1 to 360 seconds as standard.

e. Volts/hertz: Programmable.

f. Maximum load: 150% for one minute.

g. Current limit: 50% to 150% of sine wave current rating.

h. Regulation frequency stability long term: ±0.01% of base speed.

i. Slip compensation: -1/2 to 1% speed regulation.

10. The AFC shall be designed and constructed to operate within the following service conditions:

a. Elevation: to 3,300 feet without derating.

b. Ambient operating temperature range: 0ºC to 40ºC.

c. Atmosphere: Non-condensing relative humidity to 95%.

d. A-C line voltage variation: -5% to +10%.

e. A-C line frequency variation: ±2 Hz.

C. The energy efficient motor shall utilize premium materials and optimized design for energy efficient performance and minimum losses on adjustable frequency power. Motors shall have the following electrical design features:

1. Full Class F, non-hygroscopic insulation system evaluated in accordance with IEEE-117 classification tests.
2. Motors shall be rated with a minimum 1.15 service factor on sine wave power and electrical design shall not exceed the insulation allowable temperature rise at 1.0 service factor on adjustable frequency power.
3. Motor windings shall be of copper.
4. Motor rotor construction shall be die cast aluminum or fabricated copper or their respective alloys. Rotor on frames 213T and above shall be keyed to shaft and rotating assembly dynamically balanced to NEMA limits per MG1-12.05. Balance weights, if required, shall be secured to the rotor resistance ring or fan blades by rivets. Machine screws and nuts are prohibited.
5. The motor shall use an open bearing (non-shielded) positive lubrication system. The design of this positive lubrication system shall minimize contaminant entry into bearings and protect against over lubrication and corrosion and grease migration into motor.
6. All mounting hardware shall be hex head, high strength, SAE Grade 5, zinc plated for corrosion protection. Screwdriver slot fasteners are prohibited.
7. TEFC motors with external cooling fans shall have fan covers with openings meeting the "guarded" definition of NEMA.
8. TEFC motors shall have provision for drainage of condensation at low points of the enclosure.
9. Each completed and assembled motor shall receive a routine factory test per NEMA standards. Test shall include winding resistance, no load current and power, high-potential test and mechanical vibration check.
10. Motor efficiency shall meet or exceed NEMA premium efficiencies.

D. Manual Bypass Transfer Switch:

1. Provide a full voltage, 3-contactor motor transfer switch to directly switch the motor between the AFC output and the incoming power line. This switch is

mechanically interlocked between the AFC and the bypass modes of operation. It is a motor horsepower rated switch which is UL listed as a manual motor starter without the requirement for a separate magnetic bypass motor starter.

2. Provide a main incoming disconnect circuit breaker (MCB) with a through-the-door handle, which is interlocked with the bypass cabinet door.

    a. This thermal magnetic circuit breaker will provide short circuit protection for motor while operating in the bypass mode in accordance with the requirements of the National Electrical Code (NEC).

    b. Provide complete with the through-the-door handle to meet the National Electrical Code requirements for a lockable means of disconnect. This disconnect will remove all power from both control cabinets and the motor in all operating modes.

3. To meet the requirements of the National Electrical Code for motor thermal or current protection, a thermal overload relay (OL), sized for the motor nameplate full load amps (FLA) or the AFC “Sine Wave Amp” rating, whichever is lower, shall be provided.

4. For the air handling units, provide a complete manual bypass switch and AFC mounted in a common cabinet, NEMA 1 wall mounted, ventilated.

E. Provide integral 5% input AC line reactors with each VFD as sized per the VFD manufacturer's recommendation. If integral DC link reactors are provided with the VFD, also provide external AC line reactor.

2.05 EQUIPMENT HANGERS AND SUPPORT

A. Hangers and supports shall be of manufacturer and type specified or approved equal.

B. Supports:

1. Equipment shall be supported from structural steel, grouted CMU walls, or concrete slab only; piping shall not be supported in any manner from the roofing.

2. Drilled-in threaded inserts: Where supports in slabs are required after concrete has been poured, Phillips “Redhead” drilled in threaded inserts shall

be provided, installed in accordance with manufacturer's recommendations.

3. Expansion anchors and powder-actuated fasteners and devices: Install lead shield anchors or powder actuated fasteners and devices in accordance with manufacturer's recommendations.

C. Supplementary Steel: Provide all necessary supplementary steel for proper support or attachment of hangers. Steel shall be painted with one coat of rust inhibiting primer.

2.06 VIBRATION ISOLATION

A. Unless otherwise noted on Equipment Schedule, all mechanical equipment shall be mounted on vibration isolators to prevent transmission of vibration and mechanically transmitted sound to building structure. Vibration isolator shall be selected in accordance with weight distribution so as to produce reasonably uniform deflection. Deflections shall be minimum of one inch for all equipment.

1. For ceiling suspended units: Where factory installed internal or external mounted vibration isolators are not provided, provide vibration hangers containing a spring and a double deflection neoprene element in series. Neoprene elements shall have a minimum deflection of 0.35". Spring diameters shall be no less than 0.8 of compressed height of spring at rated load. Springs shall have minimum additional travel to solid equal to 50% of rated deflection. Hangers shall be as manufactured by Mason Industries, Inc., M. W. Sausse, Amberbooth or approved equal.

2. Pipe isolation: Piping connected to mechanical equipment shall be isolated from building structure throughout its turns by hangers or supports in accordance with the isolators specified in Section 15181 – CHILLED WATER PIPING.

2.07 MOTORS

A. Provide high efficiency type motors designed for the supply voltages made available for this portion of the work, and with the following attributes:

1. Sized to develop the required brake horsepower and to operate satisfactorily with a voltage variation of plus or minus 10%;

2. Conforming to NEMA motor standards;

3. Dynamically balanced, and held to commercial tolerance;

4. Selected so that, when ambient temperature reaches 120ºF for a period of 2 hours or more, the motor will operate satisfactorily without failure.

5. With squirrel-cage type drip-proof enclosure, unless otherwise indicated, constant speed, across-the-line normal starting torque designed for quiet operation;

6. Each motor of ample size to operate its unit at proper full load and speed continuously, without heating in any part more than 40ºC above the temperature of the surrounding atmosphere.

7. Where TEFC motors are indicated or specified, the cast iron frame type shall be provided.

8. Provide inverter duty motors for use with variable frequency drives.

B. Where motor is used with V-belt drive, equip with a sliding base and belt guard, and motor sheave.

C. Furnish motor starters for all equipment with electrical motors furnished under this section. Unless factory installed, installation of starters and power wiring shall be provided by Division 16 – ELECTRICAL.

2.08 MOTOR CONTROLLERS

A. NEMA ICS1 and NEMA ICS2. All controllers shall have thermal overload protection in each phase. Overload protective devices shall give adequate protection to the motor windings and be of the thermal inverse-time-limit type.

B. Provide full voltage, magnetic-type motor controllers with under voltage release and maintained contact push-button stations or switches. Provide each controller with a hand-off-automatic selector switch. Connections to the selector switch shall be such that only the normal automatic regulatory control devices will be bypassed when the switch is in the “hand” position. All safety control devices, such as low- and high-pressure cutouts, high temperature cutouts, and motor overload protective devices, shall be connected in the motor control circuit in both the “hand” and the “automatic” positions. Control circuit connections to any hand-off-automatic selector switch or to more than one automatic regulatory

control device shall be made in accordance with an indicated, or a manufacturer's approved, wiring diagram.

C. For each motor not in sight of the controller, provide a controller disconnecting means capable of being locked in the open position or a manually operated, non-fused switch in sight of the motor.

D. Enclosures shall be NEMA Type 1 for indoor locations and NEMA Type 4X, non-metallic for outdoor locations.

E. Provide each with a “hand-off-auto” switch, overload reset button, and indicating lights mounted on the hinged front cover with door interlock and manual defeater mechanism. Provide indicating lights (green for “Running” and red for “Overload”), phase failure and reversal relay, auxiliary contacts for contactors (1-N.O. and 1-N.C. unless noted otherwise), engraved plastic nameplates (“AHU-A1, B1, C1, C2 and E1”, etc.), control transformer, and fuses.

2.09 SPECIAL WIRING

A. All factory assembled, package type equipment shall be provided with integral control panel to which all motors in each unit shall be factory wired. Control panel shall contain all relays, starters, and other control devices, all arranged so as to be accessible for maintenance, testing, and inspection. Control panel on each unit shall contain control transformer installed so that all control circuits extending to remote control devices, thermostats, etc., will be 120 volts maximum.

B. Any wiring not shown and required for air conditioning to properly connect equipment, including connections to special safety control or apparatus not shown, shall be included under this section. Unless otherwise indicated, all control wiring for control power and for air conditioning control communication shall meet the requirements of the NEC and be installed in metal conduit.

2.10 REHEAT COIL

A. Coil performance shall be ARI 410 certified. Coils shall be hydrostatically tested at 450 psig for burst protection and 250 psig for leak failure. Coil shall be constructed with mill galvanized steel casings.

B. Coils shall be piped counterflow to the airflow and shall be capable of right or left hand configuration.

C. Headers and connection nozzles shall be steel or non-ferrous material. Header nozzles shall be the same material as the nozzle. Header to nozzle connections shall be welded or brazed. Drain and vent connections shall be located on the connection nozzles.

D. Tube sheets shall be 12 gauge galvanized steel.

E. Tubes shall be 1/2 in O.D. copper mechanically expanded into aluminum fins.

PART 3 - EXECUTION

3.01 COOPERATION WITH OTHER TRADES AND CONFLICT IN WORK

A. Contractor shall examine all drawings of proposed work and coordinate his work with other trades. Work conflicts shall be brought to attention of WHFD AND/OR PROJECT MANAGER and work rearranged or modified in accordance with his decision.

B. If changes in indicated locations or arrangements of work are required, they shall be made by Contractor without additional charge to the WHFD AND/OR PROJECT MANAGER provided that these changes were ordered before work is installed and no extra material or labor are required.

C. Should Contractor determine that extra material and labor will be required to accommodate any rearrangement, he shall first submit detailed estimate of cost for required changes and proceed with work only upon written authority of the WHFD AND/OR PROJECT MANAGER.

3.02 EQUIPMENT INSTALLATION

A. Equipment shall be installed as indicated and in accordance with manufacturer's recommendations and instructions.

B. All necessary supports shall be provided for equipment, appurtenances and duct as required. This work shall include any additional steel purlins, brackets, seismic restraints or supports.

C. Provide controls as indicated for proper operation of the equipment. Provide all necessary relays, contactors, enclosures and transformers to ensure proper system operation.

3.03 WORKMANSHIP AND FABRICATION

A. Ductwork: See Section 15810 – DUCTWORK AND DUCTWORK ACCESSORIES for interconnecting ductwork to air handling equipment.

B. Piping: See Section 15181 – CHILLED WATER PIPING for interconnecting piping to air handling equipment.

3.04 EQUIPMENT SUPPORT

A. Refer to drawings for type of construction from which equipment is to be supported. Structural metal supports shall be provided as indicated.

3.05 VIBRATION ISOLATION

A. See Section 15070 – MECHANICAL SOUND, VIBRATION AND SEISMIC CONTROL for interconnecting piping to air handling equipment

3.06 PAINTING AND IDENTIFYING OF PIPING

A. General:

1. The following items furnished under this section are to be painted and identified under Section 09900 – PAINTING. Do not paint over nameplates or other identifying labels.

    a. Exposed piping and insulated piping.

    b. Exposed ducts and hangers.

2. Paint exposed black iron work including pipe, fittings, structural steel members used for equipment, pipe, duct and other supports, iron body valves, pipe hangers, etc., with 2 coats of zinc rich paint.

B. Identification of Piping: Provide identification of all new pipe lines in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

C. Identification of Valves: Provide valve I.D. tags for all valves shown on the drawings in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

D. Identification of Equipment and Devices: Provide equipment identification tags for all equipment and devices shown on the drawings in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

3.07 ADJUSTING AND CLEANING

A. Pipes shall be cleaned free of scale and thoroughly flushed of all foreign matter. Equipment shall be wiped clean, with all traces of oil, dust, dirt, or paint spots removed. Temporary filters shall be provided for all fans that are operated during construction and after all construction dirt has been removed, new filters shall be installed. Bearings shall be properly lubricated with oil or grease as recommended by the manufacturer. Belts shall be tightened to proper tension. All valves and other miscellaneous equipment requiring adjustment shall be adjusted to setting indicated or directed. Fans shall be adjusted to the speed indicated by the manufacturer to meet specified conditions.

3.08 TESTING, ADJUSTING AND BALANCING

A. Test, adjust and balance each piece of equipment as required to assure proper operation. See Section 15950 – HVAC TESTING/ADJUSTING/BALANCING for further requirements.

3.09 CALIBRATION AND ADJUSTMENTS

A. After completion of the installation, perform final calibrations and adjustments of the equipment provided under this contract and supply services incidental to the proper performance of the unit control panels under warranty.

3.10 ACCEPTANCE PROCEDURE

A. Upon completion of the calibration, Contractor shall start-up the air conditioning system and perform all necessary testing and run diagnostic tests to ensure proper operation. Contractor shall be responsible for generating all software and entering all database necessary to perform the sequence of control and specified software routines. An acceptance test in the presence of the WHFD AND/OR PROJECT MANAGER shall be performed.

B. Provide operational acceptance tests. The tests shall be performed during a normal day of operation after the air conditioning system has been completely installed and made operable. Results of the tests shall be indicated on the Operational Performance Test form attached and shall be part of the submittal for the testing and balancing report.

3.11 POSTED OPERATING INSTRUCTIONS

A. Furnish approved operation instructions for each principal item of equipment for the use of the operation and maintenance personnel. The operation instructions shall include wiring diagrams, control diagrams and control sequence for each principal item of equipment. Operating instruction shall be printed or engraved and shall be framed under glass or in approved laminated plastic and posted where directed by the WHFD AND/OR PROJECT MANAGER. Operating instruction shall be attached to or posted adjacent to each principal item of equipment including start-up, procedure in the event of equipment failure and other items of instruction as recommended by the manufacturer of each item of equipment. Operating instructions exposed to the weather shall be made of weather-resistant materials or shall be suitably enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

3.12 FIELD INSTRUCTION

A. See requirements in Section 15000 – GENERAL MECHANICAL REQUIREMENTS for field instruction of air conditioning and ventilation system. Upon completion of the work and at a time designated, the services of one or more qualified personnel shall be provided by the Contractor for a period of not less than 8 hours to instruct the Owner in the operation and maintenance of the air conditioning system. These field instructions shall cover all the items contained in the bound instructions.

END OF SECTION

SECTION 15810 – DUCTWORK AND DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 WORK DESCRIPTION

A. This section covers the furnishing, fabrication, delivery and installation of the air conditioning and ventilation system complete, including, but not limited to, the following:

1. Sheet metal duct and duct insulation.
2. Diffusers, registers and grilles.
3. Flexible ducts.
4. Volume dampers, balancing dampers.
5. Operation and maintenance instructions and manuals.
6. Manufacturer's literature, shop drawings and record drawings.
7. Inspection, test and guarantee.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS unless specified otherwise in other sections of Division 15 – MECHANICAL.

B. Painting work specified in Section 09900 – PAINTING.

C. Insulation specified in Section 15080 – MECHANICAL INSULATION.

D. Air conditioning and ventilation system controls specified in Section 15910 – DIRECT DIGITAL CONTROL SYSTEMS.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS and Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

B. Shop Drawings: Submit shop drawings of plans, performance data and details showing locations and installation including, but not limited to, the following:

1. Ductwork, air devices and other duct mounted devices including controls provided by Section 15910 – DIRECT DIGITAL CONTROL SYSTEMS.

C. Product Data: Submit product data for the following:

1. Variable air volume terminals.
2. Air devices.
3. Flexible ducts
4. Volume dampers, balancing dampers.

D. Schedules:

1. Schedule of equipment listing name and addresses of manufacturers; manufacturer's local supplier's name, address and phone number; catalog numbers and trade names in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.
2. Maintenance service contract and schedule

E. Reports: See Section 15950 – HVAC TESTING/ADJUSTING/BALANCING for testing and balancing reports.

F. Certificates of Conformance or Compliance: None.

G. As-Built Drawings: Submit drawings in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

H. Operation and Maintenance Manuals: Submit manuals in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

I. Guarantee and Certificate: Submit one-year guarantee and certificate in accordance with Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Air conditioning and ventilation equipment to be considered for bid purposes shall be from a manufacturer that has locally stocked spare parts, representation, and

support of a factory authorized service organization within 500 miles of the site of installation and has serviced manufacturer's units of comparable type, size and capacity as those specified herein. The manufacturer must have other units of comparable type, size and capacity installed and operating satisfactorily in the State of Hawaii for a minimum of 2 years prior to bid opening.

2.02 AIR DEVICES

A. Supply Air Diffuser – SAD: Provide Titus Model TDC-AA series or approved equal. Diffuser shall be louvered face, aluminum, 24" x 24" lay in module with adjustable pattern, in sizes, capacities and patterns as indicated. Provide removable center core with opposed blade volume damper, square neck and standard white finish or as indicated.

B. Return, Exhaust and Transfer Air Register – RAR, EAR, TAR: Provide Titus Model 350FL series, or approved equal. Register shall be louvered, aluminum, surface mounted, 3/4" louver spacing, 35 degree fixed deflection angle with blades parallel to long dimension and in sizes and capacities as indicated. Provide opposed blade damper and standard white finish or as indicated.

C. Provide sponge rubber under all flanges.

D. Contractor shall coordinate finish of all air devices with the WHFD AND/OR PROJECT MANAGER.

2.03 DUCTWORK MATERIALS

A. All ductwork and plenum chambers shall be galvanized metal installed of gauges and with bracing and joints all in accordance with latest edition of ASHRAE Guide and SMACNA Duct Construction Standards.

B. For air conditioning and general ventilation systems, the thickness of the sheet metal and size and spacing of the stiffeners used shall be in accordance with the requirements of the latest edition of the ASHRAE Guide and Data Book and SMACNA HVAC Metal Duct Standard, +2-inch W.G. static pressure class, Seal Class A except main supply duct and branches upstream of the VAV boxes shall be constructed for +4 inches design pressure class, Seal Class A. Connections to plenum shall be airtight. No polysulfide sealant shall be used. Polyurethane

sealant is acceptable. Round take-offs shall be made with prefabricated conical tap-offs with locking damper.

C. Plenums shall be braced with 1-1/2" x 1-1/2" x 1/8" angles. Hangers shall be one inch x 18-gauge or as required by SMACNA. Brace ducts in accordance with SMACNA recommendations for seismic loads.

D. Flexible Duct: Fiberglass insulated, flexible duct with fiberglass reinforced metallized film vapor barrier, coated spring steel wire helix and woven inner liner, UL listed under UL Standard 181, Class 1 flexible and complying with NFPA 90A and 90B. Length of flexible duct to air devices shall not exceed 8 feet. Flexible ducts only allowed for connecting rigid duct to air devices or VAV boxes and for plenums of the air devices. Thermaflex Model MKE for low pressure ductwork systems (i.e., downstream of VAV boxes) and Model MKC for medium pressure ductwork systems (i.e., upstream of VAV boxes) or approved equal.

E. Provide duct access panels in accordance with SMACNA Duct Construction Standards and NFPA 90A and 96.

2.04 DUCT INSULATION

A. See Section 15080 – MECHANICAL INSULATION for requirements of duct insulation.

2.05 VOLUME DAMPERS, BALANCING DAMPERS

A. Volume Dampers: Volume dampers shall be installed where shown and as required for air balancing. Dampers shall be 2 gages heavier than the duct in which they are installed and shall be reinforced to prevent vibration and noise. Unless otherwise indicated, all volume dampers in ductwork 10 inches or greater, in either width or height, shall be opposed blade type and meet SMACNA Duct Construction Standards. Branch dampers as indicated are required regardless if the air devices are provided with volume dampers. Provide Ruskin, Pottorff or approved equal.

B. Balancing Dampers: Balancing dampers for branches and mains shall be equipped with Young Regulator No. 1, Dura Dyne or approved equal.

C. Backdraft Dampers: Backdraft dampers shall be adjustable, counterbalanced type, heavy duty extruded aluminum, minimum 0.125-inch wall thickness frame,

minimum 0.070-inch wall thickness blades with vinyl edge seals, maximum allowed spot velocity of 3500 fpm and maximum air temperature of 200 degrees

1. Provide front flange: Provide Ruskin CBD6, Pottorff or approved equivalent.

2.06 FIRE DAMPERS

A. Fire dampers shall have UL 1.5-hour rating and shall be equipped with electric/thermal link which closes damper at 165 degrees F and then automatically resets after normal temperature is restored by cycling damper operator. Provide Type B damper except dampers located within concrete walls may be Type A.

2.07 ACCESS PANELS

A. Furnish access panels for dampers, fire dampers, fire/smoke dampers, coils, fans, air handlers; filters, inlet side of coils, cold plenums, hood exhaust duct cleanout locations, valves, condensate drain standpipes, where indicated of size shown or required to access for maintenance. Access panels in fire rated ceiling assemblies or walls shall be rated equal to or greater than the assembly in which it is installed. Access panels shall be coordinated with location of duct mounted access panels.

2.08 FLEXIBLE CONNECTIONS FOR DUCTWORK

A. At ducts to equipment and where indicated, provide vent-fabric flexible connections with a minimum of 9-inch full length.

2.09 SPECIAL WIRING

A. All factory-assembled, package type equipment shall be provided with integral control panel to which all motors in each unit shall be factory wired. Control panel shall contain all relays, starters, and other control devices, all arranged so as to be accessible for maintenance, testing, and inspection. Control panel on each unit shall contain control transformer installed so that all control circuits extending to remote control devices, thermostats, etc., will be 120 volts maximum.

B. All field installed control wiring not shown and required for the control of the air conditioning system including connections to duct mounted items (e.g., motorized dampers), to special safety control or apparatus (e.g., duct smoke detectors) and to the DDC system from the duct mounted items shall be included under this

section. Control wiring shall include both control power (i.e., 120 volts or less) and communication for control signals. All control wiring shall meet the requirements of the NEC and shall be installed in metal conduit throughout.

PART 3 - EXECUTION

3.01 COOPERATION WITH OTHER TRADES AND CONFLICT IN WORK

A. Contractor shall examine all drawings of proposed work and coordinate his work with other trades. Work conflicts shall be brought to attention of WHFD AND/OR PROJECT MANAGER and work rearranged or modified in accordance with his decision.

B. If changes in indicated locations or arrangements of work are required, they shall be made by Contractor without additional charge to the WHFD AND/OR PROJECT MANAGER provided that these changes were ordered before work is installed and no extra material or labor is required.

C. Should Contractor determine that extra material and labor will be required to accommodate any rearrangement, he shall first submit detailed estimate of cost for required changes and proceed with work only upon written authority of the WHFD AND/OR PROJECT MANAGER.

3.02 EQUIPMENT INSTALLATION

A. Equipment shall be installed as indicated and in accordance with manufacturer's recommendations and instructions.

B. All necessary supports shall be provided for equipment, appurtenances and duct as required. This work shall include any additional steel purlins, brackets, seismic restraints or supports.

C. Provide controls as indicated for proper operation of the equipment. Provide all necessary relays, contactors, enclosures and transformers to ensure proper system operation.

3.03 WORKMANSHIP AND FABRICATION

A. Galvanized Steel Ductwork:

1. Fabricate all ductwork and related work to highest industry standards and

recommendations of ASHRAE and SMACNA. Provide all necessary supplementary steel structure supports, purlins or brackets to support duct properly from structure.

2. Sides of ductwork shall be cross broken or beaded per SMACNA Duct Construction Standards. Long seams shall be Pittsburgh lock groove, hammered flat or double seamed. Ducts shall also have supplemental stiffening as required to prevent drumming and to provide structurally sound assembly.

3. Center line radius of curves, bends, offsets for branch and connections shall be equal to 1-1/4 times duct width or larger. Duct turns in all square elbows shall be accomplished by using prefabricated turning vanes in accordance with SMACNA Duct Construction Standards. Double thickness turning vanes in ducts deeper than 16 inches may be used if prior approval of design is given by the WHFD AND/OR PROJECT MANAGER.

4. Volume and splitter dampers shall be installed where required and shall be provided with extension rods for adjusting and locking. Dampers shall be made of not lighter than 18-gauge steel for dimensions up to 10 inches, and multi-louvered, opposed blade type on ducts over 10 inches high. All dampers shall have Young Regulator No. 401 locking quadrants, Dura Dyne or approved equal.

5. Paint inside of all supply, return, exhaust and transfer air ducts with one coat of flat black paint wherever duct is visible through register or grille opening.

6. Ducts passing through outside walls shall be suitably and properly flashed and counter flashed to prevent leaks. Fresh air intake or ventilation opening shall be provided with screened intakes.

3.04 ADJUSTING AND CLEANING

A. Equipment shall be wiped clean, with all traces of oil, dust, dirt, or paint spots removed. Temporary filters shall be provided for all fans that are operated during construction and after all construction dirt has been removed, new filters shall be installed. Bearings shall be properly lubricated with oil or grease as recommended by the manufacturer. Belts shall be tightened to proper tension. All dampers and other miscellaneous equipment requiring adjustment shall be

adjusted to setting indicated or directed. Fans shall be adjusted to the speed indicated by the manufacturer to meet specified conditions.

3.05 TESTING, ADJUSTING AND BALANCING

A. Test, adjust and balance each piece of equipment as required to assure proper operation. Testing, adjusting and balancing is specified in Section 15950 – HVAC TESTING/ADJUSTING/BALANCING.

3.06 CALIBRATION AND ADJUSTMENTS

A. After completion of the installation, perform final calibrations and adjustments of the equipment provided under this contract and supply services incidental to the proper performance of the unit control panels under warranty.

3.07 ACCEPTANCE PROCEDURE

A. Upon completion of the calibration, Contractor shall start-up the air conditioning system and perform all necessary testing and run diagnostic tests to ensure proper operation. Contractor shall be responsible for generating all software and entering all data base necessary to perform the sequence of control and specified software routines. An acceptance test in the presence of the WHFD AND/OR PROJECT MANAGER shall be performed.

3.08 POSTED OPERATING INSTRUCTIONS

A. Furnish approved operation instructions for each principal item of equipment for the use of the operation and maintenance personnel. The operation instructions shall include wiring diagrams, control diagrams and control sequence for each principal item of equipment. Operating instruction shall be printed or engraved and shall be framed under glass or in approved laminated plastic and posted where directed by the WHFD AND/OR PROJECT MANAGER. Operating instruction shall be attached to or posted adjacent to each principal item of equipment including start-up, procedure in the event of equipment failure and other items of instruction as recommended by the manufacturer of each item of equipment. Operating instructions exposed to the weather shall be made of weather-resistant materials or shall be suitably enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

3.09 FIELD INSTRUCTION

A. Requirements for field instruction are specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

3.10 OPERATION AND MAINTENANCE MANUAL

A. Provide hard bound copies of the Operation and Maintenance Manual on all equipment and the system as a whole. Provide manuals in accordance with the requirements of Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

END OF SECTION

SECTION 15910 – DIRECT DIGITAL CONTROL SYSTEMS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 WORK DESCRIPTION

A. This section covers the furnishing, fabrication, delivery and installation of the Direct Digital Control (DDC) system for the control and monitoring of the air conditioning system. The Contractor shall provide a complete and working system, including, but not limited to, the following:

1. Hardware.
2. Software.
3. Control wiring and conduit for site and for interior areas.
4. Operation and maintenance instructions and manuals.
5. Manufacturer's literature, shop drawings and record drawings.
6. Inspection, test and guarantee.

B. Provide new DDC components to connect the existing DDC system including associated equipment, control wiring, conduit, termination boards and accessories. Provide each control system complete and operating as specified. All control wiring exterior to the building shall be provided in conduit that conforms to the NEC. Manufacturer's products, including design, materials fabrication, assembly, erection, examination, inspection, and testing shall be in accordance with NFPA 70, except as modified in this section or indicated otherwise.

C. The DDC system shall maintain stable temperature control for comfort cooling, humidity control where humidity is the sensed variable and all other conditions indicated. The end-to-end accuracy of the system, including temperature sensor error, wiring error, A/D conversion, and display, shall be 1ºF.

D. DDC system shall be provided by Setpoint Systems (www.setpointsystems.com). Contractor shall provide all necessary components, interface devices, translators, equipment and software and hardware to meet the performance requirements indicated and in accordance with the recommendations of the controls manufacturer, for their particular system.

1.03 RELATED WORK SPECIFIED IN OTHERS SECTIONS

A. Mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS unless specified otherwise.

B. Electrical work specified in Division 16 – ELECTRICAL.

C. Air conditioning and ventilation system and devices monitored and controlled by the DDC system specified in Section 15810 – DUCTWORK AND DUCTWORK ACCESSORIES.

1.04 DEFINITIONS

A. BACnet: BACnet is a standard communication protocol under development by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE). The controller manufacturer shall have a company policy to support the implementation of BACnet.

B. Digital Controller: A control module which is microprocessor based, programmable by the user, has integral I/O, and performs stand-alone operations.

C. Direct Digital Control: A digital controller as defined in this document. The controller directly senses building environment and makes control decisions based on user defined, controller resident programs. The controller outputs control signals that directly operate valves, dampers, and motor controllers. No conventional control devices, pneumatic or electronic, such as receiver-controllers, thermostats, and logic units are present within or interface with a direct digital control loop. Actuators are electric or pneumatic and the controller output is converted to the appropriate type of signal.

D. DDC System: A system made up of one or more digital controllers. Required climate control and energy management functions for complete operation of a heating, ventilating, and air conditioning (HVAC) system are provided by DDC

from digital controllers. No conventional control devices (pneumatic or electronic) such as receiver-controllers, thermostats and logic units are used. Digital controllers in a system are linked in a communication network composed of one or more levels of local area networks (LAN).

E. Distributed Control: The intent of distributed control is to install the controllers near the equipment being controlled, and to distribute the processing to each stand-alone DDC panel. The control system is built up of stand-alone controllers, utilizing sensor inputs and control outputs.

F. Dynamic Control: A process that optimizes operation of HVAC systems (air handler units, converters, chillers, and boilers) by increasing and decreasing set points or starting and stopping equipment in response to heating and cooling needs of downstream equipment. A requirement of dynamic control is knowing the heating/cooling demand status of downstream equipment, therefore dynamic control requires controllers connected in a communications network.

G. Firmware: Firmware is software programmed into read only memory (ROM) and erasable programmable read only memory (EPROM) chips. Software may not be changed without physically altering the chip.

H. Graphic Sequence of Operation: A drawing or graphic showing all interlocks and control loop sequences between the input and output points. Graphic sequence of operation is a graphical representation of the sequence of operation. The graphic sequence of operation will show all inputs, outputs and logic blocks.

I. Hand-Held Terminal: A hand-held terminal is a portable device, control system manufacturer-specific, which can be connected directly to a communications port on a digital controller and through which the digital controller can be interrogated and, in some cases, programmed.

J. Input/Output (I/O): I/O refers to analog inputs (AI), digital inputs (DI), analog outputs (AO), and digital outputs (DO) in a digital controller. Inputs are from analog sensors (temperature, pressure, humidity, flow) and digital sensors (motor status, flow switches, switch position, and pulse output devices). Outputs operate modulating and on/off control devices.

K. I/O Unit: An I/O unit provides additional point capacity to a digital controller and communicate with the stand-alone digital controller on LAN. An I/O unit is not

stand-alone because the control program does not reside in the I/O unit microprocessor.

L. Integration: The ability of control system components to have interoperability between different manufacturers to connect together and provide coordinated control via real-time data exchange and control functions through a common communications data exchange protocol. Integration shall extend to the operator's workstation software, which shall support user interaction with all control system components. Methods of integration include industry standard protocols such as: BACnet, ARCnet, LonMark/LonTalk, OLE for Process Control (OPC) or integrator interfaces between cooperating manufacturer's systems.

M. Local Area Network:

1. A communications bus that interconnects digital controllers for peer-to-peer communications. Different levels of LANs are possible within a single DDC system. In this case, a digital controller on a higher level LAN acts as a network controller to the controllers on the lower level LAN. The network controller, then, has at least 2 LAN communications ports. One port supports peer-to-peer communications with other digital controllers on the higher level LAN. The other port supports communications with the digital controllers on the lower level LAN.

2. LAN's permit sharing global information, make it possible to apply building wide control strategies such as peak demand limiting, permit dynamic control strategies, allow coordinated response to alarm conditions, and permit remote monitoring and programming of digital controllers.

3. Facility-wide LAN refers to a commercially available local area network. These LANs allow the connection to an existing or new facility-wide LAN.

N. Microprocessor: A microprocessor refers to the central processing unit (CPU) that contains all the registers and logic circuitry that make it possible for digital controllers to do computing.

O. Open Protocol Bus (OPB): A pre-programmed communications integrator that allows devices from one manufacturer to communicate and interact with those of another.

P. Open System Port (OSP): A user programmable communications port that provides the ability to develop custom communications processes to integrate other operating systems with the DDC system.

Q. Output Signal Conversion: Output signal conversion refers to the changing of one kind of control output into a proportionally related signal appropriate for direct actuation of the controlled device. Signals are converted by a transducer which may be external to the digital controller originating the output.

1. Examples in modulating control of pneumatic actuators are conversion of 4-20 mA signals into proportional 3-15 psig signals.

2. An example of output signal conversion in on/off or open/close control is a contact closure originating in a digital controller which activates a solenoid air valve which passes main air, thereby forcing a damper to open fully.

R. Optimum Start: Optimum start is a method of starting the HVAC equipment prior to occupancy time in order to have the building at set point at occupancy. Optimum start shall be based on the zone temperatures, zone set points, and outdoor temperature. Optimum start will bring the zone to set point at occupancy time.

S. Peer-to-Peer: Peer-to-Peer refers to controllers connected on a communications LAN that act independently, as equals and communicate with each other to pass information which facilitates control.

T. PID: PID refers to proportional, integral, and derivative control; the 3 types of action that are used in controlling modulating equipment.

U. Resolution: Refers to the number of possible states an input value or output value can take and is a function of the digital controller I/O circuitry; the A/D converter for input and the D/A converter for output. Ten-bit resolution has 1024 possible states and 8-bit resolution has 256 possible states.

V. Stand-Alone Control: Refers to the digital controller being able to perform required climate control, and energy management functions without connection to another digital controller or central site computer. Digital controller requirements for stand-alone control are a time clock, a microprocessor, microchip resident control programs, PID control, a communications port for

interfacing with and programming the controller, firmware for interrogation and programming, and I/O for sensing and effecting control of its control environment.

W. Terminal Control Unit (TCU): An off-the-shelf, stand-alone digital controller equipped for communication on a lower level local area network. TCUs may deviate from stand-alone only in receiving energy management and time information from a stand-alone digital controller. A TCU is commonly application specific and is used for distributed control of specific HVAC subsystems. A TCU communicates with the digital controllers. Typically, a TCU communicates on a lower level LAN. Examples where TCUs might be used to control of small air handling units (AHUs), variable air volume (VAV) boxes, fan coil units, and heat pumps.

1.05 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Manufacturer's Catalog Data:

1. DDC hardware.
2. DDC capabilities.
3. Input devices.
4. Output devices.
5. Surge and transient protection.
6. Panel mounted display and keypad.

C. Equipment and software for which specification compliance data shall be submitted include but not limited to the following:

1. DDC hardware:

a. I/O; capable of supporting platinum RTD, precision thermistor, 4-20 mA, 0-10 VDC.

b. Programs will reside in microprocessor; controllers are stand-alone.

c. Communications ports; all communications ports as specified.

d. Protected memory; minimum hours required by this specification.

e. Operating temperature limits.

2. DDC capabilities:

a. Communications; baud rate, communication ports, stand-alone.

b. Trending; capable of trending every point.

c. Alarming; capable of alarm generation as indicated.

d. Messages; as indicated.

e. Self-diagnostics; identification of a failed module.

f. PID control; capable of PID control.

3. Input devices:

a. Transmitters; accuracy, 4-20 mA, 0-10 VDC.

b. Temperature sensors; accuracy, stability, 100% factory screening, platinum RTD or thermistor.

c. Pressure sensor; accuracy.

d. Flow or motor proof; type.

e. Sensor wells; type.

4. Output devices:

a. Valves; types.

b. Actuators.

c. Control relays.

5. External surge and transient protection:

a. Power line.

b. Communications links and/or devices (between buildings).

D. Drawings: Submit the following drawings: Control system schematic.

E. Design Data: Submit test data demonstrating the following installed components will meet specification requirements.

1. Temperature sensor accuracy: Submit manufacturer specification of temperature sensor accuracy. Literature shall make clear sensor accuracy as

specified.

2. Temperature sensor stability: Provide manufacturer specification of 5-year stability of RTDs and thermistors. Literature shall make clear sensor stability as specified.

F. Schedules:

1. List of shop drawings.
2. List of symbols and abbreviations used on shop drawings.
3. List of I/O points: For each input and output physically connected to a digital controller provide, on a controller by controller basis, provide the following:
    a. Point description: for example: mixed air temperature, supply fan start/stop, etc.
    b. Point type: AO, AI, DO, or DI.
    c. Point range: Shall be 4-20 mA, 3-15 psi, platinum RTD resistance ohm, thermistor.
    d. Sensor range associated with point range: For example, 0-100ºF, 0-2" of water.
    e. Software name(s) associated with point, if any.
    f. Terminal number to which point is connected.
4. Equipment components list: Submit a listing of controllers and connected devices shown on control system schematic. List the following:
    a. Control system schematic component name.
    b. Description.
    c. Manufacturer of controller.
    d. Controller's name.
    e. Equipment part numbers.
    f. Cv for valves.
    g. For actuators:

i. Motive force (such as pneumatic, or electric).

ii. Normal position.

iii. Nominal operating range (such as 3-7 psi, 4-8 mA).

5. AC power table: Submit a table listing each controller and the circuit breaker number, panel box number, and physical location of each controller's source of AC power.

G. Statements:

1. Contractors' qualifications: Submit statements required in Part 1, Quality Assurance, Qualifications.

2. Training: Submit schedule, syllabus, and training materials in accordance with Part 3 – EXECUTION.

H. Records: Provide administrative and closeout submittals:

1. Training course documentation: Training course documentation shall include a manual for each trainee plus 2 additional copies and 2 copies of audiovisual training aids, if used. Documentation shall include an agenda, defined objectives for each lesson and detailed description of the subject matter of each lesson.

2. Service organization: Qualified service organization list that shall include the names and phone numbers of organizations qualified to service the HVAC control systems.

3. Contractor certification: Provide certification that the installation of the control system is complete and the technical requirements of this section have been met.

I. Operation and Maintenance Manuals:

1. Controls and HVAC system operator’s manual: Provide a controls and HVAC system operation and maintenance manual. This manual is designed to document the HVAC and control system. Construct this manual using a 3-ring binder with a minimum of the following 7 sections. Use tabs to divide each section. Provide one hard copy and 3 electronic copies on CD.

a. Section 1: Description of HVAC Systems: Provide a description of the

HVAC system components and control system. Include sequences of operation and a complete points list.

b. Section 2: Controls Drawings: Provide drawings as specified.

c. Section 3: Control Program Listings: Provide listing of all control programs, including terminal equipment controller setup pages.

d. Section 4: Current Operating Parameters: Provide printouts of input and output setup information, database setups. This section is intended to provide information such as point addresses, slopes and offsets for all points, database of points, etc.

e. Section 5: Design Information: Provide tab, but leave this section blank.

f. Section 6: Control Equipment Cut Sheets: Provide cut sheets of all controller hardware and accessories. Include temperature versus resistance charts for temperature sensors, and calibration charts for pressure transducers.

g. Section 7: Control Program: Provide a fully operational control system disk (CD disk format preferred) identical to the original control program as installed. In addition, provide a restore – backup disk of the control program and backup copy of AUTOCAD controls drawings. It is understood that the software will be available to the owner and used only for the buildings in this contract.

2. DDC manufacturer's hardware and software manuals. Controls and HVAC system operation and maintenance manual:

a. Section 1: Installation and Technical Manuals for all digital controller hardware.

b. Section 2: Operators Manuals for all digital controllers.

c. Section 4: Programming Manuals for all digital controllers.

1.06 STORAGE

A. Stored products shall be protected from the weather, humidity and temperature variations, dirt and dust, and other contaminants, within the storage condition limits published by the equipment manufacturer.

1.07 QUALITY ASSURANCE

A. General:

1. The direct digital control system herein specified shall be fully integrated and installed as a complete package by the DDC Contractor. The system shall include all wiring, piping, installation supervision, calibration, adjustments, and checkout necessary for a complete and fully operational system.

2. The DDC Contractor shall be regularly engaged in the engineering, programming, installation and service of direct digital control systems of similar size and complexity.

3. The DDC Contractor shall have a local facility on Oahu. Emergency service shall be available on a 24-hour, 7-day-a-week basis.

4. The DDC Contractor shall be responsible for all work fitting into place in a satisfactory and neat workmanlike manner acceptable to the WHFD AND/OR PROJECT MANAGER.

B. Experience Record:

1. The DDC Contractor shall have a minimum of 3 years of experience with the complete installation of direct digital control systems of similar size and technical complexity. The DDC Contractor shall provide a list of 3 comparable projects that have direct digital control systems with the features as specified for this project. These projects must be on-line and functional.

2. The DDC Contractor shall employ specialists in the field of direct digital control systems including: programming, engineering, field supervision, and installation. Specialists shall present factory-training certification of the submitted equipment upon request.

C. Governing Code Compliance: The DDC Contractor shall comply with all current governing codes, ordinances and regulations, including UL, NFPA, the local Building Code, NEC, and so forth.

D. FCC Regulation: All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Section 15, Governing Radio Frequency Electromagnetic Interference, and be so labeled.

E. Standard Products:

1. Materials and equipment shall be standard products of manufacturer regularly engaged in the manufacturing of such products, using similar materials, design and workmanship. The standard products shall have been in commercial or industrial use for 2 years prior to bid opening. The 2-year use shall include applications of similarly sized equipment and materials used under similar circumstances. The 2-year experience must be satisfactorily completed by a product, which has been sold on the commercial market through advertisements, manufacturer's catalogs, or brochures.

2. The equipment items shall be supported by a service organization.

F. Nameplate and Tags:

1. Nameplates bearing legends as shown and tags bearing device unique identifiers as shown shall be engraved or stamped. Nameplates shall be permanently attached to HVAC control panel doors.

2. For each field-mounted piece of equipment, not in a finished area, a plastic or metal tag with equipment name and point identifier shall be attached.

G. Verification of Dimensions: The Contractor shall become familiar with all details of the work, shall verify all dimensions in the field, and shall advise the WHFD AND/OR PROJECT MANAGER of any discrepancy before performing the work.

H. Drawings: Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. The Contractor shall carefully investigate the mechanical, electrical, and finish conditions that could affect the work to be performed, and shall finish all work necessary to meet such conditions.

I. Modification of References: The advisory provision in ASME B31.1 and NFPA 70 shall be considered mandatory. Substitute the word “shall” for “should” wherever it appears. Interpret reference to the “authority having jurisdiction”, the “Administrative Authority”, the “Owner”, or the “Design Engineer” to mean the “WHFD AND/OR PROJECT MANAGER”.

1.08 WORK INCLUDED

A. Installation of Direct Digital Control System:

1. The DDC Contractor shall furnish and install a complete DDC system for all mechanical systems and other facility systems as included in the project documents. The DDC system will provide the functional features as defined in Part 1 – GENERAL REQUIREMENTS, Part 2 – PRODUCTS, and Part 3 – EXECUTION of these specifications. The DDC Contractor shall provide a complete and operational system to perform all sequences of operations stated within Part 3 or shown on the control drawings.
2. The work under this section shall include all materials and labor to perform all work required for the installation of the DDC as specified.
3. The drawings and specifications are complementary to one another – meaning that what is called for on one is to be considered called for in both. Where conflicts exist between the specifications and/or drawings, the more stringent requirement shall apply.
4. The DDC Contractor shall be responsible for field verification of site conditions and for gathering all necessary field data for all items to be provided under this contract prior to submitting his or her bid.
5. Where work specified under other sections of this specification connects to equipment or systems that are listed and described in this section, the DDC Contractor shall provide proper connection(s) to such equipment including trade coordination.
6. The DDC Contractor shall tie-in the new work to the existing system including mapping of all new points to the existing system, modifying the existing operator interface graphic display to include all new equipment and points and integrating control, set point, alarm and trending functions for the new equipment and points to the existing system.

1.09 COORDINATION

A. Divisions:

1. The DDC Contractor shall cooperate with other divisions performing work on this project as necessary to achieve a complete and neat installation. The Contractor shall also consult the drawings and specifications of all trades to determine the nature and extent of others' work.

2. Contractors, subcontractors, employees: It will be the duty of this Contractor to work in cooperation with other Contractors, and with other Subcontractors and employees, rendering assistance and arranging his or her work so that the entire project is complete and usable.

1.10 MANUALS

A. All manuals shall be provided in hard copy format or on a single Compact Disk (CD) as part of an on-line documentation system through the operator workstation.

PART 2 - PRODUCTS

2.01 SYSTEM ARCHITECTURE

A. First-Tier Network:

1. The first-tier network shall be based on a PC industry standard of Ethernet TCP/IP, ARCnet, or LONWORKS as compatible with the existing system.

2. The DDC system shall network multiple network controllers, system controllers, and application-specific controllers. The first-tier network shall provide communications between existing operator workstations and first tier DDC controllers.

3. The first-tier network shall operate at a minimum communication speed of 2.5 M baud, with full peer-to-peer network communication.

4. Network controllers shall reside on the first tier.

B. First Tier Network Protocol Integration:

1. The system installed under this contract shall allow bi-directional communications with the Owner's designated host system. Supported media shall include fiber, 10base2, and 10baseT.

2. The ability to share data and change of state (COS) between the Owner's designated host system and the system installed under this contract shall be provided.

C. Second Tier Network:

1. The second-tier network is used to communicate between the first tier DDC controllers and field controllers.
2. Second-tier networks shall utilize either “Peer-to-Peer”, Master-Slave, or Supervised Token Passing communications.

D. Second-Tier Controller Protocol Integration:

1. Hardwired:
    a. Analog and digital signal values shall be passed from one system to another via hardwired connections.
    b. There will be one separate physical point on each system for each point to be integrated between the systems.
    c. Analog points will be 4-20 mA signals originating at the “from system” and being received by the “to system.”
    d. Digital points will be “dry contact” signals originating at the “from system” and being received by the “to system”.
2. Direct protocol:
    a. The DDC system shall include appropriate hardware equipment and software to allow data communications between the DDC system and third-party manufacturers’ control panels. The DDC shall receive, react to, and return information from multiple building systems, variable frequency drives, power monitoring systems, etc.
    b. All data required by the application shall be mapped into the First-Tier Network DDC Controller's database, and shall be transparent to the operator.
    c. Point inputs and outputs from the third-party controllers shall have real-time interoperability with DDC software features such as: Control Software, Energy Management, Custom Process Programming, Alarm Management, Historical Data and Trend Analysis, Totalization, and Dial-Up and Local Area Network Communications.
    d. Integration shall be via RS-232 or RS-485 technologies.
    e. The system operator shall have the ability to verify, and diagnose

communication messages and point information between third-party controllers and the DDC system.

2.02 DDC SYSTEM – GENERAL

A. Provide a DDC system as a distributed control system. The system shall have stand-alone digital controllers, and a communications network.

B. Provide an operator programmable system, based on the user applications, to perform closed-loop, modulating and/or on-off control of building equipment. Connect all digital controllers through the communication network to share common data and report to workstation computers. The control system shall be capable of down-loading and up-loading of programs between the existing workstation and the digital controllers.

C. The DDC system shall be fully compatible with the existing system currently operating at the facility. Contractor to provide a fully compatible and coordinated system with tie-in to the existing system including mapping of all new points to the existing system, modifying the existing operator interface graphic display to include all new equipment and points and integrating control, set point, alarm and trending functions for the new equipment and points to the existing system. Access to the new equipment and points shall be through the existing operator interface front end software and shall not require parallel operation of another software interface.

2.03 DIGITAL CONTROLLERS

A. Provide the quantity of digital controllers indicated on the drawings that will perform required climate control, energy management, and alarm functions. The quantity of controllers shall be no less than the number shown on drawings. All material used shall be currently in production.

B. Direct Digital Controllers: DDC hardware shall be UL 916 rated.

C. Distributed Control: Apply digital controllers in a distributed control manner.

D. Environmental Operating Limits: Provide digital controllers that operate in environmental conditions between 32ºF and 120ºF.

E. Stand-Alone Control: Provide stand-alone digital controllers.

F. Internal Clock: Provide clock with each controller on the first-tier local area network and shall have its clock backed up by a battery or capacitor with sufficient capacity to maintain clock operation for a minimum of 72 hours during a line power outage.

G. Memory:

1. Provide sufficient memory for each controller to support required control and communication functions.

2. Memory protection: Programs residing in memory shall be protected either by using EEPROM or by an uninterruptible power source (battery or uninterruptible power supply (UPS)). The backup power source shall have sufficient capacity to maintain volatile memory in event of an AC power failure. Where the uninterruptible power source is rechargeable (a rechargeable battery), provide sufficient capacity for a minimum of 72 hours back-up. The rechargeable power source shall be constantly charged by charging circuitry while the controller is operating under normal line power. Where a non-rechargeable power source is used, provide sufficient capacity for a minimum of 2 years accumulated power failure. Batteries shall be designed to allow replacement without soldering.

H. Inputs: Provide input function integral to the direct digital controller. Provide input type as required by the DDC design.

1. Analog inputs: Allowable input types are 3-wire 100 ohm or higher platinum RTD's, stable 10,000 ohm thermistors, 0-10 VDC and 4 to 20 mA. Thermistor and direct RTD inputs must have appropriate conversion curves stored in controller software or firmware. Analog to digital (A/D) conversion shall be a minimum of 10-bit resolution.

2. Digital inputs: Digital inputs shall sense open/close, on/off, or other 2 state indications.

I. Outputs: Provide output function integral to the direct digital controller. Provide output type as required by the DDC design. Ensure that output of controllers is compatible with controlled devices.

1. Analog outputs: Provide controllers with a minimum output resolution of

8 bits. Output shall be 4 to 20 mA or 3 to 15 psi or 0-10 VDC. Each pneumatic output shall have feedback for monitoring of the actual pneumatic signal. Feedback shall be integral to the output function.

2. Digital outputs: Provide contact closure with contacts rated at a minimum of one ampere at 24 volts.

J. PID Control: Provide controllers with proportional, proportional plus integral, and proportional plus integral plus derivative control capability. Terminal controllers are not required to have the derivative component.

K. Digital Controller Networking Capabilities: The upper level digital controllers shall be capable of being networked with other similar upper level controllers. Upper level controllers shall also be capable of communicating over a network between buildings.

L. Communications Ports:

1. Controller-to-controller LAN communications ports: Controllers in the building DDC system shall be connected in a communications network. Controllers shall have controller-to-controller communication ports to both peer controllers (lower level controller). Network may consist of more than one level of local area network and one level may have multiple drops. Communications network shall permit sharing between controllers of sensor and control information, thereby allowing execution of dynamic control strategies and coordinated response to alarm conditions.

2. On-site interface ports: Provide a RS-232, RS-485, or RJ-11, or RJ-45 communications port for each digital controller that allows direct connection of a computer or hand held terminal and through which the controller may be fully interrogated. Controller access shall not be limited to access through another controller. On-site interface communication ports shall be in addition to the communications port(s) supporting controller-to-controller communications. Communication rate shall be 56K Baud minimum. Every controller on the highest level LAN shall have a communications port supporting direct connection of a computer; a hand held terminal port is not sufficient. By connecting a computer to this port, every controller in the direct digital control system shall be able to be fully interrogated and programmed.

The following operations shall be available: downloading and uploading control programs, modifying programs and program data base, and retrieving or accepting trend reports, status reports, messages, and alarms.

M. Digital Controller Cabinet: Each digital controller cabinet shall protect the controller from dust and be rated NEMA 1, unless specified otherwise. Controller cabinets or enclosures the controller is mounted in shall be provided with a lock.

N. Main Power Switch: Each controller on the highest level LAN shall have a main power switch for isolation of the controller from AC power. The switch shall be protected from tampering within the DDC cabinet.

2.04 TERMINAL CONTROL UNITS

A. TCU's shall be manufactured by the same company as the digital controllers.

B. TCU's shall automatically start-up on return of power after a failure, and previous operating parameters shall exist or shall be automatically downloaded from a digital controller on a higher level LAN.

C. TCU's do not require an internal clock if they get time information from the digital controller.

2.05 DDC SOFTWARE

A. DDC software resides in the digital controllers and performs control sequences.

B. Sequence of Control: Provide, in the digital controllers, software to execute the sequence of control. Provide sequences of control written in text format.

C. Database Modification: Provide software to modify the control program database. Database modification shall be accomplished through connected computer or hand held terminal or through a keypad integral to the controller. Database modification shall be accomplished without having to make changes directly in line-by-line programming. As a result of this requirement, when the control program is of the line-by-line type, database parameters in the following list that take real number values shall require assignment of variable names so parameters can be changed without modifying the line-by-line programming. Alternatively, block programming languages shall provide for modification of

these database parameters in fill-in-the-blank screens. The following shall be modifiable in this way:

1. Set points
2. Deadband limits and spans
3. Reset schedules
4. Switchover points
5. PID gains and time between control output changes
6. Time
7. Timed local override time
8. Occupancy schedules
9. Holidays
10. Alarm points, alarm limits, and alarm messages
11. Point definition database
12. Point enable, disable, and override
13. Trend points, trend intervals, trend reports
14. Analog input default values
15. Passwords
16. Communications parameters including network and telephone communications setups

D. Differential: Where equipment is started and stopped or opened and closed in response to some analog input such as temperature, pressure, or humidity, include a differential for the control loop to prevent short cycling of equipment.

E. Motor and Flow Status Delay: Provide an adjustable delay between when a motor is commanded on or off and when the control program looks to the motor or flow status input for confirmation of successful execution of the command.

F. Runtime Accumulation: Provide resettable run time accumulation for each controlled electrical motor.

G. Timed Local Override: Provide user definable adjustable run time for each push of a momentary contact timed local override. Pushes shall be cumulative with each push designating the same length of time. Provide a user definable limit on the number of contact closures summed, such as 6, before the contact closures are ignored. Timed local overrides are to be disabled during occupancy periods.

H. Time Programs: Provide programs to automatically adjust for leap years, and make daylight savings time and standard time adjustments.

I. Scheduling:

1. Each control output point shall be schedulable and its operation based on time of day, day of week, and day of year. Output points may be associated into groups. Each group may be associated with a different schedule. Changing the schedule of a group shall change the schedule of each point in the group. Points may be added to and deleted from groups. Groups may be created and deleted by the operator.

2. Provide capability that will allow current schedules to be viewed and modified in a 7-day week format. When control program does not automatically compute holidays, provide capability to allow holiday schedules to be entered one full year at a time.

J. Point Override: I/O and virtual points shall be able to be software overridden in the software and commanded to any possible value from the main building digital controller.

K. Alarming: I/O points and virtual points shall be alarmable. Alarms may be enabled and disabled for every point. Alarm limits shall be adjustable on analog points. Controllers connected to an external communications device such as a printer, terminal, or computer, shall download alarm and alarm message when alarm occurs. Otherwise alarms will be stored and automatically downloaded when a communications link occurs. The following conditions shall generate alarms:

1. Motor is commanded on or off but the motor status input indicates no change.

2. Room temperature, humidity, or pressure strays outside selectable limits.

3. An analog input takes a value indicating sensor failure.

4. A module is “dead” to the LAN.

5. A power outage occurs.

L. Messages: Messages shall be operator defined and assigned to alarm points. Messages shall be displayed when a point goes into alarm.

M. Trending: DDC system shall have the capability to trend I/O and virtual points. Points may by associated into groups. A trend report may be set up for each group. The period between logging consecutive trend values shall range from one minute to 60 minutes at a minimum. Trend data type shall be selectable as either average over the logging period or instantaneous values at the time of logging. The minimum number of consecutive trend values stored at one time shall be 30 per variable. When trend memory is full, the most recent data shall overwrite the oldest data. Trend data shall be capable of being uploaded to computer. Trend data shall be available on a real time basis; trend data shall appear either numerically or graphically on a connected computer's screen as the data being processed from the DDC system data environment. Trend reports shall be capable of being uploaded to computer disc and archived.

N. Status Display: Current status of I/O and virtual points shall be displayed on command. Points shall be associated into functional groups, such as all the I/O and virtual points associated with control of a single air handling unit, and displayed as a group, so the status of a single mechanical system can be readily checked. A group shall be selectable from a menu of groups having meaningful names; such as AHU-4, Second Floor, Chiller System, and other such names.

O. Diagnostics: Each controller shall perform self-diagnostic routines and provide messages to an operator when errors are detected. DDC system shall be capable of recognizing a non-responsive module on a LAN. The remaining, responsive modules on a LAN shall not operate in a degraded mode.

P. Power Loss: In event of a power outage, each controller shall assume a disabled status and outputs shall go to a user definable state. Upon restoration of power, DDC system shall perform an orderly restart, with sequencing of outputs.

Q. Program Transfer: Provide software for download of control programs and database from a computer to controllers and upload of same to computer from controllers. Every digital controller in the DDC system shall be capable of being downloaded and uploaded to through a single controller on the highest level LAN.

R. Password Protection: Provide at least 3 levels of password protection to the DDC system permitting different levels of access to the system.

S. Energy Data Recording: Provide a resettable signal accumulation for each meter at the main building digital controller.

1. Calculate chilled water thermal energy in BTU/HR using chilled water supply temperature and flow and chilled water return temperature signals.

2. Record electrical energy in KWH and electrical demand in KW.

2.06 SENSORS AND INPUT HARDWARE

A. Field Installed Temperature Sensors:

1. Thermistors: Precision thermistors may be used in temperature sensing applications below 200ºF. Sensor accuracy over the application range shall be 0.36ºF or less between the ranges of 32ºF to 150ºF. Sensor manufacturer shall utilize 100% screening to verify accuracy. Thermistors shall be pre-aged, and inherently stable. Stability error of the thermistor over 5 years shall not exceed 0.25ºF cumulative. Sensor element and leads shall be encapsulated. Bead thermistors are not allowed. A/D conversion resolution error shall be kept to 0.1ºF. Total error for a thermistor circuit shall not exceed 0.5ºF, which includes sensor error and digital controller A/D conversion resolution error. Provide thermistor and digital controller manufacturer documentation and the Contractor's engineering calculations, which support the proposed thermistor input circuit, will have a total error of 0.5ºF or less. Provide 18-gauge twisted and shielded cable for thermistors.

2. Resistance temperature detectors (RTDs): Provide RTD sensors with 1000 ohms, or higher, platinum element which are compatible with digital controllers. Sensors shall be encapsulated in epoxy, series 300 stainless steel, anodized aluminum, or copper. Temperature sensor accuracy shall be

0.1% (one ohm) of expected ohms (1000 ohms) at 32ºF. Temperature sensor stability error over 5 years shall not exceed 0.25ºF cumulative. Direct connection of RTDs to digital controllers, without transmitters, is preferred provided controller supports direct connection of RTDs. When RTDs are connected directly to the controller, keep lead resistance error to 0.25ºF or less. Provide 3-wire sensing circuits to not exceed the 0.25ºF lead resistance error. Total error for an RTD circuit shall not exceed 0.5ºF, which includes sensor error, lead resistance error or 4 to 20 mA transmitter error, and A/D conversion resolution error. Provide manufacturer documentation and the Contractor's engineering calculations which support the proposed RTD circuit will have a total error of 0.5ºF or less for the specified application.

a. Wiring: Provide 18-gauge twisted and shielded pair cable for direct connected RTDs. Provide 18-gauge twisted and shielded pair cable for RTDs using 4 to 20 mA transmitters.

b. Transmitters: Provide 4 to 20 mA transmitters for RTDs where digital controllers do not support direct connection of RTDs to controllers; digital controllers do not meet temperature resolution requirement of 0.5ºF.

3. Temperature sensor details:

a. Room: Conceal element behind protective cover matched to the room interior. Room temperature sensor shall have integral pushbutton, digital input to the controller for system override, and a set point adjustment, analog input to the controller. Digital sensors that communicate directly with the terminal control unit are acceptable. Provide a connection to allow interrogation of the digital controller.

b. Duct averaging type: Continuous averaging RTDs for ductwork applications shall be one foot in length for each 4 square feet of ductwork cross-sectional area with a minimum length of 6 feet. Probe type duct sensors of one-foot length minimum are acceptable in ducts 12 feet square and less.

c. Immersion type: Shall be 3 inches and 6 inches where needed total immersion for use with sensor wells, unless otherwise indicated.

d. Sensor wells: Brass materials; provide thermal transmission material

compatible with the immersion sensor. Provide heat-sensitive transfer agent between exterior sensor surface and interior well surface.

e. Outside air type: Provide element on the buildings north side with sunshade to minimize solar effects. Mount element at least 3 inches from building outside wall. Sunshade shall not inhibit the flow of ambient air across the sensing element. Shade shall protect sensing element from rain.

B. Transmitters:

1. Transmitters shall have 4 to 20 mA, or 0-10 VDC output linearly scaled to the temperature, pressure, humidity, or flow range being sensed. Transmitter shall be matched to the sensor, factory calibrated, and sealed. Total error shall not exceed 0.1% of 20 mA (0.02 mA) at any point across the 4 to 20 mA span. Supply voltage shall be 24 volts ac or dc. Transmitters shall have non-interactive offset and span adjustments. For temperature sensing, transmitter stability shall not exceed 0.05ºF a year.

2. Spans and ranges: Transmitter spans or ranges shall be the following and shall be suitable for the application:

a. Temperature:

i. 50ºF span: Room, chilled water, cooling coil, discharge air, return air sensors

ii. 100ºF span: Outside air, hot water, heating coil discharge air, mixed air sensors

iii. 200ºF span: High temperature hot water, heating hot water, chilled/hot water system sensors

b. Pressure:

i. 0 to 100 psi differential: Water differential range

ii. 0 to 5 inches water differential range: Duct static pressure

C. Pressure Transmitters: Provide integral pressure transducer and transmitter. Output of pressure instrument shall be a 4 to 20 mA or 0 to 10 VDC signal proportional to the pressure span. Span shall be as specified. Accuracy shall be

1.0%. Linearity shall be 0.1%. Supply voltage shall be 24 VDC. Transmitter shall meet specified requirements.

D. Current Transducers: Provide current transducers to monitor amperage of motors. Select current transducer range for normal amperage to be above 50% of the range. Current transducers shall have an accuracy of 1% and a 4 to 20 mA output signal.

E. Input Switches:

1. Differential static pressure switch: Provide diaphragm type differential static pressure switches for binary (2 position) operation as specified in sequence of operation. Devices shall withstand pressure surges up to 150% of rated pressure. Contacts shall be single pole double throw and switch may be wired for normally open or normally closed operation. Trip set point shall be adjustable. Pressure switch shall be sized so that operating pressure trip point is approximately midpoint of pressure switch adjustable range. Repetitive accuracy shall be 2%.

2. Induced current operated solid-state switches: Provide adjustable ranging to monitor continuous loads up to 200 amperes. Switch shall indicate whether it is normally open or normally closed. Limit off-state leakage to 2 mA or less.

3. Timed local override: Provide momentary contact push button override with override time set in controller software. Provide to override DDC time of day program and activate occupancy program for assigned units. Upon expiration of override time, the control system shall return to time-of-day program. Time interval for the length of operation shall be software adjustable and shall expire unless reset.

2.07 OUTPUT HARDWARE

A. Valves:

1. Valve assembly: Valves shall have stainless steel stems. Valve bodies shall be designed for not less than 125 psig working pressure or 150% of the system operating pressure, whichever is greater. Valve leakage rating shall be 0.01% of rated Cv. Class 125 copper alloy valve bodies and Class 150 steel or stainless-steel valves shall conform to ASME/ANSI B16.5 as a

minimum. Cast iron valve components shall conform to ASTM A 126 Class B or C as a minimum.

2. Three-way valves: Three-way valves shall have equal percentage characteristics.

3. Valves for chilled water service: Bodies for valves 1-1/2" and smaller shall be brass or bronze, with threaded or union ends. Bodies for valves from 2 inches to 3 inches inclusive shall be of brass, bronze or iron. Bodies for 2-inch valves shall have threaded ends. Bodies for valves from 2 1/2 to 3 inches shall have flanged-end connections. Internal valve trim shall be brass or bronze except that valve stems may be Type 316 stainless steel. Water valves shall be sized for a 3 psi differential through the valve at rated flow, except as indicated otherwise. Select valve flow coefficient (Cv) for an actual pressure drop not less than 50% or greater than 125% of the design pressure drop at design flow. Valves 4 inches and larger shall be butterfly valves.

B. Actuator:

1. Provide electric type with spring return so that, in the event of power failure, actuators shall fail safe in either the normally open or normally closed position as specified. Actuators shall be quiet operating and function properly within the range of 85% to 110% of the motive power. Provide a minimum of one actuator for each damper. Provide actuators of NEMA 3R construction for outdoor service.

2. Electric actuators: Provide direct drive electric actuators for all damper control applications. When operated at rated voltage, each operator shall be capable of delivering the torque required for continuous uniform movement of the valve or damper and shall have end switch to limit travel or shall withstand continuous stalling without damage. Operators shall function properly with range of 85% to 110% of line voltage. Provide gears of steel or copper alloy. Fiber or reinforced nylon gears may be used for torques less than 16-inch pounds. Provide hardened steel running shafts in sleeve bearing of copper alloy, hardened steel, nylon, or ball bearing. Provide two-position operators of the single direction, spring return, or reversing type. Provide proportioning operators capable of stopping at all points in the cycle and starting in either

direction, from any point. Provide reversing and proportioning operators with limit switches to limit travel in either direction unless operator is stall type. Equip valve operators with a force limiting device such as spring yield so that, when in a relaxed position, device shall maintain a pressure on valve disc equivalent to system pressure at valve. Provide reversible shaded pole, split capacitor, synchronous, or stepped type electric motors. Provide actuators of NEMA 3R construction for outdoor service.

C. Output Switches: Control Relays: Shall be double pole, double throw (DPDT), UL listed, with contacts rated to the application, and enclosed in a dustproof enclosure. Equip with a light indicator, which is lit when coil is energized and is off when coil is not energized. Relays shall be socket type, plug into a fixed base, and be replaceable without need of tools or removing wiring.

2.08 ELECTRICAL POWER AND DISTRIBUTION

A. Provide a source 120 volts or less, 60 Hz, 2-pole, 3-wire with ground. Devices shall be UL listed or FM approved.

B. Transformers: Transformers shall conform to UL 506. Power digital controllers on the highest level LAN from dedicated circuit breakers. Transformers for digital controllers serving terminal equipment on lower level LANs shall be fed from the fan motor leads or fed from the nearest distribution panelboard or motor control center, using circuits provided for the purpose. Provide a fuse cutout on the secondary side of the transformer.

C. Surge Protection:

1. Surge and transient protection consist of devices installed externally to digital controllers.

2. Power line surge protection: Surge suppressors external to digital controller, shall be installed on all incoming AC power. Surge suppressor shall be rated by UL 1449, and have clamping voltage ratings below the following levels:

   a. Normal mode (line to neutral): Shall be 350 volts

   b. Common mode (line to ground): Shall be 350 volts

   c. Telephone and communication line surge protection: Protected from surges. Metal oxide varistor (MOV) protection, rated for the application,

shall be installed at the equipment. Additional protection, gas tubes rated for the application, shall be installed within 3 feet of the building cable entrance or within 3 feet of the telephone company's network interface.

d. Sensor and control wiring surge protection: Controllers shall have sensor and control wiring surge protection with optical isolation, metal oxide varistors (MOV), or silicon avalanche devices. Fuses are not permitted for surge protection.

D. Wiring: Provide complete electric wiring for DDC system, including wiring to transformer primaries. Control circuit conductors, which run in the same conduit as power circuit conductors, shall have the same insulation level as power circuit conductors. Circuits operating at more than 100 volts shall be in accordance with Division 16 – ELECTRICAL. Circuits operating at 100 volts or less shall be defined as low voltage and shall be run in rigid or flexible conduit, metallic tubing, metal raceways or wire trays, armored cable, or multi-conductor cable. Use multi-conductor cable for concealed accessible locations only. Provide circuit and wiring protection as required by NFPA 70. Aluminum-sheathed cable or aluminum conduit may be used but shall not be buried in concrete. Wiring in HVAC plenums shall be in conduit. Protect exposed wiring from abuse and damage.

1. AC control wiring: Control wiring for 24 volt circuits shall be insulated copper 18 AWG minimum and shall be rated for 300 VAC service. Wiring for 120 volt shall be 14 AWG minimum and shall be rated for 600 VAC service.

2. Analog signal wiring: Analog signal wiring for analog inputs and analog outputs shall be 18 AWG single or multiple twisted pair. Each cable shall be 100% shielded, and have 20 AWG drain wire. Exception is direct connect RTD wiring which shall be single 18 AWG minimum twisted pair, 100% shielded, and with 20 AWG drain wire. Each wire shall have insulation rated to 300 VAC. Cables shall have an overall aluminum-polyester or tinned-copper (cable-shield tape), overall 20 AWG tinned copper cable drain wire, and overall cable insulation rated to 300 VAC. Install analog signal wiring in conduit separate from AC power circuits.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Perform installation under supervision of competent technicians regularly employed in the installation of DDC systems. Provide components for a complete and operational system.

B. Wiring Criteria:

1. Input/output identification: Permanently label each field wire, cable, or pneumatic tube at each end with unique identification.
2. Rigid or flexible conduit shall be terminated at all sensors and output devices.
3. Surge protection: Install surge protection no more than 3 feet from where communication cable enters building.
4. Grounding: Ground controllers and cabinets to a good earth ground. Ground controller to a ground in accordance with Division 16 – ELECTRICAL. Grounding of the green ac ground wire, at the breaker panel, alone is not adequate. Run metal conduit from controller panels to adequate building grounds. Ground sensor drain wire shields at controller end.
5. Contractor is responsible for correcting all associated ground loop problems.

C. Digital Controllers:

1. Do not divide control of a single mechanical system such as an air handling unit, boiler, chiller, or terminal equipment between 2 or more controllers. A single controller shall manage control functions for a single mechanical system. It is permissible, however, to manage more than one mechanical system with a single controller.
2. Provide digital control cabinets that protect digital controller electronics from dust, at locations shown on the drawings.
3. Provide a main power switch at each highest level LAN digital controller within controller cabinet.
4. No multiplexing of points is allowed.

D. Temperature Sensors: Provide temperature sensors in locations to sense the appropriate condition. Provide sensor where they are easy to access and service without special tools. Calibrate sensors to accuracy specified. In no case will sensors designed for one application be installed for another application.

1. Duct temperature sensors:

    a. Provide sensors in ductwork in general locations as indicated. Select specific sensor location within duct to accurately sense appropriate air temperatures. Do not locate sensors in dead air spaces or positions obstructed by ducts or equipment. Install gaskets between the sensor housing and duct wall. Seal duct and insulation penetrations.

    b. String duct averaging sensors between 2 rigid supports in a serpentine position to sense average conditions. Thermally isolate temperature sensing elements from supports. Provide duct access doors to averaging sensors.

2. Immersion temperature sensors: Provide thermowells for sensors measuring temperature in liquid applications or pressure vessels. Locate wells to sense continuous flow conditions. Do not install wells using extension couplings. Where piping diameters are smaller than the length of the wells, provide wells in piping at elbows to effect proper flow across entire area of well. Wells shall not restrict flow area to less than 70% of pipe area. Increase piping size as required to avoid restriction. Provide thermowells with thermal transmission material within the well to speed the response of temperature measurement. Provide wells with sealing nuts to contain the thermal transmission material.

3. Outside air temperature sensors: Provide outside air temperature sensors on north side of the building, away from exhaust hoods, air intakes and other areas that may affect temperature readings. Provide sunshields to protect outside air sensor from direct sunlight.

E. Damper Actuators: Actuators shall not be mounted in the air stream.

F. Thermometers: Provide thermometers at locations indicated. Mount thermometers to allow readability when standing on the floor.

G. Pressure Sensors and Differential Pressure:

1. General: Install pressure sensing tips in locations to sense appropriate pressure conditions.

2. Duct static pressure sensing: Locate duct static pressure tip approximately two-thirds of distance from supply fan to end of duct with the greatest pressure drop.

3. Pump proof of flow with differential pressure switches: Install high pressure side between pump discharge and check valve.

H. Control Drawings: Post laminated copies of as-built control system drawings in each mechanical room. Provide 6 sets of as-built drawings to the activity.

3.02 ADJUSTMENTS

A. Calibrate instrumentation and controls and verify the specified accuracy using test equipment with a test equipment accuracy. Adjust controls and equipment to maintain conditions indicated, to perform functions indicated, and to operate in the sequence specified.

3.03 FIELD QUALITY CONTROL

A. General:

1. Demonstrate compliance of the heating, ventilation, and air conditioning control system with the contract documents. Furnish personnel, equipment, instrumentation, and supplies necessary to perform calibration and site testing. Ensure that tests are performed by competent employees of the DDC System Installer or the DDC system manufacturer regularly employed in the testing and calibration of DDC systems.

2. Testing will include the field tests and the performance verification tests. Field tests shall demonstrate proper calibration of input and output devices, and the operation of specific equipment. Performance verification test shall ensure proper execution of the sequence of operation and proper tuning of control loops.

3. Obtain approval of the plan for each phase of testing before beginning that phase of testing. Give to the WHFD AND/OR PROJECT MANAGER written notification of planned testing at least 45 days prior to test. Notification shall be accompanied by the proposed test procedures. In no case will the

Contractor be allowed to start testing without written approval of test procedures. The test procedures shall consist of detailed instructions for complete testing to prove performance of the heating, ventilating and air conditioning system and digital control system.

4. Before scheduling the performance verification test, furnish the field test documentation and written certification to the WHFD AND/OR PROJECT MANAGER that the installed system has been calibrated, tested, and is ready for the performance verification test. Do not start the performance verification test prior to receiving written permission from the WHFD AND/OR PROJECT MANAGER.

3.04 TRAINING

A. See requirements in Section 15000 – GENERAL MECHANICAL REQUIREMENTS for field instruction of direct digital control system. The Controls Contractor shall provide the following training services:

1. One day of on-site orientation by a Controls Contractor's Field Engineer who is fully knowledgeable of the specific installation details of the project. This orientation shall, at a minimum, consist of a review of the project as-built drawings, the control system software layout and naming conventions, and a walk through of the facility to identify panel and device locations.

2. General: Provide training course schedule, syllabus, and training materials 5 days prior to the start of training. Conduct training courses for designated personnel in the maintenance and operation of the HVAC and DDC system. Orient training to the specific system being installed under this contract. Use operation and maintenance manual as the primary instructional aid. Operation and maintenance manuals shall be provided for each trainee with 4 additional sets, 2 sets delivered for archiving at the project site, one set for the Mechanical Contractor, and one set for the WHFD AND/OR PROJECT MANAGER. Training manuals shall include an agenda, defined objectives and a detailed description of the subject matter for each lesson. Furnish audio-visual equipment and all other training materials and supplies. A training day is defined as 8 hours of classroom or lab instruction, including two 15-minute breaks and excluding lunch time, Monday thru Friday, during

the daytime shift in effect at the training facility. For guidance, assume the attendees will have a high school education and are familiar with HVAC systems. The minimum amount of training for this project shall be one day.

3. Operator training: Operator training shall include the detailed review of the control installation drawings, points list, and equipment list. The instructor shall then walk through the building identifying the location of the control devices installed. For each type of systems, the instructor shall demonstrate how the system accomplishes the sequence of operation. From the workstation, the operator shall demonstrate the software features of the system. As a minimum, the operator demonstrates and explain logging on, setting passwords, setting up a schedule, trend, point history, alarm, and archiving the database.

4. Maintenance training: The system maintenance course shall be taught at the project site within one month after the completion of the operators training. The course shall last for one 8-hour training day. The course shall include answering questions from the last training session, trouble shooting and diagnostics, repair, instructions, preventive maintenance procedures and schedules, and calibration procedures.

3.05 SEQUENCE OF OPERATION

A. Sequence of operations shall be as indicated.

END OF SECTION

SECTION 15950 – HVAC TESTING/ADJUSTING/BALANCING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 WORK DESCRIPTION

A. The work includes testing, adjusting, and balancing (TAB) of new heating, ventilating, and air conditioning (HVAC) air distribution system including equipment, ducts, and piping which are located within, on, under, between, and adjacent to buildings.

B. Test, adjust and balance all air devices shown on drawings, whether new or existing, to airflow values indicated.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Mechanical work as specified in Section 15000 – GENERAL MECHANICAL REQUIREMENTS unless specified otherwise in other sections of Division 15 – MECHANICAL.

B. Ductwork specified in Section 15810 – DUCTWORK AND DUCTWORK ACCESSORIES.

C. Automatic temperature controls specified in Section 15910 – DIRECT DIGITAL CONTROL SYSTEMS.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS and Section 15000 – GENERAL MECHANICAL REQUIREMENTS.

B. Statements:

1. Independent TAB agency personnel qualifications.
2. Design review report.
3. Pre-field TAB engineering report.
4. Advanced notice TAB field work.

5. Check out list.

C. Independent TAB Agency Personnel Qualifications: For agency proposed for approval, submit information certifying that: The TAB agency is a first tier Subcontractor who is not affiliated with any other company participating in work on this contract; the work to be perform by the TAB agency shall be limited to testing, adjusting, and balancing of HVAC air and water systems to satisfy the requirements of this specification section. Submit the following, for the agency, to the WHFD AND/OR PROJECT MANAGER for approval in compliance with paragraph titled “TAB Personnel Qualification Requirements”.

1. Independent AABC or NEBB certified TAB agency:

    a. TAB agency: AABC registration number and expiration date of current certification; or NEBB certification number and expiration date of current certification.

    b. TAB team supervisor: Name and copy of AABC or NEBB TAB supervisor certificate and expiration date of current certification.

    c. TAB team field leader: Name and documented evidence that the team field leader meets the qualification requirements.

    d. TAB team field technicians: Names and documented evidence that each field technician meets the qualification requirements.

    e. Current certificates: Registrations and certifications shall be current, and valid for the duration of this contract. Certifications, which expire prior to completion of the TAB work, shall be renewed in a timely manner so that there is no lapse in registration or certification. TAB agency or TAB team personnel without a current registration or current certification shall not perform TAB work on this contract.

    f. Replacement of TAB team members: Replacement of members may occur if each new member complies with the applicable personnel qualifications and each is approved by the WHFD AND/OR PROJECT MANAGER.

D. Design Review Report: Submit typed report describing omissions and deficiencies in the HVAC system's design that would preclude the TAB team from

accomplishing the duct leakage testing work and the TAB work requirements of this section. Provide a complete explanation including supporting documentation detailing the design deficiency. State that no deficiencies are evident if that is the case.

E. Pre-Field TAB Engineering Report: Submit report containing the following information:

1. Step-by-step TAB procedure:

    a. Strategy: Describe the method of approach to the TAB field work from start to finish. Include in this description a complete methodology for accomplishing the TAB field work session.

    b. Procedural steps: Delineate fully the intended procedural steps to be taken by the TAB field team to accomplish the required TAB work of each air distribution system and each water distribution system. Include intended procedural steps for TAB work for subsystems and system components.

2. Pre-field data: Submit AABC or NEBB or SMACNA HVACTAB data report forms with the following pre-field information filled in:

    a. Design data obtained from system drawings, specifications, and approved submittals.

    b. Notations detailing additional data to be obtained from the contract site by the TAB field team.

    c. Designate the actual data to be measured in the TAB field work.

    d. Provide a list of the types of instruments, and the measuring range of each, which are anticipated to be used for measuring in the TAB field work. By means of a keying scheme, specify on each TAB data report form submitted, which instruments will be used for measuring each item of TAB data. If the selection of which instrument to use is to be made in the field, specify from which instruments the choice will be made. The instrument key number shall be placed in the blank space where the measured data would be entered.

3. Prerequisite HVAC work checkout list: A list of inspections and work items

which are to be completed by the Contractor, and submitted and approved by the WHFD AND/OR PROJECT MANAGER prior to the TAB team coming to the contract site. At a minimum, a list of the applicable inspections and work items listed in the NEBB TABES, Section III, “Preliminary TAB Procedures” under paragraphs entitled “Air Distribution System Inspection” and “Hydronic Distribution System Inspection”. Also, list as prerequisite work items, the deficiencies pointed out by the TAB Subcontractor in his design review report.

F. Advanced Notices: Submit “Advanced Notice for TAB Field Work” in writing.

G. Completed Checkout Lists: Submit “Prerequisite HVAC Work Checkout List” and certify in writing that each item has been checked and is operating as designed.

H. Field Test Reports: Certified TAB report

I. Submit certified reports in the specified format including the above data.

1. Certified TAB reports: Submit Certified TAB Report in the following manner:

a. Report format: Submit the completed pre-field data forms approved in the pre-field TAB Engineering Report completed by TAB field team, reviewed and certified by the TAB supervisor. Bind the report with a waterproof front and back cover. Include a table of contents identifying by page number the location of each report. Report forms and report data shall be typewritten. Handwritten report forms or report data are not acceptable.

b. Temperatures: On each TAB report form reporting TAB work accomplished on HVAC thermal energy transfer equipment, include the indoor and outdoor dry bulb temperature range and indoor and outdoor wet bulb temperature range within which the TAB data was recorded.

c. Instruments: List the types of instruments actually used to measure the tab data. Include in the listing each instrument's unique identification number, calibration date, and calibration expiration date.

d. Certification: Include the typed name of the TAB supervisor and the dated signature of the TAB supervisor.

2. TAB submittal and work schedule: Compliance with the following schedule is the Contractor's responsibility.

3. TAB field work: At a minimum of 30 calendar days prior to start of field check, accomplish TAB field work; submit certified TAB report; and conduct field check.

1.05 REFERENCES

A. Comply with the recommendations and requirements of the codes and Standards listed hereinafter in addition to detailed requirements of this specification. In the event of conflicting requirements, this specification shall prevail.

1. Associated Air Balance Council (AABC):

   a. AABC MN-1 (1989) — Testing and Balancing Heating, Ventilating and Air Conditioning Systems

2. American National Standards Institute (ANSI):

   a. ANSI S1.4 (1983; R 1994) — Sound Level Meter

   b. ANSI S1.11 (1986; R 1993) — Octave - Band and Fractional- Octave - Band Analog and Digital Filters

3. American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE):

   a. ASHRAE HA (1999) — Handbook, HVAC Applications

4. Cooling Tower Institute (CTI)

   a. CTI ATC-105 (1990) — Acceptance Test Code for Water-Cooling Towers

5. National Environmental Balancing Bureau (NEBB):

   a. NEBB CMSV (1993) — Calculations and Measurements of Sound and Vibration

   b. NEBB TABES (1991) — Testing, Adjusting, Balancing of Environmental Systems

6. Sheet Metal & Air Conditioning Contractors' National Association, Inc. (SMACNA):

   a. SMACNA HVACADLTM (1985) — HVAC Air Duct Leakage Test Manual

b. SMACNA HVACTAB (1993) HVAC Systems Testing, Adjusting and Balancing

1.06 QUALITY ASSURANCE

A. Modifications of References: Accomplish work in accordance with referenced publications of AABC or NEBB except as modified by this section. In the references referred to herein, consider the advisory or recommended provisions to be mandatory, as though the word “shall” had been substituted for the words “should” or “could” or “may” wherever they appear. Interpret reference to the “authority having jurisdiction”, the “Administrative Authority”, the “Owner”, or the “Design Engineer” to mean the “WHFD AND/OR PROJECT MANAGER”.

B. TAB Personnel Qualification Requirements:

1. Independent AABC or NEBB certified TAB agency: Provide services of a TAB agency certified by AABC or NEBB to perform and manage TAB work on HVAC air and water systems. This TAB agency shall not be affiliated with any company participating in any other phase of this contract, including design, furnishing equipment or construction.

2. TAB team personnel: The TAB team approved to accomplish work on this contract shall be full-time employees of the TAB agency. No other personnel shall do TAB work on this contract.

   a. TAB team supervisor: Supervisor shall be qualified by AABC or NEBB as a TAB supervisor or a TAB engineer.

   b. TAB team field leader: Leader shall have satisfactorily performed full-time supervision of TAB work in the field for not less than 3 years immediately preceding this contract's bid opening date.

   c. TAB team field technician: Technician shall have satisfactorily assisted a TAB team field leader in performance of TAB work in the field for not less than one year immediately preceding this contract's bid opening date.

3. Responsibilities: The Contractor shall be responsible for ensuring compliance with the requirements of this section. The following delineation of specific work responsibilities is specified to facilitate execution of the various work

efforts by personnel from separate organizations. This breakdown of specific duties is specified to facilitate adherence to the schedule.

a. Contractor:

i. TAB personnel: Ensure that the TAB work is accomplished by a group meeting the requirements specified in paragraph entitled “TAB Personnel Qualification Requirements”.

ii. Pre-TAB meeting: Attend the meeting with the TAB supervisor, and ensure that a representative is present for the Sheet Metal Contractor, Mechanical Contractor, Electrical Contractor, and Automatic Temperature Controls Contractor.

iii. HVAC documentation: Furnish one complete set of the following HVAC-related documentation to the TAB agency:

a) Contract drawings and specifications

b) Approved submittal data for equipment

c) Construction work schedule

d) Up-to-date revisions and change orders for the previously listed items

iv. Submittal and work schedules: Ensure that the schedule for submittals and work required by this section are met.

v. Coordination of supporting personnel: Provide the technical personnel, such as factory representatives or HVAC Controls Installer required by the TAB field team to support the TAB field measurement work. Provide equipment mechanics to operate HVAC equipment to enable TAB field team to accomplish the TAB field measurement work. Ensure these support personnel are present at the times required by the TAB team, and cause no delay in the TAB fieldwork. Conversely, ensure that the HVAC Controls Installer has required support from the TAB team field leader to complete the controls check out.

vi. Deficiencies: Ensure that equipment defects, installation deficiencies,

and design deficiencies reported by the TAB team field leader are brought to the attention of the WHFD AND/OR PROJECT MANAGER. Ensure that design deficiencies reported by the TAB field leader, or the TAB team supervisor, are transmitted to the WHFD AND/OR PROJECT MANAGER within 7 calendar days from date of receipt from the TAB agency.

vii. Prerequisite HVAC work: Complete check out and debugging of HVAC equipment, ducts, and controls prior to the TAB engineer arriving at the project site to begin the TAB work. Debugging includes searching for and eliminating malfunctioning elements in the HVAC system installations, and verifying all adjustable devices are functioning as designed. Prior to the TAB field team's arrival, ensure completion of the applicable inspections and work items listed in the TAB team supervisor's pre-field engineering report. List as prerequisite work items, the deficiencies, pointed out by the TAB team supervisor in the design review report. Ensure that the TAB agency gets a copy of the prerequisite HVAC work checklist specified in the paragraph entitled “Submittals”. Do not allow the TAB team to commence TAB fieldwork until all of the following are completed.

a) HVAC system installations are fully complete.

b) HVAC prerequisite checkout work lists have been completed, submitted, and approved.

c) HVAC system filters are clean for TAB fieldwork.

viii. Advance notice: Furnish to the WHFD AND/OR PROJECT MANAGER with advance written notice for each event, the commencement of the fieldwork and for the commencement of the TAB fieldwork.

b. TAB agency: Provide the services of a TAB team, which complies with the requirements of paragraph entitled, “TAB Personnel Qualification Requirements”.

i. TAB team supervisor: Overall management: Supervise and manage the overall TAB team work effort, including preliminary and technical

TAB procedures and TAB team field work.

ii. Pre-TAB meeting: Attend meeting with Contractor.

iii. Design review report: Review project specifications and accompanying drawings to verify that the air systems and water systems are designed in such a way that the TAB team field leader can accomplish the work in compliance with the requirements of this section. Verify the presence and location of permanently installed test ports and other devices needed, including gauge cocks, thermometer wells, flow control devices, circuit setters, balancing valves, and manual volume dampers.

iv. Support required: Specify the technical support personnel required from the Contractor other than the TAB agency; such as factory representatives for temperature controls or for complex equipment. Inform the Contractor in writing of the support personnel needed and when they are needed. Furnish the notice as soon as the need is anticipated, either with the design review report or the pre-field engineering report or during the TAB fieldwork.

v. Pre-field engineering report: Utilizing the following HVAC-related documentation; contract drawings and specifications, approved submittal data for equipment, up-to-date revisions and change orders; prepare this report.

vi. Prerequisite HVAC work checklist: Ensure the Contractor gets a copy of this checklist at the same time as the pre-field engineering report is submitted.

vii. Technical assistance for TAB work: Provide immediate technical assistance to the TAB field team for the TAB work.

viii. Certified TAB report: Certify the TAB report. This certification includes the following work:

a) Review: Review the TAB field data report. From this field report, prepare the certified TAB report.

b) Verification: Verify adherence, by the TAB field team, to the TAB

plan prescribed by the pre-field engineering report and verify adherence to the procedures specified in this section.

ix. Design deficiencies: Submit in writing as soon as possible, to the Contractor and the WHFD AND/OR PROJECT MANAGER, each design deficiency reported by the TAB field team. Provide, in this submittal, a complete explanation including supporting documentation detailing the deficiency.

x. TAB field check: The TAB team supervisor shall attend and supervise TAB field check.

c. TAB team field leader:

i. Field manager: Manage, in the field, the accomplishment of the work specified in Part 3 – EXECUTION.

ii. Full time: Be present at the contract site when TAB field work is being performed by the TAB team; ensure day-to-day TAB team work accomplishments are in compliance with this section.

iii. Prerequisite HVAC work: Do not bring the TAB team to the contract site until a copy of the prerequisite HVAC Checklist, with all work items certified by the Contractor to be working as designed, reaches the office of the TAB agency.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 TAB PROCEDURES

A. TAB Field Work: Test, adjust, and balance the listed HVAC systems to the state of operation indicated on and specified in the contract design documents. Air systems and water systems shall be proportionately balanced and reported in the certified TAB report. Provide instruments and consumables required to accomplish the TAB work. Conduct TAB work, including sound measurement work, on the listed HVAC systems in conformance with the AABC MN-1, or NEBB TABES, and NEBB CMSV, except as modified by this section:

1. Maintenance and calibration of instruments.
2. Accuracy of measurements.
3. Preliminary procedures: Use the approved pre-field engineering report as instructions and procedures for accomplishing TAB fieldwork. Test ports required for testing by the TAB engineer shall be located in the field by the TAB engineer during TAB fieldwork. It shall be the responsibility of the sheet metal contractor to provide and install test ports as required by the TAB supervisor.
4. Air distribution systems TAB work:
    a. Air handling unit systems including fans, air handling units, fan coil units, coils, ducts, plenums, mixing boxes, variable air volume boxes, and air distribution devices for supply air, return air and outside air.
    b. Ventilating systems including fans, ducts, plenums, roof vents, registers, grilles and louvers for outside air and exhaust air.
5. Air conditioning and general ventilation systems: Air flow rates and water flow rates shall be balanced to within plus or minus 10% of the design values.

3.02 WORKMANSHIP

A. Conduct TAB work on specified HVAC systems until measured parameters are within plus or minus 10 percent of the design values, that is, the values specified or indicated on the contract documents. To minimize the possibilities of noise at the air devices, “coarse” balancing shall be performed at the duct branch and “fine” balancing shall be performed at the face of the air device.

3.03 DATA FROM TAB FIELD WORK

A. After completion of the TAB work, prepare a pre-final TAB report using the reporting forms approved in the pre-field engineering report. Data required by those approved data report forms shall be furnished by the TAB team. Except as approved otherwise in writing by the WHFD AND/OR PROJECT MANAGER, the TAB work and the TAB report shall be considered incomplete until the TAB work is accomplished to within the accuracy range specified in the paragraph titled “Workmanship” of this section. Prepare the report neatly and legibly; the pre-final TAB report shall be the final TAB report minus the TAB supervisor's review and

certification. Obtain, at the contract site, the TAB supervisor's review and certification of the TAB report. Verbally notify the WHFD AND/OR PROJECT MANAGER's TAB representative that the field check of the certified TAB report data can commence; give this verbal notice 48 hours in advance of when the field checking shall commence. Do not schedule field check of the certified TAB report until the specified workmanship requirements have been met or written approval of the deviations from the requirements have been received from the WHFD AND/OR PROJECT MANAGER.

3.04 QUALITY ASSURANCE FOR TAB FIELDWORK

A. Field Check: Test shall be made to demonstrate that capacities and general performance of air and water systems comply with the contract requirements.

1. Recheck: During field check, the Contractor shall recheck, in the presence of the WHFD AND/OR PROJECT MANAGER, random selections of data (water, air quantities, air motion, sound level readings) recorded in the certified report.

2. Areas of recheck: Points and areas of recheck shall be selected by the WHFD AND/OR PROJECT MANAGER.

3. Procedures: Measurement and test procedures shall be the same as approved for work for forming basis of the certified report.

4. Recheck selections: Selections for recheck will not exceed 25% of the total number of reported data entries tabulated in the report.

5. Retests: If random tests reveal a measured quantity, which is out-of-tolerance, the report is subject to disapproval at the WHFD AND/OR PROJECT MANAGER's discretion. In the event the report is disapproved, all systems shall be readjusted and tested, new data recorded, new certified reports submitted, and a new field check conducted at no additional cost to the WHFD AND/OR PROJECT MANAGER.

B. Approval Prerequisite: Compliance with the field checking requirements of this section is a prerequisite to the final approval of the certified TAB report submitted.

3.05 MARKING OF SETTINGS

A. Permanently mark the settings of HVAC adjustment devices including valves, splitters, and dampers so that adjustment can be restored if disturbed at any time. The permanent markings shall indicate the settings on the adjustment devices that result in the data reported on the submitted certified TAB report.

3.06 MARKING OF TEST PORTS

A. The TAB team shall permanently and legibly mark and identify the location points of the duct test ports. If the ducts have exterior insulation, these markings shall be made on the exterior side of the duct insulation. The location of test ports shall be shown on the as-built mechanical drawings with dimensions given where the test port is covered by exterior insulation.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16010 – BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 SUMMARY

A. This section specifies the basic requirements for the electrical installations and includes requirements common to more than one section of Division 16. It expands and supplements the requirements specified in sections of Division 1.

B. Standards of the organizations listed below but referred to in the various sections by basic designation only, form a part of this specification to the extent indicated by the reference thereto:

1. American Society for Testing and Materials (ASTM).
2. National Fire Protection Association (NFPA).
3. American National Standards Institute (ANSI).
4. Illuminating Engineering Society (IES).
5. Institute of Electrical and Electronics Engineers (IEEE).
6. Insulated Cable Engineers Association ICEA).
7. National Electrical Manufacturer's Association (NEMA).
8. National Electrical Contractors' Association (NECA).
9. Underwriters' Laboratories, Inc. (UL).
10. Factory Mutual (FM).
11. Federal Specifications (FS).
12. National Electrical Code (NEC) with County of Hawaii Amendments.

13. ANSI TIA/EIA Telecommunication Building Wiring Standards.

C. References shall mean to the latest edition of the standard.

D. Conform to local ordinances and codes.

1.03 QUALITY ASSURANCE

A. Verify final locations for rough ins with field measurements and with the requirements of the actual equipment to be connected. Contractor shall coordinate with the appropriate supplier, vendor, or subcontractor regarding the exact and specific rough-in requirements for equipment actually supplied.

B. Conduits, junction boxes, wireway, etc. required for low voltage/telecommunications, cabling shall be coordinated with telecommunications cabling divisions prior to rough-in.

1.04 ELECTRICAL SUBMITTALS

A. Refer to Division 1 Specifications for submittal requirements.

B. Data shall be submitted at one time in three ring binders and indexed as scheduled below. Partial submittals will not be accepted.

1. 16060 – Grounding and Bonding.
2. 16073 – Hangers and Supports for Electrical Systems.
3. 16075 – Electrical Identification.
4. 16120 – Conductors and Cables.
5. 16130 – Raceways and Boxes.
6. 16140 – Wiring Devices.
7. 16410 – Enclosed Switches.
8. 16442 – Panelboards.
9. 16511 – Interior Lighting.
10. 16700 – Communications.
11. 16721 – Fire Alarm System.
12. 16762 – Nurse Call System.

C. Submit shop drawings and product data grouped to include complete submittals of related systems, products and accessories in a single submittal.

D. Identify products requiring color selections.

E. Identify products for use on project.

1.05 RECORD DOCUMENTS

A. Refer to the Division 1 Specifications for requirements. The following paragraphs supplement the requirements of Division 1.

B. Mark drawings to indicate revisions to conduit size and location both exterior and interior, actual equipment locations, dimensioned to column lines; concealed equipment, dimensioned to column lines; distribution and branch electrical circuitry; fuse and circuit breaker size and arrangement support and hanger details; Change Orders; Addendums; concealed control system devices.

C. Mark specifications to indicate approved substitutions; Change Orders; Addendums and equipment and materials used.

1.06 WARRANTIES

A. Refer to the Division 1 Specifications for procedures and submittal requirements for warranties. Refer to individual equipment specifications for warranty requirements.

B. Compile and assemble the warranties specified in Division 16, into a separated set of vinyl covered, three ring binders, tabulated and indexed for easy reference.

C. Provide complete warranty information for each item to include product or equipment to include date of beginning of warranty or bond; duration of warranty or bond; and names, addresses and telephone numbers and procedures for filing a claim and obtaining warranty services.

PART 2 - PRODUCTS

2.01 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Substitutions shall be made in accordance with Division 1 Specifications.

2.02 PRODUCT LISTING

A. Prepare listing of major electrical equipment and materials for the project.

B. Submit this listing as a part of the submittal requirement specified in the Division 1 Specifications.

2.03 NAMEPLATE DATA

A. Provide permanent operational data nameplate on each item of power operated equipment, indicating, manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING

A. Deliver products to project properly identified with names, model numbers, types, compliance labels and similar information needed for distinct identification; adequately packaged and protected to prevent damage during shipment, storage and handling.

B. Store equipment and materials at the site unless off-site storage is authorized in writing. Contractor shall protect stored equipment and materials from damage and theft.

C. Coordinate deliveries of electrical materials and equipment to minimize construction congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

3.02 ELECTRICAL INSTALLATIONS

A. Coordinate electrical equipment and materials installation with other building components.

B. Verify all dimensions by field measurement. Do not scale drawings.

C. Arrange for chases, slots, and openings in other building components to allow for electrical installations.

D. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work.

E. Coordinate the access panel requirements with General Contractor to accommodate the installation of electrical equipment and materials.

F. Where mounting heights are not detailed or dimensioned, install electrical services and overhead equipment to provide the maximum headroom possible.

G. Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

H. Coordinate the installation of electrical materials and equipment above ceilings with suspension system, mechanical equipment and systems, and structural components.

I. Contractor shall review Mechanical, Structural, and Architectural drawings prior to bid.

J. Final connections to equipment shall be per manufacturer's approved wiring diagrams, details and instructions. It shall be the Contractor's responsibility to provide materials and equipment compatible with equipment actually supplied.

K. It is the intent of these drawings and specifications to establish a standard of quality.

L. Work shall be performed in a workmanlike manner to the satisfaction of the WHFD AND/OR PROJECT MANAGER.

M. Contractor shall verify and coordinate exact location of equipment to be furnished by others prior to rough-in.

N. Contractor shall be responsible for replacing equipment which is damage due to incorrect field wiring provided under this section or factory wiring in equipment provided under this division.

O. Contractors shall visit site prior to bid and verify that conditions are as indicated. Contractor shall include in his bid, costs required to make his work meet existing conditions.

P. Proposed substitutions of electrical equipment or request for "or equal" or approved equal" listing shall be submitted to the WHFD AND/OR PROJECT MANAGER as specified under Division 1.

Q. Wire termination provisions for panelboards, circuit breakers, safety switches and all other electrical apparatus shall be listed as suitable for 75 degree C.

R. Systems shall be complete, operable and ready for continuous operations. Lights, switches, receptacles, motors, etc., shall be connected and operable.

S. Electrical equipment shall be located to maintain clear and level clearances outlined in NEC 110-26. Panelboards, switchboards, transformers, disconnects, switches, breakers, etc. shall be located to comply with NEC 110-26(a). Where the clearances outlined in NEC 110-26 cannot be obtained, the Contractor shall notify the Engineer prior to performing any rough-in.

T. Maintain separation between telecommunication conduits and electrical feeders, electronic ballasts, transformers, etc. to minimize electromagnetic compatibility issues.

3.03 CLEANING

A. Refer to the Division 1 Specifications for general requirements for final cleaning.

END OF SECTION

SECTION 16047 - ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. The extent of general building demolition work is shown on the drawings. Coordinate the required electrical work with the general demolition.

B. Demolition includes removal and disposal of demolished materials, as shown on drawings and herein specified.

C. Interior demolition includes complete wrecking of interior partitions, work above ceilings, finishes, and structures and removal and disposal of demolished materials, as shown on drawings and herein specified.

D. WHFD AND/ OR PROJECT MANAGER shall have the option of retaining any items removed. The Contractor shall deliver these items to the Hospital's designated storage area. Any items not retained by the Hospital shall be disposed of off-site by the Contractor.

1.03 JOB CONDITIONS

A. Condition of Structures: The Hospital assumes no responsibility for actual condition of structures to be demolished.

B. Conditions of the structure existing at time of inspection for bidding purposes will be maintained by WHFD AND/ OR PROJECT MANAGER in so far as practicable. However, variations within structure may occur by the Hospital's removal and salvage operations prior to start of demolition work. The drawings are schematic and provided as an aid in bidding. The Contractor shall visit the site and determine the actual conditions prior to bidding.

C. Partial Removal: Items of salvageable value to Contractor may be removed from structure as work progresses. Salvaged items must be transported from site as

they are removed. Storage or sale of removed items on site will not be permitted.

D. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, occupied areas, and other adjacent occupied or used facilities.

E. Protections: Ensure safe passage of persons around or through area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.

F. Install temporary electrical services, lighting, etc. as required by the WHFD AND/ OR PROJECT MANAGER or authorities having jurisdiction.

G. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the Hospital.

H. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations. Allow no interruption in service unless coordinated with WHFD AND/ OR PROJECT MANAGER at least 24 hours in advance.

I. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

J. Contractor will disconnect and seal utilities serving each structure to be demolished, or interior area to be demolished, prior to start of demolition work.

K. If Contractor is required to disconnect utility services or other services to an occupied area, the Contractor shall provide temporary or alternative service to that area.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DEMOLITION

A. Remove all branch and feeder conduit and wire back to panelboards, where specified.

B. Where walls, ceilings, or floors are to remain, remove devices and wire. Provide blank cover plate at outlet box.

C. All items shown to remain active shall be furnished with necessary accessible junction boxes and all conduit and wire as required to maintain circuit continuity.

D. All outlet boxes which must be removed due to demolition but which must remain active in order to maintain circuit continuity shall be relocated into ceilings or walls and shall be accessible.

E. All material fixtures and equipment to be reused shall be removed and stored on site. Before reinstallation, all items are to be cleaned, tested, and prepared for re-use. Fixtures shall be re-lamped and new ballasts installed.

3.02 DISPOSAL OF DEMOLISHED MATERIAL

A. General: Remove from site debris, rubbish, and other materials resulting from demolition operations. Apply all fees related to removal and pumping.

B. Remove and dispose of interior demolition debris only.

C. Burning of removed materials from demolished structures will not be permitted on site.

D. Transport materials removed from demolished structures and dispose of offsite.

END OF SECTION

SECTION 16060 - GROUNDING & BONDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment grounding requirements specified in this section may be supplemented by special requirements of section described in other sections.

B. Related Sections:

1. Section 15405 – Medical Gas Systems.
2. Section 15720 – Air Handling Units.
3. Section 15910 – Direct Digital Control Systems.
4. Section 16140 – Wiring Devices.
5. Section 16410 – Enclosed Switches.
6. Section 16762 – Nurse Call System.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

1.04 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Equipment Grounding Conductors: Insulated with green-colored insulation.

2.02 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

PART 3 - EXECUTION

3.01 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

3.02 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

3.03 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

   1. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.

C. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

END OF SECTION

SECTION 16073 – HANGERS & SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.

B. Related Sections:

1. Section 07841 – Penetration Firestopping.
2. Section 09900 – Painting.
3. Section 16130 – Raceways & Boxes.
4. Section 16511 – Lighting.

1.03 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.04 SUBMITTALS

A. Product Data: For each support device.

1.05 QUALITY ASSURANCE

A. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

i. Hilti Inc.

ii. ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.

iii. MKT Fastening, LLC.

iv. Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.

2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

i. Cooper B-Line, Inc.; a division of Cooper Industries.

ii. Empire Tool and Manufacturing Co., Inc.

iii. Hilti Inc.

iv. ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.

v. MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar

to MSS Type 18; complying with MFMA-4 or MSS SP-58.

4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.01 APPLICATION

A. Comply with NECA 1, NECA 101 and manufacturer's instructions for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.

C. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

D. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports. Do not attach raceway to ceiling support wires or other piping systems.

3.02 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to pre-set concrete inserts or expansion anchors.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners or pre-set concrete inserts on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, Beam clamps (MSS Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
6. To Light Steel: Sheet metal screws.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

F. Install surface-mounted cabinets and panelboards with minimum of four anchors.

G. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.

H. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

I. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

J. Do not use power-actuated anchors.

K. Obtain permission from WHFD AND/OR PROJECT MANAGER before drilling or cutting structural members.

3.03 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Comply with requirements in Division 9 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.04 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly.

3.05 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. All abandoned wiring shall be removed in its entirety in accordance with the locally amended National Electrical Code, NFPA 70.

C. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

D. Abandoned Work: Cut and remove buried raceway, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

E. Remove demolished material from Project site.

F. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

END OF SECTION

SECTION 16075 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Identification for raceways
2. Identification for conductors.
3. Equipment identification labels.

B. Related Sections:

1. Division 16 – Electrical
2. Section 16120 – Conductors & Cables.
3. Section 16130 – Raceways & Boxes.
4. Section 16140 – Wiring Devices.
5. Section 16410 – Enclosed Switches.

1.03 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.04 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.145.

1.05 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required

by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.01 RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Color for Printed Legend:

1. Power Circuits: Black letters on an orange field.

2. Legend: Indicate system or service and voltage, if applicable.

C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

D. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

F. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

2.02 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Aluminum Wraparound Marker Labels: Cut from 0.014-inch- (0.35-mm-) thick aluminum sheet, with stamped, embossed, or scribed legend, and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.

D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking nylon tie fastener.

2.03 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on black face for normal power. White letters on red face for emergency power. Minimum letter height shall be 3/8 inch (10 mm).

2.04 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength: 50 lb (22.6 kg), minimum.
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: According to color-coding.

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.01 APPLICATION

A. Accessible Raceways, 600 V or Less, for Service, Feeder, and Branch Circuits More Than: Identify with orange self-adhesive vinyl label, paint, or self-adhesive vinyl tape applied in bands.

B. Accessible Raceways of Auxiliary Systems: Identify the following systems with color-coded, self-adhesive vinyl tape applied in bands or paint:

1. Color coding for raceways shall be as follows, verify exact requirements based on existing identification convention present at the facility:

Color Service	Band	Minimum Band Width
Power	Yellow	2”
Emergency Power	Red	2”
Life Safety/Fire Alarm	White	2”

C. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.

D. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

   a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where 2 lines of text are required, use labels 2 inches (50 mm) high.

   b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

2. Equipment to Be Labeled:

   a. Panelboards, electrical cabinets, and enclosures.

   b. Access doors and panels for concealed electrical items.

   c. Disconnect switches.

   d. Enclosed circuit breakers.

3.02 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

G. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.

1. Color shall be factory applied or, for sizes larger than No. 10 AWG, field applied.
2. Colors for 208/120-V Circuits:
    a. Phase A: Black.
    b. Phase B: Red.
    c. Phase C: Blue.
    d. Neutral: White
    e. Ground: Green
3. Colors for 480/277-V Circuits:
    a. Phase A: Brown.
    b. Phase B: Orange.
    c. Phase C: Yellow.

d. Neutral: Gray

e. Ground: Green

4. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

END OF SECTION

SECTION 16120 - CONDUCTORS & CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.

B. Related Sections:

1. Section 08710 – Door Hardware
2. Section 15400 – Plumbing.
3. Section 15405 – Medical Gas Systems.
4. Section 15720 – Air Handling Units.
5. Section 15910 – Direct Digital Control Systems.
6. Section 16073 – Hangers & Supports for Electrical Systems.
7. Section 16075 – Electrical Identification.
8. Section 16130 – Raceways & Boxes.
9. Section 16700 – Communications.
10. Section 16762 – Nurse Call System.

1.03 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.05 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 CONDUCTORS AND CABLES

A. Copper Conductors: Comply with NEMA WC 70.

B. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN XHHW and SO.

2.02 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.01 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except as indicated below.

1. Use standard conductors for control circuits.
2. Use conductor not smaller than 14 AWG for control circuits.
3. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet (25 m).
4. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet (160 m).

B. Branch Circuits: Copper. Minimum size #12 AWG; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.02 CONDUCTOR INSULATION APPLICATIONS AND WIRING METHODS

A. Feeders Concealed in Ceilings, Walls, Partitions, below raised floors and Crawlspaces: Type THHN-THWN, single conductors in raceway

3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Support cables according to Section 16073 - Hangers and Supports for Electrical Systems."

E. Identify and color-code conductors and cables according to Section 16075 - Electrical Identification.

F. Use no wire smaller than 12 AWG for power and lighting circuits, and no wire smaller than 16 AWG for control wiring.

G. Utilize 10 AWG conductor for 20 ampere, 120 volt branch circuit homeruns longer than 75 feet (23m), and for 20 ampere, 277 volt branch circuit homeruns longer than 200 feet (61m).

3.04 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

3.05 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.06 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors, for compliance with requirements.

2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

SECTION 16130 – RACEWAYS & BOXES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes raceways, fittings, boxes and enclosures, for electrical wiring.

B. Related Sections:

1. Section 16073 – Hangers & Supports for Electrical Systems.
2. Section 16075 – Electrical Identification.
3. Section 16120 – Conductors & Cables.
4. Section 16700 – Communications.

1.02 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. IMC: Intermediate metal conduit.

D. LFMC: Liquid tight flexible metal conduit.

E. RGSC: Rigid galvanized steel conduit.

F. RNC: Rigid nonmetallic conduit.

1.03 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Structural members in the paths of conduit groups with common supports.
2. Plumbing items and architectural features in the paths of conduit groups with common supports.

1.04 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: ANSI C80.1.

B. IMC: ANSI C80.6.

C. EMT: ANSI C80.3.

D. FMC: Zinc-coated steel.

E. LFMC: Flexible steel conduit with PVC jacket.

F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Fittings for EMT: Steel compression type.

2. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

G. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

2.02 METAL WIREWAYS

A. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, unless otherwise indicated.

B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

C. Wireway Covers: Screw-cover type or Flanged-and-gasketed type as required.

D. Finish: Manufacturer's standard enamel finish.

2.03 BOXES

A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

D. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, galvanized, cast iron with gasketed cover.

PART 3 - EXECUTION

3.01 RACEWAY APPLICATION

A. Comply with the following indoor applications, unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.

2. Exposed, Not Subject to Severe Physical Damage: EMT.

3. Exposed and Subject to Physical Damage: Rigid galvanized steel conduit. Includes raceways in the following locations:

4. Concealed in Ceilings and Interior Walls and Partitions: EMT.

5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.

6. Damp or Wet Locations: Rigid galvanized steel conduit, IMC.

7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.

B. Minimum Raceway Size: 3/4-inch (24-mm) trade size for homeruns and conduits below grade or slab on grade.

C. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

D. All conduits larger than 1” shall be furnished with grounding type busing with equipment grounding conductor solidly connected at both ends.

3.02 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter. Raceway and boxes located as shown on Drawings, and at other locations where required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway as required to complete wiring system. Sizes shall meet or exceed NEC requirements. Raceway routing is shown for reference only. Route as required for a complete raceway system.

B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

E. Install no more than the equivalent of three 90-degree bends in any conduit run between boxes. Provide no more than the equivalent of two (2) 90 degree bends between boxes.

F. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated except as follows:

   1. Any variance shall be obtained from the WHFD AND/ OR PROJECT MANAGER.

G. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

H. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

I. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

J. Route raceways, concealed or exposed parallel and perpendicular to walls and building structural components.

K. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures, maximum 36 inches (915 mm) for connection to equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations.

L. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

M. Cut conduit square using saw or pipecutter; de-burr cut ends.

N. Bring conduit to shoulder of fittings; fasten securely.

O. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

P. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender to fabricate bends in metal conduit larger than 2-inch (50mm) trade size.

3.03 BOX APPLICATIONS

A. Set wall mounted boxes at elevations to accommodate mounting heights indicated. Comply with ADA requirements.

B. Orient boxes to accommodate wiring devices oriented as specified in Section 16140 – Wiring Devices.

C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

D. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150mm) from ceiling access panel or from removable recessed luminaire.

E. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

F. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches (150 mm) separation. Provide minimum 24 inches (600 mm) separation in acoustic and fire rated walls.

G. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

H. Use stamped steel bridges to fasten flush mounting outlet box between studs.

I. Use adjustable steel channel fasteners for hung ceiling outlet box.

J. Do not fasten boxes to ceiling support wires or other piping systems.

K. Support boxes independently of conduit.

L. Use gang box where more than one device is mounted together. Do not use sectional box.

M. Use gang box with plaster right for single device outlets.

N. Do not use boxes smaller than 4-inches square.

3.04 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.05 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

B. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

END OF SECTION

SECTION 16140 - WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Receptacles, receptacles with integral GFCI, hospital grade receptacles and associated device plates.
2. Snap switches.
3. Occupancy Sensors.

B. Related Sections:

1. Section 08710 – Door Hardware
2. Section 15400 – Plumbing.
3. Section 15405 – Medical Gas Systems.
4. Section 15720 – Air Handling Units.
5. Section 15910 – Direct Digital Control System.
6. Division 16 – Electrical.
7. Section 16060 – Grounding & Bonding.
8. Section16075 – Electrical Identification.
9. Section 16762 – Nurse Call System.

1.03 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. TVSS: Transient voltage surge suppressor.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 STRAIGHT BLADE RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498. Provide hospital grade receptacles where indicated on drawings.

2.02 GFCI RECEPTACLES

A. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

2.03 SNAP SWITCHES

A. Comply with NEMA WD 1 and UL 20.

B. Switches, 120/277 V, 20 A.

2.04 OCCUPANCY SENSORS

A. Long-Range Wall-Switch Sensors: Dual technology, with both passive-infrared- and ultrasonic-type sensing, 120/277 V, adjustable time delay up to 30 minutes,

110-degree field of view, and a minimum coverage area of 1200 sq. ft. (111 sq. m).

B. Ceiling Mount Sensors:

1. Self adjusting
2. Time setting – Automatic adjustable from 30 sec-30min.
3. Test Mode – 6sec with auto exit programming
4. Coverage from 500 to 2000 sq. ft.
5. Ambient light recognition – prevents turning on when the room is adequately lit by natural light.
6. Light sensor – 20 to 3,000 lux
7. Mounting Height – 8 to 12 ft
8. Warranty – 5 yr

2.05 WALL PLATES

A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Satin-finished stainless steel, 0.04-inch- (1-mm-) thick,

2.06 FINISHES

A. Color: Wiring device catalog numbers in Section Text do not designate device color.

1. Wiring Devices Connected to Normal Power System: As selected by WHFD AND/OR PROJECT MANAGER, unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Emergency Power System: Red.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

B. Coordination with Other Trades:

1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.

2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.

3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.

4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.

2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

4. Existing Conductors:

a. Cut back and pigtail, or replace all damaged conductors.

b. Straighten conductors that remain and remove corrosion and foreign matter.

c. Pigtailing existing conductors is permitted provided the outlet box is large enough.

D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.

2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
10. Mounting heights shall be as follows unless noted:
    a. Receptacles: 18” A.F.F. measured to bottom.
    b. Switches: 44” A.F.F. measured to bottom.

E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the left.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.02 IDENTIFICATION

A. Comply with Section16075 – Electrical Identification.

1. Receptacles: Identify panelboard and circuit number from which served on back of device plate.

3.03 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.

B. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

END OF SECTION

SECTION 16410 – ENCLOSED SWITCHES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. This Section includes the following individually mounted, enclosed switches and circuit breakers:

1. Nonfusible switches.

B. Related Sections:

1. Division 16 – Electrical.
2. Section 16060 – Grounding & Bonding.
3. Section 16075 – Electrical Identification.
4. Section 16721 – Fire Alarm Systems.
5. Section 16762 – Nurse Call System.

1.03 DEFINITIONS

A. GD: General duty.

B. GFCI: Ground-fault circuit interrupter.

C. HD: Heavy duty.

D. RMS: Root mean square.

E. SPDT: Single pole, double throw.

1.04 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.

2. Current and voltage ratings.

3. Short-circuit current rating.

4. UL listing for series rating of installed devices.

5. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

1.05 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 140 deg F (60 deg C).

2. Altitude: Not exceeding 2500 feet (above sea level).

1.07 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.01 NONFUSIBLE SWITCHES

A. Nonfusible Switch, 600 A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

B. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.

2.02 ENCLOSURES

A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
4. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.

B. Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated.

C. Comply with mounting and anchoring requirements specified in Section 16073 – Hangers & Supports for Electrical Systems.

D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

3.03 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Section 16075 – Electrical Identification.

B. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate as specified in Section 16075 – Electrical Identification.

3.04 FIELD QUALITY CONTROL

A. Prepare for acceptance testing as follows:

1. Inspect mechanical and electrical connections.
2. Verify switch and relay type and labeling verification.
3. Verify rating of installed fuses.
4. Inspect proper installation of type, size, quantity, and arrangement of mounting or anchorage devices complying with manufacturer's certification.

3.05 CLEANING

A. On completion of installation, vacuum dirt and debris from interiors; do not use compressed air to assist in cleaning.

B. Inspect exposed surfaces and repair damaged finishes.

END OF SECTION

SECTION 16442 - PANELBOARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Distribution panelboards.

2. Lighting and appliance branch-circuit panelboards.

B. Related Sections:

1. Division 16 – Electrical.

2. Section 16073 – Hangers & Supports for Electrical Systems.

3. Section 16075 – Electrical Identification.

1.03 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. RFI: Radio-frequency interference.

D. RMS: Root mean square.

E. SPDT: Single pole, double throw.

F. AFCI Arc Fault Circuit Interrupter.

1.04 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Wiring Diagrams: Power, signal, and control wiring.

C. Panelboard Schedules: For installation in panelboards.

1.05 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:

1. Ambient Temperature: Not exceeding 140 deg F (60 deg C).

2. Altitude: Not exceeding 2500 feet (above sea level).

1.06 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1.

1. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.

2. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

3. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.

B. Phase and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity or aluminum alloy.

2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

C. Conductor Connectors: Suitable for use with conductor material.

1. Main and Neutral Lugs: Mechanical type.

2. Ground Lugs and Bus Configured Terminators: Compression type.

3. Feed-Through Lugs: Mechanical type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

2.02 PANELBOARD SHORT-CIRCUIT RATING

A. Fully rated to interrupt symmetrical short-circuit current available at terminals. The use of series rated devices is not acceptable unless noted otherwise on the drawings.

2.03 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.04 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: UL 489, with minimum integrated short circuit rating: 10,000 amperes rms symmetrical for 208 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, or higher as required to exceed available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

3. Provide SWD listed breakers for lighting currents and HACE for air conditioning currents.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Comply with mounting and anchoring requirements specified in Section 16073 – Hangers & Supports for Electrical Systems.

C. Mount top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.

D. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

E. Install overcurrent protective devices and controllers.

1. Set field-adjustable switches and circuit-breaker trip ranges.

F. Install filler plates in unused spaces.

G. Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.

H. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.02 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Section 16075 – Electrical Identification.

B. Create a directory to indicate installed circuit loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

3.03 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

3.04 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION

SECTION 16511 – LIGHTING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. A. As specified in DAGS General Conditions.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.03 SUMMARY

A. This Section includes the following:

1. Interior lighting fixtures, lamps, and ballasts.
2. Lighting fixture supports.

B. Related Sections:

1. Division 16 – Electrical.
2. Section 16073 – Hangers & Support for Electrical Systems.
3. Section 16075 – Electrical Identification.

1.04 DEFINITIONS

A. BF: Ballast factor.

B. CRI: Color-rendering index.

C. CU: Coefficient of utilization.

D. HID: High-intensity discharge.

E. LER: Luminaire efficacy rating.

F. Luminaire: Complete lighting fixture, including ballast housing if provided.

G. RCR: Room cavity ratio.

1.05 SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
2. Emergency lighting units including battery and charger.

B. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.

C. Warranties: Special warranties specified in this Section.

1.06 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.07 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

1.08 WARRANTY

A. Special Warranty for Drivers: Manufacturer's standard form in which fixture manufacturer agrees to repair or replace drivers that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: The design for each luminaire is based on the product named in the Luminaire Schedule on the Contract Drawings. Subject to compliance with requirements, submit to the Authority a comparable product by one of the other manufacturers specified for review and approval.

2.02 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

A. LED Light Fixtures:

1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.

3. Recessed Luminaires: Comply with NEMA LE 4 for ceiling compatibility for recessed luminaires.

4. CRI of minimum 80. Color Tune-able.

5. Rated lamp life of minimum 50,000 hours.

6. Lamps dimmable from 100 percent to 0 percent of maximum light output.

B. LED Troffers:

1. Housing, LED driver, and LED module shall be products of the same manufacturer.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Stainless Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

E. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions.

F. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated.

1. White surfaces: 85 percent.

2. Specular Surfaces: 83 percent.

3. Diffusing Specular Surfaces: 75 percent.

4. Laminated Silver Metallized Film: 90 percent.

2.03 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Section 16073 Hangers & Supports for Electrical Systems for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.

3.02 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Verify normal operation of each fixture after installation.

C. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION

SECTION 16700 – COMMUNICATIONS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Division 1 – General Requirements.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including DAGS General Conditions and Division 1 – General Requirements apply to this Section.

1.03 SUMMARY

A. This section includes the horizontal cabling portion of a structured cabling system (SCS):

B. Provide all horizontal cabling, terminating hardware, adapters, and cross-connecting hardware necessary to interconnect all system equipment including equipment.

C. Related Sections:

1. Section 16073 – Hangers & Supports for Electrical Systems.
2. Section 16120 – Conductors & Cables.
3. Section 16130 – Raceways & Boxes.
4. Section 16721 – Fire Alarm Systems.
5. Section 16762 – Nurse Call System.

1.04 REFERENCES

A. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only.

B. Specific reference in specifications to codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies shall mean the latest printed edition of each in effect at the date of contract unless the document is shown dated.

C. Codes and Standards:

1. ANSI/TIA-568-C Commercial Building Telecommunications Wiring Standard.
2. ANSI/TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces.
3. National Electrical Code (NEC), based upon year approval by local codes or AHJ.
4. Building Industry Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDMM), current edition.
5. Local, county, state and federal regulations and codes in effect as of date of purchase.

1.05 SUBMITTALS

A. Product Data: For each type of product, include data on features, accessories.

B. Refer to DIVISION 1 Specifications.

C. Storage temperature range: -40°F to 149°F (-40°C to 65°C).

PART 2 - PRODUCTS

2.01 HORIZONTAL CABLING

A. Recognized cabling for providing the signal medium from the work area to the communications room shall include the following:

1. Four-pair Category 6 UTP cable.

B. Category 6 UTP Cable Requirements: High performance Category 6 UTP shall adhere to the following:

1. 23/24 AWG solid bare copper.
2. Cable jacket shall comply with NEC Article 800 for use as a plenum cable and shall be UL and c (UL) Listed Type CMP (communications multipurpose plenum).
3. Cable shall terminate on an eight-pin modular jack at each outlet. All horizontal cabling shall meet or exceed the ANSI/EIA/TIA-568-C.2 Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components.

4. Cables shall be marked as UL verified with a minimum of Category 6 rating.
5. The cable shall support Voice, Analog Base band Video/Audio, Fax, Modem, Switched-56, T-1, ISDN, RS-232, RS-422, RS-485, 10BASE-T Ethernet, Token Ring, 100Mbps TP-PMD, 100BASE-T Ethernet, 155 Mbps ATM, AES/EBU Digital Audio, 270 Mbps Digital Video, 622 Mbps 64-CAP ATM and emerging high-bandwidth applications, including 1 Gbps Ethernet, gigabit ATM, as well as all 77 channels (550 MHz) of analog broadband video.
6. The maximum horizontal cable length for Category 6 copper cable from the termination of the cable in the communications room to the outlet is 295 feet.
7. Cable shall be specified to 250 MHz and shall meet the manufacturer's guaranteed electrical performance and physical specifications.

C. Cabling Method:

1. The Contractor shall:
    a. Provide cabling in accessible spaces, cable tray, (surface and/or enclosed raceway), conduits, and/or J-Hook cable support system. Within consoles, racks, cabinets, desks, and counters, in accessible ceilings spaces and in gypsum board partitions where open cable method may be used. Use UL or ETL listed plenum rated cable in all spaces.
    b. Conceal raceway and cabling except in unfinished spaces as is practical.
    c. Utilize conduits/cable tray as indicated on the drawings.
    d. Route data and voice cables separately in a neat and orderly fashion. No cable ties or wraps shall be used to secure the cables in the runway outside of the communications rooms. Hook and loop fasteners shall be used for any final cable securing needed. Fasteners shall be rated for the area they are used in, (Plenum as required).
    e. Examine pathway elements intended for cable.
    f. Check raceways and other elements for compliance with space allocations, installation tolerances, debris, hazards to cable installation, and other conditions affecting installation. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Application of Media

1. Horizontal cabling

    a. The Contractor shall:

        i. Install cable using techniques, practices, and methods that are consistent with specified data cabling and the installed components and that ensure specified performance levels of completed and linked signal paths, end to end.

        ii. Install cables in continuous lengths from communications outlet to specified patch panels for data and termination blocks for voice.

        iii. Terminate horizontal voice cables into termination blocks without damaging twisted pairs or jacket.

        iv. Terminate horizontal data cables onto 8P8C modular patch panels without damaging twisted pairs or jacket.

        v. Pull cables in smooth and regular motions using methods that prevent cable kinking.

        vi. If necessary use approved cable pulling lubricant.

        vii. Keep all items protected before and after installation with dust and moisture proof barrier materials/envelopes. If wiring is terminated on patch panels, data, voice jacks prior to painting, carpet installation, and general finish clean up, these jacks shall be placed in a protective envelope to ensure dust, debris, moisture, and other foreign material do not settle onto jacks' contacts. Envelope will be removed on final trim out after other trades have completed their finish work. It shall be the Contractor's responsibility to ensure the integrity of these protective measures throughout the life/installation of the project.

        viii. Do not bind cables tightly together with tie or other wraps. Wraps shall slip loosely around cables. Use Velcro wraps instead of cables ties for all bundling in the communications rooms.

        ix. Pull cables simultaneously if more than one is being installed in the same raceway/pathway.

        x. Use pulling means; including fish tape, cable, rope, and basket weave wire/cable grips that will not damage media or raceway.

xi. Install open cabling parallel and perpendicular to surfaces or structural members following surface contours where possible.

xii. Do not bend cable greater than a bend radius of 1.00 inch.

b. Cable bundles brought into the communications rooms shall be routed and dressed in such a manner that prior to termination the cables are not subject to damage and misuse such as installers walking on the bundles that are lying on the floor. Cable pulling force shall not exceed 25 pounds of pulling tension or cable manufacturer's recommended pulling tensions.

c. When exiting runway and/or conduit via a means to ensure support of the cable, shall thereafter be supported with approved materials, and space supporting hardware to maintain performance characteristics, or as listed below.

E. Separation of Wires and Cabling Installation Practices

1. The Contractor shall:

a. Comply with NEC / TIA rules for separating unshielded copper communication and data-processing equipment cables from potential EMI sources, including electrical power lines and equipment.

b. Maintain a minimum spacing of 18 inches from electrical feeders and/or branch circuit wiring.

c. Maintain a minimum spacing of 12 inches from auxiliary systems cabling.

d. Maintain a 1-inch separation where UTP cables must pass perpendicularly to electrical, plumbing, or other wiring, conduit, or piping systems. Use non-conduit bushings, if necessary to maintain separation, which allow for the addition of a reasonable number of cables in the future.

e. Maintain communications pathways away from electrical apparatus such as motor driven equipment and transformers, minimum separation distance of 10-feet is recommended.

f. Provide all necessary installation materials, hardware, tools and equipment to perform insulation displacement type terminations at all data outlets, patch panels, and voice termination materials.

g. Dress and terminate horizontal cables in consistent consecutive order.

h. Arrange cables on patch panels and voice termination hardware in ascending order of room numbers and outlet numbers within rooms.

i. Provide a 3-foot 6-inch service loop for horizontal cables at I/O's. Locate service loop above or below I/O were vertical cable run transitions to horizontal run.

j. Maintain twists in cable pairs to within .5-inch of termination.

k. Group all specialty cables such as the pay phone cables, elevator line, etc which do not have their own termination hardware, in one group, clearly labeled as to cable number and function, in the last positions on the horizontal cabling blocks in each communications room.

l. Limit cable-bending radius for fiber optic cable to 20 times the cable diameter during installation, and 15 times the cable diameter after installation. Follow manufacturer's requirements for copper cable bending radius.

m. Do not leave cables on the floor unprotected or cable bundles hanging from the ceilings. Coil them up in a temporary manner and protect them from damage.

n. Start numbering at the left of the main door to the room and continue in a clockwise direction around the room.

o. The cables within the room will be terminated starting with the cables located to the left of the main door to the room and continue around the room in a clockwise direction.

2.02 TERMINATION HARDWARE

A. Station Hardware

1. Flush mount jacks shall be mounted in a faceplate with back box.

2. Outlets shall not be mounted on temporary, movable, or removable surfaces, doors, or access hatches without prior Project Coordinator approval.

3. 8P8C Jack Pin Assignments - Pin connections for voice and data information outlets and patch panels shall match T-568B termination standard under the

EIA/TIA 568- A code.

4. Pin assignments at all voice and data panels or connecting blocks shall match pin assignments at the information outlets.
5. Copper patch panels shall be rated to match installed cable plant.
6. Horizontal copper cables shall be terminated in eight position/eight conductor (8P8C) modular patch panels with no distinction between voice and data.
7. All Modular jack panels shall be wired to T-568B unless requested otherwise by Project Coordinator.

B. Work area outlets

1. 8P8C non-keyed modular outlets for applications up to 1 Gbps and ANSI/TIA/EIA-568-C compliant for the specified transmission requirements.
2. Part of the UL LAN Certification and Follow-up Program.
3. Universal eight-position jack pin/pair assignments.
4. Blue in color for data outlets, white in color for voice outlets, orange in color for Wireless Access Point (WAP) outlets, and green in color for Security (CCTV, ACS, IDS) outlets.

C. Outlet Faceplates:

1. Match electrical outlets in color and material type.
2. Four-position with blanks inserted in unused ports.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify the following before proceeding:

1. Conduits, cable trays and pull boxes are properly installed.
2. All high-pair count copper cables are routed properly and attached.
3. All backbone cabling service loops are installed and protected.

3.02 INSTALLATION

A. All installation shall be done in conformance with ANSI/TIA/EIA-568-C standards, BICSI methods, industry standards and manufacturer's installation guidelines. The Contractor shall ensure that the maximum pulling tensions of the specified distribution cables are not exceeded and cable bends maintain the proper radius during the placement of the facilities. Failure to follow the appropriate guidelines shall require the Contractor to provide in a timely fashion the additional material and labor necessary to properly rectify the situation. This shall also apply to any and all damages sustained to the cables by the Contractor during the implementation.

B. Cabling between communications rooms and workstation locations shall be made as individual “home runs”. No intermediate punch down blocks or splices may be installed or utilized between the communications rooms and the information outlets at the workstation location.

C. All cable must be handled with care during installation so as not to change performance specifications. Factory twists of each individual pair must be maintained up to the connection points at both ends of the cable. There shall never be more than .5 inches of unsheathed Category 6 UTP cable at either the wiring closet or the workstation termination locations.

D. All cabling and associated hardware shall be placed so as to make efficient use of available space. All cabling and associated hardware shall be placed so as not to impair equipment's efficient use of their full capacity.

E. Exposed Cable

   1. All station cabling shall be installed inside walls or ceiling spaces whenever possible.

   2. Exposed station cable will only be run where indicated on the drawings and will only be allowed when no other options exist. Project Coordinator must approve all exceptions.

F. All cabling placed above drop ceilings must be supported using J-hooks per EIA/TIA standards.

G. Identification - The Contractor shall:

   1. Label cable terminations on designation strips.

2. Label all cable at each terminating point.
3. Label each port of the work area outlet.
4. Cable identification numbers shall not be duplicated.
5. Labeling convention to be coordinated with WHFD AND/ OR PROJECT MANAGER.
6. Label data patch panels and voice blocks in the communications rooms to match those on the corresponding voice and data outlets. The font shall be at least .125-inch in height.
7. All labels shall correspond to as-built drawings and to final test reports.

END OF SECTION

SECTION 16721 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. The renovated area requires modifications to the existing fire detection system. Systems shall be in-stalled in accordance with the specifications and drawings. Provide new fire alarm wiring, terminations and devices to connect new devices and locations under this project. Provide all work including additional devices, appliances, control modules, monitor modules, relays, interface devices, expansion modules, annunciators and other components to achieve a complete and operable fire alarm system and sequence of operations which is acceptable and approved by all Authorities Having Jurisdiction. Install new circuits to new fire alarm panel, terminate and program panel for new devices under this project. Extend and integrate the new FACP and devices into the existing fire alarm system as indicated on the drawings.

B. Basic Performance:

1. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded onto an NFPA Style 7 (Class A) signaling line circuit.

2. A single ground or open on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

3. Alarm signals arriving at the main FACP shall not be lost following a power failure (or outage) until the alarm signal is processed and recorded.

C. Related Sections:

1. Section 16410 – Enclosed Switches.

2. Section 16140 – Wiring Devices.

3. Section 16700 – Communications.

1.02 REQUIREMENTS

A. A fully addressable, intelligent, UL listed fire alarm system in full accordance with Local, State and federal requirements for the use and occupancy indicated in the

Contract Documents whether or not specifically identified herein. New components shall be fully compatible with the existing system.

1.03 DESCRIPTION

A. Furnish and install all conduit, wire, outlet boxes, junction boxes, terminal equipment, and accessories to install a zoned, non-coded continuous ringing, battery standby, supervised fire alarm system. The system shall be UL certified and shall meet requirements of NFPA 72.

B. Include with submittals a bill of material, battery calculations, a list of approved conductors, riser diagram, zone listing, permit review by the authority having jurisdiction, and proof of compliance with the fire alarm installer's license as required. Increase the quantity and power of notification appliances as necessary to comply with the spacing, line of sight and intensity requirements identified by the most stringent of code or of the code officials' requirements.

C. This section includes the furnishing, installation, and connection of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete coordinated system ready for operation. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, auxiliary control devices, annunciators, and wiring as shown on the drawings and specified herein.

D. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for protected premises signaling systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors. The system shall be UL Listed for Power Limited Applications per National Electrical Code Art. 760.

E. The new system shall be connected to, and integrated with, the existing Central Monitoring Station. The Contractor prepared shop drawings shall incorporate all code and AHJ requirements whether or not specifically indicated on the drawings.

1.04 BASIC SYSTEM FUNCTIONAL OPERATION

A. When a fire alarm condition is detected and reported by one of the system initialing devices or appliances, the following functions shall immediately occur:

1. The System Alarm LED shall flash.

2. All system output programs assigned via control by event equations to be activated by the particular point in alarm shall be executed, and the associated System Out-puts (alarm indicating appliances and/or relays) shall be activated. All assembly occupancies shall have voice evacuation with intelligible English language directions.

1.05 SUBMITTALS

A. Submit in accordance with Section 01330 – Submittal Procedures.

B. General:

1. Submittals are required for all products in this section in accordance with Section 16010 – Basic Electrical Requirements and Division 01 – General Requirements. In addition to product data and certifications, also submit hourly rate for specified training.

2. For equipment other than that specified, the contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment.

3. No instructions given in the contract documents shall be construed as an authorization to violate any code, ordinance, regulation or law.

C. Shop Drawings and Diagrams:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications. Data sheets of UL assemblies for all firewall penetrations with complete details of all materials and techniques.

2. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, riser diagram, complete wiring diagrams indicating the size, type, and number of cabling and conduit layouts.

3. Equipment layout, including the locations and addresses and model numbers of Fire Alarm Control Panel (FACP), Digital Alarm Communications/ Transmitter (DACT), power supplies and all initiating devices and indicating appliances. Show annunciator layout, configurations, and terminations. The Contract Document form the basis for shop drawings and devices/appliances

indicated may not fulfill all requirements of the code authority requirements. Shop drawings are to indicate additional features as necessary to fulfill all requirements of code authorities as a requirement under the Contract. Provide any additional devices/appliances as directed by any Authority Having Jurisdiction.

D. Certifications:

1. Together with the shop drawing submittal, submit a certification from the major equipment manufacturer indicating that the proposed supervisor of installation and the proposed performer of contract maintenance are certified by the equipment manufacturer. Include names and addresses in the certification and a copy of Contractor's Underwriters' Laboratory (UL) Certificate of Compliance.

1.06 GUARANTY

A. Refer to Division 1 – General Requirements.

1.07 APPLICABLE SPECIFICATIONS

A. The specifications, standards and requirements of the governing bodies listed below form a part of this specification. The installed system shall fully comply with the requirements of these standards, codes and governing bodies.

1. National Fire Protection Association (NFPA):

a. No. 5000-2003 Building Construction and Safety Code.

b. No. 70-2002 National Electrical Code (NEC).

c. No. 72-2002 National Fire Alarm Code.

d. No. 101-2003 Life Safety Code.

2. Underwriters Laboratories Inc. (UL):

a. No. 268 Smoke Detectors for Fire Protective Signaling Systems

b. No. 864 Control Units for Fire Protective Signaling Systems

c. No. 268A Smoke Detectors for Duct Applications.

d. No. 521 Heat Detectors for Fire Protective Signaling Systems

e. No. 464 Audible Signaling Appliances.

f. No. 38 Manually Actuated Signaling Boxes.

g. No. 1971 Visual Indicating Appliances.

3. Local and State Building Codes.

4. All requirements of the Authority Having Jurisdiction (AHJ).

1.08 APPROVALS

A. The system shall have proper listing and/or approval from the following nationally recognized agencies:

1. Underwriters Laboratories Inc. (UL).

2. Factory Mutual (FM).

3. Each subassembly of the FACP shall carry the appropriate and official UL modular label.

B. The system shall be listed by the national agencies as suitable for extinguishing release applications.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND MATERIAL, GENERAL

A. All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protected premises protective signaling (fire alarm) system.

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

C. All Equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

2.02 CONDUIT AND WIRE

A. Conduit:

1. Conduit shall be in accordance with The National Electrical Code (NEC), local and county requirements.
2. Vertical risers through the building and all wiring in exposed locations shall be in-stalled in raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where 3 or more cables are contained within a single conduit.
3. Cable must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
4. Wiring for 24 volt control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
5. Conduit shall not enter the Fire Alarm Control Panel, or any other remotely mounted Control Panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.
6. Conduit shall be 1/2 inch (19.1 millimeter) minimum, and shall be supported as required by NEC. All conduit fittings and junction box cover plates shall be painted red.
7. In concealed locations plenum rated cable with red jacketing is allowed. a. Support 5 feet on centers using metal J hooks or bridle rings anchored to the building structure. Do not support J hooks or bridle rings from ceiling support wires. Separate support wires for bridle ring support are required.

B. Wire:

1. All fire alarm system wiring shall be new.
2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760), as specified in Section 16120 – Conductors & Cables, and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system

manufacturer. Label all conductors using adhesive number labels which correspond with shop drawings. Label at origin, at termination point and at any junction boxes.

3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
4. Wiring used for the multiplex communication loop shall be twisted and shielded and installed in conduit except for the aerial drops. The system shall permit use of IDC and IAC wiring in the same conduit with the communication loop.
5. All field wiring shall be completely supervised.
6. All wiring shall be color coded as follows:
    a. Gray and White: Initiating Circuits
    b. Brown and Orange: Signal Devices
    c. Blue and Yellow: Multiplex Communications

C. Terminal Boxes, Junction Boxes and Cabinets:

1. All boxes and cabinets shall be UL listed for their use and purpose.

2.03 SYSTEM COMPONENTS

A. Fire Alarm Audio/Visual Signaling Device:

1. Electronic Strobe shall operate on 24 VDC nominal, and shall be UL listed for indoor or outdoor use.
2. The Strobe shall meet the following criteria:
    a. The maximum pulse duration shall be 2/10ths of one second.
    b. The intensity shall be a minimum of 75 candela or as indicated/required to meet the scheduled intensity in NFPA 72 for the room size indicated.
    c. The flash rate shall be as required by NFPA 72, ANSI A-117.8 and ADA.
    d. The appliance bottom shall be placed 80-inches above the highest floor level within the space, or its top 6-inches below the ceiling, whichever is the lower.
    e. Shall be flush mounted in general location shown on plans. Surface

mounting may be allowed, if approved by WHFD AND/ OR PROJECT MANAGER, in existing installations with walls that lack interior accessible cavities.

f. Strobe Candela Rating: Determine by positioning selector switch on back of device.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as recommended by the equipment manufacturer in addition to all requirements shown on the drawings. All fire alarm systems junction boxes, located above suspended ceilings, in attics, tunnels and equipment rooms, shall be identified by having their covers painted Red.

B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Outlet, Junction and Pull Boxes to be a minimum of 4-inches by 4-inches by 2-1/8-inches and shall be mounted to the building structure or surface as in accordance with NEC. The suspended ceiling or its support wires are not recognized, nor accepted as part of the building’s structure

C. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.

D. Wiring shall not share raceways or penetrations with any of the building's electrical, mechanical, communication or control systems. Wiring in exposed areas shall be installed in specified raceways. Use of the existing conduit system is unacceptable, unless stated elsewhere in these documents or attached plans. All interior wiring installed above suspended ceilings may be in code approved plenum type cable as required by code and supported by an approved bridle ring. EMT conduit nipples are required at cable penetrations of all walls and floors slabs. Seal in and around conduits and cabling with an approved smoke/fire

caulk, in full accordance with the manufacturers' recommendations to prevent passage of smoke or fire.

E. Interior runs of cabling shall be supported by B-Line, Catalog Numbers BR-12-T (3/4 inch diameter ring size) through BR-64-4T, (4 inch diameter ring size) bridle rings made of steel rod with Number 10/24 and 1/4 inch threads on the support end, or accepted equivalent. Bridle rings shall be mounted within 18 inch each direction from where the cable enters or exits a raceway and each 5 linear feet along the run of the cable. All cables shall be secured to the 2 immediate bridle rings located at outside corners with a 1/4 inch minimum size code approved cable-tie, leaving adequate slack in the cables to prevent the abrasion of the cables' jacket. The cables shall be pulled tight and secured to a bridle ring each 20 linear feet to prevent excessive sagging of the cables.

F. Alarm Conductor Identification. All cables leaving the Fire Control Panel (FACP) shall be numbered and identified as required by NEC Article 760-10 by the use of 3M ScotchCode STD adhesive numbers or accepted equivalent. These cables shall be identified individually at their origin, at each junction box, termination block and at their termination at the device or appliance. Each cable run shall be numbered consistently throughout each run of cable.

3.02 TEST

A. Provide the service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system.

1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
2. Open initiating device circuits and verify that the trouble signal actuates.
3. Open and short signaling line circuits and verify that the trouble signal actuates.
4. Open and short indicating appliance circuits and verify that trouble signal actuates.
5. Ground all circuits and verify response of trouble signals.
6. Check presence and audibility of tone at all alarm notification devices.

7. Check installation, supervision, and operation of all intelligent smoke detectors using the Walk Test.

8. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.

9. When the system is equipped with optional features, the manufacturer's manual should be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.

3.03 FINAL INSPECTION

A. Prior to requesting a Final Inspection by fire and code officials, the contractor shall accomplish an initial visual inspection and system test in accordance with the NFPA 72. This inspection and test shall be recorded on NFPA Inspection and Testing Form Figure 7.5.2.2. This completed form shall be presented to WHFD AND/ OR PROJECT MANAGER and both state and local fire inspectors prior to their initial inspection of the system.

B. At the final inspection factory trained representatives of the fire alarm contractor shall demonstrate that the systems function properly in every respect. All coordination of code officials, WHFD AND/ OR PROJECT MANAGER, DIVISION 16 - ELECTRICAL contractors, WHFD AND/ OR PROJECT MANAGER officials and WHFD AND/ OR PROJECT MANAGER'S representative is the fire alarm contractor's responsibility. All of these parties shall be represented at the final inspection.

C. The fire alarm contractor shall provide all ladders, canned smoke, test equipment, heat gun, ladders, 2-way radios, sound meters.

D. Furnish as-built copies of the fire alarm system on AutoCAD v2013 and provide sensitivity tests of all smoke detectors. All deficiencies must be corrected prior to acceptance by the WHFD AND/ OR PROJECT MANAGER. Written acceptance of the system by WHFD AND/ OR PROJECT MANAGER, and code officials must be provided before project close-out.

E. Final acceptance of the fire alarm system requires the written approval of the County of Hawaii Fire Department.

3.04 SITE DOCUMENTATION

A. Furnish a complete set of fire alarm manuals and one set of as-built fire alarm plans. Maintain a set of approved prints at the job site exclusively for recording the routing of all cables, conduits and deviations from the approved submittal drawings which are necessary because of job conditions. Mark deviations with *a* RED pencil so that they may be easily identified. All deviations from the approved submittal drawings shall be made a part of the final As-built drawings The as-built plans shall include the location and address of every device and shall indicate the address and type of device. The drawings may be as small as 1/32 inch scale if the text and devices are easily legible. A sample drawing shall be submitted to WHFD AND/ OR PROJECT MANAGER's representative for approval.

END OF SECTION

SECTION 16762 – NURSE CALL SYSTEM

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. This document describes the products and execution requirements relating to Nurse Call System.

B. Nurse Call System shall be UL Listed 1069.

C. Product specifications, general design considerations, and installation guidelines are provided in this document. The successful vendor shall meet or exceed all requirements described in this document and on the drawings.

D. Related Sections:

1. Section 16060 – Grounding & Bonding.
2. Section 16120 – Conductors & Cables.
3. Section 16140 – Wiring Devices.
4. Section 16410 – Enclosed Switches.
5. Section 16700 – Communications.

1.02 SUBMITTALS

A. Provide product data from manufacturers' specifications.

1.03 WORK INCLUDED

A. The work included under this specification consists of furnishing all labor, equipment, materials, supplies and performing all operations necessary to complete the installation. The Contractor will provide and install all of the required material whether specifically addressed in the specification or not.

B. Contractor shall subcontract nurse call system and devices with Hill-Rom. Coordinate requirements prior to Bidding.

PART 2 - PRODUCTS

2.01 PRODUCTS

A. Products shall be fully compatible with the hospitals existing system and shall match the type, style and performance requirements of all existing equipment currently in place at the hospital. Provide all devices required for a complete and operable system as specified herein and as identified on plans, including nurse call lights, pull cords, room controllers, code blue stations, and all appurtenances.

B. 12/24 VDC Cable (2-conductor, unshielded, 18 AWG)

   1. Non-Plenum – Belden #5300UE
   2. Plenum – Belden #6300UE
   3. Or Approved Equal

C. 12/24 VDC Cable (2-conductor, unshielded, 16 AWG)

   1. Non-Plenum – Belden #5200UE
   2. Plenum – Belden #6200UE
   3. Or Approved Equal

PART 3 - EXECUTION

3.01 NURSE CALL SYSTEM

A. The nurse call system shall be installed by a qualified contractor as per the requirements specified by the manufacturers' installation guidelines and best industry practice.

B. Provide all necessary interconnections, services, and adjustments required for a complete and operable system.

C. Install control signal, communications, and data transmission line grounding as necessary to preclude ground loops, noise, and surges from adversely affecting system operation.

3.02 FIELD QUALITY CONTROL

A. Testing

   1. All devices shall be tested for full operational compliance.

2. Testing of system shall be the sole responsibility of the Contractor.

3.03 LABELING

A. Label all cables at each end of each cable. Labels shall be machine generated, wrap-around type.

B. Labeling system shall designate the cable's origin and destination on each end of each distribution/horizontal cable.

3.04 WARRANTY

A. All equipment, components, etc., shall be guaranteed free of defects and any faulty workmanship for a period of one year after final acceptance.

B. The Contractor shall replace defective materials and repair faulty workmanship within 24 hours of discovery at no cost to the Hospital.

END OF SECTION

APPENDIX L

CONTRACTORS HANDBOOK

See following pages.

Contractor Guidelines

KONA
COMMUNITY HOSPITAL

Care You Can Count On

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Introduction

This Contractor Guidelines Booklet is designed for contractors and sub-contractors who provide services to Kona Community Hospital.

This booklet provides requirements and expectations of the contractors and sub-contractors that are contracted to perform work in the hospital.

Contractors and sub-contractors working in the hospital must successfully complete all requirements listed in the booklet prior to any project work beginning on-site at Kona Community Hospital.

Each General / Primary Contractor is responsible for any of their Sub-contractors activities and is expected to ensure compliance with all applicable regulatory or compliance guidelines set out in this booklet.

Failure to comply with the requirements of this booklet may result in the halting of the project and/or termination of the contract.

To ask questions about the booklet or its contents or to obtain additional copies please contact:

KCH Maintenance at 808-322-4592

Important Phone Numbers

Human Resources	322-4458
Employee Health	322-4478
Infection Prevention	322-4478
Facility Director	322-4495
Maintenance Clerk	322-4592
Risk Manager	322-6976
Hospital Supervisor	322-4594
Patient Access (Admitting)	322-5803
Security	322-4525
Maintenance Supervisor	322-4566
Housekeeping	322-4521
ICU Manager	322-5824
Emergency Room Manager	322-4484
Medical/Surgical Manager	322-4477
Surgical Services (OR) Manager	322-6909
First Floor Acute Manager	322-4407
Behavior Health Manager	322-4573
Obstetrics Manager	322-4598
Imaging Manager	322-5872
Pharmacy Manager	322-4402
Clinical Labs Manager	322-4422
Dietary Manager	322-4415
Administration (CEO, CNE)	322-6970
IT Department	322-5887
Contracts Management	322-4442

Human Resource Requirements

Contact Human Resources to schedule an appointment to pick up and review documents listed below:

- Read the Contractor Guideline booklet. Return **Contractor Guidelines Confirmation of Understanding** to Human Resources.
- **Drug Screening:** Each contractor / sub-contractor will have to complete a five panel drug screen within six months of the project start date. Negative drug screening results are to be submitted to Human Resources. Additionally, if management has a reasonable individualized suspicion that a contractor is currently violating the Hospital Drug Free workplace policy, a urine drug screen may be requested. Arrangements to complete a drug screening can be made through Human Resources at a fee of $17.00 per person. Contact Human Resources to schedule an appointment (page 4).
- **State and Federal Criminal History Record Check:** Each contractor / sub-contractor will have to complete a State and Federal criminal background check within six months of project start date. Background check results are to be submitted to Human Resources. Persons with any criminal charges pending or with any felony convictions shall not be eligible to work in the Hospital. Arrangements to complete a background check can be made through Human Resources at a fee of $50.00 per person. Contact Human Resources to schedule an appointment (page 4).
- Complete **Request for State Federal Criminal History Record Check** form
- Complete and return the **Acknowledgement and Understanding.**
- Camera Surveillance and Image Recording form. Initial, sign, and date **Appendix A**. Policy is for your records.

Employee Health Requirements

Contact Employee Health / Infection Control to review documents listed below: All documents can be picked up at Human Resources.

- Complete the following forms:

  -Contractor Health Evaluation

  -Immunization Declination Requirements for Maintenance and Construction Contractors

- Submit a completed two-step Tuberculosis test. Arrangements to complete a TB test can be made through your primary care physician or contact the Hawaii Department of Health at 808-322-1522.

- Completion of an annual influenza vaccine (or declination form) during the flu season of October through March.



Request for Records and Documentation

Contractor will cooperate with and make available to Kona Community Hospital any records and documentation required by such authorities within eight (8) hours upon request. Kona Community Hospital will make such requests during normal business hours.

Confidentiality

At Kona Community Hospital, privacy of patients is valued and protected by law. Although contractor employees will never have reason to use private health information, they may come into contact with documents and computer screens, or overhear conversations that contain private information. Please remember that this information is protected and private and should not be discussed or shared.

Not all areas of the hospital are open to the public for reasons of safety or privacy. If contractors are required to work in clinical areas they must observe specific HIPPA security/confidentially rules.

General Safety

Kona Community Hospital is committed to the safety of employees, students, visitors, and patients. All employees, including contractor employees, are expected to take safety seriously and follow good safety practices. If there is any doubt regarding the safety of a job or task, notify the Facilities Director.

If you are feeling ill stay home. You are more prone to germs from others and more likely to spread your germs to patients who are already sick and have little defenses left to use against them. You will get better faster and you won't get anyone else sick either.

Kona Community Hospital has adopted and follows a safety plan designed to provide a safe environment. The goal of this plan is to create a workplace that is free from hazards and where risks of injuries to employees, patients, visitors, and contractors is at a minimum.

Since safety is a team effort, everyone working at Kona Community Hospital must look out for themselves and each other by watching for unsafe practices and correcting or reporting them if encountered.

Contractor Check-In

Upon the daily arrival of a contractor to Kona Community Hospital, the contractor is required to check-in and sign-in at the Maintenance Office. Contractors must also check-out and sign-out daily at the Maintenance Office. Hours of normal operations are 0600 to 1430 Mondays thru Fridays. Any off shift , holiday and weekend work requires prior approval and 48 hours notice arranged with the Facilities Director. Arrangements for card access to project areas requires 48 hours notice.

Identification Badges and Basic Security

All contractor employees must wear a KCH badge (permanent / temporary). Badges are issued from HR after all HR and Employee Health requirements are completed. Badges are signed out and back in daily through the Maintenance Department. The badge must be worn above the waist. Contractor employees without badges will be asked to check in at the Maintenance Department. Off shift, holiday and weekend arrangements will be made with the Maintenance Clerk and approval of the Facilities Director to have the badges sent to Patient Access to be signed in and returned at end of shift.

Parking

Parking at Kona Community Hospital is at a premium. Contractors must park in areas designated by the facility.

Smoking and Tobacco Use

Kona Community Hospital is a Smoke and Tobacco Free Campus. Use of tobacco products including cigarettes, chew and electronic cigarettes is not allowed on campus.

Personal Appearance

- A shirt displaying the contractor's name is preferred. Long work pants or jeans and covered shoes are required
- Identification badge must be worn above the waist.
- Not allowed are slippers, shorts and sleeveless shirts with holes, and / or offensive language and / or artwork.

Appropriate Behavior

Kona Community Hospital promotes a healthy work environment and expects appropriate behavior by everyone on campus.

Reports of inappropriate behavior will be investigated and disciplinary action may result.

Whistling, inappropriate language and any other gesture that is perceived to be offensive to Kona Community Hospital employees and guests will not be tolerated and will be cause for dismissal.

All contractors are responsible for adhering to these guidelines and must report inappropriate actions to the Nursing Supervisor, Facilities Director, or Risk Manager.

Workplace Violence Prevention

Violence, threat of violence, intimidation, harassment or coercion is not tolerated on the KCH campus.

Contractor employees are responsible for adhering to these guidelines and for reporting disruptive or violent behavior to Security, Nursing Supervisor, Facilities Director or the Risk Manager.

Interacting with Patients and Hospital Staff

The employees of Kona Community Hospital are proud of their facilities and are always careful to ensure the comfort and welfare of patients, visitors and co-workers. Even if only temporarily, contractor employees will become part of the KCH work force and may even be viewed as KCH employees by patients, guests or visitors.

All contact with patients, staff and visitors must demonstrate respect for the individual. Any action or words that suggest bias or prejudice are not appropriate.

Healthcare Personal Protective Equipment Requirements

Personal protective equipment (PPE) is provided in an assortment of sizes and includes the following examples: gloves, isolation gown, mask, face shield, shoe covers and jumpsuits. Observe sterile work zone requirements and restrictions. Do not enter sterile corridors or rooms without appropriate attire required (ie. Scrubs, hats, booties, face mask, etc.) Do not wear this clothing out of the sterile area and re-enter, if you have exited area replace with clean PPE's prior to re-entry into area. You must coordinate with unit manager if you are unsure of appropriate attire or procedure required.

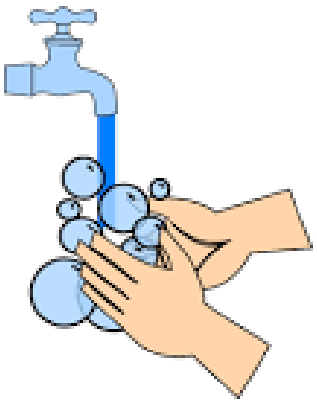


Hand-washing and Disinfection

In the Hospital setting any surfaces (phones, elevator buttons, tool handles etc.) can become a breeding ground for germs. Anyone that comes into contact with these surfaces can then transmit the germs to other areas in the hospital and potentially to our vulnerable patients. Every year thousands of people die from infections acquired at the hospital. The best defense against germs is hand washing; frequent hand washing in a healthcare setting will keep patients, staff and you safe from potential life threatening germs and spread of disease. KCH has alcohol hand washing stations throughout the facility for your convenience; to use just apply the foam/gel to your hands and rub until dry. If you like the traditional soap and water method please remember to scrub your hands for at least 20 seconds and use a paper towel to dry your hands and another one to turn off the faucet. Hand washing is expected during the following activities:

- When entering and exiting the facility and construction locations
- Before and after working on hospital equipment/locations
- When entering and exiting patient care areas
- Before applying and immediately after removing personal protective equipment.
- After removing gloves
- After using the restroom
- Before eating meals





Clothing and Construction Personal Protective Equipment

While working at KCH, your personal protective equipment protects you as a worker, but also alerts our patients and staff to potential hazards in the area. To maintain the healing environment, please ensure all clothing is clean and dust free and is in a respectful condition.

While working at KCH the following OSHA guidelines must be followed:

- 29 CFR 1926 Construction Industry
- 1926 Subpart C, General safety and health provisions
- 1926.28, Personal protective equipment
- -1926 Subpart E, Personal protective and life saving equipment
  - 1926.95, Criteria for personal protective equipment
- 1926.96, Occupational foot protection
- 1926.100, Head protection
- 1926.101, Hearing protection
- 1926.102, Eye and face protection
- 1926.103, Respiratory protection
- 1926.104, Safety belts, lifelines, and lanyards
- 1926.105, Safety nets
- 1926.106, Working over or near water
- 1926.107, Definitions applicable to this subpart
- 1926 Subpart M, Fall protection [related topic page]
- 1926.500, Scope, application, and definitions applicable to this subpart

Clothing and Construction Personal Protective Equipment

- 1926.501, Duty to have fall protection
- 1926.502, Fall protection systems criteria and practices
- 1926.503, Training requirements
- 1926 Subpart P, Excavations [related topic page]
- 1926.651, Specific excavation requirements
- 1926.652, Requirements for protective systems

First Aid

Contractors must provide adequately stocked first aid kits on their job sites for use by their employees and any injury requiring more than on site first aid must be reported to the Facilities Director as soon as possible.



Entering Patient Rooms

Non– healthcare contract workers may enter patient rooms only after making arrangements with the Facilities Director and the Maintenance Supervisor. They will coordinate with the nursing staff as applicable.

Patients on Special Precautions

Sometimes there are patients who are on special precautions such as Contact, Droplet, Airborne, GI Contact, and Neutropenic. If so, color coded signage will be posted outside their door. **You must wear** specific personal protective equipment to protect yourself, other patients and staff from potential infections. **YOU MUST** coordinate entry and exit from these rooms with the unit manager. Wear all required protective equipment (gloves, gown and/or mask) prior to entering rooms and remove all equipment before you leave the room. Most importantly be sure to perform good hand washing upon exiting the room. (Images of these signs are located on pages **33 - 35)**

Contractor employees must be aware that patients with suppressed immune systems may be found just about anywhere in the buildings. To these individuals, a simple virus could be very serious. For this reason all employees, contractor and staff, are expected to observe basic infection control procedures.

Contractor employees must protect patients by following standard precautions at all times. These include hand washing, wearing of gloves, gowns, masks, and shoe covers as appropriate. The Hospital Maintenance Department, or nursing staff will assist you in selecting the appropriate personal protection.

Designated Entrance and Exit Routes

The Facilities Director shall define entrance and exit routes for contractors that provide the least amount of interference with activities in that area. These routes must accommodate the safe transport of construction equipment/debris, construction workers, staff, patients, and guests. No egress can be blocked or restricted without the approval and coordination with the Facilities Director. Any routes blocking egress must have signage and alternative egress pathways incorporated.

Workplace Set-up

All work areas must be marked off with cones, tape, barriers, or other traffic diverters. More than 50 percent of the width of a hallway may never be blocked without making arrangements with the Facilities Director.

No impairments to the fire alarm, fire suppression, or egress routes can be made unless approved by the Facilities Director three working days in advance.

Tools and materials must be safely secured or packaged when unattended. Items must not be left in a way that could injure staff, patient(s), or visitor(s).

Tools and materials must also be safeguarded in such a manner to minimize the risk to everyone. The responsibility for safeguarding all materials/equipment from theft is the responsibility of every individual.

Patients, staff, and public areas must be protected from dust, dirt, and other construction-related contamination. The use of non-combustible dust barriers and air filtration systems with HEPA filters may be required. Transport of tools, equipment and construction debris must be done in a way to minimize dust and dirt. **All transported materials must be covered and secured at all times.**

Traffic Control

When a project includes motorized and pedestrian traffic control the Facilities Director and Contractor will determine the safest routes and procedures to facilitate this traffic. Whistles and other devices used to control traffic shall be used respectfully, and for the purpose of traffic control only. **Three (3) days notice must be give prior to restriction of any roadway at KCH & must be coordinated through the Facilities Director and KCH Security Department.**

Housekeeping & Waste Disposal

Contractor employees are expected to maintain an orderly and safe jobsite. Daily cleanup of the jobsites is required. Temporary storage of construction waste can not exceed 50 Cubic feet of materials.

Keep floors and walkways clear by cleaning up spilled liquids, and keeping cords and other obstacles out of the way of pedestrian traffic. Continually sweep and mop as necessary per requirements in the infection control risk assessment/permit. Remove construction debris daily in the following manner: during transport of materials, both in and out of the facility ensure they are properly secured and covered, ensure all dump carts (including wheels) are cleaned up prior to entering patient care areas. Transport of materials in and out of work areas should occur at the beginning and end of shifts whenever possible. **NEVER** clean up an unidentified spill; notify housekeeping immediately if you believe there may be a hazardous (body fluid) or chemical spill.

All entry ways need sticky mats, sticky mats need to be changed frequently and upon the discovery that the sticky mats are no longer sticky. Contractors are responsible for their own waste hauling receptacles. Reference Hawaii County waste hauling guidelines and separation of solid wastes. Contractors are responsible for removing and disposing of their hazardous waste via a certified hazardous waste hauler. A manifest is required for disposal and evidence to KCH the waste was disposed of properly.





Hot Work Permits

Any work that involves use of an open flame, such as torch smoldering, welding, grinding or cutting requires a Hot Work Permit. To obtain a hot work permit the welding/cutting equipment and the individuals performing the work must be on the job site. A serviceable 10 pound ABC fire extinguisher must be at each location. Please contact the Facilities Director to request a Hot Work Permit. Example of permit is located on page 43-44.

An individual will be dispatched to issue the permit.

Torches: No Liquefied Petroleum Gas , Mapp Gas or oxygen acetylene bottles over 5 lbs of volume are allowed in the facility.

Smoke detectors will require a manufacturers cover to be applied during work & cover will be removed after the project is completed for the day. A Interim Life Safety Deficiency Form must be created. See attached form and policy on pages 46 - 47.

Fire Sprinkler Heads: Must be protected when working within 4 feet of a head. Contact the Facilities Director.

If the fire sprinkler is impaired an Interim Safety Life Measure (page 46 - 47) must be created.

Smoke detectors: The following procedures apply;

1. Use a zip lock bag and cut the bottom of the bag off.
2. Use blue painter's tape to secure the bottom of the zip lock bag to the base of smoke detector. **Bag must be dated and contractors name listed.**
3. At the start of each shift the zip lock bag is closed and at the end of the shift the bag either removed or the zip lock is opened.

NOTE: Hot Work Permits CAN NOT be issued if fire suppression systems are not functional. If hot work must be performed a fire watch is required.

A fire watch is defined as:

1. The assignment of a person or persons to the area for the express purpose of notifying the Fire Department, the building occupants, or both, of an emergency.
2. Preventing a fire from happening.
3. Extinguishing small fires.
4. Protecting the public from fire or life safety dangers.

This/ these personnel must be specially trained in fire prevention techniques, and they should understand the particular fire safety situation. All fire watch(es) must be coordinated prior to the event with the Facilities Director.

Fire Blankets/Welding Pads/Smoke Eaters: May be required depending on the area that work is being performed in.

Infection Control Permits

Infection Control is taken very seriously and applies to all areas of the KCH facility. It applies both to how construction projects affect our patients as well as how our patients and the environment affect you. To ensure we are providing a safe healing environment for our patients and staff the following requirements shall be strictly followed:

You will be required to obtain an Infection Control Permit from Maintenance prior to performing construction related tasks within all patient care, laboratory or any other areas where the services rendered are directly related to patient care. There are four types of construction that are associated with four risk levels. This information defines the criteria for an Infection Control Permit.

You may **not** begin your work until the appropriate authorization has been completed and the permit is posted at/near the entrance of the worksite. Posting of this permit is required over the construction period. Please see Facilities Director to determine if a permit is required for your tasks.

All Infection Control requirements will be followed at all times as defined by the Infection Control Permit. Daily Infection Control compliance surveys will be completed by KCH maintenance staff. If at any time contractors are not meeting infection control risk assessment/permit requirements the job site can be shut down until the proper requirements are satisfactorily met. Repeat offenses can result in KCH stopping contractors work on the project. Example of Infection Control Risk Assessment and permit can be viewed on pages 37 - 40.

Dust Containment:

Negative Air Machines with HEPA filters are required in all construction areas.

- Sticky mats must be placed outside of the construction area and changed frequently.
- Plastic zip wall and/or temporary barriers must be in place prior to start of project.
- Coveralls must be worn over any soiled/contaminated clothing.
- Dusty or contaminated shoes must be covered with paper booties.
- Appropriate PPE and/or jumpsuits/scrubs will be used when entering "clean or sterile" work areas such as OR suites.
- All negative air exhaust shall be exhausted outside of the building unless circumstances deem this impossible/unreasonable. Discharge of exhaust air within the facility is a last resort and must be pre-approved by the Facilities & Infection Prevention Directors.
- Discharge of negative air exhaust into the hospital HVAC system is strictly prohibited.
- You may inspect ceiling spaces by removing one 2x2 tile or one 2x4 tile. If multiple tiles removed or any work is completed a containment unit (ie: Aire Guardian) and ladder permit (example page 42) must be in place. You are responsible for immediate clean up of any debris resulting in tile removal.

Dust Contamination:

- HEPA filters and pre-filters will be supplied by the contractor. A written log must be kept with the contractor owned air scrubber. Pre filters must be changed when visually dirty and at the beginning of each new project.
- Discharge of exhaust is required and must be pre-approved by the Facilities and Infection Control Directors.





Fire and Smoke Barrier Penetration Permits

All fire and smoke barriers must be sealed as specified in the construction documents. When working within KCH any cutting, opening, or otherwise penetrating **ANY** wall requires a wall penetration permit (Example on page 41) from the Maintenance Department. Never penetrate any walls without coordinating with the Facilities Director to obtain a permit.

Dig Permits

Prior to beginning excavation, a utility line locator firm shall be employed to physically locate the utility lines in order to avoid unplanned outages that can result from accidental damage.

No Digging may take place with out the direct involvement of the Facilities Director.

To begin a project that requires digging, call the utility line locater that is responsible for your work area to ask for the location and voltage of underground utility lines and tell them where and when you are working in that area.

Advise co-workers before you start digging and mark on your blueprints or plan the exact location of the utility lines. Then place warning signs along the route, if they are not already posted.

Protect your self by working with another person who can be a spotter or signaler, and can call for assistance in an emergency. Always keep equipment, workers, materials well outside the minimum safety distance.

If a power line has been severed, have someone call the KCH Maintenance Department immediately to shut off the electricity. If you are sitting on earth-moving or other riding equipment, stay on the equipment—don't attempt to jump off unless the machine is on fire and your life is in immediate danger.

Move the equipment away from the power source if it is at all possible. Keep others away from the accident, don't let anyone attempt to attach a winch line or approach the machinery in any way.

Security of Doors

Every individual is responsible for ensuring the job site and facility is secure.

- Do not allow another person to "tailgate" through badge entry door. If that person should have access they will have badge access.
- Do not leave doors unlocked or prop open locked doors.
- Ensure all doors are again secured when you exit.

Weekly Safety Meeting

All contractors are required to have a weekly safety meeting and documentation of meeting highlighting different OSHA standards and guidelines. The presenter needs to have the 30 hour OSHA safety training and provide documentation to KCH of completion prior to commencement of work.



Ladder Safety

Contractors must follow OSHA guidelines 3124-12R-2003.
Example of permit on page 42

Electrical Safety

All power tools must be UL approved and have a three prong grounded plug. Two prong plugs are not permitted. No three receptacle cord adaptors are allowed. Limit extension cords. No plug strip to plug strip power extenders. Manage cords safely in corridors and use approved cord covers. No extension cords or power tool cords can be repaired with electrical tape if frayed. A new cord or cord end must be installed. Lock out / Tag out procedures shall be followed per OSHA guidelines 23 CPR 1910.147. Consult with Facilities Director for KCH specific guidelines. Lock out / Tag out is not only applicable to electric work it is also applicable to plumbing, medgas, vacuums, reheat, steam, and chilled water systems.

Red Receptacle Outlets

Red receptacle outlets are located throughout KCH and are not to be used by contractors.

These red receptacle outlets are connected to the emergency power systems and will provide power even during an outage. Red receptacle outlets are not to be used for non-emergencies. Never unplug equipment from red receptacle outlets as they are used for critical patient care equipment only.

Emergency Preparedness

Kona Community Hospital requires that all employees and contractor employees must be familiar with the basic requirements of the Emergency Plans before they begin work.

Reporting an Emergency

To report an emergency at Kona Community Hospital please call the Hospital Operator at 322-9311 or dial 0 from hospital phone.

Emergency Response

In the event that emergency procedures are announced (Page Codes) check immediately with your Supervisor or the nearest KCH staff member to ask what is expected in this situation. You may be asked to leave the area.

Page Codes

Kona Community Hospital uses a color code system to notify employees, vendors and contractor employees of emergency situations. These codes will be given verbally over the public address system. These codes are:

For example, if there is a fire, there will be a page over the public address system stating: "Code Red" followed by the location.

If employees wait until an emergency is actually occurring before attempting to determine what is expected of them they may be too late because time is a very valuable commodity during an emergency.

Code Black	**Severe Weather**
Code Blue	**Cardiac Arrest/Medical Emergency**
Code Gray	**Security Assistance**
Code Green	**Bomb Threat**
Code Orange	**Hazmat/ Bioterrorism**
Code Pink	**Infant Abduction**
Code Red	**Fire**
Code Silver	**Adult Elopement**
Code Active Shooter	**Active Shooter**
Code Triage	**Disaster Activation**

Code Red—Fire Plan

Everyone working in Kona Community Hospital must always be aware of the locations of the nearest fire alarm pull station, the nearest fire extinguisher and the nearest exit.

When the fire alarm sounds everyone needs to leave the building.

R.A.C.E

R - Rescue

Rescue anyone in danger. Protecting of life is paramount.

A - Activate

Activate the nearest fire alarm station by pulling down the lever.

Dial # 40 on telephone handset and announce loudly 3 times "Code Red and location of fire (example code red electrical room first floor)". Assist others who may need assistance.

C - Confine

Close all doors, windows or openings in the room or corridor area where smoke and/or fire are present to isolate the condition.

Remember that smoke is also very dangerous, many victims of fires succumb to smoke.

If a closed door is hot, this may mean that there is fire on the other side. DO NOT OPEN a hot door.

E - Extinguish: Secure fire extinguishers for use.

Fire extinguishers may be used only for small fires that are getting started, do not attempt to use a fire extinguisher on a fire that is too large or dangerous.

Only the respiratory therapy department or nursing may turn off medical gasses.

If you elect to extinguish the fire remember:

When using a fire extinguisher, remember the word "P.A.S.S". Each letter represents a step for using the fire extinguisher.

P– Pull the pin from the fire extinguisher.

A– Aim the hose at the base of the fire.

S- Squeeze the handle (lasts 20 seconds)

S- Sweep from side to side.

Evacuation—General Guidelines

- ♠ Keep Calm
- ♠ Leave lights on
- ♠ Do not use elevators (unless directed by Fire Dept.)
- ♠ Do not use telephones (unless directed by Fire Dept.)
- ♠ Keep all corridors clear at all times.
- ♠ Do not block the fire extinguishers or fire hoses.
- ♠ Do not block or lock any designated exits
- ♠ Know the location of fire extinguishers and pull stations.

Fire Safety General Guidelines—<u>DO</u>

- ♠ Obtain a Hot Work Permit prior to performing any hot work, including welding, soldering, torch cutting, or any work using an open flame.
- ♠ Participate in fire drills.
- ♠ Follow Interim Life Safety Measures (ILSM's) implemented due to construction. Refer to attached policy (page 46)
- ♠ Place ceiling tiles back in place when completed with above ceiling.
- ♠ Protect penetrations through fire rated walls in accordance with UL System requirements.

Fire Safety General Guidelines—<u>DON'T</u>

- ♠ Do not remove or tamper with any fire protection or life safety equipment, including: smoke detectors, fire alarm speaker/strobes, fire alarm pull stations, fire sprinklers, and fire extinguishers
- ♠ Do not prop open fire rated or smoke barrier doors, especially stairwell doors.
- ♠ Do not tamper with the latch on fire rated doors (to prevent the door from latching).
- ♠ Do not store equipment or supplies in the corridor or the stairwells.
- ♠ Do not block any exit or egress.

Hazardous Materials

Materials in use in Kona Community Hospital:

Hazardous Materials are present and in use at KCH. These chemicals may include flammables, toxics, corrosives, biohazards or radioactive. Safety Data Sheets (SDS) for these chemicals are available through the SDS line located on a label affixed to every KCH phone.

Read all warning labels carefully. If the warning label is missing from a suspected hazardous chemical, notify a Supervisor or the Facilities Director.

Chemicals Brought by Contractor:

Safety Data Sheets (SDS) must be submitted to the Facilities Director for approval. All chemicals must be labeled in accordance with 29 CFR 1910.1200 (Hazard Communication).

Hazardous Material Spills:

If you discover a spill believed to be hazardous or questionable, contact:

- Housekeeping at 322-4521.

In addition, notify your supervisor and the Facilities Director.

Exposure to Human Blood or Body Fluids

The OSHA Blood Borne Pathogen Standard (1992) is to protect workers that have a reasonable anticipated risk of an occupational blood or body fluid exposure on their job. Typically contractors do not fall into this category however anyone working with in a healthcare facility can be at risk for blood and body fluid exposure. Some of the potential blood borne disease includes HIV and Hepatitis.

Needles and other sharp instruments are used throughout KCH and patient blood and body fluids are transported throughout the campus. Our expectation is that these are contained appropriately; however, exposures can still occur and KCH has developed a plan of action to address any exposure that does occur.

Contractors experiencing an exposure such as being pricked by a "sharp" or splashed (eyes, mouth, or skin) by body fluids while on the KCH campus, should immediately stop what you are doing and wash the area thoroughly with soap and water. Proceed directly to the KCH Emergency Department for a post exposure work up. Time is very important with exposure injuries so **DO NOT DELAY** in reporting injury and seeking evaluation in the Emergency Room. The incident must also be reported to your supervisor by the end of the shift.



Noise and Vibration

Noise and vibration can have severe impact on our patients and their ability to heal, staff ability to provide safe and proper care and KCH's ability to provide a harm free work environment for our employees.

All construction activities resulting in potential harmful noise levels will be pre authorized by the Facilities Director and communicated prior to the beginning work with unit managers that may be impacted by the noise/vibrations. If excessive noise levels are reported the construction work will be halted and alternative construction methods or noise barriers will be required.

Medical Equipment

Medical Equipment such as ventilators and heart monitors are found throughout KCH.

Only authorized individuals may operate or change settings on medical equipment. Contractor employees involved in construction are not authorized to operate, move, or change settings on any medical equipment. All issues regarding medical equipment must be referred to nursing staff or the Facilities Director. **Never unplug equipment that is plugged into a RED outlet.**

Utility Systems

Kona Community Hospital depends on uninterrupted delivery of utilities to operate equipment that is crucial to daily operations. Any utility shutdown must be coordinated with the Facilities Director to avoid interruption of any utility service. **NO contractor shall turn off any valve, circuit or switch.**

English Proficiency Guidelines

For safety and general information purposes, contract workers with limited English proficiency shall be assigned within close proximity to contract workers that have a fluency in English.

Confined Space

Many workplaces contain spaces that are considered “confined” because their configurations hinder the activities of employees who must enter, work in, and exit them. A confined space has limited or restricted means for entry or exit, and it is not designed for continuous human occupancy. Confined spaces include, but are not limited to underground vaults, tanks, storage bins, manholes, pits, silos, process vessels, and pipelines. Contractors must follow the OSHA guideline standard for Confined Space 1940.146 subpart A, B, C, D, E and F. A confined entry permit must be approved by the Facilities Director, as well as, 48 hours prior notice of the confined space being entered.

Signage

Kona Community Hospital maintains signage in the buildings. Construction or renovation contractors, however, must ensure that proper signage remains posted as facilities are modified or new construction is added.

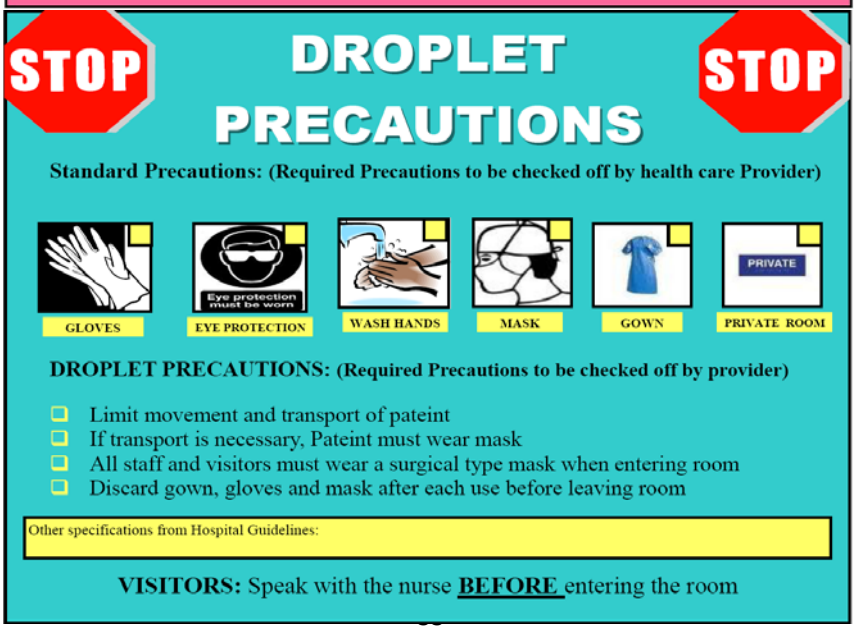
Infection Control Containment Systems

Containment units such as Aire Guardian, Hepacart and Zip Wall Systems are the responsibility of the contractor to procure and maintain. The plastic vinyl sheeting used on the containment units must be flame resistant and UL labeled to support flammability standards. The contractor is responsible for the proper use, setup, and the disinfection of the cubes daily and more frequently if needed and required by the infection control risk assessment/permit. Primary filtration on HEPA units must be replaced as needed when observed to be clogged or dirty. HEPA filters are to be changed every 2 years or as needed. Record keeping is required on filter change outs.

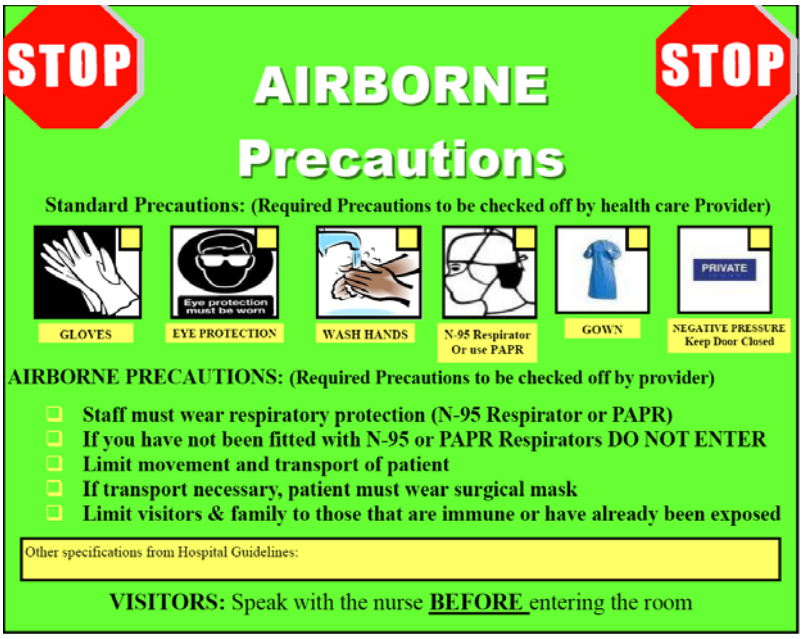


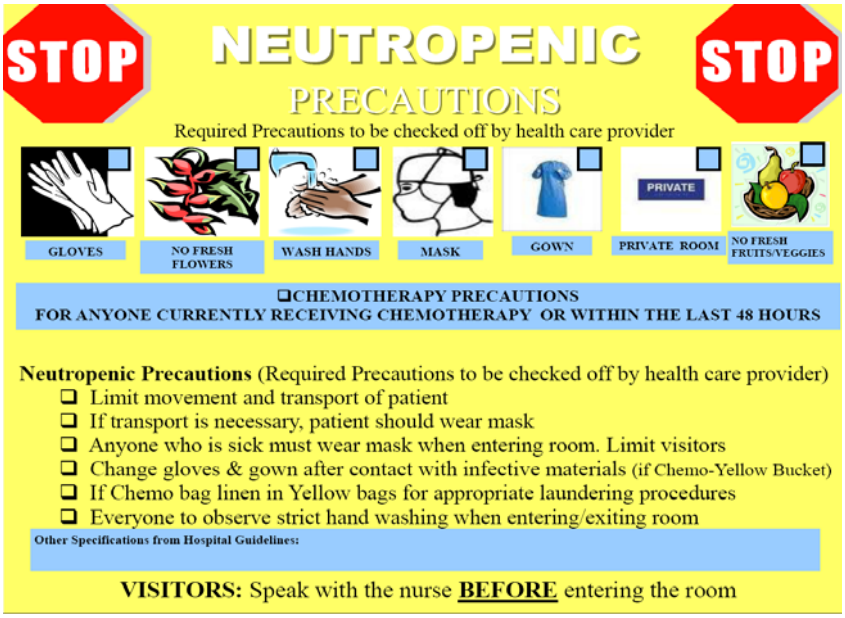
The following five Infection Control Isolation Signs are used in the facility to indicate serious and potentially infectious conditions. Personal Protective Equipment and specific disinfection procedures are REQUIRED to enter/exit these areas safely. You MUST work with nursing on appropriate procedures prior to entering these rooms.






STOP
CONTACT
GI
PRECAUTIONS
STOP
Standard Precautions: (Required Precautions to be checked off by health care provider)
Eye protection must be worn
PRIVATE
GLOVES
EYE PROTECTION
WASH HANDS
MASK
GOWN
PRIVATE ROOM
Contact Precautions: (Required Precautions to be checked off by health care provider)
Limit movement and transport of patient
If transport is necessary, patient must wear clean gown & wash hands
Wear gown & gloves when entering room, mask if risk of splashing
Change gloves and gown after contact with infective materials
Discard gown, gloves, and mask before leaving room
WASH HANDS WITH SOAP & WATER, ALCOHOL GEL INEFFECTIVE
Other Specifications from Hospital Guidelines:
VISITORS: Speak with the nurse BEFORE entering the room


STOP
AIRBORNE
Precautions
STOP
Standard Precautions: (Required Precautions to be checked off by health care Provider)
Eye protection must be worn
PRIVATE
GLOVES
EYE PROTECTION
WASH HANDS
N-95 Respirator Or use PAPR
GOWN
NEGATIVE PRESSURE Keep Door Closed
AIRBORNE PRECAUTIONS: (Required Precautions to be checked off by provider)
Staff must wear respiratory protection (N-95 Respirator or PAPR)
If you have not been fitted with N-95 or PAPR Respirators DO NOT ENTER
Limit movement and transport of patient
If transport necessary, patient must wear surgical mask
Limit visitors & family to those that are immune or have already been exposed
Other specifications from Hospital Guidelines:
VISITORS: Speak with the nurse BEFORE entering the room


STOP
NEUTROPENIC
PRECAUTIONS
STOP
Required Precautions to be checked off by health care provider
PRIVATE
GLOVES
NO FRESH FLOWERS
WASH HANDS
MASK
GOWN
PRIVATE ROOM
NO FRESH FRUITS/VEGGIES
❑CHEMOTHERAPY PRECAUTIONS
FOR ANYONE CURRENTLY RECEIVING CHEMOTHERAPY OR WITHIN THE LAST 48 HOURS
Neutropenic Precautions (Required Precautions to be checked off by health care provider)
❑ Limit movement and transport of patient
❑ If transport is necessary, patient should wear mask
❑ Anyone who is sick must wear mask when entering room. Limit visitors
❑ Change gloves & gown after contact with infective materials (if Chemo-Yellow Bucket)
❑ If Chemo bag linen in Yellow bags for appropriate laundering procedures
❑ Everyone to observe strict hand washing when entering/exiting room
Other Specifications from Hospital Guidelines:
VISITORS: Speak with the nurse BEFORE entering the room

Notes

INFECTION CONTROL RISK ASSESSMENT
Matrix of Precautions for
Construction and Renovation

STEP ONE:
Using the following table identify: Type of Construction Project Activity--Type A-D

Type A	**Inspection and Non-invasive Activities** Includes, but not limited to: Removal of ceiling tiles for visual inspection-limited to 1 tile per 50 square feet. Painting, but not sanding; and wall covering, electrical trim work, minor plumbing, and activities that do not generate dust, require cutting of walls or access to ceilings other than for visual inspection.
Type B	**Small Scale, Short Duration Activities that Create Minimal Dust** Includes, but not limited to: Installation of telephone and computer cabling; access to chase spaces; and cutting of walls or ceiling where dust migration can be controlled.
Type C	**Work that Generates a Moderate to High Level of Dust or Requires Demolition or Removal of Any Fixed-Building Components or Assemblies** Includes, but not limited to: Sanding of walls for painting or wall covering; removal of floor coverings, ceiling tiles, and casework; new wall construction; minor duct work or electrical work above ceilings; major cabling activities and any activity that cannot be completed within a single work shift.
Type D	**Major Demolition and Construction Projects** Includes, but not limited to: Activities that require consecutive work shifts; Requires heavy demolition or removal of a complete cabling system; and new construction.

STEP TWO:

Using the following tables identify: Patient Risk Groups that will be affected. If more than one group select the higher risk group.

LOW RISK	MEDIUM RISK	HIGH RISK	HIGHEST RISK
Office Areas	Cardiology Echo–Cardiography Endoscopy Nuclear Med Rehab Therapy Radiology/MRI Respiratory Therapy	Critical Care Emergency Dept Labor & Delivery Newborn Nursery Laboratory Surgery Pharmacy Pediatrics Post Anesthesia Care Unit Surgical Units	Any area caring for Immuno compromised Burn Units Cardiac Cath Lab Oncology Central Sterile Supply Intensive Care Units Medical Units Negative pressure isolation rooms Operating rooms C-Section rooms

STEP THREE:

Match:

Construction Project Type – A, B, C or D

Patient Risk Groups – Low, Medium, High or Highest

Class of Precautions

I, II, III, or IV will determine the level of infection control activities required for your construction project.

Class I-IV or **Color-coded Precautions**

IC Matrix—Class of Precautions
Construction Project by Patient Risk

PATIENT RISK GROUP	CONSTRUCTION PROJECT TYPE			
	Type A	**Type B**	**Type C**	**Type D**
LOW Risk	I	II	II	III/IV
MEDIUM Risk	I	II	III	IV
HIGH Risk	I	II	III/IV	IV
HIGHEST Risk	II	III/IV	III/IV	IV

	During Construction Project	Upon Completion of Project
Class I	Execute work by methods to minimize dust from construction operations. Immediately replace a ceiling tile displaced for visual inspection.	
Class II	Provide active means to prevent airborne dust from dispersing into air. Water mist work area to control dust while cutting. Seal unused doors with duct tape. Isolate & seal air vents. Place sticky mat at entrance & exit of work area. Remove or isolate HVAC system in areas where work is being performed.	Wipe all surfaces with disinfectant. Contain construction waste & transport in tightly covered containers. Wet mop &/or vacuum with a HEPA filtered vacuum prior to leaving work area. Clean & disinfect containment units. Remove isolation of HVAC system in areas that work is being performed.
Class III	Isolate HVAC to prevent contamination of duct system. Construct critical barriers (sheet rock, plywood, zip wall) sealing area or implement containment unit with HEPA filtration prior to start of project. Maintain negative air pressure at work site with HEPA air-filtration. Contain construction waste & equipment before transport in tightly covered containers. Cover transport container or carts & tape covering, unless solid cover.	Do not remove barriers from area until completed project is inspected by Maintenance or Infection Control & is thoroughly cleaned by Environmental Services. Remove barrier material carefully after wiped with disinfectant to minimize the spread of construction dirt & debris. Vacuum area with HEPA filtered vacuum. Wet mop area with disinfectant. Remove isolation of HVAC system in work areas. Disinfect containment units.
Class IV	Isolate HVAC to prevent contamination of duct system. Construct critical barriers (sheet rock, plywood, zip wall) sealing area or implement containment unit with HEPA filtration prior to start of project. Maintain negative air pressure at work Site with HEPA air-filtration. Seal holes pipes/conduits & punctures properly. Construct anteroom all workers pass through to be vacuumed off using HEPA vacuum before exiting area, or they must wear jumpsuits that are removed each time they exit work site. Shoe covers required when entering work site & must be changed each time worker exits area. Do not remove barriers from area until completed project is inspected by Maintenance or Infection Control & thoroughly cleaned by Environmental Services.	Remove barrier material carefully after wiped with disinfectant to minimize the spreading of construction dirt & debris. Contain construction waste & transport in tightly covered containers. Cover transport receptacle or cart & tape covering, unless solid cover. Vacuum work area with HEPA filtered vacuum & wet mop area with disinfectant. Remove isolation of HVAC system in areas where work is being performed. Clean & disinfect containment units.

INFECTION CONTROL CONSTRUCTION PERMIT

Location of Construction:	**Permit No.:** _____
Project Coordinator:	**Project Start Date:**
Contractor Performing Work:	**Est. Time of Completion:**
Supervisor: **Telephone:**	**Permit Expiration Date:**

YES	NO	CONSTRUCTION ACTIVITY	YES	NO	RISK GROUP
		TYPE A Inspection, non-invasive			GROUP 1 Low Risk
		TYPE B Small scale short duration minimal dust			GROUP 2 Medium Risk
		TYPE C Mod/high dust, multiple shifts demolition.			GROUP 3 Medium/High Risk
		TYPE D Major demolition construction multiple shift			GROUP 4: Highest Risk

CLASS I	Minimize dust from construction operations. Immediately replace ceiling tiles displaced for visual inspection. Minor demolition for remodeling.
CLASS II	Provides active means to prevent airborne dust from dispersing into air. Water mist work surfaces to control dust while cutting. Seal unused doors. Block off & seal air vents. Wipe surfaces with disinfectant. Contain construction waste for transport in tightly covered containers. Wet mop &/or vacuum with HEPA filtered vacuum prior to leaving area. Place sticky mat at entrance & exit. Isolate HVAC to prevent contamination of duct system. Construct containment barriers. Clean containment cubicles daily.
CLASS III **Date:** _ **Initial:** _	Block HVAC prevent contamination of duct system. Construct containment barriers. Negative air pressure & HEPA air-filtration. Do not remove barrier until project inspected & cleaned . Vacuum with HEPA filters & wet mop with disinfectant. Remove barrier minimizing spread of dirt & debris. Contain waste before transport in tightly covered carts & tape covering if not secure. Clean containment units & disinfect daily.
CLASS IV **Date:** _ **Initial:** _	Block HVAC prevent contamination of duct system. Construct containment barriers. Negative air pressure & HEPA air-filtration. Seal holes, pipes, conduits, & punctures. Construct anteroom all workers pass through to be vacuumed off with HEPA vacuum prior to exiting, or can wear jumpsuit that is removed each time they exit work site. When entering work site shoe Covers required. Barriers remain up until project is inspected & thoroughly cleaned by ES. Vacuum area with HEPA filtered vacuum & wet mop with disinfectant. Remove barrier minimizing spread of dirt and debris. Contain waste before transport in tightly covered carts & tape covering if not secure. Clean containment units & disinfect daily.

Additional Requirements:

Date: Initials:	Exceptions and/or additions to this permit are noted by attached memoranda. Date: Initials
Permit Requested By: Date:	Permit Authorized By: Date:

40

FIRE OR SMOKE BARRIER PENETRATION PERMIT

Contractor _____In House Work _____Date Issued: _____

Penetration Permit is required for work that will, or has potential to; disrupt the integrity of any floor, wall or ceiling which serves as a smoke or fire barrier by drilling, cutting, boring, destruction or other means. PERMIT must be completed if a Work Permit has been requested which includes penetration.

Permit MUST be signed by the Facilities staff PRIOR to the ceiling tiles being replaced. Failure to return this signed permit may prohibit payment until you are in compliance with this policy.

This permit MUST be posted on the ladder or in the immediate area of work.

Briefly Describe Scope of Work and provide a time table:

Type of Penetration	Location	Purpose	Expected Complete Date

CRITERIA	CONSIDERATIONS	Accept
Is wall, ceiling or floor a fire or smoke barrier?	If not smoke/fire barrier, no permit is required	
Does current fire stopping exist or is this a new penetration?	Current fire stop material to be evaluated for integrity post re-penetration work	
Is the fire stop to be used approved by the hospital?	Only approve fire stop may be used. Fire Stop Approved for this project:	
Has documented training for the application of fire stop been done?	Any person applying fire stop MUST be trained on application	
Must review existing plans/ drawings for any concealed hazards?	Find energized sources, cables, wires, conduits, piping, gas lines.	
Are UL Specifications available?	Attach proper UL Specifications.	

TO BE COMPLETED BY FACILITY STAFF APPROVED DENIED

Facilities Representative_____

SPECIAL INSTRUCTIONS/CONDITIONS FOR PERMIT:_____

WORK APPROVED (Before Ceiling Tile Replacement)

Facilities Representative:_____ **Date:**_____ **Print Name:**_____

COMPLETED PERMIT MUST BE RETURNED TO FACILITIES & POSTED AT WORK SITE.

PORTABLE LADDER USE PERMIT

Note: This permit, which mut be accessible during performance of the work, is to be used when performing work from a portable ladder where a fall exposure of 6 feet or greater exisits & an approved conventional fall protection system is not available or creates a greater hazard.

Project & Job Location: _____Issue Date:_____

PORTABLE LADDER USE JUSTIFICATION

SELECT CONTROLS TO BE USED TO REDUCE FALL HAZARD

Safety Monitor Assigned* 3 Point contact maintained during task

Secure ladder to fixed object Short Duration Task (less 10 mins)

Light Duty Task (material being handled weighs less than 5 lbs)

Use of special instructions (Describe):_____

Selection of Special Work Methods:_____

APPROVALS

Prepared By: Print:_____Sign:_____Date:_____

Approved By: Print:_____Sign:_____Date:_____

(Field Work Supervisor)

Approved By: Print:_____Sign:_____Date:_____

(Project Safety Representative)

UF HOT WORK PERMIT

This Hot Work Permit is required for any operation involving open flames or producing heat and/or sparks and must be completed by a Competent Hot Work Supervisor (CHWS) and posted at the site. Hot Work includes, but is not limited to: Brazing, Torch Cutting, Grinding, Soldering, and Welding. **If the required precautions cannot be met, Hot Work is not permitted.**

HOT WORK DONE BY ☐ CONTRACTOR		
DATE:	WO #	
BUILDING NAME, BLDG #, ROOM #, LOCATION		
NATURE OF JOB		
NAME OF HOT WORK OPERATOR		
I verify the above location has been examined, the precautions checked on the Required Precautions Checklist have been taken to prevent fire, and permission is authorized for work.		
NAME OF COMPETENT HOT WORK SUPERVISOR (CHWS) Contact # _____ Fax # _____		
PERMIT REQUEST	DATE	TIME ⊙AM OPM
PERMIT EXPIRES	DATE	TIME ⊙AM OPM
SIGNATURE OF CHWS		
EH&S Approval		

REQUIRED PRECAUTIONS CHECKLIST

Approved
Expiration Date
Notes:

☐ Available sprinklers, hose streams, and extinguishers are in service/operable.
☐ Hot work equipment in good repair.

Requirements within 35ft of work

☐ Flammable liquids, dust, lint and oil deposits removed.
☐ Explosive atmosphere in area eliminated.
☐ Floors swept clean of combustibles.
☐ Combustible floors wet down,
☐ Combustible floors wet down, covered with damp sand or fire-resistant sheets.
☐ Remove other combustibles where possible. Otherwise protect with fire-resistant tarpaulins, screens or shields.
☐ All wall and floor openings covered.
☐ Fire-resistant tarpaulins suspended beneath elevated hot work.

Work on walls or ceilings/enclosed equipment

☐ Construction is noncombustible and without combustible covering or insulation.
☐ Combustibles on other side of walls moved away.
☐ No danger exists by conduction of heat into another room or area
☐ Enclosed equipment cleaned of all combustibles.
☐ Containers purged of flammable liquids and vapors.

Fire watch/hot work area monitoring.

☐ Fire watch will be provided during and continuously for 30 minutes after work, including during any work breaks.
☐ Fire watch is supplied with suitable extinguishers.
☐ Fire watch is trained in use of this equipment and in sounding alarm.
☐ Fire watch may be required for adjoining areas, above and below.
☐ Hot work area inspected 30 minutes after job is completed.

Other precautions Taken

☐ Confined space entry permit required.
☐ Area is protected with smoke or heat detection.
☐ Ample ventilation to remove smoke/vapor from work area.
☐ Lockout/tagout required.
Comments:

FAX TO EH&S @352-392-6367 PRIOR TO 8:00AM OF PERMIT REQUEST DATE

This Permit was developed for compliance with:

EH&S HOT WORK SAFETY POLICY UFEHS-SAFE1-07/22/2003

WARNING

HOT WORK IN PROGRESS WATCH FOR FIRE

PART 2

INSTRUCTIONS

1. Person doing Hot Work: Indicate time started and post permit at Hot Work location.
After Hot Work, indicate time completed and leave permit posted for fire watch.
2. Fire Watch: Prior to leaving area, do final inspection and sign permit.
3. Return completed permit to Project Manager or Risk Management before leaving campus.

HOT WORK BEING DONE BY:

☐ EMPLOYEE_____

DEPARTMENT_____

☐ CONTRACTOR_____

SITE FOREMAN_____

☐ PROJECT MANAGER_____

DATE

LOCATION / BUILDING & FLOOR

NATURE OF JOB

Required safety precautions have been done.

Signature of responsible person

Permission is given to do this work, provided required precautions have been done.
SIGNED: (EHS)

PERMIT EXPIRES:
DATE **TIME**

TIME STARTED:	TIME FINISHED:

FIRE WATCH SIGNOFF

Work area and all adjacent areas to which sparks and heat might spread were inspected during the fire watch period and were found fire safe.

SIGNED:_____

Rev.2/13/2004 wrw

#

REQUIRED PRECAUTIONS CHECKLIST

☐ Available sprinklers, hose streams and extinguishers are in service.
☐ Hot Work equipment in good repair.

WITHIN 35 FEET OF WORK

☐ Flammable liquids, dust, lint and oily deposits removed.
☐ Explosive atmosphere in area eliminated.
☐ Floors swept clean of combustibles.
☐ Combustible floors wet down, covered with damp sand, metal or fire-resistive tarpaulins.
☐ Remove other combustibles or protect with fire-resistive tarpaulins or metal shields.
☐ All wall and floor openings covered.
☐ Fire-resistive tarpaulins suspended beneath work to collect sparks.

WORK ON WALLS OR CEILINGS

☐ Construction noncombustible and without combustible covering.
☐ Combustibles moved away from other side of walls.

WORK ON ENCLOSED EQUIPMENT

☐ Equipment cleaned of all combustibles.
☐ Containers purged of flammable vapors.

FIRE WATCH

☐ Fire watch to be provided during and for 60 minutes after work.
☐ Fire watch to be provided for 4 hours after work in areas without smoke detection.
☐ Supplied with suitable extinguishers
☐ Trained in the use of equipment and in sounding fire alarm.
☐ Fire watch may be required for adjoining areas above and below.

OTHER PRECAUTIONS TAKEN_____

WARNING!

HOT WORK IN PROGRESS

WATCH FOR FIRE

IN CASE OF AN EMERGENCY

CALL: CHHANY: 430-2588

ERIC:854-5583

WARNING!

KONA COMMUNITY HOSPITAL **Policies and Procedures**	**Category:** **Administration**	**Policy No.:** **123-2**
		Revised: **Oct 8, 2009**
	Issued By: **Environment of Care**	**Effective Date:** **April 17, 2002**
Subject: **INTERIM LIFE SAFETY MEASURES**	**Approved By:** Assistant Administrator	**Supersedes Policy:**
		Page: **1 of 1**

PURPOSE:

Interim Life Safety Measures (ILSMs) are required to temporarily compensate for the hazards posed by existing life safety code (LSC) deficiencies or construction activities. ILSM shall apply to all personnel, including construction workers.

POLICY:

Each interim life safety measure must be documented. Implementation of ILSM must begin upon project development, and continuously be enforced through to project completion. Inspection, testing and monitoring and evaluation actions shall be reported monthly at the hospital safety committee meeting. ILSM consists of the actions listed below.

PROCEDURES:

A. Ensure daily inspection of exits to provide free and unobstructed egress. Personnel shall receive training if alternative exits must be designated.

B. Ensure free and unobstructed access to emergency department or services, and for emergency forces.

C. Ensure that fire alarm, detection, and suppression systems are not impaired. Provide a temporary, but equivalent system when any fire system *is* impaired.
   1. Notify the Fire Department and alarm company when the alarm system in not working.
   2. Announce *every hour*: "interim safety measures are in place." After hours, the supervisor notifies all units that ILSMs are in place.

D. Ensure temporary partitions are smoke-tight and built on noncombustible materials.

E. Develop and enforcing smoking pollicies and procedures in excess of JCAHO standards. Smoking shall be prohibited in or adjacent to all construction areas.

F. Develop and enforce storage, housekeeping, and debris removal policies and procedures that reduce the flammable and combustible fire load to the lowest level necessary for daily operations.

G. Conduct at least two fire drills per shift, per quarter. When temporary systems are in place, inspect, test and document readiness of temporary systems daily.
   1. Visually inspect existing sprinklers and extra fire extinguishers daily.
   2. Inspect audible system battery-operated smoke detectors daily.

H. Increase hazard surveillance of buildings, grounds, and equipment with special attention to excavating, construction areas, storage, and field offices.

I. Train personnel when structural features of fire safety are compromised, such as compartmentation change.

J. Conduct organization-wide-safety-education programs to ensure awareness of any LSC deficiencies, construction hazards and ILSMs.

Life Safety Deficiency - ILSM Decision Matrix

Location: _____ Deficiency: _____

Assessed By: _____ Assessment Date: _____ Date applicable ILSM initiated (if required): _____

Work Order Number: _____

	Interim Life Safety Measures														
	ILSM not required. Risk is considered manageable with existing conditions	Emergency forces notification	Fire watch initiated	Signage for alternate exits	Inspect exits on a daily basis	Provide temporary fire alarm and detection systems. Test temporary systems monthly.	Test temporary systems monthly.	Additional fire fighting equipment	Temporary construction barriers	Increased hazard surveillance	Enforce housekeeping, storage and debris removal practices that reduce the flammable and combustible load to the lowest feasible level	Conducting 2 fire drills per shift per quarter in affected areas	Provide education - awareness of building deficiencies, construction hazards, and temporary measures implemented and train those affected.
Protection Deficiencies													
Lacking a code compliant smoke barrier (small hole)													
Lacking a code compliant smoke barrier (large hole)													
Large penetrations in fire barriers													
Small penetrations in fire barriers													
Suspended ceilings do not prevent the passage of smoke in corridors													
Major renovation of an occupied floor													
Significantly modifying smoke or fire barrier walls													
Hazardous areas not properly protected													
Exit Deficiencies													
Blocking off an approved exit													
Egress path width reduced													
Door Deficiencies													
Door does not close or latch													
Door and frame not labeled													
Door does not prevent the passage of smoke													
Fire Alarm and Sprinkler Deficiencies													
Fire alarm (out-of-service more than 4 hours)													
Sprinkler (out-of-service more than 4 hours)													
Installing sprinkler system (1 zone out-of-service)													
Disconnecting alarm device (1 at a time)													
Blocked access to the fire department connection													
Other Deficiencies													
Blocked Hall													
Minimal Deficiency-corrected within 48 hours													
Notes:													



Kona Community

Hospital

79-1019 Haukapila Street

Kealakekua, HI 96750

Revised January 2016

Contractor Guidelines
Confirmation of Understanding

By signing this page, I acknowledge that I:

a. Have read and understand the contents of the contractor Guidelines Booklet.

b. Responsible for my safety, and will abide by the safety rules of KCH and my employer.

Name (Print): _____

Signature: _____ Date: _____

Employer: _____

Project Name: _____

General Contractor: _____

APPENDIX M

INFECTION CONTROL REQUIREMENTS

See following pages.

KONA
COMMUNITY HOSPITAL
Care You Can Count On

INFECTION CONTROL RESPONSIBILITIES

KCH will provide and initially install:

- all barriers,
- air scrubbers/negative air machines,
- sticky mats,
- filters and plastic necessary to fulfill the infection control requirements designated by the infection control risk assessment performed internally by KCH prior to the beginning of construction

The contractor will be responsible for disposable items such as:

- trash bags,
- cleaning supplies
- bunny/tyveck suits to be used in demo

Contractor will also be responsible for the daily maintenance/cleanliness of the space in accordance with the contractor handbook to maintain infection control compliance. This will include:

- cleaning/mopping of the construction area,
- changing air scrubber filters,
- pulling up sticky mat layers,
- disposing of rubbish daily as well as any other contractor requirements referenced in the contractor handbook.

KCH will provide a dumpster located at the current Maintenance shop location for contractor use. Please notify KCH maintenance if dumpster is full. KCH has designated an approved entrance and exit route for contractor use to minimize impact to clinical services. Map is attached for reference.

APPENDIX N

BID PROPOSAL FORM

(USE SECTION 00400 IN THE SPECIFICATIONS)

*Word Document is provided online for your convenience.