KONA
COMMUNITY HOSPITAL

REQUEST FOR PROPOSALS
(COMPETITIVE SEALED PROPOSALS)

1st Floor SSB HVAC Replacement & Renovations

RFP No:
HHSC 26-0600

for

Hawaii Health Systems Corporation
West Hawaii Region
Kona Community Hospital

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http://www.kch.hhsc.org/Procurement
An Agency of the State of Hawaii

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SECTION 1 ADMINISTRATION

1.0 INTRODUCTION

HHSC invites proposals from qualified and experienced licensed general contractors to provide HVAC replacement and interior renovation services.

This Request for Proposal (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	Monday, April 6, 2026
3.	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 Wednesday, April 8, 2026 10:100am This meeting is mandatory for all Offerors. See Appendix F for Agenda. Addendum for answers to 1st Round of Questions will be provided at Pre-Proposal Conference as well as Emailed to Offerors and posted online.	Thursday, April 9, 2026 10:30am – 12:00pm HST
4.	Closing Date for Receipt of Questions	Tuesday, April 14, 2026 10:00am HST
5.	Addendum for HHSC Response to OFFEROR's 2nd Round of Questions	Friday, April 17, 2026
6.	**Closing Date for Receipt of Proposals**	**Wednesday, May 6, 2026 10:00am HST**
7.	Mandatory Requirements Evaluation	May 6, 2026
8.	Proposal Evaluations	May 11, 2026
9.	Proposal Discussions (optional)	
10.	Best and Final Offers (optional)	
11.	Contractor Selection/Award Notification (on/about)	May 12, 2026
12.	Contract Execution Period	May 14-21, 2026
13.	Contract Tentative Award Date	May 21, 2026

Figure 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 1. 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 Officers 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 Issuing Officer, Yvonne S. Taylor, will also serve as the 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 ytaylor@hhsc.org
Direct (808) 322-4442
Fax (808) 322-4488

and

Loretta Bausriyottiya, Office Asst V
Email lbuasriyottiya@hhsc.org
Direct (808) 322-6992

Figure 2. 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 500 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.

- IMPORTANT –

OFFEROR may NOT request changes and/or propose alternate language to the attached HHSC Special Conditions and DAGS 1999 Interim General Conditions.

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. 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:

Yvonne S. Taylor, Sr. Contracts Manager
West Hawaii Region
Email ytaylor@hhsc.org
Direct (808) 322-4442
Fax (808) 322-4488

and

Loretta Bausriyottiya, Office Asst V
Email lbuasriyottiya@hhsc.org
Direct (808) 322-6992

Figure 3. 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 matters must be made in writing and should be received by the Issuing Officers 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 4. Website for all Procurement Activities

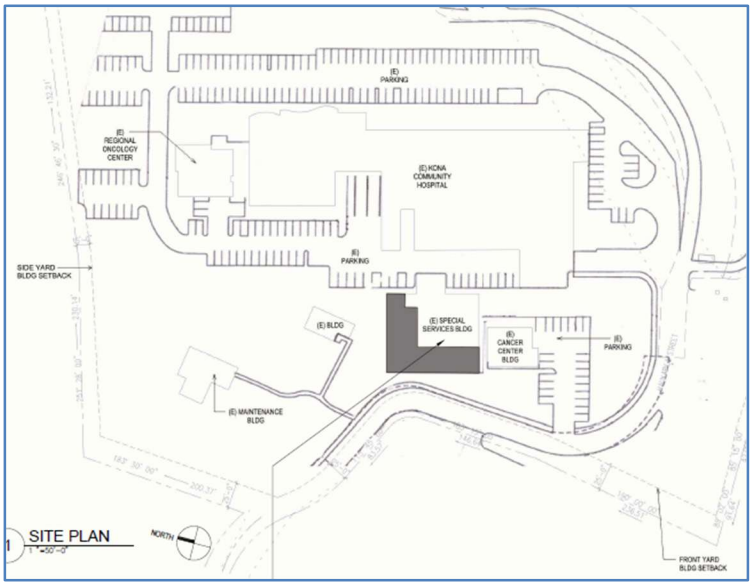
2.0 SCOPE OF SERVICES

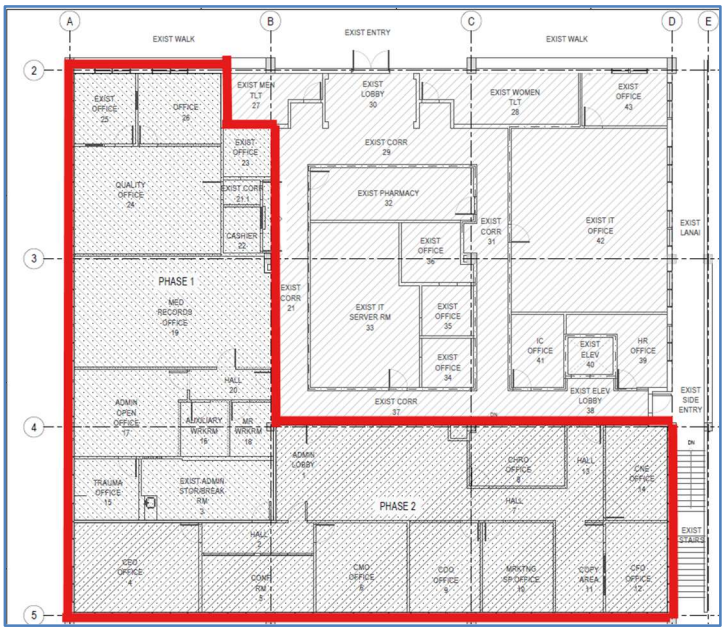
SCOPE OF SERVICES

The KCH Special Services Building ("SSB") was built in 1996 and part of the first floor is in need of a new HVAC system as well as other renovation work to accommodate departmental restructuring and moves.

Work includes, but is not limited to demolition, HVAC, electrical/data, plumbing, flooring, painting and construction of walls.

Location of the work is:





For the duration of the project, the hospital be in full operation while construction work will occur. There will also be other construction projects ongoing at the same time in other parts of the campus.

Specification manuals 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 Engineer. 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 from the jobsite 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. Contractor may use KCH's metal and general waste containers. If Contractor notices the dumpster(s) are getting full, Contractor must notify the Constrution Supervisor so pick up can be scheduled.

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, as determined by KCH, 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 for Substantial Completion.

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 engineer and/or building department for permitting issues. Permit has been approved and will be picked up by Contractor.

4. Commit sub-contractors.

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

6. Obtain required levels and types of insurance. Provide copies to the Contracts Department.

7. 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.

8. Preview OFCI equipment, if any, to ensure all items are on-site. At time of RFP release, KCH has not identified any OFCI equipment for this project.

9. Provide Construction Supervisor with contact information of employees who need to be set up in PROCORE.

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) Utilize PROCORE for document control, which includes shop drawings, RFIs and Submittals.

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 and distribute meeting minutes following each meeting.

h) KCH standard working hours are Monday through Friday 6:00am through 2:30pm.

i) Must have a supervisor or equivalent level employee on jobsite during working hours.

2. Accounting and Cost Control Systems

a) Prepare schedules of estimated values of all work awarded.

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

c) 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 Buasriyoottiya, lbuasriyottiya@hhsc.org in the Contracts department.

Post Construction

1. Coordinate the punch list walk through, Prepare punch list(s) and ensure that all items are completed on a timely basis.

2. Assemble all booklets containing all guarantees and warranties, as required, and deliver all such documents to Owner with certificates that they are complete. Provide digital copies of all documents as required.

4. Coordinate and expedite the preparation of subcontractor care and maintenance manuals and deliver all such manuals to Owner with a certificate of completion.

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

6. Coordinate the preparation of as-built drawings of the entire project including architectural and engineering drawings and provide to HHSC.

Items listed in 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 onsite Pre-Bid meeting and documented in writing via Addendum to the RFP. ***The Pre-Bid meeting is mandatory for all OFFERORS. Only OFERORS in attendance may submit a proposal.***

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, no-bidding any section of RFP, 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.

MANDATORY PROPOSAL TABS/SECTION DIVIDERS

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

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

Figure 5. Mandatory Proposal Tabs/Section Dividers

Relevant material should be placed in the appropriate tabbed area. Greyed in areas in the Mandatory Proposal Tabs/Section Dividers (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). The Issuing Officer must receive the proposal in electronic format 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 to Yvonne Taylor and Loretta Bausriyottiya (see section 1.7 for email addresses) shall have the following information in the subject line:

RFP # 26-0600 SSB 1st Floor HVAC and Interior Renovations

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 Mandatory Questions (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 MANDATORY QUESTIONS

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

3.7.3 PERSONNEL

Appendix K (Bid Proposal Form) shall be completed as a part of Section 3.8.

3.8 PRICE PROPOSAL

Complete Appendix K (Section 00400 – Bid Proposal Form).

3.8.1 PRICE

Price shall be a fixed fee for all work described in drawing and specification package dated March 2026 and specification manual dated March 2026.

Any State of Hawaii funded projects over $50,000.00 are required to have contract performance and payment bonds, the costs of which will be included in the final contract amount.

3.9 REQUIREMENTS. (Copy this section and answer with N/A or the answer)

A. **Non Applicable Requirements.** Excluding HHSC General and Special Terms and Conditions, and any objectionable or defective RFP matters, if any proposal requirement, as describe 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.

3.10 REQUIRED DOCUMENTATION/COMPLIANCE DOCUMENTS

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

A. W9
B. VENDOR TERMS AND CONDITIONS (IF ANY)

C. CONFIDENTIALITY AGREEMENT (APPENDIX H)
D. GENERAL EXCISE LICENSE (COPY)
E. CERTIFICATE OF VENDOR COMPLIANCE
F. GENERAL CONTRACTOR'S LICENSE (COPY)
G. LETTER FROM SURETY COMMITTING TO PROVIDE PERFORMANCE & PAYMENT BONDS

3.11 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

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 6. 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
		RECEIVED ON TIME
40%	40	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 7. 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" 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; DAGS 1999 INTERIM GENERAL CONDITIONS and 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 1999 INTERIM GENERAL CONDITIONS, 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 SSB 1st floor HVAC and Interior Renovations, RFP # HHSC 26-0600** , 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) Proposal via email
☐	☐	Proposal Transmittal Cover Letter:
☐	☐	i. Official Business Letterhead
☐	☐	ii. Authorized Signature
☐	☐	iii. Required Information
		Technical Proposal
☐	☐	i. Summary
☐	☐	ii. Mandatory Questions
		Price
☐	☐	i. Bid Proposal Form
☐	☐	ii. Non Applicable Proposal Requirement(s)
☐	☐	iii. Non Acceptance of any RFP Requirement(s)
☐	☐	iv. HHSC Furnished Items
		Required Documentation/Compliance Documents
☐	☐	i. W-9
☐	☐	ii. Vendor's terms and conditions (if applicable)
☐	☐	iii. Confidentiality Agreement General Contractor's License
☐	☐	iv. Certificate of Vendor Compliance
☐	☐	v. General Excise License (copy)
☐	☐	vi. General Contractor 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

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.

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.

SAMPLE

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 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. See attachment

SAMPLE

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:

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

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:

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 monthly thirty days after receipt of invoice and in accordance with the then current schedule of values.

SAMPLE

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 supplement agreement or 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 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

SAMPLE

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

APPENDIX D

1999 DAGS INTERIM GENERAL CONDITIONS

Click here: https://kch.hhsc.org/procurement

SAMPLE

APPENDIX E

MANDATORY QUESTIONS

See following pages.

EXHIBIT 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 re-heat systems in the past 3 years? If yes, provide details of applicable projects.	
	Does your company have experience with the following healthcare procedures and/or policies:	
	- Infection Control	
	- Fire Safety	
	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.)	
	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?	

EXHIBIT E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	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 with which sub-contractors to work on this Project?	
	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	

EXHIBIT E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	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 or lead carpenter 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?	
	If your company does not have a West Hawaii office, will you be willing to discuss partnering with a locally based contractor?	
	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?	

EXHIBIT E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	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 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.	
	What potential project risks or issues are anticipated and how will they be addressed in order to minimize risk?	
	KCH is currently implementing Procore project management software. It is unsure if the implementation will be compete in time for this project. Does your company use Procore currently? If yes, to what extent is Procore used?	
	C. Financial	
	What is your company's legal structure?	
	What is your OH&P percentage for this project?	
	How is OH&P calculated?	

EXHIBIT E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	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 as deposit requirements, if any.	
	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?	
	- Are your accounts in good standing? If not, why?	
	Why should KCH hire your company to perform the requirements of this project?	

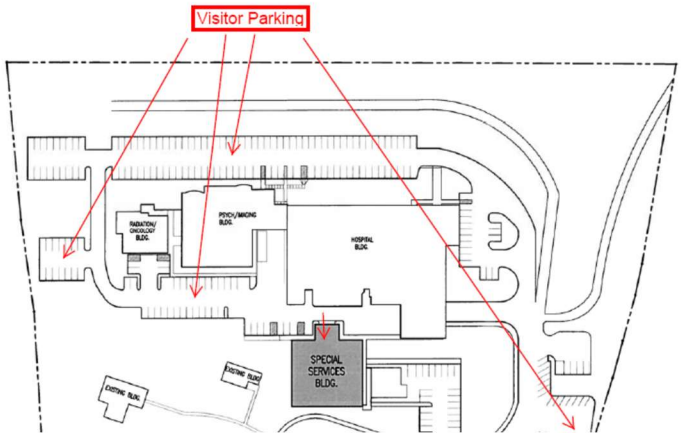
EXHIBIT E
Mandatory Questions

	Company Name & Address: Contact Name & Information:	
	QUESTION	COMMENTS
	Is there any additional information that might be valuable to KCH in determining which company to award the SSB 1st Floor HVAC and Renovation project?	

APPENDIX F

AGENDA FOR PRE-PROPOSAL CONFERENCE WITH TOUR OF HOSPITAL FACILITIES

General Information		
Date	Thursday, April 9, 2026	
Location	Kona Community Hospital **Special Services Building** **TBD** 79-1019 Haukapila Street Kealakekua, HI 96750 Map is below	
Point of Contact	Contracts Management Yvonne Taylor, Sr. Contracts Manager West Hawaii Region Email ytaylor@hhsc.org Direct (808) 365-2415	Contracts Management Loretta Buasriyottiya, Office Asst V Email lbuasriyottiya@hhsc.org Direct (808) 322-6992
Agenda		
10:20 am – 10:30 am	Check in at the front of the Special Services Building for Visitor Badges (see Security Guards). Vendors must have a signed confidentiality agreement, either already submitted or brought to the meeting. A KCH representative will meet you.	
10:30 am to 11:15 am	Briefing including review of RFP documents	
11:15 am to 12:00 pm	Project site tour	



Map of Kona Community Hospital

APPENDIX G

RFP CONFERENCE RESERVATION FORM

Submit completed forms to Issuing Officer by the date shown in Figure 1 of the solicitation.

Conference Information	
RFP No:	HHSC 26-0600
RFP Title:	Kona Community Hospital – SSB 1st Floor HVAC and Interior Renovations

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

APPENDIX H

MANDATORY HOSPITAL CONFIDENTIALITY AGREEMENT

I understand that while being on the hospital campus, 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: _____

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APPENDIX I

PROJECT DRAWINGS

See following pages

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

79-1019 HAUKAPILA STREET, KEALAKEKUA, HI 96750
TMK: 7-9-010:081

BIDDING DOCUMENTS
03/30/2026

PROJECT TEAM

OWNER:
HAWAII HEALTH SYSTEMS CORP
79-1019 HAUKAPILA STREET
KEALAKEKUA, HI 96750
808.322.4442

ARCHITECT:
KYA INC.
934 PUMEHANA STREET
HONOLULU, HI 96826
808.949.7770

MECHANICAL/PLUMBING:
INATSUKA ENGINEERING LLC
1003 BISHOP STREET
SUITE 1960
HONOLULU, HI 96813
808.469.3200

ELECTRICAL:
ALBERT CHONG ASSOCIATES, INC.
1117 KAPAHULU AVENUE
HONOLUL, HI 96816
808.738.5355

KYA
CREATE + BUILD + INSPIRE
934 Pumehana Street, Honolulu, Hawaii 96826
Phone (808) 949-7770 Fax (808) 946-0334

DAVID T. TSUCHIDA
LICENSED PROFESSIONAL ARCHITECT
No. 5707
HAWAII, U.S.A.

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

LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT	DATE
1	-
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DRAWN BY:	CHECKED BY:
DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE
COVER SHEET

SHEET NO: 01 OF 26

DRAWING NO: T001

PROJECT NO: 224003.00

GENERAL NOTES

1. ALL WORK SHOWN IS EXISTING UNLESS OTHERWISE NOTED.
2. VERIFY ON SITE, ALL DIMENSIONS & EXISTING CONDITIONS PRIOR TO STARTING WORK. CONTRACTOR SHALL BE AWARE OF ALL EXISTING CONDITIONS INVOLVED IN THE WORK.
3. NOTIFY THE ARCHITECT IMMEDIATELY, IN WRITING, OF ANY DISCREPANCIES OR DEVIATIONS BETWEEN SPECIFICATIONS, DRAWINGS, AND EXISTING CONDITIONS IN THE FIELD INCLUDING, BUT NOT LIMITED TO, DIMENSIONS, ELEVATIONS AND CLEARANCES.
4. COMPLY WITH ALL APPLICABLE CITY, STATE AND FEDERAL LAWS, BUILDING CODES, THEIR ADDITIONS, ADDENDUMS AND AMENDMENTS IN THE CONSTRUCTION OF THIS PROJECT.
5. ALL DIMENSIONS INDICATED ARE MEASURED TO THE FACE OF FINISH UNLESS INDICATED OTHERWISE.
6. PATCH ALL SURFACES AFFECTED BY SELECTIVE DEMOLITION TO MATCH ADJACENT AND/OR EXISTING CONDITIONS UNLESS NOTED OTHERWISE.
7. CAUTION SHALL BE EXERCISED SO THAT NO EXISTING AREAS 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 ORIGINAL CONDITIONS AT NO COST TO THE OWNER.
8. EXCEPT WHERE OTHERWISE DIRECTED BY THE OWNER'S REPRESENTATIVE, ALL DISPLACED MATERIALS HAVING SALVAGE VALUE SHALL BE CAREFULLY AND NEATLY STACKED OR STORED ON THE PREMISES WHERE DIRECTED AND SHALL REMAIN THE PROPERTY OF THE OWNER. ALL DISMANTLED AND DEMOLISHED MATERIALS HAVING NO SALVAGE VALUE AS DETERMINED BY THE ARCHITECT, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE COMPLETELY REMOVED AND HAULED AWAY FROM THE PREMISES.
9. CONTRACTOR SHALL ERECT TEMPORARY BARRICADES & SIGNS WHICH SHALL BE CONSTRUCTED, PAINTED & MAINTAINED BY THE CONTRACTOR AS REQUIRED BY THE OWNER.
10. 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 OWNER'S REPRESENTATIVE. DELIVERY OF MATERIALS AND EQUIPMENT SHALL BE COORDINATED TO MINIMIZE DISRUPTION OF HOSPITAL OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL OF NOISE, DEBRIS AND DUST TO PREVENT DISRUPTION OF EXISTING HOSPITAL OPERATIONS. CONTRACTOR TO PROVIDE AND MAINTAIN SUITABLE BARRIERS AS REQUIRED TO PREVENT PUBLIC ENTRY, AND TO PROTECT THE WORK AND ADJACENT PROPERTIES FROM CONSTRUCTION OPERATIONS, & REMOVE WHEN NO LONGER REQUIRED.
11. WORKMANSHIP SHALL BE OF GOOD QUALITY IN ACCORDANCE TO INDUSTRY STANDARDS. NEW MATERIALS SHALL BE USED THROUGHOUT UNLESS OTHERWISE NOTED.
12. AREAS FOR CONTRACT ZONE LIMITS, MATERIALS STORAGE, SCHEDULING OF WORK, TRASH DISPOSAL, WORKMEN'S PARKING, ETC., SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. COORDINATE ALL WORK, SCHEDULING, STAGING, AND ADMINISTRATIVE REQUIREMENTS WITH THE OWNER'S REPRESENTATIVE.
13. THESE DRAWINGS SHALL COMPLY WITH THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN.
14. EXIT EGRESS SHALL BE IN COMPLIANCE OF CODE DURING CONSTRUCTION.
15. REMOVAL & SALVAGE OF SUSPENDED ACOUSTICAL CEILING PANEL, LIGHT FIXTURES, HVAC DIFFUSERS & REGISTERS SHALL BE DETERMINED BY THE CONTRACTOR, BASED ON LOCATION OF THE FIRE SPRINKLER BRANCH LINES, DEVELOPED BY THE FIRE SPRINKLER INSTALLER. CONTRACTOR TO MINIMIZE THE REMOVAL AND SALVAGE WORK IN ORDER TO MINIMIZE DISRUPTION TO THE SURROUNDING AREAS THAT ARE IN OPERATION.
16. WHERE REMOVAL OF WALLS/CEILINGS RESULTS IN ADJACENT SPACES BECOMING ONE, REWORK WALLS/CEILING TO A SMOOTH PLANE WITHOUT BREAKS, STEPS, OR BULKHEADS.
17. AT PENETRATIONS OF FIRE-RATED WALL/CEILING CONSTRUCTION, COMPLETELY SEAL ALL VOIDS WITH FIRE-RATED, FIRE-RESISTANT MATERIAL, FULL THICKNESS OF THE CONSTRUCTION ELEMENT.
18. PATCH OR REPLACE PORTIONS OF EXISTING SURFACES THAT ARE DAMAGED, LIFTED, DISCOLORED, OR SHOWING OTHER IMPERFECTIONS.
19. 1.14 PLAN REVIEW AND APPROVAL BY THE AHJ SHALL NOT RELIEVE THE APPLICANT OF COMPLIANCE WITH THIS CODE.
20. 1.3.6.3 REPAIRS, RENOVATIONS, ALTERATIONS, RECONSTRUCTION, CHANGES OF OCCUPANCY, AND ADDITIONS TO BUILDINGS SHALL CONFORM TO THIS CODE, NFPA 101, AND THE BUILDING CODE.
21. LIABILITY, 1.9.4 THIS CODE SHALL BE CONSTRUED TO RELIEVE FROM OR LESSEN THE RESPONSIBILITY OF ANY PERSON OWNING, OPERATING OR CONTROLLING ANY BUILDING OR STRUCTURE FOR ANY DAMAGES TO PERSONS OR PROPERTY CAUSED BY DEFECTS, NOR SHALL THE CODE ENFORCEMENT AGENCY OR ITS PARENT JURISDICTION BE HELD AS ASSUMING ANY SUCH LIABILITY BY REASON OF THE INSPECTIONS AUTHORIZED BY THIS CODE OR ANY PERMITS OR CERTIFICATES ISSUED UNDER THIS CODE.

PROJECT DATA

CLIENT:	KONA COMMUNITY HOSPITAL
OWNER:	HAWAII HEALTH SYSTEMS CORP.
PROPERTY ADDRESS:	79-1019 HAUKAPILA STREET KEALAKEKUA, HI 96750
LAND USE INFORMATION:	
TAX MAP KEY:	7-9-010: 081
LOT AREA	12.075 ACRE OR 525,987 FT
LOT ZONING:	A-5A, SLU: U
FRONT YARD:	25 FEET
SIDE & REAR YARD:	15 FEET
HEIGHT LIMIT:	55 FEET
LOT RESTRICTION:	NONE
FLOOD ZONE:	ZONE X
SMA:	NOT IN SMA
HISTORIC SITE REGISTER:	NONE
SPECIAL DESIGN DISTRICT:	NOT IN SPECIAL DISTRICT
STATE LAND USE:	U-URBAN
USE:	HOSPITAL

APPLICABLE CODES & STANDARDS:

HAWAII COUNTY CODES W/ SoH AMENDMENTS
2018 INTERNATIONAL EXISTING BUILDING CODE W/ STATE AMENDMENTS
2018 INTERNATIONAL BUILDING CODE W/ STATE AMENDMENTS
2018 NFPA 101, LIFE SAFETY CODE
2018 NFPA 99, HEALTH CARE FACILITIES CODE
2016 NFPA 80, STANDARD FOR FIRE DOORS AND OTHER OPENING PROTECTIVES
2018 NFPA 1, FIRE CODE
2016 NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
2013 NFPA 241, BUILDING CONSTRUCTION AND DEMOLITION OPERATIONS (SAFETY REQUIREMENTS CONSTRUCTION AND DEMOLITION)
2018 UNIFORM PLUMBING CODE (UPC) W/ LOCAL AMENDMENTS
2017 NATIONAL ELECTRIC CODE W/ LOCAL AMENDMENTS
2018 INTERNATIONAL ENERGY CONSERVATION CODE (IECC) W/ STATE AMENDMENTS
2018 GUIDELINES FOR DESIGN AND CONSTRUCTION OF HEALTH CARE FACILITIES (FACILITIES GUIDELINES INSTITUTE)
2010 ADA STANDARDS FOR ACCESSIBLE DESIGN
SECTION 103-50, HAWAII REVISED STATUES

FIRE SAFETY NOTES

FIRE SAFETY: STRUCTURES UNDERGOING CONSTRUCTION ALTERATION, OR DEMOLITION OPERATIONS, INCLUDING THOSE IN UNDERGROUND LOCATIONS, SHALL COMPLY WITH NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS AND THIS CHAPTER, 2018 NFPA 1.

FIRE SAFETY DURING ALTERATION PER 2018 NFPA 1, UON :

16.4.4.1 WHERE THE BUILDING IS PROTECTED BY FIRE PROTECTION SYSTEMS, SUCH SYSTEMS SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES DURING ALTERATION.

16.4.4.2 WHERE ALTERATION REQUIRES MODIFICATION OF A PORTION OF THE FIRE PROTECTION SYSTEM, THE REMAINDER OF THE SYSTEM SHALL BE KEPT IN SERVICE AND THE FIRE DEPARTMENT SHALL BE NOTIFIED.

16.4.4.3 WHEN IT IS NECESSARY TO SHUT DOWN THE SYSTEM, THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE ALTERNATE MEASURES OF PROTECTION UNTIL THE SYSTEM IS RETURNED TO SERVICE.

10.7.1.1 AS NECESSARY DURING EMERGENCIES, MAINTENANCE, DRILLS, PRESCRIBED TESTING, ALTERATIONS, OR RENOVATIONS, PORTABLE OR FIXED FIRE-EXTINGUSHING 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 SECTIONS 13.7.1.5.2, 34.6.3.3, 41.2.2.7, 41.2.2.6. 41.2.4, 41.3.5, 41.4.1, 34.5.4.3, AND 25.1.8 AT NO COST TO THE AHJ. 2018 NFPA 1, AS AMENDED.

13.7.1.1 WHERE BUILDING FIRE ALARM SYSTEMS OR AUTOMATIC FIRE DETECTORS ARE REQUIRED BY OTHER SECTIONS OF THIS CODE, THEY SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH NFPA 70, NFPA 72, NATIONAL FIRE ALARM CODE, AND SECTION 13.7.

13.7.1.9.6 UNLESS OTHERWISE PROVIDED IN 13.7.1.9.6.1 THROUGH 13.7.1.9.6.8, NOTIFICATION SIGNALS FOR OCCUPANTS TO EVACUATE SHALL BE BY AUDIBLE AND VISIBLE SIGNALS IN ACCORDANCE WITH NFPA 72 AND ICC/ANSI A117.1, ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, OR OTHER MEANS OF NOTIFICATION ACCEPTABLE TO THE AHJ.

18-5.2 RETENTION OF PLANS: ONE SET OF APPROVED PLANS, SPECIFICATIONS, AND COMPUTATIONS SHALL BE RETAINED BY THE BUILDING OFFICIAL FOR A PERIOD OF NOT LESS THAN 90 DAYS FROM DATE OF COMPLETION OF THE WORK COVERED THEREIN, AND ONE SET OF APPROVED PLANS SHALL BE RETURNED TO THE APPLICANT, AND SAID SET SHALL BE KEPT ON THE SITE OF THE BUILDING OR WORK AT ALL TIMES DURING WHICH THE WORK AUTHORIZED THEREBY IS IN PROGRESS. (SEC. 18-5.2 R.O. 1978 (1983 ED.)); (1990 Code, Ch. 18, Art. 5, § 18-5.2) (AM. ORD. 93-59)

INDEX TO DRAWINGS

GENERAL

SHT NO.	SHT NO.	SHEET NAME
01	T001	COVER SHEET, PROJECT TEAM INDEX
02	T002	GENERAL NOTES, FIRE SAFETY NOTES, LOCATION MAP, VICINITY MAP,PROJECT DATA, SHEET INDEX
03	T003	ABBREVIATIONS, PLAN SYMBOLS & DWG SYMBOLS
04	T004	SITE PLAN & BLDG. INFO.
05	T005	FIRST FLOOR LIFE SAFETY PLAN
06	T006	FIRST FLOOR PHASING PLAN

ARCHITECTURAL

	SHT NO.	SHEET NAME
07	A001	FIRST FLOOR DEMOLITION PLAN
08	A002	FIRST FLOOR DEMOLITION REFLECTED CEILING PLAN
09	A101	FIRST FLOOR PLAN
10	A102	FIRST FLOOR REFLECTED CEILING PLAN
11	A501	TYPICAL PARTITION TYPES AND DETAILS
12	A502	DOOR & WINDOW DETIALS
13	A503	CEILING & MISC. DETAILS
14	A601	DOOR SCHEDULES & TYPES
15	A602	ROOM FINISH SCHEDULE, COLOR & MATERIAL SCHEDULE

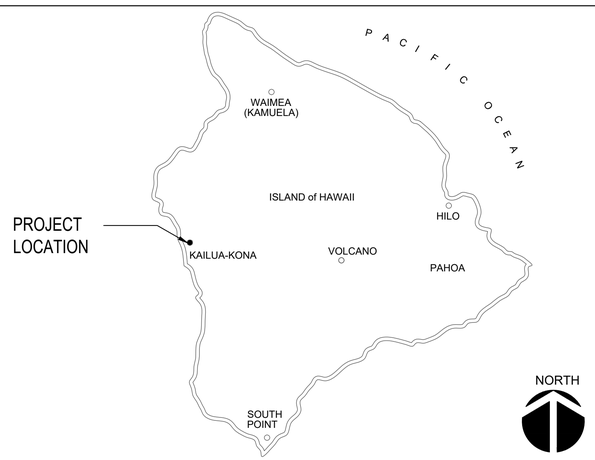
MECHANICAL

	SHT NO.	SHEET NAME
16	M001	LEGEND AND NOTES
17	M002	SCHEDULES
18	M101	SSB FIRST FLOOR HVAC PLAN DEMOLITION
19	M201	SSB FIRST FLOOR HVAC PLAN NEW WORK
20	M301	DETAILS
21	M302	HVAC DIAGRAMS

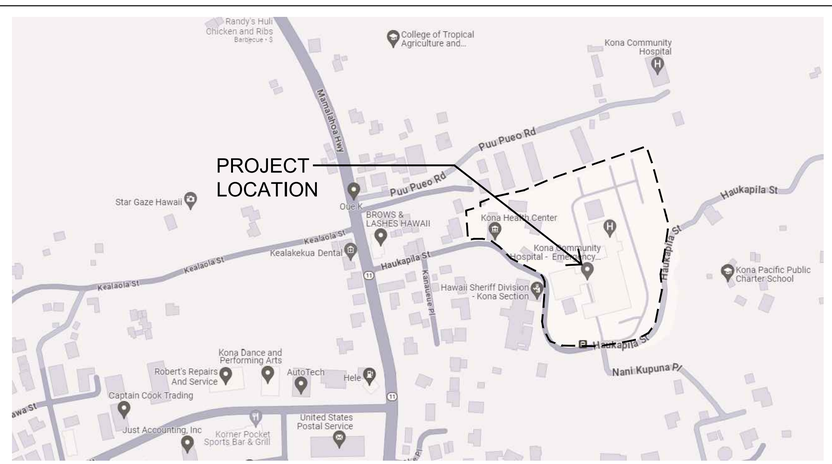
ELECTRICAL

	SHT NO.	SHEET NAME
22	E000	ELECTRICAL SYMBOLS LIST
23	E101	FIRST FLOOR LIGHTING DEMOLITION PLAN
24	E102	FIRST FLOOR POWER AND SIGNAL DEMOLITION PLAN
25	E201	FIRST FLOOR NEW LIGHTING PLAN
26	E202	FIRST FLOOR NEW POWER AND SIGNAL PLAN

LOCATION MAP



VICINITY MAP



KYA
CREATE + BUILD + INSPIRE
934 Pumehana Street, Honolulu, Hawaii 96826
Phone (808) 949-7770 Fax (808) 946-0334

DAVID T. TSUCHIDA LICENSED PROFESSIONAL ARCHITECT No. 5707 HAWAII, U.S.A.

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

LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT DATE	
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DRAWN BY:	CHECKED BY:
DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE

GENERAL NOTES, FIRE SAFETY NOTES, LOCATION MAP, VICINITY MAP, PROJECT DATA & SHEET INDEX

SHEET NO: 02 OF 26

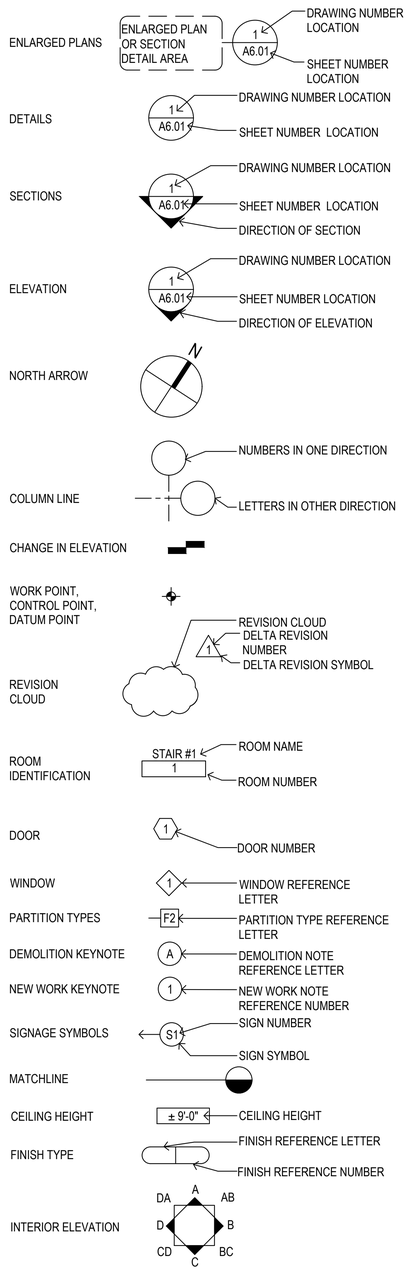
DRAWING NO: T002

PROJECT NO: 224003.00

ABBREVIATIONS

&	AND
∠	ANGLE
@	AT
℄	CENTERLINE
⌊	CHANNEL
°	DEGREES
Ø	DIAMETER or ROUND
±	PLUS/MINUS
#	POUND or NUMBER
℔	PROPERTY LINE
AASS	ALARMED AUTOMATIC SUPPRESSION SYSTEM
ABV	ABOVE
AC	ASPHALT CONCRETE
A/C	AIR CONDITIONING
ACM	ASBESTOS CONTAINING MATERIALS
ACT	ACOUSTICAL CEILING TILE
AD	AREA DRAIN
ADJ	ADJUSTABLE
AF	ACCESS FLOOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISH GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
AP	ACCESS PANEL
APRX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ASPH	ASPHALT
ASSY	ASSEMBLY
BD	BOARD
BVL	BEVELED
BIT	BITUMUOUS
BIOMED	BIO MEDICAL
BKS	BACKSPLASH
BL	BUILDING LINE
BLW	BELOW
BLDG	BUILDING
BM	BEAM
BOT	BOTTOM
BRG	BEARING
BS	BOTH SIDES
BTW	BETWEEN
C/C (CC)	CENTER TO CENTER
CAB	CABINET
CATH	CATHETER
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CJT	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLO	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
COND	CONDITION
CONF	CONFERENCE
CONX	CONNECTION
CONST	CONSTRUCTION
CORR	CORRIDOR
COUNS	COUNSELOR
CPT	CARPET
CRM	CONCRETE ROCK MASONRY
CSWK	CASEWORK
CT	CERAMIC TILE
CTR	CENTER
CTSK	COUNTERSINK
DB	DECIBEL
DBL	DOUBLE
DF	DRINKING FOUNTAIN
DIAG	DIAGONAL
DIM	DIMENSION
DISP	DISPENSER
DIV	DIVISION
DN	DOWN
DP	DAMPPROOFING
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DWG	DRAWING
E	EAST
EA	EACH
EF	EXHAUST FAN
ECT	ELECTROCONVULSIVE THERAPY
EFG	ENTRANCE FOOT GRILLE
EXST.	EXIST / EXISTING
EG	EXISTING GRADE
EGS	EXPOSED GRID SYSTEM
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATOR 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
EXST	EXISTING
EXT	EXTERIOR
EXTD	EXTRUDED
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FFE	FURNITURE, FIXTURE & EQUIPMENT
FFS	FINISH FLOOR SEPARATION
FP	FIRE PROTECTION
FIN	FINISH
FLR	FLOOR
FLEX	FLEXIBLE
FLASH'G	FLASHING
FLRG	FLOORING
FMS	FIRE MANAGEMENT SYSTEM
FOS	FACE OF STUD
FOW	FACE OF WALL
FPRF	FIREPROOF
FR	FRAME
FT	FOOT/FEET
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GL	GLASS
GLAZ'G	GLAZING
GR	GRADE
GYP	GYPSUM
G.W.B.	GYPSUM WALL BOARD
H	HIEGHT
H.C.	HANDICAPPED
HD	HEAD
HDWE	HARDWARE
HDWD	HARDWOOD
HM	HOLLOW METAL
HNDRL	HANDRAIL
HORIZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HSKP	HOUSEKEEPING
HGT	HEIGHT
HWH	HOT WATER HEATER
IAW	IN ACCORDANCE WITH
ID	INSIDE DIAMETER IDENTIFICATION
IF	INSIDE FACE
IG	INSULATED GLASS
IN	INCHES
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
J.C.	JANITOR CLOSET
JT	JOINT
L	LEFT
LAB	LABORATORY
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/MANUF	MANUFACTURER
MGR	MANAGER
MH	MOUNTING HEIGHT
MIN	MINIMUM
MISC	MISCELLANEOUS
MLDG	MOULDING
MLWK	MILL WORK
MM	MILIMETER
MO	MASONRY OPENING
MS	METAL STUD
MR	METAL RAILING
MTD	MOUNTED
MTG	MEETING
MTL (MET)	METAL
MULL	MULLION
N	NORTH
N/A	NOT APPLICABLE
N/R	NON-RATED
NC	NO CHANGE
NIC	NOT IN CONTRACT
NO / #	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTE	NOT TRUE ELEVATION
NTS	NOT TO SCALE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OD	OVERFLOW DRAIN
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OVERHEAD
OPNG (OPG)	OPENING
OPP	OPPOSITE
OPH	OPPOSITE HAND
OR	OPERATION ROOM
OS	ONE SIDE
OVHG	OVERHAND
OVS	OVERFLOW SCUPPER
PFI	PLAN FOR IMPROVEMENT
PICC	PERIPHERALLY INSERTED CENTRAL CATHETER
PJ	PANEL JOINT
PL	PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLBG	PLUMBING
PNL	PANEL
POL	POLISHED
POST-OP	POST OPERATION
PR	PAIR
PREFAB	PREFABRICATED
PRG:	PROGRAMMABLE SQUARE FOOTAGE
PROJ	PROJECTED
PT	POINT
PNT	PAINT
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PVMT	PAVEMENT
QTY	QUANTITY
R	RISER
RAD	RADIUS
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RDL	ROOF DRAIN LEADER
REC	RECESSED
RECT	RECTANGULAR
REFL	REFLECTED
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
SC	SECURE CORRIDOR
SCD	SEE CIVIL DRAWINGS
SCHED	SCHEDULE
SCWD	SOLID CORE WOOD DOOR
SECT	SECTION
SEC/WAIT	SECRETARY/WAITING
SESD	SEE ELECTRICAL/SECURITY DRAWINGS
SF	SQUARE FOOT
SH	SHELF/SHELVES
SHT	SHEET
SHWR	SHOWER
SIM	SIMILAR
SJ	SEISIC 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
SS	STAINLESS STEEL
S.T.	STAFF TOILET STAGGERED
STA/STN	STATION
STAG	STAGGERED
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STO	STORAGE
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SVCS	SERVICES
SYS	SYSTEM
T	TREAD
T&B	TOP AND BOTTOM
TBS	TO BE SELECTED
TEMP	TEMPERED
TEX	TEXTURE
THK	THICK
THRESH	THRESHOLD
TKB	TACKBOARD
TLT	TOILET
TOC	TOP OF CONCRETE
TOE	TOP OF EAVE
TOF	TOP OF FLOOR
TOM	TOP OF MASONRY
TOS	TOP OF SLAB
TOW	TOP OF WALL
TP	TOILET PARTITION
TPD	TOILET PAPER DISPENSER
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
VENT	VENTILATION
VERT	VERTICAL
VEST	VESTIBULE
VRC	VERTICAL CONVEYOR
VTR	VENT TO ROOF
W	WEST WIDTH
W/	WITH
WO	WHERE OCCURS
WC	WATER CLOSET OR WALL COVERING
WD	WOOD
WDW	WINDOW
WM	WATER MESH
WO	WHERE OCCURS
WP	WATERPROOF
WPG	WATERPROOFING
WS	WOOD STUDS
YD	YARD

DRAWING SYMBOLS



IECC CERTIFICATION

HAWAI'I COUNTY CODE ENERGY CODE
2018 IECC, HAWAII REVISED STATUTES HRS 107-24 TO 28 & HAWAII 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:

STATE AMENDMENTS: EFFECTIVE FOR NEW APPLICATIONS BEGINNING 09/01/2021
COUNTY AMENDMENTS: PENDING

COMPLIANCE METHOD

- [X] 2018 IECC as amended. Mandatory & Prescriptive
- [ ] 2018 IECC as amended. Mandatory & Total Building Performance
- [ ] ASHRAE Standard 90.1-2016. Mandatory & Prescriptive
- [ ] ASHRAE Standard 90.1-2016. 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

Signature: _____ Date: 03/2602026 Stamp, Date & Two-Part Statement

Name: DAVID T. TSUCHIDA
Title: LICENSED PROFESSIONAL ARCHITECT
License No.: 5707
Project Name: KCH - FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION
Project TMK: (3) 7-9-010:081

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DAVID T. TSUCHIDA LICENSED PROFESSIONAL ARCHITECT No. 5707 HAWAII, U.S.A.

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LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT

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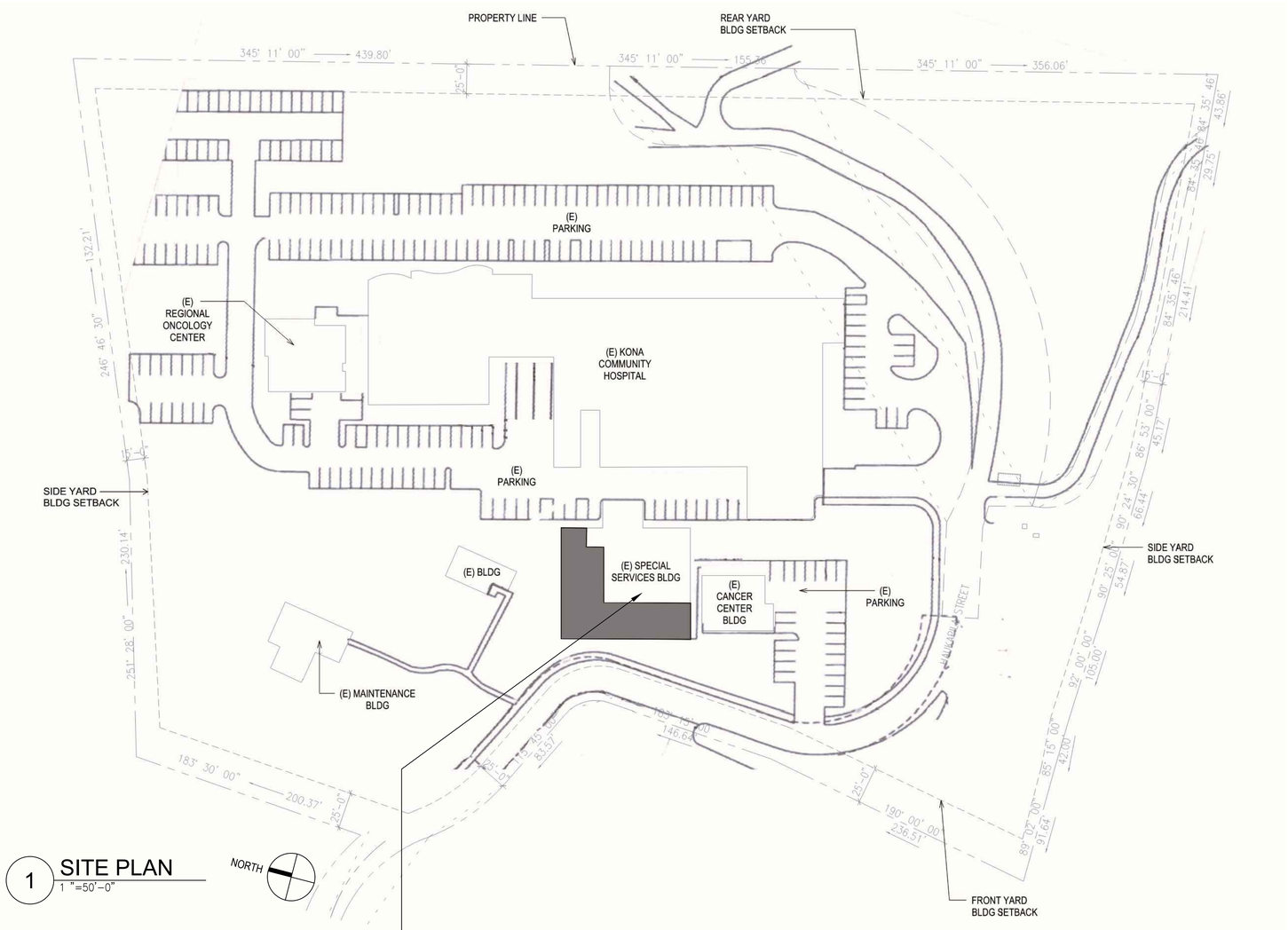
SHEET TITLE

ABBREVIATIONS, PLAN SYMBOLS & DWG SYMBOLS

SHEET NO: 03 OF 26

DRAWING NO: T003

PROJECT NO: 224003.00



1 SITE PLAN
1 "=50'-0"

PROJECT LOCATION :

TAX KEY MAP: 7-9-010: 081 KONA COMMUNITY HOSPITAL
79-1019 HAUKAPILA STREET
KEALAKEKUA, HI 96750

BUILDING NAME: SPECIAL SERVICES BUILDING (SSB)
BUILT: 1996 (UBC 1991, ORIGINAL CODE)
OCCUPANCY:
IBC 2018: FIRST FLOOR: (E) BUSINESS GROUP B, NO CHANGE
GROUND FLOOR: (E) BUSINESS GROUP B &
(E) ASSEMBLY GROUP A-3, NO CHANGE

CONSTRUCTION TYPE:
UBC, 1991: TYPE II-N
IEBC 2018: TYPE II-B
NFPA 101-2018: TYPE II (000)

FLOOR LEVELS: 00-01
NUMBER OF STORIES: 02

AUTOMATIC FIRE
SPRINKLER SYSTEM: N/A, NOT REQUIRED, NO CHANGE

OVERALL BLDG SF: (E) 17,754 SF, NO CHANGE
GROUND FLOOR: (E) 8,877 SF
FIRST FLOOR: (E) 8,877 SF

PROJECT RENOVATION SF: FIRST FLOOR: 4,825 SF

PROJECT AREA USES: (E) BUISNESS GROUP B, NO CHANGE

TABLE 601: FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS

BUILDING ELEMENT	TYPE II-B
PRIMARY STRUCTURAL FRAME	0
BEARING WALLS EXTERIOR	0
BEARING WALLS INTERIOR	0
NONBEARING WALLS AND PARTITIONS EXTERIOR	0
NONBEARING WALLS AND PARTITIONS INTERIOR	0
FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS	0
ROOF CONSTRUCTION AND ASSOCIATED SECONDARY MEMEBERS	0

TABLE 1020.1 CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OL SERVED	REQUIRED FIRE-RESISTANCE
RATING WITHOUT SPRINKLER		
FIRST FLOOR: B	GREATER THAN 30	1
GROUND FLOOR: B, A	GREATER THAN 30	1

EXIST DESIGN LOADS PER UBC 1991

BASIC WIND SPEED: 80 MPH
SEISMIC: ZONE 3
BUILDING: RISK CATEGORY II
PARTITIONS: 5 PSFS
LIVE LOADS:
ROOF 20 PSF
FLOOR 100 PSF (THRUOUT)

DESIGN LOADS PER IBC 2018

WIND: ASCE 7-16;
BASIC WIND SPEED: 130 MPH
WIND TOPOGRAPHIC FACTOR: 1.2 -1.3 Kzt
WIND DIRECTIONALITY FACTOR: 0.70
EXPOSURE C
PARTIALLY ENCLOSED STRUCTURE
SEISMIC DESIGN: CATEGORY E
BUILDING: RISK CATEGORY II
PARTITIONS: 5 PSFS
LIVE LOADS: (IBC TABLE 1607.1)
ROOF 20 PSF
OFFICE 100 PSF

CODE ANALYSIS:

ORIGINALLY BUILT UNDER UBC 1991

PROJECT SCOPE
EXIST OCCUPANCY IS GROUP B. PROJECT SCOPE DOES NOT CHANGE THE USE OR OCCUPANCY :

PER 2018 IEBC CHAPTER 2 DEFINITIONS,THE RENOVATION **DOES NOT** RESULT IN THE FOLLOWING AND THEREFORE IS NOT CONSIDERED A CHANGE IN OCCUPANCY:

1. A CHANGE OF OCCUPANCY.
2. A CHANGE FROM ONE GROUP TO ANOTHER GROUP WITHIN AN OCCUPANCY CLASSIFICATION.
3. ANY CHANGE IN USE WITHIN A GROUP FOR WHICH THERE IS A CHANGE IN APPLICATION OF REQUIREMENTS OF THIS CODE.

(E) OFFICE SPACE IS CONVERTED TO OUTPATIENT CLINIC (PROVIDES MEDICAL CARE ON LESS THAN A 24 HOUR BASIS TO PERSONS WHO ARE NOT RENDERED REQUIRES CHANGE IN HVAC REQMTS AND ELECTRICAL PARTITION WALL LOCATIONS.

THE RENOVATION OF 4,825 SF AT FIRST LEVEL **DOES NOT**:
1. MODIFY (E) EXIT ROUTES
2. ADD FLOOR AREA TO (E) BUILDING
3. CHANGE BUILDING TO A HIGHER RISK CATEGORY
4. ADD LOADS TO (E) STRUCTURAL ELEMENTS
5. REPLACE OR ADD STRUCTURAL ELEMENTS
6. REPLACE THE (E) ROOF OR PORTION OF ROOF
7. EXCEED 50 PERCENT OF THE (E) BUILDING AREA (17,754 SF). **SEE SHEET T-05** FOR PROJECT'S AREA OF WORK.
8. REQUIRE FIRE SPRINKLER SYSTEM
   - ALTERATIONS MEET EGRESS REQUIREMENTS FOR NON-SPRINKLERED BUILDING (SEE SHEET T-04 AND T-05).
   - ALTERATIONS MEET REQUIREMENTS TO BE CLASSIFIED AS A GROUP B OCCUPANCY, AND EACH BUILDING STORY EXITS AT GRADE (IBC SECTION 903.2.2).

2018 IEBC CHAPTER 3: PROVISIONS FOR ALL COMPLIANCE METHODS
2018 IEBC CHAPTER 5: PERSCRIPTIVE COMPLIANCE METHOD

PERSCRIPTIVE COMPLIANCE METHOD USED (IEBC 301.3.1)

1. EXIST BUILDING TO COMPLY WITH INTERNATIONAL FIRE CODE (IFC)
2. ALTERATIONS TO COMPLY WITH **CHAPTER 5** (PER IEBC SECTION 301.3.1)
3. ALTERATIONS TO COMPLY WITH THE **SECTION 103-50 HAWAII REVISED STATUES, 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN,** (PER IEBC SECTION 301.5 & 305)

2018 IEBC SECTION 302 GENERAL PROVISIONS

BUILDING ALTERATIONS AND REPAIRS COMPLY WITH THE PROVISIONS IN THE **IECC** (CHAPTER 5D HAWAII COUNTY CODE, **IFC** (CHAPTER 26 HAWAII COUNTY CODE), **IMC, IPC** (CHAPTER 5F HAWAII COUNTY CODE **, AND NFPA 70.**
(PER IEBC SECTION 302.3)

SEE MECH AND ELEC DRAWINGS FOR DUCT DAMPERS AND FIRE ALARM AND DETECTION SYSTEM INFORMATION.

EXISTING MATERIALS ALREADY IN USE PERMITTED TO REMAIN. (PER IEBC SECTION 302.4)

NEW AND REPLACEMENT MATERIALS TO COMPLY WITH MATERIALS PERMITTED BY THE APPLICABLE CODE FOR NEW CONSTRUCTION. (PER IEBC SECTION 302.5 & 702.1)

NEW CONSTRUCTION ELEMENTS COMPONENTS, SYSTEMS, AND SPACES TO COMPLY WITH THE REQMNTS OF IBC. (PER IEBC SECTION 503.1)

2018 IEBC SECTION 303 STRUCTURAL DESIGN LOADS & EVALUATION & DESIGN PROCEDURES
2018 IEBC SECTION 503 ALTERATIONS

BUILDING IS NOT IN A FLOOD HAZARD ZONE AND ALTERATIONS DO NOT CHANGE THE LOADS ON THE EXISTING STRUCTURAL ELEMENTS, NOR DO THEY CHANGE THE EXIST GRAVITY LOAD CARRYING ELEMENTS (IEBC SECTION 503.3) THEY DO NOT INCLUDE NEW STRUCTURAL WORK OR REROOFING WORK. THE WORK AREA DOES NOT EXCEED 50 PERCENT OF THE BUILDING AREA.THEREFORE EXST GRAVITY LOAD-CARRYING STRUCTURAL ELEMENTS ARE PERMITTED TO REMAIN AND A NEW ANALYSIS OF STRUCTURAL SYSTEMS IS NOT REQUIRED.
(PER IEBC SECTIONS 303.1 & 503.1 THROUGH 503.13)

ALTERATIONS DO NOT CAUSE INCREASED LIVE LOADS OR CAUSE EXIST STRUCTURE BE ASSIGNED TO A HIGHER RISK CATEGORY. THEREFORE EXIST STRUCTURE NEED NOT COMPLY WITH CHAPTER 16. (PER IEBC SECTION 506.4 & 1006)

2018 IEBC SECTION 305 ACCESSIBILITY FOR EXISTING BUILDINGS

ALTERATIONS DO NOT AFFECT ACCESSIBLE ENTRANCE OR ROUTE TO PRIMARY FUNCTION AREAS. ENTRANCE AND ROUTE TO REMAIN ACCESSIBLE.
(PER IEBC SECTION 305.7 & 305.8.1)

2018 IEBC SECTION 503.5 CARBON MONOXIDE ALARMS

NO SLEEPING UNITS OR DWELLING UNITS. CARBON MONOXIDE ALARMS ARE NOT REQUIRED.

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HAWAII, U.S.A.

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LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT	
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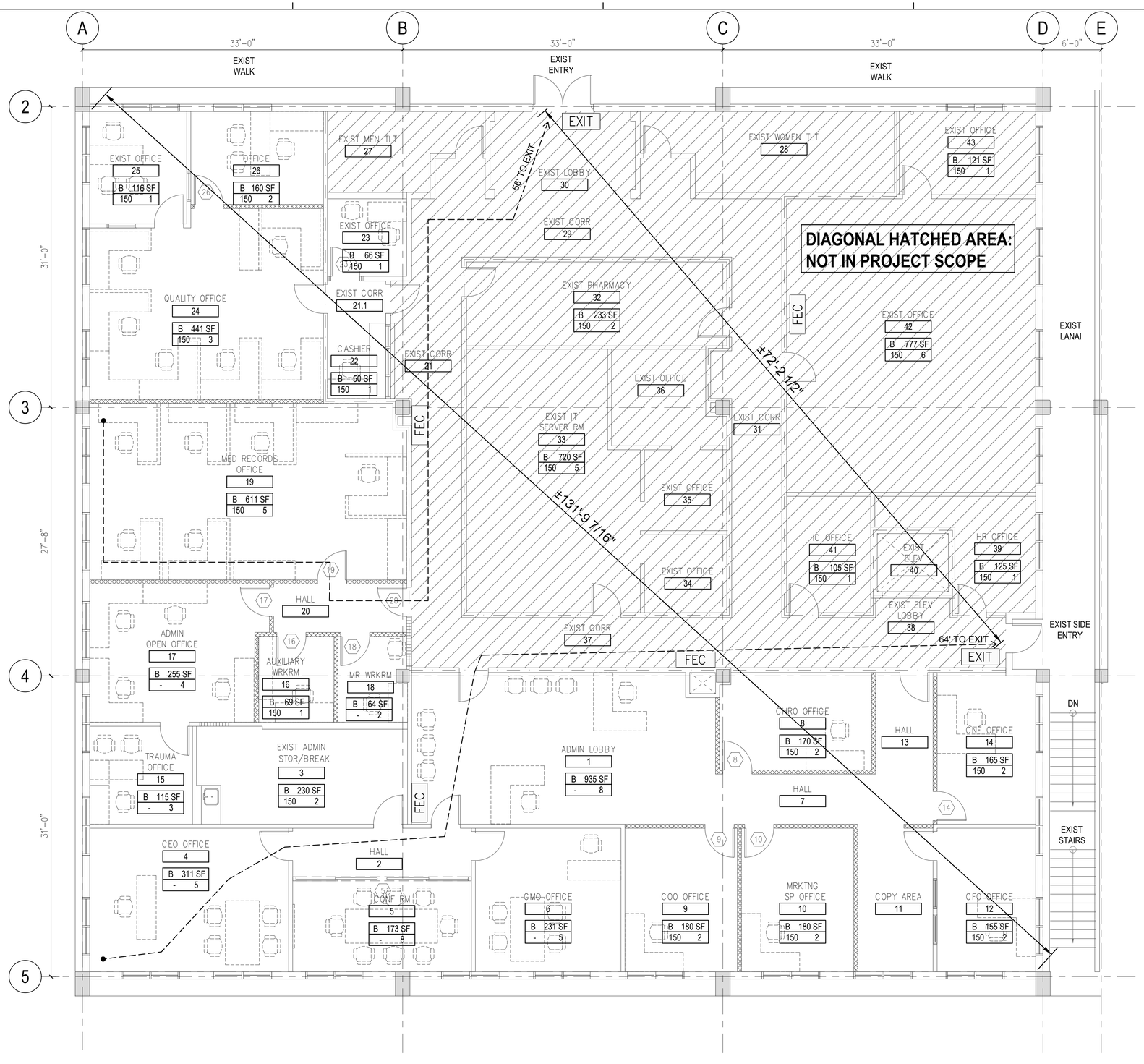
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SITE PLAN & BLDG. INFO.
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SHEET NO: 04 OF 26

DRAWING NO: T004

PROJECT NO: 224003.00



1 FIRST FLOOR LIFE SAFETY PLAN
3/16"=1'-0"

OCCUPANCY LOAD AREA FACTORS		
OCCUPANCY	B	
AREA FACTOR	150	
SPACE	**AREA (SF)**	**OCCUPANT LOAD**
PROJECT AREA		
ADMIN OFFICE	2,730	35
ADMIN OPEN OFFICE	255	4
TRAUMA OFFICE	115	3
MED RECORDS OFFICE	611	5
AUXILIARY WRKRM	89	1
MR WRKRM	69	1
QUALITY OFFICE	800	7
CASHIER	50	1
NOT IN SCOPE AREA		
EXIST PHARMACY	233	2
EXIST IT SERVER RM	720	5
EXIST OFFICE	900	7
IC OFFICE	125	1
HR OFFICE	105	1
CORR CIRCULATION	1,265	N/A
TOTAL	**8,067**	**66**

EGRESS ANALYSIS

FIRST FLOOR (NOTE: BOTH STORY LEVELS HAVE AN EXIT DISCHARGE AT GRADE)

PER IBC SECTION 304
GROUP B - BUSINESS OCCUPANCY

PER IBC TABLE 1004.5:
OCCUPANT LOAD FOR FIRST FLOOR
(SEE OCCUPANT LOAD AREA FACTORS TABLE FOR CALCULATION BREAKDOWN)
66 OCCUPANCT

PER IBC SECTION 1005.3.1
MINIMUM OCCUPANT CALCULATED EGRESS STAIRWAY WIDTH REQUIRED
0.3 INCHES PER OCCUPANT = 0.3 X 66 = 19.8 INCHES
MINIMUM STAIRWAY REQUIRED WIDTH NOT LESS THAN **44 INCHES** (SECTION 1011.2)
MINIMUM WIDTH PROVIDED.

PER IBC SECTION 1005.3.2
OTHER MINIMUM OCCUPANT CALCULATED EGRESS COMPONENT WIDTH REQUIRED
0.2 INCHES PER OCCUPANT = 0.2 X 66 =13.2 INCHES
MINIMUM EXIT DOOR CLEAR OPENING WIDTH REQUIRED = **32 INCHES** (SECTION 1010.1.1)
MINIMUM EXIT PROVIDED. SEE EGRESS DOOR TAGS.

PER IBC TABLE 1006.3.2
MINIMUM # OF EXITS AND EXIT ACCESS DOORWAYS REQUIRED = 2
MINIMUM # OF EXITS AND EXIT ACCESS DOORWAYS PROVIDED = 2 (EXIST)

PER IBC TABLE 1007.1.1
MAXIMUM DIAGONAL DISTANCE ACROSS FLOOR PLATE = 131'-8"
MINIMUM REQUIRED EGRESS DIVERSITY: 131'-10"/ 2 = 65'-11" (NON SPRINLKERED)
MINIMUM EGRESS DIVERSITY PROVIDED = 72'-2" (EXIST)

PER IBC TABLE 1017.2
MAXIMUM EXIT ACCESS TRAVEL DISTANCE = 200 FT
LONGEST ACTUAL EXIT ACCESS TRAVEL DISTANCE = 94 FT

PER IBC TABLE TABLE 1020.1
MINIMUM CORRIDOR FIRE-RESISTANCE RATING
OL GREATER THAN 30 (NON SPRINKLERED) = 1HR FIRE RATING
MINIMUM CORRIDOR FIRE-RESISTANCE RATING PROVIDED = 1 HR FIRE RATING (EXIST)

TABLE 1020.2
MINIMUM CORRIDOR WIDTH REQUIRED = 44 INCHES
CORRIDOR WIDTH PROVIDED = 62 INCHES (EXIST)

PER IBC 1005.3.2
OFFICE SPACE DOORS ALLOWED TO SWING IN OPPOSITE DIRECTION OF EGRESS DUE TO SPACES HAVING LESS THAN 50 PERSONS.

PER IBC TABLE 1006.2.1
ADMIN OFFICE:
MAXIMUM OCCUPANT LOAD 49 > 35
MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE = 75' (NON-SPRINKLERED AND OL>30)
2 EXITS (EXIST) PROVIDED TO MEET DEAD END REQUIREMENTS.

PER IBC SECTION 1006.3.2
1-500 OL PER STORY REQUIRES MINIMUM OF 2 EXITS OR ACCESS TO EXITS.
2 EXITS (EXIST) FROM FIRST FLOOR PROVIDED.

0 2' 4' 6' 13'
3/16"=1'-0"

NORTH

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DAVID T. TSUCHIDA LICENSED PROFESSIONAL ARCHITECT No. 5707 HAWAII, U.S.A.

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LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
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FIRST FLOOR
LIFE SAFETY PLAN
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SHEET NO: 05 OF 26

DRAWING NO: T005

PROJECT NO: 224003.00



1 FIRST FLOOR PHASING PLAN

3/16"=1'-0"

0 2' 4' 6' 13'

3/16"=1'-0"

NORTH

KYA

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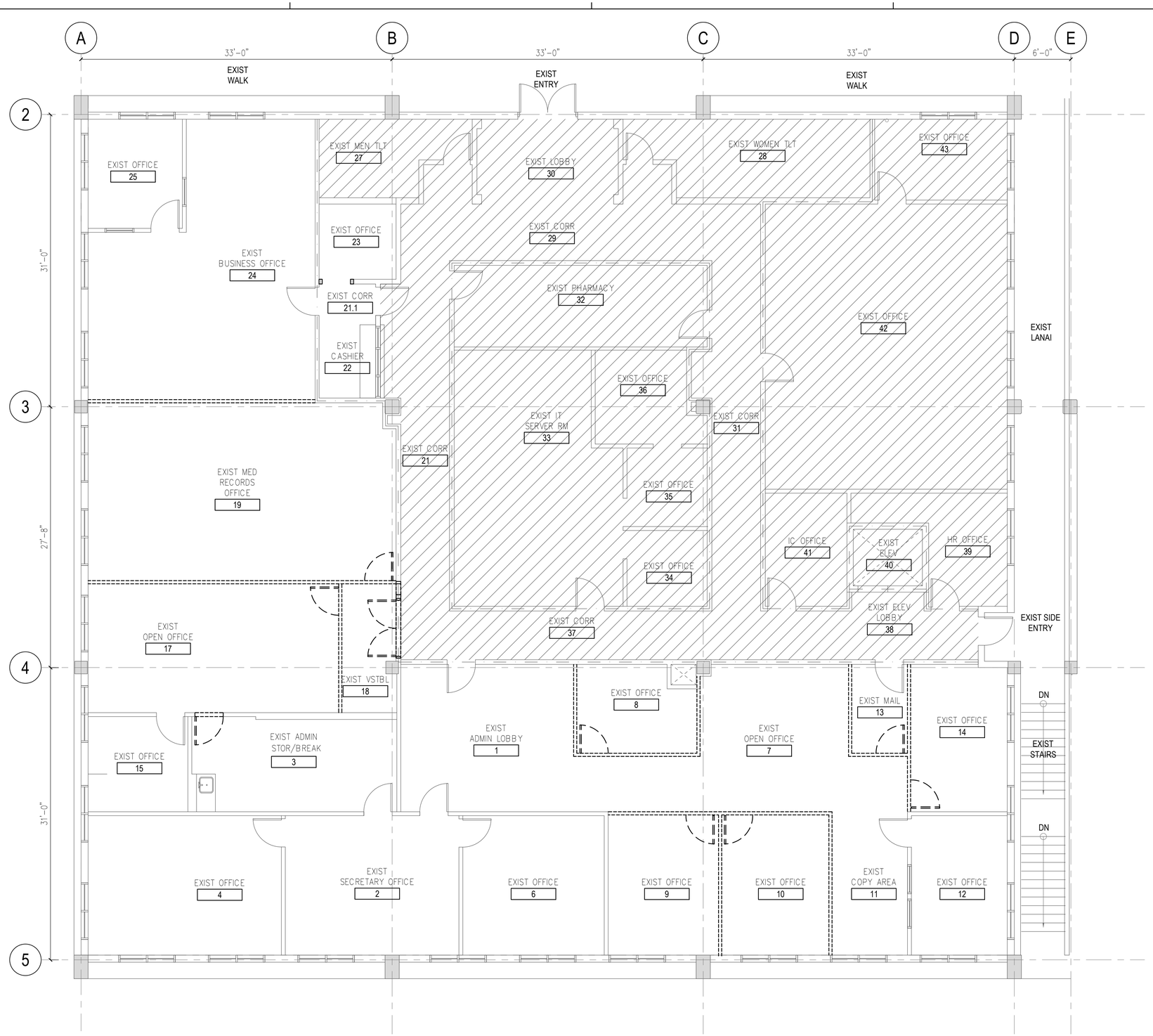
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FIRST FLOOR
LIFE SAFETY PLAN
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SHEET NO: 06 OF 26

DRAWING NO: T006

PROJECT NO: 224003.00



1 FIRST FLOOR DEMOLITION PLAN
3/16 "=1'-0"

0 2' 4' 6' 13'
3/16"=1'-0"

NORTH

GENERAL DEMOLITION NOTES

1. EXIT EGRESS SHALL BE IN COMPLIANCE OF CODE DURING CONSTRUCTION; REFER TO SHEET T005 FOR DETAILS
2. RENOVATION TO BE COMPLETED IN PHASES; REFER TO SHEET T006 FOR PHASING PLAN
3. EXISTING FURNITURE THAT ARE NOT SPECIFIED IN THE DRAWINGS SHALL BE SALVAGED BY OWNER
4. EXISTING ELECTRONIC DEVICES: PRINTER, FAX MACHINE, COMPUTER TERMINALS, TELEPHONES, SCANNERS, ETC. TO BE SALVAGED BY OWNER
5. EXISTING WOOD PARTITION AND TEMPORARY PARTITION TO BE SALVAGED BY OWNER
6. CONTRACTOR TO DEMOLISH EXISTING FLOOR BASE IN PROJECT AREA.

DEMOLITION LEGEND

- DIAGONAL HATCHED AREA NOT IN SCOPE
- EXIST. WALLS
- EXIST. DOORS
- EXIST. GLAZING
- DEMO DOOR, DOOR FRAME AND ASSOCIATED HARDWARE
- OWNER TO REMOVE TEMPORARY PARTITION & MODULAR WOOD PARTITION

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PROJECT

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FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

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PROJECT	
DATE -	

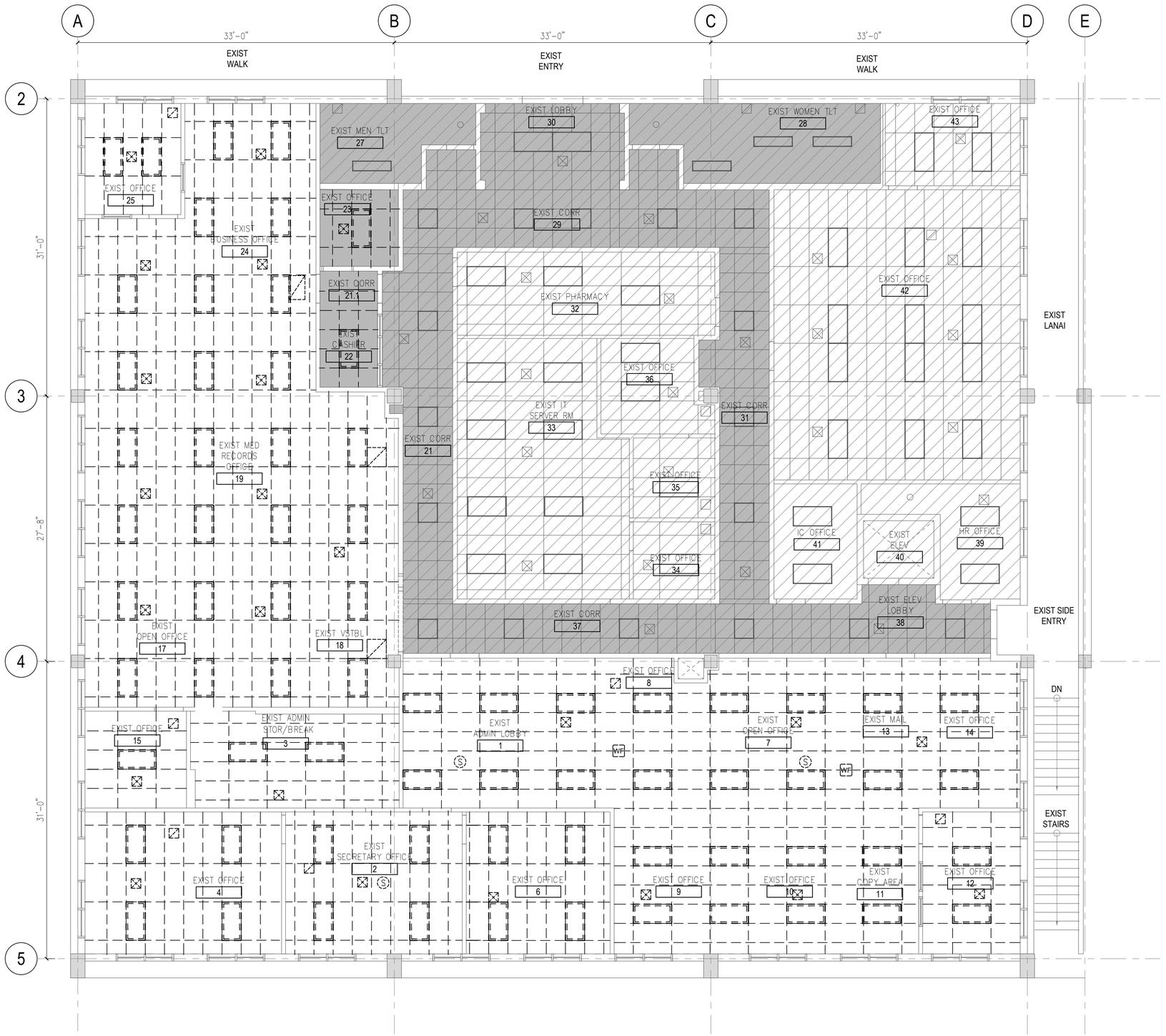
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FIRST FLOOR DEMOLITION PLAN
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SHEET NO: 07 OF 26

DRAWING NO: A001

PROJECT NO: 224003.00



1 FIRST FLOOR DEMOLITION REFLECTED CEILING PLAN
3/16 "=1'-0"

GENERAL DEMOLITION NOTES

1. EXIT EGRESS SHALL BE IN COMPLIANCE OF CODE DURING CONSTRUCTION; REFER TO SHEET T005 FOR DETAILS.
2. RENOVATION TO BE COMPLETED IN PHASES; REFER TO SHEET T006 FOR PHASING PLAN.
3. EXISTING FURNITURE THAT ARE NOT SPECIFIED IN THE DRAWINGS SHALL BE SALVAGED BY OWNER.
4. EXISTING ELECTRONIC DEVICES: PRINTER, FAX MACHINE, COMPUTER TERMINALS, TELEPHONES, SCANNERS, ETC. TO BE SALVAGED BY OWNER.
5. EXISTING WOOD PARTITION AND TEMPORARY PARTITION TO BE SALVAGED BY OWNER.

DEMOLITION LEGEND

- DIAGONAL HATCHED AREA NOT IN SCOPE
- EXIST. WALLS
- DEMO ACOUSTICAL CEILING TILE AND GRID
- REMOVE 2X4 CEILING LIGHT FIXTURE, SEE ELEC. DWGS.
- REMOVE SUPPLY AIR DIFFUSER, SEE MECH. DWGS.
- REMOVE AIR REGISTER, SEE MECH. DWGS.
- (S) REMOVE CEILING SPEAKER, SEE ELEC. DWGS.
- WF REMOVE WIFI ROUTER, SEE ELEC. DWGS.

INTERIOR ELEVATION KEY

0 2' 4' 6' 13'
3/16"=1'-0"

NORTH

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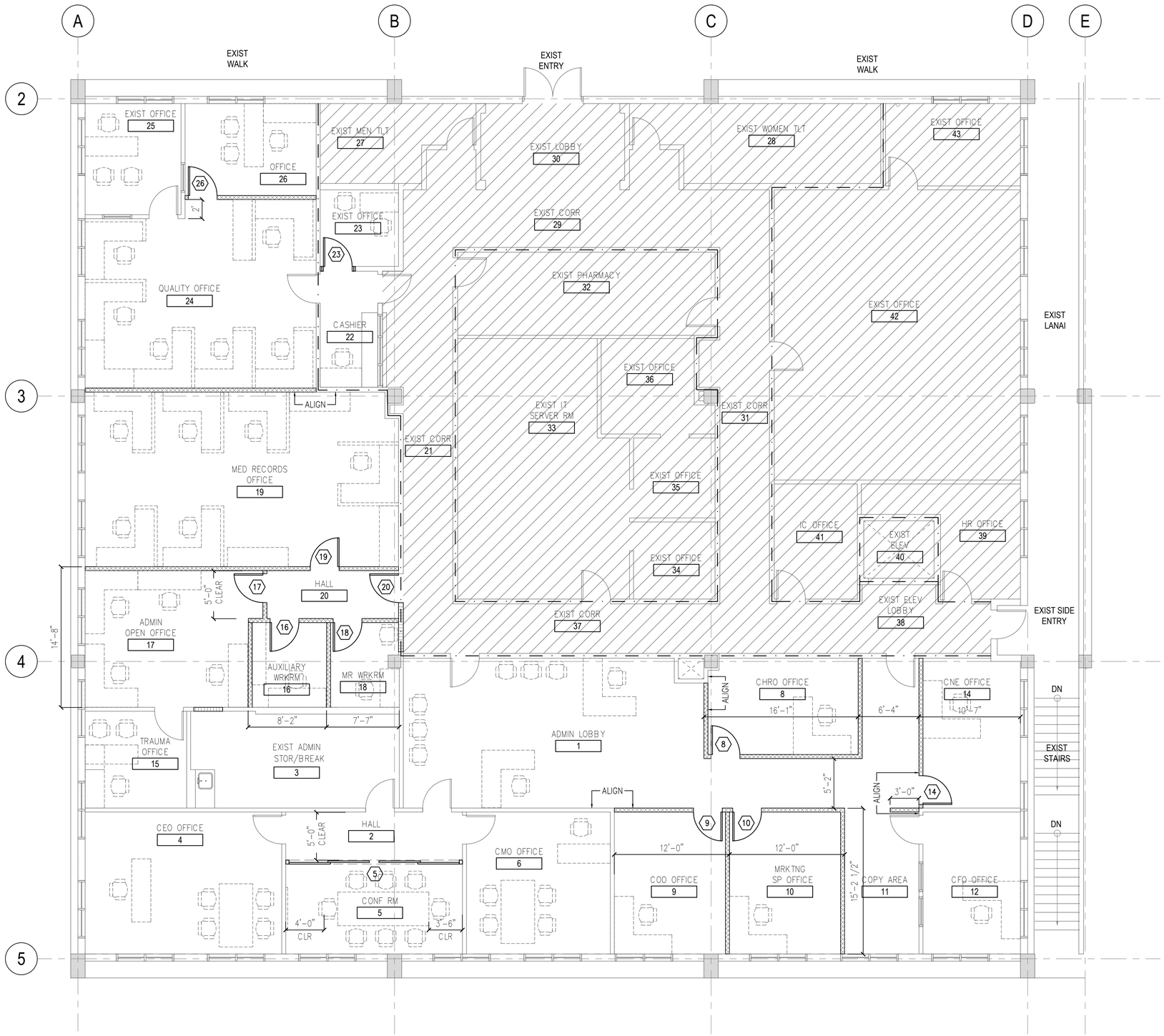
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DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE
FIRST FLOOR DEMOLITION REFLECTED CEILING PLAN

SHEET NO: 08 OF 26

DRAWING NO: A002

PROJECT NO: 224003.00



1 FIRST FLOOR PLAN
3/16 "=1'-0"

GENERAL NOTES

1. EXIT EGRESS SHALL BE IN COMPLIANCE OF CODE DURING CONSTRUCTION; REFER TO SHEET T005 FOR DETAILS
2. EXISTING SPACES WITHIN THE LIMITATION OF WORK SHALL BE REFURBISHED WITH NEW FLOORING AND PAINT PER THE ROOM FINISH SCHEDULE
3. ALL CONSTRUCTION LUMBER AND SHEATHING SHALL BE PRESSURE FIRE TREATED

FLOOR PLAN LEGEND

- DIAGONAL HATCHED AREA NOT IN SCOPE
- EXIST. WALL
- EXIST. 1HR FIRE RATED WALLS
- EXIST. DOOR
- EXIST. GLAZING
- EXIST. SINK, COUNTER, AND CASEWORK
- OFOI FURNITURE, CONTRACTOR TO PROVIDE CASEWORK BACKING AT NEW WALL PARTITIONS AT DESKS
- NEW WALL PARTITION (P3), SEE DETAIL 2/A501
- NEW WALL INFILL (PE), SEE DETAIL 2/A501
- NEW DOOR

INTERIOR ELEVATION KEY

0 2' 4' 6' 13'
3/16"=1'-0"

NORTH

KYA
CREATE + BUILD + INSPIRE
934 Pumehana Street, Honolulu, Hawaii 96826
Phone (808) 949-7770 Fax (808) 946-0334

DAVID T. TSUCHIDA LICENSED PROFESSIONAL ARCHITECT No. 5707 HAWAII, U.S.A.

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

LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT DATE	
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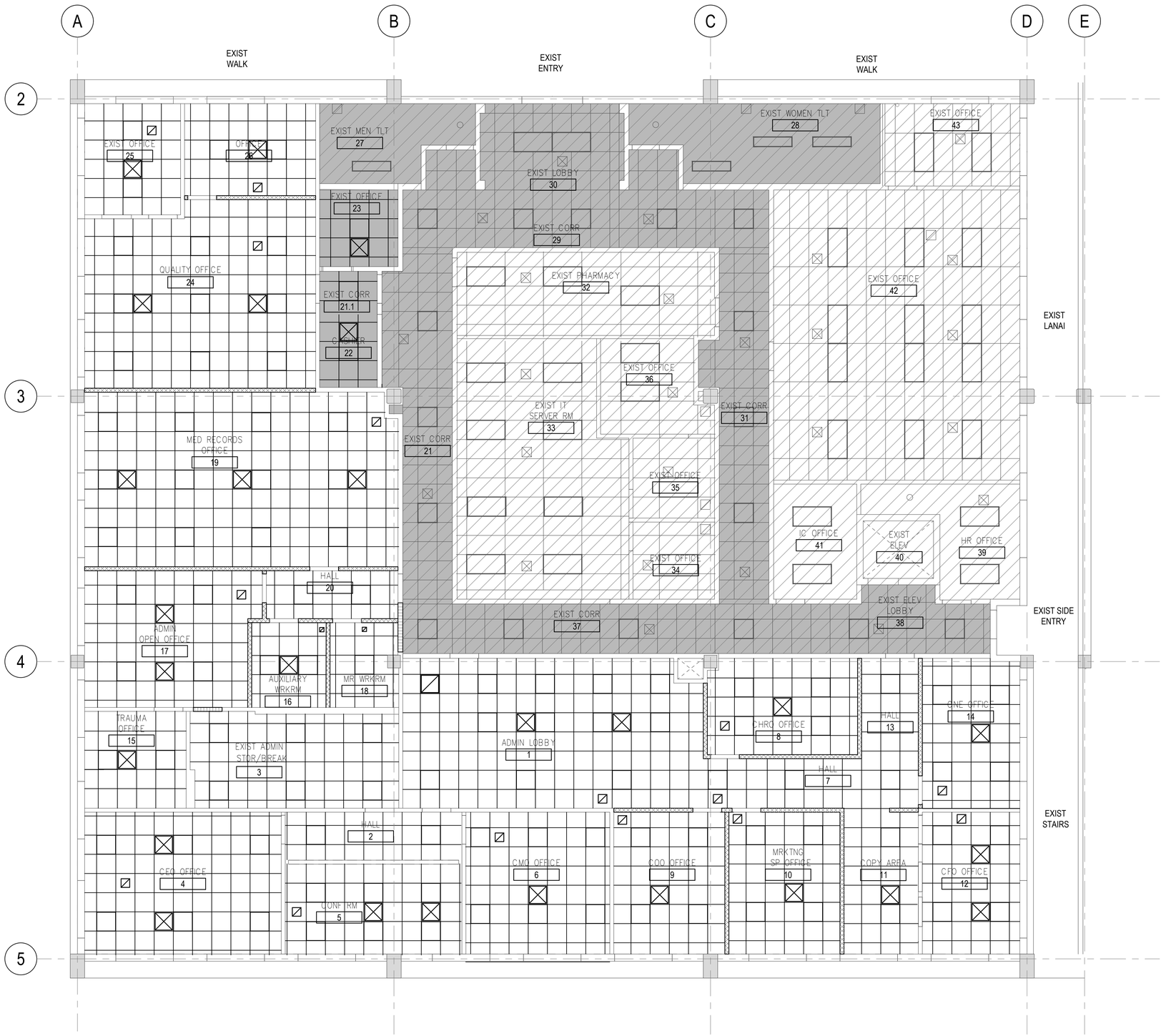
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DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE
FIRST FLOOR PLAN

SHEET NO: 09 OF 26

DRAWING NO: A101

PROJECT NO: 224003.00



1 FIRST FLOOR REFLECTED CEILING PLAN
3/16 "=1'-0"

GENERAL NOTES

CEILING PLAN LEGEND

- DIAGONAL HATCHED AREA NOT IN SCOPE
- EXIST. WALL
- EXIST. 1HR FIRE RATED CORRIDOR WALL
- EXIST. 1HR FIRE RATED GYP. BD. CEILING ASSEMBLY
- ACT-02, 1HR FIRE RATED CEILING ASSEMBLY, SEE DETAILS 1 & 2/A502
- ACT-01, SEE DETAILS 1 & 2/A502
- INDICATES NEW WALL
- NEW 2x2 CEILING LIGHT FIXTURE, SEE ELEC. DWGS.
- NEW SUPPLY AIR DIFFUSER, SEE MECH. DWGS.
- NEW AIR REGISTER, SEE MECH. DWGS.
- S NEW CEILING SPEAKER, SEE ELEC. DWGS.
- WIFI NEW WIFI ROUTER, SEE ELEC. DWGS.

0 2' 4' 6' 13'
3/16"=1'-0"

NORTH

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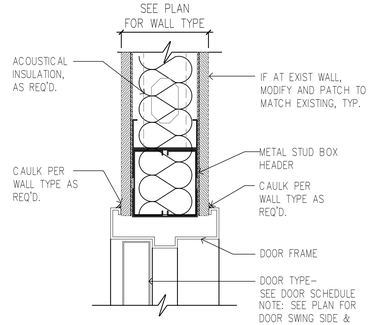
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DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE
FIRST FLOOR REFLECTED CEILING PLAN
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SHEET NO: 10 OF 26

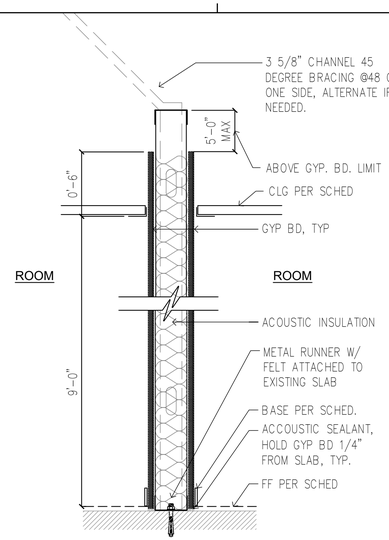
DRAWING NO: A102

PROJECT NO: 224003.00



5 TYP. DOOR HEADER DETAIL

3"=1'–0"



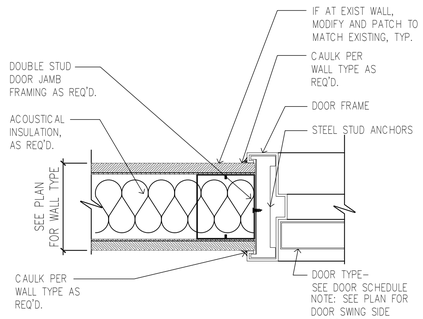
GENERAL NOTES:

1. ALL GYPSUM BOARD IS TYPE 'X', 5/8" THICK UNLESS OTHERWISE NOTED.
2. PROVIDE UL LISTED FIRESTOPPING (OR APPROVED EQUAL) AT ALL RATED THRU–WALL OPENINGS.
3. PROVIDE WATER RESISTANT GWB @ PLUMBING WALLS.
4. PROVIDE IMPACT RESISTANT GWB @ CORRIDORS, & VESTIBULES.
5. PROVIDE ACOUSTIC GWB @ STC WALLS & WHERE SCHEDULED.

NUMBER	FRAME SIZE	GA	STUD SPACING	GYP BOARD	WALL THICKNESS	STC	RATED	UL NUMBER
P3	3 5/8"	20	16" O.C.	5/8" TYPE 'X'	4 7/8"	40	–	–
1P3	3 5/8"	20	16" O.C.	5/8" TYPE 'X'	4 7/8"	40	1 HR	U419
PE	MATCH EXST	MATCH EXST	MATCH EXST	5/8" TYPE 'X'	–	–	–	–

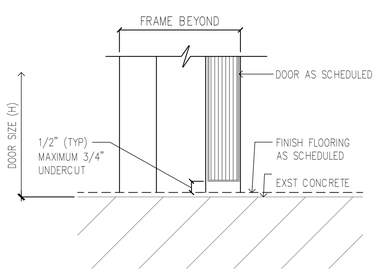
2 TYPICAL ACOUSTICAL CEILING DETAIL

1 1/2"=1'–0"



4 TYP. DOOR JAMB DETAIL

3"=1'–0"



3 THRESEHOLD DETAIL

3"=1'–0"

TYPICAL BACKING @ WORKSTATION CABINETS

6" x 16 GA HORIZ UNPUNCHED TRACK, 1–1/2" FLANGE CONT TO FULL LENGTH OF CABINET, CUT FLANGES OFF AT STUDS AND SET IN TIGHT AGAINST FACE OF STUDS WITH 3 – #8 x 1" SELF–TAPPING SHEET METAL SCREWS TO EA END

TYPICAL WALL BACKING DETAIL

NOTE:
INSTALL BACKING PLATES ACROSS MIN 3 STUD SPACES BACKING PLATE LENGTH AS REQUIRED TO SUPPORT ITEMS

TYPE A:

CASEWORK
ALL OTHER ITEMS NOT INDICATED OR INDICATED AS NIC

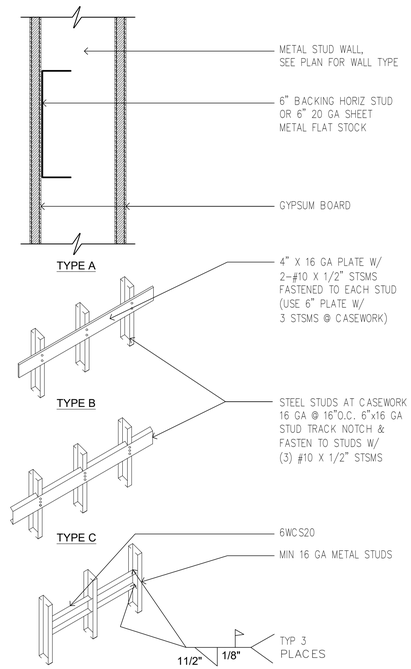
TOILET ACCESSORIES
FEC, WALL MOUNTED PHONE, WALL MTD DOOR STOPS, AND AS INDICATED

TYPE C:

COMPUTER MONITOR BRACKET

NOTES:

1. EXTEND BACKING PLATES TO LAST STUD BEYOND FACE OF FIXTURE OR ACCESSORY.
2. PROVIDE METAL SLEEVES THROUGH WALL FINISH AT FIXTURE FASTENING, AS REQ'D.
3. ALL BACKING PLATES SHOWN OR NOT SHALL SCREWED TO STUDS.



1 BACKING DETAIL

3"=1'–0"

KYA
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HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
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PROJECT

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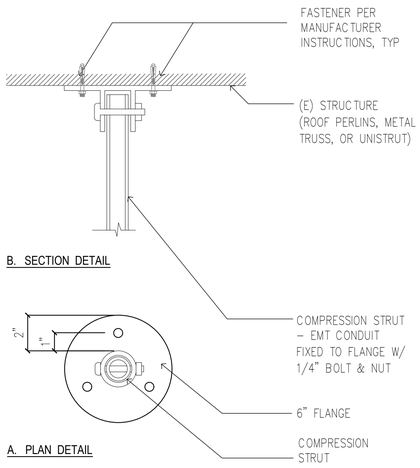
SHEET TITLE

TYPICAL PARTITION TYPES AND DOOR DETAILS

SHEET NO: 11 OF 26

DRAWING NO: A501

PROJECT NO: 224003.00

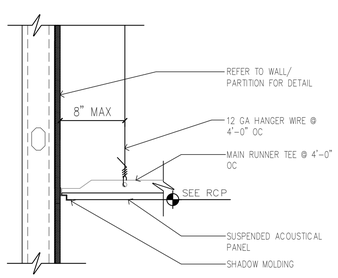


STRUTS AND BRACING WIRES ARE TO PROVIDED AND ENGINEERED WHERE PARTITIONS ARE INDICATED TO BE ATTACHED TO AND BRACED BY THE CEILING SYSTEM.

EMT SIZE	MAX. HEIGHT ft. - in.
1/2"	4'-0"
3/4"	5'-2"
1"	6'-6"
1 1/4"	8'-6"
1 1/2"	9'-11"

TYP. COMPRESSION STRUT SCHEDULE

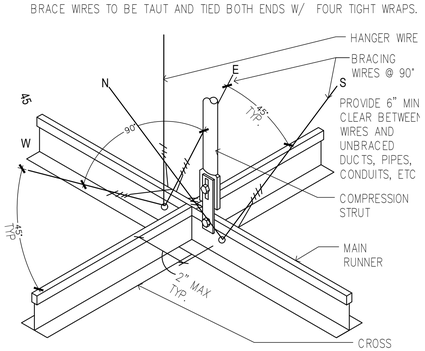
6 COMPRESSION STRUT
3"=1'-0"



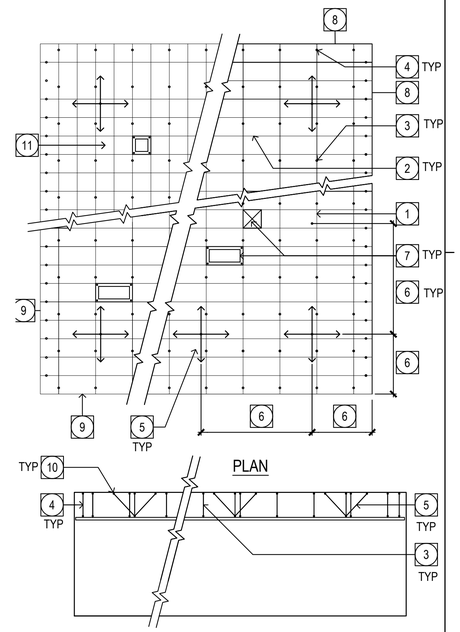
5 TYP ACOUSTICAL CEILING DETAIL
1 1/2"=1'-0"

BRACING NOTES:

1. THE UNATTACHED PERIMETER SHALL HAVE A MIN. OF 1/2" CLEARANCE AT ENDS OF COMPONENTS.
2. CONTINUOUS SPACER BAR TO BE LOCKED TO COMPONENTS ON THE UNATTACHED WALL.
3. PERIMETER TERMINAL COMPONENT ENDS MUST BE SUPPORTED BY A 12 GA. WIRE ON ALL WALLS.
4. BRACING WIRES TO BE ATTACHED AT A MAXIMUM OF 45 TO THE PLANE OF THE CEILING AND PARALLEL TO COMPONENTS INTERSECTING AT THE BRACE LOCATION. BRACE WIRES TO BE TAUT AND TIED BOTH ENDS W/ FOUR TIGHT WRAPS.



2 TYP. LATERAL FORCE BRACING
3"=1'-0"



PLAN

SECTION

KEYNOTES

1. MAIN RUNNER @ 48" O.C. MAX
2. CROSS RUNNERS @ 24" O.C. MAX
3. 12 GA HANGER WIRES @ 48" OC MAX.
4. 12 GA HANGER WIRE @ 8" OR 1/4 LENGTH OF END TEE FROM WALL.
5. 12 GA SPLAYED BRACING WIRES & COMPRESSION POST.
6. SEE NOTES FOR SPACING OF BRACING WIRES.
7. LIGHT FIXTURES & HVAC GRILLES.
8. CEILING GRID MEMBER ATTACHED TO WALL AT TWO ADJACENT WALLS, SEE DETAIL 5/A503.
9. CEILING GRID MEMBERS NOT ATTACHED AT OPPOSITE WALLS, SEE DETAIL 5/A503.
10. HANGER WIRE AND BRACING WIRE ATTACHMENT TO STRUCTURE.
11. ACOUSTIC CEILING PANEL.

1 SUSPENDED CEILING
1"=1'-0"

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79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT	DATE
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SHEET TITLE
CEILING & MISC. DETAILS

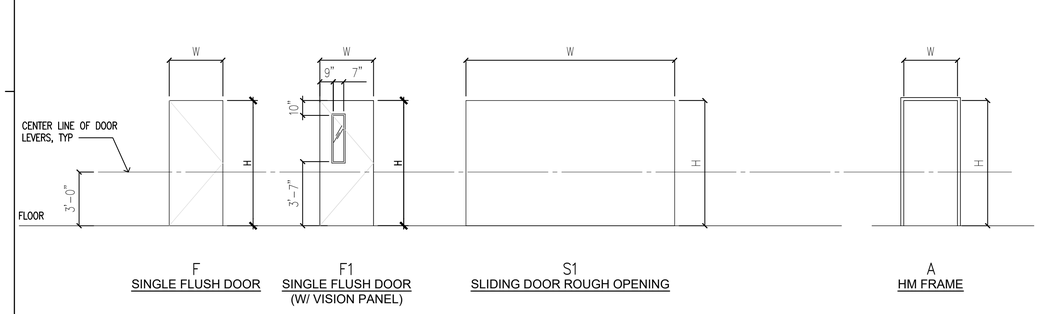
SHEET NO: 12 OF 26

DRAWING NO: A502

PROJECT NO: 224003.00

DOOR SCHEDULE

DOOR NO.	LOCATION	DOOR OPENING W	DOOR OPENING H	THICKNESS	TYPE	DOOR CONSTRUCTION /FINISH	GLASS/ LOUVER	FRAME TYPE	FRAME CONSTRUCTION/FINISH	HEAD DETAIL	JAMB DETAIL	SILL DETAIL	FIRE RATING	HARDWARE GROUP	REMARKS
5	CONF RM	17'-9"	8'-6"	0'-1 3/4"	S1	-	-	-	-	-	-	-	-	-	SEE SPECS FOR ALTERNATE 1 AND ALTERNATE 2
8	CHRO OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
9	COO OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
10	MRKTNG SP OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
14	CNE OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
16	WRKRM	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
17	ADMIN OPEN OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
18	MR WRKRM	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
19	MED RECORDS OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
20	HALL	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	20 MIN	SEE SPEC	PROVIDE PEMKO HEAVY DUTY 4" METAL SADDLE THRESHOLD TO TRANSITION EXIST CARPET TILE TO EXIST RESILIENT TILE.
23	EXIST OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	
26	OFFICE	3'-0"	7'-0"	0'-1 3/4"	F1	SC/PL	SG	A	HM/PT	5/A501	4/A501	3/A501	-	SEE SPEC	



A DOOR TYPES
1/4"=1'-0"

DOOR SCHEDULE NOTES

1. DOOR CONSTRUCTION

   AL ALUMINUM
   AR ALUMINUM ROLL-UP
   CP CEMENT PANEL
   FG FRAMELESS GLASS DOOR
   HM HOLLOW METAL (STEEL)
   MR METAL (STEEL) ROLL-UP
   SC SOLID CORE WOOD

2. FACING AND FINISH

   FF FACTORY FINISH
   PL PLASTIC LAMINATE
   PT PAINTED
   ST STAINED

3. GLASS/LOUVER TYPES

   GL PRESSED GLASS, LAMINATED TRANSLUCENT
   SG SAFETY GLASS, CLEAR

DOOR SCHEDULE REMARKS

A.

B. RELOCATED EXISTING DOOR ASSEMBLY: DOOR, FRAME, AND HARDWARE. FIELD VERIFY DOOR ASSEMBLY TO MEET 45 MIN FIRE RATING REQUIREMENT

C. PREP EXISTING DOOR FRAME TO RECEIVE NEW PAINT FINISH

D. PROVIDE POWER AS REQUIRED FOR THE EXISTING RELOCATED KEYPAD LOCK

1. CARD READER AND WIRING ARE PROVIDED BY PACIFIC SECURITY INTEGRATIONS CONTRACTED BY THE GENERAL CONTRACTOR.

KYA
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SHEET TITLE
DOOR & WINDOW SCHEDULE

SHEET NO: 14 OF 26

DRAWING NO: A601

PROJECT NO: 224003.00

FINISH SCHEDULE

ROOM NO.	ROOM NAME	FLOOR	BASE	WALL				CEILING	REMARKS
				A	B	C	D		
1	ADMIN LOBBY	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
2	HALL	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
3	EXIST ADMIN STOR /BREAK RM	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01/PT-02	ACT-01	PROVIDE RUBBER TRANSITION AT NEW TILE CARPET AND EXIST RESILIENT TILE
4	CEO OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
5	CONF RM	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
6	CMO OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
7	HALL	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
8	CHRO OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
9	COO OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
10	MRKTNG SP OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
11	COPY AREA	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
12	CFO OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
13	HALL	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
14	CNE OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
15	TRAUMA OFFICE	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
16	WORKROOM	CPT-01	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
17	ADMIN OPEN OFFICE	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	PATCH EXIST FLOORING AT NEW WALL PARTITIONS.
18	MR WORKROOM	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	PATCH EXIST FLOORING AT NEW WALL PARTITIONS.
19	MED RECORDS OFFICE	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	PATCH EXIST FLOORING AT NEW WALL PARTITIONS.
20	HALL	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	PATCH EXIST FLOORING AT NEW WALL PARTITIONS AND DOOR.
21.1	EXIST CORR	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-02	PATCH EXIST FLOORING AT NEW DOOR.
22	CASHIER	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-02	
23	EXIST OFFICE	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-02	PATCH EXIST FLOORING AT NEW DOOR.
24	QUALITY OFFICE	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	PATCH EXIST FLOORING AT NEW WALL PARTITIONS.
25	EXIST OFFICE	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	
26	OFFICE	EXST	RB-01	PT-01	PT-01	PT-01	PT-01	ACT-01	PATCH EXIST FLOORING AT NEW WALL PARTITIONS.

COLOR AND MATERIAL SCHEDULE

KEY	DESCRIPTION	MANUFACTURER	GENERAL SPECIFICATIONS	REMARKS
ACT-01	ACOUSTICAL CEILING TILE	ARMSTRONG	ULTIMA TEGULAR, 1911 SIZE: 24" X 24" COLOR: WHITE	GRID PRELUDE XL 15/16" EXPOSED TEE, COLOR: WHITE
ACT-02	ACOUSTICAL CEILING TILE	ARMSTRONG	ULTIMA TEGULAR, 1894, FIRE GUARD, SIZE: 24" X 24" COLOR: WHITE	GRID PRELUDE XL 15/16" EXPOSED TEE, FIRE GUARD, COLOR: WHITE
CPT-01	CARPET TILE	MOHAWK GROUP	STYLE: THREADED CRAFT BT414 COLOR: MIST 7948 SIZE: 24" X 24"	METAL THRESHOLD AT CORRIDOR, RUBBER THRESHOLD AT BREAKROOM/STORAGE.
PT-01	PAINT		FINISH: SEMI-GLOSS COLOR: KCH STANDARD FIELD WHITE	
PT-02	PAINT		FINISH: SEMI-GLOSS COLOR: KCH STANDARD ACCENT BLUE	
PT-03	PAINT		FINISH: SEMI-GLOSS COLOR: KCH STANDARD ACCENT YELLOW	
RB-01	RUBBER BASE		STYLE: 4" STANDARD PROFILE COLOR: TBD	

FINISH SCHEDULE REMARKS

1. PATCH DAMAGED SURFACE AND SAND SMOOTH TO RECEIVE NEW FINISH AS SCHEDULED

FINISH SCHEDULE ABBREVIATIONS

ACT	ACOUSTICAL CEILING TILE
CPT	CARPET TILE
PT	PAINTED FINISH
RB	RESILIENT BASE

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DAVID T. TSUCHIDA LICENSED PROFESSIONAL ARCHITECT No. 5707 HAWAII, U.S.A.

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

LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT	
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DRAWN BY:	CHECKED BY:
DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE

FINISH SCHEDULE AND COLOR & MATERIALS SCHEDULE

SHEET NO: 15 OF 26

DRAWING NO: A602

PROJECT NO: 224003.00

MECHANICAL LEGEND

SYMBOLS	ABBR.	DESCRIPTION
AIR DISTRIBUTION		
A/B		RECTANGULAR DUCTWORK A DENOTES SIDE VIEWED B DENOTES SIDE NOT VIEWED
		FLEXIBLE DUCTWORK REFER TO SCHEDULE
ABBR		ACTUATED DAMPER
	2	2 POSITION
		SPIN–IN CONNECTION WITH DAMPER
		SQUARE BEND WITH TURNING VANES
		RADIUS BEND
A/B C D		SUPPLY AIR DIFFUSER A DENOTES AIR DEVICE SIZE B DENOTES NECK SIZE C DENOTES AIR DEVICE TYPE D DENOTES AIR QUANTITY (CFM)
AxB C D		RETURN / EXHAUST AIR REGISTER AxB DENOTES AIR DEVICE SIZE C DENOTES AIR DEVICE TYPE D DENOTES AIR QUANTITY (CFM)
		AIR FLOW IN
		AIR FLOW OUT
CONTROL		
T		THERMOSTAT / ROOM TEMP SENSOR
SD		DUCT SMOKE DETECTOR
EQUIPMENT		
EQUIPMENT TYPE * NO EQUIPMENT NUMBER	AHU	AIR HANDLING UNIT
	VAV	VARIABLE AIR VOLUME
	EF	EXHAUST FAN
MISCELLANEOUS		
	CFM	CUBIC FEET PER MINUTE
	DWG	DRAWING
	(E)	EXISITNG
	(N)	NEW
	TYP	TYPICAL
	DEMO	DEMOLITION
	DN	DOWN

GENERAL NOTES

A. CONFORM TO APPLICABLE LAWS AND REGULATIONS OF THE STATE OF HAWAII AND COUNTY OF HAWAII.
   1. INTERNATIONAL BUILDING CODE (2018) AND LOCAL AMENDMENTS
   2. INTERNATIONAL EXISTING BUILDING CODE (2018) AND LOCAL AMENDMENTS
   3. UNIFORM PLUMBING CODE (2018) AND LOCAL AMENDMENTS
   4. TITLE 11, ADMINISTRATIVE RULES, DOH, CHAP 39, A/C AND VENTILATION
   5. FIRE CODE NFPA 1 (2021) AND LOCAL AMENDMENTS
   6. INTERNATIONAL ENERGY CONSERVATION CODE (2018) AND LOCAL AMENDMENTS

B. OBTAIN AND PAY FOR APPLICABLE PERMITS, LICENSES, FEES AND OTHER CHARGES FOR WORK NOTED. SUBCONTRACTORS SHALL BE LICENSED FOR WORK THEY PERFORM.

C. 1 ELECTRONIC COPY OF EQUIPMENT DATA AND DIMENSIONED SHOP DRAWINGS FOR REVIEW. SHOP DRAWINGS SHALL BE COORDINATED WITH OTHER TRADES. UPON COMPLETION PROVIDE FOUR SETS OF RECORD AS–BUILT DRAWINGS.

D. CONTRACTOR SHALL MAINTAIN A SET OF CONTRACT DRAWINGS AT THE JOB SITE, MARKING THEM TO SHOW VARIATIONS BETWEEN THE CONSTRUCTION DOCUMENTS AND THE ACTUAL INSTALLATION. THE VARIATIONS SHALL BE SUBMITTED AS THE RECORD SET PRIOR TO PROJECT COMPLETION.

E. THE CONTRACT REQUIRES THE FIRE PROTECTION, EMCS, AND MECHANICAL CONTRACTORS TO CAREFULLY COORDINATE THEIR WORK WITH EACH OTHER, THE GENERAL CONTRACTOR, AND OTHER TRADES. PRIORITY SHALL BE GIVEN IN THE FOLLOWING ORDER:
   1. GRAVITY DRAINAGE PIPING
   2. EQUIPMENT AND DUCTWORK.
   3. FORCED AND PRESSURE PIPING SUCH AS WATER AND FIRE SPRINKLER PIPING.

F. GUARANTEE – THE INSTALLED WORK SHALL BE GUARANTEED FOR ONE YEAR COMMENCING FROM BENEFICIAL USE OF OWNER.

G. INATSUKA ENGINEERING SHALL RETAIN OWNERSHIP OF CONSTRUCTION DOCUMENTS AS INSTRUMENTS OF SERVICE.

DEPARTMENT OF HEALTH NOTES

THE AIR CONDITIONING AND VENTILATION SYSTEM SHALL COMPLY WITH TITLE II, ADMINISTRATION RULES, DEPARTMENT OF HEALTH, CHAPTER 39, AIR CONDITIONING AND VENTILATION REQUIREMENTS.

MECHANICAL NOTES:

A. INSULATION HAS NOT BEEN SHOWN FOR CLARITY. REFER TO SPECIFICATIONS.

B. PROVIDE SMOOTH DUCT TRANSITIONS UNDER BEAMS WHERE REQUIRED ON BOTH HIGH AND LOW PRESSURE DUCTS.

C. USE OF FLEXIBLE DUCTWORK IS RESTRICTED TO 6'–0" MAXIMUM LENGTH FROM AIR TERMINAL TO BRANCH DUCT. INSTALL PER UNIFORM MECHANICAL CODE REQUIREMENTS.

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 MECHANICAL SYSTEMS (C403, C404 & C405) OF THE 2015 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 90.1-2016. Mandatory & Prescriptive
- ☐ ASHRAE Standard 90.1-2016. 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: Scott H. Inatsuka Date: 03/10/2026

Name: SCOTT H. INATSUKA
Title : MECHANICAL ENGINEER
License No. : 9384–M
Project Name: KONA COMMUNITY HOSPITAL – ADMINISTRATIVE RENOVATION
Project TMK: (3) 7–9–010:081

SCOTT H. INATSUKA LICENSED PROFESSIONAL ENGINEER No. 9384–M HAWAII, U.S.A.

CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

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SCOTT H. INATSUKA LICENSED PROFESSIONAL ENGINEER No. 9384–M HAWAII, U.S.A.

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Scott H. Inatsuka

LICENSE EXPIRATION DATE: APRIL 30, 2028

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
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PROJECT

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DRAWN BY:	CHECKED BY:
DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE

LEGEND AND NOTES

SHEET NO: 16 OF 26

DRAWING NO: M001

PROJECT NO: 224003.00

CHILLED WATER AIR HANDLING UNITS

TAG	FILTER SECTION		SUPPLY FAN					COOLING COIL									SOUND POWER LEVEL (DB) INLET/OUTLET								POWER (V/PH/HZ)	WEIGHT (LB)	BASES OF DESIGN	NOTES
	TYPE	MERV RATING	SUPPLY CFM	OA CFM	ESP (IN WG)	FAN RPM	HP	CAPACITY (MBH)		EAT (°F)	LAT (°F)	COIL FACE (FPM)	COIL ROWS	EWT/LWT (°F)	GPM	PD (FT H20)	OCTAVE BAND CENTER FREQUENCY (HZ)											
								TOTAL	SENSIBLE	DB/WB	DB/WB						63	125	250	500	1000	2000	4000	8000				
AHU-F1	2" FLAT	MERV 8	4,450	250	2.00	1,991	5	122.3	88.3	74.0/63.5	55/55	500	8	45/55	24.4	1.50	69.4/74.3	75.2/79.2	81.7/85.7	82.3/86.3	78.1/83.1	74.9/79.9	69.1/75.1	65.2/71.2	208/3/60	602	VTS MODEL AVS040E	SEE BELOW
AHU-F4	2" FLAT	MERV 8	2,750	250	2.00	1,923	3	82.7	59.8	74.0/63.5	55/55	311	8	45/55	16.5	0.75	66.6/71.5	72.4/76.4	78.9/82.9	79.5/83.5	75.3/80.3	72.1/77.1	66.3/72.3	62.4/68.4	208/3/60	548	VTS MODEL AVS030E	SEE BELOW

NOTES:
1. CABINET SHALL BE DOUBLE WALL CONSTRUCTION, WITH MINIMUM 2" THICK INSULATION EQUIVALENT TO R-13.
2. PROVIDE WITH STAINLESS STEEL DRAIN PAN WITH DOUBLE WALL CONSTRUCTION.
3. PROVIDE WITH UV-C LIGHT, FIELD 120V POWER. PROVIDE WITH OUTDOOR RATED WARNING LABEL, DISCONNECT SWITCH AND DOOR INTERLOCK SWITCH TO TURN OFF UV-C LIGHT WHEN ACCESS DOOR IS OPENED.
4. SUPPLY FAN SHALL BE DIRECT DRIVE PLENUM FANS CONTROLLED BY VARIABLE FREQUENCY DRIVE.
5. PROVIDE WITH VARIABLE FREQUENCY DRIVE SHALL BE IN NEMA 1 ENCLOSURE, WITH 3% INPUT LINE REACTOR, FUSED DISCONNECT SWITCH AND MANUAL 3 CONTACTOR BYPASS. VFD SHALL BE DANFOSS MODEL VLT-FC102.
6. PROVIDE WITH DUCT SMOKE DETECTORS FOR UNIT OVER 2000 CFM OF SUPPLY AIR.
7. PROVIDE WITH MODULATE CONTROL VALVE, REFER TO DETAIL FOR ADDITIONAL REQUIREMENTS.
8. REFER TO SEQUENCE OF OPERATION FOR ADDITIONAL REQUIREMENTS.

AIR DEVICES

TAG	DESIGNATION	DESCRIPTION	MANUFACTURER	MODEL	SIZE INDICATION
		SUPPLY			
SAD	SUPPLY AIR DIFFUSER	24x24 BORDER, STANDALONE VARIABLE AIR VOLUME DIFFUSER, BUILT IN TEMPERATURE CONTROL TO ALLOW ADJUSTING TEMPERATURE SET POINT USING A STANDARD PHILIPS SCREW DRIVER, ALL ALUMINUM, STANDARD WHITE POWDER COATED FINISH, PROVIDE WITH YOUNG CABLE REGULATOR WHERE CEILING IS INACCESSIBLE	ACUTHERM	TF	MODULE/NECK SIZE
SAD-F	SUPPLY AIR DIFFUSER	FIRE RATED DIFFUSER, UL LISTED. 24x24 OR 12X12 BORDER, STEEL CONSTRUCTION WITH 3-HR FIRE DAMPER, OBVD, PROVIDE WITH YOUNG CABLE REGULATOR WHERE CEILING IS INACCESSIBLE	TITUS	TDC-FR	MODULE/NECK SIZE
LD	LINEAR SUPPLY DIFFUSER	STANDALONE VARIABLE AIR VOLUME DIFFUSER, BUILT IN TEMPERATURE CONTROL TO ALLOW ADJUSTING TEMPERATURE SET POINT USING A STANDARD PHILIPS SCREW DRIVER, CONSTRUCTED OF EXTRUDED ALUMINUM, STANDARD WHITE POWDER COATED FINISH, 2 SLOT, 1 WAY FLOW	ACUTHERM	TL	LENGTH AND NK SIZE
		RETURN/ EXHAUST			
RAR	RETURN AIR REGISTER	35 DEG BLADE DEFLECTION, ALL ALUMINUM, WHITE, OBVD, PROVIDE WITH YOUNG CABLE REGULATOR WHERE CEILING IS INACCESSIBLE	TITUS	350FL	DUCT SIZE
RAR-F	RETURN AIR REGISTER	FIRE RATED PERFORATED RETURN, UL LISTED. 12X12 MODULE, STEEL CONSTRUCTION WITH 3 HR RATED FIRE DAMPER, WHITE, PROVIDE WITH YOUNG CABLE REGULATOR WHERE CEILING IS INACCESSIBLE	TITUS	PAR-FR	DUCT SIZE
OAG	OUTDOOR AIR INTAKE GRILLE	45 DEG BLADE DEFLECTION, GRILLE ONLY, TYPE 304 STAINLESS STEEL CONSTRUCTION, SEE ARCH DWG FOR COLOR AND FINISH	TITUS	350RL-SS	DUCT SIZE

ZONE DAMPER

TAG	UNIT LOCATION	INLET SIZE (IN)	AIRFLOW CFM			MAX PRESSURE DROP (IN WG)	ELECTRICAL		BASIS OF DESIGN	NOTES
			DESIGN	MAX	MIN		VOLT	POWER		
ZD-F1	OFFICE 23 + CASHIER	6	180	180	100	0..05	24 VAC	2 VA	SPECIFIC CONTROLS MODEL SC-ZD	SEE BELOW

NOTES:
1. PROVIDE WITH STEPDOWN TRANSFORMER TO 24 VAC.
2. PROVIDE WITH WALL MOUNTED THERMOSTAT.

FLEX DUCT

SIZE	CFM RANGE
6"Ø	≤ 120 CFM
8"Ø	≤ 121-200 CFM
10"Ø	≤ 201-310 CFM
12"Ø	≤ 311-450 CFM
14"Ø	≤ 451-620 CFM

BASIS OF DESIGN

DESIGN PARAMETERS (KONA, HAWAII)
1. SUMMER 1.0% OUTDOOR DESIGN TEMPERATURE – 87.0°FDB, 75.4°FWB.
2. INDOOR DESIGN TEMPERATURE:
   GENERAL OFFICE: 73°FDB, 55% RH

BUILDING ORIENTATION – 77 DEG FROM TRUE NORTH
3. OUTDOOR AIR REQUIREMENTS – MINIMUM BASED ON ASHRAE 62.1 2010.
4. BUILDING CONSTRUCTION:
   EXISTING WALL: CMU, U-VALUE – 0.58 BTU/(HR-SF-°F).
   ROOF: METAL ROOF, U-VALUE – 0.065 BTU/(HR-SF-°F).
6. WINDOWS CONSTRUCTION:
   SHGC 0.5 MAX, U-VALUE 1.00 BTU/(HR-SF-°F) MAX

INTERNAL LOAD

ROOM	AREA (SF)	LIGHTING W/SF	PEOPLE (#)	MISC. LOAD
1 ADMIN LOBBY	685	1.00	2	2 PC - 250 W
3 BREAKROOM	235	0.62	4	1 REFRIGEANTOR - 400W
4 CEO OFFICE	325	0.93	1	1 PC - 125W
5 CONFERENCE ROOM	190	1.07	8	4 LAPTOP - 108 W
6 CMO OFFICE	240	0.93	1	1 PC - 125W
8 CHRO OFFICE	170	0.93	1	1 PC - 125W
9 COO OFFICE	185	0.93	1	1 PC - 125W
10 MARKETING SP OFFICE	185	0.93	1	1 PC - 125W
11 COPY AREA	130	0.56	1	COPIER - 540W
12 CFO OFFICE	165	0.93	1	1 PC - 125W
14 CNE OFFICE	175	0.93	1	1 PC - 125W
15 TRAUMA	120	0.93	1	1 PC - 125W
16 TOUCH DOWN WORKSTATION OFFICE	90	0.93	2	2 PC - 250 W
17 ADMIN OPEN OFFICE	300	0.81	4	4 PC - 500 W
18 MARKETING WORKSTATION OFFICE	60	0.93	1	1 PC - 125W
19 EXISTING BUSINESS OFFICE	620	0.81	4	4 PC - 500 W
22 CASHIER OFFICE	60	0.93	1	1 PC - 125W
23 OFFICE	75	0.93	1	1 PC - 125W
24 EXISTING RECORD OFFICE	475	0.81	4	4 PC - 500 W
25 OFFICE	130	0.93	1	1 PC - 125W
26 OFFICE	175	0.93	1	1 PC - 125W

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LICENSE EXPIRATION DATE: APRIL 30, 2028

PROJECT
KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

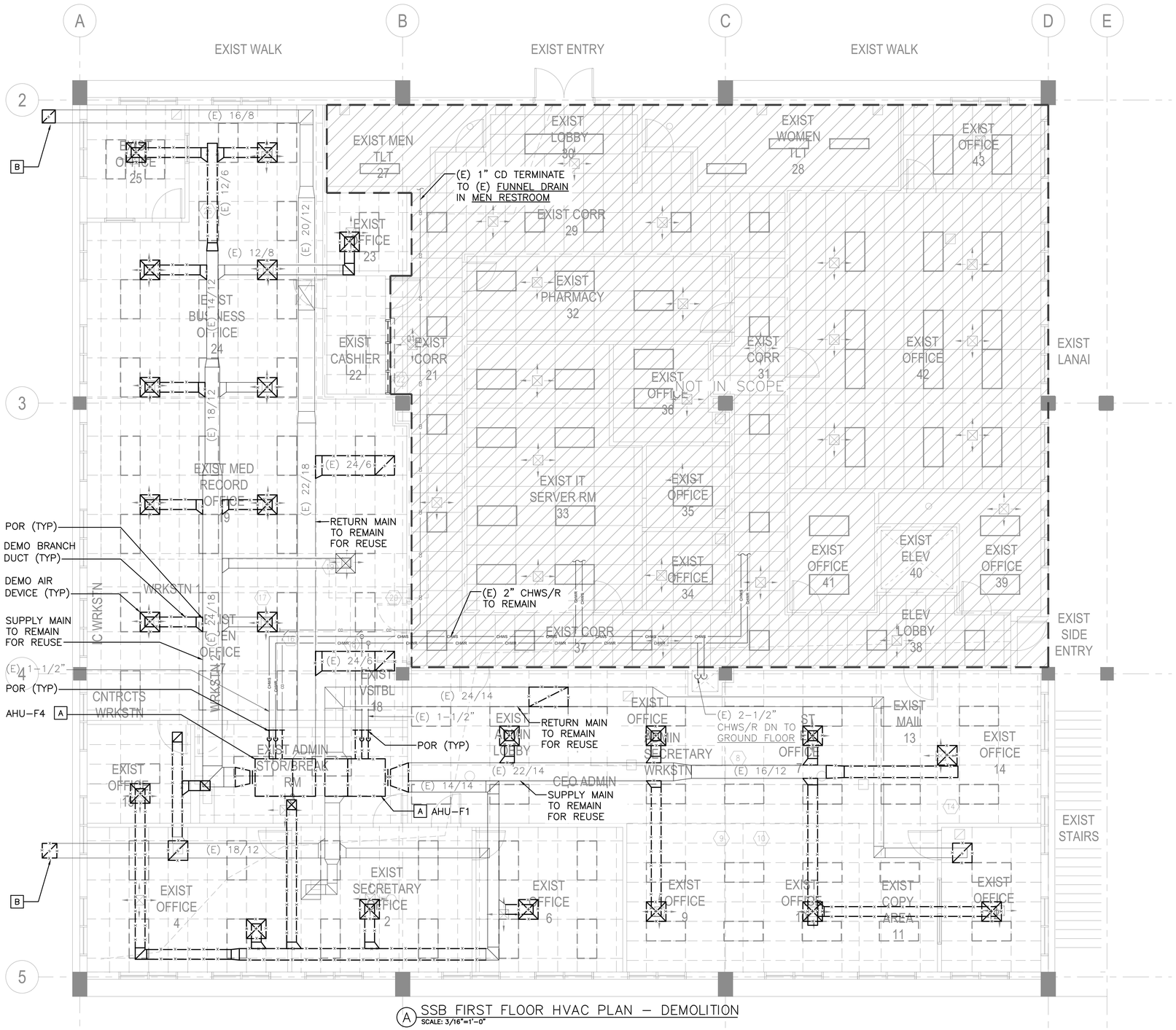
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(808) 322-4442

DATE
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DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE
SCHEDULES

SHEET NO: 17 OF 26
DRAWING NO: M002
PROJECT NO: 224003.00



A SSB FIRST FLOOR HVAC PLAN – DEMOLITION
SCALE: 3/16"=1'-0"

PRE-TAB NOTES:

1. PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL PERFORM A PRE TEST AND BALANCE (PRE-TAB) OF THE HVAC AIR DISTRIBUTION SYSTEM SERVING THE PROJECT AREA. SUBMIT PRE-TAB REPORT TO DESIGN TEAM FOR REVIEW. THE PRE-TAB REPORT SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING:
   - AIR FLOW TO EACH AIR DEVICES.
   - SUPPLY, OUTSIDE AND RETURN DUCT TRAVERSE CFM.
   - AHU CHILLED WATER EWT, LWT AND FLOW RATE.

DEMO KEY NOTES:

A DEMO CHILLED WATER AIR HANDLING UNIT AND ASSOCIATED, CONTROLS, SUPPORTS AND APPURTENANCES. EXISTING DUCTWORK TO REMAIN FOR REUSE UNLESS OTHERWISE NOTED. DEMO CHW PIPING AND CONDENSATE DRAIN PIPING UP TO POR.

B DEMO EXISTING OA INTAKE GRILLE FOR DIRECT REPLACEMENT. CONTRACTOR SHALL CONFIRM DIMENSION OF THE GRILLE PRIOR TO ORDERING THE REPLACEMENT.

0 2' 4' 8' 16'
1/8"=1'-0"

NORTH

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LICENSE EXPIRATION DATE: APRIL 30, 2028

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
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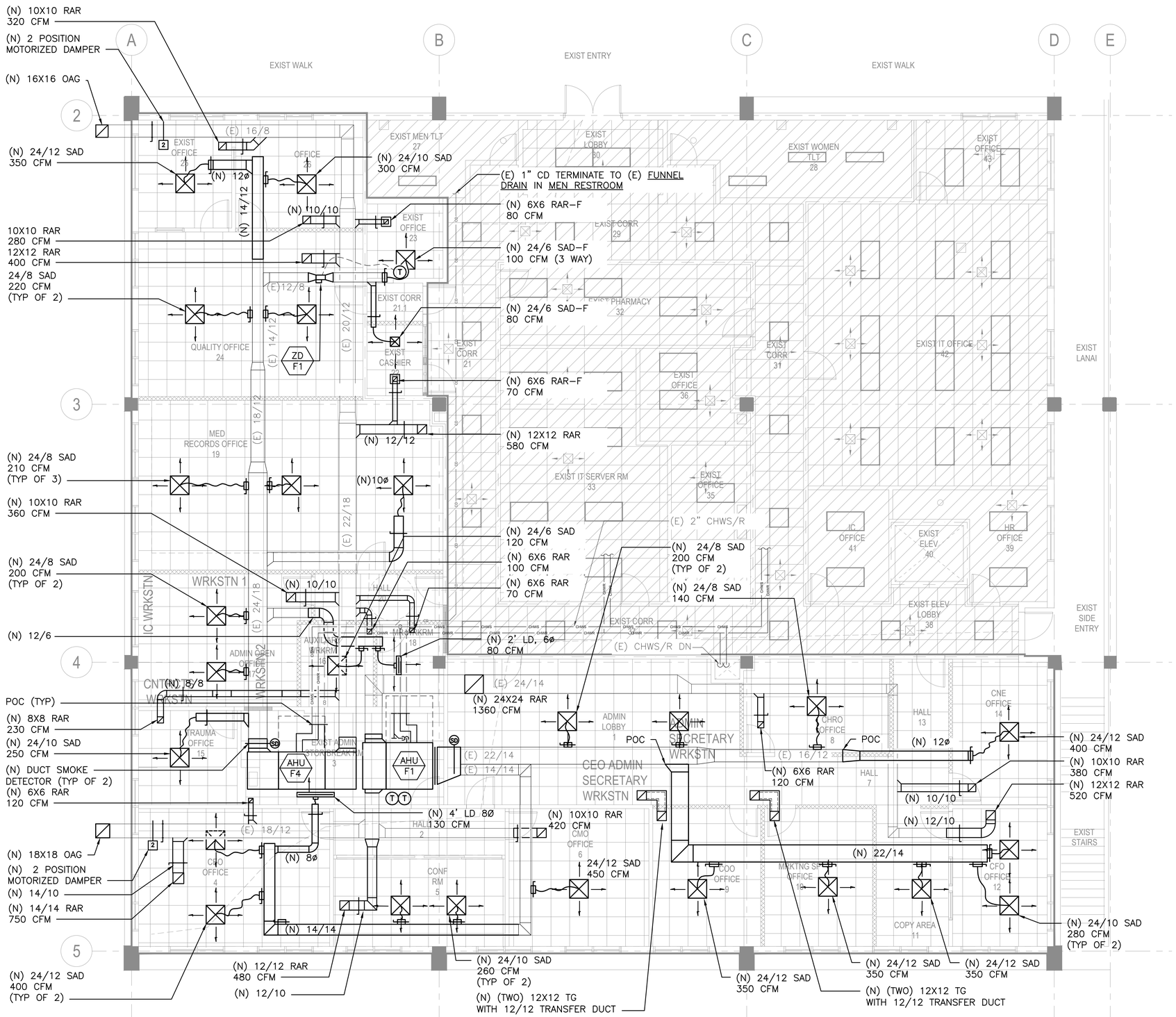
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03/30/2026	BIDDING

SHEET TITLE
SSB FIRST FLOOR HVAC PLAN DEMOLITION

SHEET NO: 18 OF 26

DRAWING NO: M101

PROJECT NO: 224003.00



A SSB FIRST FLOOR HVAC PLAN – NEW WORK
SCALE: 3/16"=1'-0"

0 2' 4' 8' 16'
1/8"=1'-0"

NORTH

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LICENSE EXPIRATION DATE: APRIL 30, 2028

PROJECT

KONA COMMUNITY HOSPITAL

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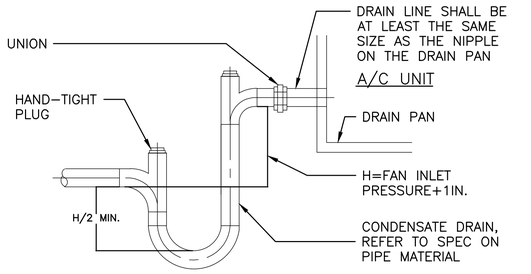
SHEET TITLE

SSB FIRST FLOOR HVAC PLAN
NEW WORK

SHEET NO: 19 OF 26

DRAWING NO: M201

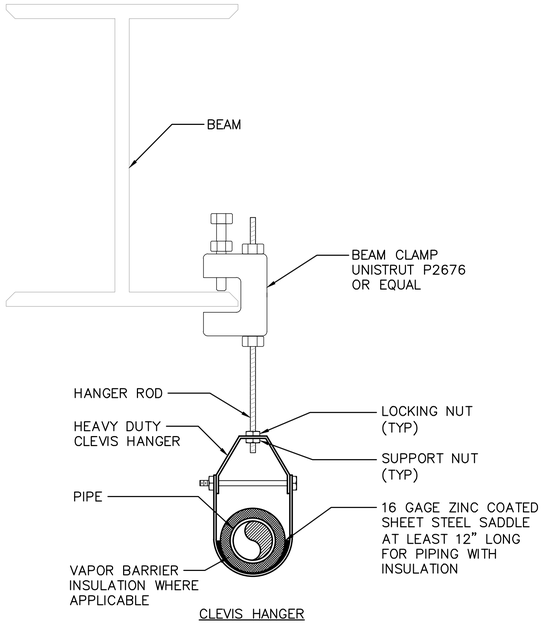
PROJECT NO: 224003.00



DRAW–THROUGH COIL ARRANGEMENT

NOTE:
1. CONDENSATE DRAIN LINE TO BE INSULATED, REFER TO SPECIFICATIONS.

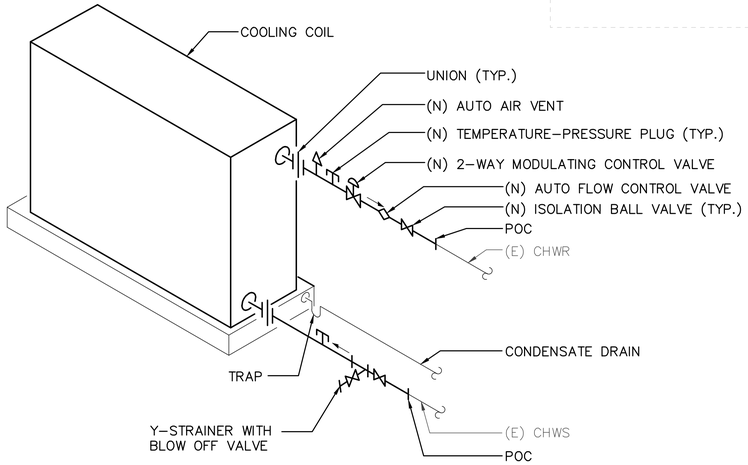
C CONDENSATE DRAIN DETAIL
SCALE: NOT TO SCALE



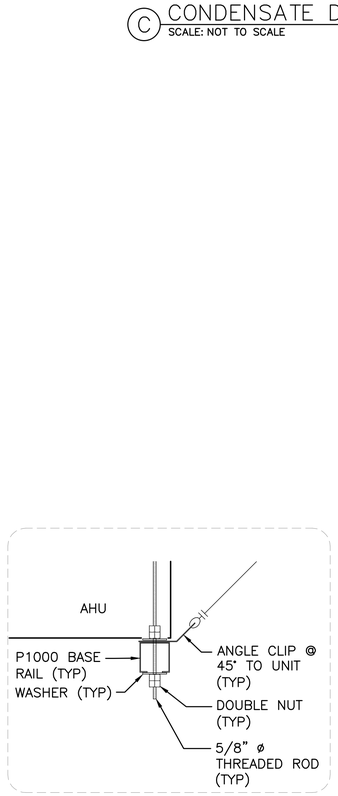
CLEVIS HANGER

NOTE
A. PIPE SUPPORT INSTALLATION & SIZE CONFORM WITH SMACNA "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS."

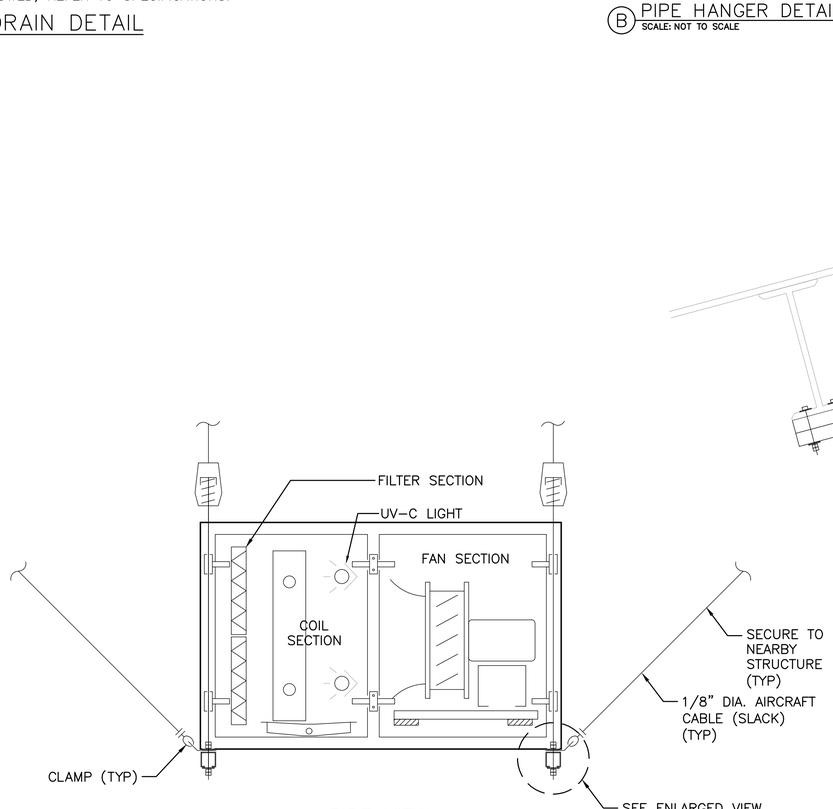
B PIPE HANGER DETAIL
SCALE: NOT TO SCALE



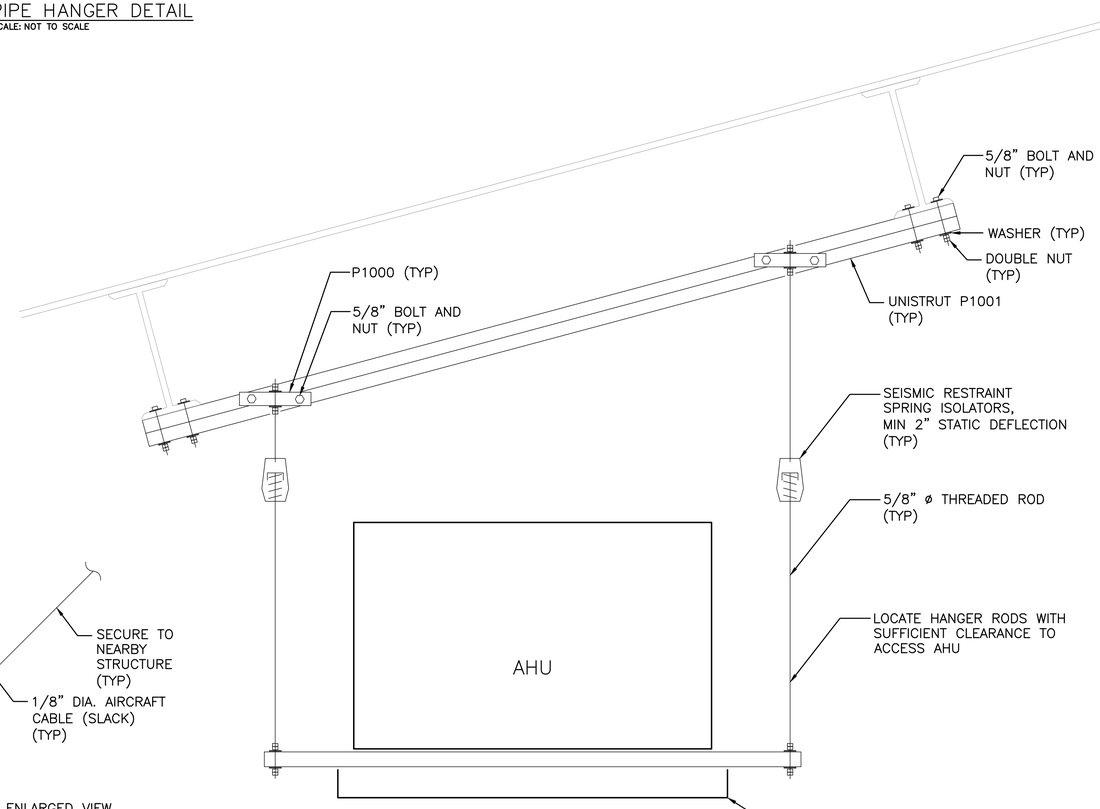
A CHILLED WATER CONNECTION DETAIL
SCALE: NOT TO SCALE



ENLARGED



SIDE VIEW



FRONT VIEW

D AIR HANDLING UNIT MOUNTING DETAIL
SCALE: NOT TO SCALE

KYA
CREATE + BUILD + INSPIRE
934 Pumehana Street, Honolulu, Hawaii 96826
Phone (808) 949-7770 Fax (808) 946-0334

SCOTT H. INATSUKA
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HAWAII, U.S.A.

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LICENSE EXPIRATION DATE: APRIL 30, 2028

PROJECT
KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

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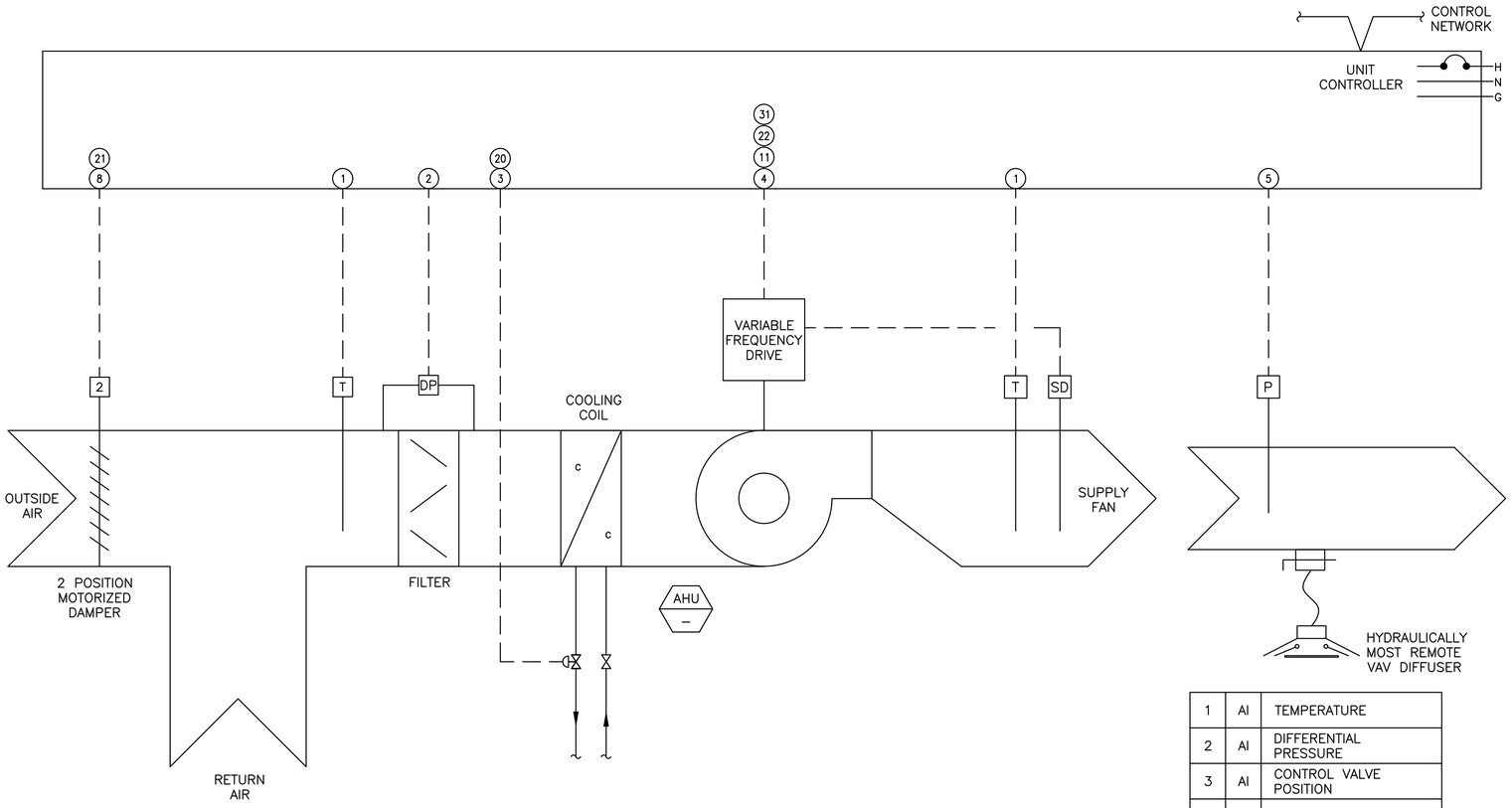
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03/30/2026	BIDDING

SHEET TITLE
DETAILS

SHEET NO: 20 OF 26

DRAWING NO: M301

PROJECT NO: 224003.00



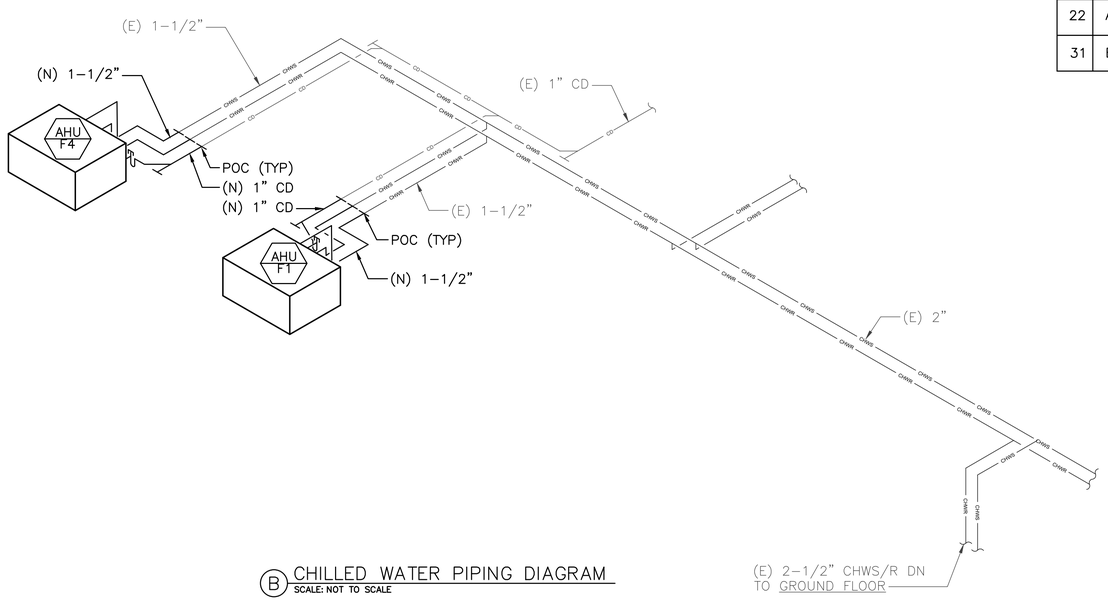
1	AI	TEMPERATURE
2	AI	DIFFERENTIAL PRESSURE
3	AI	CONTROL VALVE POSITION
4	AI	FAN SPEED
5	AI	STATIC PRESSURE
11	BI	FAN STATUS
12	BI	DAMPER POSITION
20	AO	CONTROL VALVE POSITION
21	AO	DAMPER POSITION
22	AO	FAN SPEED
31	BO	FAN START/STOP

Ⓐ VARIABLE AIR VOLUME AIR HANDLER UNIT CONTROL DIAGRAM
SCALE: NOT TO SCALE

AIR HANDLING UNITS

SEQUENCE OF OPERATION

1. SYSTEM OFF
   a. FAN OFF.
   b. CHILLED WATER CONTROL VALVE CLOSED.
   c. AIR MEASURING DAMPER CLOSED.
2. SYSTEM START
   a. PROGRAMMED START FROM HOSPITAL DDC SYSTEM.
   b. OPERATOR ENTERED COMMAND AT UNIT CONTROLLER'S USER INTERFACE.
   c. FAN SHALL START.
   d. THE AIRFLOW MEASURING DAMPER SHALL MODULATE TO A CONSTANT OUTSIDE AIRFLOW.
   e. CHILLED WATER CONTROL VALVE SHALL OPEN.
   f. MOTORIZED DAMPER SHALL OPEN.
3. SYSTEM OPERATION
   a. VAV DIFFUSER SHALL MODULATE TO MAINTAIN ROOM SET POINT TEMPERATURE.
   b. THE COOLING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE LEAVING AIR TEMPERATURE SET POINT.
   c. THE FAN MOTOR SPEED SHALL MODULATE TO MAINTAIN THE STATIC PRESSURE SETPOINT FROM THE STATIC PRESSURE SENSOR.
   d. AIR HANDLING UNITS WITH SMOKE DETECTORS SHALL SHUT DOWN UPON SMOKE DETECTOR ACTIVATING AND SEND A SIGNAL TO THE FIRE ALARM SYSTEM. SEE DRAWINGS FOR SMOKE DETECTOR LOCATIONS.
4. SYSTEM STOP
   a. PROGRAMMED STOP FROM HOSPITAL DDC SYSTEM.
   b. OPERATION ENTERED COMMAND AT UNIT CONTROLLER'S USER INTERFACE.
   c. FAN SHALL STOP.
   d. CHILLED WATER CONTROL VALVE SHALL CLOSE.
   e. MOTORIZED DAMPER SHALL CLOSE.
5. SET POINTS
   a. LEAVING AIR TEMPERATURE 55 DEGREES F.
   b. ROOM TEMPERATURE 73 DEGREES F (ADJUSTABLE).
   c. STATIC PRESSURE SETPOINT (REFER TO SCHEDULE).
6. ALARMS
   a. ROOM SPACE TEMPERATURE SET POINT +/−2 DEGREES F.
   b. FILTER HIGH DIFFERENTIAL PRESSURE (DIRTY FILTER).
   c. FAN FAILURE.
   d. SMOKE ALARM DETECTION.
7. TRENDS
   a. TREND ALL ALARMS.



Ⓑ CHILLED WATER PIPING DIAGRAM
SCALE: NOT TO SCALE

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LICENSE EXPIRATION DATE: APRIL 30, 2028

PROJECT
KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

PROJECT	
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DATE: 03/20/2026	EVENT: CD
03/30/2026	BIDDING

SHEET TITLE
HVAC DIAGRAMS

SHEET NO: 21 OF 26

DRAWING NO: M302

PROJECT NO: 224003.00

REMOVE	EXIST	NEW	DESCRIPTION
			CEILING LUMINAIRE
			EXIT LIGHT, CEILING, BLACKENED SEGMENT INDICATES ILLUMINATED SIDES AND ARROWS INDICATE DIRECTIONAL ARROWS
			MOTION SWITCH, CEILING MOUNTED
			COMBINATION INFRARED/ULTRASONIC MOTION SWITCH, CEILING MOUNTED
		S	SWITCH, 1P20A, +42"
		S_3	SWITCH, 3P20A, +42"
		S_M	SWITCH, OCCUPANCY SENSOR, +42"
			DIMMER SWITCH, SIZE AS INDICATED OR REQUIRED, +42"
			DUPLEX CONVENIENCE OUTLET, 3W, 15A, 125V, GROUNDING TYPE, +18" UNLESS OTHERWISE NOTED
			QUADRAPLEX RECEPTACLE, 2 DUPLEX RECEPTACLES, 3W, 15A, 125V. GROUNDING TYPE, +18" UNLESS OTHERWISE NOTED
			COMBINATION FLOOR POWER/TELCOM OUTLET
	E		PANELBOARD, FLUSH
			TELECOMMUNICATION OUTLET, +18" UNLESS OTHERWISE NOTED
			FIRE ALARM AUTOMATIC DETECTOR, CEILING
			FIRE ALARM AUDIO SIGNAL WITH FLASHING LIGHT, +80" TO BOTTOM OF APPLIANCE
			FIRE ALARM FLASHING LIGHT, +80" TO BOTTOM OF APPLIANCE
			FIRE ALARM CONTROL PANEL
			BLANK PLATE
			MOTOR CONNECTION
			MOTOR CONTROLLER
			SAFETY SWITCH
			CONDUIT STUB
			WIRING IN RACEWAY CONCEALED IN WALL OR CEILING
			WIRING IN FLEXIBLE RACEWAY, 6 FEET MAXIMUM

NOTES:

1. ANY CIRCUIT WITH NO FURTHER DESIGNATION INDICATES A TWO WIRE CIRCUIT. CIRCUITS WITH ADDITIONAL WIRES ARE INDICATED AS FOLLOWS —‖—, 3 WIRES: —‖—, 4 WIRES, ETC.

2. —⏚— INDICATES GROUNDING CONDUCTOR SIZED PER NATIONAL ELECTRICAL CODE ARTICLE 250.122. PROVIDE GROUNDING CONDUCTOR IN ALL RACEWAYS.

COUNTY OF HAWAI'I
CHAPTER 12, HAWAI'I COUNTY BUILDING CODE
HAWAI'I COUNTY CODE 1987, AS AMENDED

ARTICLE 6 – ENERGY CONSERVATION CODE

To the best of my knowledge, this project's design substantially conforms to:

Section 12-6.3 Adoption of the International Energy Conservation Code (IECC)
Section 12-6.4 Local Amendments to the IECC
For electrical and lighting systems (Section C405 and C408).

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

INFORMATION IN CONSTRUCTION DOCUMENTS	YES	N/A
Interior Lighting		
Occupant sensor controls. C405.2.1	☒	☐
Time switch controls. C405.2.2	☐	☒
Daylight responsive controls. C405.2.3	☐	☒
Daylight zones on plans. C405.2.3.2 & C405.2.3.3	☐	☒
Guest room controls. C405.2.4*	☐	☒
Exit signs. C405.3	☒	☐
Interior lighting fixture schedule		
Input power for interior lighting fixtures. C405.4.1	☒	☐
Interior lighting fixture locations	☒	☐
Lighting control functional performance testing requirement. C408.3	☐	☒
Exterior lighting		
Exterior lighting controls. C405.2.5	☐	☒
Exterior lighting fixture schedule	☐	☒
Input power for exterior lighting fixtures	☐	☒
Exterior lighting fixture locations	☐	☒
Exterior lighting power. C405.5	☐	☒
Electrical		
Electrical metering. C405.6	☐	☒
Electrical transformer efficiency. C405.7	☐	☒
Electrical motors. C405.8	☐	☒
Vertical and horizontal transportation systems. C405.9	☐	☒
Tenant submetering. C405.10	☐	☒

FUNCTIONAL TESTING
C408.3.1 Functional testing. Prior to passing final inspection, the registered design professional shall provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the construction documents and manufacturer's instructions. Functional testing shall be in accordance with Sections C408.3.1.1 and C408.3.1.2 for the applicable control type.

NOTES

SIGNATURE:

DATE: 3-18-2026

NAME: ALBERT RICHARD CHONG

TITLE: PRESIDENT

LICENSE NO.: 6183-E

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CREATE + BUILD + INSPIRE
934 Pumehana Street, Honolulu, Hawaii 96826
Phone (808) 949-7770 Fax (808) 946-0334

ALBERT RICHARD CHONG
LICENSED PROFESSIONAL ENGINEER
No. 6183-E
HAWAII, U.S.A.

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

LICENSE EXPIRATION DATE: 04/30/26

PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

HAWAII HEALTH SYSTEMS CORPORATION
79-1019 HAUKAPILA STREET
KEALAKEKUA, HI 96750
(808) 322-4442

PROJECT DATE	
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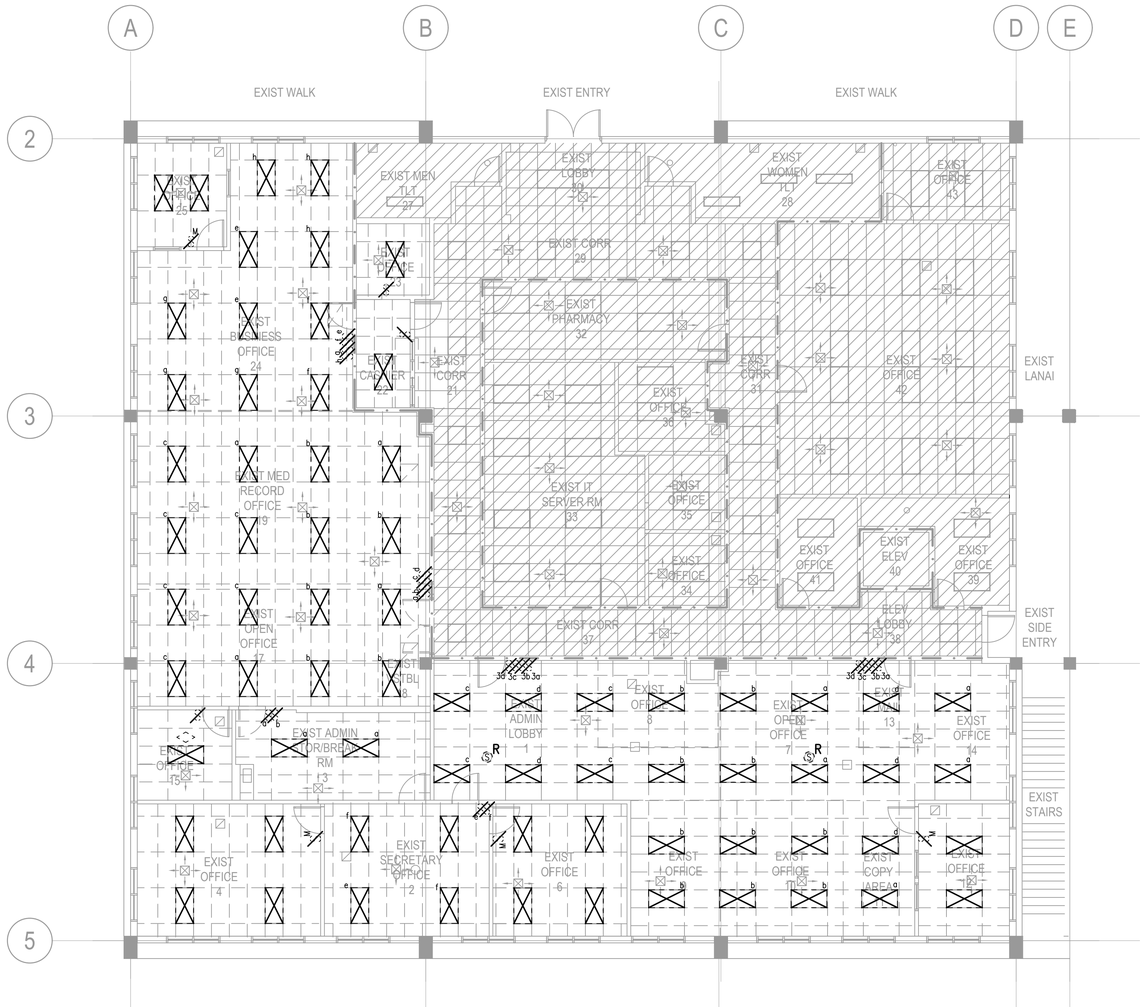
SHEET TITLE
ELECTRICAL SYMBOLS LIST

SHEET NO: 22 OF 26

DRAWING NO: E000

PROJECT NO: 224003.00

Albert Chong Associates Inc.
Consulting Electrical Engineers and Lighting Designers
1117 Kapahulu Avenue
Honolulu, Hawaii 96816
Telephone (808) 738-5355



1 FIRST FLOOR LIGHTING DEMOLITION PLAN

1/8 "=1'-0"

DEMOLITION NOTES:

1. EXISTING PLANS DO NOT INDICATE COMPLETE EXISTING WIRING CONDITIONS. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.
2. BEFORE ANY WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO BE CUT TO ASSURE THAT SERVICES REQUIRED ARE NOT DISCONNECTED.
3. REMOVE ALL EXISTING WIRING NOT TO REMAIN IN SERVICE.
4. REMOVE ALL CONDUITS NO LONGER REQUIRED
5. PHASE WORK TO ASSURE CONTINUITY OF ELECTRICAL, TELEPHONE AND SIGNAL SERVICES TO PARTS OF BUILDING THAT WILL REMAIN IN USE.
6. REMOVE ALL EXISTING LIGHT FIXTURES, RECEPTACLES, SWITCHES INDICATED TO BE REMOVED OR NO LONGER REQUIRED. BLANK OUTLETS. PLUG ALL HOLES IN BOXES AND CABINETS. ABANDON CONDUITS BELOW GRADE NO LONGER REQUIRED. PLUG OUT ALL WIRES IN ABANDONED CONDUITS.

0 2' 4' 8' 16'
1/8"=1'-0"

NORTH

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KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

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79-1019 HAUKAPILA STREET
KEALAKEKUA HI 96750
(808) 322-4442

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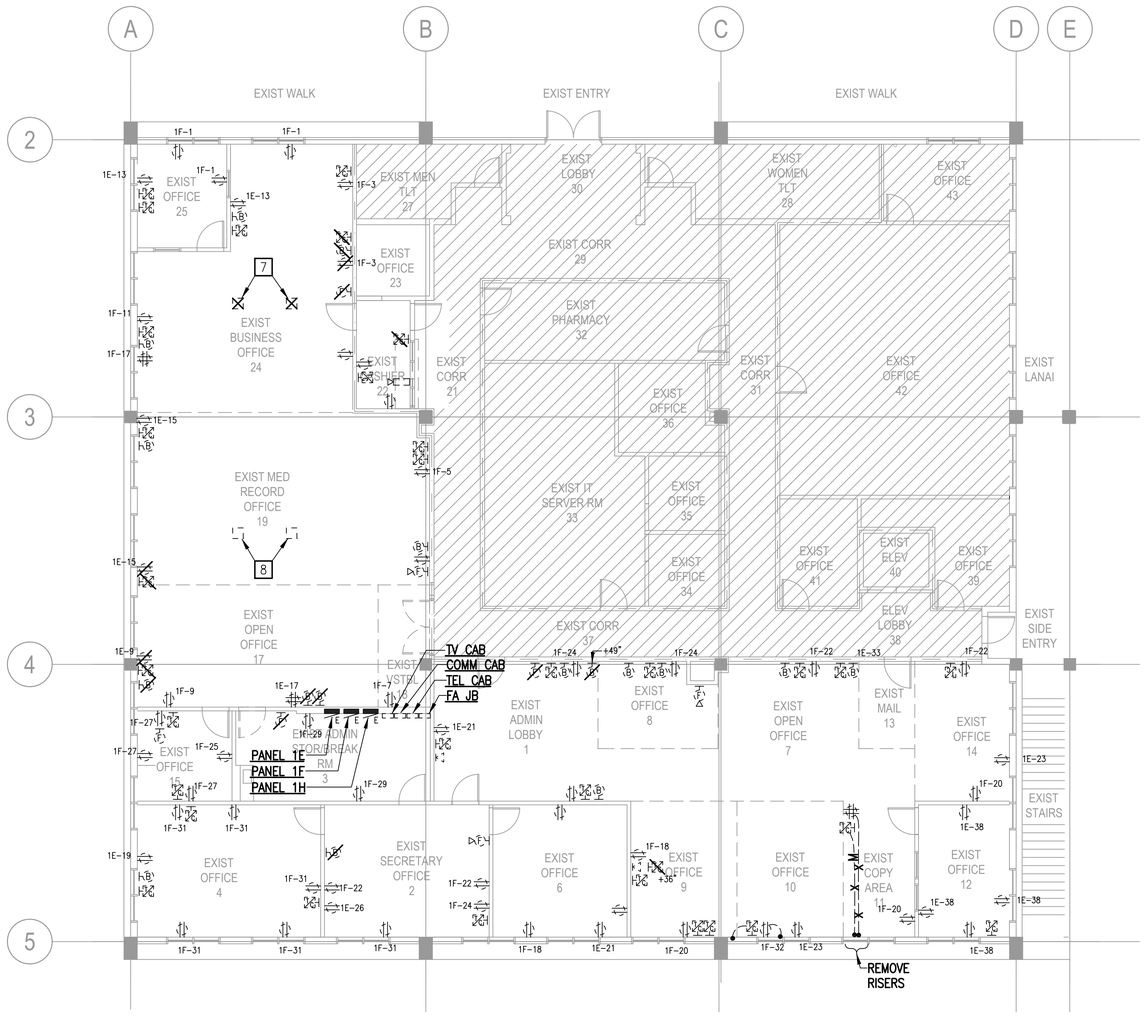
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SHEET TITLE
FIRST FLOOR LIGHTING DEMOLITION PLAN

SHEET NO: 23 OF 26

DRAWING NO: E101

PROJECT NO: 224003.00



1 FIRST FLOOR POWER AND SIGNAL DEMOLITION PLAN
1/8 "=1'-0"

0 2' 4' 8' 16'
1/8"=1'-0"

NORTH

DEMOLITION NOTES:

1. EXISTING PLANS DO NOT INDICATE COMPLETE EXISTING WIRING CONDITIONS. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.
2. BEFORE ANY WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO BE CUT TO ASSURE THAT SERVICES REQUIRED ARE NOT DISCONNECTED.
3. REMOVE ALL EXISTING WIRING NOT TO REMAIN IN SERVICE.
4. REMOVE ALL CONDUITS NO LONGER REQUIRED
5. PHASE WORK TO ASSURE CONTINUITY OF ELECTRICAL, TELEPHONE AND SIGNAL SERVICES TO PARTS OF BUILDING THAT WILL REMAIN IN USE.
6. REMOVE ALL EXISTING LIGHT FIXTURES, RECEPTACLES, SWITCHES INDICATED TO BE REMOVED OR NO LONGER REQUIRED. BLANK OUTLETS. PLUG ALL HOLES IN BOXES AND CABINETS. ABANDON CONDUITS BELOW GRADE NO LONGER REQUIRED. PLUG OUT ALL WIRES IN ABANDONED CONDUITS.
7. REMOVE POWER/TELECOM INCLUDING CONNECTIONS TO SYSTEM FURNITURE IN ITS ENTIRETY. VERIFY LOCATIONS.
8. EXISTING POWER/TELECOM CONNECTIONS TO SYSTEM FURNITURE TO REMAIN.

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FIRST FLOOR POWER AND SIGNAL DEMOLITION PLAN

SHEET NO: 24 OF 26

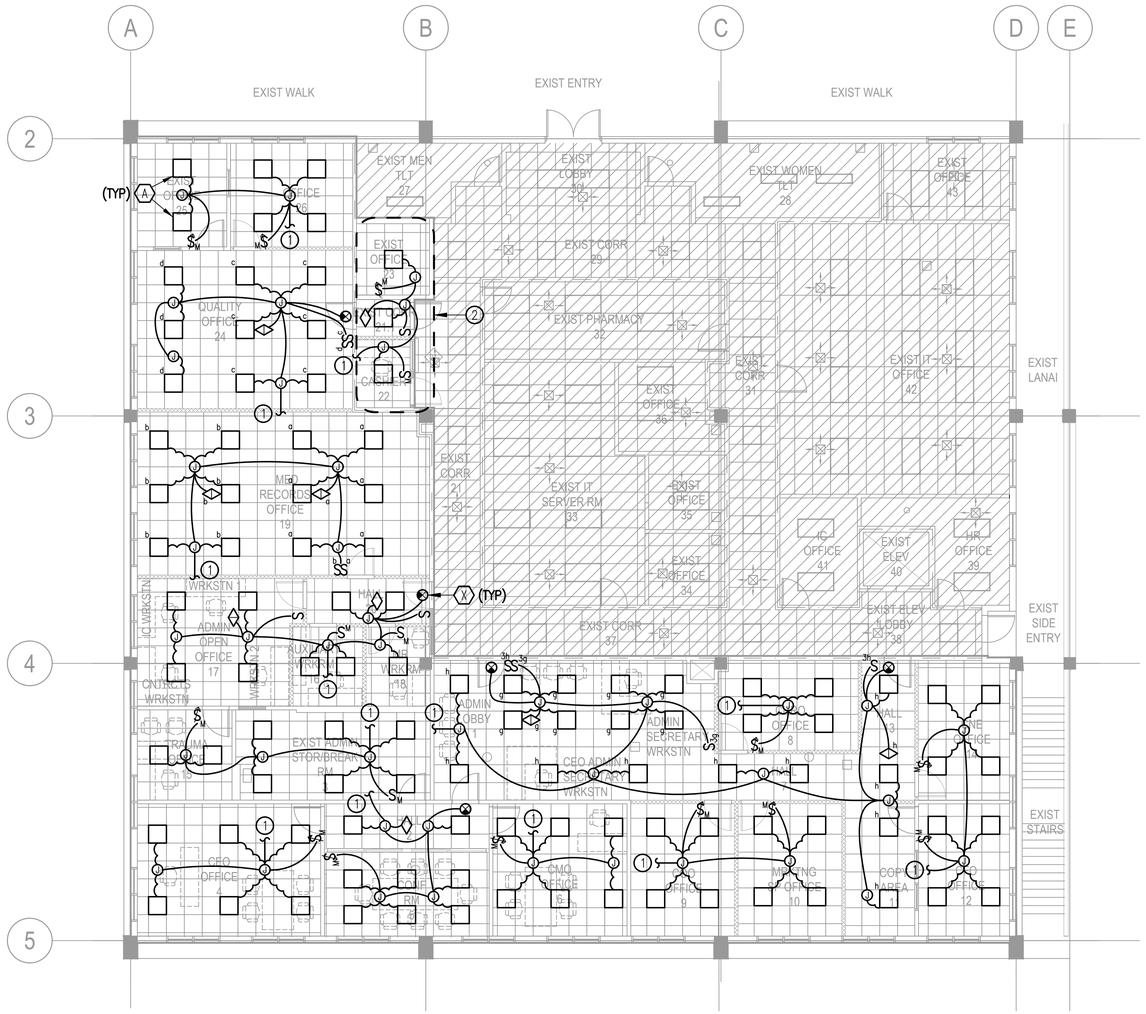
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PROJECT NO: 224003.00

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LIGHTING NOTES:

1. RECONNECT NEW LIGHTING TO EXISTING LIGHTING CIRCUITS. EXTEND/TRIM AS NECESSARY.
2. FIRE RATED CEILING. PROVIDE FIRE RATED COVERS AS REQUIRED.



LUMINAIRE SCHEDULE		
TYPE	LAMP	DESCRIPTION
A	35K/28W	METALUX 22GR3235D
X	LED	SURE LITES LPX6

1 FIRST FLOOR NEW LIGHTING PLAN
1/8 "=1'-0"

0 2' 4' 8' 16'
1/8"=1'-0"

NORTH

KYA
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PROJECT

KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

TMK: 7-9-010:081

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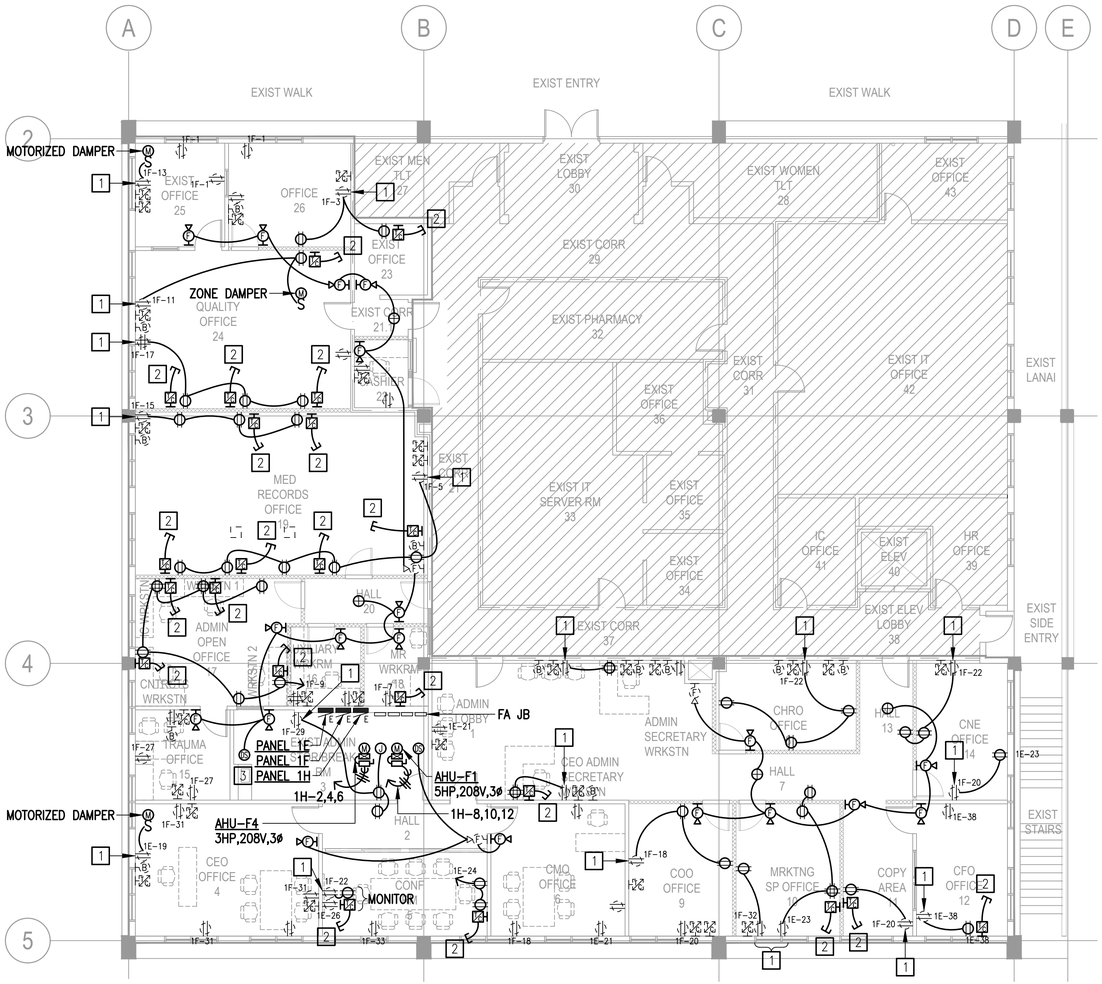
SHEET TITLE
FIRST FLOOR NEW LIGHTING PLAN

SHEET NO: 25 OF 26

DRAWING NO: E201

PROJECT NO: 224003.00

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Telephone (808) 738-5355



1 FIRST FLOOR NEW POWER AND SIGNAL PLAN
1/8 "=1'-0"

POWER AND SIGNAL NOTES:

1. CONNECT TO EXISTING CIRCUIT. CONTRACTOR TO TRIM/EXTEND CIRCUIT AS NEEDED.
2. 1"C STUB ABV CLG.
3. PROVIDE NEW 2-3P20A BREAKERS IN SPACES 2,4,6 AND 8,10,12.

0 2' 4' 8' 16'
1/8"=1'-0"

NORTH

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KONA COMMUNITY HOSPITAL

FIRST FLOOR SSB HVAC REPLACEMENT & RENOVATION

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KEALAKEKUA HI 96750
(808) 322-4442

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SHEET TITLE
FIRST FLOOR NEW POWER AND SIGNAL PLAN

SHEET NO: 26 OF 26

DRAWING NO: E202

PROJECT NO: 224003.00

APPENDIX J

SPECIFICATIONS/PROJECT MANUAL

See following pages

PROJECT MANUAL

KONA COMMUNITY HOSPITAL
1ST FLOOR SSB
HVAC REPLACEMENT & RENOVATION

Haukapila Street
Kealakekua, Hawaii

Bidding Documents

March 30, 2026

KYA INC. Project No. 224003.00
Contract No. 26-0175 RFP 26-0600

Architect:	KYA Inc.
Mechanical Engineer:	Inatsuka Engineering LLC.
Electrical Engineer:	Albert Chong Associates, Inc.

DOCUMENT 00 01 10 – TABLE OF CONTENTS

General Requirements Subgroup

~~**DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**~~
~~ISSUED BY THE OWNER~~
~~00400 BID PROPOSAL FORM~~ (inserted in Price Section)
~~00500 SUBSTITUTION REQUEST FORM~~

DIVISION 01 – GENERAL REQUIREMENTS
ISSUED BY THE OWNER

01100	SUMMARY OF WORK
	ICRA Procedures_Policy#125-54
01120	ALTERATION PROJECT PROCEDURES
01230	ALTERNATES
01260	CONTRACT CONSIDERATIONS
01270	VARIABLE QUANTITIES UNIT PRICES
01290	PAYMENT PROCEDURES
01310	PROJECT MANAGEMENT AND COORDINATION
01330	SUBMITTAL PROCEDURES
01400	QUALITY REQUIREMENTS
01450	MOISTURE VAPOR AND ALKALINITY TESTING
01500	TEMPORARY FACILITIES AND CONTROLS
01600	PRODUCT REQUIREMENTS
01730	EXECUTION REQUIREMENTS
01732	CUTTING AND PATCHING
01770	CLOSEOUT PROCEDURES
01783	PROJECT RECORD DOCUMENTS

Facility Construction Subgroup

DIVISION 02 – EXISTING CONDITIONS
02 04 00 SELECTIVE BUILDING DEMOLITION

DIVISION 03 – CONCRETE (NOT INCLUDED)

DIVISION 04 – MASONRY (NOT INCLUDED)

DIVISION 05 – METALS
05 40 00 COLD-FORMED METAL FRAMING

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES
06 10 54 ROUGH CARPENTRY

DIVISION 07 – THERMAL AND MOISTURE PROTECTION
07 21 00 THERMAL AND ACOUSTIC INSULATION
07 84 00 FIRESTOPPING
07 92 00 JOINT SEALANTS

DIVISION 08 – OPENINGS
08 11 00 HOLLOW METAL FRAMES
08 14 24 PLASTIC LAMINATE-FACED WOOD DOORS
08 32 00 SLIDING GLASS DOORS **(ALTERNATE 2)**
08 43 00 SPECIAL FUNCTION DOORS **(ALTERNATE 1)**
08 71 00 FINISH HARDWARE
HARDWARE SCHEDULE
08 80 00 GLAZING
08 81 17 FIRE RATED GLASS

DIVISION 09 – FINISHES
09 22 16 NON-STRUCTURAL METAL FRAMING
09 29 00 GYPSUM BOARD
09 51 13 ACOUSTICAL PANEL CEILINGS
09 65 14 RESILIENT BASE
09 68 13 CARPET TILE
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DIVISION 10 – SPECIALTIES (NOT INCLUDED)

DIVISION 11 – EQUIPMENT (NOT INCLUDED)

DIVISION 12 – FURNISHINGS (NOT INCLUDED)

DIVISION 13 – SPECIAL CONSTRUCTION (NOT INCLUDED)

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DIVISION 21 – FIRE SUPRESSION (NOT INCLUDED)

DIVISION 22 – PLUMBING (NOT INCLUDED)

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING
23 05 17 SLEEVES AND SLEEVE SEALS FOR PLUMBING AND HVAC PIPING
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26 05 10 BASIC ELECTRICAL REQUIREMENTS
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DIVISION 31 – EARTHWORK (NOT INCLUDED)

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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 two primary phases of remodel work in the Special Services Building (SSB) on the Kona Community Hospital campus. The SSB consists of a a ground and first floor. The remodel work includes 4,755 SF of existing office space on the first floor. The project shall be completed in two phases due to the Quality Office, Medical Records Office and Administration Office occupying the space during construction.

B. The Work of the contract generally includes, but is not limited to the following:

1. Phase 1: Renovation involves replacement of AHU-F4 and touches an estimated 2,292 SF of existing office space:

    a. Existing occupants shall be moved out of space. Furniture, office equipment, and temporary walls shall be removed by KCH before construction begins.

    b. Demolition of acoustical ceiling tiles, suspended ceiling grids, and light fixtures.

    c. Selective demolition of existing carpet at new wall partitions.

d. Selective demolition of HVAC components related to AHU-F4 replacement and new wall partitions.

e. Selective demolition of electrical and telecommunications related to AHU-F4 replacement, new acoustical ceiling system and new wall partitions.

f. Install of new AHU-F4, select ductwork, supply diffusers, return diffusers, and related work.

g. Install of new wall partitions with paint finish, select new doors, new acoustical ceiling grid system. Spaces to receive carpet patching at new wall partitions and paint refresh at existing walls.

h. Install of select new electrical components, select new telecommunications outlets, and new light fixtures.

2. Phase 2: Renovation involves replacement of AHU-F1 and touches an estimated 2,463 SF of existing office space:

   a. Existing occupants shall be moved out of space. Furniture, office equipment, and wood partitions shall be removed by KCH before construction begins.

   b. Demolition of carpet, acoustical ceiling tiles, suspended ceiling grids, and light fixtures.

   c. Selective demolition of HVAC components related to AHU-F1 replacement and new wall partitions.

   d. Selective demolition of electrical and telecommunications related to AHU-F1 replacement, new acoustical ceiling system and new wall partitions.

   e. Install of new AHU-F1, select ductwork, supply diffusers, return diffusers, and related work.

   f. Install of new wall partitions with paint finish, select new doors, new acoustical ceiling grid system, new carpet. Existing walls to receive paint refresh.

   g. Install of select new electrical components, select new telecommunications outlets, and new light fixtures.

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 in gravel lot adjacent to Hospital.
2. Contractor's personnel may use the hospital cafeteria.
3. Contractor's personnel may use the hospital's restrooms.
4. Smoking is not permitted anywhere on KCH property. Consumption of food and beverages will not be permitted on the premises except in designated areas.
5. Playing of radios will not be permitted.
6. Shall be properly attired for work. (No tank tops, cut-off jeans, slippers, etc.)
7. Shall conduct themselves with decorum and courtesy toward staff, patients, and public.
8. Shall not use loud and offensive language.
9. Shall read and sign the KCH 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. Medical/office equipment.
2. 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 the 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., Policy #125-54 as attached. Walk off mats at site entrance shall be changed as needed. HEPA filtration units are to be utilized 24 hours per day throughout the construction process.

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~~

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Title: INFECTION CONTROL DURING CONSTRUCTION AND RENOVATION	Reference #: 449 Version: 2
Owner: Lisa Downing (RN)	Date Approved: 07/12/2019 Last Review Date: 07/12/2019

PURPOSE:

This policy will outline infection control measures that will be implemented during all phases of renovation or construction that takes place at Kona Community Hospital. This will require that an infection control risk assessment be conducted when planning projects that involve demolition, construction, or renovation. The purpose of the assessment is to avoid compromising patient care due to construction activities in occupied areas of the hospital's buildings. Appropriate controls will be implemented based on the results of the risk assessment to provide an environment that is safe from environmental hazards for patients, visitors, contract workers, employees and physicians. These infection control measures will also be observed during any maintenance activities that would fall under repairs or renovation in sensitive areas.

POLICY:

The Environment of Care and Infection Control committees will manage the policy. The Environment of Care and the Infection Control Practitioner will review all construction or renovation projects in the planning phases and throughout the project. This will include and not be limited to:

1. Design, number and type of isolation rooms.
2. Heating, ventilation, and air conditioning systems (HVAC)
3. Mechanical system involving water supply and plumbing.
4. Number, type and placement of handwashing fixtures
5. Sharps disposal unit placement
6. Accommodation for personal protection equipment
7. Surfaces: ceiling tiles, walls, flooring coverings and furnishings
8. Utility rooms: soiled, clean, instrument processing, workrooms.

Maintenance Department, Engineer, and Facility Manager will keep the Environment of Care Committee and the Infection Control Department informed of all locations of renovation and construction. An Infection Control Risk Assessment (ICRA) will be completed prior to any construction, repairs or renovations. **Infection Control Construction Permit is required for all class III or IV construction and risk categorization.** The Facility Manager, Engineer or Infection Control Department will monitor the construction daily while work is being performed or as needed and complete the Construction Compliance Survey form. All construction workers, including subcontractors, are to follow the infection control procedures described in this policy.

RESPONSIBILITIES:

A multidisciplinary group will be formed to evaluate infection control risk, beginning with the planning phase of construction or renovation project. The Construction/Facility Manager is to ensure that the **ICRA (Infection Control Risk Assessment)** (see Appendix 1) and the policy are written into the construction contract document. The construction contractor is obligated to perform specific requirements that are in the contract during the construction process. The multidisciplinary team will consist of at a minimum the Facilities Director (or designee), Construction Supervisor and the Infection Prevention Director. Expertise not provided by the core membership should be brought in whenever the complexity of the project requires it (see following table).

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TEAM MEMBERS	FUNCTIONS AND RESPONSIBILITES
Infection Control Coordinator and committee	Coordinate member's input in developing a comprehensive project management plan. Review and sign a permit for any construction or renovation that is in the highest risk group or Class III and IV. (see ICRA) Ensure compliance with the policy. Oversee all infection control aspects of construction activities. Provide education about the infection control impact of construction to staff and construction workers.
Project/Facility Manager **Safety Officer (EOC)** **Maintenance** **Construction Supervisor**	Representative of the Health Care Facility. Develop a plan for structural maintenance. Responsible for the daily monitoring of the construction compliance survey **(see Appendix 5)** that is to be reviewed as needed depending on the scope of the project and if there are compliance issues. Maintenance department will confirm specified air velocity whenever barricades are erected or modified.
Administration **Engineering**	Support the ICRA team to function appropriately and continuously throughout the construction phase. Prevent unnecessary exposures of patient, visitors and staff to infectious agents.
Environmental Services	Establish a mechanism for addressing and correcting problems quickly. Thoroughly clean the construction or renovation area before patients are readmitted into these areas.
Maintenance **Construction Supervisor**	Develop contingency plans for power failures, water supply disruptions, fires, and emergency response.
Contractor / Architects	Contractor will inform his personnel on KCH's policies that will govern their activities. Contractor will be familiar with the Infection Control Construction Permit requirements prior to construction. Contractor is responsible for maintaining equipment and replacement of HEPA and other filters in accordance with manufacturer's recommendation per contract requirements. Provide a water damage management plan (including drying protocols) for handling water intrusion from floods, leaks and condensation.

DEFININTIONS OF CONSTRUCTION ACTIVITIES: (see Appendix 1)

The amount of dust that is generated, the duration of the activity, and the amount of shared HVAC systems define the construction activity types. Contact KCH's Construction Supervisor and Infection Control if any project is questionable under these guidelines.

A. **Type A:** Inspection and Non-Invasive activities includes but is not limited to, removal of ceiling titles for visual inspection limited to 1 title per 50 square feet, painting with minimal dust production, wall covering, electrical trim work, minor plumbing, and activities that do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.

B. **Type B:** Small scale, short duration activities that create minimal dust. Includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting of walls or ceiling where dust migration can be controlled.

C. **Type C:** Any work that generates a moderate to high-level amount of dust or requires demolition or removal of any fixed building components or assemblies. Includes, but is not limited to sanding of wall for painting or wall covering, removal of floor coverings, ceiling titles and casework, new wall construction, minor ductwork or electrical work above ceilings, major cabling activities, and any activity that cannot be completed within a single work shift. .

D. **Type D**: Major demolition and construction projects. Includes, but is not limited to activities that require consecutive work shifts, require heavy demolition or removal of a complete ceiling system and new construction.

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DEFINITIONS OF INFECTION CONTROL RISK GROUPS: (see Appendix 2)

Patient Risks Groups

Low Risk	Medium Risk	High Risk	Highest Risk
• Office areas	• Cardiology • Echocardiography • Endoscopy • Nuclear Med • Physical Therapy • Radiology/MRI • Respiratory Therapy	• CCU • ER • L&D • Lab • Newborn Nursery • Outpatient Surgery • Pediatrics • Pharmacy • Dietary • PACU	• Oncology • Burn units • Cardiac Cath lab • Central Supply • Intensive care Units • Medical unit • Isolation rooms • Operating and C-section rooms • Area caring for immunocompromised patients

CLASS OF PRECAUTIONS: Construction Project by patient Risk Matrix

Step 1 Identify the type of construction activity
Step 2 Identify the patient risk group from the table above.
Step 3 Match the construction class of precaution with the designated risk group in the matrix below**.**
NOTE: Infection Control approval will be required when the construction activity and risk level indicates that Class III or Class IV control procedures is necessary. All infection control barrier plans, air exhaust, HVAC, routing plans, etc will be approved by infection control prior to start of project.

Construction Project Type

Patient Group Risk Level	Type A	Type B	Type C	Type D
Low Risk	I	II	II	III/IV
Medium Risk	I	II	III	IV
High Risk	I	III	III/IV	IV
Highest Risk	III	III/IV	III/IV	IV

PERFORMANCE REQUIREMENTS

- Infection Control is critical in all areas of all facilities. Construction activities causing disturbance of existing dust or creating new dust must be conducted in tight enclosures cutting off any flow of particles into patient areas.

- KCH requires any contractor, sub-contractor, material suppliers, vendors, employees or agents to be bound by these same requirements. Before construction begins on site, the Contractor's on site management team shall attend a pre-construction meeting held by KCH's Infection Control and/or Construction supervisor. They shall attend the meeting to ensure appropriate instruction of precautions for Infection Control Practices during construction or renovation.

- HEPA equipped air filtration machines will be used and a negative pressure monitor will be used to maintain a minimum negative pressure of -0.020. HEPA equipped air filtration machines shall be connected to normal power and continually operational.

- The KCH's Environment of Care or Infection Control department may modify performance requirements for certain activities.

INFECTION CONTROL PERMIT (see Appendix 4)

- An Infection Control permit is required for Class III or higher procedures. Refer to the Construction Project by patient risk matrix shaded area in the table.
- When required, obtain an approved Infection Control Permit from the Infection Control Department before beginning any construction/maintenance work.
- Permit is to be displayed at entrance to the hospital or work area during entire construction period.
- Return permit to infection control at completion of work.

BARRIERS: The area should be isolated, as the project requires.

- A closed door with masking tape applied over the frame and door is acceptable for projects, which can be contained.
- Construction, demolition or reconstruction/maintenance not capable of containment within a single room must have the following barriers erected.
  - Small duration projects generating minimal dust may use fire-rated plastic sheeting. It should be sealed at full ceiling height with 2 foot overlapping flaps for access to entry.
  - Projects that produces moderate to high levels of dust requires rigid, dust-proof, and fire rated barrier walls (dry wall/construction walls) with caulked/gasket seams for a tight seal.
  - Large dusty projects need an entry vestibule (anteroom) for removal of protective clothing or vacuum off existing clothing and tool storage.

GENERAL:

- Temporary construction barriers and closures above ceilings shall be dust tight**.**
- All materials entering the facility and the construction zone are disinfected completely with hospital approved disinfectant including equipment, barrier wall systems, tools, trash carts, HEPA carts etc.
- All material leaving facility will be wrapped in plastic sheeting or secured in plastic bags and placed in a securely covered transport cart/trash receptacle that has been disinfected (wiped down to remove dust and debris) with hospital approved disinfectant.
- Tacky mats will be maintained at the construction entry to the building and at the entry to the construction zone. The mats will be changed daily or more frequently if necessary to prevent accumulation of dust.
- Any dust tracked outside of barrier shall be removed immediately. Cleaning outside barrier to be by HEPA filtered vacuum or damp cloth.
- Any ceiling access panels opened for investigation beyond sealed areas shall be replaced immediately and not left unattended.
- Ensure that the supply-air and return-air vents are sealed in the construction zone to prevent contamination of the HVAC system and surrounding areas.
- When openings are made into existing ceilings, use HEPA type carts (bubbles) or provide polyethylene enclosure around ladder sealing off opening, fitted tight to ceiling and floor. Provide thorough cleaning of existing surfaces that become exposed to dust.

- Removal of construction barriers and ceiling protection shall be done carefully and only after clearance from Construction Supervisor or Infection Control. Vacuum and/or damp mop/wipe all interior barrier surfaces to remove any construction/maintenance debris/dust prior to removal of barriers.

- When access panels are opened in occupied areas for work above ceilings. Use HEPA type carts (bubbles) or polyethylene enclosure around ladder sealing off opening, fitted tight to ceiling and floor.

- All vacuuming regardless of location (under negative or positive pressure) will be completed with a certified HEPA filtered vacuum.

RESPONSIBILITIES BY ACTIVITY CLASS: (see appendix 3)

Class I

- Execute work by methods to minimize raising dust from construction operations.
- Immediately replace any ceiling title displaced for visual inspection.
- Immediately disinfect any dust, debris or dirt that was generated.

Class II

- Provide active means to prevent-airborne dust from dispersing into atmosphere.
- Water mist work surfaces to control dust while cutting.
- Use attached vacuum for drills/saws.
- Seal unused doors with making tape.
- Block off and seal air vents
- Wipe tools, equipment and work surfaces with disinfectant.
- Use sticky mats if needed

Class III

- Consult Infection Control department prior to construction/maintenance project activity begins to verify infection control barrier plan and scope of project.
- Obtain approved Infection Control permit from Construction Supervisor or Infection Control department before construction begins. Post in appropriate location.
- Isolate HVAC intake/output system in area where work is being done to prevent contamination of duct system and other locations.
- Complete all critical plastic/hard wall barriers before construction begins or implement HEPA type cart (bubbles). Barriers must be approved by Construction Supervisor and/or Infection Control prior to start of project.
- Maintain negative air pressure (-0.020) within the work site utilizing HEPA equipped air filtration units that are exhausted to the outside. Must be approved by Construction Supervisor and/or Infection Control prior to start of project.
- Negative air pressure monitors will be used.
- Contain construction waste before transport in plastic (or bags) and tightly covered containers.
- Cover transport receptacles or carts both when moving items in and out of facility.
- Wet mop and/or vacuum with HEPA filtered vacuum before leaving work areas including workers, carts, materials, waste carts and equipment.
- Place sticky mats at entrance and exit of work area and entrance to the facility if needed.
- Do not remove barriers from work area until cleared by Construction Supervisor and/or Infection Control.

Class IV

- Consult Infection Control Department prior to construction/maintenance project activity begins to verify infection control barrier plan and scope of project.
- Obtain approved Infection Control permit from Construction Supervisor or Infection Control department before construction begins. Post in appropriate location.

- Construction Supervisor and Infection Control will approve all construction routes prior to start of project.
- Isolate HVAC intake/output system in area where work is being done to prevent contamination of duct system and other locations.
- Complete all critical plastic/hard wall barriers before construction begins or implement HEPA type cart (bubbles). Barriers must be approved by Construction Supervisor and/or Infections Control prior to start of project.
- Maintain negative pressure (-0.020) within work site utilizing HEPA equipped air filtration units that are exhausted to the outside. Must be approved by Construction Supervisor and/or Infection Control prior to start of project.
- Negative air pressure monitors will be used
- Contain construction waste before transport in plastic (or bags) and tightly covered containers.
- Cover transport receptacles or carts both when moving items in and out of facility.
- Wet mop and/or vacuum with HEPA filtered vacuum before leaving work areas including workers, carts, materials, waste carts and equipment.
- Place sticky mats at entrance and exit of work area and entrance to the facility.
- Construct anteroom (or use prefab HEPA anteroom) and require all personnel to pass through this room so they can be vacuumed using an HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site. This is required during demolition and when dust is significant.
- All personnel entering work site are required to wear shoe covers during demolition and times when dust is significant. Shoe covers must be changed each time the worker exits the work area.
- Do not remove barriers from work area until cleared by Construction Supervisor and Infection Control.

    - Contractor daily cleaning to include construction area, anterooms, all surfaces that dust can accumulate, inside barrier walls, HEPA carts and filters, floors, lights and other fixtures within the project site. Areas outside the construction site that are visibly soiled due to construction activities must be immediately cleaned. This includes cleaning and disinfection with hospital provided/approved disinfectants (cloths, mops, chemicals) and HEPA filtered vacuums.
    - Construction area is required to be kept clean at all times during dusty phases of the project. This may require intermittent cleaning by contractor to keep potential dust from being tracked outside of the construction zone.
    - KCH's Environmental Services will complete a deep cleaning prior to removal of any infection control barriers and area will be inspected by Construction Supervisor and/or Infection Control before returning work area to service.

ENVIRONMENTAL MONITORING

- Contractor is responsible for maintaining equipment and replacement of HEPA and other filters in accordance with manufacturer's recommendations and infection control plans.
- KCH will monitor infection control requirements are met on a daily basis during the project and communicate deficiencies to the contractor for immediate remediation or in cases of patient/staff safety risks will stop construction activities until issues are resolved.

ENFORCEMENT

- Construction Supervisor, Infection Control, Hospital Supervisor, Project Manager, Safety Officer and the Environment of Care Committee have authority to shut down a project whenever a potential or actual hazardous infection control deficiency exists.

- Construction Supervisor and/or Infection Control will record the following:
    - Document each violation with photographs
    - Maintain a record of all infection violations.

REFERENCES:

Hansen, W. 2001. "Infection Control During Construction" A *Guide to Prevention and JCAHO COMPLIANCE.*

APIC, 2000 "The role of infection control during construction in health care facilities"

APIC, Infection Control Tool Kit Series: Construction and Renovation.

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CONSTRUCTION COMPLIANCE SURVEY

Project: _____Review Date:_____ Observed by: _____

Location	Standards	Not Met	Met	N/A	Responsable Person / Comment
	Contractors wearing required identification and signs posted for the area				
	Construction Personnel wearing required PPE (coveralls, booties, hard hats, respirators)				
	Negative Air Pressure • All windows closed behind area • Negative pressure maintained • Exhaust fans functioning • Air quality adequate • No excess fumes				
	Contractors following safe work practices				
	Walk-off mats adequate and clean to control dust				
	Construction Barriers appropriate for patient population • Sealed plastic with overlay • Hard barrier with door • Closed patient doors sealed with tape • HEPA carts (bubbles)				
	Project area • Debris removed from construction area daily • Trash contained/transported appropriately • Routine cleaning done of the jobsite • Minimal dust • Daily wet mop, cleaning				
	Traffic Control • Workers following approved routes				

Additional Comments/Actions:

_____
_____
_____
_____
_____

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INFECTION CONTROL RISK ASSESSMENT

Matrix of Precautions for Construction and Renovation/Maintenance

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 ♦ Wall covering, electrical trim work, minor plumbing, and activities that do not generate dust or 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, removal of a complete cabling system; and new construction.

STEP TWO:

Using the following tables identify: Patient Risk Groups who will be affected. If more than one risk group will be affected, select the higher risk group.

LOW RISK	MEDIUM RISK	HIGH RISK	HIGHEST RISK
♦ Office Areas	♦ Cardiology ♦ Echocardiography ♦ Endoscopy ♦ Nuclear Medicine ♦ Physical Therapy ♦ Radiology/MRI ♦ Respiratory Therapy	♦ Critical Care Unit ♦ Emergency Room ♦ Labor and Delivery ♦ Laboratories (specimen) ♦ Newborn Nursery ♦ Outpatient Surgery ♦ Pediatrics ♦ Pharmacy ♦ Post Anesthesia Care Unit ♦ Surgical Units ♦ Dietary	♦ Any area caring for immuno-compromised patients ♦ Burn Unit ♦ Cardiac Cath Lab ♦ Central Sterile Supply ♦ Intensive Care Units ♦ Medical Unit ♦ Negative pressure isolation rooms ♦ Oncology ♦ Operating Rooms, including C-Section Rooms

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STEP THREE:
Match:
Patient Risk Groups – Low, Medium, High and Highest
Construction Project Type – A, B, C and D
Class of Precautions – I, II, III, or IV, or level of infection control activities required.
Class I-IV or **Color-coded Precautions** are delineated on the following page.

IC Matrix **Class of Precautions: Construction Project by Patient Risk**

	CONSTRUCTION PROJECT TYPE			
PATIENT RISK GROUP	**Type A**	**Type B**	**Type C**	**Type D**
LOW Risk Group	I	II	II	III/IV
MEDIUM Risk Group	I	II	III	IV
HIGH Risk Group	I	II	III/IV	IV
HIGHEST Risk Group	II	III/IV	III/IV	IV

NOTE: Infection Control approval will be required when the Construction Activity and Risk Level indicate that **Class III** or **Class IV** control procedures is necessary.

Adapted with permission V Kennedy, B Barnard, St Luke Episcopal Hospital, Houston Texas ECSI ASHE PDC 2001

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DESCRIPTION OF REQUIRED INFECTION CONTROL PRECAUTIONS BY CLASS

	During Construction Project	Upon Completion of Project
Class I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection.	1. Wipe work surfaces with disinfectant.
Class II	1. Provide active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape 4. Block off & seal air vents. 5. Place dust mat at entrance and exit of work area. 6. Remove or isolate HVAC system in areas where work is being performed.	1. Wipe work surfaces with disinfectant. 2. Contain construction waste before transporting in tightly covered containers. 3. Wet mop and/or vacuum with an HEPA filtered vacuum before leaving work area. 4. Remove isolation of HVAC system in areas where work is being performed.
Class III	1. Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers, e.g., sheet rock, plywood, plastic to seal area from non-work, area or implement control-cube method (cart with a plastic covering and sealed connection to the work site, with an HEPA vacuum for vacuuming, prior to exit) before construction begins. 3. Maintain negative air pressure within work site, utilizing HEPA equipped air-filtration units. 4. Contain construction waste for transport in tightly covered containers. 5. Cover transport receptacles or carts. Tape covering, unless solid cover.	1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department, and thoroughly cleaned by the owner's Environmental Services Department. 2. Remove barrier materials carefully to minimize the spreading of dirt and debris associated with construction. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with disinfectant. 5. Remove isolation of HVAC system in areas where work is being performed.
Class IV	1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers, e.g., sheet rock, plywood, plastic to seal area from non-work area, or implement control cube method (cart with a plastic covering and sealed connection to the work site, with an HEPA vacuum for vacuuming, prior to exit) before construction begins. 3. Maintain negative air pressure within work site, utilizing HEPA equipped air-filtration units. 4. Seal holes, pipes, conduits, and punctures appropriately. 5. Construct anteroom and require all personnel to pass through this room so that they can be vacuumed off using an HEPA vacuum cleaner before leaving work site, or they can wear cloth or paper coveralls that are removed each time they leave the work site. 6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area. 7. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department, and thoroughly cleaned by the owner's Environmental Services Department.	1. Remove barrier material carefully to minimize the spreading of dirt and debris associated with construction. 2. Contain construction waste before transporting in tightly covered containers. 3. Cover transport receptacles or carts. Tape covering, unless the cover is tightly secure. 4. Vacuum work area with HEPA filtered vacuums. 5. Wet mop area with disinfectant. 6. Remove isolation of HVAC system in areas where work is being performed.

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KONA
COMMUNITY HOSPITAL

Location of Construction: **Permit No.:** _____

Project Coordinator: **Project Start Date:**

Contractor Performing Work: **Estimated Time of Completion:**

Supervisor:Telephone: **Permit Expiration Date:**

YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		TYPE A: Inspection, non-invasive activity			GROUP 1: Low Risk
		TYPE B: Small scale, short duration, moderate to high levels			GROUP 2: Medium Risk
		TYPE C: Activity generates moderate to high levels of dust, requires greater one work shift for completion.			GROUP 3: Medium/High Risk
		TYPE D: Major duration and construction activities requiring consecutive work shifts.			GROUP 4: Highest Risk

CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace any ceiling tile displaced for visual inspection. 3. Minor demolition for remodeling.
CLASS II	1. Provides active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Wipe surfaces with disinfectant. 6. Contain construction waste before transporting in tightly covered containers. 7. Wet mop and/or vacuum with an HEPA filtered vacuum before leaving work area. 8. Place dust mat at entrance and exit of work area. 9. Remove or isolate HVAC system in areas where work is being performed.
CLASS III **Date:** _____ **Initial:** _____	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site, utilizing HEPA equipped air-filtration units. 5. Do not remove barriers from work area until complete project is thoroughly cleaned by Environmental Services Department. 6. Vacuum work with HEPA filtered vacuums. 7. Wet mop with disinfectant. 8. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 9. Contain construction waste before transport in tightly covered containers. 10. Cover transport receptacles or carts, and tape covering. 11. Remove or isolate HVAC system in areas where work is being performed.
CLASS IV **Date:** _____ **Initial:** _____	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site, utilizing HEPA equipped air-filtration units. 5. Seal holes, pipes, conduits, and punctures appropriately. 6. Construct anteroom and require all personnel to pass through this room so that they can be vacuumed off using an HEPA vacuum cleaner before leaving work site, or they can wear cloth or paper coveralls that are removed each time they leave the work site. 7. All personnel entering the work site are required to wear shoe covers. 8. Do not remove barriers from the work area, until completed project is thoroughly cleaned by the Environmental Service Department. 9. Vacuum work area with HEPA filtered vacuums. 10. Wet mop with disinfectant. 11. Remove barrier materials carefully to minimize the spreading of dirt and debris associated with construction. 12. Contain construction waste before transporting in tightly covered containers. 13. Cover transport receptacles or carts, and tape covering. 14. Remove or isolate HVAC system in areas where construction is being done.

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:

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END OF SECTION 01100

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 specification. 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 affect 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. Alternates described in this Section are part of the Work only if enumerated in the Agreement.

2. The cost or credit for each alternate is the net addition or deduction from the Contract Sum to incorporate the alternate into the Work. No other adjustments are made to the Contract Sum.

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: The purchase and installation AD Systems XtendSlide Inset Bypass Biparting Doors. Reference Specification **Section 08 43 00 Special Function Doors (Alternate 1)**. All work and construction related to the install shall be priced and included in Lump Sum Alternate No. 1 Bid Total.

B. Alternate No. 2: The purchase and installation Andersen MultiGlide Aluminum Clad Wood Doors. Reference Specification **Section 08 32 00 Sliding Glass Doors (Alternate 2).** All work and construction related to the install shall be priced and included in Lump Sum Alternate No. 2 Bid Total.

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.

END OF SECTION 011

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

END OF SECTION

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.

END OF SECTION 01

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, 1ST Floor
SSB HVAC Replacement & Renovation

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**

OPTIONAL

QUOTATION REQUEST

QUOTATION REQUEST NO:
DATE: **PROJECT NO:**
PROJECT: Kona Community Hospital, 1ST Floor
SSB HVAC Replacement & Renovation

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**

OPTIONAL

CHANGE ORDER

CHANGE ORDER NO:
DATE: **PROJECT NO:**
PROJECT: Kona Community Hospital, 1ST Floor
SSB HVAC Replacement & Renovation

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:**_____

END OF SECTION 0110110

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 (NOT USED)

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 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 5 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 as changes are made 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 10 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)
01100 – Summary of Work, ICRA Procedures														■		
01290 – Payment Procedures														■		
01310 – Project Management & Coordination														■		
1450 - Moisture Vapor Test			■				■	■								
01600 – Product Requirements														■		
01770 – Closeout Procedures	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■
01783 – Project Record Documents	■			■						■	■		■	■		

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)
05 40 00 – Cold-Formed Metal Framing				■										■	■	
06 10 54 – Rough Carpentry	■	■	■	■										■	■	
07 21 00 – Thermal and Acoustic Insulation			■	■										■	■	
07 84 00 – Firestopping			■	■	■		■							■	■	
07 92 00 – Joint Sealants		■		■	■											
08 11 00 – Hollow Metal Frames	■	■		■					■		■				■	■
08 14 24 – Plastic Laminate-Faced Wood Doors	■	■	■	■					■		■				■	■
08 32 00 – Sliding Glass Doors **Alternate 1**	■	■	■	■					■		■				■	■
08 71 00 – Door Hardware	■		■	■			■		■		■			■	■	■
08 80 00 – Glazing			■	■											■	■
08 81 17 – Fire Rated Glass			■	■		■	■								■	■
09 22 16 – Non-Structural Metal Framing	■			■											■	■
09 29 00 – Gypsum Board			■	■			■								■	■
09 51 13 – Acoustical Panel Ceilings	■	■		■			■		■		■			■	■	■
09 65 14 – Resilient Base	■	■		■					■		■			■	■	■
09 68 13 – Carpet Tile	■	■		■			■		■					■	■	■
09 90 00 – Interior Paint		■	■	■	■						■			■	■	■
10 14 13 – Regulatory Signage	■	■		■												

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)
23 05 17 – Sleeves and Sleeve Seals for Plumbing and HVAC Piping				■												
23 05 18 – Escutcheons for Plumbing and HVAC Piping				■												
23 05 29 – Hangers and Supports for Plumbing and HVAC Piping and Equipment	■		■	■										■		
23 05 48 – Vibration and Seismic Controls for Plumbing and HVAC Piping and Equipment			■	■			■							■		
23 05 53 – Identification for Plumbing and HVAC Piping and Equipment				■												
23 05 93 – Testing, Adjusting, and Balancing for HVAC				■			■									
23 07 13 – Duct Insulation			■	■						■						■
23 07 19 – HVAC Piping Insulation	■			■			■							■	■	
23 09 00 – HVAC Instrumentation and Controls	■			■			■		■	■	■			■		
23 21 13 – Hydronic Piping				■					■					■	■	
23 21 16 – Hydronic Piping Specialties				■					■					■	■	
23 31 13 - Metal Ducts	■		■	■										■	■	

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)
23 33 00 – Duct Accessories	■		■	■		■	■		■		■			■	■	■
23 73 13.13 – Indoor Air-Handling Unit	■		■	■		■	■		■	■	■			■	■	■
26 05 00 – Common Work Results for Electrical	■			■										■		
26 05 10 – Basic Electrical Requirements	■			■										■		
26 50 00 - Lighting	■			■					■						■	
27 10 00 – Building Telecommunication Cabling System	■		■	■			■							■		
28 31 00 – Fire Detection and Alarm	■		■	■		■			■	■				■	■	

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 coordinate and schedule the hospital's 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 (if necessary).
3. Firestopping 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 SURFACES scheduled to receive new floor finish, paint or coatings.

   a. Test existing concrete surfaces.

   b. Test new concrete surfaces, including patch areas such as concrete placed over trenches.

1.02 RELATED SECTIONS

A. Section 09 68 13 – Carpet Tile.

B. Section 09 90 00 – Interior 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.

1.03 RELATED SECTIONS

A. Section 01330 – Submittal Procedures.

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 airtight 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 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 07 84 00 – 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, firestopping, to full thickness of the penetrated element. See Section 07 84 00 – 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 02 – EXISTING CONDITIONS

SECTION 02 04 00 – 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.

3. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Sections include the following:

1. Section 01100 – SUMMARY OF WORK.

2. Section 01260 – CONTRACT CONSIDERATIONS.

3. Section 01310 – PROJECT MANAGEMENT AND COORDINATION

4. Section 01400 – QUALITY REQUIREMENTS.

5. Section 01500 – TEMPORARY FACILITIES AND CONTROLS.

6. Section 01732 – CUTTING AND PATCHING.

1.02 DEFINITIONS

A. Demolish: 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: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

C. Remove and Salvage: Detach items from existing construction and deliver them to the Owner ready for reuse.

D. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

E. 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 reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.04 SUBMITTALS

A. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

1.05 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 the requirements of NFPA Code 241, Building Construction and Demolition Operations, the ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and the NECA National Joint Guideline NJG-6, "Temporary Job Utilities and Services", ANSI A10.6 and Uniform Fire Code, 1997 Edition, Article 87.

1.06 PROJECT CONDITIONS

A. Portions of the site immediately adjacent to the selective demolition area will be occupied. Conduct selective demolition minimizing disruption of the Hospital's operations and as noted in SECTION 01100 - SUMMARY OF WORK.

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 or used facilities without written permission from authorities having jurisdiction.

C. The Owner assumes no responsibility for condition of areas to be selectively demolished.

1. The Owner 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 or off-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 equals or surpasses that of existing materials.

B. Comply with material and installation requirements as specified.

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 Owner's Project Coordinator.

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 Owner's Project Coordinator. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner's Project Coordinator and to authorities having jurisdiction.

Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

1. 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 as acceptable to the Owner's Project Coordinator.

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 Owner's Project Coordinator. Provide alternate routes around closed or obstructed traffic ways.

2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways.

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: (NOT USED)

3.04 POLLUTION CONTROLS

A. Dust Control: Use temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with SECTION 01500 – CONSTRUCTION FACILITIES & TEMPORARY CONTROLS and 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 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.

3.01 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 unless appropriate precautions have been taken.

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 Contraction 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 Contracting Officer, 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.

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 Owner's Project Coordinator 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 of the property and legally disposes of them.

END OF SECTION

DIVISION 05 – METALS

SECTION 05 40 00 – COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in DIVISION 1.

1.02 SUMMARY

A. This Section includes the following:

1. Interior load-bearing wall framing.

1.03 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Shop Drawings: Show layout, spacing, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:

1. Mechanical fasteners.

2. Miscellaneous structural clips and accessories.

D. Research/Evaluation Reports: For cold-formed metal framing.

1.04 QUALITY ASSURANCE

A. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.

B. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing; protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel Sheet: ASTM A 1003, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

1. For members 20 and 18 gage grade and coating shall be:

a. Grade: ST33H.

b. Coating: G90.

2.02 WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges.

1. Minimum Base-Metal Thickness: as indicated by designation on the contract drawings.

2. Flange Width: as indicated by designation on the contract drawings.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: Matching steel studs.

2. Flange Width: as indicated by designation on the contract drawings.

2.03 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.

2. Bracing, bridging, and solid blocking.

3. Web stiffeners.

2.04 ANCHORS, CLIPS, AND FASTENERS

A. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

B. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.05 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.

B. Shims: Load bearing, high-density multi-monomer plastic, non-leaching.

C. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.06 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.

2. Cut framing members by sawing or shearing; do not torch cut.

3. Fasten cold-formed metal framing members by screw fastening.

a. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

4. Fasten other materials to cold-formed metal framing by screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

1. Screw wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed metal framing members by screw fastening. Wire tying of framing members is not permitted.

a. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 INTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to bottom track, unless otherwise indicated. Space studs as follows:

1. Stud Spacing: As indicated.

C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.

D. Install solid blocking at 48-inch centers maximum spacing.

E. Install horizontal bridging in wall studs, spaced in rows not more than 48 inches apart. Fasten at each stud intersection.

1. Install solid blocking at 48-inch centers maximum spacing.

2. Bridging: Cold-rolled steel channel, mechanically fastened to webs of punched studs.

F. Install miscellaneous framing and connections, including web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

3.04 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to the manufacturer and Installer that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Wood blocking, furring, shim, cants, concealed hanging strips, and nailers.

1.03 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. WCLIB: West Coast Lumber Inspection Bureau.

2. WWPA: Western Wood Products Association.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber 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 PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency

2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.

3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

4. Provide dressed lumber, S4S, unless otherwise indicated.

2.02 DIMENSION LUMBER FRAMING

A. Joists, Rafters, and Other Framing: No. 1 grade.

1. Species: Douglas fir-larch; WCLIB or WWPA.

2.03 ENGINEERED WOOD PRODUCTS (Not Used)

2.04 WOOD-PRESERVATIVE-TREATED LUMBER AND PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA C2**,** except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry, unless otherwise indicated:

1. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.

2.05 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.

2. Nailers.

3. Cants.

B. For items of dimension lumber size, provide Standard, Stud, or No. 2 grade lumber with 19 percent maximum moisture content of the following species:

1. Douglas Fir-Larch

C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.06 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

B. Nails, Brads, and Staples: ASTM F 1667.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

C. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

D. Securely attach rough carpentry work to substrate by anchoring and 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.

E. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.02 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.03 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 07 21 00 – THERMAL & ACOUSTIC INSULATION

PART 1 - GENERAL

1.01 DESCRIPTION

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. Provide thermal and acoustic insulation and accessories as indicated and scheduled on the drawings.

B. This Section includes the following:

1. Blanket Insulation.

C. Related Work Described Elsewhere:

1. Division 05 – COLD-FORMED METAL FRAMING.
2. Division 07 – JOINT SEALANTS
3. Division 09 – NON STRUCTURAL METAL FRAMING.
4. Division 09 – GYPSUM BOARD
5. Division 23 - HEATING VENTILATION AND AIR CONDITIONING

1.03 DEFINITIONS

A. Mineral-fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blanket with latter formed into batts (flat-cut lengths) or rolls.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Test Reports: Based on evaluations of comprehensive tests performed by a qualified testing agency for insulation products.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting

agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84.

2. Fire-Resistance Ratings: ASTM E 119

3. Combustion Characteristics: ASTM E 136.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation. Protect against ignition at all times.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturers: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to products specified.

1. Thermafiber, Inc. (an Owens Corning company),
One Owens Corning Parkway, Toledo, OH 43659.
Toll free 888-834-2371, Fax 260-563-8979, www.thermafiber.com

2. Owens Corning Insulating Systems, LLC
ONE OWENS CORNING PARKWAY
TOLEDO, OHIO 43659
1-800-GET-PINK®
www.owenscorning.com

2.02 GLASS-FIBER BLANKET INSULATION

A. Product: Thermafiber Sound Attenuation Fire Blanket (SAFB); unfaced.
Formaldehyde Free (FF)
Density – 4-Inch-Thick: 2.5 pcf, nominal.
GREENGUARD GOLD Certified
ULE Validated Formaldehyde Free

1. Unfaced Glass-Fiber Blanket Insulation: ASTM C 665 Type I consisting of fibers with maximum flame spread and smoke developed indexes of 25 and 50 respectively, passing ASTM E 136 for combustion characteristics.

2. Acoustical Wall Insulation: NFPA 101 Class A rated. ASTM C 665 Type I except a flame spread of 25 or less and 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, size to fit framing spacing. Noise Reduction Coefficient (NRC) values as determined in accordance with ASTM C 423.

3. 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:

4. Fiberglass – Minimum 25 percent glass cutlet.

2.06 INSULATION FASTENERS

A. Corrosion resistant fasteners as recommended by the insulation manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions with installer present for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean substrates of substances harmful to insulation or vapor retarders including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.03 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, or snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Set vapor retarder faced units with vapor retarder in location indicated.

E. Install mineral fiber in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.

2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3.04 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary covering or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07 84 00 – FIRESTOPPING

PART 1 – GENERAL

1.01 DESCRIPTION

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 firestopping for through-penetrations and joints in or between the following fire-resistance rated assemblies, including both blank opening, linear openings, and openings containing penetrating items:

B. Provide Firestop systems consisting of a material, or combination of materials installed to retain the integrity of fire resistance rated construction by maintaining an effective barrier against the spread of flame, smoke and/or hot gases through penetrations, fire resistive joints, and perimeter openings in accordance with the requirements of the Building Code for this project.

C. Firestop systems shall be used in locations including, but not limited to, the following:
   1. Penetrations through fire resistance rated floor and roof assemblies including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
   2. Penetrations through fire resistance rated wall assemblies including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
   3. Membrane penetrations in fire resistance rated wall assemblies where items penetrate on side of the barrier.
   4. Sealant joints in fire resistance rated assemblies.
   5. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.

D. RELATED WORK

   1. Division 07 – Joint Sealers
   2. Division 08 – Openings
   3. Division 09 – Non-Structural Metal Framing
   4. Division 09 – Gypsum Board
   5. Division 23 – Heating, Ventilation, and Air-Conditioning
   6. Division 26 – Electrical

1.03 PERFORMANCE CRITERIA

A. FIRE TEST REQUIREMENTS

1. American Society For Testing and Materials Standards (ASTM):

a. ASTM E-814, “Fire Tests of Penetration Fire Stops”.
b. ASTM E-1966, “Test Method for Fire Resistive Joint Systems”.
c. ASTM E-119, “Fire Tests of Building Construction and Materials”.
d. ASTM E-84, “Surface Burning Characteristics of Building Materials”.
e. ASTM E-518 “Standard Test Method for Thermal Resistance”.
f. ASTM C-411 “Standard Test Method for Hot Surface Performance of High-Temperature Thermal Insulation”.
g. ASTM E2837, “Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Non-rated Horizontal Assemblies”.
h. ASTM E2174, “Standard Practice for On Site Inspection of Installed Fire Stops”.
i. ASTM E2393, “Standard Practice for On Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers”.

2. Underwriters Laboratories Inc. (UL):

a. ANSI/ UL1479, “Fire Tests of Through Penetration Firestops”.
b. ANSI/ UL2079, “Tests for Fire Resistance of Building Joint Systems”.
c. ANSI/ UL263, “Fire Tests of Building Construction and Materials”.
d. ANSI/ UL723, “Surface Burning Characteristics of Building Materials”.

B. REFERENCES

1. UL Fire Resistance Directory -Volume 2:
a. Through-Penetration Firestop Devices (XHJI)
b. Fire Resistive Ratings (BXUV)
c. Through-Penetration Firestop Systems (XHEZ)
d. Fill, Void, or Cavity Material (XHHW)
e. Continuity Head-of-Wall Joint Systems (XHBO)

2. CODES:
a. National Fire Protection Agency (NFPA) 101- Life Safety Code
b. National Fire Protection Agency (NFPA) 70- National Electrical Code
c. International Building Code (IBC) - International Building Code
d. Factory Mutual Approvals (FM)

1.04 DEFINITIONS

A. Firestopping: The use of a material or combination of materials in a fire-rated structure (wall or floor) where it has been breached, so as to restore the integrity of the fire rating of that wall or floor.

B. System: The use of a specific Firestop material or combination of materials around a specific penetrant(s) or into a specific joint in conjunction with a specific wall and/or floor construction type.

C. Barrier: Any bearing or non-bearing wall or floor that has an hourly fire and smoke rating.

D. Through-penetration: Any penetration of a fire-rated wall or floor that completely breaches the barrier.

E. Membrane-penetration: Any penetration in a fire-rated wall that breaches only one side of the barrier.

F. Fire Resistive Joint: Any gap, joint, or opening, whether static or dynamic, between two fire-rated barriers including where the top of a wall meets a floor; wall edge to wall edge configurations; floor edge to floor edge configurations; floor edge to wall configurations.

G. Perimeter Barrier: Any gap, joint, or opening, whether static or dynamic, between a fire-rated floor assembly and a non-rated exterior wall assembly.

H. Engineering Judgment: A firestopping assembly proposed for conditions where a tested and listed firestopping system does not exist.

1. AHJ: Authority Having Jurisdiction.

1.05 PERFORMANCE REQUIREMENTS

A. Penetrations: Provide through-penetration Firestop systems that are produced and installed to resist the spread of fire, passage of smoke and other hot gases according to requirements indicated, to restore the original fire-resistance rating of barrier penetrated.

1. Provide and install complete penetration firestopping systems that have been tested and approved by nationally accepted testing agencies per ASTM E 814 or UL 1479 fire tests in a configuration that is representative of field conditions.
2. F-Rated Systems: Provide through-penetration Firestop systems with F-ratings indicated, as determined per ASTM E 814 or UL 1479, but not less than one (1) hour or the fire resistance rating of the barrier being penetrated.
3. T-Rated Systems: Provide through-penetration Firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814 or UL 1479, where required by the Building Code.
4. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration Firestop systems.
5. For penetrations involving insulated piping, provide through-penetration Firestop systems not requiring removal of insulation.

B. Fire Resistive Joints: Provide joint systems with fire resistance assembly ratings indicated, as determined by UL 2079 (ASTM E 1399 and E 1966), but not less than

the fire resistance rating of the construction in which the joint occurs. Firestopping assemblies must be capable of withstanding anticipated movements for the installed field conditions.

1. For Firestopping assemblies 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.
2. For floor penetrations exposed to possible loading and traffic, provide Firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.

C. Firestopping products shall have flamespread ratings less than 25 and smoke-developed ratings less than 450, as determined per ASTM E 84.

D. Where there is no specific third party tested and classified Firestop system available for an installed condition, the firestopping contractor shall obtain from the firestopping material manufacturer an Engineering Judgment (EJ) to be submitted to the Approving Authority and Authority Having Jurisdiction for approval prior to installation. The EJ shall follow requirements set forth by the International Firestop Council (IFC).

1.06 SUBMITTALS

A. Procedure: In accordance with Division 1 – Submittals

B. Manufacturer's Data: Submit manufacturer's product data for all and specifications for materials and prefabricated devices required. Data shall indicate product characteristics, typical uses, performance and limitation criteria, shelf life and test data.

C. Manufacturer's installation instructions. Submit manufacturer's installation instructions for each type of product.

D. Material Safety Data Sheets (MSDS). Submit MSDS for each Firestop product.

E. UL Tested Systems: Submit drawings showing typical installation details for the methods of installation. Indicate which Firestop materials will be used and thickness for different hourly ratings and steel thickness.

F. Certification: Letter of certification, or certified laboratory test report that the material of combination of materials proposed for use meets the requirements specified in ASTM E 814, are so classified in UL Building Materials Directory, and are approved by the AHJ.

G. Engineering Judgments: Submit manufacturer's drawings for all non-standard applications where no UL tested system exists. All drawings must indicate the "Tested" UL system upon which the judgment is based as to assess the relevance of the judgment to some known performance.

H. Approved Applicator: Submit document from manufacturer wherein manufacturer recognizes the installer as qualified or submit a list of past projects to demonstrate capability to perform intended work.

I. Color Samples: Submit three (3) sets each of color finish samples of sealants that will be exposed to view in finish spaces.

J. Upon completion: Installer shall provide written certification that materials used were installed in accordance with the manufacturer's installation instructions and details to retain the integrity of the required fire resistance rated construction.

K. Documentation:

1. Design Listings: Submit system design listings, including illustrations, from a qualified testing and inspecting agency that is applicable to each Firestop configuration.
2. For each type of firestopping product selected. Certify that firestopping materials are asbestos free and contain volatile organic compounds (VOCs) within limits of the local jurisdiction.
3. Where there is no specific third party tested and classified Firestop system available for a particular configuration, the firestopping contractor shall obtain from the firestopping material manufacturer an Engineering Judgment (EJ) for submittal.
4. Qualification Data: For firms and persons specified in “Quality Assurance” article 1.7 to demonstrate their capabilities and experience. Submit document from manufacturer wherein manufacturer recognizes the installer as qualified.

1.07 QUALITY ASSURANCE

A. Workmanship:

1. Installation shall conform to requirements of qualified designs or manufacturer approved modification, as supported by the manufacturer's engineering reports or as approved by the Architect and accepted by the AHJ.

2. Exposed surfaces of the Firestop shall be finished to the standard of adjacent faces of the partition being penetrated.

3. Construction joints include those used to accommodate expansion, contraction, wind, or seismic movement; firestopping material shall not interfere with the required movement of the joint.

B. Regulatory Requirements:

1. Firestop systems shall be installed in all openings and around all penetrating elements or devices as required by the Contract Documents and as required by applicable design, building and construction codes, subject to the interpretation of the authority having jurisdiction.

2. Firestop materials shall have the approval of the authority having jurisdiction.

C. Contractor Qualifications: An acceptable installer shall meet the following requirements:

1. Company specializing in performing work of this section with a minimum of 5 years experience who specializes in the installation of Firestop products. Company must be Factory Mutual Approved.
2. Personnel shall be certified, licensed, or otherwise qualified by the Firestop manufacturer as having been provided the necessary training to select and install products according to the manufacturer's requirements.

D. Certification:

1. The performance of the Firestop designs shall have been demonstrated by third party testing in accordance with the applicable reference standard. Evidence of third-party acceptance shall include labeling or listing by an acceptable agency.
2. Manufactured assemblies and material formulations shall be prepared under a third party monitored Quality Control Program, e.g. U.L. Follow-up Service.
3. Contractor shall certify compliance with the provisions of this section.

E. Single Source Limitations: Obtain Firestop systems, for each kind of penetration and construction condition indicated from a single manufacturer.

F. Provide firestopping system design listings from UL or in accordance with the appropriate ASTM Standard(s) per article 1.5.

G. Materials from different Firestop manufacturers shall not be installed in the same Firestop system or opening. Provide Firestop systems compatible with substrates under conditions of application and service.

H. A manufacturer's direct representative (not a distributor or agent) shall be on site during the initial installation of Firestop systems to train appropriate contractor personnel in proper selection and installation procedures specific to the project. This will be done per the manufacturer's written recommendations published in their literature and drawing details.

I. Firestopping material shall be asbestos and lead free and shall not incorporate nor require the use of hazardous solvents.

J. Firestopping sealants must be flexible, allowing for normal pipe movement.

K. Firestopping materials shall not crack or pull back from contact surfaces such that a void is created.

L. Firestopping materials shall be moisture resistant, and may not dissolve in water after curing.

M. Materials used shall be in accordance with the manufacturer’s written installation instructions.

N. Label each firestopping system installation with the following information:

1. Firestopping product name
2. System listing number

3. Name and address of manufacturer

O. Inspection of penetrations through fire rated floor and wall assemblies shall be in accordance with ASTM E 2174, Standard Practice for On-Site Inspection of Installed Fire Stops.

P. Inspection of fire resistive joints and perimeter barriers shall be in accordance with ASTM E 2393, Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturer's labels identifying product and manufacturer, date of manufacture, lot number, UL classification marking, and mixing instructions for multi-component materials.

B. Store and handle materials per manufacturer's instructions to prevent deterioration or damage due to moisture, temperature changes, contaminants, or other causes. Do not use damaged or contaminated materials.

C. All Firestop materials shall be installed prior to expiration of shelf life.

1.09 PROJECT CONDITIONS

A. Environmental Limitations: Install firestopping when ambient or substrate temperatures are within limits permitted by the manufacturer's written instructions.

B. Ventilate per the manufacturer's written instructions on the product's Material Safety Data Sheet.

C. Verify the condition of the substrates before starting work.

D. Care should be taken to ensure that firestopping materials are installed so as not to contaminate adjacent surfaces.

1.10 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that firestopping assemblies 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. Do not conceal firestopping installations until the Owner's inspection agency or Authorities Having Jurisdiction have examined each installation.

D. Schedule firestopping after installation of penetrants but prior to concealing the openings.

PART 2 - PRODUCTS

2.01 FIRESTOPPING, GENERAL

A. Firestopping products specified in system design listings by UL may be used providing they conform to the construction type, penetrant type, annular space requirements and fire rating involved in each separate assembly.

B. Manufacturer of firestopping products shall have been successfully producing and supplying these products for a period of not less than three years and be able to show evidence of at least ten projects where similar products have been installed and accepted.

C. Accessories: Provide components for each Firestop system that are needed to install fill materials and to comply with "Performance Requirements" Article. Use only components specified by the firestopping manufacturer and approved by UL for the Firestop systems indicated. Accessories include, but are not limited to the following items:

1. Permanent forming/damming/backing materials, including the following:
    a. Mineral wool insulation.
    b. Foams or sealants used to prevent leakage of fill materials in liquid state.
    c. Fire-rated form board.
    d. Polyethylene/polyurethane backer rod.
    e. Rigid polystyrene board.
2. Temporary forming materials.
3. Substrate primers.
4. Steel sleeves

D. All Firestopping products and systems shall be designed and installed so that the basic sealing system will allow the full restoration of the fire resistance properties of the barrier being penetrated with minimal repair if penetrants are subsequently removed.

2.02 MIXING

A. For those products requiring mixing before application, comply with firestopping 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.

2.03 MANUFACTURERS

A. Subject to compliance with the requirements, provide products by the following:

1. Specified Technologies, Inc. (STI), Somerville, New Jersey
   (800) 992 -1180.
2. Substitutions: Not permitted.
3. Single Source: Obtain firestop systems for each type of penetration and construction condition indicated only form a single manufacturer.

2.04 MATERIALS

A. General: Use only firestopping products that have been tested for specific fire-resistance-rated construction conditions conforming to construction assembly type, penetrating item type or joint opening width and movement capabilities, annular space requirements and fire-rating involved for each separate instance.

All through penetrations shall be labeled on both sides of the wall to indicate the appropriate UL system number, product used, installation date, hour rating installer, location number and telephone contact for the corresponding manufacturer. Material installed shall be as required for installation conditions and to achieve the required fire resistance.

B. Intumescent Sealants: Single component intumescent latex formulations containing no water soluble intumescent ingredients capable of expanding a minimum 8 times, the following product are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSS Intumescent Sealant
2. Specified Technologies, Inc. (STI) SpecSeal Series LCI Intumescent Sealant.

C. Endothermic Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture, the following product are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series LC Entothermic Sealant

D. Elastomeric Sealants: Single component latex formulations that upon cure do not re-emulsify during exposure to moisture and accommodate minimum +/- 25 percent movement, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series AS Elastomeric Spray

E. Firestop Devices: Factory-assembled steel collars lined with intumescent material capable of expanding a minimum 30 times sized to fit specific outside diameter of penetrating item, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty Pads
2. Specified Technologies, Inc. (STI) SpecSeal Series EP PowerShield Insert Pads

F. Firestop Putty: Intumescent, 100% solids, non-hardening, water resistant, butyl rubber based putties containing no solvents or silicone compounds, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty

G. Wrap Strips: Single component intumescent elastomeric strips faced on both sides with a plastic film and capable of expanding a minimum of 30 times, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series RED2 Wrap Strip

2. Specified Technologies, Inc. (STI) SpecSeal Series BLU2 Wrap Strip

H. Firestop Pillows: Re-enterable, non-curing, mineral fiber core encapsulated with an intumescent coating on all six sides contained in a flame retardant poly bag, the following product are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSB Firestop Pillows

I. Mortar: Portland cement based dry-mix product formulated for mixing with water at Project site to form a non-shrinking, water –resistant, homogenous mortar, the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Series SSM Firestop Mortar

J. Silicone Sealants: Moisture curing, single component, silicone elastomeric sealant for horizontal surfaces (pourable or nonsag) or vertical surface (nonsag), the following products are acceptable:

1. Specified Technologies, Inc. (STI) SpecSeal Sil300 Silicone Firestop Sealant
2. Specified Technologies, Inc. (STI) SpecSeal SIL300 SL Self-Leveling Silicone Firestop Sealant

K. All-Weather Coatings: Mositure curing, single component silicone copolymer elastomeric spray coatings for horizontal surfaces where greater water resistance is required or inclement weather is anticipated, the following products are acceptable:
1. Specified Technologies, Inc. (STI) SpecSeal FT305 Firestop Spray

L. Silicone Foam: Multicomponent, silicone-based liquid elastomers, that when mixed, expand and cure in place to produce a flexible, non-shrinking foam, the following products are acceptable:
1. Specified Technologies, Inc. (STI) Pensil 200 Silicone Foam

M. Composite Sheet: Intumescent material sandwiched between a galvanized steel sheet and steel wire mesh protected with aluminum foil capable of sustaining a minimum 2,500 lbs (1,134 kg) when subjected to load testing, the following products are acceptable:
1. Specified Technologies, Inc. (STI) SpecSeal CS Composite Sheet

N. Cast-In-Place Firestop Device: Single component molded firestop device installed on forms prior to concrete placement with totally encapsulated, tamper-proof integral firestop system and smoke sealing gasket, the following products are acceptable:
1. Specified Technologies, Inc. (STI) SpecSeal CD Cast-In Firestop Device

O. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use on steel HVAC ducts, the following products are acceptable:
1. Specified Technologies, Inc. (STI) SpecSeal FyreFlange Firestop Angles

P. Firestop Plugs: Re-enterable, foam rubber plug impregnated with intumescent material capable of expanding minimum 10 times with expansion beginning at 350°F (177°C) for use in blank openings and cable sleeves, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series FP Firestop Plug

Q. Fire-Rated T Rating Collar Device: Louvered steel collar system with synthetic aluminized polymer coolant wrap installed on metallic pipes where T Ratings are required by applicable building code requirements, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal T-Collar Device

R. Fire-Rated Cable Grommet: Molded two-piece grommet made from plenum grade polymer with a foam inner core for sealing cable penetrations up to 0.53 in. (14 mm) diameter, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) EZ-Firestop Grommet (RFG1 or RFG2)

S. Fire-Rated Closet Flange Gasket: Molded, single-component, intumescent gasket for use beneath a closet flange in floor applications, the following products are acceptable:
   1. Specified Technologies, Inc. (STI) SpecSeal Series CF34 Closet Flange Firestop Gasket.

T. Firestopping at Electrical Boxes and Utility Outlets:
   1. Intumescent Technologies, FIREBLOK Fire Suppression gaskets.
   2. Specified Technologies, Inc. (STI) SpecSeal Series SSP Firestop Putty Pads.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Verify that all pipes, conduits, cables, and/or other items which penetrate fire-rated construction have been permanently installed prior to installation of firestops.

3.02 PREPARATION

A. Coordination: Coordinate the work with other trades. Apply firestopping materials, at penetrations of pipes and ducts, prior to insulating, unless the insulation meets the requirements for specified firestopping.

B. Surface Cleaning: Clean out openings immediately before installing Firestop systems to comply with written recommendations of firestopping manufacturer and the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of Firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with Firestop systems. Remove loose particles remaining from cleaning operation.

C. Verify that environmental conditions are safe and suitable for installation of firestopping products.

D. Verify that all pipes, conduit, cable, and other items which penetrate fire-rated construction have been permanently installed prior to installation of firestopping.

3.03 INSTALLATION:

A. General: Install through-penetration Firestop systems to comply with “Performance Requirements” article in Part 1 and firestopping manufacturer’s written installation instructions and published drawings for products and applications indicated.

B. Installation of firestopping shall be performed by an applicator/installer qualified as described in article 1.7.

C. Apply firestopping in accordance with UL listed system designs or manufacturer’s EJ per the manufacturer’s installation instructions.

D. Filling of Voids: Completely fill voids at the surface; the depth of the material shall be approved by UL.

E. Insulated Pipes and Ducts: Insulate pipes and ducts penetrating fire rated walls with materials which provide the same performance as the firestopping material. Extend this material a minimum of 6-inches on each side of the opening. The vapor barrier of the insulation material shall have a maximum per rating of 0.03.

F. Electrical Cables and Conduits: Firestopping at penetrations shall comply with the requirements of NFPA 70 - "National Electric Code".

G. When required to contain firestopping materials within openings, damming or packing materials may be utilized. Combustible damming materials must be removed after appropriate curing of firestopping component. Non-combustible damming materials may be left as a permanent component of the Firestop system, if recommended by the manufacturer.

H. 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 fully 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.

I. Install duct wrap system in accordance with manufacturer's installation instructions.

3.04 FIELD QUALITY CONTROL:

A. To ensure proper installation, fire stopped areas shall not be covered or enclosed until inspection is complete and approval has been received.

3.05 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by Firestopping manufacturer(s) and that do not damage materials in which openings occur. Leave finished work in neat, clean condition with no evidence of spillovers or damage to adjacent surfaces.

B. Provide final protection and maintain conditions during and after installation that ensure 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 Firestop systems immediately and install new materials to produce Firestop systems complying with specified requirements.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes joint sealants for the following applications:

1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces.
   a. Control and expansion joints in unit masonry.
   b. Perimeter joints between materials listed above and frames of doors.
   c. Other joints as indicated.

2. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces.
   a. Perimeter joints of exterior openings where indicated.
   b. Vertical joints on exposed surfaces of partitions.
   c. Perimeter joints between interior wall surfaces and frames of interior doors.
   d. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   e. Other joints as indicated.

1.02 PERFORMANCE REQUIREMENTS

A. Provide joint sealants for interior applications that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.03 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples: Manufacturer's color charts consisting of strips of cured sealants showing full range of colors available for each product exposed to view.

C. Product Certificates: For each type of joint, sealant, and accessory, signed by product manufacturer.

D. Qualification Data: For Installer.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.05 PROJECT 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 Architect 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.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.02 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.03 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Dow Corning Corporation; 790.
   b. GE Advanced Materials – Silicones; Sil Pruf LM SCS2700.
   c. Sika Corporation, Construction Products Division; Sika Sil-C990.

B. Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use T.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Dow Corning Corporation; NS Parking Structure Sealant.
   b. Pecora Corporation; 311 NS.

   c. Tremco ncorporated; Spectrum 800.

C. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Pecora Corporation; 898.

2.04 URETHANE JOINT SEALANTS

A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation; Construction Products Division; Sikaflex – 15LM.
   b. Tremco Incorporated; Vulkem 921.

B. Immersible, Single-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Uses T and I.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation; Construction Products Division; Sikaflex – 1a.
   b. Tremco Incorporated; Vulkem 116.

C. Immersible, Single-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Uses T and I.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Sika Corporation; Construction Products Division; Sikaflex – 1CSL.
b. Tremco Incorporated; Vulkem 45.

2.05 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Bostik Findley; Chem-Calk 600.
b. Pecora Corporation; AC-20+.
c. Schnee-Morehead, Inc.; SM 8200.
d. Sonneborn, Division of ChemRex Inc.; Sonolac.
e. Tremco; Tremflex 834.

2.06 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard, nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:
1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
2. Products:
a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondryingm nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Products:
a. Pecora Corporation; BA-98.
b. Tremco; Tremco Acoustical Sealant.

2.07 JOINT-SEALANT BACKING

A. General: Provide sealant backing of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), O (open-cell material), or B (bicellular material with a surface skin), or any of the preceding types, as approved in writing by joint-sealant manufacturer for

joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 degree F (minus 32 degree C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape, recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.08 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.

2. Clean 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 sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form-release agents from concrete.
   a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residue capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates**,** where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant 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 that 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

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configurations per Figure 5A in ASTM C 1193, unless otherwise indicated.
    a. Use masking tape to protect surfaces adjacent to recessed tool joints.

3.04 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

DIVISION 08 – OPENINGS

SECTION 08 11 00 – HOLLOW METAL FRAMES

PART 1 – GENERAL

1.01 DESCRIPTION

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. Provide standard steel doors and frames as indicated and scheduled on drawings.

B. Related Work Described Elsewhere:

1. Section 08 14 24 – PLASTIC LAMINATE-FACED WOOD DOORS
2. Section 08 71 00 - FINISH HARDWARE.
3. Section 08 80 00 - GLAZING.
4. Section 09 90 00 - PAINTING.

1.03 SUBMITTALS

A. General: Submit in accordance with Section 01300 - SUBMITTALS.

B. Manufacturer's Data: Submit manufacturer's technical product data substantiating that products comply with requirements.

C. Shop Drawings: Submit for fabrication and installation of steel frames. Include details of each frame type, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections, gauges, and finishes. Show anchorage and accessory items.

D. Schedule: Provide schedule of frames using same reference numbers for details and openings as those on contract drawings.

E. Label Construction Certification: For assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for that

each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

1.04 QUALITY ASSURANCE

A. Provide frames complying with ANSI/SDI A250.8 "Recommended Specifications for Standard Steel Doors and Frames" and as herein specified.

B. Fire-Rated Assemblies: Where fire-rated assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with ICC IBC Section 715, "Opening Protectives", NFPA 80 "Standard for Fire Doors and Fire Windows", and have been tested, listed, and labeled in accordance with UL 10C "Fire Tests of Door Assemblies" and NFPA 252 "Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.

C. Door Hardware Mounting Heights: The Contractor shall be responsible to coordinate all mounting heights of various finish hardware with all project requirements. Accessible hardware shall be mounted per ADAAG 404.2.7.

1.05 DELIVERY. STORAGE AND HANDLING

A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage. Strap knock-down frames in bundles. Provide temporary steel spreaders securely fastened to the bottom of each welded frame.

B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to the University; otherwise, remove and replace damaged items as directed.

C. Store frames at building site under cover in a dry, secure place. Place units on minimum 4-inch high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chambers. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inch spaces between stacked doors to promote air circulation.

D. Handle manufactured materials as recommended by the manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Galvanized Steel Sheets: All frames shall be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel per ASTM A 1008/A 1008M "Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable" and ASTM A 568/A 568M "Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for". Sheet shall be galvannealed to 'A-60' minimum coating weight for interior applications and galvanized to 'G-90' minimum coating weight for exterior applications per ASTM A 924/A 924M "Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process". Internal reinforcing shall be manufactured of hot rolled pickled and oiled steel per ASTM A 1011/A 1011M "Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability and Ultra-High Strength".

B. Frame Sheet Steel:

1. Cold Rolled, commercial quality carbon steel, Type B; suitable for exposed applications, complying with ASTM A 1008.

2. Hot Rolled, commercial quality carbon steel, Type B: free of scale, pitting, or surface defects, pickled and oiled, complying with ASTM A 1011.

3. For all frames, provide 14 ga. G90 or A60 steel.

C. Core Materials: Polystyrene foam core, self-extinguishing, non-toxic, except 1 pound density mineral fiber at steel reinforced doors and as standard with the manufacturer for rated doors to conform to design requirements.

D. Supports and Anchors: Fabricate of not less than 18 gauge galvanized sheet steel.

1. For all frames over 42” in width provide a full sleeve header reinforcement that is welded in place.

E. Frame Anchors:

1. Wall Anchors for Attachment to Drywall Partitions:

a. Use stud anchors sized to accommodate frame jamb depth and face dimension on all welded frames.

2. Stud-Wall Type; Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

3. Post installed Expansion Type for In-Place Concrete: Minimum 3/8-inch diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

4. 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:

   a. Stud Wall Type: Provide three anchors per jamb up to 60-inches in height and four anchors for jambs 60 to 90 inches in height.

   b. Post installed Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

5. Floor Anchors: Angle Clip Type:

   a. 16 gauge minimum.

   b. To receive 2 fasteners per anchor.

   c. Welded to the bottom of each jamb.

F. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize, complying with ASTM A 153/A 153M "Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware", Class C or D as applicable.

G. Factory Applied Primer Paint: Rust-inhibitive enamel paint, either air-drying or baking, suitable as a base for specified finish paints conforming to ANSI A250.10 "Test Procedures and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames". Primers shall be free from asbestos, lead, mercury, chromate, and cadmium.

2.02 FABRICATION. GENERAL

A. Fabricate steel frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI A250.8 requirements as follows:

1. Seamless edges: Continuously welded seam dressed smooth.

2. Lead-Lined: As required by Section 134900 – Radiation Protection.

B. Fabricate frames, concealed stiffeners, reinforcement, edge channels, and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).

D. Fabricate all frames from galvanized sheet steel.

E. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.

F. Finish Hardware Preparation: Prepare frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI/SDI A250.8, ANSI/SDI A250.6, and additional requirements of ANSI/BHMA A156.115 specifications for door and frame preparation for hardware.

1. Reinforce frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site. Provide minimum gauge hardware reinforcing for mortise or surface applied hardware as follows:

a. Hinges:

(1) 10 gauge or equivalent number of threads on doors.

(2) 7 gauge on frames. High frequency hinge reinforcements.

b. Locks: 12 gauge or equivalent number of threads.

c. Surface Closers: 12 gauge.

2. Locate finish hardware as indicated on final shop drawings or, if not indicated, in accordance with DHI-05 "Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames" and the Americans with Disabilities Act Accessibility Guidelines (ADAAG) Section 404.2.7.

G. Factory Painting:

1. Clean, phosphatize, and prime paint exposed surfaces of steel door and frame units, including galvanized surfaces.

2. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

3. Apply factory coat of prime paint to an even consistency to provide a uniformly finished surface ready to receive finish paint.

H. Tolerances: Comply with SCI 117, “Manufacturing Tolerances for Standard Steel Doors and Frames”.

2.03 MANUFACTURERS

A. Standard Steel Door and Frame Manufacturers: Subject to compliance with requirements of this section, provide products from one of the following:

1. CURRIES Co., Mason City, Iowa.

2.04 STANDARD STEEL FRAMES

A. Provide metal frames for doors of type and style as shown on drawings and schedules conforming with ANSI/SDI A250.8. Conceal fastenings, unless otherwise indicated. Fabricate frames of cold-rolled furniture steel minimum 14 gauge for exterior and interior.

1. Fabricate frames with mitered corners, solid welded construction for exterior applications and interior frames.

2. Form all frames of hot dip galvanized steel.

3. Frames shall comply with ANSI/SDI A250.4 "Performance Test Procedures for Steel Door Frames and Frame Anchors", Level A, one million cycle swing test performance for a 4070 door frame.

B. Door Silencers: Except on weather-stripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.

C. Plaster Guards: Provide 26 gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

D. Template Hardware: Factory cut doors and frames for all template hardware, including hinges, bolts, etc.

2.05 FIRE-RATED ASSEMBLIES

Assemblies shall bear the listing identification label of the Underwriters Laboratories, Inc. (UL), Factory Mutual Engineering Corp. (FM), Warnock Hersey International (WHI), or a nationally recognized testing laboratory qualified to perform tests of fire assemblies in accordance with ANSI/UL 10C and NFPA 252 and having a listing for the tested assemblies. Doors exceeding the sizes for which listing label service is offered shall be inspected in accordance with NFPA 80 and NFPA 80A. Listing identification labels shall be constructed and permanently applied by a method which results in their destruction should they be removed. Labels shall be metal with raised letters and shall bear the rating followed by the letter "s", and name and file number of the door and frame manufacturer and service conducting the inspection. Labels shall be factory applied and shall not be painted.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install standard steel frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of ANSI/SDI A250.11 "Recommended Erection Instructions for Steel Frames", unless otherwise indicated.

1. Anchors: Provide sufficient anchorage to attach to wall and floor in accordance with ANSI/SDI A250.4 Test compliance Level A of one million cycles, or anchorage as detailed on drawings to specific wall conditions.

2. Except for frames located at in-place concrete and masonry installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

5. Install fire-rated frames in accordance with NFPA 80.

6. At frames to be grouted, the inside of the frame shall be given a coat of heavy-bodied bituminous paint.

3.02 ADJUST AND CLEAN

A. Factory Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of factory coating and apply touch-up of matching air-drying coating.

B. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating conditions.

END OF SECTION

SECTION 08 14 24 – PLASTIC LAMINATE-FACED WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. High pressure plastic laminate (HPL)-faced flush wood doors.
   2. Supplementary components and accessories normally furnished or necessary for a complete installation, whether or not such items are indicated on the Drawings or included in the Specifications.

B. Related Requirements:
   1. Section 08 71 00 for door hardware.

1.2 REFERENCES

A. Abbreviations and Acronyms:
   1. DHI: Door Hardware Institute.
   2. WDMA: Wood Door Manufacturers Association.

B. Definitions:
   1. Manufacturer: Means the door manufacturer, unless otherwise indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate building opening tolerances with door manufacturing and erection tolerances.
   2. Coordinate hardware preparations, handing, and reinforcement requirements and locations with the Drawings, door schedule, and selected hardware sets.
   3. Coordinate door hardware finishes with other door hardware finishes.

1.4 SUBMITTALS

A. Action Submittals: Submit the following for responsive action (formal review and approval).
   1. Product Data:
      a. Submit manufacturer’s product data, specifications, typical installation details,

and all other information necessary to show conformance to the Contract Documents, excluding material safety data sheets (MSDSs) and safety data sheets (SDSs), both of which are returned to the Contractor without review or responsive action.

b. Submit sample warranties with warranty periods, terms, conditions, exclusions, and remedies explicitly defined for each warranty, including clear warranty period start dates. (e.g., date of manufacture, purchase, installation, Beneficial Occupancy, Substantial Completion, Final Completion, etc.)

2. Door Schedule: Submit schedule showing opening identification symbols and door and frame types and sizes, including thickness, swing, fire-resistance rating label requirements, undercuts, and finishes. Use the same reference numbers for openings and details as the Drawings.

3. Shop Drawings: Include project-specific dimensioned details drawn to scale showing conditions not detailed on the product data; or that are detailed, but not in a manner specific to the project. Cross-reference details to door schedule.

4. Samples: Submit at least 8-inch square representative samples of each door color, finish, and variety.

B. Informational Submittals: Submit the following for information (informal review: responsive action not expected or required, except to record non-conformance with submittal requirements).

1. Manufacturer's Instructions: Submit manufacturer-prepared published instructions for proper installation of furnished doors.
   a. If manufacturer's instructions are unavailable or do not apply to specific project conditions, then consult the manufacturer's representative and obtain project- specific supplemental instructions printed on manufacturer's letterhead.
   b. Promptly distribute supplemental instructions to the Architect, who may have comments that lead to contract modifications or minor changes in the work.

2. Qualification Statements: Submit written descriptions confirming experience specified in QUALITY ASSURANCE article below.

C. Closeout Submittals:

1. Maintenance Data: Submit copies of manufacturer's instructions and other requirements and recommendations for door maintenance, cleaning, and repair to the Architect as a condition of project closeout.

2. Warranty Documentation: Submit final warranties signed by the manufacturer's representative with complete terms indicated for all warranties covering items furnished or installed under this specification section.

1.5 QUALITY ASSURANCE

A. Source Limitations:
   1. Doors must be obtained through one source from the same manufacturer (to ensure compatibility, regulatory conformance, and a warrantable installation).
      a. Certain items may be obtained from more than one manufacturer, but only when used for separate installations.
      b. Items provided for each different installation must be obtained from the same source and manufacturer.
   2. Provide secondary materials, components, accessories and other items from sources required, recommended, or accepted by the primary manufacturer for actual in-service conditions applicable to the project.

B. Regulatory Requirements:
   1. Fire-Protection Rating: Within fire-resistance rated assemblies, provide fire-protection-rated doors conforming to NFPA 80, "*Standard for Fire Doors and Other Opening Protectives*" and tested in conformance with NFPA 252, "*Standard Methods of Fire Tests of Door Assemblies*" and UL 10B, "*Standard for Fire Tests of Door Assemblies*"**;** or UL 10C, "*Standard for Positive Pressure Fire Tests of Door Assemblies*" for doors at atmospheric (neutral) pressure. A label or listing mark indicating the fire-protection rating must be permanently affixed at the factory in a location such that the label remains visible after the door is installed and must include UL "S" and "Positive Pressure Test" listings.
   2. Smoke-Control Door Assemblies: Provide doors conforming to the requirements of with NFPA 80, "*Standard for Fire Doors and Other Opening Protectives*" and tested in conformance with NFPA 105, "*Standard for Smoke Door Assemblies and Other Opening Protectives*" or UL 1784, "*Standard for Air Leakage Tests of Door Assemblies*".

C. Quality Standard Requirements:
   1. Product Standard: Comply with the requirements Window & Door Manufacturers Association publication ANSI/WDMA I.S.1-A, "*Industry Standard for Interior Architectural Wood Flush Doors"*.
   2. Door Hardware Installation Standards: Install door hardware in conformance with ANSI/DHI A115-IG, "*Installation Guide for Doors and Hardware*".

D. Qualifications:
   1. Installer: Company or individuals must have at least 5 years' experience installing

doors for at least 30 previous projects similar to this project in size, material, design, and complexity.

2. Supervisors: Individuals must have at least 7 years' experience installing doors for at least 30 previous projects similar to this project in size, material, design, and complexity, including at least 2 years' supervisory experience directing and leading door installers.

1.6 HANDLING

A. Receiving: Inspect all deliveries for deteriorated, damaged, and defective items.
   1. Reject items that are not packaged in a manner that prevents damage; or that exhibit deterioration or damage or have damaged or open packaging or containers.
   2. Reject items that are not transported, delivered, or protected in conformance with manufacturer-recommended transport, delivery, and receiving requirements.
   3. Unload and store only inspected and accepted items.

B. Storage: Store unloaded items indoors as shipped, upright in their original packaging or containers, within dry, well-ventilated, broom-cleaned and enclosed storage areas.
   1. Furnish adequate dunnage and bracing during storage.
   2. Prevent stored items from contacting the floor, from soiling and staining, and from deterioration and damage.
   3. Do not leave items uncovered where they might be exposed to weather or become wet; or exposed to heat or sudden changes in temperature or relative humidity; or other sources of deterioration and damage, including dust and other airborne contaminants.

C. Handling: Handle items in conformance with manufacturer's instructions and other requirements and recommendations, and in a manner that that prevents damage. Avoid damage to packaging and containers.

D. Damaged Item Replacement: Promptly remove and replace deteriorated, damaged, or defective doors with undamaged new doors that do not exhibit deterioration, damage, or defects.

E. Packaging Waste Management: Do not burn or bury construction waste at the project site. Remove and legally dispose of all construction waste away from the project site.

1.7 WARRANTY

A. Manufacturer Warranty: Furnish to the Owner a written manufacturer warranty for

products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 5 years.

PART 2 - PRODUCTS

2.1 PLASTIC LAMINATE-FACED DOORS

A. Description: Flush wood doors conforming to WDMA I.S.1-A Performance Grade Heavy Duty.

B. Restrictions: Doors manufactured with adhesives and composite wood products containing urea formaldehyde are prohibited.

C. Product: “Marquis Series” doors manufactured by Marshfield DoorSystems, Inc., or equal.

D. Requisite Properties:

1. Type: Solid Core
2. Grade: Custom
3. Thickness: 1-3/4 inches.
4. Construction: 5-ply.
5. Core: Manufacturer’s standard wood-based particleboard, structural composite lumber, agrifiber, or fire-resistant mineral core.
6. Edge Construction: Structural composite lumber or hardwood lumber stiles and rails securely bonded to core components and machine calibrated before veneering, with laminate vertical edges and laminate top and bottom rails matching laminate faces.
7. Meeting Edge: Beveled.
8. Hardware Blocking:
    a. 5-by-18-inch lock blocks at both stiles.
    b. 5-inch top- and bottom-rail blocking.
    c. 2-1/2-inch mid-rail blocking.
9. Horizontal Surfaces: Structural composite lumber.
10. Openings: Cut and trim through-door openings in factory.

a. Light Openings: Trim openings with materials and profiles indicated.

b. Glazing: Factory install glazing.

2.2 PLASTIC LAMINATE FACING

A. Description: General purpose type HPDL conforming to NEMA publication "*NEMA Standards Publication LD-3*" requirements for Grade SGF (flame-retardant) for fire-rated doors; Grade HGS (standard) for other doors. Provide laminate vertical edges and laminate top and bottom rails matching laminate faces.

B. Products: Indicated on the Drawings in the Room Finish Schedule and Color & Material Schedule, or equal.

2.3 ACCESSORIES

A. Vision Lights: "Vision Lite Kits" manufactured by TRUDOOR, LLC, or equal.
1. Frames: At least at least 0.0359-inch BMT (MSG 20) uncoated steel sheet, with mitered and welded corners and countersunk mounting holes.
2. Finish: Manufacturer's standard powder coat finish.
3. Frame Color: Match Existing

B. Electrical Device Requirements: Make provisions for installation of electrified hardware and door electrical devices, and arrange so that wiring is readily installed, removed, and replaced.

1. Provide cutouts and reinforcement required for installation of devices.
2. Provide metal conduits or raceways to accommodate wiring between devices. (e.g., from electric hinge to other electric door hardware)

C. Fastenings: Provide backings, inserts, loose connection hardware, fasteners, anchors, attachments, connectors, and other items supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

D. Other Accessories: Provide accessories and secondary items normally furnished or necessary for a complete installation; or supplied, required, recommended, or accepted by the manufacturer for actual in-service conditions applicable to the project.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Oversight: Ensure an adequate number of supervisors are present and proper supervision practices are followed at the project site before the installer begins work and at all times during installation.

B. Verification: Verify in-place supporting and adjacent construction conforms to the manufacturer's requirements or recommendations and satisfies all other conditions that might affect the quality of installation or the durability, appearance, or performance of installed and adjacent items.

C. Evaluation and Assessment:

1. Identify project conditions that do not conform to the manufacturer's instructions and other requirements and recommendations.
2. Perform or arrange and pay costs without reimbursement from Owner for all remedial work necessary to correct or improve deficient conditions, without limitation, before the installer begins work.

3.2 INSTALLATION

A. General Requirements:
1. Install doors in conformance with the quality standards publications using materials and methods required, recommended, or accepted by the manufacturer, along with manufacturer-recommended accessories and techniques.
2. Set items true to line, to required levels and lines, and plumb, level, and square, without warp or rack, with flush well-fitted joints, and in alignment with adjacent construction
3. Perform drilling and fitting as required or necessary for an accurate fit and complete installation.
4. Installed doors must be warrantable. Do not install, correct, or replace doors in a manner that results in any warranty or guarantee becoming void.

B. Special Techniques:
1. Factory-Fitted Doors: Align in frames for uniform clearance at each edge. Hang doors to operate freely for their entire travel, but not loosely, without sticking or hinge binding, with hardware adjusted and functioning properly.
2. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

C. Interface with Adjacent Items: Provide materials, components, and accessories normally furnished or necessary to securely attach doors to supporting construction.

D. Installation Tolerances:
1. Fire-Rated Doors: Install doors with clearances in conforming to NFPA 80.

2. Smoke- Control Doors: Install doors with clearances in conforming to NFPA 105.
3. Other Doors: Install doors within the following clearance variations.
   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 1/4-inch.
   d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 1/4-inch.

3.3 ADJUSTING

A. Verify smooth and quiet door and hardware operation.

B. Lubricate and adjust operating parts and hardware to function properly, free from warp, twist, binding, and distortion. Confirm latches and locks engage securely without forcing or binding.

C. Rehang or replace doors that do not operate freely in a safe and reliable manner.

3.4 CORRECTION AND REPAIR

A. Non-conforming, damaged, and defective work must be brought into conformance with the Contract Documents. Correct and repair as necessary, without limitation, including arranging all correction and repair work and paying all correction and repair costs without reimbursement from Owner, until accepted in writing by the Architect.

B. Arrange and pay costs without reimbursement from Owner for removing and replacing work that cannot be corrected or repaired to the Architect's acceptance.

3.5 CLEANING

A. Cleaning Work: Clean all visible door surfaces in a manner that does not result in any warranty or guarantee becoming void.
   1. Use cleaning materials, equipment, and accessories supplied, and means, methods, techniques, and procedures required, recommended, or accepted by the manufacturer.
   2. Do not use cleaning materials or procedures known to change, or that might change, the appearance of exposed finishes or adjacent surfaces; or cause deterioration or damage to exposed finishes or adjacent surfaces.
   3. Protect adjacent surfaces not being cleaned from staining, deterioration, damage, or other detrimental effects caused by cleaning.

B. Waste Management: After completing the work of this specification section, leave work areas free from debris, waste, scrap, equipment, tools, and other items.

3.6 PROTECTION

A. Protect installed doors in place from soiling, deterioration, and damage until Substantial Completion.

B. Remove protection when it's no longer needed and before Substantial Completion.

END OF SECTION

SECTION 08 32 00 – SLIDING GLASS DOORS (**ALTERNATE 2)**

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Gliding glass doors of aluminum and wood construction, for Interior use.

B. Related Sections: Section(s) related to this section include:

1. Section 08 80 00 - GLAZING

1.2 REFERENCES

A. General: Standards listed by reference form a part of this specification section. Standards listed are identified by issuing authority, abbreviation, designation number, title or other designation. Standards subsequently referenced in this Section are referred to by issuing authority abbreviation and standard designation.

B. American Architectural Manufacturers Association (AAMA):

1. AAMA 2604 – Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
2. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
3. NAFS – North American Fenestration Standard/Specification for Windows, Doors and Skylights.

C. ASTM International (ASTM):

1. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
2. ASTM C1048 – Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
3. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
4. ASTM E2068 – Standard Test Method for Determination of Operating Force of Sliding Windows and Doors.
5. ASTM E2190 – Standard Specification for Insulating Glass Unit Performance and Evaluation.

D. Insulating Glass Certification Council (IGCC): Insulating Glass Unit Certification.

E. Window and Door Manufacturers Association (WDMA):

1. WDMA Hallmark Certification Program for Manufacturers.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meetings: Conduct pre-installation meeting to clarify Project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance Requirements:

1. Comply with requirements of NAFS.
2. Comply with Seismic requirements for this project.
3. Comply with Manufacturer maximum design deflection.

1.5 SUBMITTALS

A. Product Data: For each type of product required.

B. Shop Drawings: Showing methods of installation, plans, sections, elevations and details of walls, specified loads, flashings, vents, sealants, and interfaces with all materials not supplied by the door manufacturer, and identification of proposed component parts and finishes.

C. Samples: Selection and verification samples for finishes, colors and textures. Submit two complete sample sets of each type of material required.

D. Certificates: Signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

E. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

F. Manufacturer's Instructions: Manufacturer installation, storage, and other instructions.

G. Qualification Statements: For manufacturer and installer.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Single manufacturer capable of demonstrating an extended history of at least twenty years of window and door design, production and innovation.
2. Member in good standing of The Insulating Glass Certification Council (IGCC).
3. Hallmark Certified Manufacturer and member in good standing of the Window and Door Manufacturers Association (WDMA).
4. Member in good standing of U.S. Green Building Council.
5. ENERGY STAR Partner.

B. Installer Qualifications:

1. Trained and qualified by the door manufacturer to install the products required in this Section.
2. Minimum five years' experience in the installation of products required for the Project.
3. Experience on at least five projects of similar size, type and complexity as the Project.
4. Entity utilizing workers competent in techniques required by manufacturer for product types and applications indicated.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Deliver materials to Project in manufacturer's original unopened, undamaged containers with identification labels intact. Mark each door on packing material with the panel and door unit identification number used on Shop Drawings.

C. Storage and Protection: Store materials and accessories in an upright position, protected from exposure to harmful environmental conditions, at temperature and humidity conditions recommended by manufacturer, off the ground, under cover and not exposed to weather and construction activities.

1.8 WARRANTY

A. Special Warranty: Manufacturer's transferrable, non-prorated limited warranty.

1. Warranty Period, Glass: 20 years.
2. Warranty Period, Non-Glass Components: 10 years.

B. Special Warranty: Installer's standard form in which installer agrees to repair or replace doors that fail due to poor workmanship or faulty installation within the specified warranty period.

1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 PRODUCT

2.1 ALUMINUM CLAD WOOD DOORS

A. General: Provide sliding glass doors complying with the performance requirements indicated and tested according to NAFS and operable as follows:

1. During operation door panels shall glide smoothly on wheels providing secure contact with the runner track, with an initiating force of no more than 13 pound feet (58 N) and a maintaining force of no more than 8 pound feet (35 N) when tested according to ASTM E2068.

B. Basis-of-Design Product: Subject to compliance with requirements provide Andersen Corporation: MultiGlide Aluminum Clad Wood Doors.

C. Substitution Limitations: No substitutions.

D. Door Configuration: Stacked, Two-directional, 6-Panel, interior stacking, S2L-2R.

F. Sill Type and Material:

1. On-floor drainage sill, continuous with interior and exterior ramp, aluminum alloy, ASTM B221, 6005-T6, marine grade, clear anodized Architectural Class I.

G. Head Track Type and Material: Continuous modular design with clip-together sections, aluminum alloy, ASTM B221, 6063-T6, anodized Architectural Class I.

H. Frame Material: Aluminum alloy, ASTM B221, 6063-T6, anodized Architectural Class I.

I. Door Frame and Panel Configuration: Traditional with bottom rail height 12 inches.

J. Door Panel Exterior and Interior Finish:

1. Anodized Finish: Architectural quality, in compliance with AAMA 611 Class I Clear Anodized.

M. Hardware:

1. Handle Finish: Satin Nickel.
2. Locking Mechanism: Adjustable two-point locking system equipped with laminated stainless-steel hooks and anti-slam device, non-keyed.

3. Edge Pull Type and Finish: Spring return, Satin Nickel.

4. Roller Wheels: Continuously adjustable synthetic roller wheels with stainless-steel ball-bearings, tested 25,000 cycles.

2.2 NON-IMPACT-RESISTANT GLAZING.

A. Sound Transmission Class (STC)/Outdoor Indoor Transmission Classification (OITC), ASTM E90: 29/24.

B. Glass Units: Provide insulating glass units certified through Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190.

1. Manufacturer Designation: Andersen Low-E4 Glass.
2. Glazing Configuration: Dual-pane, 1 inch overall, argon gas blend-filled cavity.
3. Tint: Clear.
4. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and stainless-steel spacers.
5. Glass Type: Fully tempered, ASTM C1048.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that all substrate conditions are suitable for installation in compliance with manufacturer's recommendations.

B. Do not begin installation until substrates have been properly prepared and any conditions not in compliance with manufacturer's recommendations have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's product recommendations, including but not limited to technical bulletins, and installation instructions in product literature and on product packaging. Comply with Drawings and Shop Drawings for installing runner tracks, doors, hardware, accessories, and other components.

B. Install doors plumb, level and square. Anchor doors securely to structure in correct orientation to adjacent construction as indicated. Comply with product installation instructions for proper flashing integration into wall system. Install doors so as to drain condensation and moisture penetration to the exterior.

C. Adjust gliding doors, insect screens, hardware and accessories as applicable for correct fit. Adjust weatherstrip for smooth operation and weather-tight closure.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: If requested by Owner, provide manufacturer's field service consisting of product use recommendations and periodic site visits for observation of product installation in accordance with manufacturer's recommendations.

1. Site Visits: 1

3.4 CLEANING

A. Remove protective films and non-permanent labels prior to 90 days after installation.

B. Remove excess sealant, soiling, dirt and other substances. Clean door frame and glass surfaces. Avoid damaging coatings and finishes.

C. Touch-up, repair or replace glass or other door components broken, scratched or damaged during construction prior to Substantial Completion.

D. Remove and lawfully dispose of construction debris from Project site.

3.5 PROTECTION

A. Protect installed doors and finish surfaces from damage during construction until completion of Project and acceptance by Owner.

END OF SECTION

SECTION 08 34 00 – SPECIAL FUNCTION DOORS (**ALTERNATE 1)**

GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes:

1. Interior Aluminum-Framed Top-Hung Sliding Doors

B. Related Sections:

1. Section 08 80 00 – GLAZING

1.03 REFERENCES

A. ANSI – American National Standards Institute

1. ANSI 156.18 Materials and Finishes
2. ANSI A117.1 Accessible and Usable Buildings and Facilities

B. BHMA – Builders Hardware Manufacturers Association

C. DHI – Door and Hardware Institute

D. NFPA – National Fire Protection Association

1. NFPA 80 – Standard for Fire Doors and Other Opening Protectives
2. NFPA 101 – Life Safety Code
3. NFPA 105 – Standard for Smoke Door Assemblies and Other Opening Protectives
4. NFPA 252 – Standard Methods for Fire Tests of Doors Assemblies

E. AWS – Architectural Woodwork Standards

1.04 SUBMITTALS

A. Comply with Section 01330 – SUBMITTAL PROCEDURES

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating dimensions, tolerances, materials, components, hardware, finish, options, and accessories. Shop Drawings to show required blocking by others.

D. Samples: Submit manufacturer's samples of the following sliding door components:

1. Aluminum frame finish sample.

E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

F. Warranty Documentation: Submit manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of interior aluminum frames and doors.

B. Source: Obtain sliding aluminum framed doors and hardware from single source.

C. Manufacturer's Qualifications: Manufacturer regularly engaged for past 5 years in manufacture of sliding doors similar to that specified.

1.06 PERFORMANCE

A. Aluminum perimeter frames with perimeter gaskets by manufacturer

1. Architect to verify frame thickness suitable for required application.

B. Soft-closing mechanism at both sides of door integrated with top track. Soft closers tested to a minimum of 150,000 cycles.

C. Concealed door guide.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Notify manufacturer immediately of any shipping damage.

C. Storage and Handling Requirements:

1. Store and handle materials in accordance with manufacturer's instructions.
2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
3. Store materials in clean, dry area indoors.
4. Protect materials and finish during storage, handling, and installation to prevent damage.

PRODUCTS

2.01 MANUFACTURERS

A. **AD SYSTEMS** 2201 100th St. SW, Everett, WA 98204 | Website: http://specADsystems.com | Phone: 425-740-6011 | ADSystems.Estimating@allegion.com

2.02 INTERIOR SLIDING ALUMINUM-FRAMED DOORS AND PARTITIONS

A. Manufacturer:

1. Scheduled Manufacturer: XtendSlide™ High Performance (Telescoping Sliding) Door System by AD Systems.

a. Inset

1) Bypass-dual direction systems with no stile pocket/door jamb
a) Bi-parting bypass
i. 2 doors meet in the middle
ii. 2 doors can open into the middle

2. Acceptable Substitute: No Substitution.

B. Specified Wall Thickness 5-7/8".

C. Frame Profiles: Extruded aluminum "wraparound" frame. Integral vertical jamb (stile pocket) for single direction system.

D. Finish:

1. Standard: Painted Hardcoat (Kynar) Finish. Meets AAMA 2604 Standard Colors: Light Sequin 789G048

E. Door Leaves: all Doors to be factory machined for hardware including pilot and function holes.

NOTE: Specify material for doors or reference separate specification section for wood doors, wood stile and rail doors, aluminum doors, etc.

1. Aluminum Stile & Rail Door: Manufacturer's standard 1-3/4-inch-thick glazed doors with extruded-aluminum tubular stile and rail members. Welded and bolted corner connections.

    a. 3-1/2-inch vertical stiles plus 1/2-inch stop.
    b. 3-1/2-inch Horizontal stiles plus 1/2-inch stop
    c. 10" bottom Rail.
    d. Glazing: clear, safety laminated glass, sound enhanced laminated glass.

F. Door Components:

    NOTE: Specify required components. Delete components not required.

1. Telescoping Top Track(s): AD Systems extruded aluminum track by AD Systems
2. Valances: Extruded aluminum with integral end caps
3. Top Rollers: Tandem nylon roller sized to match door weight.
4. Concealed Floor Guide: Integral Jamb floor guide by AD Systems.
5. Soft-Closers: Soft-closing dampener mechanism at closing of door leaf. Demonstrate closers as tested to 150k cycles.
6. Pull Handles:

    a. Inset
        1) Bypass-Dual direction system with no stile pocket/door jamb
            a) AD Systems single Ladder Pull. 16" long x 1" diameter. Finish: US32D Satin Stainless Steel.

EXECUTION

3.01 EXAMINATION

A. Examine wall openings to receive sliding doors for plumb, level, and square. Note: Finish door operation will be affected by out of tolerance framing.

B. Verify dimensions of wall openings.

C. Examine surfaces to receive top and bottom guide.

D. Notify Architect of conditions that would adversely affect installation or subsequent use of sliding doors.

E. Do not begin installation until unacceptable conditions are corrected.

F. Base of door side to be flush or minimal. Rubber Base acceptable.

3.02 INSTALLATION

A. Install sliding doors in accordance with manufacturer's instructions at locations indicated on the Drawings.

B. Install sliding doors plumb, level, square, and in proper alignment.

C. Install sliding doors to close against walls without gaps.

D. Install sliding doors to open and close smoothly.

E. Anchor sliding doors securely in place to supports. Required: Fire treated 2 x 6 blocking required full length of track.

3.03 ADJUSTING

A. Adjust sliding doors for proper operation in accordance with manufacturer's instructions.

B. Adjust sliding doors to operate smoothly without binding.

C. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

3.04 CLEANING

A. Clean sliding doors promptly after installation in accordance with manufacturer's instructions.

B. Do not use harsh cleaning materials or methods that could damage materials or finish.

3.05 PROTECTION

A. Protect installed sliding doors from damage during construction.

END OF SECTION

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Mechanical and electrified door hardware
   2. Field verification, preparation and modification of existing doors and frames to receive new door hardware.

B. Section Excludes:
   1. Windows
   2. Cabinets (casework), including locks in cabinets
   3. Signage
   4. Toilet accessories
   5. Overhead doors

C. Related Sections:
   1. Division 01 "GENERAL REQUIREMENTS".
   2. Division 06 Section: ''ROUGH CARPENTRY''.
   3. Division 07 Section: ''JOINT SEALANTS'' for sealant requirements applicable to threshold installation specified in this section.
   4. Division 08 Sections:
      a. ''HOLLOW METAL FRAMES''.
      b. ''PLASTIC LAMINATE -FACED WOOD DOORS''.
   5. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.
   6. Division 26 ''Electrical'' sections for connections to electrical power system and for low-voltage wiring.
   7. Division 28 ''Electronic Safety and Security'' sections for coordination with other components of electronic access control system and fire alarm system.

1.2 REFERENCES

A. UL LLC
   1. UL 10B - Fire Test of Door Assemblies
   2. UL 10C - Positive Pressure Test of Fire Door Assemblies

3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute
1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association
1. NFPA 70 – National Electric Code
2. NFPA 80 – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute
1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.3 SUBMITTALS

A. General:
1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
a. Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, ''EXAMINATION'' article, herein.
b. Review drawings and Sections from related trades to verify compatibility with specified hardware.
c. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:
1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
   a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule:
   a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
   b. Indicate complete designations of each item required for each opening, include:
      1) Door Index: door number, heading number, and Architect's hardware set number.
      2) Quantity, type, style, function, size, and finish of each hardware item.
      3) Name and manufacturer of each item.
      4) Fastenings and other pertinent information.
      5) Location of each hardware set cross-referenced to indications on Drawings.
      6) Explanation of all abbreviations, symbols, and codes contained in schedule.
      7) Mounting locations for hardware.
      8) Door and frame sizes and materials.
      9) Degree of door swing and handing.
      10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
5. Key Schedule:
   a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
   b. Use ANSI/BHMA A156.28 ''Recommended Practices for Keying Systems'' as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.

d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:
1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
b. Include warranties for specified door hardware.

D. Closeout Submittals:
1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
b. Catalog pages for each product.
c. Final approved hardware schedule edited to reflect conditions as installed.
d. Final keying schedule
e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:
1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
a. Fire door assemblies, in compliance with NFPA 80.
b. Required egress door assemblies, in compliance with NFPA 101.

1.4 QUALITY ASSURANCE

A. Qualifications and Responsibilities:
1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the

primary materials with a warehousing facility in the Project's vicinity and be available at reasonable times during the Work for consultation.

2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:
   1. Fire-Rated Door Openings:
      a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
      b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
   2. Smoke and Draft Control Door Assemblies:
      a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
      b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
   3. Electrified Door Hardware
      a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
   4. Accessibility Requirements:
      a. Comply with governing accessibility regulations cited in ''REFERENCES'' article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings
   1. Keying Conference
      a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
         1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
         2) Preliminary key system schematic diagram.
         3) Requirements for key control system.
         4) Requirements for access control.
         5) Address for delivery of keys.
   2. Pre-installation Conference

a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
b. Inspect and discuss preparatory work performed by other trades.
c. Inspect and discuss electrical roughing-in for electrified door hardware.
d. Review sequence of operation for each type of electrified door hardware.
e. Review required testing, inspecting, and certifying procedures.
f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.6 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate

provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

1.7 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
   1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
   2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
      a. Mechanical Warranty
         1) Locks
            a) Schlage ND Series: 10 years
         2) Exit Devices
            a) Von Duprin: 3 years
         3) Closers
            a) LCN 4000 Series: 30 years
         4) Automatic Operators
            a) LCN: 2 years
      b. Electrical Warranty
         1) Locks
            a) Schlage: 1 year
         2) Exit Devices
            a) Von Duprin: 1 year
         3) Closers
            a) LCN: 2 years

1.8 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Approval of alternate manufacturers and/or products other than those listed as ''Scheduled Manufacturer'' or ''Acceptable Manufacturers'' in the individual article for the product category are only to be considered by official substitution request in accordance with section 00500.

B. Approval of products from manufacturers indicated in ''Acceptable Manufacturers'' is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

C. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

A. Fabrication
   1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
   2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
   3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “HOLLOW METAL FRAMES”, “PLASTIC LAMINATE-FACED WOOD DOORS” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.
   1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
   2. Use materials which match materials of adjacent modified areas.

3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
   1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

D. Cable and Connectors:
   1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
   2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
   3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.3 HINGES

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product:
      a. Ives 5BB series

B. Requirements:
   1. Provide hinges conforming to ANSI/BHMA A156.1.
   2. Provide five knuckle, ball bearing hinges.
   3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
      a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
      b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
   4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
      a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
      b. Interior: Heavy weight, steel, 5 inches (127 mm) high
   5. 2 inches or thicker doors:
      a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
      b. Interior: Heavy weight, steel, 5 inches (127 mm) high
   6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
   7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
   8. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.

9. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins
10. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.4 FLUSH BOLTS

A. Manufacturers:
   1. Scheduled Manufacturer:
      a. Ives

B. Requirements:
   1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.5 COORDINATORS

A. Manufacturers:
   1. Scheduled Manufacturer:
      a. Ives

B. Requirements:
   1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
   2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.6 METAL ACCESS PANEL ASSEMBLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage ND series

B. Requirements:
1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to ''KEYING'' article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Provide electrified options as scheduled in the hardware sets.
8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
   a. Vandlgard: Provide levers with vandal resistant technology for use at heavy traffic or abusive applications.
   b. Lever Design: RHO

2.7 ELECTRIC STRIKES

A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
   a. Von Duprin 6000 Series

B. Requirements:
1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.8 KEYSWITCHES

A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
   a. Schlage 650 series

B. Requirements:

1. Provide key switches capable of being configured to momentary or maintained action.
2. Provide key switches that accept a mortise cylinder. Cylinders: Refer to ''KEYING'' article, herein.

2.9 POWER SUPPLIES

A. Manufacturers and Products:
   1. Scheduled Manufacturer and Product:
      a. Schlage/Von Duprin PS900 Series

B. Requirements:
   1. Provide power supplies approved by manufacturer of supplied electrified hardware.
   2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
   3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
   4. Provide power supplies with the following features:
      a. 12/24 VDC Output, field selectable.
      b. Class 2 Rated power limited output.
      c. Universal 120-240 VAC input.
      d. Low voltage DC, regulated and filtered.
      e. Polarized connector for distribution boards.
      f. Fused primary input.
      g. AC input and DC output monitoring circuit w/LED indicators.
      h. Cover mounted AC Input indication.
      i. Tested and certified to meet UL294.
      j. NEMA 1 enclosure.
      k. Hinged cover w/lock down screws.
      l. High voltage protective cover.

2.10 CYLINDERS [VERIFY]

A. Manufacturers:
   1. Scheduled Manufacturer and Product:
      a. EXISTING KEY SYSTEM.

B. Requirements:
   1. Provide cylinders/cores to match Owner’s existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.

2.11 KEYING [VERIFY]

A. Scheduled System:
   1. Existing factory registered system:
      a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
   2. Existing non-factory registered system:
      a. Provide cylinders/cores keyed into Owner's existing keying system managed by Owner's locksmith, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference. Contact:
         1) Firm Name:
         2) Contact Person:
         3) Telephone:

B. Requirements:
   1. Construction Keying:
      a. Temporary Construction Cylinder Keying.
         1) Provide construction cores that permit voiding construction keys without cylinder removal, furnished in accordance with the following requirements.
            a) Split Key or Lost Ball Construction Keying System.
            b) 3 construction control keys, and extractor tools or keys as required to void construction keying.
            c) 12 construction change (day) keys.
         2) Owner or Owner's Representative will void operation of temporary construction keys.
      b. Replaceable Construction Cores.
         1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
            a) 3 construction control keys
            b) 12 construction change (day) keys.
         2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
   2. Permanent Keying:
      a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
         1) Master Keying system as directed by the Owner.
      b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
      c. Provide keys with the following features:
         1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)

2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
3) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.

d. Identification:
1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
2) Identification stamping provisions must be approved by the Architect and Owner.
3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

e. Quantity: Furnish in the following quantities.
1) Permanent Control Keys: 3.
2) Master Keys: 6.
3) Change (Day) Keys: 3 per cylinder/core that is keyed differently
4) Key Blanks: Quantity as determined in the keying meeting.

2.12 KEY CONTROL SYSTEM

A. Manufacturers:
1. Scheduled Manufacturer:
a. Telkee

B. Requirements:
1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
b. Provide hinged-panel type cabinet for wall mounting.

2.13 DOOR CLOSERS

A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:

a. LCN 4040XP series

B. Requirements:
1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.14 DOOR STOPS AND HOLDERS

A. Manufacturers:
1. Scheduled Manufacturer:
a. Ives

B. Provide door stops at each door leaf:
1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.15 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:
   1. Scheduled Manufacturer:
      a. Zero International

B. Requirements:
   1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
   2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
   3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
   4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.16 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:
   1. Hinges at Exterior Doors: BHMA 630 (US32D)
   2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
   3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
   4. Protection Plates: BHMA 630 (US32D)
   5. Overhead Stops and Holders: BHMA 630 (US32D)
   6. Door Closers: Powder Coat to Match
   7. Wall Stops: BHMA 630 (US32D)
   8. Latch Protectors: BHMA 630 (US32D)
   9. Weatherstripping: Clear Anodized Aluminum
   10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.

C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

D. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Where on-site modification of doors and frames is required:
   1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
   2. Field modify and prepare existing doors and frames for new hardware being installed.
   3. When modifications are exposed to view, use concealed fasteners, when possible.
   4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
      a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
      b. Wood Doors: DHI WDHS.5 ''Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors.''
      c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.3 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
   1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
   2. Custom Steel Doors and Frames: HMMA 831.
   3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
   4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:
   1. Install construction cores to secure building and areas during construction period.
   2. Replace construction cores with permanent cores as indicated in keying section.
   3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
   1. Conduit, junction boxes and wire pulls.
   2. Connections to and from power supplies to electrified hardware.
   3. Connections to fire/smoke alarm system and smoke evacuation system.
   4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
   5. Connections to panel interface modules, controllers, and gateways.
   6. Testing and labeling wires with Architect's opening number.

K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.

M. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

P. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section ''Joint Sealants.''

Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

R. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 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.
   1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
   2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
   3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to 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.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

Hardware Group No. 1
For use on Door #(s):
20

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DESK MOUNT BUTTON	660-PB OR BY DIV. 28	628	SCE

VERIFY KEY SYSTEM. KEY TO EXISTING.
CARD READER, POWER SUPPLY, DPS, AND WIRING BY SECURITY CONTRACTOR; COORDINATION ITEMS: POWER/CONDUIT/WIRING/PUSH BUTTON/ ELECTRONIC SECURITY SYSTEM; ALL ACCESS CONTROL EQUIPMENT SPECIFIED UNDER SECTION 28 13 11 BY SECURITY CONTRACTOR.

Hardware Group No. 2
For use on Door #(s):

8	9	10	14	16	17
18	19	22	26		

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE

VERIFY KEY SYSTEM. KEY TO EXISTING.

Hardware Group No. 3
For use on Door #(s):
5

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
	EA	NOTE	HARDWARE BY DOOR MANUFACTURER		

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Related Sections:

1. Section 08 14 24 – PLASTIC LAMINATED-FACED WOOD DOORS.

2. Section 08 32 00 – SLIDING GLASS DOORS

3. Section 08 81 17 – FIRE RATED GLASS.

1.03 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributed to the following: defective manufacture, fabrication and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the specified design wind loads.

C. Maximum Lateral Deflection: For each type of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1", whichever is less. Larger deflections may be provided, when following conditions are confirmed in writing.

1. No jurisdictional code requirements limiting deflection.

2. Where Glazing Manufacturer accepts responsibility of performance for their recommendations.

3. Engineering shows that deflection of that magnitude is possible without breaking.

4. Engineering shows that glass can be retained in each scheduled wood framing. Written supporting confirmation is submitted from affected Glazed Metal Framing Manufacturer.

5. Edge Support: Engineer and coordinate perimeter framing to ensure that edge support is adequate for required performances.

6. Acceptance: Owner and Architect acceptance.

D. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change Range: 120 deg. F ambient, 180 deg. F material surfaces.

E. Safety Glazing: For assemblies requiring safety glazing performances, assemblies to comply with 16 CFR Part 1201 and ANSI Z97.1 as follows.

1. < or = 9 sf Size: Category I compliance.

2. > 9 sf Size and Hazardous Areas: Category II compliance.

1.04 SUBMITTALS

A. Product Data: For each glass product indicated, submit each Glazing Manufacturers' technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.

B. Samples:

1. Glazing Surface Film: Provide 4-inch by 4-inch Samples of specified texture, color, and pattern for verification.

2. Glazing Materials: Submit samples for review.

C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

1. For solar-control, low-e coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.

E. Qualification Data: For installers.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An experience installer who has completed glazing similar in material, design, and extent to that indicated for this Project, whose work has resulted in glass installations with a record of successful in-service performance.

B. Source Limitations for Glass: Obtain each type of glass from one source from a single manufacturer.

C. Glazing Standards: Flat Glass Marketing Association (FGMA) “Glazing Manual” and “Sealant Manual”.

D. Engineering: Submit Glass Manufacturer’s recommended engineering design to meet specified Project composite performances as coordinated with each Glazed Product Manufacturer’s requirements.

E. Labels: Label glass products designating type and thickness of glass. Provide Authority acceptable labels where safety glazing required.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.07 PROJECT CONDITIONS

A. Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.08 EXTRA MATERIALS

A. Glazing Surface Film: Furnish 2 percent extra material at time of installation. Deliver in protective packaging for storage and label content appropriately.

PART 2 – PRODUCTS

2.01 HEAT-TREATED GLASS PRODUCTS

A. Heat-Treated Glass Standard: ASTM C 1048, Type I (transparent flat glass) Quality-Q3 of class, kind, and condition indicated.

B. Clear, uncoated, fully tempered safety glass. 1/8" minimum thickness but not less than required for safety and engineered wind performances.

2.02 GLASS FABRICATION

A. General: Fabricate glass to sizes required for glazed openings indicated, with edge clearances and tolerances complying with Glass Framing System Manufacturer to ensure performances of the installed glass in the scheduled system.

B. Heat-Treated Glass: Manufacture by the horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed.

2.03 GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact including glass products, seals of insulating glass units, and glazing channel substrates.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

2.04 SETTING MATERIALS

A. Setting Blocks: Elastomeric material with a Shore Type A durometer hardness of 85, plus or minus 5.

B. Edge Blocks: ASTM C 864, neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

2.05 MISCELLANEOUS MATERIALS

A. Cleaners/Primers: Type recommended and acceptable to Glass, Gasket, and Glazed Product Manufacturers for required application.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Inspect work of installed glass framing for proper installation tolerances, squareness, offsets at corners; for presence and functioning of weep systems when required; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates.

B. Comply with all manufacturer's instructions for surface preparation before installation of glazing surface film.

3.03 GLAZING

A. Comply with combined printed recommendations of the Glass Manufacturers and the Framing System Manufacturer to ensure required performances of the system.

B. Protect glass from edge damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site.

C. Setting/Edge Blocks: Install in conformance with FGMA recommendations. Set blocks in thin course of sealant which is acceptable for heel bead use.

D. Glass: Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics. Replace damaged or defective glass, including those with edge damage.

E. Seals: Glaze systems as follows.

1. General: Manufacturer’s standard glazing methods for each product.

2. Gaskets: Gasketed assemblies to be miter cut at corners.

3.05 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching cross streamers to framing, held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

B. Protect completed interior glass finish during remainder of construction period.

C. Protect glass from contact with contaminating substances, including weld spatter.

D. Examine glass surfaces adjacent to or below exterior concrete or other masonry surfaces at frequent intervals during construction, but not less than once a month,

for build-up of dirt, scum, alkaline deposits, or stains. Remove as recommended by glass manufacturer.

END OF SECTION

SECTION 08 81 17 – FIRE-RATED GLASS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Fire-rated glazing materials installed as vision lights in fire-rated doors.
2. Fire-rated glazing materials installed as borrowed lites in fire-rated frames.

B. Related Sections include the following:
1. Section 08 11 00 – HOLLOW METAL FRAMES.
2. Section 08 14 24 – PLASTIC LAMINATE-FACED WOOD DOORS.

1.02 REFERENCES

A. ASTM E2074-00: Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.

B. ASTM E2010-01: Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.

C. American National Standards Institute (ANSI): ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings

D. Consumer Product Safety Commission (CPSC): CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials

E. Glass Association of North America (GANA):
1. GANA – Glazing Manual.
2. FGMA – Sealant Manual.

F. National Fire Protection Association (NFPA):
1. NFPA 80: Fire Doors and Windows.
2. NFPA 252 – Fire Tests of Door Assemblies.
3. NFPA 257 – Fire Tests of Window Assemblies.

G. Underwriters Laboratories, Inc. (UL):
1. UL 9 – Fire Tests of Window Assemblies.
2. UL 10B – Fire Tests of Door Assemblies.
3. UL 10C – Positive Pressure Fire Tests of Door Assemblies.

1.03 PERFORMANCE REQUIREMENTS

A. Fire-rated glass ceramic laminated clear and wireless glazing material for use in impact safety-rated locations such as doors, transoms and borrowed lites with fire rating requirements ranging from 20 minutes to 3 hours with required hose stream test.

B. Passes positive pressure test standards UL10C, UBC 7-2 and UBC 7-4.

1.04 SUBMITTALS

A. Comply with requirements of Section 01300-SUBMITTALS.

B. Product Data: Submit manufacturer's technical data for each glazing material required, including installation and maintenance instructions.

C. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

D. Product Test Listings: From UL indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.

E. Samples: Submit, for verification purposes, approx. 8-inch by 10-inch sample for each type of glass indicated.

1.05 QUALITY ASSURANCE

A. Glazing Standards: FGMA Glazing Manual and Sealant Manual.

B. Fire Protective Rated Glass: Each lite shall bear permanent, non-removable label of UL certifying it for use in tested and rated fire protective assemblies.

C. Fire Protective Glazing Products for Door Assemblies: Products identical to those tested per ASTM E2074-00 and UL 10B, labeled and listed by UL.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials under provisions of Section 01600-MATERIAL AND EQUIPMENT.

B. Deliver materials to specified destination in manufacturer or distributor's packaging, undamaged, complete with installation instructions.

C. Store off ground, under cover, protected from weather and construction activities.

1.07 WARRANTY

A. Provide manufacturer's limited warranty under provision of Section 01700-CONTRACT CLOSEOUT.

B. Warranty Period: Five years from date of purchase.

PART 2 - PRODUCTS

2.01 FIRE-RATED GLAZING MATERIALS

A. Manufacturer: FireLite Plus® as manufactured by Nippon Electric Glass Company, Ltd., and distributed by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065, voice 1-800-426-0279, fax 1-800-451-9857, e-mail sales@fireglass.com, web site www.fireglass.com.

Properties: Thickness: 5/16 inch [8 mm] overall.

1. Weight: 4 lbs./sq. ft.
2. Approximate Visible Transmission: 85 percent.
3. Approximate Visible Reflection: 9 percent.
4. Fire-rating: 20 minutes to 3 hours for doors; 20 minutes to 90 minutes for other applications.
5. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
6. STC Rating: Approximately 38 dB.
7. Surface Finish:
   a. Premium Grade-Ground and polished on both sides
   b. Standard Grade-Comparable surface finish to alternative fire-rated ceramic products marketed as "Premium"
8. Positive Pressure Test: UL 10C, UBC 7-2 and 7-4; passes.

B. Maximum sheet sizes based on surface finish:

1. Premium: 48 inches by 96 inches.
2. Standard: 48 inches by 96 inches.

C. Labeling:
1. Permanently label each piece of FireLite Plus® with the FireLite® logo, UL logo and fire rating in sizes up to 3,325 sq. in., and with the FireLite® label only for sizes that exceed the listing (as approved by the local authority having jurisdiction).

D. Fire Rating: Fire rating listed and labeled by UL for fire rating scheduled at opening locations on drawings, when tested in accordance with [ASTM E2074-00 and ASTM E2010-01] [ULC Standards CAN4 S-104 and CAN4 S-106] [NPFA 252 and NFPA 257] [UL 9, UL 10B and UL 10C].

E. Substitutions: No substitutions allowed.

2.02 GLAZING COMPOUND FOR FIRE-RATED GLAZING MATERIALS

A. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.

B. Glazing Compound: DAP 33 putty.

C. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:
1. Dow Corning 795 - Dow Corning Corp.
2. Silglaze-II 2800 - General Electric Co.
3. Spectrem 2 - Tremco Inc.

D. Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.

E. Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.03 FABRICATION

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
2. Minimum required face or edge clearances.
3. Observable edge damage or face imperfections.

B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

C. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.02 INSTALLATION (GLAZING)

A. Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.

B. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.

C. Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.

D. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.

E. Place setting blocks located at quarter points of glass with edge block no more than 6 inches from corners.

F. Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.

G. Place glazing tape on free perimeter of glazing in same manner described above.

H. Install removable stop and secure without displacement of tape.

I. [Use specified glazing compound, without adulteration; bed glazing material in glazing compound; entirely fill all recess and spaces. Provide visible glazing compound with smooth and straight edges.]

J. Install in vision panels in fire-rated doors to requirements of NFPA 80.

K. Install so that appropriate UL, FireLite Plus® markings remain permanently visible.

3.03 PROTECTION AND CLEANING

A. Protect glass from contact with contaminating substances resulting from construction operations. Remove any such substances by method approved by glass manufacturer.

B. Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of substantial completion. Wash glass by method recommended by glass manufacturer.

3.04 GLAZING SCHEDULE

Rating	Assembly	Max. Exposed Area (Sq. In.)	Max. Width Of Exposed Glazing (In.)	**OR**	Max. Height Of Exposed Glazing (In.)	Stop Height
20 min.	Doors					
	HMS or Wood*	3,204	36		89	5/8”
	Fireframes D.S.	3,204	36		89	3/4"
	Other than doors					
	HMS or Wood	3,325	95		95	5/8”
	Fireframes D.S.	3,325	95		95	3/4"
45 min.	Doors					
	HMS or Wood	3,204	36		89	5/8”
	Fireframes D.S.	3,204	36		89	3/4"
	Other than doors					
	HMS or Wood	3,325	95		95	5/8”
	Fireframes D.S.	3,325	95		95	3/4"
60 min.	Doors (non-temp rise)	3,204	36		89	5/8”
	HMS or Wood	3,204	36		89	3/4"
	Fireframes D.S.	100	12		33	5/8”
	Doors (temp rise)					
	Other than doors	3,325	95		95	5/8”
	HMS or Wood	3,325	95		95	3/4"
	Fireframes D.S.					
90 min.	Doors (non-temp rise)	2,034	36		56 ½”	3/4”
	Doors (temp rise)	100	12		33	1/2”
	Other than doors	2,627	56 ½”		56 ½”	5/8”
	HMS	2,627	56 ½”		56 ½”	3/4"
	Fireframes D.S.					
3 hours	Doors	100	12		33	1/2”

* HMS indicates hollow metal steel framing. Fire frames D.S. indicates Designer Series narrow profile framing. For wood frames, check with manufacturer for maximum tested glass sizes.

END OF SECTION

DIVISION 09 – FINISHES

SECTION 09 2216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes non-load-bearing steel framing members for the following applications:

1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).

2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).

3. Shaft-wall enclosures.

4. Horizontal enclosures.

B. Related Requirements

1. Section 05 40 00 – COLD-FORMED METAL FRAMING.

2. Section 09 29 00 – GYPSUM BOARD.

3. Section 09 51 13 – ACOUSTICAL PANEL CEILINGS.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

1.04 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

C. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

PART 2 - PRODUCTS

2.01 NON-LOAD-BEARING STEEL FRAMING, GENERAL

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.

2. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized, unless otherwise indicated.

2.02 SHAFT WALL AND HORIZONTAL ENCLOSURE

A. Framing Members: Comply with ASTM C 754 for conditions indicated.

B. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.

1. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized, unless otherwise indicated.

2.03 SUSPENSION SYSTEM COMPONENTS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.

B. Hanger Attachments to Concrete:

1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.

2. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by an independent testing agency.

C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.

D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: As indicated on Drawings.

E. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges, 3/4 inch (19.1 mm) deep.

2. Steel Studs: ASTM C 645.

a. Minimum Base-Metal Thickness: As indicated on Drawings.

b. Depth: As indicated on Drawings.

3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22.2 mm) deep.

a. Minimum Base Metal Thickness: As indicated on Drawings.

4. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep members designed to reduce sound transmission.

a. Configuration: Asymmetrical or hat shaped.

F. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:

a. Armstrong World Industries, Inc.; Drywall Grid Systems.

2.04 STEEL FRAMING FOR FRAMED ASSEMBLIES

A. Steel Studs and Runners: ASTM C 645.

1. Minimum Base-Metal Thickness: As indicated on Drawings.

2. Depth: As indicated on Drawings.

B. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (50.8-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.

2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- (50.8-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

   a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

   b. Products: Subject to compliance with requirements, provide one of the following:

      1) Steel Network Inc. (The); VertiTrack VTD Series.

      2) Superior Metal Trim; Superior Flex Track System (SFT).

C. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: As indicated on Drawings.

E. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: As indicated on Drawings.

2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.

F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base Metal Thickness: As indicated on Drawings.

2. Depth: As indicated on Drawings.

G. Resilient Furring Channels: 1/2-inch- (12.7-mm-) deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical.

H. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: As indicated on Drawings.

2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare-steel thickness of 0.0312 inch (0.79 mm).

3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm) diameter wire.

I. Shaft wall and Horizontal Enclosure

1. Studs: Manufacturer's standard profile for repetitive members, corner and end members, and fire-resistance-rated assembly indicated.

a. Depth: As indicated.

2. Runner Tracks: Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches (51 mm) long and in depth matching studs.

a. Minimum Base-Metal Thickness: Matching steel studs.

3. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

a. Products: Subject to compliance with requirements, provide one of the following:

1) Dietrich Metal Framing; The System by Metal-Lite, Inc.

2) Fire Trak Corp.; Fire Trak.

4. Jamb Struts: Manufacturer's standard J-profile strut with long-leg length of 3 inches (76 mm), in depth matching studs, and not less than 0.0329 inch (0.84 mm) thick.

2.05 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

B. Coordination with Sprayed Fire-Resistive Materials:

2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.03 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.04 INSTALLING SUSPENSION SYSTEMS

A. Install suspension system components in sizes and spacings indicated on Drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

    a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

    a. Size supplemental suspension members and hangers to support ceiling loads within [performance limits established by referenced installation standards.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure

and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

5. Do not attach hangers to steel roof deck.

6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.05 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.

1. Space studs as indicated on the drawings'

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

a. Install two studs at each jamb, unless otherwise indicated.

b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.

c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

a. Firestop Track: Where indicated, install to maintain continuity of fire resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

6. Curved Partitions:

a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.

b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches (150 mm) o.c.

D. Direct Furring:

1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
1. Gypsum board and accessories.

B. Related Sections include the following:
1. Section 079200 Joint Sealants.
2. Section 092216 Non-Structural Metal Framing.
3. Section 095113 Acoustical Panel Ceilings.
4. Section 099100 Painting.
5. Section 13490 – Radiation Protection

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

1.04 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

1.05 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.01 PANELS, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.02 INTERIOR GYPSUM BOARD

A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, USG Corporation.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. United States Gypsum Company
b. CertainTeed Corporation
c. Georgia-Pacific Gypsum (G-P Gypsum).

B. Gypsum Board:
1. Thickness: 5/8 inch unless otherwise indicated on Drawings.
2. Edges: Tapered.
3. ASTM 36, regular type unless Type X fire-resistant type or as indicated and required to meet UL assembly types.

C. Ceiling Board:
1. ASTM C36 non-sag type.
2. Thickness: 1/2 inch unless otherwise indicated on Drawings.
3. Long Edges: Tapered.

D. High-Impact Type: Manufactured with Type X core, plastic film laminated to back side for greater resistance to through-penetration (impact resistance).
   1. Core: 5/8-inch-thick unless otherwise indicated on Drawings.
   2. Plastic-Film Thickness: 0.020 inch (0.508 mm).

E. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.
   1. Core: 5/8 inch (15.9 mm), Type X.
   2. Long Edges: Tapered.

F. Cementitious Backer Board:
   1. Aggregate Portland cement board with woven glass fiber mesh facing complying with ANSI A118.9.
   2. Thickness: 5/8 inch unless otherwise indicated.
   3. Acceptable product: USG Durock cement board or equal.

2.03 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
   1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.

   2. Shapes:
      a. Cornerbead.
      b. Bullnose bead
      c. LC-Bead: J-shaped; exposed long flange receives joint compound.
      d. L-Bead: L-shaped; exposed long flange receives joint compound.
      e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
      f. Expansion (control) joint.
      g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.04 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
   1. Interior Gypsum Wallboard: Paper.
   2. Exterior Gypsum Soffit Board: Paper.
   3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

   1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
   a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use setting-type, sandable topping.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.05 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
   1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
   1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
   1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."
   1. Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
   1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
   2. Fit gypsum panels around ducts, pipes, and conduits.
   3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

3.03 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:
1. Regular Type: As indicated on Drawings.
2. Type X: Where required for fire-resistance-rated assembly.
3. Type C: Where required for specific fire-resistance-rated assembly indicated.
4. Ceiling Type: Ceiling surfaces.
5. Abuse-Resistant Type: As indicated on Drawings.
6. High-Impact Type: As indicated on Drawings.
7. Moisture- and Mold-Resistant Type: As indicated on Drawings.
8. Cementitious Backer Board: As indicated on Drawings.

B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
        1) Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:
1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

3. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.04 APPLYING EXTERIOR GYPSUM PANELS FOR CEILINGS AND SOFFITS

A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
   1. Fasten with corrosion-resistant screws.

3.05 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:
   1. Cornerbead: Use at outside corners.
   2. LC-Bead: Use at exposed panel edges.
   3. L-Bead: Use where indicated.
   4. U-Bead: Use at exposed panel edges.

D. Custom Ceiling Perimeter Trim
   1. Install per manufacturer instructions.

E. Exterior Trim: Install in the following locations:
   1. LC-Bead: Use at exposed panel edges.

3.06 INSTALLATION – SHAFT WALL AND HORIZONTAL ENCLOSURE

A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
   1. ASTM C 754 for installing steel framing except comply with framing spacing indicated.

B. Do not bridge architectural or building expansion joints with shaft-wall assemblies; frame both sides of expansion joints with furring and other support.

C. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.

D. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire

protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.

F. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with ASTM C 919 requirements or with manufacturer's written instructions, whichever are more stringent.

3.07 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 5: Where new gypsum board are being installed.
    a. Primer and its application to surfaces are specified in other Division 09 Sections.

E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

3.08 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes:

1. Acoustical Ceiling Panels.
2. Exposed Tee Suspension Systems designed for seismic applications.
3. Perimeter trim and accessories.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices.

C. Related Sections include the following:

1. DIVISION 23 - HVAC.
2. DIVISION 26 - ELECTRICAL.

1.03 DEFINITIONS

A. AC: Articulation Class.

B. CAC: Ceiling Attenuation Class.

C. LR: Light Reflectance coefficient.

D. NRC: Noise Reduction Coefficient.

1.04 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: 1/4 inch = 1 foot (1:48).

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. Qualification Data: For testing agency.

F. Field quality-control test reports.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each acoustical panel ceiling.

H. Research/Evaluation Reports: For each acoustical panel ceiling and components [and anchor and fastener type].

I. Maintenance Data: For finishes to include in maintenance manuals.

1.05 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:

    a. Smoke-Developed Index: 50 or less.

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 C 636 and 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."

1.06 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.

1.07 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.

1.08 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.

1.09 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 5.0 percent of quantity installed.

2. Exposed Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.

3. Hold-Down Clips: Equal to 5.0 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 appearance characteristics indicated for each product type.
   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 Architect 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. **ACT-01**

1. Manufacturer: Armstrong World Industries; www.armstrongceilings.com.

2. Materials: Acoustical Panels, Ultima by Armstrong Ceilings, Item no. 1911

3. Characteristics:

   a. ASTM E1264 Classification: Type A, Form A2.2, Pattern E, Fire Class A.

b. Edge Profile: 15/16” Beveled Tegular for interface with compatible Armstrong grid.

c. Size: 24” x 24” x 3/4".

d. NRC: 0.75

e. CAC: 35.

f. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.88.

g. Recycled Content: Up to 50%.

h. R Value (BTU Units): 2.2.

B. Substitutions: No substitutions permitted.

C. **ACT-02**

1. Manufacturer: Armstrong World Industries; www.armstrongceilings.com.

2. Materials: Acoustical Panels, Ultima by Armstrong Ceilings, Item no. 1894.

3. Characteristics:

a. ASTM E1264 Classification: Type A, Form A2.2, Pattern E, Fire Class A.

b. Fire Guard: A fire-resistive ceiling when used in applicable UL assembles.

c. Edge Profile: 15/16” Beveled Tegular for interface with compatible Fire Guard Armstrong grid.

d. Size: 24” x 24” x 3/4".

e. NRC: 0.60

f. CAC: 40.

g. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.88.

h. Recycled Content: Up to 50%.

i. R Value (BTU Units): 2.2

C. Substitutions: No substitutions permitted.

2.03 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, Table1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. 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

2.04 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

A. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).
   1. Structural Classification: ASTM C 635 HD.

   2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.

   3. Acceptable Product: Prelude XL 15/16" Exposed Tee as manufactured by Armstrong World Industries, Inc.

B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

C. 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.

D. 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.

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 system and acoustical ceiling panels shall be installed in accordance with the manufacturer’s installation instructions and recommendations.

C. 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 spacing that interfere with location of hangers at spacing 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, post installed 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.

D. 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. Fasten bracing wires into concrete with cast-in-place or post installed anchors.

E. 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 1/8 inch in 12 feet (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.

F. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

G. 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 09 65 13 – RESILIENT WALL BASE

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Resilient wall base and accessories

B. Related Sections:
1. Division 1 Sections
2. Division 9 – Gypsum Board

1.2 SUBMITTALS
A. Product Data: For each type of product indicated.
B. Samples for Initial Selection: For each type of product indicated.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.

B. Substrate Conditions:

1. Moisture Content: Do not install resilient flooring materials over substrates with moisture contents in excess of what is allowed by the Resilient Material Manufacturer. Preform all moisture tests of types acceptable to each Manufacturer of Project required products.

2. Submittal: Submit test reports signed by Installer and Manufacturer confirming that the test types , time tests were performed, quantity and distribution of test, and results are acceptable to each Resilient Product Manufacturer for proper installation of each Project required products.

1.4 REGULATORY REQUIREMENTS

A. Ground and floor surfaces along accessible routes and in accessible rooms and spaces including floors, walks, ramps, stairs and curb ramps, shall be stable, firm, and slip resistant per ADAAG Section 4.5.1.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products 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 or more than 90 deg F. Store tiles on flat surfaces.

1.6 PROJECT CONDITIONS

A. Close spaces to traffic during floor covering installation.
B. Close spaces to traffic for 48 hours after floor covering installation.
C. Environmental Conditions: Refer to Division 1 requirements.

1.7 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.

2. Resilient Wall Base and Accessories: Furnish not less than 10 linear feet for every 100 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

A. Available Manufacturers: Refer to Division 1 requirements.

2.2 MILLWORK RESILIENT WALL BASE:

A. General Characteristics: Comply with following , unless otherwise acceptable to Architect:

1. Type: ASTM F 1861, Type TP, Group 1(solid); as necessary to match scheduled color.
2. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm^2 or greater, Class I.
3. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, Class B, Smoke less than 450
4. Height: Varies with selected product style
5. Lengths: Roll stock in longest available lengths; as required to install least amount of seams in any run.
6. Varies due to profile at 1/8” minimum.
7. Style: Primary product as specified herein, with matching end stops and performed corner units
8. Finish: Matt.

9. Phthalate -free
10. 100% Recyclable
11. Contains 14% pre-consumer recycled content

B. Rubber Wall Base:

1. Johnsonite: Resilient Rubber Wall Base
2. Product Line: "TS Rubber Wall Base"
3. Style: Oblique
4. Color: Refer to Architectural drawings.

2.3 ACCESSORIES:

A. Acceptable Manufacturers:

1. Johnsonite.
2. Burke Mercer Flooring Products
3. Roppe Corporation.

B. Resilient Edge Strips: 1/8" thick, 1" width minimum, homogeneous rubber composition, tapered or bullnose profile, color to match adjacent flooring, and with provision for adhesive application.

2.4 RESILIENT MOLDING ACCESSORY

A. Description: Reducer strip for resilient floor covering.
1. Johnsonite.
2. Burke Mercer Flooring Products.
3. Roppe Corporation.

B. Material: Rubber.

2.5 MISCELLANEOUS MATERIALS:

A. General: For each Project required product, miscellaneous materials are to be specifically recommended by the Resilient Material manufacturer of each product for the Project specific conditions of use and installation.

B. Adhesives: Manufacturer's recommended low VOC content water base adhesives. All adhesives to have ten (10) years minimum proven bonding capability history under actual installation conditions similar to Project substrate and environmental exposure condition; unless otherwise acceptable to Architect.

C. Finishing Materials: Finishing materials, e.g. cleaner, sealers, waxes, etc. for

added protection and published by Manufacturer for each primary resilient product.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.

1. 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 resilient products.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.

B. 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.

3.4 RESILIENT WALL BASE INSTALLATION

A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

D. Do not stretch wall base during installation.

E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.

F. Premolded Corners: Install premolded corners before installing straight pieces.

3.5 RESILIENT ACCESSORY INSTALLATION

A. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

3.6 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing resilient product 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.

a. Do not wash surfaces until after time period recommended by manufacturer.

B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

1. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.

a. Use commercially available product acceptable to manufacturer.

b. Coordinate selection of floor polish with Owner's maintenance service.

2. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.

3. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION

SECTION 09 68 13 - CARPET TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, included General and

1.2 SUMMARY

A. This Section includes:

1. Modular Carpet Tile as indicated and scheduled.

2. Adhesives and accessories as required for installation.

1.3 REFERENCES

A. ASTM International Standards:

1. ASTM E648 – Critical Radiant Flux of Floor Covering Systems.

2. ASTM E662 – Smoke Density.

3. ASTM F710 – Preparing Concrete Floors to Receive Resilient Flooring.

B. Carpet and Rug Institute (CRI):

1. Green Label Plus Certification.

1.4 SUBMITTALS

A. Product Data: Manufacturer’s specifications, installation instructions, and maintenance guidelines.

B. Samples: Minimum 12" x 12" carpet tile sample showing color, texture, and backing.

C. Shop Drawings: Layout plan indicating tile orientation and transitions.

D. Maintenance Data: Cleaning and maintenance recommendations.

1.5 WARRANTY

A. Provide manufacturer’s standard commercial warranty.

1.6 QUALITY ASSURANCE

A. Mockups for each type of carpet tile installation

B. Installer Qualifications: Experienced installer trained and approved by manufacturer.

C. Regulatory Requirements:

1. Tarr Rating: Wear Resistance: Suitable for heavy commercial traffic.

2. Flammability: ASTM E648, Class 1 – Glue Down.

3. Static Propensity: AATC 134, Under 3.5 KV.

4. Smoke Density: ASTM E662, less than 450.

5. Comply with local fire and building codes.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Carpet Tile – CPT-01:

1. Manufacturer: Mohawk Group, Collection: Artisanal, Style: Threaded Craft (BT414),

2. Fiber Content: ColorStrand Nylon

3. Surface Appearance: Textured Patterned Loop

4. Density: 6428

5. Pile Thickness: 0.084

6. Backing: Ecoflex Matrix

7. Dye Method: 100% solution dyed

8. Size: 24” X 24”

B. No substitutions.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packaging with labels intact.

B. Store in a clean, dry, temperature-controlled environment.

C. Protect from moisture, dirt, and damage.

3.2 PROJECT CONDITIONS

A. Maintain ambient temperature between 65°F and 85°F for at least 48 hours before, during, and after installation.

B. Do not install until building is enclosed and HVAC systems are operational.

3.3 EXAMINATION

A. Verify subfloor is clean, dry, and free of contaminates.

B. Ensure subfloor complies with ASTM F710.

C. Do not proceed until unsatisfactory conditions are corrected.

3.4 PREPARATION

A. Remove debris, dust, grease, and curing compounds.

B. Level subfloor to acceptable tolerances as required by manufacturer.

C. Perform moisture testing as required by manufacturer.

3.5 INSTALLATION

A. Installation carpet tiles in accordance with manufacturer’s instructions.

B. Adhesive: Enpress, M700 Plus, FlexLok+ Tabs, Total Bond.

C. Layout: Quarter-turn, monolithic, or ashlar pattern as shown on architectural drawings.

D. Install transition Strips: as required for adjacent flooring.

E. Ensure tight joints and proper alignment.

F. Roll installed carpet with appropriate roller to ensure adhesion.

3.6 CLEANING

A. Remove adhesive residue from carpet surface.

B. Vacuum carpet after installation.

C. Protect finished flooring from damage until Substantial Completion.

D. Replace damaged tiles prior to final acceptance.

END OF SECTION

SECTION 09 90 00 – INTERIOR PAINT

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Surface preparation and the application of paint systems.

1.2 RELATED SECTIONS

A. Division 1 Section.
B. Division 9 – Gypsum Board
C. Division 15 and 16

1.3 SUBMITTALS

A. Product Data: For each paint system specified. Include block fillers and primers.
B. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
C. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
D. Samples for Initial Selection: For each type of topcoat product indicated.
    1. Provide 8 by 10 brushouts for each color scheduled on Drawings.
        a. Number: 3 each for each color.
        b. Accepted brushout will become standard for the project.
E. Product List: For each product indicated, include the following:
    1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
F. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.
C. Final approval of colors will be from job-applied samples.

D. Paint, Stain and Coating Application: Meet requirements of PDCA “Custom Grade”.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the 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 stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Product Storage:

1. Store materials not in use in tightly covered containers in a well-ventilated area. Do not allow temperature in storage area to exceed temperature allowed by the stored product manufacturer.
2. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
3. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 PROJECT CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature range required by the paint product manufacturer.

B. Do not apply exterior coatings during rain, or when relative humidity exceed the maximum humidity allowed by the paint product manufacturer.

C. Provide minimum lighting level of 80 ft candles measured mid-height at substrate surface.

1.7 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below.

B. Quantity: Furnish the Owner with an additional 1 percent, but not less than 1 gal. (3.785 L) or 1 case, as appropriate, of each material and color applied.

C. Package paint materials in unopened, factory-sealed containers for storage. Label each container with color, type, texture, and room locations, in addition to the manufacturer's label. Deliver extra materials to the Owner.

PART 2 PRODUCTS

2.1 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials of the types scheduled under Finish Systems below that are:

1. compatible with one another and the substrates indicated under conditions of service and application,

2. recommended by coating manufacturer based on testing and field experience as documented in published product literature or confirmed in writing by manufacturer.

B. 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. Sherwin-Williams Company (The).

2. PPG Architectural Finishes, Inc.

3. Benjamin Moore & Co.

4. Glidden Professional.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

C. Hazardous Content: Do not use paint or paint products containing lead, cadmium, zinc or strontium chromates or mercury.

D. Provide primer and finish coats with a suitable chemical mildewstat or mildewcide in amounts to suit local conditions but no less than one ounce per gallon.

E. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

2.3 BASIS- OF- DESIGN PRODUCTS- PAINTS, GLAZED COATINGS AND STAINS

A. Basis of design products are scheduled below.

B. Paint systems for which no basis- of- design product has been selected are scheduled by paint type below with a list of acceptable products.

C. Substitutions of products other than the basis of design product or from another manufacturer not listed where no basis of design product has been selected may be allowed if the Architect determines that the proposed products are of comparable tested quality to those products specified herein. Qualities as tested by appropriate industry methods include the following:

1. Percent solids by volume.
2. Square foot coverage at the scheduled dry film thickness (DFT) in mils.
3. Quantitative material analysis: percent resin binder and percent titanium dioxide.
4. Abrasion resistance.
5. Flexibility.
6. Washability.
7. Accelerated weathering.
8. Color retention (exterior paints only).Alkali and mildew resistance.
9. INTERIOR PAINT SYSTEMS: Low odor and zero volume of volatile organic content (VOC) in grams per liter.

2.4 BASIS- OF- DESIGN PRODUCTS- INTERIOR OPAQUE PAINT FINISHES (**P**)

A. Zero VOC Opaque Latex Paint Finishes:

B. Sherwin-Williams Co. (S-W). ProMar 200 Zero VOC Low Odor (interior low odor/ zero VOC).

C. Subject to provisions of Paragraph 2.2.C. the following products may be approved as a substitution:

1. Benjamin Moore & Co. (Moore). Pristine Eco Spec (interior low-odor/ low-voc) and low-odor/ low-voc primer.
2. ICI Dulux (ICI) Latex Paints: ICI Lifemaster 2000 (interior low odor/low VOC).

2.5 BASIS- OF- DESIGN PRODUCTS- INTERIOR GLAZED COATINGS (**GC**)

A. Water based high solids, low odor low VOC epoxy system.

1. Rust-oleum
    a. Primer: Water and stain resistant primer; Sierra Performance Coatings Griptec Multi-Surface Sandable Primer S30.
        1. VOC content: zero.
    b. Intermediate Coat and Topcoat: Two component epoxy acrylic enamel; Sierra Performance Coatings Water Based Epoxy Wall and Trim Enamel.
        1. VOC content: zero.

B. Subject to the low odor and low VOC content provision and other provisions of Paragraph 2.2.C. products of one of the following manufacturers may acceptable as substitutions for the basis-of-design products listed above.
    1. Sherwin-Williams S-W
    2. Carboline
    3. ICI
    4. Benjamin Moore
    5. PPG
    6. Tnemec

2.6 BASIS- OF- DESIGN PRODUCTS- TRANSPARENT PAINT FINISHES (**ST**).

A. Waterborne Finishes
    1. Wood Kote (WK): Cascade PolyKote (interior low odor/ low VOC).

B. Subject to the low odor and low VOC content provision and other provisions of Paragraph 2.2.B. products of one of the following manufacturers may acceptable as substitutions for the basis-of-design products listed above.
    1. Sherwin-Williams Co. (S-W).
    2. Benjamin Moore & Co. (Moore).
    3. Pratt & Lambert, Inc. (P & L).
    4. Devoe Coatings
    5. Cabot

2.7 EXTERIOR PAINT SYSTEMS

A. Opaque Paint Finishes: The product lines listed below represent the listed manufacturer's best-quality products.
    1. Sherwin-Williams Co. (S-W).
        a. Latex Paints: Super Paint Exterior Latex (exterior)
        b. Oil/Alkyd Paints: ProMar 200 Alkyd (exterior).
    2. Benjamin Moore & Co. (Moore).

a. Latex Paints: MoorLife, MoorGard, MoorGlo Premium Paints (exterior) Oil/Alkyd Paints: Moore Industrial M-22 Urethane Alkyd (exterior and interior).

3. ICI Dulux (ICI).

a. Latex Paints: Dulux Professional Exterior (exterior), Dulux Ultra (interior) and ICI Lifemaster 2000 (interior low odor/low VOC).

b. Oil/Alkyd Paints: Ultra-Hide Durus Exterior Alkyd (exterior), Ultra-Hide Traditional Enamel (interior).

c. Special Finish- High Performance Exterior Coating- Ferrous Metals

d. Carboline

e. Solvent-based organic zinc-rich epoxy primer: Carbozinc 11 HS (shop-applied).

f. Solvent Based Organic Zinc Rich Epoxy primer: Carboline 859 (field-applied).

g. Surface tolerant epoxy primer: Rustbond Penetrating Sealer (field-applied).

h. Modified aluminum epoxy mastic: Carbomastic 15 (field applied).

i. Solvent-borne cycoaliphatic epoxy intermediate coat: Carboguard 893SG (field-applied)

j. Solvent-borne aliphatic acrylic polyurethane topcoat (gloss finish): Carbothane 134 HG (field applied).

4. Devoe

a. Solvent based modified inorganic zinc primer: Gardcote DP64U935/902 (shop-applied).

b. Polymeric epoxy primer: Gardcote Epoxy Primer DP54U735/902 (field-applied).

c. Surface tolerant epoxy primer: Gardcote Surface Tolerant MMB Epoxy DP32UXXX (field applied).

d. Epoxy polyamide intermediate coat: High Glaze DP56UXXX/902 (field-applied).

e. Aliphatic Acrylic Polyurethane Topcoat (gloss finish): Alilthane II DP47UXXXX (field applied).

2.8 COLOR AND GLOSS

A. Colors of finish coats are scheduled on the drawings.

B. The tinting base for finish coats shall be only as recommended by paint manufacturer for the color tones selected.

C. Proprietary Names Used in the Color Schedule: Use of manufacturer's proprietary product names to designate colors is not intended to imply that products named are required to be used to the exclusion of matching colors available from other listed manufacturers.

D. Gloss of finish coats is scheduled on the drawings.

2.9 ACCESSORY MATERIALS

A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; of commercial quality.

B. Patching Materials: Latex filler.

C. Fastener Head Cover Materials: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements of this section and the paint product manufacturer.

B. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

C. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

D. 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.

E. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Plaster and Gypsum Wallboard: 12 percent.
2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D2016.
4. Exterior Wood: 15 percent, measured in accordance with ASTM D2016.
5. Concrete Floors: 8 percent.

G. Measure pH of the substrate surfaces. Do not apply finishes unless alkalinity level is below the maximum allowed by the paint product manufacturer.

3.2 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 the size or weight of the item, provide surface-applied protection before surface preparation and painting.

B. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

C. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.

D. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

E. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

F. Cementitious Materials: Prepare concrete, concrete masonry block, 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.

G. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

H. Allow cast-in-place concrete, portland cement and gypsum plaster, veneer plaster and other field cured substrates at least 30 days to cure before coating.

I. Determine alkalinity of substrates by performing appropriate tests. If alkalinity exceeds manufacturer’s recommendation for the primer correct this condition before application.

J. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

K. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

L. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

M. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.

N. When transparent finish is required, backprime with spar varnish.

O. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.

P. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

Q. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.

1. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of SSPC-SP 6.

2. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming

3. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

R. Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

S. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

3.3 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.

B. Paint colors, surface treatments, and finishes are indicated in the schedules.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

D. 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 the system integrity and provide desired protection.

E. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

F. Paint interior surfaces of unlined ducts with a flat, nonspecular black paint where visible through registers or grilles.

G. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

H. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

I. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

J. Sand lightly between each succeeding enamel or varnish coat.

K. 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.

L. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.

M. Omit primer on metal surfaces that have been shop primed and touchup painted.

N. 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 edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

O. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

P. 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 the type of material applied. Use brush of appropriate size for the surface or item being painted.

2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.

Q. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

1. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

2. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the 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.

3. 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.

4. 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.

5. Provide satin finish for final coats.

6. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

3.4 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:

B. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.

C. The Owner may direct the Contractor to stop painting if test results show material being used does not comply with approved product submittals. The Contractor shall remove noncomplying paint from the site, pay for testing, and repaint surfaces previously coated with the rejected paint. If necessary, the Contractor may be required to remove rejected paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

B. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

D. Shop Fabricated Conventionally Primed Steel Items: To exterior surfaces or surfaces exposed to unconditioned air, provide the following special finish.

1. High performance epoxy/aliphatic polyurethane coating system applied to conventional factory primer provided under provisions of other sections.

a. Full field applied primer: Solvent based organic zinc rich primer or modified inorganic zinc epoxy primer at 3 mils DFT

b. Intermediate coat: Solvent-based cycloaliphatic amine epoxy or epoxy polyamide at 4 mils DFT.

c. Topcoat: Solvent-borne aliphatic acrylic topcoat (gloss finish) at 2 mils DFT, color as selected from manufacturer's standard color range.

E. Shop Fabricated Steel with a High Performance Primer: To exterior surfaces or surfaces exposed to unconditioned air, provide the following special finish:

1. High performance epoxy coating system.

a. High performance factory applied primer provided under Section(s) 05500 and 05120: Solvent-free inorganic zinc-rich epoxy or modified inorganic zinc rich primer, at 3 mils DFT.

b. Field applied spot primer for welds, bolts and damaged factory primer: Cycloaliphatic amine epoxy primer or modified inorganic zinc rich primer to 25 mils DFT.

c. Intermediate coat: Cycloaliphatic amine epoxy or solvent-borne epoxy polyamide or surface tolerant MMB epoxy primer, at 4 mils DFT.

d. Topcoat: Solvent-borne aliphatic acrylic topcoat (gloss finish) at 2 mils DFT, color as selected from manufacturer's standard color range.

F. Aluminum: Provide the following finish systems over exterior aluminum surfaces:

1. Alkyd-Enamel Finish: 2 finish coats over a primer.

a. Primer: Rust-inhibitive, acrylic- or alkyd-based, metal primer, as recommended by the manufacturer for use over aluminum, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.4 mils (0.036 mm).

b. First and Second Coats: alkyd enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).

3.7 INTERIOR PAINT SYSTEMS

A. Concrete and Masonry (Other than Concrete Masonry Units): Provide the following paint systems over interior concrete and brick masonry surfaces:

1. Acrylic-Enamel Finish: 2 finish coats over a primer.

a. Primer: Alkali-resistant, acrylic-latex, interior low VOC, low odor, primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.0 mil (0.025 mm).

b. First and Second Coats: Low-luster (eggshell or satin), low VOC, low odor, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils (0.071 mm).

B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:

1. Acrylic-Enamel Finish: 2 finish coats over a primer.

a. Primer: Latex-based, low VOC, low odor,interior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).

b. First and Second Coats: Low-luster (eggshell or satin), low VOC, low odor, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils (0.071 mm).

END OF SECTION

SECTION 23 05 17 - SLEEVES AND SLEEVE SEALS FOR PLUMBING AND HVAC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sleeves.
   2. Sleeve-seal systems.
   3. Grout.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Galvanized-Steel Wall Pipes: ASTM A53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.

C. Galvanized-Steel-Pipe Sleeves: ASTM A53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
   1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
   2. Pressure Plates: Plastic.
   3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.3 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

B. Characteristics: Nonshrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
   1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
   1. Cut sleeves to length for mounting flush with both surfaces.
      a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
   2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.
   1. Cut sleeves to length for mounting flush with both surfaces.
   2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
   3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 07 92 00 - Joint Sealants.

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 07 84 00 - Firestopping.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.

B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.3 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. Use sleeves and sleeve seals for the following piping-penetration applications:
   1. Exterior Concrete Walls above Grade:
      a. Piping Smaller than NPS 6: Galvanized-steel-pipe sleeves.
   2. Exterior Concrete Walls below Grade:
      a. Piping Smaller than NPS 6: Galvanized-steel-pipe sleeves with sleeve-seal system.
         1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
   3. Concrete Slabs-on-Grade:
      a. Piping Smaller than NPS 6: Galvanized-steel-pipe sleeves with sleeve-seal system.
         1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
   4. Concrete Slabs above Grade:
      a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
   5. Interior Partitions:
      a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.

END OF SECTION

SECTION 23 05 18 -ESCUTCHEONS FOR HVAC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Escutcheons.
   2. Floor plates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.

C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.

2.2 FLOOR PLATES

A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.

B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
   1. Escutcheons for New Piping:
      a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
      b. Chrome-Plated Piping: One-piece, cast-brass type with polished, chrome-plated finish.
      c. Insulated Piping: One-piece, stamped-steel type.

d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type.
h. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
i. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type.
j. Bare Piping in Equipment Rooms: One-piece, cast-brass type with polished, chrome-plated finish.
k. Bare Piping in Equipment Rooms: One-piece, stamped-steel type.

C. Install floor plates for piping penetrations of equipment-room floors.

D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
1. New Piping: One-piece, floor-plate type.

3.2 FIELD QUALITY CONTROL

A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION

SECTION 23 05 29 - HANGERS AND SUPPORTS FOR HVAC PIPING IAND EQUPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal pipe hangers and supports.
   2. Trapeze pipe hangers.
   3. Thermal-hanger shield inserts.
   4. Fastener systems.
   5. Equipment supports.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
   1. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
   2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
   3. Design seismic-restraint hangers and supports for piping and equipment.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
   1. Trapeze pipe hangers.
   2. Equipment supports.

C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.5 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:
   1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
   2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
   3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
   4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
   5. Hanger Rods: Continuous-thread rod, nuts, and washer made of hot-dipped galvanized steel.

B. Stainless-Steel Pipe Hangers and Supports:
   1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
   2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
   3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:
   1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
   2. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 THERMAL-HANGER SHIELD INSERTS

A. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig minimum compressive strength and vapor barrier.

B. Insulation-Insert Material for Hot Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength.

C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.4 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, stainless- steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.5 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.6 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
   1. Properties: Nonstaining, noncorrosive, and nongaseous.
   2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
   1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
   2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

D. Fastener System Installation:
   1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
   2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

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

F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

H. Install lateral bracing with pipe hangers and supports to prevent swaying.

I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

L. Insulated Piping:
   1. Attach clamps and spacers to piping.
      a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
      c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
   2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
   3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
   4. Shield Dimensions for Pipe: Not less than the following:
      a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
      b. NPS 4: 12 inches long and 0.06 inch thick.
      c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
      d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
      e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
   5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
   6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 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 a minimum dry film thickness of 2.0 mils.

B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 09 91 00 - Painting.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports and metal trapeze pipe hangers and attachments for general service applications.

F. Use stainless-steel pipe hangers and stainless-steel attachments for hostile environment applications such as all outdoor or naturally-ventilated spaces.

G. Use copper-plated pipe hangers and copper attachments for copper piping and tubing. Use stainless steel hangers and attachments such as all outdoor or naturally-ventilated spaces.

H. Use padded hangers for piping that is subject to scratching.

I. Use thermal-hanger shield inserts for insulated piping and tubing.

J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
   2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
   3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
   4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
   5. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
   6. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
   7. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
   8. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
   9. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.

L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
   2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   3. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
   4. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
   5. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
   6. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
   7. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
   8. C-Clamps (MSS Type 23): For structural shapes.
   9. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
      a. Light (MSS Type 31): 750 lb.
      b. Medium (MSS Type 32): 1500 lb.
      c. Heavy (MSS Type 33): 3000 lb.
   10. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
   11. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
   2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
   3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
   2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
   3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.

O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

P. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION

SECTION 23 05 48 - VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Elastomeric hangers.
2. Spring hangers.
3. Restraint cables.
4. Seismic-restraint accessories.
5. Mechanical anchor bolts.

B. ACTION SUBMITTALS

C. Product Data: For each type of product.

D. Delegated-Design Submittal: For each vibration isolation and seismic-restraint device.

1. Include design calculations and details for selecting vibration isolators and seismic restraints complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.2 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Field quality-control reports.

1.3 QUALITY ASSURANCE

A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are unavailable, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic-Restraint Loading:

1. Site Class as Defined in the IBC: TBD.
2. Assigned Seismic Occupancy Category as Defined in the IBC: III.
   a. Component Importance Factor: 1.5.
   b. Component Response Modification Factor: Refer to ASCE 7, Table 13.6-1.
   c. Component Amplification Factor: Refer to ASCE 7, Table 13.6-1.
3. Design Spectral Response Acceleration at Short Periods (0.2 Second): TBD.
4. Design Spectral Response Acceleration at 1.0-Second Period: TBD.
5. Seismic Design Category: TBD.

B. Static Deflection: Unless noted otherwise, use a 2" static deflection for spring isolators.

C. For outdoor or naturally ventilated applications, isolator material shall be one of the following:

1. Stainless steel
2. Corrosion coating for specific use in coastal or marine environments.
3. Minimum two (2) coats of epoxy paint.

2.2 ELASTOMERIC HANGERS

A. Elastomeric Mount in a Steel Frame with Upper and Lower Steel Hanger Rods:

1. Frame: Steel, fabricated with a connection for an upper threaded hanger rod and an opening on the underside to allow for a maximum of 30 degrees of angular lower hanger-rod misalignment without binding or reducing isolation efficiency.
2. Dampening Element: Molded, oil-resistant rubber, neoprene, or other elastomeric material with a projecting bushing for the underside opening preventing steel to steel contact.

2.3 SPRING HANGERS

A. Combination Coil-Spring and Elastomeric-Insert Hanger with Spring and Insert in Compression:

1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
7. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
8. Self-centering hanger-rod cap to ensure concentricity between hanger rod and support spring coil.

2.4 RESTRAINT CABLES

A. Restraint Cables: ASTM A 603 galvanized or ASTM A 492 stainless-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement. Provide stainless steel cables for applications in spaces that are naturally ventilated or subject to the outdoors.

2.5 SEISMIC-RESTRAINT ACCESSORIES

A. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.

B. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchor bolts and studs.

C. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices used.

D. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

E. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 EXECUTION

3.1 APPLICATIONS

A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.

B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

3.2 VIBRATION CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 03 30 00 - Cast-In-Place Concrete.

B. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.

C. Equipment Restraints:

1. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
2. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.

D. Piping Restraints:

1. Comply with requirements in MSS SP-127.
2. Space lateral supports a maximum of 40 feet (12 m) o.c., and longitudinal supports a maximum of 80 feet (24 m) o.c.
3. Brace a change of direction longer than 12 feet (3.7 m).

E. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.

F. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.

G. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

H. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

I. Drilled-in Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre-stressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Set anchors to manufacturer's recommended torque, using a torque wrench.
5. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.
6. Measure isolator restraint clearance.
7. Measure isolator deflection.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

END OF SECTION

SECTION 22 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Equipment labels.
   2. Warning signs and labels.
   3. Pipe labels.
   4. Duct labels.

1.2 ACTION SUBMITTAL

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:
   1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
   2. Letter Color: White.
   3. Background Color: Black.
   4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
   5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   7. Fasteners: Stainless-steel rivets or self-tapping screws.
   8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's Drawing designation or unique equipment number, plus the Specification Section number and title where equipment is specified.

C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: Yellow.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.

2.4 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: White.

C. Background Color: Black.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Piping Color-Coding: Painting of piping is specified in Section 09 91 00 - Painting.

B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
   1. Near each valve and control device.
   2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
   4. At access doors, manholes, and similar access points that permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
   7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

C. Pipe Label Color Schedule:
   1. Chilled-Water Piping:
      a. Background Color: Green.
      b. Letter Color: White.

3.4 DUCT LABEL INSTALLATION

A. Install self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:
   1. Blue: For cold-air supply ducts.
   2. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
   3. ASME A13.1 Colors and Designs: For hazardous material exhaust.

B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

END OF SECTION

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Balancing Air Systems:
      a. Variable-air-volume systems.
   2. Balancing Hydronic Piping Systems:
      a. Constant-flow hydronic systems.
      b. Variable-flow hydronic systems.

1.2 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An independent entity meeting qualifications to perform TAB work.

F. TDH: Total dynamic head.

1.3 ACTION SUBMITTALS

A. TAB Report: Documentation indicating that Work complies with ASHRAE/IES 90.1, Section 6.7.2.3 - "System Balancing."

1.4 INFORMATIONAL SUBMITTALS

A. Strategies and Procedures Plan: Within 60 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

B. Certified TAB reports.

1.5 QUALITY ASSURANCE

A. TAB Specialists Qualifications: Certified by AABC.
   1. TAB Field Supervisor: Employee of the TAB specialist and certified by AABC.
   2. TAB Technician: Employee of the TAB specialist and certified by AABC as a TAB technician.

B. TAB Specialists Qualifications: Certified by NEBB or TABB.
   1. TAB Field Supervisor: Employee of the TAB specialist and certified by NEBB or TABB.
   2. TAB Technician: Employee of the TAB specialist and certified by NEBB or TABB as a TAB technician.

C. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."

D. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6.7.2.3 - "System Balancing."

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.

B. Examine installed systems for balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are applicable for intended purpose and are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.
   1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
   2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, filters are clean, and equipment with functioning controls is ready for operation.

J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.

K. Examine strainers. Verify that startup screens have been replaced by permanent screens with indicated perforations.

L. Examine control valves for proper installation for their intended function of throttling, diverting, or mixing fluid flows.

M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

N. Examine system pumps to ensure absence of entrained air in the suction piping.

O. Examine operating safety interlocks and controls on HVAC equipment.

P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures for balancing the systems.

B. Perform system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. Include, at a minimum, the following:
   1. Airside:
      a. Duct systems are complete with terminals installed.
      b. Volume, smoke, and fire dampers are open and functional.

c. Clean filters are installed.
d. Fans are operating, free of vibration, and rotating in correct direction.
e. Variable-frequency controllers' startup is complete and safeties are verified.
f. Automatic temperature-control systems are operational.
g. Ceilings are installed.
h. Windows and doors are installed.
i. Suitable access to balancing devices and equipment is provided.

2. Hydronics:
a. Verify leakage and pressure tests on water distribution systems have been satisfactorily completed.
b. Piping is complete with terminals installed.
c. Water treatment is complete.
d. Systems are flushed, filled, and air purged.
e. Strainers are pulled and cleaned.
f. Control valves are functioning per the sequence of operation.
g. Shutoff and balance valves have been verified to be 100 percent open.
h. Pumps are started and proper rotation is verified.
i. Pump gage connections are installed directly at pump inlet and outlet flanges or in discharge and suction pipe prior to valves or strainers.
j. Variable-frequency controllers' startup is complete and safeties are verified.
k. Suitable access to balancing devices and equipment is provided.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in ASHRAE 111 and in this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. After testing and balancing, install test ports and duct access doors that comply with requirements.
3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish.

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Cross-check the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. For variable-air-volume systems, develop a plan to simulate diversity.

D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and functioning.

K. Check for proper sealing of air-handling-unit components.

L. Verify that air duct system is sealed.

3.5 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

A. Adjust the variable-air-volume systems as follows:
   1. Verify that the system static pressure sensor is located two-thirds of the distance down the duct from the fan discharge.
   2. Verify that the system is under static pressure control.
   3. Select the terminal unit that is most critical to the supply-fan airflow. Measure inlet static pressure, and adjust system static pressure control set point so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
   4. Calibrate and balance each terminal unit for maximum and minimum design airflow as follows:
      a. Adjust controls so that terminal is calling for maximum airflow. Some controllers require starting with minimum airflow. Verify calibration procedure for specific project.

b. Measure airflow and adjust calibration factor as required for design maximum airflow. Record calibration factor.

c. When maximum airflow is correct, balance the air outlets downstream from terminal units.

d. Adjust controls so that terminal is calling for minimum airflow.

e. Measure airflow and adjust calibration factor as required for design minimum airflow. Record calibration factor. If no minimum calibration is available, note any deviation from design airflow.

f. When in full cooling or full heating, ensure that there is no mixing of hot-deck and cold-deck airstreams unless so designed.

g. On constant volume terminals, in critical areas where room pressure is to be maintained, verify that the airflow remains constant over the full range of full cooling to full heating. Note any deviation from design airflow or room pressure.

5. After terminals have been calibrated and balanced, test and adjust system for total airflow. Adjust fans to deliver total design airflows within the maximum allowable fan speed listed by fan manufacturer.

   a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.

   b. Set terminals for maximum airflow. If system design includes diversity, adjust terminals for maximum and minimum airflow so that connected total matches fan selection and simulates actual load in the building.

   c. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.

   d. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.

   e. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.

6. Measure fan static pressures as follows:

   a. Measure static pressure directly at the fan outlet or through the flexible connection.

   b. Measure static pressure directly at the fan inlet or through the flexible connection.

   c. Measure static pressure across each component that makes up the air-handling system.

   d. Report any artificial loading of filters at the time static pressures are measured.

7. Set final return and outside airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.

   a. Balance the return-air ducts and inlets the same as described for constant-volume air systems.

   b. Verify that terminal units are meeting design airflow under system maximum flow.

8. Re-measure the inlet static pressure at the most critical terminal unit and adjust the system static pressure set point to the most energy-efficient set point to maintain the optimum system static pressure. Record set point and give to controls contractor.
9. Verify final system conditions as follows:
    a. Re-measure and confirm that minimum outdoor, return, and relief airflows are within design. Readjust to match design if necessary.
    b. Re-measure and confirm that total airflow is within design.
    c. Re-measure final fan operating data, rpms, volts, amps, and static profile.
    d. Mark final settings.
    e. Test system in economizer mode. Verify proper operation and adjust if necessary. Measure and record all operating data.
    f. Verify tracking between supply and return fans.

3.6 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

A. Prepare test reports for pumps, coils, and heat exchangers. Obtain approved submittals and manufacturer-recommended testing procedures. Crosscheck the summation of required coil and heat exchanger flow rates with pump design flow rate.

B. Prepare schematic diagrams of systems' "as-built" piping layouts.

C. In addition to requirements in "Preparation" Article, prepare hydronic systems for testing and balancing as follows:
    1. Check liquid level in expansion tank.
    2. Check highest vent for adequate pressure.
    3. Check flow-control valves for proper position.
    4. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
    5. Verify that motor starters are equipped with properly sized thermal protection.
    6. Check that air has been purged from the system.

3.7 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

A. Adjust pumps to deliver total design GPM.
    1. Measure total water flow.
        a. Position valves for full flow through coils.
        b. Measure flow by main flow meter, if installed.
        c. If main flow meter is not installed, determine flow by pump TDH or exchanger pressure drop.
    2. Measure pump TDH as follows:
        a. Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.

b. Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
c. Convert pressure to head and correct for differences in gage heights.
d. Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow, and verify that the pump has the intended impeller size.
e. With valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.

3. Monitor motor performance during procedures and do not operate motor in an overloaded condition.

B. Adjust flow-measuring devices installed in mains and branches to design water flows.
1. Measure flow in main and branch pipes.
2. Adjust main and branch balance valves for design flow.
3. Re-measure each main and branch after all have been adjusted.

C. Adjust flow-measuring devices installed at terminals for each space to design water flows.
1. Measure flow at terminals.
2. Adjust each terminal to design flow.
3. Re-measure each terminal after it is adjusted.
4. Position control valves to bypass the coil, and adjust the bypass valve to maintain design flow.
5. Perform temperature tests after flows have been balanced.

D. For systems with pressure-independent valves at terminals:
1. Measure differential pressure and verify that it is within manufacturer's specified range.
2. Perform temperature tests after flows have been verified.

E. For systems without pressure-independent valves or flow-measuring devices at terminals:
1. Measure and balance coils by either coil pressure drop or temperature method.
2. If balanced by coil pressure drop, perform temperature tests after flows have been verified.

F. Verify final system conditions as follows:
1. Re-measure and confirm that total water flow is within design.
2. Re-measure final pumps' operating data, TDH, volts, amps, and static profile.
3. Mark final settings.

G. Verify that memory stops have been set.

3.8 PROCEDURES FOR VARIABLE-FLOW HYDRONIC SYSTEMS

A. Balance systems with automatic two- and three-way control valves by setting systems at maximum flow through heat-exchange terminals, and proceed as specified above for hydronic systems.

B. Adjust the variable-flow hydronic system as follows:
   1. Verify that the differential-pressure sensor is located as indicated.
   2. Determine whether there is diversity in the system.

C. For systems with no diversity:
   1. Adjust pumps to deliver total design GPM.
      a. Measure total water flow.
         1) Position valves for full flow through coils.
         2) Measure flow by main flow meter, if installed.
         3) If main flow meter is not installed, determine flow by pump TDH or exchanger pressure drop.
      b. Measure pump TDH as follows:
         1) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
         2) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
         3) Convert pressure to head and correct for differences in gage heights.
         4) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
         5) With valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.
      c. Monitor motor performance during procedures and do not operate motor in an overloaded condition.
   2. Adjust flow-measuring devices installed in mains and branches to design water flows.
      a. Measure flow in main and branch pipes.
      b. Adjust main and branch balance valves for design flow.
      c. Re-measure each main and branch after all have been adjusted.
   3. Adjust flow-measuring devices installed at terminals for each space to design water flows.
      a. Measure flow at terminals.
      b. Adjust each terminal to design flow.
      c. Re-measure each terminal after it is adjusted.
      d. Position control valves to bypass the coil and adjust the bypass valve to maintain design flow.

e. Perform temperature tests after flows have been balanced.

4. For systems with pressure-independent valves at terminals:
   a. Measure differential pressure and verify that it is within manufacturer's specified range.
   b. Perform temperature tests after flows have been verified.
5. For systems without pressure-independent valves or flow-measuring devices at terminals:
   a. Measure and balance coils by either coil pressure drop or temperature method.
   b. If balanced by coil pressure drop, perform temperature tests after flows have been verified.
6. Prior to verifying final system conditions, determine the system differential-pressure set point.
7. If the pump discharge valve was used to set total system flow with variable-frequency controller at 60 Hz, at completion open discharge valve 100 percent and allow variable-frequency controller to control system differential-pressure set point. Record pump data under both conditions.
8. Mark final settings and verify that all memory stops have been set.
9. Verify final system conditions as follows:
   a. Re-measure and confirm that total water flow is within design.
   b. Re-measure final pumps' operating data, TDH, volts, amps, and static profile.
   c. Mark final settings.
10. Verify that memory stops have been set.

D. For systems with diversity:
   1. Determine diversity factor.
   2. Simulate system diversity by closing required number of control valves, as approved by the design engineer.
   3. Adjust pumps to deliver total design GPM.
      a. Measure total water flow.
         1) Position valves for full flow through coils.
         2) Measure flow by main flow meter, if installed.
         3) If main flow meter is not installed, determine flow by pump TDH or exchanger pressure drop.
      b. Measure pump TDH as follows:
         1) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
         2) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
         3) Convert pressure to head and correct for differences in gage heights.
         4) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.

5) With valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.

c. Monitor motor performance during procedures and do not operate motor in an overloaded condition.

4. Adjust flow-measuring devices installed in mains and branches to design water flows.
   a. Measure flow in main and branch pipes.
   b. Adjust main and branch balance valves for design flow.
   c. Re-measure each main and branch after all have been adjusted.
5. Adjust flow-measuring devices installed at terminals for each space to design water flows.
   a. Measure flow at terminals.
   b. Adjust each terminal to design flow.
   c. Re-measure each terminal after it is adjusted.
   d. Position control valves to bypass the coil, and adjust the bypass valve to maintain design flow.
   e. Perform temperature tests after flows have been balanced.
6. For systems with pressure-independent valves at terminals:
   a. Measure differential pressure, and verify that it is within manufacturer's specified range.
   b. Perform temperature tests after flows have been verified.
7. For systems without pressure-independent valves or flow-measuring devices at terminals:
   a. Measure and balance coils by either coil pressure drop or temperature method.
   b. If balanced by coil pressure drop, perform temperature tests after flows have been verified.
8. Open control valves that were shut. Close a sufficient number of control valves that were previously open to maintain diversity, and balance terminals that were just opened.
9. Prior to verifying final system conditions, determine system differential-pressure set point.
10. If the pump discharge valve was used to set total system flow with variable-frequency controller at 60 Hz, at completion open discharge valve 100 percent and allow variable-frequency controller to control system differential-pressure set point. Record pump data under both conditions.
11. Mark final settings and verify that memory stops have been set.
12. Verify final system conditions as follows:
    a. Re-measure and confirm that total water flow is within design.
    b. Re-measure final pumps' operating data, TDH, volts, amps, and static profile.
    c. Mark final settings.
13. Verify that memory stops have been set.

3.9 TOLERANCES

A. Set HVAC system's airflow rates and water flow rates within the following tolerances:
   1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
   2. Air Outlets and Inlets: Plus or minus 10 percent.
   3. Cooling-Water Flow Rate: Plus or minus 10 percent.

B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

3.10 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
   1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
   2. Include a list of instruments used for procedures, along with proof of calibration.
   3. Certify validity and accuracy of field data.

B. Final Report Contents: In addition to certified field-report data, include the following:
   1. Pump curves.
   2. Fan curves.
   3. Manufacturers' test data.
   4. Field test reports prepared by system and equipment installers.
   5. Other information relative to equipment performance; do not include Shop Drawings and Product Data.

C. General Report Data: In addition to form titles and entries, include the following data:
   1. Title page.
   2. Name and address of the TAB specialist.
   3. Project name.
   4. Project location.
   5. Architect's name and address.
   6. Engineer's name and address.
   7. Contractor's name and address.
   8. Report date.
   9. Signature of TAB supervisor who certifies the report.
   10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
   11. Summary of contents including the following:
      a. Indicated versus final performance.

b. Notable characteristics of systems.
c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:
    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Water and steam flow rates.
3. Duct, outlet, and inlet sizes.
4. Pipe and valve sizes and locations.
5. Terminal units.
6. Balancing stations.
7. Position of balancing devices.

E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:
1. Unit Data:
    a. Unit identification.
    b. Location.
    c. Make and type.
    d. Model number and unit size.
    e. Manufacturer's serial number.
    f. Unit arrangement and class.
    g. Discharge arrangement.
    h. Sheave make, size in inches, and bore.
    i. Center-to-center dimensions of sheave and amount of adjustments in inches.
    j. Number, make, and size of belts.
    k. Number, type, and size of filters.

2. Motor Data:
    a. Motor make, and frame type and size.
    b. Horsepower and rpm.
    c. Volts, phase, and hertz.
    d. Full-load amperage and service factor.
    e. Sheave make, size in inches, and bore.
    f. Center-to-center dimensions of sheave and amount of adjustments in inches.
3. Test Data (Indicated and Actual Values):
    a. Total airflow rate in CFM.
    b. Total system static pressure in inches wg.
    c. Fan rpm.
    d. Discharge static pressure in inches wg.
    e. Filter static-pressure differential in inches wg.
    f. Preheat-coil static-pressure differential in inches wg.
    g. Cooling-coil static-pressure differential in inches wg.
    h. Heating-coil static-pressure differential in inches wg.
    i. Outdoor airflow in CFM.
    j. Return airflow in CFM.
    k. Outdoor-air damper position.
    l. Return-air damper position.
    m. Vortex damper position.

F. Apparatus-Coil Test Reports:
1. Coil Data:
    a. System identification.
    b. Location.
    c. Coil type.
    d. Number of rows.
    e. Fin spacing in fins per inch o.c.
    f. Make and model number.
    g. Face area in sq. ft.
    h. Tube size in NPS.
    i. Tube and fin materials.
    j. Circuiting arrangement.
2. Test Data (Indicated and Actual Values):
    a. Airflow rate in CFM.
    b. Average face velocity in FPM
    c. Air pressure drop in inches wg.
    d. Outdoor-air, wet- and dry-bulb temperatures in deg F.

e. Return-air, wet- and dry-bulb temperatures in deg F.
f. Entering-air, wet- and dry-bulb temperatures in deg F.
g. Leaving-air, wet- and dry-bulb temperatures in deg F.
h. Water flow rate in GPM.
i. Water pressure differential in feet of head or psig.
j. Entering-water temperature in deg F.
k. Leaving-water temperature in deg F.
l. Refrigerant expansion valve and refrigerant types.
m. Refrigerant suction pressure in psig.
n. Refrigerant suction temperature in deg F.
o. Inlet steam pressure in psig.

G. Gas- and Oil-Fired Heat Apparatus Test Reports: In addition to manufacturer's factory startup equipment reports, include the following:
1. Unit Data:
a. System identification.
b. Location.
c. Make and type.
d. Model number and unit size.
e. Manufacturer's serial number.
f. Fuel type in input data.
g. Output capacity in Btu/h.
h. Ignition type.
i. Burner-control types.
j. Motor horsepower and rpm.
k. Motor volts, phase, and hertz.
l. Motor full-load amperage and service factor.
m. Sheave make, size in inches, and bore.
n. Center-to-center dimensions of sheave and amount of adjustments in inches.
2. Test Data (Indicated and Actual Values):
a. Total airflow rate in CFM.
b. Entering-air temperature in deg F.
c. Leaving-air temperature in deg F.
d. Air temperature differential in deg F.
e. Entering-air static pressure in inches wg.
f. Leaving-air static pressure in inches wg.
g. Air static-pressure differential in inches wg.
h. Low-fire fuel input in Btu/h.
i. High-fire fuel input in Btu/h.

j. Manifold pressure in psig.
k. High-temperature-limit setting in deg F.
l. Operating set point in Btu/h.
m. Motor voltage at each connection.
n. Motor amperage for each phase.
o. Heating value of fuel in Btu/h.

H. Electric-Coil Test Reports: For electric furnaces, duct coils, and electric coils installed in central-station air-handling units, include the following:
1. Unit Data:
a. System identification.
b. Location.
c. Coil identification.
d. Capacity in Btu/h.
e. Number of stages.
f. Connected volts, phase, and hertz.
g. Rated amperage.
h. Airflow rate in CFM.
i. Face area in sq. ft.
j. Minimum face velocity in fpm.
2. Test Data (Indicated and Actual Values):
a. Heat output in Btu/h.
b. Airflow rate in CFM.
c. Air velocity in FPM.
d. Entering-air temperature in deg F.
e. Leaving-air temperature in deg F.
f. Voltage at each connection.
g. Amperage for each phase.

I. Fan Test Reports: For supply, return, and exhaust fans, include the following:
1. Fan Data:
a. System identification.
b. Location.
c. Make and type.
d. Model number and size.
e. Manufacturer's serial number.
f. Arrangement and class.
g. Sheave make, size in inches, and bore.
h. Center-to-center dimensions of sheave and amount of adjustments in inches.

2. Motor Data:
    a. Motor make, and frame type and size.
    b. Horsepower and rpm.
    c. Volts, phase, and hertz.
    d. Full-load amperage and service factor.
    e. Sheave make, size in inches, and bore.
    f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
    g. Number, make, and size of belts.
3. Test Data (Indicated and Actual Values):
    a. Total airflow rate in CFM.
    b. Total system static pressure in inches wg.
    c. Fan rpm.
    d. Discharge static pressure in inches wg.
    e. Suction static pressure in inches wg.

J. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:
1. Report Data:
    a. System and air-handling-unit number.
    b. Location and zone.
    c. Traverse air temperature in deg F .
    d. Duct static pressure in inches wg.
    e. Duct size in inches.
    f. Duct area in sq. ft.
    g. Indicated airflow rate in CFM.
    h. Indicated velocity in FPM.
    i. Actual airflow rate in CFM.
    j. Actual average velocity in FPM.
    k. Barometric pressure in psig.

K. Air-Terminal-Device Reports:
1. Unit Data:
    a. System and air-handling unit identification.
    b. Location and zone.
    c. Apparatus used for test.
    d. Area served.
    e. Make.
    f. Number from system diagram.
    g. Type and model number.
    h. Size.

i. Effective area in sq. ft.

2. Test Data (Indicated and Actual Values):
   a. Airflow rate in CFM.
   b. Air velocity in FPM.
   c. Preliminary airflow rate as needed in CFM.
   d. Preliminary velocity as needed in FPM.
   e. Final airflow rate in CFM.
   f. Final velocity in FPM.
   g. Space temperature in deg F.

L. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:
   1. Unit Data:
      a. System and air-handling-unit identification.
      b. Location and zone.
      c. Room or riser served.
      d. Coil make and size.
      e. Flowmeter type.
   2. Test Data (Indicated and Actual Values):
      a. Airflow rate in CFM.
      b. Entering-water temperature in deg F.
      c. Leaving-water temperature in deg F.
      d. Water pressure drop in feet of head or psig.
      e. Entering-air temperature in deg F.
      f. Leaving-air temperature in deg F.

M. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:
   1. Unit Data:
      a. Unit identification.
      b. Location.
      c. Service.
      d. Make and size.
      e. Model number and serial number.
      f. Water flow rate in GPM.
      g. Water pressure differential in feet of head or psig.
      h. Required net positive suction head in feet of head or psig.
      i. Pump rpm.
      j. Impeller diameter in inches.
      k. Motor make and frame size.

l. Motor horsepower and rpm.
m. Voltage at each connection.
n. Amperage for each phase.
o. Full-load amperage and service factor.
p. Seal type.

2. Test Data (Indicated and Actual Values):
a. Static head in feet of head or psig.
b. Pump shutoff pressure in feet of head or psig.
c. Actual impeller size in inches.
d. Full-open flow rate in GPM.
e. Full-open pressure in feet of head or psig.
f. Final discharge pressure in feet of head or psig.
g. Final suction pressure in feet of head or psig.
h. Final total pressure in feet of head or psig.
i. Final water flow rate in GPM.
j. Voltage at each connection.
k. Amperage for each phase.

N. Instrument Calibration Reports:
1. Report Data:
a. Instrument type and make.
b. Serial number.
c. Application.
d. Dates of use.
e. Dates of calibration.

3.11 VERIFICATION OF TAB REPORT

A. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Construction Manager.

B. Architect shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.

C. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."

D. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

E. If TAB work fails, proceed as follows:
   1. TAB specialists shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
   2. If the second final inspection also fails, Owner may contract the services of another TAB specialist to complete TAB work according to the Contract Documents and deduct the cost of the services from the original TAB specialist's final payment.
   3. If the second verification also fails, design professional may contact AABC Headquarters regarding the AABC National Performance Guaranty.

F. Prepare test and inspection reports.

3.12 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION

SECTION 23 07 13 - DUCT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes insulating the following duct services:
   1. Indoor, concealed supply and outdoor air.
   2. Indoor, concealed return located in unconditioned space.

B. Related Sections:
   1. Section 23 07 19 - HVAC Piping Insulation.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

G. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.2 FIRE-RATED INSULATION SYSTEMS

A. Fire-Rated Blanket: High-temperature, flexible, blanket insulation with FSK jacket that is tested and certified to provide a 2-hour fire rating by an NRTL acceptable to authorities having jurisdiction.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

2.4 MASTICS

A. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.
   1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
   2. Service Temperature Range: Minus 20 to plus 180 deg F.
   3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
   4. Color: White.

2.5 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:
   1. Materials shall be compatible with insulation materials, jackets, and substrates.
   2. Fire- and water-resistant, flexible, elastomeric sealant.
   3. Service Temperature Range: Minus 40 to plus 250 deg F.
   4. Color: Aluminum.

B. ASJ Flashing Sealants, and Vinyl and PVC Jacket Flashing Sealants:
   1. Materials shall be compatible with insulation materials, jackets, and substrates.
   2. Fire- and water-resistant, flexible, elastomeric sealant.
   3. Service Temperature Range: Minus 40 to plus 250 deg F.
   4. Color: White.

2.6 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
   1. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.7 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in., in a Leno weave, for ducts.

2.8 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.
   1. Adhesive: As recommended by jacket material manufacturer.
   2. Color: White.

C. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
   1. Factory cut and rolled to size.
   2. Finish and thickness are indicated in field-applied jacket schedules.
   3. Moisture Barrier for Indoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
   4. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.

D. Self-Adhesive Outdoor Jacket: 60-mil-thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a cross laminated polyethylene film covered with stucco-embossed aluminum-foil facing.

2.9 TAPES

A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
   1. Width: 3 inches.
   2. Thickness: 6.5 mils.
   3. Adhesion: 90 ounces force/inch in width.
   4. Elongation: 2 percent.
   5. Tensile Strength: 40 lbf/inch in width.
   6. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

B. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
   1. Width: 2 inches.
   2. Thickness: 3.7 mils.
   3. Adhesion: 100 ounces force/inch in width.
   4. Elongation: 5 percent.
   5. Tensile Strength: 34 lbf/inch in width.

2.10 SECUREMENTS

A. Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal or closed seal.

B. Insulation Pins and Hangers:
   1. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
      a. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
      b. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.
      c. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
   2. Nonmetal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate fastened to projecting spindle that is capable of holding insulation, of thickness

indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

a. Baseplate: Perforated, nylon sheet, 0.030 inch thick by 1-1/2 inches in diameter.

b. Spindle: Nylon, 0.106-inch-diameter shank, length to suit depth of insulation indicated, up to 2-1/2 inches.

c. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.

3. Self-Sticking-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

a. Baseplate: Galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.

b. Spindle: Copper- or zinc-coated, low-carbon steel, fully annealed, 0.106-inch-diameter shank, length to suit depth of insulation indicated.

c. Adhesive-backed base with a peel-off protective cover.

4. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

a. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

5. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

C. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.

D. Wire: 0.080-inch nickel-copper alloy.

2.11 CORNER ANGLES

A. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Keep insulation materials dry during application and finishing.

G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

H. Install insulation with least number of joints practical.

I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
   3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

K. Install insulation with factory-applied jackets as follows:
   1. Draw jacket tight and smooth.
   2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
   3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
      a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.

L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.3 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations.

Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.

1. Comply with requirements in Section 07 84 00 - Firestopping for firestopping and fire-resistive joint sealers.

E. Insulation Installation at Floor Penetrations:

1. Duct: For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 07 84 00 - Firestopping.

3.4 INSTALLATION OF MINERAL-FIBER INSULATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Impale insulation over pins and attach speed washers.
    f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

B. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.
5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.5 FIELD-APPLIED JACKET INSTALLATION

A. Where FSK jackets are indicated, install as follows:
    1. Draw jacket material smooth and tight.
    2. Install lap or joint strips with same material as jacket.
    3. Secure jacket to insulation with manufacturer's recommended adhesive.
    4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.
    5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

B. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.6 FIRE-RATED INSULATION SYSTEM INSTALLATION

A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.

B. Insulate duct access panels and doors to achieve same fire rating as duct.

C. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Section 07 84 00 - Firestopping.

3.7 FINISHES

A. Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 09 91 00 - Painting.
   1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
      a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

C. Do not field paint aluminum or stainless-steel jackets.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:
   1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.9 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:
   1. Indoor, concealed supply and outdoor air.
   2. Indoor, concealed return located in unconditioned space.

B. Items Not Insulated:
   1. Fibrous-glass ducts.
   2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
   3. Factory-insulated flexible ducts.
   4. Factory-insulated plenums and casings.
   5. Flexible connectors.
   6. Vibration-control devices.
   7. Factory-insulated access panels and doors.

3.10 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Concealed, Supply-Air Duct and Plenum Insulation: Mineral-fiber blanket, 2.2 inches thick and 0.75-lb/cu. ft. nominal density to achieve overall R-6 insulation value when installed.

B. Concealed, Return-Air Duct and Plenum Insulation: Mineral-fiber blanket, 2.2 inches thick and 0.75-lb/cu. ft. nominal density to achieve overall R-6 insulation value when installed.

3.11 FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Ducts and Plenums, Concealed:
   1. Self-Adhesive Outdoor Jacket.

END OF SECTION

SECTION 23 07 19 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes insulating the following HVAC piping systems:
   1. Chilled-water piping, indoors.
   2. Condensate drain piping, indoors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
   2. Detail insulation application at pipe expansion joints for each type of insulation.
   3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
   4. Detail removable insulation at piping specialties.
   5. Detail application of field-applied jackets.
   6. Detail application at linkages of control devices.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Products shall not contain asbestos, lead, mercury, or mercury compounds.

B. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

C. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

D. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

E. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
   1. Block Insulation: ASTM C 552, Type I.
   2. Special-Shaped Insulation: ASTM C 552, Type III.
   3. Board Insulation: ASTM C 552, Type IV.
   4. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
   5. Preformed Pipe Insulation with Factory-Applied ASJ-SSL: Comply with ASTM C 552, Type II, Class 2.
   6. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

F. Polyolefin: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials and Type II, Grade 1 for sheet materials.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Cellular-Glass Adhesive: Two-component, thermosetting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F (minus 73 to plus 93 deg C).

C. Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

D. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

E. PVC Jacket Adhesive: Compatible with PVC jacket.

2.3 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
   1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
   2. Service Temperature Range: Minus 20 to plus 180 deg F.
   3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
   4. Color: White.

C. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
   1. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
   2. Service Temperature Range: Minus 20 to plus 180 deg F.
   3. Solids Content: 60 percent by volume and 66 percent by weight.
   4. Color: White.

2.4 SEALANTS

A. Joint Sealants:
   1. Materials shall be compatible with insulation materials, jackets, and substrates.
   2. Permanently flexible, elastomeric sealant.
   3. Service Temperature Range: Minus 100 to plus 300 deg F.
   4. Color: White or gray.

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
   1. Materials shall be compatible with insulation materials, jackets, and substrates.
   2. Fire- and water-resistant, flexible, elastomeric sealant.
   3. Service Temperature Range: Minus 40 to plus 250 deg F.
   4. Color: White.

2.5 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
   1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
   2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

2.6 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in., in a Leno weave, for pipe.

2.7 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
   1. Adhesive: As recommended by jacket material manufacturer.
   2. Color: White.
   3. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
      a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

C. Self-Adhesive Outdoor Jacket: 60-mil-thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a cross-laminated polyethylene film covered with stucco-embossed aluminum-foil facing.

2.8 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
   1. Width: 3 inches.
   2. Thickness: 11.5 mils.
   3. Adhesion: 90 ounces force/inch in width.
   4. Elongation: 2 percent.
   5. Tensile Strength: 40 lbf/inch in width.
   6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
   1. Width: 2 inches.
   2. Thickness: 6 mils.
   3. Adhesion: 64 ounces force/inch in width.
   4. Elongation: 500 percent.
   5. Tensile Strength: 18 lbf/inch in width.

2.9 SECUREMENTS

A. Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal or closed seal.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.

C. Wire: 0.062-inch soft-annealed, stainless steel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
   3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
   4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
   1. Draw jacket tight and smooth.
   2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
   3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
      a. For below-ambient services, apply vapor-barrier mastic over staples.
   4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
   5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:
   1. Vibration-control devices.
   2. Testing agency labels and stamps.

3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.3 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
   1. Seal penetrations with flashing sealant.
   2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
   3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
   4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
   1. Seal penetrations with flashing sealant.
   2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
   3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
   4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
   1. Comply with requirements in Section 07 84 00 - Firestopping for firestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:
   1. Pipe: Install insulation continuously through floor penetrations.
   2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 07 84 00 - Firestopping.

3.4 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
   1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
   2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
   3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
   4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
   5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.

6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.5 INSTALLATION OF POLYOLEFIN INSULATION

A. Insulation Installation on Straight Pipes and Tubes:
   1. Seal split-tube longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:
   1. Install pipe insulation to outer diameter of pipe flange.
   2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
   3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of polyolefin sheet insulation of same thickness as pipe insulation.
   4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:
   1. Install mitered sections of polyolefin pipe insulation.
   2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:
   1. Install cut sections of polyolefin pipe and sheet insulation to valve body.
   2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
   3. Install insulation to flanges as specified for flange insulation application.
   4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.6 FIELD-APPLIED JACKET INSTALLATION

A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications. Seal with manufacturer's recommended adhesive.
   1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

3.7 FINISHES

A. Pipe Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in and Section 09 91 00 - Painting.
   1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
      a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

C. Do not field paint aluminum or stainless-steel jackets.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:
   1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.9 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
   1. Drainage piping located in crawl spaces.
   2. Underground piping.
   3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.10 INDOOR PIPING INSULATION SCHEDULE

A. Chilled Water above 40 Deg F: Insulation shall be one of the following:
   1. Cellular Glass: 2 inches thick.

2. Polyolefin: 1 inch thick.

B. Condensate and Equipment Drain Water below 60 Deg F (16 Deg C):
1. Cellular Glass: 1-1/2 inches thick

3.11 Polyolefin: 1 inch thick.

3.12 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:

D. None.

E. Piping, Exposed:

PVC: 30 mils (0.8 mm) thick.

END OF SECTION

SECTION 23 09 00 - HVAC INSTRUMENTATION AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes control equipment for HVAC systems and components, including control components for terminal heating and cooling units not supplied with factory-wired controls.

1.2 ACTION SUBMITTALS

A. Product Data: For each control device indicated.

B. Shop Drawings:
   1. Schematic flow diagrams.
   2. Power, signal, and control wiring diagrams.
   3. Details of control panel faces.
   4. Damper schedule.
   5. Valve schedule.
   6. DDC System Hardware: Wiring diagrams, schematic floor plans, and schematic control diagrams.
   7. Control System Software: Schematic diagrams, written descriptions, and points list.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control test reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

B. Software and firmware operational documentation.

1.5 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

2.1 MANUFACTURERS

A. The existing control system is Delta system. All new work must be fully integrated into the Delta system. Room pressure sensors shall be incorporated into Delta system.

2.2 CONTROL SYSTEM

A. Products: Subject to compliance with requirements, all controls components and programming shall be provided by the following:
   1. Delta system.

B. Control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, accessories, and software connected to distributed controllers operating in multiuser, multitasking environment on token-passing network and programmed to control mechanical systems. An operator workstation permits interface with the network via dynamic color graphics with each mechanical system, building floor plan, and control device depicted by point-and-click graphics. All new graphics will be added to the existing Delta System.

2.3 DDC EQUIPMENT

A. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; local operator access and display panel; integral interface equipment; and backup power source.
   1. Units monitor or control each I/O point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator workstation.
   2. Stand-alone mode control functions operate regardless of network status. Functions include the following:
      a. Global communications.
      b. Discrete/digital, analog, and pulse I/O.
      c. Monitoring, controlling, or addressing data points.
      d. Software applications, scheduling, and alarm processing.
      e. Testing and developing control algorithms without disrupting field hardware and controlled environment.

B. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.
   1. Units monitor or control each I/O point, process information, and download from or upload to operator workstation or diagnostic terminal unit.

2. Stand-alone mode control functions operate regardless of network status. Functions include the following:
   a. Global communications.
   b. Discrete/digital, analog, and pulse I/O.
   c. Monitoring, controlling, or addressing data points.
3. Local operator interface provides for download from or upload to operator workstation.

C. I/O Interface: Hardwired inputs and outputs may tie into system through controllers. Protect points so that shorting will cause no damage to controllers.
1. Binary Inputs: Allow monitoring of on-off signals without external power.
2. Pulse Accumulation Inputs: Accept up to 10 pulses per second.
3. Analog Inputs: Allow monitoring of low-voltage (0- to 10-V dc), current (4 to 20 mA), or resistance signals.
4. Binary Outputs: Provide on-off or pulsed low-voltage signal, selectable for normally open or normally closed operation.
5. Analog Outputs: Provide modulating signal, either low voltage (0- to 10-V dc) or current (4 to 20 mA).
6. Tri-State Outputs: Provide two coordinated binary outputs for control of three-point, floating-type electronic actuators.
7. Universal I/Os: Provide software selectable binary or analog outputs.

D. Power Supplies: Transformers with Class 2 current-limiting type or overcurrent protection; limit connected loads to 80 percent of rated capacity. DC power supply shall match output current and voltage requirements and be full-wave rectifier type with the following:
1. Output ripple of 5.0 mV maximum peak to peak.
2. Combined 1 percent line and load regulation with 100-mic.sec. response time for 50 percent load changes.
3. Built-in overvoltage and overcurrent protection and be able to withstand 150 percent overload for at least 3 seconds without failure.

E. Power Line Filtering: Internal or external transient voltage and surge suppression for workstations or controllers with the following:
1. Minimum dielectric strength of 1000 V.
2. Maximum response time of 10 nanoseconds.
3. Minimum transverse-mode noise attenuation of 65 dB.
4. Minimum common-mode noise attenuation of 150 dB at 40 to 100 Hz.

2.4 UNITARY CONTROLLERS

A. Unitized, capable of stand-alone operation with sufficient memory to support its operating system, database, and programming requirements, and with sufficient I/O capacity for the application.
   1. Configuration: Local keypad and display; diagnostic LEDs for power, communication, and processor; wiring termination to terminal strip or card connected with ribbon cable; memory with bios; and 72-hour battery backup.
   2. Operating System: Manage I/O communication to allow distributed controllers to share real and virtual object information and allow central monitoring and alarms. Perform scheduling with real-time clock. Perform automatic system diagnostics; monitor system and report failures.
   3. Enclosure: Dustproof rated for operation at 32 to 120 deg F.

2.5 ANALOG CONTROLLERS

A. Step Controllers: 6- or 10-stage type, with heavy-duty switching rated to handle loads and operated by electric motor.

B. Electric, Outdoor-Reset Controllers: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range, adjustable set point, scale range minus 10 to plus 70 deg F, and single- or double-pole contacts.

C. Electronic Controllers: Wheatstone-bridge-amplifier type, in steel enclosure with provision for remote-resistance readjustment. Identify adjustments on controllers, including proportional band and authority.
   1. Single controllers can be integral with control motor if provided with accessible control readjustment potentiometer.

D. Fan-Speed Controllers: Solid-state model providing field-adjustable proportional control of motor speed from maximum to minimum of 55 percent and on-off action below minimum fan speed. Controller shall briefly apply full voltage, when motor is started, to rapidly bring motor up to minimum speed. Equip with filtered circuit to eliminate radio interference.

2.6 ELECTRONIC SENSORS

A. Description: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.

B. Thermistor Temperature Sensors and Transmitters:
   1. Accuracy: Plus or minus 0.36 deg F at calibration point.
   2. Wire: Twisted, shielded-pair cable.

3. Insertion Elements in Ducts: Single point, 8 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft..
4. Averaging Elements in Ducts: 36 inches long, flexible; use where prone to temperature stratification or where ducts are larger than 10 sq. ft..
5. Insertion Elements for Liquids: Brass or stainless-steel socket with minimum insertion length of 2-1/2 inches.
6. Room Sensor Cover Construction: Manufacturer's standard locking covers.
    a. Set-Point Adjustment: Exposed.
    b. Set-Point Indication: Exposed.
    c. Temperature display: Exposed.
    d. Orientation: Vertical or Horizontal.
7. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
8. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

C. RTDs and Transmitters:
1. Accuracy: Plus or minus 0.2 percent at calibration point.
2. Wire: Twisted, shielded-pair cable.
3. Insertion Elements in Ducts: Single point, 8 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft..
4. Averaging Elements in Ducts: 18 inches long, rigid; use where prone to temperature stratification or where ducts are larger than 9 sq. ft.; length as required.
5. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
6. Room Sensor Cover Construction: Manufacturer's standard locking covers.
    a. Set-Point Adjustment: Exposed.
    b. Set-Point Indication: Exposed.
    c. Temperature display: Exposed.
    d. Orientation: Vertical or Horizontal.
7. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
8. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

D. Humidity Sensors: Bulk polymer sensor element.
1. Accuracy: 2 percent full range with linear output.
2. Room Sensor Range: 20 to 80 percent relative humidity.
3. Room Sensor Cover Construction: Manufacturer's standard locking covers.
    a. Set-Point Adjustment: Exposed.
    b. Set-Point Indication: Exposed.
    c. Orientation: Vertical or Horizontal.

4. Duct Sensor: 20 to 80 percent relative humidity range with element guard and mounting plate.
5. Outside-Air Sensor: 20 to 80 percent relative humidity range with mounting enclosure, suitable for operation at outdoor temperatures of 32 to 120 deg F.
6. Duct and Sensors: With element guard and mounting plate, range of 0 to 100 percent relative humidity.

E. Pressure Transmitters/Transducers:
1. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.
   a. Accuracy: 2 percent of full scale with repeatability of 0.5 percent.
   b. Output: 4 to 20 mA.
   c. Building Static-Pressure Range: 0- to 0.25-inch wg.
   d. Duct Static-Pressure Range: 0- to 5-inch wg.
2. Water Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure; linear output 4 to 20 mA.
3. Water Differential-Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure and tested to 300-psig; linear output 4 to 20 mA.
4. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential.
5. Pressure Transmitters: Direct acting for gas or liquid service; range suitable for system; linear output 4 to 20 mA.

F. Room Sensor Cover Construction: Manufacturer's standard locking covers.
1. Set-Point Adjustment: Exposed.
2. Set-Point Indication: Exposed.
3. Orientation: Vertical or Horizontal.

2.7 STATUS SENSORS

A. Status Inputs for Fans: Differential-pressure switch with pilot-duty rating and with adjustable range of 0- to 5-inch wg.

B. Status Inputs for Pumps: Differential-pressure switch with pilot-duty rating and with adjustable pressure-differential range of 8 to 60 psig, piped across pump.

C. Status Inputs for Electric Motors: Comply with ISA 50.00.01, current-sensing fixed- or split-core transformers with self-powered transmitter, adjustable and suitable for 175 percent of rated motor current.

D. Voltage Transmitter (100- to 600-V ac): Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and 1 percent full-scale accuracy.

E. Power Monitor: 3-phase type with disconnect/shorting switch assembly, listed voltage and current transformers, with pulse kilowatt hour output and 4- to 20-mA kW output, with maximum 2 percent error at 1.0 power factor and 2.5 percent error at 0.5 power factor.

F. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.

G. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.

H. Water-Flow Switches: Bellows-actuated mercury or snap-acting type with pilot-duty rating, stainless-steel or bronze paddle, with appropriate range and differential adjustment, in NEMA 250, Type 1 enclosure.

2.8 ACTUATORS

A. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
   1. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
   2. Nonspring-Return Motors for Valves Larger Than NPS 2-1/2: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
   3. Spring-Return Motors for Valves Larger Than NPS 2-1/2: Size for running and breakaway torque of 150 in. x lbf.
   4. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
   5. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.

B. Electronic Actuators: Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque.
   1. Valves: Size for torque required for valve close off at maximum pump differential pressure.
   2. Dampers: Size for running torque calculated as follows:
      a. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sq. ft. of damper.
      b. Opposed-Blade Damper with Edge Seals: 5 inch-lb/sq. ft. of damper.
      c. Parallel-Blade Damper without Edge Seals: 4 inch-lb/sq. ft of damper.
      d. Opposed-Blade Damper without Edge Seals: 3 inch-lb/sq. ft. of damper.
      e. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm: Increase running torque by 1.5.

f. Dampers with 3- to 4-Inch wg of Pressure Drop or Face Velocities of 2500 to 3000 fpm: Increase running torque by 2.0.

3. Coupling: V-bolt and V-shaped, toothed cradle.
4. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
5. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on nonspring-return actuators.
6. Power Requirements (Two-Position Spring Return): 24-V ac.
7. Power Requirements (Modulating): Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
8. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal.
9. Temperature Rating: 40 to 104 deg F.
10. Temperature Rating (Smoke Dampers): Minus 22 to plus 250 deg F.
11. Run Time: 12 seconds open, 5 seconds closed.
12. Manufacturer: Belimo.

2.9 CONTROL VALVES

A. Control Valves: Factory fabricated, of type, body material, and pressure class based on maximum pressure and temperature rating of piping system, unless otherwise indicated.

B. Hydronic system globe valves shall have the following characteristics:
1. NPS 2 and Smaller: Class 125 bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with backseating capacity repackable under pressure.
2. NPS 2-1/2 and Larger: Class 125 iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.
3. Internal Construction: Replaceable plugs and stainless-steel or brass seats.
a. Single-Seated Valves: Cage trim provides seating and guiding surfaces for plug on top and bottom.
b. Double-Seated Valves: Balanced plug; cage trim provides seating and guiding surfaces for plugs on top and bottom.
4. Sizing: 3-psig maximum pressure drop at design flow rate or the following:
a. Two Position: Line size.
b. Two-Way Modulating: Either the value specified above or twice the load pressure drop, whichever is more.
5. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.
6. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of total system (pump) head for two-way valves and 100 percent of pressure differential across valve or 100 percent of total system (pump) head.

C. Butterfly Valves: 200-psig, 150-psig maximum pressure differential, ASTM A 126 cast-iron or ASTM A 536 ductile-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals.
   1. Body Style: Lug or Grooved.
   2. Disc Type: Aluminum bronze.
   3. Sizing: 1-psig maximum pressure drop at design flow rate.

D. Terminal Unit Control Valves: Bronze body, bronze trim, two or three ports as indicated, replaceable plugs and seats, and union and threaded ends.
   1. Rating: Class 125 for service at 125 psig and 250 deg F operating conditions.
   2. Sizing: 3-psig maximum pressure drop at design flow rate, to close against pump shutoff head.
   3. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.

E. Self-Contained Control Valves: Bronze body, bronze trim, two or three ports as indicated, replaceable plugs and seats, and union and threaded ends.
   1. Rating: Class 125 for service at 125 psig and 250 deg F operating conditions.
   2. Thermostatic Operator: Wax-filled integral sensor with integral adjustable dial.

2.10 DAMPERS

A. Dampers: AMCA-rated, opposed-blade design; 0.108-inch-minimum thick, galvanized-steel or 0.125-inch-minimum thick, extruded-aluminum frames with holes for duct mounting; damper blades shall not be less than 0.064-inch-thick galvanized steel with maximum blade width of 8 inches and length of 48 inches. Provide type 316 stainless steel damper blades where exposed to outside air.
   1. Secure blades to 1/2-inch-diameter, zinc-plated axles using zinc-plated hardware, with oil-impregnated sintered bronze blade bearings, blade-linkage hardware of zinc-plated steel and brass, ends sealed against spring-stainless-steel blade bearings, and thrust bearings at each end of every blade.
   2. Operating Temperature Range: From minus 40 to plus 200 deg F.
   3. Edge Seals, Standard Pressure Applications: Closed-cell neoprene.
   4. Edge Seals, Low-Leakage Applications: Use inflatable blade edging or replaceable rubber blade seals and spring-loaded stainless-steel side seals, rated for leakage at less than 10 cfm per sq. ft. of damper area, at differential pressure of 4-inch wg when damper is held by torque of 50 in. x lbf; when tested according to AMCA 500D.

2.11 CONTROL CABLE

A. Electronic and fiber-optic cables for control wiring are specified in Section 26 05 19 - Low Voltage Electrical Power Conductors and Cables.

B. ENCLOSURES

C. Control panels, actuator housings, sensors: NEMA 250, to comply with environmental conditions at installed locations.
   1. Indoor, dry and clean locations: Type 1.
   2. Outdoor, naturally ventilated or other wet or damp indoor locations: Type 4X, stainless steel. Enclosures for variable frequency drives shall be Type 3R, stainless steel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify location of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches above the floor.
   1. Install averaging elements in ducts and plenums in crossing or zigzag pattern.

B. Install guards on thermostats in the following locations:
   1. Entrances.
   2. Public areas.
   3. Where indicated.

C. Install automatic dampers according to Section 23 33 00 - Duct Accessories.

D. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

E. Install labels and nameplates to identify control components according to Section 23 05 53 - Identification for HVAC And Plumbing Piping and Equipment.

F. Install hydronic instrument wells, valves, and other accessories according to Section 23 22 16 - Hydronic Piping Specialties.

G. Install duct volume-control dampers according to Section 23 31 13 - Metal Ducts.

H. Install electronic and fiber-optic cables according to Section 27 10 00 - Building Telecommunication Cabling System.

3.2 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install raceways, boxes, and cabinets according to Section 26 05 33 - Raceway and Boxes for Electrical Systems.

B. Install building wire and cable according to Section 26 05 19 - Low Voltage Electrical Power Conductors and Cables.

C. Install signal and communication cable according to Section 27 10 00 - Building Telecommunication Cabling System.
   1. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.
   2. Install exposed cable in raceway.
   3. Install concealed cable in raceway.
   4. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.
   5. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
   6. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
   7. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

D. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.

E. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

F. Wireless communication between System Controllers and VAV controllers is acceptable where approved.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:
   1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
   2. Test and adjust controls and safeties.
   3. Test calibration of controllers by disconnecting input sensors and stimulating operation with compatible signal generator.
   4. Test each point through its full operating range to verify that safety and operating control set points are as required.
   5. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
   6. Test each system for compliance with sequence of operation.
   7. Test software and hardware interlocks.

C. DDC Verification:
   1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
   2. Check instruments for proper location and accessibility.
   3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
   4. Check instrument tubing for proper fittings, slope, material, and support.
   5. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
   6. Check temperature instruments and material and length of sensing elements.
   7. Check control valves. Verify that they are in correct direction.
   8. Check DDC system as follows:
      a. Verify that DDC controller power supply is from emergency power supply, if applicable.
      b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
      c. Verify that spare I/O capacity has been provided.
      d. Verify that DDC controllers are protected from power supply surges.

D. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls.

END OF SECTION

SECTION 23 21 13 - HYDRONIC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes pipe and fitting materials and joining methods for the following:
   1. Chilled water piping
   2. Condensate drain pipe

1.2 ACTION SUBMITTALS

A. Delegated-Design Submittal:
   1. Design calculations and detailed fabrication and assembly of pipe anchors and alignment guides, hangers and supports for multiple pipes, expansion joints and loops, and attachments of the same to the building structure.
   2. Locations of pipe anchors and alignment guides and expansion joints and loops.
   3. Locations of and details for penetrations, including sleeves and sleeve seals for exterior walls, floors, basement, and foundation walls.
   4. Locations of and details for penetration and firestopping for fire- and smoke-rated wall and floor and ceiling assemblies.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
   1. Chilled-Water Piping: 150 psig at 73 deg F.
   2. Condensate-Drain Piping: 50 deg F at 180 deg F .

2.2 COPPER TUBE AND FITTINGS

A. Drawn-Temper Copper Tubing: ASTM B 88, Type L.

B. Annealed-Temper Copper Tubing: ASTM B 88, Type K.

C. Grooved, Mechanical-Joint, Wrought-Copper Fittings: ASME B16.22.
   1. Grooved-End Copper Fittings: ASTM B 75copper tube or ASTM B 584, bronze casting.
   2. Grooved-End-Tube Couplings: Rigid pattern unless otherwise indicated; gasketed fitting. Ductile-iron housing with keys matching pipe and fitting grooves, prelubricated EPDM gasket rated for minimum 230 deg. For use with housing, and steel bolts and nuts.

D. Wrought-Copper Unions: ASME B16.22.

2.3 PLASTIC PIPE AND FITTINGS

A. PVC Plastic Pipe: ASTM D1785.
   1. PVC Socket Fittings: ASTM D2466 for Schedule 40.
   2. PVC Schedule 80 Threaded Fittings: ASTM D2464.

2.4 JOINING MATERIALS

A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
   1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inchaximum thickness unless otherwise indicated.
      a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
      b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

E. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BAg-1, silver alloy for joining copper with bronze or steel.

F. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

G. Gasket Material: Thickness, material, and type suitable for fluid to be handled and working temperatures and pressures.

H. Solvent Cements for PVC Piping: ASTM D2564. Include primer in accordance with ASTM F656.

2.5 TRANSITION FITTINGS

A. General Requirements:
   1. Same size as pipes to be joined.
   2. Pressure rating at least equal to pipes to be joined.
   3. End connections compatible with pipes to be joined.

B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

C. Plastic-to-Metal Transition Fittings:
   1. Description:
      a. PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions.
      b. One end with threaded brass insert and one solvent-cement-socket or threaded end.
   2. One-piece fitting with one threaded brass or copper insert and one solvent-cement-joint end of material and wall thickness to match plastic pipe material.

D. Plastic-to-Metal Transition Unions:
   1. Brass or copper end and solvent-cement-joint end of union to match pipe in size and material.
   2. Description:
      a. PVC four-part union.
      b. Brass or stainless steel threaded end.
      c. Solvent-cement-joint or threaded plastic end.
      d. Rubber O-ring.
      e. Union nut.

2.6 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Unions:
   1. Description:
      a. Standard: ASSE 1079.

b. Pressure Rating: 150 psigEnd Connections: Solder-joint copper alloy and threaded ferrous.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Hot-water heating piping, aboveground, NPS 2 and smaller, shall be the following:
   1. Type L drawn-temper copper tubing, wrought-copper fittings, and soldered or (at contractor's option) pressure-seal joints.

B. Chilled-Water Piping, Aboveground, NPS 2 (DN 50) and Smaller, to be Any of the Following:
   1. Type K or Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or brazed joints.
   2. Schedule 40, Grade B steel pipe; Class 125, cast-iron fittings; and threaded or grooved mechanical joints.

C. Condensate-Drain Piping Installed Aboveground to Be Any of the Following:
   1. Type K or Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or brazed joints.
   2. Schedule 40, solid wall PVC plastic pipe and drainage pattern fittings and solvent-welded joints.

D. Air-Vent Piping:
   1. Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.
   2. Outlet: Type K, annealed-temper copper tubing with soldered or flared joints.

3.2 PIPING INSTALLATIONS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping to permit valve servicing.

F. Install piping at indicated slopes.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Install piping to allow application of insulation.

J. Select system components with pressure rating equal to or greater than system operating pressure.

K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

L. Install drains, consisting of a tee fitting, NPS 3/4ball valve, and short NPS 3/4threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.

N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.

O. Install branch connections to mains using tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.

P. Install valves according to Section 22 05 23.12 - Ball Valves for Plumbing Piping

Q. Install unions in piping, NPS 2and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.

R. Install flanges in piping, NPS 2-1/2and larger, at final connections of equipment and elsewhere as indicated.

S. Install shutoff valve immediately upstream of each dielectric fitting.

T. Comply with requirements in Section 23 05 53 - Identification for HVAC and Plumbing Piping and Equipment for identifying piping.

U. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 23 05 17 - Sleeves and Sleeve Seals for Plumbing and HVAC Piping.

V. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 23 05 17 - Sleeves and Sleeve Seals for Plumbing and HVAC Piping.

W. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 23 05 18 - Escutcheons for Plumbing and HVAC Piping.

3.3 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Soldered Joints: Apply ASTM B813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints in accordance with ASTM B828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B32.

D. Brazed Joints: Construct joints in accordance with AWS's "Brazing Handbook," "Pipe and Tube" chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8/A5.8M.

E. Threaded Joints: Thread pipe with tapered pipe threads in accordance with ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

F. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings in accordance with the following:
   1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.
   2. PVC Pressure Piping: Join ASTM D1785 schedule number, PVC pipe, and PVC socket fittings in accordance with ASTM D2672. Join other-than-schedule-number PVC pipe and socket fittings in accordance with ASTM D2855.
   3. PVC Nonpressure Piping: Join in accordance with ASTM D2855.

G. Grooved Joints: Assemble joints with coupling and gasket, lubricant, and bolts. Cut or roll grooves in ends of pipe based on pipe and coupling manufacturer's written instructions for pipe wall thickness. Use grooved-end fittings and rigid, grooved-end-pipe couplings.

H. Plain-End Mechanical-Coupled Joints: Prepare, assemble, and test joints in accordance with manufacturer's written installation instructions.

3.4 INSTALLATION OF DIELECTRIC FITTINGS

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 (DN 50) and Smaller: Use dielectric nipples or unions.

C. Dielectric Fittings for NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Use dielectric flanges or flange kits or nipples.

D. Dielectric Fittings for NPS 5 (DN 125) and Larger: Use dielectric flange kits.

3.5 INSTALLATION OF HANGERS AND SUPPORTS

A. Comply with requirements for seismic-restraint devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."

B. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment" for hangers, supports, and anchor devices.

C. Install hangers for copper tubing and steel piping, with maximum horizontal spacing and minimum rod diameters, to comply with MSS SP-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

D. Install hangers for plastic piping, with maximum horizontal spacing and minimum rod diameters, to comply with manufacturer's written instructions, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

E. Support horizontal piping within 12 inchesof each fitting and coupling.

F. Support vertical runs of copper tubing and steel piping to comply with MSS SP-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

G. Support vertical runs of PVC piping to comply with manufacturer's written instructions, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

H. Support vertical runs of fiberglass piping to comply with manufacturer's written instructions, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

3.6 TERMINAL EQUIPMENT CONNECTIONS

A. Sizes for supply and return piping connections are to be the same as or larger than equipment connections.

B. Install control valves in accessible locations close to connected equipment.

C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.

D. Install ports for pressure gauges and thermometers at coil inlet and outlet connections. Comply with requirements in Section 230500 "Common Work Results for HVAC."

3.7 IDENTIFICATION

A. Identify system components. Comply with requirements for identification materials and installation in Section 230553 "Identification for HVAC Piping and Equipment."

3.8 SYSTEM STARTUP

A. Perform the following before operating the system:
   1. Open manual valves fully.
   2. Inspect pumps for proper rotation.
   3. Set makeup pressure-reducing valves for required system pressure.
   4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
   5. Set temperature controls so all coils are calling for full flow.
   6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
   7. Verify lubrication of motors and bearings.

3.9 FIELD QUALITY CONTROL

A. Prepare hydronic piping in accordance with ASME B31.9 and as follows:
   1. Leave joints, including welds, uninsulated and exposed for examination during test.
   2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
   3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
   4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure is to be capable of sealing against test pressure without damage to valve.
   5. Install pressure-relief valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

B. Perform the following tests on hydronic piping:
   1. Use ambient-temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
   2. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
   3. Isolate expansion tanks and determine that hydronic system is full of water.

4. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure is not to exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9.
5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
6. Prepare written report of testing.

END OF SECTION

SECTION 23 21 16 - HYDRONIC PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes special-duty valves and specialties for the following:
   1. Chilled water piping.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of the following:
   1. Valves: Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
   2. Air-control devices.
   3. Hydronic specialties.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. ASME Compliance: Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
   1. Chilled-Water Piping: 150 psig at 73 deg F.

2.2 VALVES

A. Ball Valves: Comply with requirements specified in Section 22 05 23.12 - Ball Valves for Plumbing Piping

B. Automatic Temperature-Control Valves, Actuators, and Sensors: Comply with requirements specified in Section 23 09 00 - HVAC Instrumentation and Controls.

C. Bronze, Calibrated-Orifice, Balancing Valves:
   1. Body: Bronze, ball or plug type with calibrated orifice or venturi.
   2. Ball: Brass or stainless steel.
   3. Plug: Resin.
   4. Seat: PTFE.
   5. End Connections: Threaded or socket.
   6. Pressure Gage Connections: Integral seals for portable differential pressure meter.
   7. Handle Style: Lever, with memory stop to retain set position.
   8. CWP Rating: Minimum 125 psig.
   9. Maximum Operating Temperature: 250 deg F.

D. Automatic Flow-Control Valves:
   1. Body: Brass or ferrous metal.
   2. Piston and Spring Assembly: Stainless steel, tamper proof, self-cleaning, and removable.
   3. Combination Assemblies: Include bonze or brass-alloy ball valve.
   4. Identification Tag: Marked with zone identification, valve number, and flow rate.
   5. Size: Same as pipe in which installed.
   6. Performance: Maintain constant flow, plus or minus 5 percent over system pressure fluctuations.
   7. Minimum CWP Rating: 175 psig.
   8. Maximum Operating Temperature: 200 deg F.

2.3 AIR-CONTROL DEVICES

A. Manual Air Vents:
   1. Body: Bronze.
   2. Internal Parts: Nonferrous.
   3. Operator: Screwdriver or thumbscrew.
   4. Inlet Connection: NPS 1/2.
   5. Discharge Connection: NPS 1/8.
   6. CWP Rating: 150 psig.
   7. Maximum Operating Temperature: 225 deg F.

2.4 HYDRONIC PIPING SPECIALTIES

A. Y-Pattern Strainers:
   1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.

2. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
3. Strainer Screen: Stainless-steel, 40-mesh strainer, or perforated stainless-steel basket.
4. CWP Rating: 125 psig.

B. Stainless-Steel Bellow, Flexible Connectors:
1. Body: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
2. End Connections: Threaded or flanged to match equipment connected.
3. Performance: Capable of 3/4-inch misalignment.
4. CWP Rating: 150 psig.
5. Maximum Operating Temperature: 250 deg F.

PART 3 - EXECUTION

3.1 VALVE APPLICATIONS

A. Install shutoff-duty valves at each branch connection to supply mains and at supply connection to each piece of equipment.

B. Install calibrated-orifice, balancing valves at each branch connection to return main.

C. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.

D. Install check valves at each pump discharge and elsewhere as required to control flow direction.

E. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.

F. Install pressure-reducing valves at makeup-water connection to regulate system fill pressure.

3.2 HYDRONIC SPECIALTIES INSTALLATION

A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

B. Install piping from boiler air outlet, air separator, or air purger to expansion tank with a 2 percent upward slope toward tank.

C. Install in-line air separators in pump suction. Install drain valve on air separators NPS 2 and larger.

D. Install expansion tanks above the air separator. Install tank fitting in tank bottom and charge tank.
   1. Install tank fittings that are shipped loose.
   2. Support tank from floor or structure above with sufficient strength to carry weight of tank, piping connections, fittings, plus tank full of water. Do not overload building components and structural members.

E. Install expansion tanks on the floor. Vent and purge air from hydronic system, and ensure that tank is properly charged with air to suit system Project requirements.

END OF SECTION

SECTION 23 31 13 - METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Rectangular ducts and fittings.
   2. Round ducts and fittings.
   3. Sheet metal materials.
   4. Sealants and gaskets.
   5. Hangers and supports.
   6. Seismic-restraint devices.

B. Related Sections:
   1. Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC for testing, adjusting, and balancing requirements for metal ducts.
   2. Section 23 33 00 - Air Duct Accessories for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.

B. Structural Performance: Duct hangers and supports and seismic restraints shall withstand the effects of gravity and seismic loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and ASCE/SEI 7.

C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ANSI/ASHRAE 62.1.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:
   1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.

2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, and static-pressure classes.
4. Elevation of top of ducts.
5. Dimensions of main duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.
8. Seam and joint construction.
9. Penetrations through fire-rated and other partitions.
10. Equipment installation based on equipment being used on Project.
11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
12. Hangers and supports, including methods for duct and building attachment, seismic restraints, and vibration isolation.

C. Delegated-Design Submittal:
1. Sheet metal thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Materials, fabrication, assembly, and spacing of hangers and supports.
5. Design Calculations: Calculations for selecting hangers and supports and seismic restraints.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
2. Suspended ceiling components.
3. Structural members to which duct will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Penetrations of smoke barriers and fire-rated construction.
6. Items penetrating finished ceiling including the following:
a. Luminaires.
b. Air outlets and inlets.
c. Speakers.
d. Sprinklers.
e. Access panels.
f. Perimeter moldings.

B. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
   2. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."

D. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.1 RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Fabricate round ducts larger Than 90 inches in diameter with butt-welded longitudinal seams.

D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.

D. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.

E. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
   1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Water-Based Joint and Seam Sealant:
   1. Application Method: Brush on.
   2. Solids Content: Minimum 65 percent.
   3. Shore A Hardness: Minimum 20.
   4. Water resistant.
   5. Mold and mildew resistant.
   6. VOC: Maximum 75 g/L (less water).
   7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
   8. Service: Indoor or outdoor.
   9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

C. Flanged Joint Sealant: Comply with ASTM C 920.
   1. General: Single-component, acid-curing, silicone, elastomeric.
   2. Type: S.
   3. Grade: NS.
   4. Class: 25.
   5. Use: O.

D. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

E. Round Duct Joint O-Ring Seals:
   1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
   2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.

3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.5 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments (outdoors and ventilated spaces): Stainless steel rods and nuts.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

H. Trapeze and Riser Supports:
   1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
   2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
   3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

2.6 SEISMIC-RESTRAINT DEVICES

A. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
   1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.

B. Channel Support System: Shop- or field-fabricated support assembly made of slotted steel channels rated in tension, compression, and torsion forces and with accessories for attachment to braced component at one end and to building structure at the other end. Include matching components and corrosion-resistant coating.

C. Restraint Cables: ASTM A 492, stainless-steel cables with end connections made of cadmium-plated steel assemblies with brackets, swivel, and bolts designed for restraining cable service; and with an automatic-locking and clamping device or double-cable clips.

D. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.

E. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 23 33 00 - Air Duct Accessories for fire and smoke dampers.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials.

3.2 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts at a minimum to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
   1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
   2. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
   3. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
   4. Conditioned Space, Exhaust Ducts: Seal Class B.
   5. Conditioned Space, Return-Air Ducts: Seal Class B.

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
   1. Where practical, install concrete inserts before placing concrete.
   2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
   3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
   4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
   5. Do not use powder-actuated concrete fasteners for seismic restraints.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.5 SEISMIC-RESTRAINT-DEVICE INSTALLATION

A. Install ducts with hangers and braces designed to support the duct and to restrain against seismic forces required by applicable building codes. Comply with ASCE/SEI 7.
   1. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
   2. Brace a change of direction longer than 12 feet.

B. Select seismic-restraint devices with capacities adequate to carry present and future static and seismic loads.

C. Install cables so they do not bend across edges of adjacent equipment or building structure.

D. Install cable restraints on ducts that are suspended with vibration isolators.

E. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction.

F. Attachment to Structure: If specific attachment is not indicated, anchor bracing and restraints to structure, to flanges of beams, to upper truss chords of bar joists, or to concrete members.

G. Drilling for and Setting Anchors:
   1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcement or embedded items during drilling. Notify the Architect if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
   2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
   3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
   4. Set anchors to manufacturer's recommended torque, using a torque wrench.
   5. Install zinc-coated steel anchors for interior applications and stainless-steel anchors for applications exposed to weather.

3.6 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Section 23 33 00 - Air Duct Accessories.

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.7 DUCT CLEANING

A. Clean new and existing duct system(s) before testing, adjusting, and balancing.

B. Use service openings for entry and inspection.
   1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Section 23 33 00 - Air Duct Accessories for access panels and doors.
   2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
   3. Remove and reinstall ceiling to gain access during the cleaning process.

C. Particulate Collection and Odor Control:
   1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.

2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.

D. Clean the following components by removing surface contaminants and deposits:
   1. Air outlets and inlets (registers, grilles, and diffusers).
   2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
   3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
   4. Coils and related components.
   5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
   6. Supply-air ducts, dampers, actuators, and turning vanes.
   7. Dedicated exhaust and ventilation components and makeup air systems.

E. Mechanical Cleaning Methodology:
   1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
   2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
   3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
   4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
   5. Clean coils and coil drain pans according to NADCA 1992. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.
   6. Provide drainage and cleanup for wash-down procedures.
   7. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents according to manufacturer's written instructions after removal of surface deposits and debris.

3.8 START UP

A. Air Balance: Comply with requirements in Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

3.9 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:

B. Supply Ducts:
   1. Ducts downstream of a Variable-Air-Volume box or Terminal Unit:
      a. Pressure Class: Positive 2-inch wg.
      b. Minimum SMACNA Seal Class: B.
      c. SMACNA Leakage Class for Rectangular: 12.
      d. SMACNA Leakage Class for Round and Flat Oval: 6.
   2. Ducts upstream of a Variable-Air-Volume box or Terminal Unit:
      a. Pressure Class: Positive 3-inch wg.
      b. Minimum SMACNA Seal Class: B.
      c. SMACNA Leakage Class for Rectangular: 12.
      d. SMACNA Leakage Class for Round and Flat Oval: 6.

C. Return Ducts:
   1. Ducts Connected to Air-Handling Units:
      a. Pressure Class: Positive or negative 3-inch wg.
      b. Minimum SMACNA Seal Class: B.
      c. SMACNA Leakage Class for Rectangular: 12.
      d. SMACNA Leakage Class for Round and Flat Oval: 6.

D. Exhaust Ducts:
   1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:
      a. Pressure Class: Negative E-inch wg.
      b. Minimum SMACNA Seal Class: A
      c. SMACNA Leakage Class for Rectangular: 12.
      d. SMACNA Leakage Class for Round and Flat Oval: 6.

E. Intermediate Reinforcement:
   1. Galvanized-Steel Ducts: Galvanized steel.
   2. Stainless-Steel Ducts:
      a. Exposed to Airstream: Match duct material.
      b. Not Exposed to Airstream: Match duct material.

F. Elbow Configuration:
   1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
      a. Velocity 1000 fpm or Lower:
         1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.

2) Mitered Type RE 4 without vanes.

b. Velocity 1000 to 1500 fpm:

1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.

2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.

3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

c. Velocity 1500 fpm or Higher:

1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.

2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.

3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."

a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.

b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.

c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."

a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.

2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.

3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.

4) Radius-to Diameter Ratio: 1.5.

b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.

c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

G. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."

a. Rectangular Main to Rectangular Branch: 45-degree entry.

b. Rectangular Main to Round Branch: Spin in.

2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
   a. Velocity up to 1500 fpm: Conical tap.
   b. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION

SECTION 23 33 00 - DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Backdraft and pressure relief dampers.
   2. Manual volume dampers.
   3. Control dampers.
   4. Fire dampers.
   5. Smoke dampers.
   6. Flange connectors.
   7. Turning vanes.
   8. Flexible connectors.
   9. Flexible ducts.
   10. Duct accessory hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
   1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
      a. Special fittings.
      b. Manual volume damper installations.
      c. Control-damper installations.
      d. Fire-damper and smoke-damper installations, including sleeves; and duct-mounted access doors.
      e. Wiring Diagrams: For power, signal, and control wiring.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
   1. Galvanized Coating Designation: G90.
   2. Exposed-Surface Finish: Mill phosphatized.

B. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and finish for exposed ducts.

C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 BACKDRAFT AND PRESSURE RELIEF DAMPERS

A. Description: Gravity balanced.

B. Maximum Air Velocity: 1250 fpm.

C. Maximum System Pressure: 1-inch wg.

D. Frame: Hat-shaped, 0.094-inch-thick, galvanized sheet steel, with welded corners or mechanically attached and mounting flange.

E. Blades: Multiple single-piece blades, center pivoted, maximum 6-inch width, 0.025-inch-thick, roll-formed aluminum with sealed edges.

F. Blade Action: Parallel.

G. Blade Seals: Felt.

H. Blade Axles:
   1. Material: Stainless steel.
   2. Diameter: 0.20 inch.

I. Tie Bars and Brackets: Galvanized steel.

J. Return Spring: Adjustable tension.

K. Bearings: synthetic pivot bushings.

L. Accessories:
   1. Adjustment device to permit setting for varying differential static pressure.
   2. Counterweights and spring-assist kits for vertical airflow installations.
   3. Electric actuators.
   4. Chain pulls.
   5. Screen Mounting: Front mounted in sleeve.
      a. Sleeve Thickness: 20 gage minimum.
      b. Sleeve Length: 6 inches minimum.
   6. Screen Mounting: Rear mounted.
   7. Screen Material: Stainless steel.
   8. Screen Type: Bird.
   9. 90-degree stops.

2.4 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:
   1. Standard leakage rating, with linkage outside airstream.
   2. Suitable for horizontal or vertical applications.
   3. Frames:
      a. Frame: Hat-shaped, 0.094-inch-thick, galvanized sheet steel.
      b. Mitered and welded corners.
      c. Flanges for attaching to walls and flangeless frames for installing in ducts.
   4. Blades:
      a. Multiple or single blade.
      b. Parallel- or opposed-blade design.
      c. Stiffen damper blades for stability.
      d. Galvanized-steel, 0.064 inch thick.
   5. Blade Axles: Galvanized steel.
   6. Bearings:
      a. Oil-impregnated bronze.

b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.

7. Tie Bars and Brackets: Galvanized steel.

2.5 FIRE DAMPERS

A. Type: Dynamic; rated and labeled according to UL 555 by an NRTL.

B. Closing rating in ducts up to 4-inch wg static pressure class and minimum 2000-fpm velocity.

C. Fire Rating: 1-1/2 hours.

D. Frame: Multiple-blade type; fabricated with roll-formed, 0.034-inch-thick galvanized steel; with mitered and interlocking corners.

E. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.

1. Minimum Thickness: 0.39 inch thick, as indicated, and of length to suit application.
2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.

F. Mounting Orientation: Vertical or horizontal as indicated.

G. Blades: Roll-formed, interlocking, 0.024-inch-thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch-thick, galvanized-steel blade connectors.

H. Horizontal Dampers: Include blade lock and stainless-steel closure spring.

I. Heat-Responsive Device: Electric, resettable link and switch package, factory installed, 165 deg F rated.

2.6 SMOKE DAMPERS

A. General Requirements: Label according to UL 555S by an NRTL.

B. Smoke Detector: Integral, factory wired for single-point connection.

C. Frame: Hat-shaped, 0.094-inch-thick, galvanized sheet steel, with welded or mechanically attached corners and mounting flange.

D. Blades: Roll-formed, horizontal, interlocking, 0.034-inch-thick, galvanized sheet steel.

E. Leakage: Class II.

F. Rated pressure and velocity to exceed design airflow conditions.

G. Mounting Sleeve: Factory-installed, 0.05-inch-thick, galvanized sheet steel; length to suit wall or floor application with factory-furnished silicone calking.

H. Damper Motors: Two-position action.

I. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors.
   1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
   2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Section 23 09 00 - HVAC Instrumentation and Controls.
   3. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
   4. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
   5. Outdoor Motors and Motors in Outdoor-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof. Equip motors with internal heaters to permit normal operation at minus 40 deg F.
   6. Nonspring-Return Motors: For dampers larger than 25 sq. ft., size motor for running torque rating of 150 in. x lbf and breakaway torque rating of 300 in. x lbf.
   7. Electrical Connection: 115 V, single phase, 60 Hz.

J. Accessories:
   1. Auxiliary switches for signaling.
   2. Test and reset switches, remote mounted.
   3. Integral duct smoke detector, ionization type.

2.7 FLANGE CONNECTORS

A. Description: Add-on or roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.

B. Material: Galvanized steel.

C. Gage and Shape: Match connecting ductwork.

2.8 TURNING VANES

A. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
   1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

B. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."

C. Vane Construction: Single wall.

2.9 FLEXIBLE CONNECTORS

A. Materials: Flame-retardant or noncombustible fabrics.

B. Coatings and Adhesives: Comply with UL 181, Class 1.

C. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 inches wide attached to two strips of 2-3/4-inch-wide, 0.028-inch-thick, galvanized sheet steel or 0.032-inch-thick aluminum sheets. Provide metal compatible with connected ducts.

D. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
   1. Minimum Weight: 26 oz./sq. yd.
   2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
   3. Service Temperature: Minus 40 to plus 200 deg F.

2.10 FLEXIBLE DUCTS

A. Insulated, Flexible Duct: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.
   1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
   2. Maximum Air Velocity: 4000 fpm.
   3. Temperature Range: Minus 20 to plus 210 deg F.
   4. Insulation R-value: Comply with ASHRAE/IESNA 90.1.

B. Flexible Duct Connectors:
   1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.
   2. Non-Clamp Connectors: Adhesive plus sheet metal screws.

2.11 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.

D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
   1. Install steel volume dampers in steel ducts.
   2. Install aluminum volume dampers in aluminum ducts.

E. Set dampers to fully open position before testing, adjusting, and balancing.

F. Install test holes at fan inlets and outlets and elsewhere as indicated.

G. Install fire and smoke dampers according to UL listing.

H. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
   1. On both sides of duct coils.
   2. Upstream and downstream from duct filters.
   3. At outdoor-air intakes and mixed-air plenums.
   4. At drain pans and seals.
   5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.

6. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
7. At each change in direction and at maximum 50-foot spacing.
8. Upstream from turning vanes.
9. Upstream or downstream from duct silencers.
10. Control devices requiring inspection.
11. Elsewhere as indicated.

I. Install access doors with swing against duct static pressure.

J. Access Door Sizes:
1. One-Hand or Inspection Access: 8 by 5 inches.
2. Two-Hand Access: 12 by 6 inches.
3. Head and Hand Access: 18 by 10 inches.
4. Head and Shoulders Access: 21 by 14 inches.
5. Body Access: 25 by 14 inches.
6. Body plus Ladder Access: 25 by 17 inches.

K. Label access doors according to Section 23 05 53 - Identification for HVAC and Plumbing Piping and Equipment to indicate the purpose of access door.

L. Install flexible connectors to connect ducts to equipment.

M. Connect diffusers or light troffer boots to ducts directly or with maximum 60-inch lengths of flexible duct clamped or strapped in place.

N. Connect flexible ducts to metal ducts with draw bands.

O. Install duct test holes where required for testing and balancing purposes.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:
1. Operate dampers to verify full range of movement.
2. Inspect locations of access doors and verify that purpose of access door can be performed.
3. Operate fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
4. Inspect turning vanes for proper and secure installation.

END OF SECTION

SECTION 237313.13 – INDOOR AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes factory-assembled, indoor air-handling units with limited features, including the following components and accessories:
   1. Casings.
   2. Fans, drives, and motors.
   3. Coils.
   4. Air filtration.
   5. Dampers.

1.2 ACTION SUBMITTALS

A. Product Data: For each air-handling unit.

B. Shop Drawings: For each type and configuration of indoor, basic, air-handling unit.
   1. Include plans, elevations, sections, and mounting details.
   2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Detail fabrication and assembly of indoor, basic air-handling units, as well as procedures and diagrams.
   4. Include diagrams for power, signal, and control wiring.

C. Delegated Design Submittal: For vibration isolation, supports, and seismic restraints indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   1. Design Calculations: Calculate requirements for selecting vibration isolators, supports, and seismic restraints and for designing vibration isolation bases.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Floor plans and other details, or BIM model, drawn to scale, showing the items described in this Section, and coordinated with all building trades.

B. Seismic Qualification Data: Certificates for indoor, basic air-handling units, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
   4. Restraint of internal components.

C. Source quality-control reports.

D. Startup service reports.

E. Field quality-control reports.

F. Sample Warranty: For manufacturer's warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air-handling units to include in emergency, operation, and maintenance manuals.

1.5 WARRANTY

A. Warranty: Manufacturer agrees to repair or replace components of indoor, basic, air-handling units that fail in materials or workmanship within specified warranty period.

B. Warranty Period: Manufacturer's standard, but not less than one year(s) from date of unit startup.

PART 2 - PRODUCTS

2.1 UNIT CASINGS

A. General Fabrication Requirements for Casings;
   1. Forming: Form walls, roofs, and floors with at least two breaks at each joint.
   2. Joints: Sheet metal screws or pop rivets.
   3. Sealing: Seal all joints with water-resistant sealant. Hermetically seal at each corner and around entire perimeter.
   4. Base Rail:
      a. Material: Galvanized steel.

b. Height: 4 inches.

B. Double-Wall Construction:
1. Outside Casing Wall: AluZinc steel, minimum 22 gauge thick, with manufacturer's standard finish that meets a minimum of 2,400 hours Salt Spray rated corrosion resistance (per ASTM B-117)
2. Inside Casing Wall: AluZinc steel, solid, minimum 25 gauge thick.
3. Casing Insulation:
a. Materials: injected polyurethane foam insulation.
b. Casing Panel R-Value: Minimum 13.
c. Insulation Thickness: 2 inch.
d. Thermal Break: Provide continuity of insulation with no through-casing metal in casing walls, floors, or roofs of air-handling unit.

C. Airstream Surfaces: Surfaces in contact with airstream shall comply with requirements in ASHRAE 62.1.

D. Static-Pressure Classifications:
1. For Unit Sections Upstream of Fans: Minus 2-inch wg.
2. For Unit Sections Downstream and Including Fans: 2-inch wg.

E. Panels and Doors:
1. Panels:
a. Fabrication: Formed and reinforced with same materials and insulation thickness as casing.
b. Fasteners: Two or more camlock type for panel lift-out operation. Arrangement shall allow panels to be opened against airflow.
c. Gasket: Neoprene, applied around entire perimeters of panel frames.
d. Size: Large enough to allow unobstructed access for inspection and maintenance of air-handling unit's internal components. At least 18 inches wide by full height of unit casing up.
2. Doors:
a. Fabrication: Formed and reinforced with same materials and insulation thickness as casing.
b. Hinges: A minimum of two ball-bearing hinges or stainless-steel piano hinge and two wedge-lever-type latches, operable from inside and outside. Arrange doors to be opened against airflow. Provide safety latch retainers on doors so that doors do not open uncontrollably.
c. Gasket: Neoprene, applied around entire perimeters of frame.
d. Size: Large enough to allow for unobstructed access for inspection and maintenance of air-handling unit's internal components. At least 18 inches wide by full height of unit casing up.

3. Locations and Applications:
   a. Fan Section: Doors.
   b. Coil Section: Panels.
   c. Filter Section: Doors large enough to allow periodic removal and installation of filters.

F. Condensate Drain Pans:
   1. Location: Each type of cooling coil.
   2. Construction:
      a. Stainless-steel sheet.
   3. Drain Connection:
      a. Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.
      b. Minimum Connection Size: NPS 1.
   4. Slope: Minimum 0.125 in./ft. slope, to comply with ASHRAE 62.1, in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and from humidifiers, and to direct water toward drain connection.
   5. Length: Extend drain pan downstream from leaving face for distance to comply with ASHRAE 62.1.
   6. Width: Entire width of water producing device.
   7. Depth: A minimum of 2 inches deep.

2.2 FAN, DRIVE, AND MOTOR SECTION

A. Fan and Drive Assemblies: Statically and dynamically balanced and designed for continuous operation at maximum-rated fan speed and motor horsepower.

B. Fans:
   1. Shafts:
      a. Turned, ground, and polished hot-rolled steel.
   2. Shaft Bearings:
      a. Heavy-duty, permanently sealed, with an L-10 rated life of minimum 400,000 hours.
   3. Plenum Fans: Composite material or aluminum construction and rated in accordance with and certified by AMCA for performance.
   4. Mounting: Fan assembly shall include a minimum 14 gauge spun steel fan inlet funnel and a G90 galvanized steel motor support plate and fan base with internal rubber in shear (RIS) isolation

C. Drive, Direct: Factory-mounted, direct drive.

D. Motors:
   1. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."
   2. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
   3. Enclosure Type: Totally enclosed fan cooled (TEFC).
   4. Enclosure Materials: Cast iron.
   5. Efficiency: Premium efficient as defined in NEMA MG 1.
   6. NEMA Design: MG1.
   7. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in electrical Sections.

2.3 COIL SECTION

A. General Requirements for Coil Section:
   1. Comply with AHRI 410.
   2. Fabricate coil section to allow removal and replacement of coil for maintenance and to allow in-place access for service and maintenance of coil(s).
   3. Coils shall not act as structural component of unit.

B. Cooling Coils:
   1. Chilled-Water Coil: Continuous circuit.
      a. Piping Connections: Threaded or Flanged, same end of coil.
      b. Tube Material: Copper.
      c. Tube Thickness: 0.020 inches.
      d. Fin Type: Plate.
      e. Fin Material: Aluminum.
      f. Fin Thickness: 0.006 inches.
      g. Fin and Tube Joint: Mechanical bond.
      h. Headers:
         1) Cast iron with cleaning plugs and drain and air vent tappings.
         2) Seamless copper tube with brazed joints, prime coated.
         3) Fabricated steel, with brazed joints, prime coated.
         4) Provide insulated cover to conceal exposed outside casings of headers.
      i. Frames: Channel frame, minimum 0.052-inch- thick galvanized steel.
      j. Working-Pressure Ratings: 200 psig.

2.4 AIR FILTRATION SECTION

A. Particulate air filtration is specified in Section 234100 "Particulate Air Filtration."

B. Panel Filters:
   1. Description: Flat, Pleated factory-fabricated, self-supported disposable air filters with holding frames. Refer to schedule for the required MERV rating.
   2. Filter Unit Class: UL 900.
   3. Media: Interlaced glass, synthetic, or cotton fibers coated with nonflammable adhesive and antimicrobial coating.
   4. Filter-Media Frame: High wet-strength beverage board.

C. Side-Access Filter Mounting Frames:
   1. Particulate Air Filter Frames: Match inner casing and outer casing material, and insulation thickness. Galvanized steel track.
      a. Sealing: Incorporate positive-sealing device to ensure seal between gasketed material on channels to seal top and bottom of filter cartridge frames to prevent bypass of unfiltered air.

2.5 SOURCE QUALITY CONTROL

A. AHRI 430 Certification: Test, rate, and label air-handling units and their components in accordance with AHRI 430.

B. AHRI 260 or AMCA 311 Sound Performance Rating Certification: Test, rate, and label in accordance with AHRI 260 or AMCA 311.

C. Fan Aerodynamic Performance Rating: Factory test and rate fan performance for airflow, pressure, power, air density, rotation speed, and efficiency in accordance with AMCA 210.

D. Fan Energy Index (FEI): Test in accordance with AMCA 210 and rate in accordance with AMCA 99, AMCA 207, and AMCA 208.

E. Fan Operating Limits: Classify fans in accordance with AMCA 99, Section 14.

F. Water Coils: Factory tested to 300 psig (2070 kPa) according to AHRI 410 and ASHRAE 33.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Examine roughing-in for steam, hydronic, and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.

B. Equipment Mounting:
   1. Install air-handling units on cast-in-place concrete equipment bases. Coordinate sizes and locations of concrete bases with actual equipment provided. Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
   2. Comply with requirements for vibration isolation and seismic-control devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."

C. Suspended Units: Suspend and brace units from structural-steel support frame using threaded steel rods and spring hangers. Coordinate sizes and locations of structural-steel support members with actual equipment provided. Comply with requirements for vibration isolation devices specified in Section 230548 "Vibration and Seismic Controls for HVAC.

D. Arrange installation of units to provide access space around air-handling units for service and maintenance.

E. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing with new, clean filters.

F. Connect duct to air-handling units with flexible connections. Comply with requirements in Section 233300 "Air Duct Accessories."

3.2 PIPING CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where installing piping adjacent to air-handling unit, allow for service and maintenance.

C. Connect piping to air-handling units mounted on vibration isolators with flexible connectors.

D. Connect condensate drain pans using ASTM B88, Type M copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.

E. Chilled-Water Piping: Comply with applicable requirements in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties." Install shutoff valve and union or flange at each coil supply connection. Install balancing valve and union or flange at each coil return connection.

3.3 ELECTRICAL CONNECTIONS

A. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

C. Install electrical devices furnished by manufacturer, but not factory mounted, according to NFPA 70 and NECA 1.

D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.
   1. Nameplate shall be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."
   2. Nameplate shall be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least 1/2 inch high.

3.4 CONTROL CONNECTIONS

A. Install control and electrical power wiring to field-mounted control devices.

B. Connect control wiring according to Section 260523 "Control-Voltage Electrical Power Cables."

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.
   1. Complete installation and startup check according to manufacturer's written instructions.
   2. Verify that shipping, blocking, and bracing are removed.
   3. Verify that unit is secure on mountings and supporting devices and that connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, controllers, and switches.
   4. Verify proper motor rotation direction, free fan wheel rotation, and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.
   5. Verify that bearings, pulleys, belts, and other moving parts are lubricated with factory-recommended lubricants.
   6. Verify that outdoor- and return-air mixing dampers open and close, and maintain minimum outdoor-air setting.
   7. Comb coil fins for parallel orientation.
   8. Verify that proper thermal-overload protection is installed for electric coils.
   9. Install new, clean filters.
   10. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.

B. Starting procedures for air-handling units include the following:
   1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm.

2. Measure and record motor electrical values for voltage and amperage.
3. Manually operate dampers from fully closed to fully open position and record fan performance.

3.6 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for air-handling system testing, adjusting, and balancing.

C. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.7 CLEANING

A. After completing system installation and testing, adjusting, and balancing of air-handling unit and air-distribution systems, and after completing startup service, clean air-handling units internally to remove foreign material and construction dirt and dust. Clean fan wheels, cabinets, dampers, coils, and filter housings, and install new, clean filters.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
1. Leak Test: After installation, fill water and steam coils with water, and test coils and connections for leaks.
2. Charge refrigerant coils with refrigerant and test for leaks.
3. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
4. Air-handling unit and components will be considered defective if unit or components do not pass tests and inspections.
5. Prepare test and inspection reports.

3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain air-handling units.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 26 05 10 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 WORK DESCRIPTION

A. Section Includes: Basic electrical requirements specifically applicable to Division 26 – ELECTRICAL sections in addition to Division 01 Sections.

1.2 PROJECT PHASING

A. Coordinate electrical schedule and operations with Queen's Medical Center's Project Manager.

1.3 DRAWINGS

A. Electrical power, signal and lighting plans are schematic and indicate general layout and approximate locations of outlets, switches, luminaires, devices, and other electrical equipment. Make minor adjustments in layouts to ensure coordination.

B. Review contract drawings and specifications, and verify locations of structural members, equipment, apparatus, and other conditions which may affect work. Provide conduit transitions and offsets, junction boxes and similar fittings as necessary to install complete electrical systems.

C. Coordinate work with wiring and equipment included in other sections and divisions of the specifications.

D. Design and layouts indicated on drawings are based on specified products and equipment. Provide modifications required to materials, components and equipment to accommodate products and equipment other than specified.

E. Obtain Architect's acceptance of significant deviations from drawing layouts before performing the work.

F. Architect or Owner reserves the right to relocate any device within 10 feet of its indicated location up to the time of its installation without additional cost to the Owner.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00 – SUBMITTALS.

B. Submit shop drawings and product data grouped to include complete submittals of related systems, products and accessories in a single submittal.
   1. Submit quantities required in Section 01 33 00 – SUBMITTALS plus one additional copy to be retained by the Architect.
   2. Include submittals for the following items:
      a. Section 26 05 12 – BASIC MATERIALS AND METHODS: Wiring devices, cables.
      b. Section 26 50 00 – LIGHTING: Lighting fixtures.
      c. Any other special or built-to-order equipment.

C. Record Documents: Provide in accordance with Section 01 33 00 – SUBMITTALS.

1.5 REGULATORY REQUIREMENTS

A. Conform to 2018 International Building Code.

B. Conform to NFPA 70 (NEC), National Electrical Code 2017 edition, applicable NFPA regulations, City and County of Honolulu, and 2018 International Energy Conservation Code.

C. Comply with ANSI, NEMA, EEI, and IPCEA standards.

D. Obtain permits and request inspections from authority having jurisdiction. Deliver certificates of final inspection to the Architect.

1.6 PROJECT CONDITIONS

A. Install work in locations shown on drawings, unless prevented by project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to work specified in other sections. Obtain permission of Architect before proceeding.

1.7 WARRANTY

A. Special Warranties: Provide warranties required under the respective specification sections.

B. Comply with procedures and requirements specified in Section 01 33 00 – SUBMITTALS.

1.8 ELECTRICAL WORK CLOSEOUT

A. Prepare the following items and submit to the Architect before final acceptance.
   1. Two copies of all test results as required under this section.
   2. Two copies of local and/or state code enforcing authorities' final inspection certificates.
   3. Copies of as-built record drawings as required under the General Conditions and this section.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 12 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK DESCRIPTION

A. Section Includes: Basic electrical requirements specifically applicable to Division 26 – ELECTRICAL sections in addition to Division 01 – GENERAL REQUIREMENTS sections.

1.2 SYSTEM DESCRIPTION

A. Furnish all labor and materials required to complete all electrical work as indicated on the drawings and/or specified herein. In general, the following work is included:
   1. Removal of existing electrical equipment devices, light fixtures, raceway and wire as indicated.
   2. Power systems; including branch circuits, outlets, wiring devices, raceways, and wiring.
   3. Raceways and outlets for telecommunication systems, including low voltage cabling.
   4. Raceways and outlets for fire alarm system and nurse call system, including low voltage cabling.
   5. Installation of power to equipment furnished by Owner or by others, including the furnishing of disconnects.
   6. Coordination of power to equipment furnished by others.
   7. Submittal of product data and shop drawings as specified in Section 26 05 10 – BASIC ELECTRICAL REQUIREMENTS.
   8. Preparation of “as-built” drawings as specified in Section 26 05 10 – BASIC ELECTRICAL REQUIREMENTS.

B. The term “wiring” shall include raceways, outlets, conductors, fixtures, and devices.

C. Wiring and connecting all electrical equipment supplied for installation and use in this contract and not specifically listed as work by others.

1.3 RULES, STANDARDS, AND PERMITS

A. The entire work shall comply as specified in Section 26 05 10 – BASIC ELECTRICAL REQUIREMENTS.

1.4 SUBMITTALS

A. Submit shop drawings and product data in accordance with Section 01 33 00 – SUBMITTALS and Section 26 05 10 – BASIC ELECTRICAL REQUIREMENTS.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials and equipment shall be new and those listed by Underwriters' Laboratories shall bear “UL” label of approval. Brand names, manufacturer's names and catalog numbers indicate standards of design and quality required.

B. Raceways:
   1. Rigid steel, zinc-coated, 3/4-inch minimum diameter, except as noted. Other sizes to conform to NEC Chapter 9, Table 3A, based on RHW wires.
   2. Electrical Metallic Tubing (EMT): Galvanized round bore with compression connectors, 3/4-inch minimum diameter, other sizes to conform to NEC Chapter 9, Table 3A, based on RHW wires.
   3. Flexible Steel Conduit: Galvanized steel, neoprene jacketed for wet locations. Continuous single strip 5 feet maximum, galvanized 3/4-inch minimum diameter or larger for fluorescent luminaire connection. (Use for connections to equipment subject to vibration only.)

2.2 ELECTRIC SERVICE SYSTEM

A. Voltages:
   1. Service Voltage: 480/277 volts, 3-phase, 4-wire and 208/120 volts, 3-phase, 4-wire.
   2. Utilization Voltages:
      a. 480/277 volts, 3-phase, 4-wire, solidly grounded.
      b. 208/120 volts, 3-phase, 4-wire, solidly grounded.

B. Work Under This Contract:
   1. Extend branch circuits from existing panelboards.
   2. Assure that equipment selected will fit spaces allocated for the equipment and provide equipment that will fit spaces allotted prior to ordering equipment.

C. Fittings and Accessories:
   1. Raceway Fittings:
      a. Rigid Conduit: Steel or malleable iron, galvanized. Zinc die cast fittings; not permitted.
      b. EMT: Compression type, steel or malleable iron. Set screw type not permitted.
      c. Flexible Metallic Conduit: Angle wedge type with insulated throat.
      d. Bushings: Metallic insulated type. Weatherproof or dust-tight installations; liquid-tight with sealing ring and insulated throat.
      e. Expansion and Deflection Fittings: O.Z./Gedney Type “DX” or accepted equal.

D. Cable Accessories: All conductor and cable sizes specified herein and indicated on drawings are based on copper type conductors or cables.
   1. Cable supports in risers; clamping device with insulation wedges or "Kellems" grips.
   2. Tags: Flameproof linen or fiber in accessible locations.
   3. Terminations, Splices and Tapes:
      a. Copper Conductors No. 10 and Smaller: Compression type connectors and clear nylon insulated covering.

E. Conductors shall be delivered to site in original factory packages or reels. Conductors shall be copper, #12 AWG minimum. Aluminum conductors are prohibited. No. 10 and No. 12 wires shall be solid conductor.
   1. Interior Locations: Branch circuits, Type RHW, TW, THW or THWN.
   2. Color Coding: As per code. Where color-coded insulation is unavailable, overlap color taping.

F. Boxes:
   1. Outlet and small junction boxes shall be zinc-coated pressed steel of ample size. Light outlets shall be fitted with no-bolt type fixture studs as necessary for fixture support. Minimum size of power outlet boxes, 4-inch square or octagon.
   2. Extension or raised rings for pressed boxes pressed from NEC gauge steel and galvanized.
   3. Large junction boxes and covers shall be zinc-coated. Screws for cover shall be brass.
   4. Provide all boxes in finished walls with plaster rings. Provide plaster ring and finish blank device plates for all small flush junction boxes.

G. Wiring Devices: Hospital grade unless otherwise noted.
   1. Receptacles, duplex 3-wire, 20 amperes, 125 volts, grounding type, hospital grade, Hubbell Style Line HBL2182WA.
   2. Ground fault circuit interrupting (GFCI) receptacles, duplex 3-wires, 20 amperes, 125 volts, hospital grade, Hubbell GFR 8300HWL.

H. Device and Cover Plates: Stainless steel Hubbell SS26 (single gang), SS262 (2 gang).

I. Circuit Breakers - Molded Case:
   1. Thermal-magnetic, 400 amp frame and below; solid state, 600 amp frame and above, bolt-on, quick-make quick-break for both types.
   2. Manually operated with insulated trip free handle and rated for switching duty.
   3. Multi-Pole Types: With internal trip bar.
   4. Terminals: Suitable for copper.
   5. Auxiliary devices as indicated.
   6. Frames as indicated, interchangeable trips and interrupting capacity not less than noted available symmetrical short circuit current.

J. Hardware, Supports, Backing, Etc.: Provide all hardware, supports, backing and other accessories necessary to install electrical equipment. Wood materials shall be termite-resistant. Ferrous material shall be galvanized for corrosion protection. Non-ferrous materials shall be brass or bronze.

K. Identification:
   1. Plates: All cover and device plates shall be furnished with self-adhering or adhesive backed labels under any one of the following conditions:
      a. Switches in locations where the equipment or circuits controlled cannot be readily seen.
      b. Standard duplex receptacles.
      c. Where so indicated on the drawings.
   2. Provide updated type written directories for all affected panelboards. Replace existing directories with new type written directories clearly indicating all branch circuits.

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS

A. Comply with local ordinances and regulations of the City and County of Honolulu. Workmanship subject to approval of Architect who shall be afforded every opportunity to determine skill and competency. Concealed work re-opened at random during formal inspection by Architect without additional charge to the Owner.

B. Construction shall conform to construction practices as recommended by American Electricians Handbook by Croft (latest edition), Edison Electric Institute, National Electrical Code 2017 edition, National Electrical Safety Code and applicable instructions of manufacturers of equipment and materials supplied for project.

C. Raceways:
   1. All conduits within building shall be rigid steel conduits or electrical metallic tubing. Electrical metallic tubing may be used only in dry walls and above dry ceilings.
   2. Cut raceways square, and ream inner edges. Butt together evenly in couplings.
   3. Make bends and offsets with hickey or conduit bending machine. Do not use vise or pipe tee. Bends made so that interior cross-sectional area will not be reduced. Radius of curve of inner edge will not be reduced. Radius of curve of inner edge of field bend not less than 10 times internal diameter of raceway. Use of running threads not permitted. Where raceways cannot be joined by standard threaded couplings, use approved watertight raceway unions.
   4. Cap raceways during construction with plastic or metal-capped bushings to prevent entrance of dirt or moisture. Swab all raceways out and dry before wires or cables are pulled in.
   5. Mount raceway free from other piping, valves, or mechanical equipment.
   6. Fish wires, free from other piping, valves, or mechanical equipment.

7. Install insulating bushings and two locknuts on each end of every run of conduit at enclosures and boxes. Provide grounding bushings as required to grounding receptacles and connect conduits to service ground, per NEC Article 250.
8. Project adequate number of conduit threads through box for bushings.
9. Run exposed raceways parallel with, or at right angles to structural or architectural elements.
10. Securely fasten raceways with galvanized pipe straps with screws or bolts and spaced not more than 7 feet apart, as conditions require. Vertical runs supported at intervals not exceeding 5 feet by approved clamp hangers. Conduit runs with one 90-degree bends or equivalent, 140 feet maximum without pull box. Conduit runs with two 90-degree bends or equivalent, 100 feet maximum without pull box. Support raceways from structure. Do not support from or on mechanical pipes, ducts or ceiling suspension wires.
11. After cables have been installed, seal all ducts with mastic compound to prevent entry of water from ductline to termination of ducts in areas below grade.
12. Install #10 gauge galvanized steel pull wire or nylon line with 200-pound tensile strength in all empty raceways.
13. All raceway penetrations through fire rated assemblies shall be fire stopped with the appropriate fire rated material.

D. Outlet Boxes: Provide outlet boxes to suit conditions encountered. Provide outlet boxes in spaces with extension or raised rings of such depth that metal will be flush with surrounding surfaces of opening. Concealed boxes shall be pressed steel, galvanized, 4 inches square by 1 1/2 inches deep minimum.

E. Junction, and Pull Boxes:
   1. Location: Clear of other work. Conceal junction and pull boxes in finished spaces and maintain accessibility.
   2. Support from building structure, independent of conduit. Do not support to ceiling systems.
   3. Outlet boxes for fixtures recessed in hung ceiling; accessible through opening created by removal of fixture.

F. Conductor fill in raceways shall conform to NEC Chapter 9, Table 5 (based on Type RHW wires) unless otherwise indicated on the drawings.

G. Wire Pulling: Mechanical means for pulling shall be torque-limiting type and used for #2 AWG and smaller wires. Pulling tension shall not exceed wire manufacturer's recommendations. Lubricants used for wire pulling in all areas except as noted shall be such that it will not damage conductor insulation or sheathing. For neoprene jacketed and plastic-sheathed conductors, use powdered soapstone.

H. Wire Splicing:
   1. Form wires neatly in enclosures and boxes.

2. Splice in accordance with NEC Article 110. Crimp connect conductors #10 and smaller. Reinsulate splices and waterproof splices. Reinsulate splices according to wire manufacturer's instructions. Splice insulation shall be 200 percent in thickness of original wire insulation and of same electrical and mechanical characteristics. Tape shall be 7 mil minimum thickness vinyl plastic.

I. Grounding:
1. Metallic enclosures, raceways and electrical equipment grounded according to requirements of National Electrical Code, Article 250. Ground connection to equipment, raceways, grounding type receptacles and other metallic parts directly exposed to ungrounded electric conductors by continuous metal raceways, or No. 14 AWG minimum, AWG copper, NEC type TW, green insulated. Install ground wire in all raceways size in accordance with NEC.
2. All ground wires shall be run together with circuit conductors.

J. Equipment Connections: Connect all equipment and appliances.

K. Finishing:
1. Patch, repair and restore all structural and architectural elements cut or drilled for installation of electrical system. Drilling, cutting, patching, repairing and restoring shall be subject to approval of Architect.
2. Attach electrical equipment to wood by wood screws, and to concrete by embedded or expansion inserts and bolts. Use power-driven charge with approval only. Close unused knock-outs on boxes or enclosures with metal cap. Powder actuated fasteners shall not be used on precast concrete. Do not use powder activated fasteners to attach enclosures and boxes to the building.
3. Wipe clean all exposed raceways and enclosures with rag and solvent. Prime painting and finishing of unfinished raceways and enclosures shall conform to Section 09 90 00 – PAINTING. Factory finished enclosures shall not be painted. Switches, circuit breakers, junction boxes, and equipment shall be identified by engraved plastic nameplates on cover or door. Voltage and phase shall be indicated on nameplates for switches and circuit breakers.
4. Connect circuits to circuit assignments shown on drawings. Provide neatly typewritten circuit directory for all panelboards. Circuit directory shall indicate location of loads served by each circuit.

3.2 TESTING

A. All wiring shall be tested to ensure proper operation according to functions specified.

3.3 GUARANTEE

A. Installation shall be complete in every detail and ready for use. Any item supplied by Contractor developing defects within one year of final acceptance by Owner, except lamps which shall be guaranteed for 50 percent of rated life as published by manufacturer, shall be replaced by such materials, apparatus or parts including installation labor to make such defective portion of complete system conform to true intent and meaning of drawings and specifications, at no additional charge to the Owner.

END OF SECTION

SECTION 26 50 00 - LIGHTING

PART 1 - GENERAL

1.1 WORK DESCRIPTION

A. Section Includes:
   1. All luminaires and lamps as shown on drawings will be purchased by the General Contractor.
   2. Furnish all labor and materials required to complete all electrical work as indicated on the drawings and/or specified herein. In general, the following work is included:
      a. New lighting system including luminaires and accessories.
      b. Components.
      c. LED drivers.

B. Related Sections:
   1. Section 26 05 10 – BASIC ELECTRICAL REQUIREMENTS.
   2. Section 26 05 12 – BASIC MATERIALS AND METHODS.

1.2 INCORPORATED DOCUMENTS

A. Published specifications, standards, tests or recommended methods of trade, industry or governmental organizations apply to work in this section where cited below:
   1. ETL: Engineering Testing Laboratories.
   2. IES: Illuminating Engineering Society of North America.
   3. NEMA: National Electrical Manufacturers Association.
   4. UL: Underwriters' Laboratories, Inc.

1.3 QUALITY ASSURANCE

A. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.

B. Supply all equipment and accessories new, free from defects and listed by Underwriters' Laboratories, Inc., or bearing its label.

C. Supply all equipment and accessories in compliance with the applicable standards listed in this section and with all applicable national, state and local codes.

D. All items of a given type shall be the products of the same manufacturer.

1.4 SUBMITTALS

A. Submittals shall be per Section 01 33 00 – SUBMITTALS and Section 26 05 10 – BASIC ELECTRICAL REQUIREMENTS.

B. Submittals shall be complete, bound under cover and indicating project title. Contractor shall review submittals for conformance with contract documents, make necessary revisions and submit to Architect, indicating the following:
   1. Manufacturer's name, brand name, and catalog reference of equipment supplied.
   2. Details of construction and finishes of luminaires.
   3. Drawings: To scale (as noted on drawings).
   4. Photometric data, including optical performance rendered by independent testing laboratory developed according to IES Methods as follows:
      a. For down and semi-down lights used for general illumination:
         1) Coefficients of utilization.
         2) Candlepower data, presented graphically and numerically, in 10 degree increments (5 degree, 15 degree, etc.). Data developed for up and down quadrants normal, parallel, and at 45 degree to lamps if light output is asymmetric.
         3) Zonal lumens stated numerically in 10 degree increments (5 degree, 15 degree, etc.) as above.
      b. For Other Luminaires: Candlepower curves, presented graphically and numerically, in 10 degree increments (5 degree, 15 degree, etc.), or smaller increments for narrow-beam luminaires.
   5. Luminaire Lists: Submit quantity list of luminaires.

1.5 GUARANTEE

A. Guarantee of all equipment and labor by manufacturer for one year from written notification of acceptance by the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. Type of luminaires indicated by letters or letters followed by numbers. See drawings for tabulation of fixture types.

B. LED fixtures shall be in compliance with IESNA Standard LM-80 and demonstrate L70 life after 50,000 hours.

C. LED lamps shall be a color temperature of 3500 degrees Kelvin, a CRI of 80 minimum, and lumen maintenance L70 rating of 50,000 hours minimum.

D. Sheet Metal Luminaire Housings: Welded construction, with exceptions noted under luminaire types.

E. Luminaire catalog numbers used to illustrate equipment type do not necessarily denote required mounting equipment or accessories. Provide accessories to suit.

F. Removable from Luminaire Housings: Chains, springs, hinges or other fastening devices required on apertures, reflectors and baffles.

2.2 LUMINAIRE CONSTRUCTION

A. Free of light leaks.

B. Ventilation for:
   1. LED drivers.

2.3 LUMINAIRE CONSTRUCTION

A. Free of light leaks.

2.4. LED DRIVERS

A. Driver shall be of the constant current type.
   1. Voltage: 120/277.
   2. Constant Current.
   3. Driver Current: 350mA-700mA.
   4. Maximum THD: 10 percent.
   5. Minimum Power Factor: 0.9

B. Acceptable Manufacturers:
   1. Philips Advance – Xitanium
   2. Lutron Hi-Lume
   3. Sylvania/Osram

C. Dimmable LED Drivers: Driver shall be of the constant current type.
   1. Voltage: 120/277
   2. Driver Current: 350mA-700mA
   3. 0-10v dimming cable down to 10 percent
   4. Maximum THD: 10 percent
   5. Minimum Power Factor: 0.9

2.5 LIGHTING CONTROLS

A. Switches:
   1. Single Pole Wall Switches: Specification grade commercial Style Line decorator side and back wired. Flush mounting, heat-resistant plastic housing and self-grounding metal, strap. Silver or silver alloy contact. Rated 20A, at 120-277V. Use single pole as indicated on drawings or required. Hubbell DS120W.
   2. Dimmer Switch: Linear slide with thin profile design. Lutron NOVAT-NFT-10-120-WH. Provide compatible dimmer switch for LED luminaires.
   3. Ceiling occupancy sensor: Ultrasonic and passive infrared, adjustable time delay, 120VAC, Hubbell OMNIDT1000QTI-MP120QTI, white.
   4. Wall switch occupancy sensor: Automatic passive infrared, dual 120/277 VAC, adjustable time delay and sensitivity. Hubbell IWSZP3PW.

B. Wall Plates: Stainless steel style line decorator. Hubbell SS26 (single gang), SS262 (2 gang).

2.6 CONTACT SURFACES

A. Aluminum to Bronze: Coating equal to Minnesota Mining and Manufacturing Co., No. 1706, "Coro-Guard", applied to both surfaces.

B. Aluminum to Concrete: Coating of polyurethane base paint, similar to Lehman Bros. "Ox-O-Deck", or asphaltum.

2.7 WIRING

A. 120/208 Volt Luminaire Wiring: 300 volt, 302 degrees F (150 degrees C), Type AP or SFF, beginning at separately mounted outlet box.

B. 277/480 Volt Luminaire Wiring: 600 volt, 220 degrees F (105 degrees C). Appliance Type AWM or THHN, beginning at separately mounted outlet box.

C. Splices: Mechanical spring pressure connector or crimp connector.

D. Minimum 3/8-inch (9.5 mm) flexible conduit connections for recessed fixtures except as indicated. Maximum length: 6 feet, 0 inches (1.85 M).

2.8 SUPPORTS

A. Individual Luminaires: Carry weight of fixture to building structure, clear of ducts or pipes. Do not support to ceiling systems.

2.9 FINISHES

A. Unpainted Aluminum Surfaces: Satin anodized, except as noted.

B. Reflectors: Free of marks, labels or blemishes.

PART 3 - EXECUTION

3.1 INSTALLATION OF LUMINAIRES

A. Locations:
   1. On Drawings: Diagrammatical.
   2. Verify with ceiling types on the architectural reflected ceiling drawings.
   3. Coordinated space conditions with other trades.
   4. Luminaire Rows: In straight lines except as noted.
   5. Surface Mounting: As noted.
   6. Coordinate space conflicts with the mechanical drawings.

B. Mounting: Ceiling Construction:
   1. Refer to Architectural Drawings for finish schedules.
   2. Refer to manufacturer's installation details and applicable codes for required luminaire mounting accessories.

C. Replace blemished, damaged, or unsatisfactory luminaires and drivers as directed.

END OF SECTION

SECTION 28 31 00 - FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Materials, equipment, fabrication, installation, and tests in conformity with applicable codes and authorities having jurisdiction.

B. Manual Stations.

C. Automatic Detectors.

D. Visible Devices.

E. Audible/Visible Devices.

F. Control all magnetic door holders.

G. Monitor all mechanical equipment as noted.

H. Monitor all fire smoke dampers.

I. Conduit and system wiring.

J. Anchorage, hangers and supports, for fire alarm equipment as required.

K. Shop drawings.

L. Record drawings.

M. Tests and Guarantee.

1.2 SUBMITTALS

A. Submit under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES.
   1. Manual pull station.
   2. Automatic detectors.
   3. Audible/visible devices.
   4. Visible devices.
   5. Intelligent devices.
   6. Magnetic door holder devices.
   7. Point to point wiring diagrams.

1.3 QUALITY ASSURANCE

A. Regulations and Codes: Perform the entire installation in strict accordance with the applicable provisions of the latest edition of the National Electrical Code, Local Ordinances, and rules and regulations even though the work is not mentioned in these particular Specifications or Drawings.

B. Examination of Drawings: Carefully study Drawings and Specifications pertaining to the work. If any of the work laid out, indicated or otherwise specified, is contrary to or conflicts with any local, United States ordinances or regulations, report the same to the Architect before a bid is submitted. The Architect will then issue instructions as to procedure.

C. Allowable Tolerances: Specifications are accompanied by Architectural Drawings of building, and diagrammatic Electrical Drawings showing locations of outlets, fixtures, switches, circuit runs, devices, and other equipment. Locations are approximate and before installing, study adjacent construction details and make installation in most logical manner. Any devices may be relocated within 10'-0" before installation at direction of Architect without additional charge to the Owner. Before installing, verify dimensions and sizes of equipment at job site. Circuit and conduit routing is typical and may be altered in any logical manner, however, obtain Architect's approval of changes and show same on record drawings.

1.4 PERMITS, TESTS AND INSPECTIONS

A. Permits, Fees and Licenses: Apply, secure, and pay for required permits, fees, licenses, and royalties to accomplish the work.

B. Tests and Inspections: Apply, secure, and pay for required tests and inspections to accomplish the work in conformance with these Drawings and Specifications.

1.5 OPERATION AND MAINTENANCE DATA

A. Maintenance Agreement: Submit a cost quotation to the Owner for providing a yearly preventive maintenance contract in servicing their fire alarm system. This contract to take effect after the full year's guarantee is expired.

B. Operating and Maintenance Instructions and Spare Parts Lists. Provide six (6) complete sets of operating and maintenance instructions and spare parts lists to the Architect, bound in suitable manuals. Mark manuals and parts lists to indicate items appropriate to the unit being furnished. Include an as-built drawing of the entire fire alarm system in the manual. Instruct maintenance personnel in the operation and maintenance of the Fire Alarm System.

1.6 WARRANTY

A. Complete installation in every detail and ready for use. Replace items supplied, which develop defects, within one year of final acceptance by Architect. Replace with materials, apparatus or parts including installation labor to make such defective portion of complete system conform to true intent and meaning of Drawings and Specifications at no additional charge to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Use standard products of a single manufacturer for equipment and accessories specified herein. Provide UL label on each major component. Provide a Fire Alarm System that is UL listed, labeled, installed and maintained per NFPA 70, NFPA 72, National Fire Code and Section 13.7.2006 NFPA.

1. This specification is based on SimplexGrinnell's fire alarm system. No substitutions.

B. System Operations:

1. Operation of a pull station lever on any manual station or activation of any automatic detector in System causes the following events to occur:
   a. Annunciate the type of device and the zone activated at the Control Panel.
   b. Activate general alarm signaling (audible/visible) throughout the building.
   c. Audible and visible signaling devices shall continue to operate until the system has been returned to normal or until silenced from the Control Panel.
2. The system detects changes in status of the monitored points within the system and shall indicate any such changes at the Control Panel. The green all clear LED shall be illuminated when conditions are normal. The receipt of an alarm condition causes the following:
   a. Display the alarm condition on the alphanumeric display.
   b. Sound the alarm signal at the Control Panel and illuminate the system alarm LED. The alarm signal and LED pulses until the appropriate "acknowledge" switch is depressed which causes it to be silenced.
   c. The system alarm LED remains illuminated and the system all clear LED remains extinguished until the alarm condition has been corrected.
3. Annunciation of fire alarm signals shall be by audible tones and by display.
4. Activation of any manual fire alarm station, space smoke detector or duct smoke detector, flow switch shall initiate a fire alarm signaling.
5. A signal from the air duct smoke detectors shall also actuate the general fire alarm signaling.

C. System Components: System includes the following:
   1. Manual Stations: Simplex 4099-9021.
   2. Automatic fire smoke detector with base. Simplex 4098-9714 with 4098-9792 base.
   3. Smoke Detectors: Simplex 4098-9714 w/4098-9792.
   4. Duct Smoke Detectors. Simplex 4098-9756 with sampling tube, relay IAM, and relay form C SPDT PAM-SD.
   5. Addressable Audio/Visual Devices: Simplex 4906-9227.
   6. Addressable Visual Device: Simplex 4906-9201.
   7. Point-to-point wiring diagrams and device wiring diagrams.

D. Component Specifications:
   1. Initiating Devices:
      a. Manual Stations: Manual alarm initiating stations shall be wall mounted over flush outlet boxes. When located exposed to weather, outlet box shall be of cast metal with watertight gasket between box and station. Stations shall be no grip, of single pull, with cast-in operating directions. Enclosure shall be of heavy-duty Lexan, red enamel finished with white lettering. Switch shall be normally open, UL approved for fire alarm service. Case shall be equipped with foolproof latch, which may be opened for testing, or resetting after station has been operated for fire drills.
      b. Manual Station Protective Shield: Protective shield shall be tamperproof, clear Lexan shield and red frame, which is to be mounted over manual stations. The protective shield shall be equipped with audible horn and battery.
   2. Audio and Visual Devices:
      a. Horn shall be 4", 24V DC surface type with a red finish. Output shall be 100 dB at 10 feet or as stated on drawings.
      b. Flashing Light: The flashing light shall include a Xenon flasher with built-in reflector and the word "FIRE" imprinted on the clear pyramidal lens. Mounting shall be semi flush. Visual signals shall meet ADA requirements of 110 candela-second Xenon flash output or as stated on drawings.
   3. Smoke Detectors: Smoke detector shall be of the photoelectric type with low profile head and a separate 2-wire base. The smoke detector shall contain a red LED, which shall pulse to indicate power on and glow continuously to indicate alarm. Detector shall also contain test switch (magnetically operated), which shall test the electronics of the unit and simulate an alarm condition. Detector shall be UL cross-linked with the main FACP.
   4. Conduit and Wiring: Conduit and wiring shall be provided in accordance with Section 26 05 10 - BASIC ELECTRICAL REQUIREMENTS of these specifications.
   5. Installation of Fire Alarm Equipment: Install all fire alarm components forming part of work of this Section in complete accordance with manufacturers' recommendations and all pertinent codes and regulations.

2.2 FIRE ALARM SYSTEM WIRING

A. All wiring shall conform to NEC Article 760 and to the manufacturer's wiring specifications. Minimum sizes shall be as follows:
   1. Signal Line Circuits - #18 AWG TSP solid copper.
   2. Notification Circuits – #14 AWG solid copper.
   3. Power Circuits - #12 AWG solid copper.

B. All wiring shall be installed in conduit (EMT).

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS

A. Comply with local ordinances and regulations of the City and County of Honolulu. Workmanship is subject to the approval of the Architect who will afford every opportunity to determine skill and competency. Reopen concealed work at random during inspection without additional charge to the Owner.

3.2 RACEWAYS

A. Steel, installed as specified in Section 26 05 10 - BASIC ELECTRICAL REQUIREMENTS. Conceal raceways unless otherwise noted on the Drawings.

3.3 CONDUCTORS

A. Not less than sizes indicated or as specified by the equipment manufacturer. Use red jacketed color-coded, plenum rated conductors. Tag conductors at terminal points and splice boxes with wire markers. Install in ceiling cable trays. Furnish a schedule showing color-coding and wire marking to be used prior to installation of conductors. Solder or crimp connect splices. Wirenuts are not permitted.

3.4 EQUIPMENT INSTALLATION

A. Install stations, speakers, zone addressable monitors and detectors to height indicated on the Drawings. Install panels in locations noted. Label annunciators to show zones to which stations are connected. Should any defects be discovered in the system in the course of the final test, correct same.

B. Installation of duct smoke detectors shall be by certified HVAC contractor.

3.5 SYSTEM VERIFICATION

A. The fire alarm equipment supplier shall make a thorough inspection of the complete installed fire alarm systems including all components such as manual stations, thermal detectors, products-of-combustion detectors, sprinkler flow switches, supervisory switches, controls, etc., to insure the following:
   1. Complete and functional system.
   2. Underwriters Laboratories requirements.
   3. Installed in accordance with manufacturer's recommendations.
   4. Regulations covering supervision of components are adhered to.

3.6 TESTING AND GUARANTEE

A. The Electrical Contractor shall guarantee all wiring and equipment free from inherent mechanical and electrical defects for a period of one year from the date of completion.

B. Submit a written test report from an authorized representative of the equipment manufacturer that the system has been 100 percent tested and approved. Submit prior to request for final payment.

C. The NFPA 72 Record of Completion shall be completed and supplied.

D. Provide a complete set of record as-built drawings, indicating system components and location, wiring, and conduit system, and operation details.

E. Final testing shall be performed in the presence of the Local Fire Department and the Owner's representative. The final test shall include a complete test of all system devices and functions, and any additional testing requested by the Local Fire Department. The Electrical Contractor shall provide all personnel and equipment necessary to accomplish the test.

3.7 DIVISION OF RESPONSIBILITY

A. The Electrical Contractor shall be responsible for obtaining final acceptance of the fire alarm system as required by the Local Fire Department and authority having jurisdiction.

END OF SECTION

APPENDIX K

BID PROPOSAL FORM – SECTION 00400

(see following pages)

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, ytaylor@hhsc.org

RE: RFP 26-0600 1ST FLOOR SSB HVAC REPLACEMENT AND RENOVATIONS

Dear Yvonne:

The undersigned has carefully examined the attached plans and specifications marked "KONA COMMUNITY HOSPITAL, 1ST FLOOR SSB HVAC REPLACEMENT AND RENOVATIONS" 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)}:

1.	DIVISION 1: General Requirements	$_____
2.	DIVISION 2: Selective Building Demolition	$_____
3.	DIVISION 5: Metals	$_____
4.	DIVISION 6: Wood, Plastics, and Composites	$_____
5.	DIVISION 7: Thermal and Moisture Protection	$_____
6.	DIVISION 8: Openings (Exclude Door #5)	$_____
7.	DIVISION 9: Finishes	$_____
8.	DIVSION 23: Heating, Ventilating, and Air Conditioning	$_____
9.	DIVISION 26: Electrical	$_____
10.	DIVSION 27: Communications	$_____
11.	DIVSION 28: Electronic Safety and Security	$_____

TOTAL LUMP SUM BASE BID: $_____

Total in Words

_____

ALTERNATE NO. 1

Door #5 AD SYSTEMS XTENDSLIDE

1. DIVISION 5: Metals $_____
2. DIVISION 8: Openings $_____

TOTAL LUMP SUM ALTERNATE NO. 1 BID: **$_____**

Total in Words

_____

ALTERNATE NO. 2

Door #5 ANDERSON'S MULTIGLIDE

1. DIVISION 5: Metals $_____
2. DIVISION 8: Openings $_____

TOTAL LUMP SUM ALTERNATE NO. 2 BID: **$_____**

Total in Words

_____

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. 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)
   - Any Other Applicable License (Copy)
   - Letter from Surety Committing to Provide the Required Bonds

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

APPENDIX L

CONTRACTOR GUIDELINES 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.

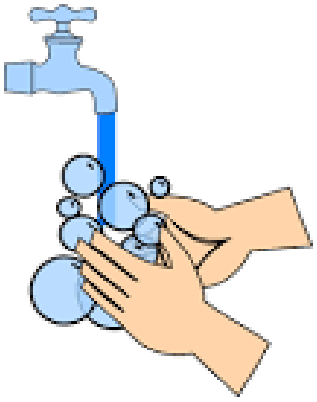


Hand-washing and Disinfection

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.

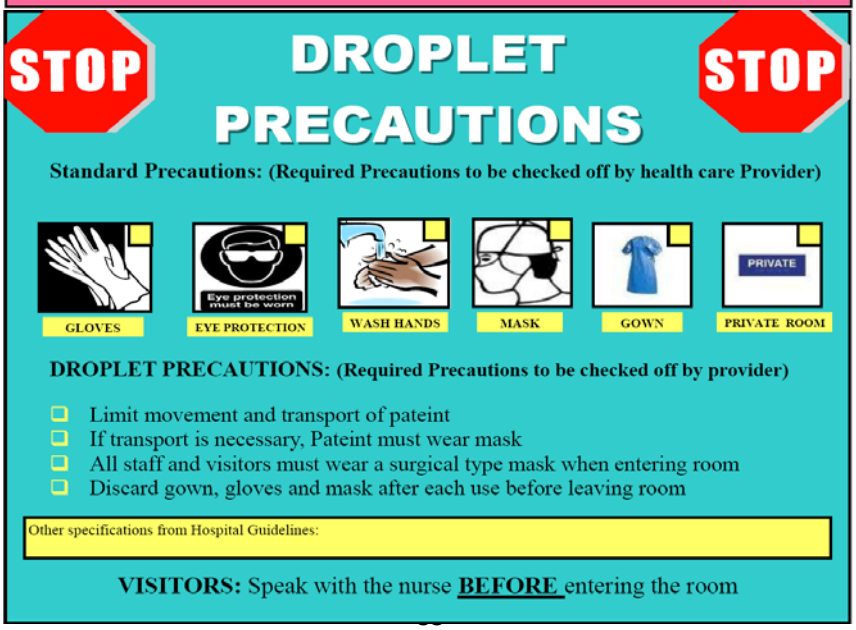
Infection Control Containment Systems

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.

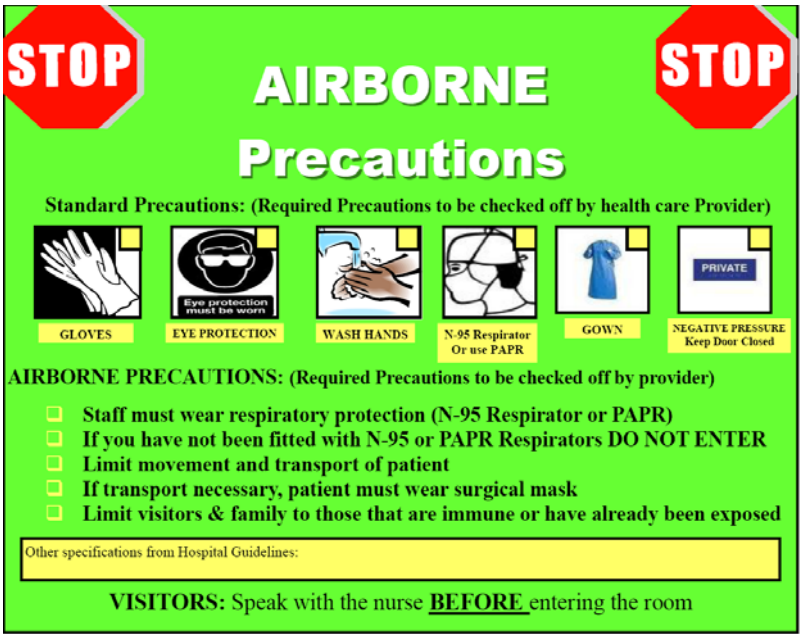


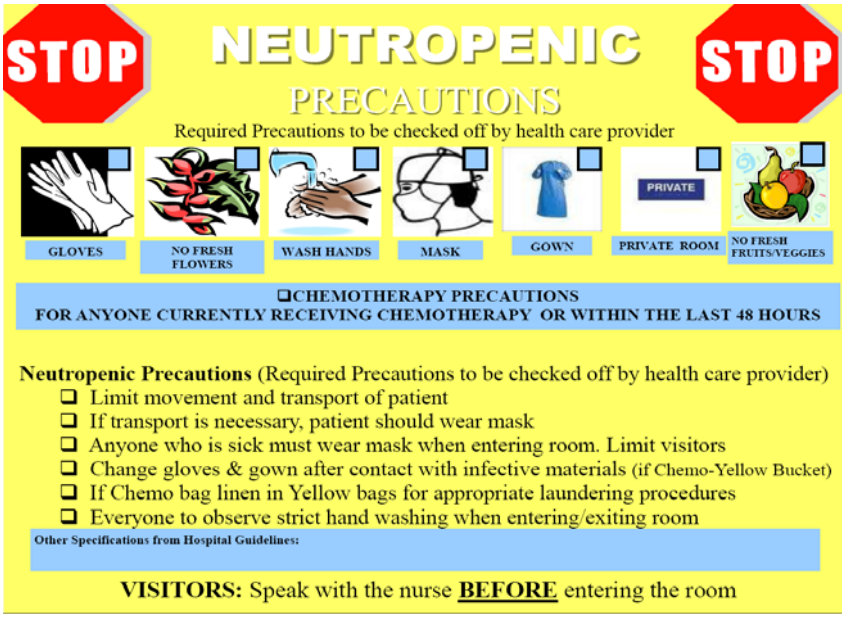
The following five Infection Control Isolation Signs are used in the facility to indicate serious and potentially infectious conditions. Personal Protective Equipment and specific disinfection procedures are REQUIRED to enter/exit these areas safely. You MUST work with nursing on appropriate procedures 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:

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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: _____