LISLE LIBRARY DISTRICT

DUPAGE COUNTY

ILLINOIS

LISLE LIBRARY DISTRICT

RFP:

BAS REPLACEMENT

August 13th, 2024

001113 Advertisement for Bids

NOTICE IS HEREBY GIVEN by the President and Board of Trustees of Lisle Library District, DuPage County, Illinois, that sealed bids will be received for the following improvement: **BAS Replacement**. The Project Specifications will be available on our website, https://www.lislelibrary.org beginning August 13th, 2024, until bid opening day.

An electronic set bid Documents will be provided to interested bidders, beginning on August 13th, 2024, upon email request to Edgardo Nunez at enunez@ccsdifference.com.

Questions shall be directed to: enunez@ccsdifference.com. The deadline for questions is 5:00 p.m., August 28th, 2024.

Said bids will be received up to 1:00 p.m. local time, September 4th, 2024, at the library's front desk, 777 Front St, Lisle IL, and will be publicly opened and read at 1:10pm on the same day and location.

Indicate on the face of the sealed envelope: "SEALED BID FOR: BAS Replacement". Unsigned or late bids will not be considered. The proposer assumes the risk of any delay in handling or delivery of the mail. Lisle Library District reserves the right to accept or reject any or all bids when there are sound documented reasons to do so and to waive informalities and minor irregularities in bids received.

No bid shall be withdrawn after the opening of the proposals without the consent of the President and Board of Trustees of Lisle Library District for a period of Sixty (60) days after the scheduled time of closing bids.

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002113 Instruction to Bidders

Purpose

Lisle Library District, DuPage County, Illinois, notifies that sealed bids will be received for the following improvement:

BAS Replacement.

The Project consists of the BAS replacement as detailed in the Bid Documents.

Proposal Preparation/Format

Proposal shall be submitted in a sealed envelope addressed to:

Lisle Library District,
777 Front St, Lisle,
IL 60532
RE: SEALED PROPOSAL FOR: Lisle Library District RFP: **BAS Replacement.**

The Contractor's name and address shall appear in the upper left-hand corner of the proposal envelope with the RFP name appearing in the lower left-hand corner of the envelope. Bids will be submitted in an orderly format divided into sections and tabbed as appropriate. The Contractor shall submit minimally one (1) original, one (1) copy and one (1) electronic copy (PDF copy on flash drive) of the Bid. Failure to submit a proposal in this manner may be considered cause for rejection of the proposal as determined by Lisle Library District **(LLD).**

LLD does not assume the responsibility for delayed postal deliveries and does not recognize postmarks as representing the fact that a bid has been "received" by LLD before the specified deadline. The method of delivery of the proposal is solely the Contractor's risk.

If upon examination of the Bid Documents, the bidder shall discover discrepancies, omissions, or duplications in the bid documents, or questions of scope or intended quality, the bidder shall immediately notify LDD and its representatives, at enunez@ccsdifference.com, no later than the deadline for request for clarification indicated elsewhere in this RFP.

Contractor's may rely only on information contained in the proposal documents and provided in written addenda during this process and shall not rely on any oral information or interpretations given by any representatives or agents of LLD.

Contractor must complete, date, and sign the affidavits and certifications accompanying this proposal document. Failure to do so may result in rejection of the bid.

Contractor agrees to comply with all pertinent statutes of the State of Illinois relative to employment in connection with public contracts including, but not limited to, the pertinent provisions of the Illinois Fair Employment Practices Act, as amended; and agree that no unfair employment practice as defined therein, be committed by the Contractor, its subcontractor(s), suppliers of materials or services to the Contractor or their subcontractors, or any labor organization furnishing skilled or unskilled labor to the Contractor or their subcontractors.

Before submitting proposals, prospective Contractor(s) shall carefully examine the proposed Contract documents, acquaint themselves with all governing laws, ordinances, etc. and otherwise thoroughly familiarize themselves with all matters which may affect the performance of the work. The act of submitting a bid shall be considered as meaning that the Contractor has so familiarized themselves and, therefore, no concession will be granted by LLD because of any claim of misunderstanding or lack of information. Contractor(s) is expected to read and study all specifications with special care and to observe

all their requirements. Discrepancies, ambiguities, errors, or omissions noted by the Contractor shall be reported promptly for correction or interpretation before the date of the opening of proposal.

Proposal Withdrawal

Bids may be withdrawn by letter, telegram, or in person prior to the time and date established for the opening of bids.

Exception to preparation/Format

The RFP describes the requirements and response format in sufficient detail to secure comparable proposals, recognizing that various proponent approaches may vary widely. Any proposal that differs from the described format may be considered non-responsive and rejected.

Request for Clarification

All requests for clarification shall be electronically submitted to: enunez@ccsdifference.com. Electronic inquiries shall be considered submitted once an electronic reply confirming receipt is sent to the inquirer. The deadline for clarifications is **5:00 p.m., August 28th, 2024**.

Site Visits / Access

The optional Pre-Bid Walkthrough is scheduled for 8/21/2024 at 11:00 am CST. Please submit assistance confirmation electronically at least 48 hours in advance of the prior mentioned site visit date to: enunez@ccsdifference.com. Electronic inquiries shall be considered submitted once an electronic reply confirming receipt is sent to the inquirer.

Submittal Requirements

Proposals must be received at Lisle Library District, 777 Front St, Lisle, IL 60532, up to 1:00 p.m. local time, September 4th, 2024. Unsigned or late bids will not be considered. Prospective packages shall be submitted in a sealed envelope clearly marked. No facsimile of proposals will be accepted. All material considered Confidential or Proprietary shall be identified within the proposal.
Oral, telephonic, telegraphic, or facsimile transmitted bids will not be accepted. The bids shall be in a sealed envelope, properly marked with the title:

SEALED BID FOR:
BAS Replacement

Implied Requirements

Any product or service that is not specifically addressed in the RFP, but which is necessary to provide functional capabilities proposed by the Contractor, must be included in the proposal.

Bid and Presentation Costs

LLD is not liable in any way for any costs incurred by the Contractors in the preparation of their proposals in response to this RFP, nor for the presentation of their proposals and/or participation in any discussion or negotiations.

Acceptance of Bid Content

The content of the Bid of the successful Contractor will become part of any contract awarded because of these specifications.

Basis of Award

Based on its evaluation of the bids, LLD intends to award the project in the based interest of Library, based on Cost, Scope, Quality and Schedule considerations.

002400 Procurement Scope

Existing Conditions

Space heating and cooling for the Lisle Library District is provided by (4) existing Air Handling Units (AHUs) located in two mechanical rooms on the first floor. Each AHU serves a separate portion of the building and provides all ventilation, cooling, and heating via individual zone VAV boxes, VRT boxes and Fan Powered VAV boxes with associated thermostats by Schneider located throughout. The hot water heating coils for the building are supplied by (1) Weil-McLain Boiler and (1) Bryan Boiler with associated inline pumps.

Each AHU is manufactured by Trane and (3) of the units operate as a variable air volume system with the remaining (1) operating as a multizone unit. Each AHU is equipped with a Direct-Expansion (DX) coil for cooling and a hot water coil for heating that is provided by the building's existing boiler plant.

Condenser units (CU) associated with each AHU are located on grade in mechanical enclosures located outside of each mechanical room and are manufactured by Trane and Carrier. It should be noted that the western mechanical enclosure is located under a metal grating.

The existing system is currently controlled by a Schneider Electric controls system with Tritium Niagara front end. Below is a list of existing controllers currently installed in the building via BacNet IP/MS/TP. Refer to attachments for additional information.

Replacement of Existing Building Automation System

It should be noted that the design-build Prime Contractor is responsible for final design, permitting, construction, commissioning, warranty, and maintenance of new equipment provided under this project. The following scope of work is developed as a basis of design and is a part of the project documents and Owner Project Requirements (OPR).

The intent of the project is to replace the building automation system controllers with new open protocol controllers and recommission existing HVAC system.
To facilitate the bid, we have prepared preliminary submittals for the new boiler equipment. The following is a proposed scope of work for the BAS Replacement Scope:

General Scope:

i. Contractor shall remove and salvage existing ceiling tile and grid as required for the testing and implementing controls scope requirements.
ii. Contractor shall reinstall all ceiling tile and grid that was removed as part of the project. Any damaged tile or grid shall be replaced at the cost of the contractor.

Controls Scope:

i. Contractor shall disconnect and remove existing building automation controllers throughout the building. Existing control wiring and front end computer shall remain and reused with new building automation system.
ii. Contractor to Furnish and install new controllers to control existing equipment as noted below and in the sequence of operations. New controller to be integrated into existing Tridium Niagara front end. Coordinate IP addresses with owner's IT department to prevent IP address conflicts.

Graphics to have a similar layout to existing graphics; BASC responsible for obtaining approval from owner regarding graphical layout.

iii. BASC to reuse existing control wiring as necessary for installation of new controllers. Provide new control wiring in conduit as required for implementation of sequence. New control conduit shall be painted or dyed blue. Minimum conduit size shall be ¾".

iv. BASC shall perform full functional testing prior to final acceptance of this system and prior to final demonstration to Elara.
    a. Provide in progress and completed point to point checkouts throughout the project.
    b. BASC to prepare and provide documentation confirming that sequences of operation have been tested.
    c. Functional testing shall, at a minimum, document completed testing of the following:
        - Freezestat testing
        - High Static safety testing
        - Low static safety testing
        - Fan Failure Testing
        - Duct smoke detector / fire alarm shut down relay
        - All sequences of operation including start-up, shutdown, equipment failures, etc.
        - Completed graphics with all hard-wired points and associated setpoints in sequences of operation mapped.

v. All Tridium Niagara licenses provided shall be fully open. If the license statement is found to be only a partially open license during construction, the contractor will be required to pay the additional licensing fees to "open" the license at no additional cost to the owner. NICS statement for workbench in, workbench out, station in, and station out shall contain wildcards (*) as opposed to requiring specific tools to work on the system.

vi. At the conclusion of the project, the BASC is to give all service tools to the Lisle Library district including all admin level passwords and provide 8 hours of training to Lisle Library staff.

Minimum Requirements

i. Design Build Contractor Responsibilities: As this project is a design-build project, the successful contractor will be responsible for the overall execution of the project, including final equipment selections, design, construction, operation, commissioning, warranties and preventative maintenance.

ii. Insurance Requirements: Refer to Instructions to bidders for additional Service information.

iii. Target Completion Date: the intent is for all work to be completed by 8 weeks from commencement of onsite work.

iv. For each Air Handling Unit, the acceptable allowable downtime for the hot water heating coil, DX cooling coil, Fan and each individual zone shall be 4-6 Hours.

v. The contractor shall complete the work on one Air Handling unit prior to beginning work on the next unit to minimize impact to the library.

vi. Code Compliance: This project shall comply with all relevant local and state codes including the 2021 International Building (IBC), Mechanical (IMC), energy conservation code (IECC), 2020 National Electrical Code (NEC) and the Lisle Village building code.

vii. Shop Drawings: The successful contractor shall provide shop drawings for review by the owner and owner's representative.

viii. Submittals: Similar to shop drawings, final submittals shall be provided prior to the release of equipment for review by the owner and owner's representative.

ix. Responsible for Permit: The successful contractor shall be responsible for obtaining required permits for this work including any permit drawings that may be required.

x. Warranties: The entire project shall be provided with a parts and labor warranty for the 1st year, which shall include preventative maintenance as recommended by the boiler manufacturer.

xi. Project Meetings: The project manager is required to attend any project meetings.

xii. Owners specific requirements:

a. AIA Contract: Refer to the attached Owner's AIA A142 contract. Submission of a bid assumes the contractor agrees to utilize the Owner's contract.

xiii. Building Rules and Regulations: The successful contractor shall work within the rules and regulations of the building in terms of work hours, entry into areas, storage and staging, proception of finishes and parking.

xiv. As-built Drawings: After the completion of the construction phase, the contractor should include as-built Drawings as part of the project close-out documents submittal.

xv. Bidding Instructions: At a minimum the following shall be provided with the bid:

a. Completed Bid Form (attached)
b. Anticipated Design Schedule
c. List of Anticipated Subcontractors
d. Example maintenance contract

003100 Available Project Information

Summary

This document summarizes information available to Bidders:

xvi. Contract documents:
   a. Request for proposal dated 08-13-2024

xvii. Reference documents:
   a. 230923 – Controls Specifications **(Attachment A)**
   b. 230993 – Sequence of Operations. **(Attachment B)**
   c. Existing controller schedule. **(Attachment C)**
   d. Rider to Owner Contract **(Attachment D)**
   e. Layout Reference Drawing **(Attachment E)**

004100 Bid Form

RFP: BAS Replacement
Proposal Due Date /Time: September 4th, 2024, by 1:00pm.

For consideration, Bids must be received no later than the bid due time as set forth above.

You are invited to submit a Bid for the above described work subject to the terms and conditions set forth in the Instruction to Bidders.

Bidder Identification:

Name:
Address:
Address:
City, State, Zip:
Contact Name:
Telephone:
Email address:

Bid Submittal Requirements

The Undersigned hereby confirms that all requirements of the bid submittal listed in the Request for Proposal have been included in the submitted Proposal. Failure to include any of the requirement materials may be considered cause for rejection of the proposal. Documents that need to be submitted with this proposal include:

- ❑ Signed and completed Bid Form
- ❑ Contractor critical path schedule
- ❑ Bid Bond in the Sum of 10% of the base bid amount
- ❑ Certification of prevailing wage requirements*
- ❑ Certification of jobsite Covid-19 requirements compliance*
- ❑ Certification of Illinois Preference Act Requirements*
- ❑ Non-Collusion Affidavit signed and notarized*
- ❑ Bidder eligibility Certificate*
- ❑ Certificate of compliance with Illinois Frug-Free Workplace Act*
- ❑ Certificate regarding non-discrimination in employment – protected categories*
- ❑ Certificate regarding sexual harassment policy*
- ❑ Contractor and subcontractor substance abuse prevention policy*
- ❑ Certificate regarding criminal background investigation
- ❑ Documentation that contractor’s insurance rating is 1.0 or less

- ❑ Letter from president of the company certifying absence of any filings for protection from creditors under Federal bankruptcy laws and/or placement under receivership or similar restrictions in the last five years.
- ❑ Letter from president of the company certifying absence of contracts terminated by owner for nonperformance in the past five years, except where not due to the material fault of the bidders.
- ❑ Letter from bonding company certifying absence of claims on bidder's bond in the past five years, except where not due to the material fault of the bidder.
- ❑ Bidder exclusions and clarifications (if any)
- ❑ Bidder comments or requested modifications to standard AIA A142, if any.
- ❑ Completed AIA Document A305-1986

*** : Document attached at the end of the Bid Form section.**

Base Bid

The Undersigned proposes to furnish and perform all Work necessary for the completion of the General Contract as shown and specified in accordance with the Contract Documents for the BASE BID LUMP SUM of:

$_____

_____ Dollars

and, if this proposal is accepted, agrees to execute a formal Contract subject to modifications as may be exercised by the Owner under alternate proposals.

Proposed Unit Costs

Proposed Labor unit rates for modifications to scope.

UNIT COST SHEET		
Item	**Unit Cost**	**Comments**
Superintendent	$ (hr)	
Technician	$ (hr)	
Foreman	$ (hr)	
Journeyman	$ (hr)	
Laborer	$ (hr)	

Proposed Labor & Material Markup Rates

Markups for modifications to scope.

MARKUP SHEET		
Equipment	**Cost**	**Comments**
OH&P	%	
Insurance	%	
Bond	%	

Proposed Ongoing Service & Support Rates

Provided hourly rates shall be inclusive of all OH&P, insurance & Markups

RATE SHEET				
Category	**Proposed Rate / Percentage**			**Comments**
	Hourly Rates for service for 1 year from the date of project completion			
	Regular	**Overtime**	**Double**	
Superintendent	$	$	$	
Foreman	$	$	$	
Journeyman	$	$	$	
Apprentice	$	$	$	
Laborer	$	$	$	
Trip Charge (for emergency service)	$			
Minimum Charge (for emergency service)	$			
Material Markup %			%	
Overhead and Profit Markup %			%	

Prevailing Wage Requirement

Each contractor or subcontractor performing work on this project shall comply in all respects with all laws governing the employment of Labor, Social Security, and Unemployment Insurance of both the State and Federal government. There shall be paid to each employee performing construction work or transportation of materials and equipment on this project at the site of the Project, no less than the minimum wage for the classifications of labor employed in compliance with 820 ILCS 130/1 et seq., as now existing or hereafter amended.

Tax Exemption

The Owner is exempt from sales tax and the Undersigned acknowledges that sales taxes have not been included in the Bid.

Contract Security

The contractor shall attach to the Form of Proposal a Bid Bond, in the amount not less than 10% of the Base Bid amount, payable to the LLD, if the undersigned fails to execute the Standard Form of Owner/Contractor Agreement (AIA Document A142), as modified herein by the Supplementary Conditions, and which is hereby made a part of this Contract Document by reference, and furnish evidence of his ability to become bonded and provide insurance coverage as specified, within five days after Owner's notification of the intent to award the contact to the contractor.

Bid Affirmation

In submitting this proposal, it is understood that the right is reserved by LLD to reject any and all Bids for any reason in the best interest of the library. The undersigned proposes and agrees to execute and deliver the contract in the prescribed form within ten (10) days after the award of the contract.

The undersigned agrees not to withdraw the Bid for 60 days.

It is hereby affirmed that the above proposal has been made in accordance with the terms and conditions set forth on the face hereof and in the bidding documents listed in this Request to Bid and the bidder will accept any awards made to him as a result of this quotation.

Bidder’s Name:
Address:
City, State Zip

Authorized Signature:

Name: *(Print/Type)*

Title:

If a corporation: Incorporated in The State of

ATTEST

Secretary:

The Bidder as listed above **IS** or **IS NOT** *(circle one)* Union signatory.

AIA® Document A305™ – 1986

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO:

ADDRESS:

SUBMITTED BY:

NAME:

ADDRESS:

PRINCIPAL OFFICE:

[ ] Corporation
[ ] Partnership
[ ] Individual
[ ] Joint Venture
[ ] Other

NAME OF PROJECT *(if applicable)*:

TYPE OF WORK (file separate form for each Classification of Work):

[ ] General Construction
[ ] HVAC
[ ] Electrical
[ ] Plumbing
[ ] Other (please specify)

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.

§ 1. ORGANIZATION

§ 1.1 How many years has your organization been in business as a Contractor?

§ 1.2 How many years has your organization been in business under its present business name?

§ 1.2.1 Under what other or former names has your organization operated?

§ 1.3 If your organization is a corporation, answer the following:

§ 1.3.1 Date of incorporation:

§ 1.3.2 State of incorporation:

§ 1.3.3 President's name:

§ 1.3.4 Vice-president's name(s)

§ 1.3.5 Secretary's name:

§ 1.3.6 Treasurer's name:

§ 1.4 If your organization is a partnership, answer the following:

§ 1.4.1 Date of organization:

§ 1.4.2 Type of partnership (if applicable):

§ 1.4.3 Name(s) of general partner(s)

§ 1.5 If your organization is individually owned, answer the following:

§ 1.5.1 Date of organization:

§ 1.5.2 Name of owner:

§ 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

§ 2. LICENSING

§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

§ 3. EXPERIENCE

§ 3.1 List the categories of work that your organization normally performs with its own forces.

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

§ 3.2.1 Has your organization ever failed to complete any work awarded to it?

§ 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

§ 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

§ 3.4.1 State total worth of work in progress and under contract:

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

§ 3.5.1 State average annual amount of construction work performed during the past five years:

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

§ 4. REFERENCES

§ 4.1 Trade References:

§ 4.2 Bank References:

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

§ 4.3.2 Name and address of agent:

§ 5. FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

§ 6. SIGNATURE

§ 6.1 Dated at this day of

Name of Organization:

By:

Title:

§ 6.2

being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this day of 20

Notary Public:

My Commission Expires:

LISLE LIBRARY DISTRICT

Certified Payroll for Public Works Projects

Dear Contractor/Subcontractor,

As you may know, the Public Act 94-0515 amend the Prevailing Wage Act. Effective August 10, 2005, all contractors and their subcontractors who are engaged in public works projects must provide a certified monthly payroll report either in person, by mail or electronically for our records.

Please refer to the two (2) attached exhibits.

101874

LISLE LIBRARY DISTRICT

Wage Rates

Each CONTRACTOR or Subcontractor performing Work on this Project shall comply in all respects with all laws governing the employment of Labor, Social Security, and Unemployment Insurance of both the State and Federal government. There shall be paid to each employee engaged in Work under this Contract at the site of the Project, no less than the minimum wage for the classifications of labor employed in compliance with 820 ILCS 130/1 et seq., as now existing or hereafter amended.

In accordance with 820 ILCS 130/5, The contractor and each subcontractor shall make and keep, for a period of not less that 3 years, records of all laborers, mechanics, and other workers employed by them on the Project; the records shall include each worker's name, address, telephone number when available, social security number, classification or classifications, the hourly wages paid in each period, the number of hours worked each day, and the starting and ending times of work each day.

The Contractor and each subcontractor shall submit monthly, in person, by mail, or electronically a certified payroll to the Library. The certified payroll shall consist of a complete copy of the records. The certified payroll shall be accompanied by a statement signed by the contractor or subcontractor which avers that:

(i) such records are true and accurate;

(ii) the hourly rate paid to each worker is not less that the general prevailing rate of hourly wages required; and

(iii) the contractor or subcontractor is aware that filing a certified payroll that he or she knows to be false is a Class B misdemeanor

Upon 2 business days' notice, the contractor and each subcontractor shall make available for inspection its records to the Library, its officers and agents, and to the Director of Labor and his deputies and agents at all reasonable hours at a location within this State. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor.

For your reporting ease, our sample cover sheet is attached.

LISLE LIBRARY DISTRICT
Contractor/Subcontractor Monthly Report Cover Sheet

Contractor/Subcontractor

Name: _____

Project Description - Bid number or physical description and/or area where work is being done:

Dates of Work Covered By this Report:

Name of the Person Making the Report:

Telephone Number:

Reporting Person's Title:

All reports here-in are to be forwarded to:

LISLE LIBRARY DISTRICT
777 Front St
Lisle, IL 60532

*** The attached reports are to be in complete compliance with the Illinois Compiled Statute 820.I.L.C.S. 130/5.**

LISLE LIBRARY DISTRICT
Certification of Prevailing Wage Requirements

I, _____, Contractor, hereby certifies that all laborers, workers and mechanics performing work under the contract shall not be paid less than the prevailing wage as found by the Illinois Department of Labor or the Board of Trustees and that Contractor and all subcontractors shall in all other respects comply with the *Prevailing Wage Act* in carry out work under the contract. If, during the course of work under this contract, the Department of Labor revises the prevailing rate of hourly wages to be paid under this contract, Contractor shall have the sole responsibility and duty to ensure that the revised prevailing rate of hourly wages is paid by Contractor and all subcontractors to each worker to whom a revised rate is applicable. Revisions to the prevailing wage as set forth above shall not result in an increase in the contract sum. Contractor shall protect, defend, indemnify and hold the Owner harmless for any claims or demands made as a result of Contractor's failure to comply with this certification.

Certified By: _____ Dated: _____
(Contractor's Authorized Representative)

_____
(Name of Contractor of Subcontractor's Representative)

_____
(Title of Representative)

_____
(Name of Contractor or Subcontractor)

Address of Contractor or Subcontractor:

_____

_____

SUBSCRIBED and SWORN TO before me this _____ day of _____, 2021.

_____
(Notary Public)

LISLE LIBRARY DISTRICT
Certification of Jobsite
Covid-19 Requirements Compliance

I, _____, Contractor, hereby certifies that all laborers, workers and mechanics performing work under the contract shall at all times while on the job site comply with applicable requirements of the National Center for Disease Control and Illinois Department of Public Health as they pertain to health and safety guidelines relative to control of the disease commonly known as Covid-19, and that Contractor and all subcontractors shall in all other respects comply with the these requirements as they carry out work under the contract. If, during the course of work under this contract, any of the above entities modify their requirements as they pertain to control to Covid-19, Contractor shall have the sole responsibility and duty to ensure that the revised requirements are stringently adhered to. Revisions to the requirements as set forth above shall not result in an increase in the contract sum. Individual workers who fail to adhere to these requirements will not be allowed access to the job site. Contractor shall protect, defend, indemnify and hold the Owner harmless for any claims or demands made as a result of Contractor's failure to comply with this certification.

Certified By: _____ Dated: _____
(Contractor's Authorized Representative)

_____
(Name of Contractor of Subcontractor's Representative)

_____
(Title of Representative)

_____
(Name of Contractor or Subcontractor)

Address of Contractor or Subcontractor:

_____

_____

SUBSCRIBED and SWORN TO before me this _____ day of _____, 2021.

_____
(Notary Public)

LISLE LIBRARY DISTRICT
Certification of Illinois
Preference Act Requirements

I, _____, Contractor, hereby certifies that it will use at least 90% Illinois laborers on all public works projects that receive State funds or funds administered by the State during a period of excessive unemployment. Excessive unemployment is defined as any month immediately following two (2) consecutive calendar months that the Illinois unemployment rate exceeds 5%. Contractor shall protect, defend, indemnify and hold the Owner harmless for any claims or demands made as a result of Contractor's failure to comply with this certification.

Certified By: _____ Dated: _____
(Contractor's Authorized Representative)

_____
(Name of Contractor of Subcontractor's Representative)

_____
(Title of Representative)

_____
(Name of Contractor or Subcontractor)

Address of Contractor or Subcontractor:

_____

_____

SUBSCRIBED and SWORN TO before me this _____ day of _____, 2021.

_____
(Notary Public)

LISLE LIBRARY DISTRICT
Non-Collusion Affidavit

AFFIDAVIT: "I (we) hereby certify and affirm that my (our) proposal was prepared independently for this project and that it contains no fees or amounts other than for the legitimate execution of this work as specified and that it includes no understanding or agreements in restraint of trade."

(If an Individual)

Signature of Bidder _____ (Seal)

Business Address _____

_____

(If a Partnership)

Firm Name _____ (Seal)

By _____

Business Addresses _____ (_____)

of all Partners _____ (_____)

of the Firm _____ (_____)

(If a Corporation)

Corporate Name _____

By _____

Business Address _____

_____ (Corporate Seal)

Name of Officers: (President) _____
(Secretary) _____
(Treasurer) _____

Attest: _____
(Secretary)

Name of Bidder _____

Date _____

LISLE LIBRARY DISTRICT
Bidder Eligibility Certificate

720 ILCS 5/33E-11 requires that all contractors bidding for public agencies in the State of Illinois certify that they are not barred from bidding on public contracts for bid rigging or bid rotation.

The following certification must be completed, signed and submitted with the Bidder's Form of Proposal.
FAILURE TO DO SO WILL RESULT IN DISQUALIFICATION OF THE BIDDER.

_____, as part of its bid on a contract for
(Firm Name of Contractor)

LISLE LIBRARY DISTRICT
RENOVATION

certifies that said contractor is not barred from bidding on the aforementioned contract as a result of a violation of either 720 ILCS 5/33E-3 or 720 ILCS 5/33E-4.

Firm Name: _____

By: _____ (Typed or printed name)
(Authorized Agent of Contractor)

_____
(Signature)

_____
(Title)

Subscribed and sworn to
before me on this _____day
of _____, 2021.

_____
(Notary Public)

LISLE LIBRARY DISTRICT
Certification of Compliance with Illinois Drug-Free Workplace Act

[Contractors With 25 Or More Employees]

_____, having 25 or more employees, does hereby certify pursuant to Section 3 of the *Illinois Drug-Free Workplace Act* (30 ILCS 580/3) that [he, she, it] shall provide a drug-free workplace for all employees engaged in the performance of work under the contract by complying with the requirements of the *Illinois Drug-Free Workplace Act* and, further certifies, that [he, she, it] is not ineligible for award of this contract by reason of debarment for a violation of the *Illinois Drug-Free Workplace Act*.

_____
By Authorized Agent

_____
Date

SUBSCRIBED and SWORN TO before me
this _____ day of _____, 2021.

_____
NOTARY PUBLIC

LISLE LIBRARY DISTRICT
Certificate Regarding Non-Discrimination in Employment - Protected Categories

_____ [contractor], does hereby certify that [he, she, it] has a written policy that includes, at a minimum, the following information: (i) the definition of persons in a Protected Category in Employment under State and Federal law; (ii) the illegality of discrimination against persons in a Protected Category in Employment; (iii) an internal complaint process including penalties; (iv) the legal recourse, investigative and complaint process available through both the Illinois Department of Human Rights and Human Rights Commission and the U.S. Equal Employment Opportunity Commission; (v) directions on how to contact the Illinois Department of Human Rights and Human Rights Commission and the U.S. Equal Employment Opportunity Commission; and (vi) protection against retaliation.

Discrimination against Persons in a Protected Category in Employment can occur in the following categories: Age, Disability, Equal Pay/Compensation, Genetic Information, Harassment, National Origin, Pregnancy, Race/Color, Religion, and Sex-Based Discrimination.

_____
By Authorized Agent

_____
Date

SUBSCRIBED and SWORN TO before me
this _____ day of _____, 2021.

_____
NOTARY PUBLIC

LISLE LIBRARY DISTRICT
Certificate Regarding Sexual Harassment Policy

_____ [contractor], does hereby certify pursuant to Section 2-105 of the *Illinois Human Rights Act* (775 ILCS 5/2-105) that [he, she, it] has a written sexual harassment policy that includes, at a minimum, the following information: (i) the illegality of sexual harassment; (ii) the definition of sexual harassment under State law; (iii) a description of sexual harassment, utilizing examples; (iv) an internal complaint process including penalties; (v) the legal recourse, investigative and complaint process available through the Department of Human Rights and Human Rights Commission; (vi) directions on how to contact the Department of Human Rights and Human Rights Commission; and (vii) protection against retaliation.

_____
By Authorized Agent

_____
Date

SUBSCRIBED and SWORN TO before me
this _____ day of _____, 2021.

_____
NOTARY PUBLIC

LISLE LIBRARY DISTRICT
CONTRACTOR AND SUBCONTRACTOR
SUBSTANCE ABUSE PREVENTION POLICY

Pursuant to P.A. 95-0635 (the "Substance Abuse Prevention on Public Works Act"), employees of the Contractor and employees of any Subcontractor are prohibited from the use of drugs or alcohol, as defined in the Act, while performing work on any public works project.

Before the Contractor or Subcontractor commences work, the Contractor and any Subcontractor shall have in place a written Substance Abuse Prevention Program for the prevention of substance abuse among its employees which meets or exceeds the requirements in P.A. 95-0635 or shall have a collective bargaining agreement in effect dealing with the subject matter of P.A. 05-0635.

The Contractor and any Subcontractor shall file with the public body engaged in the construction of the public works: a copy of the substance abuse prevention program along with a cover letter certifying that their program meets the requirements of the Act or a letter certifying that the Contractor or Subcontractor has a collective bargaining agreement in effect dealing with the subject matter of this Act. A certification form is attached and must be completed by the Contractor and each Subcontractor to this Contract.

101874

Date

Ms. Tatiana Weinstein, Director
Lisle Library
777 Front Street
Lisle, Illinois 60532

Re: Substance Abuse Prevention Program

Pursuant to Public Act 95-0635, the undersigned hereby certifies that it is in compliance with the terms and provisions of the Substance Abuse Prevention on Public Works Act. In particular, the undersigned hereby represents and warrants to the Lisle Library as follows:

[complete either A or B below]

A. The undersigned representative of the Contractor/Subcontractor certifies that the contracting entity has signed collective bargaining agreements that are in effect for all of its employees, and that deal with the subject matter of Public Act 95-0635.

_____
Contractor/Subcontractor

_____
Name of Authorized Representative (type or print)

_____
Title of Authorized Representative (type or print)

Date: _____ _____
Signature of Authorized Representative

B. The undersigned representative of the Contractor/Subcontractor certifies that the contracting entity has in place for all of its employees not covered by a collective bargaining agreement that deals with the subject of the Act, the attached substance abuse prevention program that meets or exceeds the requirements of Public Act 95-0635 **[attach a copy of the program]**.

_____
Contractor/Subcontractor

_____
Name of Authorized Representative (type or print)

_____
Title of Authorized Representative (type or print)

Date: _____ _____
Signature of Authorized Representative

LISLE LIBRARY DISTRICT
Certificate Regarding Criminal Background Investigations

Contractor hereby represents, warrants, and certifies that no officer or director thereof has any knowledge that any employee thereof has been convicted of committing or attempting to commit "Criminal Code of 2012," 720 ILCS, Sections 5/11-6 (Indecent solicitation of a child), 5/11-30 (Public indecency), 5/11-14 (Prostitution), 5/11-18 (Patronizing a prostitute), 5/11-18.1 (Patronizing a minor engaged in Prostitution, 5/14-3 (Promoting prostitution), 5/11-14.4 (Promoting juvenile prostitution), 5/11-19.1 (Sexual exploitation of a child), 5/11-20 (Obscenity), 5/11-20.1 (Child Pornography), 5/11-1.30 (Aggravated criminal sexual assault), 5/11-1.50 (Criminal sexual abuse), and 5/11-1.60 (Aggravated criminal sexual abuse), and/or those offenses defined in the "Cannabis Control Act," 720 ILCS, 550/l et. seq. (except the "Illinois Controlled Substances Act," 720 ILCS 570/100 et. seq. and/or any offense committed or attempted in any other state or against the laws of the United States, which if committed or attempted in this State, would have been punishable as one or more of the foregoing offenses. Contractor further agrees that it shall not employ any person who have or may have direct, daily contact with the pupils and for whom a criminal background investigation has not been conducted pursuant hereto, and further represents and agrees that all applicants for any such employment shall furnish with their applications the attached written "Authorization for Criminal Background Investigations" form authorizing the Board of Trustees to request a fingerprint-based criminal background investigation of said applicant pursuant to State of Illinois statues and to receive criminal history record information pursuant thereto to determine if the applicant has been convicted of committing or attempting to commit any of the criminal or drug offenses enumerated above. Contractor shall incur any costs and expenses associated with the fingerprint-based criminal background investigation. Contractor further represents, warrants, and certifies that no applicant for employment with respect to whom the criminal investigation reveals any conviction for committing and/or attempting to commit any of the above enumerated offenses, shall be employed thereby in any position that involves or may involve contact with minors. This certification is executed on the date hereinafter indicated by the designated contractor by its duly authorized officer.

By: _____

Its: _____

Dated: _____

LISLE LIBRARY DISTRICT
Authorization for Criminal Background Investigations

AUTHORIZATION FOR CRIMINAL BACKGROUND INVESTIGATION INFORMATION

The undersigned hereby authorizes the Board of Trustees, Lisle Library District to request a fingerprint-based criminal background investigation from the Illinois State Police, pursuant to State of Illinois statues, and to receive criminal history record information pursuant thereto.

By: _____
(Printed/Typed Name of Applicant Employee)

By: _____
(Signature of Applicant or Employee)

Dated: _____

NOTE: SIGNATURE NOT REQUIRED FOR SUBMITTAL WITH BID. THIS IS THE FORM REFERRED TO FOR USE WITH EMPLOYMENT APPLICATIONS.

007300 Supplementary Conditions

Project Schedule

The Contractor shall include all necessary provisions, including any necessary overtime to complete the base scope per the dates below:

Project Award: 9/18/2024
Shop drawings completion: 10/17/2024
Contract Required Substantial Completion: 8 Weeks after onsite mobilization.

The Contractor shall submit a Construction Schedule with the Bid. The schedule shall identify the critical path and substantial completion.

Site Supervision

The Contractor shall provide site supervision as required to manage and oversee the work.

Prevailing Wage Rates

This Contract calls for the construction of a "public work", within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130/.01, et seq. (the "Act"). The Act requires Contractors and Subcontractors to pay laborers, workers and mechanics performing services on public works projects no less than the "prevailing rate of wages" (hourly cash wages plus fringe benefits) in the county where the work is performed. For information regarding current prevailing wage rates, please refer to the Illinois Department of Labor's website at: http://www.state.il.us/agency/idol/rates/rates.HTM. All Contractors and Subcontractors rendering services under this Contract must comply with all requirements of the Act, including but not limited to, all wage, notice and record keeping duties.

The schedule of prevailing wage rates current as of the time of these Specifications is attached hereto and made a part hereof. Should a change in the schedule of prevailing wage rates occur during the term of any Contract and cause an increase in the cost of labor to any Contract, Subcontractor or sub-Subcontractor, such an increase shall not be the basis for any change order or change in the construction cost to Owner.

Preference in Employment

No person shall be refused or denied employment in any capacity on the grounds of unlawful discrimination, as that term is defined in the Illinois Human Rights Act, nor be subjected to unlawful discrimination in any manner, in connection with the contracting for or the performance of any work or service of any kind, by, for, on behalf of, or for the benefit of the Owner.

The Illinois Human Rights Act applies fully to this Contract and this Contract shall be performed in all respects in compliance with the Illinois Human Rights Act 775 ILCS 5/1-101, et seq., and the Illinois Public Works Employment Discrimination Act 775 ILCS 10/0.01, et seq.

Review of Project Site and Contract Documents

By preparing his bid on the Project, the Contractor acknowledges and agrees that the Contract Specifications and drawings are complete, and sufficient to enable the Contractor to determine the cost of the work and to enable him to construct the work, in accordance with all applicable laws and regulations governing the work, and otherwise to

fulfill his obligations under and as provided in the Contract. The Contractor further acknowledges that he has visited and examined the site, including all physical and other conditions affecting the work and is fully familiar with all of the conditions affecting the same and has considered all these factors in preparing his bid.

In connection therewith, the Contractor specifically represents and warrants to Owner that he has, by careful examination, satisfied himself as to: (1) the nature, location, and character of the project and the site, including, without limitation, the surface conditions of the site and all structures and obstructions thereon and thereunder, both natural and manmade, and surface water conditions of the site and the surrounding area, and subsurface conditions and subsurface water conditions; (2) the nature, location, and character of the general area in which the Project is located, including without limitation, its climatic conditions, available labor supply and labor costs, and available equipment supply and equipment costs; and (3) the quality and quantity of all materials, supplies, tools, equipment, labor, and professional services necessary to complete the work in the manner and within the cost and time frame required by the Contract. All work shall conform to the Contract, including the drawings and Specifications. No change therefrom shall be made without Owner's and Engineer's prior written approval.

Execution of Contract

The Contract shall be executed by the successful bidder and returned together with the Contract Bond within five (5) days after the Contract has been mailed to the bidder.

Failure to Execute Contract

Failure of the successful bidder to execute the Contract and file acceptable Bonds within five (5) days after the Contract has been mailed to the bidder shall be just cause for the cancellation of the award and the forfeiture of the Proposal Guaranty, which shall become the property of the Owner, not as a penalty, but in liquidation of damages sustained. Award may then be made to the next lowest responsible bidder, or the work may be re-advertised and constructed under Contract, or otherwise, as the Owner may decide.

Guarantee of Work

Any defective material, or workmanship, or any unfaithful or imperfect work, which may be discovered before the final acceptance of the work and/or within one (1) year thereafter, shall be corrected immediately on the requirements of the Owner, without extra charge, notwithstanding that it may have been overlooked in the previous inspections and estimates. Failure to review construction shall not relieve the Contractor from any obligation to perform sound and reliable work as herein described.

To insure compliance with this provision, the Contract Bond shall remain in effect for a period of one (1) year from the date of final acceptance, which shall be defined as the date of the final payment estimate.

The Contractor warrants to the Owner that all materials and equipment furnished under the Contract will be new and, in the case of equipment, in good working order, that all materials, equipment and labor furnished under the Contract will be free from defects of any kind and shall be in strict conformance with the Contract requirements. This warranty shall not be restricted by the limitations of any manufacturer's warranty or the one (1) year follow up warranty noted above, and shall be enforceable within the Statute of Limitation period as prescribed by law. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Liability or refusal of a Subcontractor or equipment supplier responsible for the defective work or materials, to correct or replace same, shall not excuse the Contractor from performing under this warranty.

Existing Utilities

Existing public utilities, such as water mains, sewers, gas lines, street lights, telephone lines, electric power lines, cable television, etc., shall be protected against damage during the construction of this project. Whenever the location of an existing utility is known, the approximate location of said utility is indicated on the Plans. This information is given only for the convenience of the bidder and the Owner assumes no responsibility as to the accuracy of the information provided. The Contractor shall consider in his bid the location of all permanent and temporary utility appurtenances in their present or relocated positions, whether shown on the Plans or not, and no additional compensation will be allowed for delays, inconvenience, or special construction methods required in prosecuting the work due to the existence of said utilities.

The Contractor shall contact the Owners of all public and private utilities and obtain locations of all utilities within the limits of the proposed construction and make arrangements, if necessary, to adjust or move any existing utility at the utility company's expense. Any expense incurred by the Contractor in connection with making arrangements shall be borne by the Contractor and considered incidental to the Contract. It shall be this Contractor's responsibility to determine the actual location of all such facilities in the field.

The adjustment of all facilities of Nicor, AT&T, ComEd, Cable Television, etc., shall be done by the respective utility company and, if a conflict is known, are indicated on the Plans as to be done **"BY OTHERS"**. All other utility adjustments to sewer, water, and other local facilities under the control of the Owner shall be performed under this Contract and will be paid for under the respective items in the Contract, unless otherwise indicated on the Plans or directed by the Engineer.

The Contractor shall contact **J.U.L.I.E. (1-800-892-0123)** at least 72 hours prior to commencement of work, for public utility locations. The Contractor shall also contact the Water Department of the Owner for location of their facilities, the Department of Public Works of the Owner for location of street lighting cable and sanitary sewers, and the Sanitary District, County, or local Water Commission for location of their facilities if not serviced by a municipal system. In areas on or adjacent to State or County highways, the Contractor shall notify the Electrical Department of the appropriate agency for location of traffic signal equipment. Any cost incurred for the locating of electric or traffic control facilities shall be borne by the Contractor, and no extra compensation shall be allowed.

DIVISION 010000

SECTION 013300 SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.
3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals
4. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
5. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that requires Architect/Engineer’s responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals.”

B. Informational Submittals: Written and graphic information and physical samples that do not not require Architect/Engineer’s responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect/Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format.

    a. Scheduled date for first submittal
    b. Specification Section number and title.
    c. Submittal category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect/Engineer's final release or approval.
    g. Scheduled date of fabrication.
    h. Scheduled dates for purchasing.
    i. Scheduled dates for installation.
    j. Activity or event number.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect/Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect/Engineer for Contractor's use in preparing submittals.

1. Architect/Engineer will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.

    a. Architect/Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    b. Digital Drawing Software Program: Coordinate with Architect/Engineer.
    c. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect/Engineer.
    d. The following digital data files will by furnished for each appropriate discipline.
        1) Floor plans.
        2) Reflected ceiling plans.

B. Prepare product submittals individually, by specification section and sub-section. Do not combine products from different specification sections.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 20 days for initial review of each submittal.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

E. Paper Submittals: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect/Engineer.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Architect/Engineer.
    d. Name of Construction Manager
    e. Name and address of Contractor.
    f. Name and address of subcontractor.
    g. Name and address of supplier.
    h. Name of manufacturer.

i. Submittal number or other unique identifier, including revision identifier.

1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an additional sequential number after another decimal point (e.g., 061000.01.01).

j. Number and title of appropriate Specification Section.
k. Drawing number and detail references, as appropriate.
l. Location(s) where product is to be installed, as appropriate.
m. Contractor's review stamp

4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect/Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect/Engineer

5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect/Engineer will discard submittals received from sources other than Contractor.

a. Transmittal Form for Paper Submittals: Use AIA Document G810.
b. Transmittal Form: Provide locations on form for the following information:

1) Project name.
2) Date.
3) Destination (To:).
4) Source (From:).
5) Name and address of Architect/Engineer.
6) Name of Construction Manager.
7) Name of Contractor
8) Name of firm or entity that prepared submittal
9) Names of subcontractor, manufacturer, and supplier.
10) Category and type of submittal.
11) Submittal purpose and description.
12) Specification Section number and title.
13) Specification paragraph number or drawing designation and generic name for each of multiple items
14) Drawing number and detail references, as appropriate.
15) Indication of full or partial submittal.
16) Transmittal number, numbered consecutively.
17) Submittal and transmittal distribution record.
18) Remarks.
19) Signature of transmitter.

F. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/Engineer.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner**,** containing the following information.

    a. Project name.
    b. Date.
    c. Name and address of Architect/Engineer.
    d. Name of Construction Manager.
    e. Name of Contractor.
    f. Name of firm or entity that prepared submittal.
    g. Names of subcontractor, manufacturer, and supplier.
    h. Category and type of submittal.
    i. Submittal purpose and description.
    j. Specification Section number and title.
    k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    l. Drawing number and detail references, as appropriate.
    m. Location(s) where product is to be installed, as appropriate.
    n. Related physical samples submitted directly.
    o. Indication of full or partial submittal.
    p. Transmittal number, numbered consecutively.
    q. Submittal and transmittal distribution record.
    r. Contractor’s review stamp.
    s. Other necessary identification.
    t. Remarks.

5. Metadata: Include the following information as keywords in the electronic submittal file metadata.

    a. Project name.
    b. Number and title of appropriate Specification Section.
    c. Manufacturer name.
    d. Product name

G. Options: Identify options requiring selection by Architect/Engineer.

H. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect/Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Contractor's review stamp.
4. Resubmit submittals until they are marked with approval notation from Architect/Engineer's action stamp.

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals are marked with approval notation from Architect/Engineer's action stamp.

PART 2 – PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as PDF electronic files

a. Architect/Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Manufacturer's certificates as indicated below.
d. Standard color charts.
e. Statement of compliance with specified referenced standards.
f. Testing by recognized testing agency.

g. Application of testing agency labels and seals.
h. Notation of coordination requirements.
i. Availability and delivery time information

4. For equipment, include the following in addition to the above, as applicable

a. Wiring diagrams showing factory-installed wiring.
b. Printed performance curves.
c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format.

a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Architect/Engineer's digital data drawing files is otherwise permitted. Shop drawings to indicate all adjacent construction and demonstrate adjacent construction has been coordinated between all trades.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Submit Shop Drawings in the following format.

a. One paper copy to be received within 2 days of sending the electronic file.
b. PDF electronic file.

4. BIM File Incorporation: Develop and incorporate Shop Drawing files into Building Information Model established for Project.

a. Prepare Shop Drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.
b. Prepare Shop Drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of appropriate Specification Section.
    e. Specification paragraph number and generic name of each item.

3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/Engineer will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit three sets of Samples. Architect/Engineer will retain two Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated..
2. Manufacturer and product name, and model number if applicable.
3. Submit product schedule in the following format.

    a. PDF electronic file.

F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in 013200 "Construction Progress Documentation."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

L. LEED Submittals: Comply with requirements specified in Section 018113 "Sustainable Design Requirements."

M. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Architect/Engineers and owners, and other information specified.

N. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

O. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

P. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents and approves the use and application/installation of their products as indicated in the contract drawings and shop drawings. Manufacture to sign and submit form included in this section stating compliance/approval prior to shop drawing submittal. Include evidence of manufacturing experience where required.

Q. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

R. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

S. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

T. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

U. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

W. Compatibility Test Reports: : Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

X. Field Test Reports: Submit written reports, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED DESIGN services

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect/Engineer.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file, paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

C. BIM File Incorporation: Incorporate delegated-design drawing and data files into Building Information Model established for Project.

1. Prepare delegated-design drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.

PART 3 – EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Engineer.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT/ENGINEER'S ACTION

A. Action Submittals: Architect/Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect/Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

B. Informational Submittals: Architect/Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect/Engineer will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect/Engineer.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect/Engineer without action.

END OF SECTION

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Maintenance stock.
5. Final cleaning.
6. Repair of the Work.

B. Related Sections:

1. Section 013233 "Photographic Documentation" for submitting Final Completion construction photographic documentation.
2. Section 017300 "Execution" for progress cleaning of Project site.
3. Section 017400 “Warranties and Bonds for MEP/FP and Security” for specific requirements for MEP/FP and security warranties and bonds.
4. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
6. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel

1.2 Action Submittals

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection

1.4 Maintenance Material Submittals

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

B. Refer to individual specification section for maintenance material submittal requirements.

1.5 SUBSTANTIAL COMPLETION procedures

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of items on the list, and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items and deliver to location designated by Architect/Engineer. Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect/Engineer's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit sustainable design submittals required in Section 018113 "Sustainable Design Requirements and in individual Sections.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."

6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection for Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer 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 Architect/Engineer, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection 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.

1.6 FINAL COMPLETION procedures

A. Submittals Prior to Final Completion: Before requesting final inspection for determining date of final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect/Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect/Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner’s personnel in operation, adjustment, maintenance of products, equipment, and systems. Submit demonstration and video recordings.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of 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.

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 Architect/Engineer.
    d. Name of Contractor.
    e. Page number.

4. Submit list of incomplete items in the following format.

    a. MS Excel electronic file. Architect/Engineer will return annotated file.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect/Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 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 Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-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.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals

PART 2 – PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 – EXECUTION

3.1 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.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated 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. Remove snow and ice to provide safe access to building.
f. 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.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision- obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
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. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning

p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
q. Leave Project clean and ready for occupancy.

C. Demonstration and Training: Demonstrate and train Owner's personnel in proper operation and maintenance of building equipment. Refer to individual specification sections for additional requirements.

D. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

E. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures

END OF SECTION

SECTION 017823 OPERATION - AND MAINTENANCE DATA

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Commissioning Authority will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Commissioning Authority.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
b. Enable inserted reviewer comments on draft submittals.

2. One set of prints.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Commissioning Authority will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Commissioning Authority will return copy with comments.

1. Correct or revise each manual to comply with Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Commissioning Authority's comments and prior to commencing demonstration and training.

PART 2 – PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Commissioning Authority.
8. Names and contact information for major consultants to the Architect/Engineer that designed the systems contained in the manuals.
9. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross- referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 – EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Sections:

1. Section 017700 "Closeout Procedures" for general closeout procedures.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of record Drawings as follows.

a. Initial Submittal

1) Submit PDF electronic files of scanned record prints and one of file prints.
2) Architect/Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal

1) Submit PDF electronic files of scanned record prints and one set(s) of prints.
2) Print each drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files and one set of prints of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal and one set of prints.

1. Where record Product Data is required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal and one set of prints.

E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 – PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

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 provide information for preparation of corresponding marked-up record prints.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an understandable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Cross-reference record prints to corresponding archive photographic documentation.

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 Architect/Engineer'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 completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
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 and newly prepared record drawings into manageable sets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect/Engineer.
e. Name of Contractor.

2.2 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.

B. Format: Submit record Specifications as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications and one set of prints.

2.3 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, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Product Data and one set of prints.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 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.

B. Format: Submit miscellaneous record submittals as PDF electronic file or scanned PDF electronic file(s) of marked-up miscellaneous record submittals and one set of prints.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 – EXECUTION

3.1 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: The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed. Provide access to project record documents for Architect/Engineer's reference during normal working hours.

END OF SECTION

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For Facilitator, instructor, and videographer.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect/Engineer.
d. Name of Construction Manager
e. Name of Contractor.
f. Date of video recording.

2. Transcript: Prepared in PDF electronic format. Include a cover sheet with same

label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.

3. At completion of training, submit complete training manual(s) for Owner's use in PDF electronic file format on compact disc.

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect/Engineer.

PART 2 – PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

    a. System, subsystem, and equipment descriptions.
    b. Performance and design criteria if Contractor is delegated design responsibility.
    c. Operating standards.
    d. Regulatory requirements.
    e. Equipment function.
    f. Operating characteristics.
    g. Limiting conditions.
    h. Performance curves.

2. Documentation: Review the following items in detail:

    a. Emergency manuals.
    b. Operations manuals.
    c. Maintenance manuals.
    d. Project record documents.
    e. Identification systems.
    f. Warranties and bonds.
    g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

    a. Instructions on meaning of warnings, trouble indications, and error messages.
    b. Instructions on stopping.
    c. Shutdown instructions for each type of emergency.
    d. Operating instructions for conditions outside of normal operating limits.
    e. Sequences for electric or electronic systems.
    f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.
    d. Regulation and control procedures.
    e. Control sequences.
    f. Safety procedures.
    g. Instructions on stopping.
    h. Normal shutdown instructions.
    i. Operating procedures for emergencies.
    j. Operating procedures for system, subsystem, or equipment failure.
    k. Seasonal and weekend operating instructions.
    l. Required sequences for electric or electronic systems.
    m. Special operating instructions and procedures.

5. Adjustments: Include the following:

    a. Alignments.
    b. Checking adjustments.
    c. Noise and vibration adjustments.
    d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

    a. Diagnostic instructions.
    b. Test and inspection procedures.

7. Maintenance: Include the following:

    a. Inspection procedures.
    b. Types of cleaning agents to be used and methods of cleaning.
    c. List of cleaning agents and methods of cleaning detrimental to product.
    d. Procedures for routine cleaning
    e. Procedures for preventive maintenance.
    f. Procedures for routine maintenance.
    g. Instruction on use of special tools.

8. Repairs: Include the following:

    a. Diagnosis instructions.
    b. Repair instructions.
    c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    d. Instructions for identifying parts and components.
    e. Review of spare parts needed for operation and maintenance.

PART 3 – EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operations and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Architect/Engineer will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral performance-based test.

F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video: Provide minimum 640 x 480 video resolution converted to a format file type acceptable to Owner, on electronic media.

1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:

a. Name of Contractor/Installer.
b. Business address.
c. Business phone number.
d. Point of contact.
e. E-mail address.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.

1. Film training session(s) in segments not to exceed 15 minutes.

a. Produce segments to present a single significant piece of equipment per segment.
b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

1. Furnish additional portable lighting as required.

E. Narration: Describe scenes on video recording by audio narration by microphone while or dubbing audio narration off site after video recording is recorded. Include description of items being viewed.

F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.

G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

Attachment A

SECTION 230923
DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

A. System description.

B. Controllers.

C. Power supplies and line filtering.

D. Controller software.

1.02 RELATED REQUIREMENTS

A. Section 230993 - Sequence of Operations for HVAC Controls.

1.03 REFERENCE STANDARDS

A. MIL-STD-810 - Environmental Engineering Considerations and Laboratory Tests; 2019h.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Delta Controls

B. Distech Controls, Inc.

C. Honeywell International, Inc

D. Johnson Controls, Inc

E. KMC Controls; Conquest

F. Siemens AG, Building Technologies Division

2.02 SYSTEM DESCRIPTION

A. Automatic temperature control field monitoring and control system using field programmable micro-processor based units.

B. Base system on distributed system of fully intelligent, stand-alone controllers, operating in a multi-tasking, multi-user environment on token passing network, with central and remote hardware, software, and interconnecting wire and conduit.

C. Include computer software and hardware, operator input/output devices, control units, local area networks (LAN), sensors, control devices, actuators.

D. Controls for variable air volume terminals, radiation, reheat coils, unit heaters, fan coils, and the like when directly connected to the control units. Individual terminal unit control is specified in Section 230913.

E. Provide control systems consisting of thermostats, control valves, dampers and operators, indicating devices, interface equipment and other apparatus and accessories required to operate mechanical systems, and to perform functions specified.

F. Include installation and calibration, supervision, adjustments, and fine tuning necessary for complete and fully operational system.

2.03 CONTROLLERS

A. Building Controllers:
   1. General:
      a. Manage global strategies by one or more, independent, standalone, microprocessor based controllers.
      b. Provide sufficient memory to support controller's operating system, database, and programming requirements.
      c. Share data between networked controllers.

d. Controller operating system manages input and output communication signals allowing distributed controllers to share real and virtual object information and allowing for central monitoring and alarms.
e. Utilize real-time clock for scheduling.
f. Continuously check processor status and memory circuits for abnormal operation.
g. Controller to assume predetermined failure mode and generate alarm notification upon detection of abnormal operation.
h. Communication with other network devices to be based on assigned protocol.

2. Communication:
   a. Controller to reside on a BACnet network using ISO 8802-3 (ETHERNET) Data Link/Physical layer protocol.
   b. Perform routing when connected to a network of custom application and application specific controllers.
   c. Provide service communication port for connection to a portable operator's terminal or hand held device with compatible protocol.
3. Anticipated Environmental Ambient Conditions:
   a. Outdoors and/or in Wet Ambient Conditions:
      1) Mount within waterproof enclosures.
      2) Rated for operation at 40 to 150 degrees F (4 to 65 degrees C).
   b. Conditioned Space:
      1) Mount within dustproof enclosures.
      2) Rated for operation at 32 to 120 degrees F (0 to 50 degrees C).
4. Provisions for Serviceability:
   a. Diagnostic LEDs for power, communication, and processor.
   b. Make all wiring connections to field removable, modular terminal strips, or to a termination card connected by a ribbon cable.
5. Memory: In the event of a power loss, maintain all BIOS and programming information for a minimum of 72 hours.
6. Power and Noise Immunity:
   a. Maintain operation at 90 to 110 percent of nominal voltage rating.
   b. Perform orderly shutdown below 80 percent of nominal voltage.
   c. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W. at 3 feet (1 m).

B. Input/Output Interface:
1. Hardwired inputs and outputs tie into the DDC system through building, custom application, or application specific controllers.
2. All Input/Output Points:
   a. Protect controller from damage resulting from any point short-circuiting or grounding and from voltage up to 24 volts of any duration.
   b. Provide universal type for building and custom application controllers where input or output is software designated as either binary or analog type with appropriate properties.
3. Binary Inputs:
   a. Allow monitoring of On/Off signals from remote devices.
   b. Provide wetting current of 12 mA minimum, compatible with commonly available control devices and protected against the effects of contact bounce and noise.
   c. Sense dry contact closure with power provided only by the controller.
4. Pulse Accumulation Input Objects: Comply with all requirements of binary input objects and accept up to 10 pulses per second.
5. Analog Inputs:
   a. Allow for monitoring of low voltage 0 to 10 VDC, 4 to 20 mA current, or resistance signals (thermistor, RTD).
   b. Compatible with and field configurable to commonly available sensing devices.

6. Binary Outputs:
   a. Used for On/Off operation or a pulsed low-voltage signal for pulse width modulation control.
   b. Outputs provided with three position (On/Off/Auto) override switches.
   c. Status lights for building and custom application controllers to be selectable for normally open or normally closed operation.
7. Analog Outputs:
   a. Monitoring signal provides a 0 to 10 VDC or a 4 to 20 mA output signal for end device control.
   b. Provide status lights and two position (AUTO/MANUAL) switch for building and custom application controllers with manually adjustable potentiometer for manual override on building and custom application controllers.
   c. Drift to not exceed 0.4 percent of range per year.
8. Tri State Outputs:
   a. Coordinate two binary outputs to control three point, floating type, electronic actuators without feedback.
   b. Limit the use of three point, floating devices to the following zone and terminal unit control applications:
   c. Control algorithms run the zone actuator to one end of its stroke once every 24 hours for verification of operator tracking.
9. System Object Capacity:
   a. System size to be expandable to twice the number of input output objects required by providing additional controllers, including associated devices and wiring.
   b. Hardware additions or software revisions for the installed operator interfaces are not to be required for future, system expansions.

2.04 POWER SUPPLIES AND LINE FILTERING

A. Power Supplies:
   1. Provide UL listed control transformers with Class 2 current limiting type or over-current protection in both primary and secondary circuits for Class 2 service as required by the NEC.
   2. Limit connected loads to 80 percent of rated capacity.
   3. Match DC power supply to current output and voltage requirements.
   4. Unit to be full wave rectifier type with output ripple of 5.0 mV maximum peak to peak.
   5. Regulation to be 1 percent combined line and load with 100 microsecond response time for 50 percent load changes.
   6. Provide over-voltage and over-current protection to withstand a 150 percent current overload for 3 seconds minimum without trip-out or failure.
   7. Operational Ambient Conditions: 32 to 120 degrees F (0 to 50 degrees C).
   8. EM/RF meets FCC Class B and VDE 0871 for Class B and MIL-STD-810 for shock and vibration.
   9. Line voltage units UL recognized and CSA approved.

B. Power Line Filtering:
   1. Provide external or internal transient voltage and surge suppression component for all workstations and controllers.
   2. Minimum surge protection attributes:
      a. Dielectric strength of 1000 volts minimum.
      b. Response time of 10 nanoseconds or less.
      c. Transverse mode noise attenuation of 65 dB or greater.
      d. Common mode noise attenuation of 150 dB or greater at 40 to 100 Hz.

2.05 CONTROLLER SOFTWARE

A. All applications reside and operate in the system controllers and editing of all applications occurs at the operator workstation.

B. System Security:
   1. User access secured via user passwords and user names.
   2. Passwords restrict user to the objects, applications, and system functions as assigned by the system manager.
   3. User Log On/Log Off attempts are recorded.
   4. Automatic Log Off occurs following the last keystroke after a user defined delay time.

C. Object or Object Group Scheduling:
   1. Weekly Schedules Based on Separate, Daily Schedules:
      a. Include start, stop, optimal stop, and night economizer.
      b. 10 events maximum per schedule.
      c. Start/stop times adjustable for each group object.

D. Provide standard application for equipment coordination and grouping based on function and location to be used for scheduling and other applications.

E. Alarms:
   1. Binary object is set to alarm based on the operator specified state.
   2. Analog object to have high/low alarm limits.
   3. All alarming is capable of being automatically and manually disabled.
   4. Alarm Reporting:
      a. Operator determines action to be taken for alarm event.
      b. Alarms to be routed to appropriate workstation.
      c. Reporting Options:

F. Maintenance Management: System monitors equipment status and generates maintenance messages based upon user-designated run-time limits.

G. Sequencing: Application software based upon specified sequences of operation in Section 230993.

H. PID Control Characteristics:
   1. Direct or reverse action.
   2. Anti-windup.
   3. Calculated, time-varying, analog value, positions an output or stages a series of outputs.
   4. User selectable controlled variable, set-point, and PED gains.

I. Staggered Start Application:
   1. Prevents all controlled equipment from simultaneously restarting after power outage.
   2. Order of equipment startup is user selectable.

J. Energy Calculations:
   1. Accumulated instantaneous power or flow rates are converted to energy use data.
   2. Algorithm calculates a rolling average and allows window of time to be user specified in minute intervals.
   3. Algorithm calculates a fixed window average with a digital input signal from a utility meter defining the start of the window period that in turn synchronizes the fixed-window average with that used by the power company.

K. Anti-Short Cycling:
   1. All binary output objects protected from short-cycling.
   2. Allows minimum on-time and off-time to be selected.

L. On-Off Control with Differential:
   1. Algorithm allows binary output to be cycled based on a controlled variable and set-point.
   2. Algorithm to be direct-acting or reverse-acting incorporating an adjustable differential.

M. Run-Time Totalization:
   1. Totalize run-times for all binary input objects.
   2. Provides operator with capability to assign high run-time alarm.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that conditioned power supply is available to the control units and to the operator work station. Verify that field end devices, wiring, and pneumatic tubing is installed prior to installation proceeding.

3.02 INSTALLATION

A. Install control units and other hardware in position on permanent walls where not subject to excessive vibration.

B. Install software in control units and in operator work station. Implement all features of programs to specified requirements and appropriate to sequence of operation. Refer to Section 230993.

C. Provide conduit and electrical wiring in accordance with Section 260583. Electrical material and installation shall be in accordance with appropriate requirements of Division 26.

3.03 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate complete and operating system to Owner.

3.04 MAINTENANCE

A. Provide service and maintenance of energy management and control systems for one years from Date of Substantial Completion.

B. Provide two complete inspections, one in each season, to inspect, calibrate, and adjust controls as required, and submit written reports.

END OF SECTION

Attachment B

SECTION 230993
SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other sections.

B. Sequence of operation for:
   1. Air terminal units.
   2. Cabinet heaters.
   3. Central fan systems.
   4. Heating coils.
   5. Unit heaters.

1.02 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Sequence of Operation Documentation: Submit written sequence of operation for entire HVAC system and each piece of equipment.
   1. State each sequence in small segments and give each segment a unique number for referencing in Functional Test procedures; provide a complete description regardless of the completeness and clarity of the sequences specified in Contract Documents.
   2. Include at least the following sequences:
      a. Start-up.
      b. Normal operating mode.
      c. Unoccupied mode.
      d. Shutdown.
      e. Temperature and pressure control, such as setbacks, setups, resets, etc.
      f. Detailed sequences for all control strategies, such as economizer control, optimum start/stop, staging, optimization, demand limiting, etc.
      g. Effects of power or equipment failure with all standby component functions.
      h. Sequences for all alarms and emergency shut downs.
   3. Include schedules, if known.

C. Designer's Qualification Statement.

D. Project Record Documents: Record actual locations of components and setpoints of controls, including changes to sequences made after submission of shop drawings.

1.03 QUALITY ASSURANCE

A. Design system under direct supervision of a Professional Engineer experienced in design of this work and licensed in Illinois.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CRITICAL ALARMS

A. Visual alarm initiated at LAN based workstation

B. Alarm is logged to history file.

C. LAN based network master controller and/or LAN based workstation dials out to remote site and beings paging sequence of up to five persons pages or voice phone numbers and give a voice, number or alphanumeric message as defined by Owner until the system receives an acknowledgement from the respondent.

3.02 NON-CRITICAL ALARMS

A. Visual alarm is initiated at LAN based workstation.

B. Alarm is logged to history file.

C. After adjustable time-out (defined by Owner) initiate critical alarm sequences.

3.03 HOT WATER BOILERS

A. General:
   1. Control electronically with DDC Controller.
   2. Provide graphic display on the BAS workstation.
   3. Totalize runtime of the boilers.
   4. Provide integration of boiler flame safeguard controls with BAS. Integration shall provide of all data available at these controllers via the FMS. Install Communications interface furnished by the boiler manufacturer. Provide all the necessary communication wiring between communications interface and burner controllers (provided by boiler manufacturer).
   5. BAS shall pick up boiler alarm from each other boiler panel. Burner panel will have a set of dry contacts in control panel. BAS connected to each panel. BAS will show one boiler panel alarm on BAS system for any failure.
   6. BAS Contractor shall install a temperature sensor in the supply and return header of the main boiler loop and report loop temperatures on BAS system.
   7. BAS shall hard wire interlock each boiler and the water heater to open and close its respective combustion air damper and/or energize combustion air fan. The end switch on the combustion damper will be interlocked with boiler panels so boiler wont fire until damper proven open and/or the combustion air fan is energized.
   8. The BAS shall control and monitor the following for each boiler:
      a. Boiler enable/disable (each).
      b. Boiler alarm condition (each).
      c. Boiler water supply temperature. Critical alarm on high limit.
      d. Boiler water return temperature. Critical alarm on low limit.
      e. Heating water pump status and proof of flow.
   9. The BAS shall provide boiler control as follows:
      a. Provide and adjustable spring/fall to winter changeover signal from the BAS based on O.A.T.
   10. System Off:
      a. Boilers and associated heating water pumps shall be off.
   11. System Start:
      a. When the outdoor air temperature falls below the heating system enable set point (60 degrees F, adj.) the boilers (operator selectable) shall be indexed to operate:
         1) Associated pumps shall start.
         2) Boilers shall be enabled to start when proof of flow has been established.
   12. System Run:
      a. Boiler Fire Rate:
         1) Boiler fire rate shall be controlled by the boiler integral controls with setpoints given from the BAS through the LON interface for HWB-1.
         2) For boiler HWB-Existing the BAS will cycle the boiler to maintain the setpoint.

b. Reset Schedule:
1) Reset schedule shall be adjustable, with initial schedule of 180 degrees F primary hot water supply temperature set point at 0 degrees F outside air temperature to 160 degrees F set point at 60 degrees F air temperature. Coordinate minimum hot water temperature with boiler manufacturer recommendations.

13. System Stop:
a. When the outdoor air temperature rises above the heating system enable set point (60 degrees F, adj.), the boilers shall be disabled:
1) Boilers shall modulate to low fire and be disabled.
2) Associated heating pumps shall continue to run for 5 minutes (adj.) after boiler shutdown and then be stopped.
b. Boilers shall remain off for a minimum of 15 minutes (adj.) or per manufacturer recommendations.

14. Safeties and Alarms:
a. Flame Safeguard: Flame safeguard microprocessor shall annunciate discrete alarm conditions.
b. Annunciate off-normal alarm whenever boiler status does not equal command.

15. Failure Modes:
a. Boiler Failure: If a boiler fails to operate, the boiler shall be disabled and alarm shall be annunciated. Combustion air damper shall close.
b. Pump Failure: If any pumps fails to operate, an alarm shall be annunciated. Pump shall be disabled and associated combustion air damper and/or combustion air fan de energized and isolation values shall close.
c. Sensor Failure: Upon the failure of an analog sensor, associated fire rates shall remain at their last position and alarm shall be annunciated.

B. Heating Pumps (P-EAST, P_WEST, & P-3)
1. Above 65 degrees F. (adj.) pumps will be off.
2. Upon failure of any pump, to alarm through the BAS.
3. Each pump will have a differential pressure flow sensor in piping to report flow to DDC panel.
4. Zone pumps P_E and P_W will run based on an adjustable OA temperature setpoint. Pump P-3 when enabled, will run from its zone sensor. OA temperature below 38° F (adj) P-3 will run continuously.
5. Points List
a. Pump Start/Stop
b. Pump Status

C. Combustion Air Control
1. Upon a signal from one of the heating boiler control panels, the associated boiler combustion air damper will be open. An end switch connection will be made and air flow proven and a signal will be sent to the boiler control panel for boiler to start. When boiler stops, combustion air damper will close. Provide low limit freezestat and alarm with manual reset to stop fan and open heating control valve. Discharge air sensor to control valve under normal conditions.
2. Initiate critical alarm if boiler room space temperature is below 50 degrees F.

3.04 AIR TERMINAL UNITS

A. Variable Air Terminal Units (VAV and VRT) See each AHU sequence for additional information.
1. The VAV terminal units shall be individually controlled by a DDC controller per terminal unit.
2. The BAS shall perform the following terminal unit control strategies and provide the points as specified in the sequence of operation for monitoring and diagnosis.

a. Set Point Control: The BAS shall edit the space temperature set point of each VAV box. The temperature set point shall be operator adjustable. In the event of communication loss, the box will continue to control to current set points.
b. Cooling Air Valve (Damper) Control: The BAS shall control the cooling air valve to a fully open, fully closed, maximum CFM or minimum CFM position based on operator commands. The operator shall also have the capability to adjust the maximum and minimum air flow limits of the air valve through BAS.
c. Operating Mode: The BAS shall place the box in either the occupied or unoccupied mode based on an operator adjustable time schedule. Separate heating and cooling set points shall be enterable for each mode through the BAS. Other modes available for special applications shall include full open, full closed, maximum flow and minimum flow.
d. Automatic Recalibration: The system shall automatically recalibrate its air flow sensing and air valve position measurement system at system start up and on a scheduled basis.
e. Remote Set Point Adjustment: The BAS temperature set point programmed in software shall be capable of being manually overridden by a remote adjustment at the temperature sensor. This manual readjustment feature may be disabled through the BAS, if desired.
f. Terminal Unit Status Report: For each terminal unit, the BAS shall provide an operating status summary of all unit sensed vales (zone temperature, CFM, etc.), set points and modes.

3. Terminal Box Diagnostics:
   a. If temperature sensor input fails above its high range, until shall control as its maximum CFM set point. If sensor inputs fail below its low range, unit shall control to its minimum CFM set point.
   b. In both cases, all heat outputs shall be disabled. A diagnostic message shall be displayed upon operator inquiry.
   c. If flow measuring system fails, unit shall automatically convert to a pressure dependent, damper position based algorithm. Diagnostic message shall be displayed upon operator inquiry.
   d. If temperature set point potentiometer on space sensor fails, unit shall automatically control to 74 °F. Diagnostic message shall be displayed upon operator inquiry.
   e. If communications are lost, controller shall continue to operate in the current mode of operation. All set points shall be retained in non-volatile memory.
4. VAV Box with Reheat Control
   a. DDC room thermostat modulates N.O. reheat coil valve and VAV box operator in sequ3nc3 to maintain desired room temperature set point (adj.).
5. Fan Powered VAV boxes
   a. The primary valve delivers cooled air to the unit outlet.
   b. Upon decrease in space temperature beyond control of the primary air valve, the fan is simultaneously energized with the first stage of heat.
   c. Parallel fan delivers warm plenum air from the controlled space to the unit outlet, mixing with the primary air before entering the space.
6. Safeties and Alarms
   a. An alarm shall be noted in the event of a low and/or high temperature limit in the zone sensor.
7. Points List
   a. Supply Air Temperature
   b. Damper position
   c. Room Temperature
   d. Fan Start/Stop (where applicable)
   e. Fan Status (where applicable)
   f. Heating Valve Control (where applicable)

3.05 CENTRAL FAN SYSTEMS

A. Fire Shut Down of Air Supply Units Over 2000 CFM
   1. Review and maintain all interlocks with the fire alarm system.

B. Night Cool-Down Mode
   1. Provide the following sequence for all air handling systems, including the Supply/Exhaust/Return under DDC control: If the building is scheduled for occupancy the coming day, night outdoor air enthalpy is below 60°F Wb and outdoor air temperature is more that 5°F lower than indoor temperature: The system(s) meeting these critical shall operate in 100% outdoor air economizer mode until the indoor and outdoor temperatures are within 2°F or return air temperature is below 75°F.

C. AHU-1W Control (Multi-Zone Converted to VAV Hot Water/DX)
   1. VAV when Cooling, Constant Volume when Heating
      a. General:
         1) Control electronically with DDC controller.
         2) Provide graphic display terminal on the DDC workstation.
         3) Provide optimized start/stop with multiple schedule options for each system through the DDC system on a 365 day annual time of day schedule with four events per defined special uses.
         4) Provide a timed override mode enabled through AHU space sensors to return space to occupied mode for 2 hours (adj.) for tenant comfort.
         5) All set points will be adjustable through BAS, at the operator workstation.
      b. System Off:
         1) The supply fan shall be off.
         2) The outside air and exhaust dampers shall be closed.
         3) The return air damper shall be open.
         4) The air cooled condenser shall be disabled.
         5) The heating coil valve shall modulate to maintain the mixed air plenum temperature at 50 °F (adj.).
      c. System Start
         1) When the air-handling unit is indexed to operate the supply fan shall start.
         2) Upon proof of supply fan operation, dampers and control valves shall be indexed to their “System Run” condition.
      d. System Run
         1) Unoccupied Heating Mode:
            (a) Supply Fan: Supply fan shall cycle to maintain space temperature at the unoccupied heating set point (adj.)
            (b) Economizer Dampers: Outside air dampers are fully closed and return air damper is fully open.
            (c) Condensing Unit: Fully disabled. Cold deck dampers closed.
            (d) Heating Coil valve: Fully open when the supply fan is on. Heat deck dampers open.
         2) Unoccupied Cooling Mode:
            (a) Supply Fan: Cycle supply fan to maintain space temperature at the unoccupied cooling set point (adj.)
            (b) Condensing Unit: Enabled when the supply fan is on. Cold deck open.
            (c) Heating Coil Valve: Fully closed. Hot Deck closed.
         3) Warm-up Mode:
            (a) Supply Fan: Supply fan shall start and run continuously.
            (b) Economizer Dampers: Outside air dampers are fully closed and return air damper is fully open.
            (c) Condensing Unit: Fully disabled. Cold deck closed.

(d) Heating Coil Valve: Modulate to maintain the discharge air temperature at set point reset by space temperature. Limit discharge of unit to 120°F (adj.). When return air temperature rises above 74°F. (adj.), the system will return to normal operations. Hot deck open.

4) Cool-down Mode:
   (a) Supply Fan: Supply fan shall start and run continuously.
   (b) Outside Air Dampers: Dampers shall be enabled to open to minimum OA position.
   (c) Condensing Coil Valve: enable to maintain discharge air temperature at set point as reset by space temperature. Cold deck open.
   (d) Heating Coil Valve: Fully closed. Hot deck closed.
5) Occupied Mode:
   (a) MZ cooling damper should remain open until zone VAV is a minimum air flow, and warm air damper should remain closed. Once heating is required, the MZ zone dampers should modulate from the MZ cooling air damper open to the MZ warm air damper open to maintain zone temperature. When the MZ damper is modulating for heat its VAV box will be at heating minimum air CFM of 50% (adj.) maximum CFM.
   (b) Warm air heat coil discharge temp and cooling coil temp should be reset based on the zones requiring most heating or cooling. Cold air discharge set up from 60 °F to 65°F and heating to 75°F or more dependent on zone needs.
   (c) Utilize outdoor air for cooling when outdoor temperature is below 60°F (adj).
   (d) Condensing unit is enabled when outdoor temperature is above 60°F (adj).
   (e) The DX will be disabled if the zones are not calling for cooling.
   (f) The BAS will maintain a duct static pressure of 1.25” w.c. (adj) by modulating the VFD speed.
   (g) The AHU will have an adjustable minimum OA damper setpoint.
6) Humidifier:
   (a) The humidifier is self-contained and runs on its integral controls.
   (b) The BAS will monitor status and discharge humidity (alarm if <35% (adj) or >90% (adj).
   (c) The BAS will provide an interlock to disable humidifier when AHU is off.
7) System Stop:
   (a) When the air handling unit is indexed to shut down, the supply fan shall stop.
   (b) Dampers and control valves shall be indexed to their “System Off” conditions.

e. Safeties and Alarms:
   1) Low Limit: Manual reset low limit thermostat shall stop the supply and return fans, close the outdoor air dampers and cooling coil valve, open the heating coil valve, and annunciate alarm should the coil discharge air temperature fall below 38 degrees F.
   2) High Static: Manual rest Hight Static shall stop the supply and return fans, close the outdoor air dampers, open the heating coil valve, and annunciate alarm should the duct static exceed 3”w.c.
   3) Smoke and Fire Alarms will stop the unit and put dampers and valves in their normal “unit off position when in alarm and annunciate an alarm.
   4) Annunciate off normal alarms whenever supply or return fan status does not equal alarm.
   5) All alarms shall be reported to the operated workstation for the BAS.
f. Point List
   1) Fan Start/stop
   2) Fan Status

3) Discharge Air Temperature
4) Room Temperature Set point
5) Room Temperature
6) OA/RA Damper Control
7) DX Stages
8) Heating Valve Control
9) Mixed Air Temperature
10) Return Air Temperature

g. Failure Modes:
1) Fan Failure: If the supply or return fan fails to operate, both fans shall shut down and alarm be annunciated. Dampers and control valves shall be indexed to their “System Off” conditions.
2) Sensor Failure: Upon the failure of an analog sensor, associated dampers and control valves shall remain at their last position and alarm shall be annunciated.
3) Power Failure:
4) Fans: Upon restoration of power, the supply fan shall start after an adjustable delay to provide a staggered start of all building loads.
5) Dampers: Dampers shall be provided with spring return actuators to fail to their “System Off” positions.
6) Valves: Heating valves shall be provided with spring return actuator to fail open the coil.

D. AHU-2W Control
1. Variable Air Volume - Hot Water/DX Cooled
a. General:
1) Control electronically with DDC controller.
2) Provide graphic display terminal on the DDC workstation.
3) Provide optimized start/stop with multiple schedule options for each system through the DDC system on a 365 day annual time of day schedule with four events per defined special uses.
4) Provide a timed override mode enabled through AHU space sensors to return space to occupied mode for 2 hours (adj.) for tenant comfort.
5) All set points will be adjustable through BAS, at the operator workstation and remotely.

b. System Off:
1) The supply fan shall be off. The supply fan VFD will be commanded to 0%
(a) The outside air damper shall be closed.
(b) The return air damper shall be open.
(c) The heating coil valve shall modulate to maintain the mixed air plenum temperature at 50 degrees F. (adj.).
(d) The air cooled condensing unit will be disabled.
2) System Start:
(a) When the air-handling unit is indexed to operate the supply fan shall start. NOTE: The missed air dampers and the supply fan speed dive shall be ramped to its operating value over a time period (adj., initially set to five minutes).
(b) Upon proof of supply fan operation, dampers and control valves shall be indexed to their “System Run” condition.
3) System Run:
(a) Unoccupied Heating Mode:
(b) Supply: Supply fan shall cycle to maintain supply air temperature at the unoccupied heating set point (adj.). The supply fan speed will be controlled to maintain duct static pressure at set point (adj.).

(c) Economizer Dampers: Outside air dampers are fully closed and return air damper is fully open.
(d) Heating Coil Valve: When the supply and return fans are on modulate, the heating valve to maintain supply air temperature.
(e) The air cooled condensing unit will be disabled.

4) Unoccupied Cooling Mode:
(a) Supply Fan: Cycle supply fan to maintain space temperature at the unoccupied cooling set point (adj.).
(b) Economizer Dampers: Economizer dampers shall be enabled to provide free cooling when the outside air temperature is below the dry bulb economizer set point.
(1) Economizer Available: Outside air damper is fully open and return air damper is fully closed when the supply fans are on.
(2) Economizer Not Available: Outside air damper is fully closed and return air damper is fully open.
(3) Heating Coil Valve: Fully closed.
(4) Air Cooled Condensing Unit: Allow to operate when the supply fan and return fans are on the maintain supply air at discharge air temperature set point.

5) Warm-up Mode:
(a) Supply Fan: Supply fan shall start and run continuously. The supply fan speed will be controlled to maintain duct static pressure.
(b) Economizer Dampers: Outside air dampers are fully closed and return air damper is fully open.
(c) Heating Coil Valve: Modulate to maintain the discharge air temperature at set point reset by space temperature. Limit discharge of unit to 100°F (adj.). When return air temperature rises above 70°F. (adj.), the system will return to normal operations.
(d) The air cooled condensing unit will be disabled.

6) Cool-down Mode:
7) Supply Fan: Supply fan shall start and run continuously. The supply fan speed will be controlled to maintain duct static pressure set point and the return fan speed will be controlled to track the supply fan (adj.).
8) Economizer Dampers: Economizer dampers shall be enabled to provide free cooling when the outside air temperature is below the dry bulb economizer set point.
(a) Economizer Available: Economizer dampers shall modulate in sequence with the condensing unit subject to a mixed air low limit of 40 degrees F. (adj.).
(b) Economizer Not Available: Outside air and exhaust dampers are fully closed and return air damper is fully open.
9) Heating Coil Valve: Fully closed.
10) Air Cooled Condensing Unit: Operate in sequence with the economizer dampers to maintain this discharge air temperature at set point as reset by space temperature.

c. Occupied Mode:
1) Supply fan: Supply fan shall run continuously. The supply fan speed shall be controlled to maintain duct static pressure (adj.) and the return fan speed will be controlled to track the supply fan (adj.).
(a) Outside Air Damper: Damper shall open to provide cod required minimum outside air.
(b) Discharge Air Control: The mixed air dampers, heating coil and the cooling coil will modulate in sequence to maintain the discharge air temperature at setpoint.

(c) Discharge Air Setpoint: This unit will work as a cooling and heat unit. The setpoint will be based on the zones served demand. If 2 of the 3 areas served are calling for cooling the discharge setpoint will be 55°F (adj) and the VAV boxes will function as cooling boxes. If 2 of 3 areas served are calling for heating the discharge setpoint will be 70°F (adj) reset upward as zone demand calls for and the VAV boxes will function as cooling boxes.
(d) The DX cooling will be disabled below an OA temperature 60°F (adj).
(e) Economizer Dry Bulb Changeover: temperature is below the switchover setpoint of 60 °F (adj), the economizer will be enabled. When the shared outside air temperature rises above the switchover setpoint plus a differential, the economizer will be disabled.
(f) Humidifier:
(1) The humidifier is self-contained and runs on its integral controls.
(2) The BAS will monitor status and discharge humidity (alarm if<35% (adj) or >90% (adj)).
(3) The BAS will provide an interlock to disable humidifier when the AHU is off.
(g) System Stop:
(1) When the air handling unit is indexed to shut down, the supply fan shall stop.
(2) Dampers and control valves shall be indexed to their "system Off" conditions.

d. Safeties and Alarms:
1) Low Limit: Manual reset low limit thermostat shall stop the supply fan, close the outdoor air dampers and open the heating coil valve, and fully, and annunciate alarm should the coil discharge air temperature fall below 38 °F.
2) Smoke Control:
(a) Duct smoke detector(s) shall stop the supply fan and annunciate alarm when products of combustion are detected in the air stream. Dampers and control valves shall be indexed to their "System Off" conditions.
(b) The supply fan shall be interlocked to shut down upon a command from the building fire alarm system.
(c) Upon a return to normal, the supply fan shall start after an adjustable delay to provide a staggered start of all building loads.
3) Static High Limit: Supply fan will be shut down if the discharge air static pressure exceeds 3" w.c. (adj.).
4) Annunciate of normal alarms whenever supply fan status does not equal alarm.
5) All alarms shall be reported to the operated workstation for the BAS.
6) Point List
(a) Fan Start/Stop
(b) Fan Status (CSR)
(c) Discharge Air Temperature
(d) Discharge Air Temperature Set Point
(e) Supply Duct Pressure
(f) Supply Duct Pressure Set Point
(g) OA/RA Damper control
(h) Cooling Valve Control
(i) Pre-Heating Valve Control
(j) Mixed Air Temperature
(k) Return Air Temperature

2. North Zone Reheat Coils:
a. The north zone reheat coil valve will modulate to maintain its non-adjustable space sensor setpoint. Its setpoint will be the received from and match the setpoint of VAV-6 adjustable space sensor.

1) Failure Modes:
   (a) Fan Failure: If the supply fan fails to operate, an alarm will be annunciated. Dampers and control valves shall be indexed to their “System Off” conditions.
   (b) Sensor Failure of an analog sensor, associated dampers and control valves shall remain at their last position and alarm shall be annunciated.
   (c) Power Failure:
      (1) Fans: Upon restoration of power, the supply fan shall start after an adjustable delay to provide a staggered start of all building loads.
      (2) Dampers: Economizer dampers shall be provided with spring return actuators to fail to their “System Off” positions.
      (3) Valves: Heating valves shall be provided with spring return actuator to fail open to the coil.

E. AHU-1E Control (multi-Zone With VFD, Hot Water/DX)
   1. Constant Volume
      a. General:
         1) Control electronically with DDC controller.
         2) Provide graphic display terminal on the DDC workstation.
         3) Provide optimized start/stop with multiple schedule options for each system through the DDC system on a 365 day annual time of day schedule with four events per defined special uses.
         4) Provide a timed override mode enabled through AHU space sensors to return space to occupied mode for 2 hours (adj.) for tenant comfort.
         5) All set points will be adjustable through BAS, at the operator workstation and remotely.
      b. System Off:
         1) The supply fan shall be off.
         2) The outside air and exhaust dampers shall be closed.
         3) The return air damper shall be open.
         4) The air cooled condenser shall be disabled.
         5) The heating coil valve shall modulate to maintain the mixed air plenum temperature at 50 °F (adj.).
      c. System Start
         1) When the air-handling unit is indexed to operate the supply fan shall start.
         2) Upon proof of supply fan operation, dampers and control valves shall be indexed to their “System Run” condition.
      d. System Run
         1) Unoccupied Heating Mode:
            (a) Supply Fan: Supply fan shall cycle to maintain space temperature at the unoccupied heating set point (adj.)
            (b) Economizer Dampers: Outside air dampers are fully closed an return air damper is fully open.
            (c) Condensing Unit: Fully disabled Cold deck dampers closed.
            (d) Heating Coil valve: Fully open when the supply fan is on. Heat dampers open.
         2) Unoccupied Cooling Mode:
            (a) Supply Fan: Cycle supply fan to maintain space temperature at the unoccupied cooling set point (adj.)
            (b) Condensing Unit: Enabled when the supply fan is on. Cold deck open.
            (c) Heating Coil Valve: Fully closed. Hot Deck closed.
         3) Warm-up Mode:
            (a) Supply Fan: Supply fan shall start and run continuously.

(b) Economizer Dampers: Outside air dampers are fully closed and return air damper is fully open.
(c) Condensing Unit: Fully disabled. Cold deck closed.
(d) Heating Coil Valve: Modulate to maintain the discharge air temperature at set point reset by space temperature. Limit discharge of unit to 120°F (adj.). When return air temperature rises above 74°F. (adj.), the system will return to normal operations. Hot deck open.

4) Cool-down Mode:
(a) Supply Fan: Supply fan shall start and run continuously.
(b) Outside Air Dampers: Dampers shall be enabled to open to minimum OA position.
(c) Condensing Coil Valve: enable to maintain discharge air temperature at set point as reset by space temperature. Cold deck open.
(d) Heating Coil Valve: Fully closed. Hot deck closed.

5) Occupied Mode:
(a) MZ dampers will modulate to maintain the space temperature setpoint of each of 3 zones.
(b) Warm air heat coil discharge temp and cooling coil temp should be reset based on the zones requiring most heating or cooling. Cold air discharge set up from 60 °F to 65°F and heating to 75°F or more dependent on zone needs.
(c) Utilize outdoor air for cooling when outdoor temperature is below 60°F (adj).
(d) Condensing unit is enabled when outdoor temperature is above 60°F (adj).
(e) The DX will be disabled if the zones are not calling for cooling
(f) The BAS will maintain a constant (adj) speed on the VFD.
(g) The AHU will have an adjustable minimum OA damper setpoint.

e. System Stop:
1) When the air handling unit is indexed to shut down, the supply fan shall stop.
2) Dampers and control valves shall be indexed to their “System Off” conditions.

f. Safeties and Alarms:
1) Low Limit: Manual reset low limit thermostat shall stop the supply and return fans, close the outdoor air dampers and cooling coil valve, open the heating coil valve, and annunciate alarm should the coil discharge air temperature fall below 38 degrees F.
2) High Static: Manual rest Hight Static shall stop the supply and return fans, close the outdoor air dampers, open the heating coil valve, and annunciate alarm should the duct static exceed 3”wc.
3) Smoke and Fire Alarms will stop the unit and put dampers and valves in their normal “unit off position when in alarm and annunciate an alarm.
4) Annunciate off normal alarms whenever supply or return fan status does not equal alarm.
5) All alarms shall be reported to the operated workstation for the BAS.

g. Point List
1) Fan Start/Stop
2) Fan Status
3) Discharge Air Temperature
4) Room Temperature Set point
5) Room Temperature
6) OA/RA Damper Control
7) DX Stages
8) Heating Valve Control
9) Mixed Air Temperature
10) Return Air Temperature

h. Failure Modes:

1) Fan Failure: If the supply or return fan fails to operate, both fans shall shut down and alarm be annunciated. Dampers and control valves shall be indexed to their “System Off” conditions.
2) Sensor Failure: Upon the failure of an analog sensor, associated dampers and control valves shall remain at their last position and alarm shall be annunciated.
3) Power Failure:
   (a) Fans: Upon restoration of power, the supply fan shall start after an adjustable delay to provide a staggered start of all building loads.
   (b) Dampers: Dampers shall be provided with spring return actuators to fail to their “System Off” positions.
   (c) Valves: Heating valves shall be provided with spring return actuator to fail open the coil.

F. AHU-2E Control
1. Variable Air Volume - Hot Water/DX Cooled
   a. General:
      1) Control electronically with DDC controller.
      2) Provide graphic display terminal on the DDC workstation.
      3) Provide optimized start/stop with multiple schedule options for each system through the DDC system on a 365 day annual time of day schedule with four events per defined special uses.
      4) Provide a timed override mode enabled through AHU space sensors to return space to occupied mode for 2 hours (adj.) for tenant comfort.
      5) All set points will be adjustable through BAS, at the operator workstation and remotely.
   b. System Off:
      1) The supply fan shall be off. The supply fan VFD will be commanded to 0%
         (a) The outside air damper shall be closed.
         (b) The return air damper shall be open.
         (c) The heating coil valve shall modulate to maintain the mixed air plenum temperature at 50 degrees F. (adj.).
         (d) The air cooled condensing unit will be disabled.
   c. System Start:
      1) When the air-handling unit is indexed to operate the return fan shall start first. Following a 5-second (adj.) delay, the supply fan shall start. NOTE: The mixed air dampers and the supply/return fans speed drives shall be ramped to their respective operating values over a time period (adj., initially set to five minutes).
      2) Upon proof of supply fan operation, dampers and control valves shall be indexed to their “System Run” condition.
   d. System Run:
      1) Unoccupied Heating Mode:
         (a) Supply and Return Fans: Supply and return fans shall cycle to maintain supply air temperature at the unoccupied heating set point (adj.). The supply fan speed will be controlled to maintain duct static pressure at set point (adj.).
         (b) Economizer Dampers: Outside air dampers are fully closed and return air damper is fully open.
         (c) Heating Coil Valve: When the supply and return fans are on modulate, the heating valve to maintain supply air temperature.
         (d) The air cooled condensing unit will be disabled.
      2) Unoccupied Cooling Mode:
         (a) Supply and Return Fans: Cycle supply and return fans to maintain space temperature at the unoccupied cooling set point (adj.).

(b) Economizer Dampers: Economizer dampers shall be enabled to provide free cooling when the outside air temperature is below the dry bulb economizer set point.
   (1) Economizer Available: Outside air damper is fully open and return air damper is fully closed when the supply fans are on.
   (2) Economizer Not Available: Outside air damper is fully closed and return air damper is fully open.
   (3) Heating Coil Valve: Fully closed.
   (4) Air Cooled Condensing Unit: Allow to operate when the supply fan and return fans are on the maintain supply air at discharge air temperature set point.

3) Warm-up Mode:
   (a) Supply and Return Fan: Supply and return fans shall start and run continuously. The supply fan speed will be controlled to maintain duct static pressure.
   (b) Economizer Dampers: Outside air dampers are fully closed and return air damper is fully open.
   (c) Heating Coil Valve: Modulate to maintain the discharge air temperature at set point reset by space temperature. Limit discharge of unit to 100°F (adj.). When return air temperature rises above 70°F. (adj.), the system will return to normal operations.
   (d) The air cooled condensing unit will be disabled.
4) Cool-down Mode:
   (a) Supply and Return Fan: Supply and return fans shall start and run continuously. The supply fan speed will be controlled to maintain duct static pressure set point and the return fan speed will be controlled to track the supply fan (adj.).
   (b) Economizer Dampers: Economizer dampers shall be enabled to provide free cooling when the outside air temperature is below the dry bulb economizer set point.
      (1) Economizer Available: Economizer dampers shall modulate in sequence with the condensing unit subject to a mixed air low limit of 40 degrees F. (adj.).
      (2) Economizer Not Available: Outside air and exhaust dampers are fully closed and return air damper is fully open.
      (3) Heating Coil Valve: Fully closed.
      (4) Air Cooled Condensing Unit: Operate in sequence with the economizer dampers to maintain this discharge air temperature at set point as reset by space temperature.
5) Occupied Mode:
   (a) Supply and Return fans: Supply fan shall run continuously. The supply fan speed shall be controlled to maintain duct static pressure (adj.) and the return fan speed will be controlled to track the supply fan (adj.).
   (b) Damper shall open to provide cod required minimum outside air.
   (c) Discharge Air Control: The mixed air dampers, heating coil and the cooling coil will modulate in sequence to maintain the discharge air temperature at setpoint 60°F (adj). The DX cooling will be disabled below 60°F (adj) OA temperature.
   (d) Economizer Dry Bulb Changeover: temperature is below the switchover setpoint, the economizer will be enabled. When the shared outside air temperature rises above the switchover setpoint plus a differential, the economizer will be disabled.
   (e) Humidifier:
      (1) The humidifier is self contained and runs on its integral controls.

(2) The BAS will monitor status and discharge humidity (alarm if<35% (adj) or >90% (adj)).
(3) The BAS will provide an interlock to disable humidifier when the AHU is off.

(f) System Stop:
(1) When the air handling unit is indexed to shut down, the supply fan shall stop.
(2) Dampers and control valves shall be indexed to their “System Off” conditions.

(g) Safeties and Alarms:
(1) Low Limit: Manual reset low limit thermostat shall stop the supply fan, close the outdoor air dampers and open the heating coil valve, and fully, and annunciate alarm should the coil discharge air temperature fall below 38 degrees F.
(2) Smoke Control:
(3) Duct smoke detector(s) shall stop the supply fan and annunciate alarm when products of combustion are detected in the air stream. Dampers and control valves shall be indexed to their “System Off” conditions.
(4) The supply fan shall be interlocked to shut down upon a command from the building fire alarm system.
(5) Upon a return to normal, the supply fan shall start after an adjustable delay to provide a staggered start of all building loads.
(6) Static High Limit: Supply fan will be shut down if the discharge air static pressure exceeds 3” WC (adj.).
(7) Annunciate of normal alarms whenever supply fan status does not equal alarm.
(8) All alarms shall be reported to the operated workstation for the BAS.

(h) Point List
(1) Fan Start/Stop
(2) Fan Status (CSR)
(3) Discharge Air Temperature
(4) Discharge Air Temperature Set Point
(5) Supply Duct Pressure
(6) Supply Duct Pressure Set Point
(7) OA/RA Damper control
(8) Cooling Valve Control
(9) Pre-Heating Valve Control
(10) Mixed Air Temperature
(11) Return Air Temperature

e. Failure Modes:
1) Fan Failure: If the supply or return fan fails to operate, both fans shall shut down and alarm be annunciated. Dampers and control valves shall be indexed to their “System Off” conditions.
2) Sensor Failure: Upon the failure of an analog sensor, associated dampers and control valves shall remain at their last position and alarm shall be annunciated.
3) Power Failure:
(a) Fans: Upon restoration of power, the supply fan shall start after an adjustable delay to provide a staggered start of all building loads.
(b) Dampers: Dampers shall be provided with spring return actuators to fail to their “System Off” positions.
(c) Valves: Heating valves shall be provided with spring return actuator to fail open the coil.

G. Adult Service Area RTU

1. The BAS will provide start/stop based on a time of a day schedule. Once enabled the unit runs on its own controls
2. The BAS will monitor the run status and space temperature. If the run status does not match the command or the space temperature exceeds the space limits an alarm will be generated on the DDC workstation
3. In unoccupied mode the BAS will enable the unit to maintain and unoccupied space setpoint (adj on the workstation).

H. Static Pressure Control for Variable Frequency
   1. Static Pressure Control for Variable Frequency
      a. The building automation system shall monitor the damper position of all VAV terminal units and determine each VAV AHU's critical zone VAV terminal (CZ), which is the VAV terminal unit that is the widest open.
      b. When the CZ is more than 95% open, the supply fan discharge static pressure set point shall be reset downward by 10% of the previous set point at frequency of 10 minutes until the CZ is more than 97% open or the inlet vanes (or Frequency Inverter) are at their minimum setting.
      c. When the CZ is more than 95% open, the supply fan discharge static pressure set point is at the minimum setting, the discharge air temperature set point shall be reset upward in increments of 0.5°F. at a frequency of 10 minutes and the static pressure setpoint held constant until the CZ is more than 97% open or the discharge air temperature is reset to its maximum setting of 10°F. above design setting.
      d. The reverse control sequencing shall occur when the CZ is above 98% open until the discharge air temperature set point and the static pressure set point are at the design set points.
      e. The control bands, set point increment values, set point decrement values and adjustment frequencies shall be adjusted to maintain maximum static pressure optimization with stable system control and maximum comfort control.
      f. The BAS shall also read the status on the supply air sensor and display the pressure reading on the status screen.

I. AHU Humidifiers (Typical for 3)
   1. The humidifiers are self-contained and will work from their integral controls.
   2. The BAS will monitor the status, alarm and discharge humidity and will alarm on the DDC workstation if conditions are out of normal.
   3. The BAS will provide an enable/disable contact to ensure the humidifier is disabled when the AHU is not running. Once enabled it will run on its integral controls.

3.06 EXHAUST FAN CONTROL

A. Interlock all toilet and janitor room exhaust fans to start and stop through the nearest central station air-handling unit DDC controller.

B. BAS system will show status (on/off) of all exhaust fan through a current sensing relay on each system. Issue a non-critical alarm on failure.

3.07 UNIT HEATERS

A. Hot water Cabinet Unit Heater (CUH)
   1. A space sensor will cycle the fan to maintain the space temperature setpoint. The CUH will be prevented from running if the hot water system is not in heating mode.
   2. BAS system will show status (on/off) of all CUH through a current sensing relay on each system. Issue a non-critical alarm on failure.

B. Suspended Unit Heater (SUH)
   1. A space sensor will cycle the fan to maintain the space temperature setpoint. The SUH will be prevented from running if the hot water system is not in heating mode.
   2. BAS system will show status (on/off) of all SUH through a current sensing relay on each system. Issue a non-critical alarm on failure.

3.08 OUTDOOR LIGHTING CONTROL

A. The BAS control shall provide a photocell as an analog input to the BAS and will provide lighting control contacts in series with an electrically held lighting contractor. The control contact shall be time based and automatically activated. It shall have the ability to be field or remotely programmed for operation at any entered time of day. Control from the designated exterior lighting points in series with the time-of-day program.

END OF SECTION

Attachment C

#	Controler Model Number	Type	Serves	Communication
1	EISK8-100T	JACE	Building BAS	Ethernet CAT-6
2	MNB-1000	Supervisory	AHU-1E	Ethernet CAT-6
3	MNB-1000-15	Expansion Module	AHU-1E	N/A
4	MNB-1000	Supervisory	AHU-2E	Ethernet CAT-6
5	MNB-1000	Supervisory	AHU-1W	Ethernet CAT-6
6	MNB-1000-15	Expansion Module	AHU-1W	N/A
7	MNB-1000	Supervisory	AHU-2W	Ethernet CAT-6
8	MNB-1000-15	Expansion Module	AHU-2W	N/A
9	MNB-1000-15	Expansion Module	AHU-2W	N/A
10	ENC-1	Supervisory	Boiler + Field Controllers	Ethernet CAT-6
11	Boiler LON	ProtoNode	Boiler	LON
12	MNB-V2	Field	VAV-1	MS/TP
13	MNB-V2	Field	VAV-2	MS/TP
14	MNB-V2	Field	VAV-3	MS/TP
15	MNB-V2	Field	VAV-4	MS/TP
16	MNB-V2	Field	VAV-5	MS/TP
17	MNB-V2	Field	VAV-6	MS/TP
18	MNB-V2	Field	VAV-7	MS/TP
19	MNB-V2	Field	VAV-8	MS/TP
20	MNB-V2	Field	VRT-1	MS/TP
21	MNB-V2	Field	VRT-2	MS/TP
22	MNB-V2	Field	VRT-3	MS/TP
23	MNB-V2	Field	VRT-4	MS/TP
24	MNB-V2	Field	VRT-5	MS/TP
25	MNB-V2	Field	VRT-6	MS/TP
26	MNB-V2	Field	VRT-7	MS/TP
27	MNB-V2	Field	VRT-8	MS/TP
28	MNB-V2	Field	VRT-9	MS/TP
29	MNB-V2	Field	VRT-10	MS/TP
30	MNB-V2	Field	VRT-11	MS/TP
31	MNB-V2	Field	VRT-12	MS/TP
32	MNB-V2	Field	VRT-13	MS/TP
33	MNB-V2	Field	VRT-14	MS/TP
34	MNB-V2	Field	VRT-15	MS/TP
35	MNB-V2	Field	VRT-16	MS/TP
36	MNB-V2	Field	VRT-17	MS/TP
37	MNB-V2	Field	VRT-18	MS/TP
38	MNB-V2	Field	VRT-19	MS/TP
39	MNB-V2	Field	VRT-20	MS/TP
40	MNB-V2	Field	VRT-21	MS/TP
41	MNB-V2	Field	VRT-22	MS/TP

Attachment C

42	MNB-V2	Field	VRT-23	MS/TP
43	MNB-V2	Field	VRT-24	MS/TP
44	MNB-V2	Field	VRT-25	MS/TP
45	MNB-V2	Field	VRT-26	MS/TP
46	MNB-V2	Field	VRT-27	MS/TP
47	MNB-V2	Field	VRT-28	MS/TP
48	MNB-V2	Field	VRT-29	MS/TP
49	MNB-V2	Field	VRT-30	MS/TP
50	MNB-V2	Field	VRT-31	MS/TP
51	MNB-V2	Field	VRT-32	MS/TP
52	MNB-V2	Field	VRT-33	MS/TP
53	MNB-V2	Field	VRT-34	MS/TP
54	MNB-70	Field	CUH-E	MS/TP
55	MNB-70	Field	SUH-E	MS/TP

Attachment D

8/13/2024

RIDER TO LLD CONTRACT WITH CONTRACTOR

For Inclusion in Standard Form of Agreement
Between Owner and Contractor ("Agreement")

For information purposes:

A. This Rider applies to all services to be provided by Contractor pursuant to the Agreement.

B. All representations made by the Owner in the Contract Documents that complete the Agreement are made to the best of Owner's knowledge and belief.

C. The contractor shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum as security for the payment of all persons performing labor and furnishing materials in connection with this Contract. The Performance Bond and the Labor and Material Payment Bond shall be submitted on AIA Form A312 or on other forms acceptable to the Architect/Engineer.

D. Performance Bonds to be provided (AIA Form) shall contain the following language:

> "Any suit under this bond must be instituted before the expiration of the statute of limitation applicable to any claims against the Contractor named herein."

E. Any claims shall be commenced within the limitations stated in 735 ILCS 5/13-214. * The parties intend that modifications in the Agreement or Contract Documents of the limitations provided by 735 ILCS 5/13-214, if any, shall be given no effect.

F. Contractor shall purchase insurance to cover claims and expenses, including costs of defense, asserted against Owner and Architect/Engineer and Owner's Representative, their agents, employees and consultants for bodily injury, sickness, disease or death caused by any negligent act or omission of the Contractor, Sub-Contractors, anyone directly or indirectly employed by them or anyone for whose acts any of them may be liable. The coverage afforded the Owner and Architect/Engineer and Owner's Representative shall be primary insurance for the Owner and Architect/Engineer and Owner's Representative with respect to claims arising out of operations performed by or on behalf of the Contractor. If the Owner and Architect/Engineer and Owner's Representative have other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis. The amount of liability of the Contractor under this insurance policy shall not be reduced by

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* (a) Actions based upon tort, contract or otherwise against any person for an act or omission of such person in the design, planning, supervision, observation or management of construction, or construction of an improvement to real property shall be commenced within 4 years from the time the person bringing an action, or his or her privity, knew or should reasonably have known of such act or omission. Notwithstanding any other provision of law, contract actions against a surety on a payment or performance bond shall be commenced, if at all, within the same time limitation applicable to the bond principal.

(b) No action based upon tort, contract or otherwise may be brought against any person for an act or omission of such person in the design, planning, supervision, observation or management of construction, or construction of an improvement to real property after 10 years have elapsed from the time of such act or omission . . .

the existence of such other insurance.

1. Such insurance shall be written to include the following coverages and for not less than the following minimum limits, or greater if required by law:

   i. General Liability:
      1. Commercial General Liability
      2. Occurrence Basis
      3. Limits:
         a. General Aggregate - $2,000,000
         b. Products – Comp / Ops Aggregate - $1,000,000
         c. Personal & Advertising Injury - $1,000,000
         d. Each Occurrence - $1,000,000
         e. Fire Damage (any one fire) - $50,000
         f. Medical Expense (any one person) - $5,000

   ii. Automobile Liability
      1. Any Auto Owned by Contractor
      2. Hired Autos
      3. Non-Owned Autos
      4. Limits:
         a. Combined Single Limit - $1,000,000

   iii. Umbrella / Excess Liability
      1. Limits:
         a. Each Occurrence - $10,000,000
         b. Aggregate - $10,000,000

   iv. Workers' Compensation and Employers' Liability
      1. Employers' Liability Limits:
         a. Each Accident - $500,000
         b. Disease-Policy Limit - $500,000
         c. Disease-Each Employee - $500,000

G. Work will not begin, nor will any payment be authorized absent submission by the Contractor to the Owner and/or Owner's Representative of proof that all required insurance coverages and bonds are in effect. A Certificate of Insurance is not adequate proof. The Contractor may provide a Certificate of Insurance but shall also provide the actual endorsement from the Contractor's insurance company.

H. "As built" drawings from the Contractor are a condition of receipt of the Contractor's final payment.

I. The responsibilities/liabilities of the Owner and the Contractor and their consultants, agents and employees and any concomitant damages and/or consequential damages shall be determined in such amount and to such extent as provided by Illinois law, insurance coverage, caps or limitations notwithstanding. By way of this provision, the parties intend that any limitations in the Agreement of the amounts or types of damages available to the parties shall be given no effect.

J. The Contractor shall reimburse the Owner for all reasonable fees charged to the Owner by the Architect/Engineer and Owner's Representative, if any, which the Owner incurs as a result of the Contractor's failure to fulfill the Contractor's obligations including, without limitation, timely completion of the project.

K. Contractor shall pay all reasonable attorneys' fees, experts' fees, and costs incurred by the Owner in enforcing the terms and provisions of this Agreement and in defending any proceeding to which the Owner is made a party as result of the acts or omissions of the Contractor.

L. Contractor shall defend, indemnify, and hold harmless Owner, Architect/Engineer and Owner's Rep from and against all claims, losses, damages, and expenses to the extent such claims, losses, damages or expenses are caused by Contractor's conduct, acts, errors or omissions.

Attachment D

M. In an effort to resolve any conflicts that arise under this Agreement, prior to commencing litigation all disputes between the Owner and the Contractor arising out of or relating to this Agreement shall be submitted to non-binding mediation. After such non-binding mediation and, unless the parties agree to submit to binding arbitration, any claims, disputes, liabilities of the parties or other matters between the Owner and the Contractors shall be resolved in the Circuit Court of Dupage County, Illinois in accordance with Illinois law.

N. Contractor shall obtain lien waivers for all labor and materials for the project.

O. Contractor acknowledges sole responsibility for determining the nature and extent of any and all work required to complete the Project.

P. It is intended that neither the Owner nor the Architect/Engineer nor the Owner's Representative has responsibility for constructions means, methods, techniques, sequences, or procedures, and/or safety precautions and programs.

Q. Contractor shall at all times observe and comply with all laws, ordinances, regulations and codes of any applicable governmental entity including, without limitation, prevailing wage laws.

R. Contractor acknowledges full and sole authority for all safety programs and precautions in connection with the work.

S. Contractor acknowledges that he has examined the property and has familiarized himself with all local conditions affecting the property.

T. The Contractor's standard of care shall be the standard of care consistent with those usual and customary standards of professional care, skill, and diligence which are, at the time of performance of services under this Agreement, commonly followed by Contractors performing the same or similar services in the locale in which the Project is located. Consistent with this standard of care, Contractor is cognizant of its duties:

a) vis-à-vis assessing compliance with the Drawings and Specs; and

b) to confirm in writing, when appropriate, interpretations by government officials of building codes and applicable regulations.

U. Contractor, at Contractor's expense, will obtain and maintain all necessary permits and licenses.

V. Contractor shall provide Owner with all documents requested by Owner thereby enabling Owner to respond timely to any request to Owner for documents pursuant to the Freedom of Information Act.

W. The Owner is subject to the Freedom of Information Act, 5 ILCS 140/1, et seq. ("FOIA"). All information submitted by Contractor to Owner is subject to disclosure to third parties in accordance with FOIA. If Contractor intends for Owner to withhold the bidder's trade secrets, commercial information, or financial information from disclosure to a third party in response to a FOIA request, Contractor must include with its bid written notification specifically identifying such information, along with a statement that disclosure of such information will cause competitive harm to the bidder, as provided by FOIA Section 7(1)(g), 5 ILCS 140/7(1)(g). Any information submitted which is not so marked by Contractor at the time of bid submittal will be presumed to be open to public inspection. Contractor may be required to substantiate the basis for its claims. Owner reserves the right, in its sole discretion and subject only to applicable law, to withhold or release Contractor's information in response to a FOIA request.

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X. Owner's Representative Required Provisions:

i. Contractors responsible for construction shall purchase insurance to cover claims and expenses, including costs of defense, asserted against Owner's Representative, its agents, employees and consultants for bodily injury, sickness, disease or death caused by any negligent act or omission of the Contractor, any sub-contractor, anyone directly or indirectly employed by them or anyone for whose acts any of them may be liable. Such insurance shall state that: "The coverage afforded the additional insured shall be primary insurance for the additional insured with respect to claims arising out of operations performed by or on behalf of the Contractor. If the additional insured have other insurance, which is applicable to the loss, such other insurance shall be on an excess or contingent basis. The amount of the company's liability under this insurance policy shall not be reduced by the existence of such other insurance."

ii. To the fullest extent permitted by law, the Contractor shall waive any right of contribution and shall indemnify and hold harmless the Owner, CCS International, Inc. (the Owner's Representative) and their agents and employees and consultants from and against all claims, damages, losses and expenses, including but not limited to attorney's fees and economic or consequential damages, arising out of or resulting from or in connection with the performance of the Work, provided that any such claim, damage, loss or expense is caused in whole or in part by any negligent act or omission of any Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity that would otherwise exist as to any party or person described in this Agreement.

iii. In any and all claims against the Owner or Owner's Representative or any of their agents or employees and consultants by any employee of the Contractor or Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph agreement shall not be limited in any way by any limitation on the amount or type damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefits acts.

iv. "Claims, damages, losses and expenses" as these words are used in this Agreement shall be construed to include, but not limited to (1): injury or damage consequent upon the failure of or use or misuse by Contractor, its Subcontractors, agents, servants, or employees, of any hoist, rigging, blocking, scaffolding, or any and all other kinds of items of equipment, whether or not the same be owned, furnished or loaned by Owner; (2): all attorneys' fees and costs incurred in bringing an action to enforce the provisions of this indemnity or any other indemnity contained in the General Conditions, as modified by the Supplementary General Conditions; and (3): time expended by the party being indemnified and their employees, at their usual rate plus costs of travel, long distance telephone and reproduction of documents.

v. The indemnity provisions of this Agreement shall not require the Contractor to indemnify the Owner, Owner's Representative, their consultants, agents or employees to the extent of their own negligence. The Owner's Representative is intended to be a third party beneficiary of all provisions of the Agreement.

Attachment D

Y. Architect/Engineer Required Provisions:

i. To the fullest extent permitted by law, the Contractor shall waive any right of contribution and, with respect to the Indemnified Parties, any limitation of liability under Worker Compensation laws, and shall indemnify and hold harmless the Owner, the Architect/Engineer and their agents and employees and consultants (the Indemnified Parties") from and against all claims, damages, losses and expenses ("Claims"), including but not limited to attorney's fees and economic or consequential damages, arising out of, resulting from or in connection with the performance of the Work, provided that any such Claim, is caused in whole or in part by any negligent act or omission of any Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by an Indemnified Party. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist to any party or person described in this Agreement.

ii. In any and all Claims against any Indemnified Party by any employee of the Contractor or any Subcontractor, anyone directly or indirectly employed by any of them for whose acts any of them may be liable, the indemnification obligation under this Paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker compensation acts, disability benefit acts or other employee benefits acts.

iii. The term 'Claim' as used in this Paragraph shall be construed to include, but not limited to (1) injury or damage consequent upon the failure of or use of misuse by Contractor, its Subcontractors, agents, servants or employees, of any kind of items of equipment, whether or not the same be owned, furnished or loaned by Owner or Contractor; (2) all attorney's fees and costs incurred in bringing an action to enforce the provisions of this indemnity or any other indemnity contained in the Contract Documents; and (3) time expended by the Indemnified Party and its employees, at their usual rates plus costs of travel, long distance telephone and reproduction of documents.

iv. Only to the extent necessary to prevent this provision from being void under 740 ILCS 35/1, et seq., entitled "Indemnification of person from person's own negligence, this indemnity agreement shall not require the Contractor to indemnify any Indemnified Party against that party's own negligence."

Attachment D

Z. THIS RIDER IS THE LAST ARTICLE TO THE AGREEMENT AND IS EXECUTED ON THE DATES STATED BELOW. IN THE EVENT OF ANY CONFLICT BETWEEN THE PROVISIONS OF THIS RIDER AND ANY OTHER PROVISIONS OF THE AGREEMENT, THIS RIDER CONTROLS. THIS PARAGRAPH IS STATED IN ALL CAPITAL LETTERS AND IS INITIALED AS CONFIRMATION OF THE PARTIES' UNDERSTANDING OF THE PRECEDENCE THIS RIDER TAKES OVER ANY OTHER PROVISIONS OF THE AGREEMENT.

_____ Contractor (Initial)

Date Initialed: _____

_____ Owner (Initial)

Date Initialed: _____

CONTRACTOR TBD
COMPANY

By: _____

President

Date Signed: _____, 2021

BOARD OF LIBRARY TRUSTEES
LISLE PUBLIC LIBRARY DISTRICT

By: _____

President

Date Signed: _____, 2021

MECHANICAL ABBREVIATIONS

AAV	AUTOMATIC AIR VENT (VALVE)
AB	AIR BLENDER
AC	AIR CONDITIONING UNIT OR AIR COMPRESSOR
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR
AF	AIR FILTER
AFC	AUTOMATIC FLOW CONTROL DEVICE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AMP	AMPERE
AMS	AIR FLOW MEASURING STATION
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT/ARCHITECTURAL
AS	AIR SEPARATOR
AUTO	AUTOMATIC
AVG	AVERAGE
BAS	BUILDING AUTOMATION SYSTEM
BD	BALANCING DAMPER
BDD	BACK-DRAFT DAMPER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
CAP	CAPACITY
CC	COOLING COIL
CCW	COUNTER CLOCKWISE
CD	CONDENSATE DRAIN
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CL	CENTER LINE
CO	CLEAN OUT OR CARBON MONOXIDE
CONT	CONTINUOUS, CONTINUATION
CP	COIL PUMP
CT	COOLING TOWER
CU	CONDENSING/ER UNIT
CU FT	CUBIC FEET
CV	CONSTANT AIR VOLUME
CW	COLD WATER OR CLOCKWISE
D	DRAIN
DB	DECIBEL OR DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DE	DRYER EXHAUST
DER	DRYER EXHAUST RISER
DEG.F	DEGREE FARENHEIT
DG	DOOR GRILLE
DIA	DIAMETER
DIFF	DIFFUSER
DISCH	DISCHARGE
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING
E	EXHAUST
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EBB	ELECTRIC BASEBOARD HEATER
EC	ELECTRICAL CONTRACTOR
ECH	ELECTRIC CABINET HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL-WATER SOLUTION (% GLYCOL BY VOLUME)
EHC	ELECTRIC HEATING COIL
ELEC	ELECTRIC/ELECTRICAL
EL/ELEV	ELEVATION
ENT	ENTERING
EQUIP OR EQT	EQUIPMENT
E/RF	EXHAUST/RETURN FAN
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXIST	EXISTING
F	FILTER
°F	DEGREE FARENHEIT
FA	FREE AREA
FD	FIRE DAMPER
FLA	FULL LOAD AMPERES
FLEX	FLEXIBLE
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
FPB	FAN POWERED TERMINAL UNIT
FP	FIRE PROTECTION
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FREEZE STAT
F/SD	COMBINATION FIRE/SMOKE DAMPER
FT	FEET OR FLASH TANK
FTR	FIN TUBE RADIATION (HOT WATER)
FV	FACE VELOCITY
GA	GAUGE
GAL	GALLON
GC	GENERAL CONTRACTOR
GD	GRAVITY DAMPER
GEN	GENERAL
GE	GENERAL EXHAUST
GER	GENERAL EXHAUST RISER
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H	HUMIDISTAT
HC	HEATING COIL
HORIZ	HORIZONTAL
HP	HORSEPOWER OR HEAT PUMP
HR	HOUR
HTG	HEATING
HUM	HUMIDIFIER
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IN OR "	INCH
INSUL.	INSULATION
IN W.C.	INCHES WATER COLUMN
IN W.G.	INCHES WATER GAUGE
KE	KITCHEN EXHAUST
KER	KTICHEN EXHAUST RISER
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LL	LOW LIMIT OR LANDLORD
LP	LOW PRESSURE GAS
LRA	LOCKED ROTOR AMPERES
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MB	MIXING BOX
MBH	THOUSAND BTU PER HOUR
MIN	MINIMUM OR MINUTE(S)
MD	MOTORIZED DAMPER
MP	MEDIUM PRESSURE GAS
NC	NORMALLY CLOSE OR NOISE CRITERIA
NIC	NOT IN CONTRACT
NK	NECK
NO	NORMALLY OPEN
NO OR #	NUMBER
NR	NOT REQUIRED
NTS	NOT TO SCALE
NV	NATURAL VENTILATION
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
OPNG	OPENING
OV	OUTLET VELOCITY OR OVAL
P	PUMP
CTP	COOLING TOWER PUMP
CWP	CONDENSER WATER PUMP
PC	PLUMBING CONTRACTOR
PCD	PUMPED CONDENSATE DISCAHRGE
PG	PROPYLENE GLYCOL-WATER SOLUTION (%GLYCOL BY VOLUME)
PLBG	PLUMBING
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
R	RETURN OR RISER
RA	RETURN AIR
REQ'D	REQUIRED
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RO	RELIEF OPENING
RP	RADIANT PANEL
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE (VENT) OR ROOF VENTILATOR
S	SUPPLY
SA	SOUND ATTENUATOR
SF	SUPPLY FAN OR SQUARE FEET
SHT	SHEET
SL	SENSIBLE LOAD
SP	STATIC PRESSURE
SPECS	SPECIFICATIONS
SQ	SQUARE
SQ.FT.	SQUARE FEET
SS	STAINLESS STEEL
STD	STANDARD
STRUC	STRUCTURE/STRUCTURAL
T	THERMOSTAT/TEMPERATURE SENSOR
TD	TEMPERATURE DIFFERENCE OR TRANSFER DUCT
TEF	TOILET EXHAUST FAN
TER	TOILET EXHAUST RISER
TEMP	TEMPERATURE
TO	TRANSFER OPENING
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UC	UNDER-CUT (DOOR)
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
V	VENT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VSD	VARIABLE SPEED DRIVE
W	WATT
W/	WITH
WC	WATER COLUMN
WFD	WATER PRESSURE DROP
WMS	WIRE MESH SCREEN
WT	WEIGHT
XA	VARIABLE LENGTH ACCESS

SOUND ATTENUATOR

UC OR DG — DG: DOOR GRILLE; UC: DOOR UNDERCUT

T — THERMOSTAT

T — THERMOSTAT MOUNTED TO THERMOISOLATING PAD IF ON EXTERIOR COLUMN

T — DUCT MOUNTED THERMOSTAT

H — HUMIDISTAT

SD — SMOKE DETECTOR

CD — CARBON MONOXIDE DETECTOR

CO2 — CARBON DIOXIDE DETECTOR

N.I.C. - FUTURE TENANT BUILDOUT

REQUIRED MAINTENANCE CLEARANCE

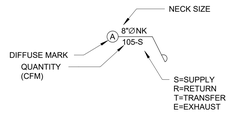
IDENTIFICATION SYMBOLS

X — KEYED NOTE TAG

X / X — EQUIPMENT TAG; EQUIPMENT TAG NO.

X / M-X — SECTION NUMBER; DRAWING ON WHICH SECTION IS SHOWN

AIR DEVICES DATA TAG



DUCTWORK SYMBOLS

DOUBLE LINE

(E)12X12 — EXISTING DUCT

EXISTING DUCT OR ITEM TO BE REMOVED

EXISTING DUCT OR ITEM TO REMAIN

BRANCH TAKE-OFF

RADIUS ELBOW

SQUARE TAP COLLAR

RADIUS TEE

BELLMOUTH CONNECTION TO RECT. DUCT

CONICAL TEE

WYE OR TEE

EXHAUST/RETURN AIR DEVICE

24X12 — RECT. DUCT DIMENSIONS (SIZE IN INCHES. FIRST DIM. IS SHOWN)

24Ø — ROUND DUCT DIMENSIONS DIAMETERS

24/12 — FLAT OVAL (SIZE IN INCHES) (FIRST DIM. IS SHOWN)

DUCT TRANSITION

ELBOW TURNED DOWN

ROUND DUCT DN

SUPPLY AIR DUCT

EXHAUST AND RETURN DUCT

OUTSIDE AIR INTAKE

FLEX. DUCT CONNECTION

FD — FIRE DAMPER

CLEAN OUT

MANUAL DAMPER

MD — MOTORIZED (AUTOMATIC) DAMPER

LLMD — LOW LEAKAGE MOTORIZED DAMPER

AD — ACCESS DOOR

CAP

DN — DUCT OFF-SET DN (IN DIRECTION OF FLOW)

UP — DUCT OFF-SET UP (IN DIRECTION OF FLOW)

FLEXIBLE DUCT

AIR TERMINAL UNIT

AIR TERMINAL UNIT W/REHEAT

PIPING SYMBOLS

(E)SERVICE — EXISTING PIPE

EXISTING PIPE OR ITEM TO BE REMOVED

EXISTING PIPE OR ITEM TO REMAIN

CD — CONDENSATE DRAIN

CWR — CONDENSER WATER RETURN

CWS — CONDENSER WATER SUPPLY

CTWR — COOLING TOWER WATER RETURN

CTWS — COOLING TOWER WATER SUPPLY

D — DRAIN

G — NATURAL GAS

HWR — HOT WATER HEATING RETURN

HWS — HOT WATER HEATING SUPPLY

V V — VENT

AIR SEPARATOR

DIRECTION OF FLOW ARROW

CONCENTRIC REDUCER

ECCENTRIC REDUCER

TEE

TEE TURNED DOWN

TEE TURNED UP

ELBOW 45°

ELBOW TURNED UP

ELBOW TURNED DOWN

PRESSURE GAUGE

FLANGE

CAPPED END CONNECTION

EXPANSION JOINT

FLEXIBLE CONNECTION

FM — FLOW METER

EXPANSION COMPENSATOR

BALL VALVE

PRESSURE INDEPENDANT FLOW CONTROL AND SHUT-OFF VALVE

BUTTERFLY VALVE

CHECK VALVE

HOSE END DRAIN VALVE

TRIPLE DUTY CHECK VALVE

GATE VALVE

GLOBE VALVE

MANUAL AIR VENT

M M — MOTORIZED 2-WAY OR 3-WAY CONTROL VALVE

SOLENOID VALVE

PRESSURE REDUCING VALVE

PRESSURE RELIEF VALVE

GAS COCK

PIPE UNION

STRAINER

SAFETY VALVE

VACUUM BREAKER

IN-LINE PUMP

PRESSURE GAUGE WITH COCK

THERMOMETER

FLOW SWITCH

PIPE ANCHOR

PIPE GUIDE

UNION

Y-TYPE STRAINER

Y-TYPE STRAINER WITH HOSE ENDED DRAIN VALVE

BASKET STRAINER

FILTER/DRYER

M — MOTOR ACTUATOR

T — CONDENSATE TRAP

PRESSURE-TEMPERATURE PORT

AS-BUILTS
JENSEN'S PLUMBING & HEATING
670 E. CALHOUN ST.
WOODSTOCK, IL 60098

OWNER
LISLE LIBRARY DISTRICT
777 FRONT STREET
LISLE, IL 60532

ARCHITECT
SHEEHAN NAGLE HARTRAY ARCHITECTS
30 WEST MONROE, SUITE 900
CHICAGO, IL 60603

MEP / TECHNOLOGY ENGINEER
SALAS O'BRIEN
815 SOUTH WABASH AVENUE
CHICAGO, IL 60605

STRUCTURAL ENGINEER
GRAEF
332 SOUTH MICHIGAN AVENUE, SUITE 1400
CHICAGO, IL 60604

CIVIL ENGINEER AND LANDSCAPE CONSULTANT
ERIKSSON ENGINEERING ASSOCIATES
145 COMMERCE DRIVE, SUITE A
GRAYSLAKE, IL 60030

LIGHTING CONSULTANT
GWEN GROSSMAN LIGHTING DESIGN
53 WEST JACKSON STREET, SUITE 1457
CHICAGO, IL 60604

STEVE J. SOVAK
062-041237
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

No.	Description	Date
CD-3	WCPR-1/CD-3 ISSUED FOR CONSTRUCTION	03.02.2022
3	ISSUED FOR BID AND PERMIT	11.19.2021
2	ISSUED FOR DESIGN DEVELOPMENT	09.08.2021
1	ISSUED FOR SCHEMATIC DESIGN	06.30.2021

LISLE LIBRARY DISTRICT

777 FRONT STREET
LISLE, IL 60532

BID AND PERMIT

MECHANICAL SYMBOLS AND ABBREVIATIONS

M001

SCALE: AS NOTED

MECHANICAL SPECIFICATIONS

GENERAL PROVISIONS FOR MECHANICAL WORK

1. MINOR ITEMS AND ACCESSORIES OR DEVICES INFERABLE AS NECESSARY TO THE COMPLETE AND PROPER OPERATION OF ANY SYSTEM SHALL BE PROVIDED FOR SUCH SYSTEMS, WHETHER OR NOT THEY ARE SPECIFICALLY CALLED FOR BY THE SPECIFICATIONS OR THE DRAWINGS.

2. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL NECESSARY PERMITS AND LICENSE FEES, MAKE ARRANGEMENTS FOR INSPECTIONS, PAY ALL FEES IN CONNECTION THEREWITH, AND PAY ALL APPLICABLE FEDERAL, STATE AND LOCAL TAXES.

3. THE CONTRACTOR SHALL GUARANTEE ALL WORK TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR IN ACCORDANCE WITH THE GENERAL CONDITIONS, UNLESS A LONGER PERIOD IS STIPULATED UNDER SPECIFIED HEADINGS. HE SHALL REPAIR OR REPLACE, AT NO ADDITIONAL COST TO THE OWNER, ANY MATERIAL OR EQUIPMENT DEVELOPING DEFECTS. REPAIRS OR REPLACEMENTS SHALL BEAR AN ADDITIONAL TWELVE (12) MONTHS GUARANTEE FROM TIME OF REPAIR OR REPLACEMENT COMPLETION. THIS REQUIREMENT SHALL BE BINDING, EVEN THOUGH IT WILL EXCEED PRODUCT GUARANTEES NORMALLY FURNISHED BY SOME MANUFACTURERS.

4. THE CONTRACTOR SHALL SUBMIT HIS OWN AND EACH MANUFACTURERS' WRITTEN CERTIFICATES AND WARRANTIES WHICH INDICATE THAT EACH ITEM OF EQUIPMENT FURNISHED, COMPLIES WITH ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. GUARANTEES AND WARRANTIES SHALL COMMENCE FROM THE DATE OF THE SIGNED ACCEPTANCE BY THE OWNER OF A PARTICULAR ITEM OF EQUIPMENT OR A PARTICULAR DEFINED PORTION OF THE WORK.

5. ALL WORK SHALL BE INSTALLED IN CONFORMANCE WITH ALL GOVERNMENTAL JURISDICTIONAL AUTHORITIES' REGULATIONS, LAWS, RULES, OR ORDINANCES IN EFFECT AND GOVERNING SAME; SUCH RULES AND REGULATIONS AND LOCAL ORDINANCES SHALL BE CONSIDERED PART OF SPECIFICATIONS. MECHANICAL CONTRACTOR SHALL BE HELD STRICTLY RESPONSIBLE FOR ANY VIOLATION OF SAME AND SHALL CHANGE HIS WORK TO CONFORM WITHOUT ADDITIONAL COST TO OWNER.

6. ALL WORK SHALL ALSO CONFORM TO THE PUBLISHED STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION, AND ELECTRICAL WORK AND EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF THE CURRENT ISSUE OF THE NATIONAL ELECTRICAL CODE. ALL MATERIALS, IN GENERAL, SHALL BE UNDERWRITERS' LABORATORIES LISTED AND SHALL BEAR UL LABEL WHERE LABELING SERVICE IS AVAILABLE.

7. WHERE JURISDICTIONAL RULES REQUIRE ASSISTANCE OF MECHANICS OF TRADES OTHER THAN THOSE ORDINARILY EMPLOYED BY A PARTICULAR MECHANICAL CONTRACTOR IN THE HANDLING, STORAGE OR SETTING OF SPECIAL EQUIPMENT, THE MECHANICAL CONTRACTOR SHALL EMPLOY SUCH TRADESMEN SO AS TO BE IN CONFORMANCE WITH LOCAL JURISDICTIONAL AGREEMENTS.

8. IT IS CONTEMPLATED THAT WORK INCLUDED BE DONE DURING REGULAR WORKING HOURS ON A "STRAIGHT TIME" BASIS. ANY WORK REQUIRING OVERTIME SHALL INCLUDE THE COST FOR SUCH OVERTIME WORK AS A PART OF THE BASE BID PROPOSAL.

9. THE ENGINEER HAS NO CONTRACTUAL RESPONSIBILITY IN CONNECTION WITH JOB SITE SAFETY MEASURES OR PRECAUTIONS AS RELATED TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES IN THAT REGARD. THE MECHANICAL CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE ARCHITECT/ENGINEER'S OBSERVATIONS OF THE MECHANICAL CONTRACTOR'S PERFORMANCE ARE NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE MECHANICAL CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE. IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION", VOLUME 36, NO.75, PART II OF THE FEDERAL REGISTER BY THE U.S. DEPARTMENT OF LABOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SUCH SAFETY MEASURES AND SHALL CONSULT WITH THE STATE OR FEDERAL SAFETY INSPECTOR FOR INTERPRETATION WHENEVER IN DOUBT AS TO WHETHER SAFE CONDITIONS DO OR DO NOT EXIST; OR WHETHER HE IS OR IS NOT IN COMPLIANCE WITH STATE OR FEDERAL REGULATIONS.

10. THE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC IN NATURE AND SHOW GENERAL ARRANGEMENT OF ALL EQUIPMENT, PIPING, DUCTWORK, SERVICES, ETC. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO SHOW ALL OFFSETS, FITTINGS, AND ACCESSORIES WHICH MAY BE REQUIRED. FURNISH ALL FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED TO MEET SUCH CONDITIONS AND TO FIT WORK OF OTHER TRADES.

11. FURNISH EQUIPMENT CUTSHEETS OR BROCHURES AND PRINTS SHOWING ALL DETAILS OF CONSTRUCTION FOR PIPE LAYOUTS AND EQUIPMENT. FURNISH ASSOCIATED WIRING DIAGRAMS FOR ALL EQUIPMENT.

12. REVIEW OF THE SHOP DRAWINGS IS RENDERED AS A SERVICE ONLY AND SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR OF BUILDING CONDITIONS; NOR SHALL IT BE CONSTRUED AS RELIEVING THE MECHANICAL CONTRACTORS OF BASIC RESPONSIBILITIES UNDER HIS CONTRACT.

13. ALL EQUIPMENT SUBMITTED AS SHOP DRAWINGS SHALL BE APPROVED BY THE GOVERNING JURISDICTIONAL AUTHORITIES PREVIOUS TO SUBMITTAL. SUBMISSION OF A SHOP DRAWING SHALL MEAN THAT APPROVAL HAS BEEN OBTAINED FOR INSTALLATION OF THE EQUIPMENT SUBMITTED FOR REVIEW.

14. AT COMPLETION OF THE PROJECT, ALL CHANGES AND DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE RECORDED BY THE MECHANICAL CONTRACTOR ON AS-BUILT DRAWINGS AND SUPPLIED TO THE ARCHITECT/ENGINEER IN FOUR PAPER SETS AND A USB DRIVE WITH PDFS.

15. THE OWNER, ARCHITECT, ENGINEER OR OTHERS WHO THEY MAY DESIGNATE SHALL BE PRIVILEGED TO ENTER AND OCCUPY THE BUILDING OR PORTIONS THEREOF, AT ANY TIME PRIOR TO COMPLETION OF THE MECHANICAL WORK WITHOUT PREJUDICE. BEFORE MAKING ANY INSTALLATION, THE MECHANICAL CONTRACTOR SHALL CONFER WITH ALL OTHER CONTRACTORS WHOSE WORK MAY AFFECT THE WORK UNDER THEIR SECTIONS AND MAKE THE NECESSARY CHANGES TO AVOID INTERFERENCES OR IMPROPER EFFECT ON WORK TO BE PERFORMED BY ALL OTHER TRADES. IN THE EVENT THAT INTERFERENCES DEVELOP, THE ARCHITECT'S DECISION WILL BE FINAL AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR MOVING OF MISPLACED PIPING, DUCTS, CONDUIT AND/OR EQUIPMENT.

16. ALL MATERIALS AND/OR EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

17. EACH MAJOR COMPONENT OF THE EQUIPMENT SHALL HAVE THE MANUFACTURER'S NAME, ADDRESS, MODEL NUMBER AND RATING ON A PLATE SECURELY AFFIXED IN A CONSPICUOUS PLACE. THE NAMEPLATE OF A DISTRIBUTING AGENT IS NOT ACCEPTABLE. ASME CODE RATINGS, OR OTHER DATA WHICH IS DIE-STAMPED INTO THE SURFACE OF THE EQUIPMENT SHALL BE IN A VISIBLE LOCATION.

18. USE ONLY NEW MATERIALS OF THE BEST QUALITY OF THEIR RESPECTIVE KINDS; LABOR SHALL BE DONE IN A THOROUGH WORKMANLIKE MANNER TO THE SATISFACTION OF THE ARCHITECT.

19. MATERIALS SHALL BE MANUFACTURED BY REPUTABLE MANUFACTURERS WHO HAVE BEEN PRODUCING THIS TYPE OF MATERIAL TO BE SOLD IN MAJOR CITIES IN THE UNITED STATES FOR A PERIOD OF AT LEAST FIVE (5) YEARS, UNLESS OTHERWISE NOTED HEREIN. THE INSTALLATION OF ANY ACCESS PANEL IS STRICTLY LIMITED TO ONLY APPROVED LOCATIONS AS INDICATED ON THE DRAWINGS.

20. FIRE STOPPING SHALL BE REQUIRED AT ALL FLOOR AND FIRE RATED WALL/PARTITION PENETRATIONS. FIRE STOPPING SYSTEMS SHALL BE DOW CORNING, U.S.G. OR 3M. INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED DIRECTIONS AND PER FIRE TESTED DESIGNS THAT HAVE BEEN ACCEPTED BY THE APPROPRIATE CODE AUTHORITY HAVING JURISDICTION.

21. ALL WORKMANSHIP SHALL BE FIRST CLASS IN EVERY RESPECT AND SHALL BE PERFORMED ONLY BY SKILLED MECHANICS, RECOGNIZED AS SUCH IN THEIR RESPECTIVE TRADES.

22. FURNISH NECESSARY SCAFFOLDING, STAGING OR CRIBBING REQUIRED FOR THE COMPLETION OF THE WORK. SUCH SCAFFOLDING, ETC., SHALL BE REMOVED FROM THE PREMISES WHEN ITS USE IS NO LONGER REQUIRED ON THE JOB.

23. SHOULD DAMAGE TO ANY MECHANICAL, ELECTRICAL OR ARCHITECTURAL PART OF THE BUILDING OCCUR, PAY ALL COSTS TO THE RESPECTIVE SUBCONTRACTORS AFFECTED ON THE JOB TO MAKE REPAIRS AND/OR TEMPORARY CONNECTIONS REQUIRED.

24. OPENINGS MADE IN FIRE RATED WALL, CEILING OR FLOOR SHALL BE EFFECTIVELY CLOSED AND REPAIRED SO THE FIRE RATING IS NOT REDUCED BELOW ORIGINAL FIRE RATING REQUIREMENTS.

25. FURNISH 4 COMPLETE PORTFOLIOS TO THE OWNER'S REPRESENTATIVE, CONTAINING AS- BUILT SHOP DRAWINGS, TEST AND BALANCE REPORTS, OPERATING INSTRUCTIONS, WARRANTIES, PARTS LISTS, WIRING DIAGRAMS, ETC., ON ALL EQUIPMENT FURNISHED UNDER THIS CONTRACTOR.

26. THE CONTRACTOR SHALL FURNISH A COMPETENT INSTRUCTOR TO ADVISE THE OWNER'S OPERATING PERSONNEL AS TO THE PROPER OPERATION, SERVICING, ETC., OF ALL EQUIPMENT AND SYSTEMS INSTALLED.

27. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL CLEAN ALL OF HIS WORK, EQUIPMENT, ETC., FREE FROM DUST, ETC., AND LEAVE THE WORK IN GOOD HOUSEKEEPING FASHION IN A MANNER ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. PROVIDE NECESSARY FITTINGS, LAMPS, VALVES, ETC., AND LEAVE THE WORK CLEAN AND IN PERFECT OPERATING CONDITION.

MECHANICAL SYSTEM

1. THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS ARE TO COVER THE FURNISHINGS OF ALL LABOR, MATERIALS, EQUIPMENT, APPARATUS, SERVICE, PERMANENT AND TEMPORARY FACILITIES AS NECESSARY TO THE HEATING AND AIR CONDITIONING AND PROCESS WORK INVOLVED IN THE FURNISHING, INSTALLING, TESTING, ADJUSTING, RETESTING, READJUSTMENT AS REQUIRED AND DIRECTED, AND PLACING INTO APPROVED SATISFACTORY OPERATION THE COMPLETE RESPECTIVE SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY THE JOB CONDITIONS.

2. REMOVE EXISTING WORK AS SHOWN ON PLANS AND AS REQUIRED FOR INSTALLATION OF NEW WORK. DO NOT CUT OR TAKE DOWN FIRE PROOFING FROM BEAMS.

3. COORDINATE DEMOLITION WORK WITH THE WORK OF ALL TRADES AND WITH LANDLORD'S & TENANT'S REQUIREMENTS. MINIMIZE THE DURATION OF SHUTDOWNS OF SYSTEMS.

4. WHEREVER REMOVING ITEMS, CAP REMAINING PIPING, DUCTWORK, PNEUMATIC LINES ETC., SO AS TO RENDER REMAINING WORK HARMLESS AND WITHOUT NUISANCE.

5. TAKE REMOVED ITEMS FROM THE PROPERTY AND DISPOSE OF IN AN APPROVED MANNER, OR TURN OVER TO OWNER OR TENANT, AS REQUESTED. CONSULT WITH BUILDING STAFF BEFORE EXISTING EQUIPMENT IS DISPOSED OF.

6. ALL ELECTRICAL, PLUMBING, OR PROCESS WATER PIPING AND WIRING, ARE TO BE COMPLETELY REMOVED BACK TO THEIR SOURCE OR MAIN DISTRIBUTION PANEL OR SYSTEM. ALL PIPING TO BE REMOVED SHALL BE REMOVED CAREFULLY AND ORDERLY BACK TO THE ACTIVE SOURCE AND SHALL BE CAPPED AT THE SOURCE AND SHALL BE RENDERED HARMLESS AND INCAPABLE OF CAUSING DAMAGE.

7. REUSE AND RELOCATE MEDIUM PRESSURE MAIN DUCTWORK TO EXTENT POSSIBLE FOR NEW LAYOUT.

8. DURING CONSTRUCTION, CONTRACTOR SHALL PROVIDE FILTER MEDIA OVER ALL MAIN DUCT OPENINGS, INCLUDING RETURN SHAFT OPENINGS. CONTRACTOR SHALL CHANGE FILTERS AS NECESSARY AND REMOVE UPON SUBSTANTIAL COMPLETION.

9. FURNISH AND INSTALL A COMPLETE AND OPERABLE SYSTEM CONSISTING OF, BUT NOT LIMITED TO:
   a. SERIES FAN POWERED BOX WITH HOT WATER HEAT TERMINAL UNITS.
   b. VARIABLE AIR VOLUME TERMINAL UNITS WITH AND WITH HOT WATER HEAT.
   c. EXHAUST FANS
   d. PROVIDE COMPLETE TESTING AND BALANCING OF ALL SYSTEMS.
   e. PROVIDE A COMPLETE AND OPERABLE SYSTEM OF TEMPERATURE CONTROLS COMPATIBLE WITH EXISTING CONTROL SYSTEM.

10. FURNISH AND INSTALL ALL INSULATION AS HEREINAFTER SPECIFIED.

11. FURNISH CUTTING AND CORING FOR INSTALLATION OF DUCTS, PIPING, AND EQUIPMENT.

12. THE WORK UNDER THIS SECTION SHALL COMPLY WITH THE LATEST EDITION OF THE APPLICABLE STANDARDS AND CODES OF THE FOLLOWING:
   a. CITY OF LISLE BUILDING CODES
   b. ILLINOIS ACCESSIBILITY CODE (IAC)
   c. INTERNATIONAL ENERGY CONSERVATION CODE 2015 (IECC)
   d. ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS.
   e. ASHRAE AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS.
   f. ARI AIR CONDITIONING AND REFRIGERATION INSTITUTE.
   g. ASTM AMERICAN SOCIETY FOR TESTING MATERIALS.
   h. AABC ASSOCIATED AIR BALANCE COUNCIL
   i. NFPA NATIONAL FIRE PROTECTION ASSOCIATION.
   j. SMACNA SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION.
   k. UL: UNDERWRITER'S LABORATORY

13. EXERCISE CARE IN TRANSPORTING AND HANDLING TO AVOID DAMAGE TO FIXTURES, EQUIPMENT AND MATERIALS.

14. STORE MATERIALS ON THE SITE SO AS TO PREVENT DAMAGE.

15. KEEP EQUIPMENT AND MATERIALS CLEAN, DRY AND FREE FROM DELETERIOUS CONDITIONS.

16. DRILLED-IN THREADED INSERTS: PHILLIPS "REDHEAD" DRILLED-IN THREADED INSERTS SHALL BE PROVIDED. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS OR DAMAGES CREATED BY CORING, CUTTING, AND/OR HAMMER DRILLING OF THE SLAB. ALL REPAIRS MUST BE MADE IN A TIMELY MANNER. ALL CORING MUST BE DONE AFTER BUSINESS HOURS AND ALL CORING LOCATIONS MUST BE APPROVED BY THE BUILDING'S STRUCTURAL ENGINEER IF MANAGEMENT DEEMS NECESSARY. SCANNING MUST BE PERFORMED PRIOR. LANDLORD WILL REQUIRE WRITTEN APPROVAL BY THE BUILDING'S STRUCTURAL ENGINEER. ALL CORING IS TO BE COORDINATED WITH CHIEF BUILDING ENGINEER AND LANDLORD.

18. FOR ALL SECTIONS OF MEDIUM PRESSURE SUPPLY LOOP AFFECTED BY NEW CONSTRUCTION, CONTRACTOR SHALL CHECK AND SEAL THE EXISTING TO REMAIN DUCTWORK.

ACCEPTABLE EQUIPMENT MANUFACTURERS:

1. FANS – GREENHECK, COOK, TWIN CITY
2. DIFFUSERS/REGISTERS – TITUS, PRICE, NAILOR
3. VAV TERMINALS – TITUS
4. PUMPS – ARMSTRONG, BELL & GOSSETT
5. ALL OTHER PROPOSED EQUIPMENT SHALL BE SUBMITTED VIA CHANGE PROTOCOL INCLUDING A MINIMIMUM FIVE (5) PREVIOUS INSTALLATION LOCATION, ASSOCIATED BUILDING CONTACTS (OWNER AND BUILDING ENGINEER/OPERATOR), AND REASON FOR CHANGE.

PIPING:

1. PIPING APPLICATIONS
   A. OVERFLOW AND DRAIN PIPING SHALL BE TYPE L DRAWN TEMPER COPPER TUBING WITH SOLDERED JOINTS.
   B. HOT WATER HEATING PIPING 2" AND SMALLER SHALL BE TYPE L DRAWN COPPER TUBING WITH WROUGHT-COPPER FITTINGS AND SOLDERED OR BRAZED JOINTS.
   C. HOT WATER HEATING PIPING 2-1/2" AND LARGER SHALL BE ONE OF THE FOLLOWING:
      a. TYPE L DRAWN DRAN TEMPER COPPER TUBING WITH WROUGHT-COPPER FITTINGS AND SOLDERED OR BRAZED JOINTS.
      b. ASTM 106, SCHEDULE 40 STEEL PIPE, WROUGHT-STEEL FITTINGS AND WROUGHT-CAST OR FORGED STEEL FLANGES AND FLANGE FITTINGS, AND WELDED AND FLANGED JOINTS.

2. PIPE HANGERS AND SUPPORTS
   A. ALL HANGERS, SUPPORTS, AND ACCESSORIES INSTALLED IN AREAS WITH NO CEILING SHALL BE PAINTABLE.
   B. INSTALL THE FOLLOWING PIPE ATTACHMENTS:
   C. ADJUSTABLE STEEL CLEVIS HANGERS FOR INDIVIDUAL HORIZONTAL RUNS LESS THAN 20 FEET IN LENGTH. \ADJUSTABLE ROLLER HANGERS AND SPRING HANGERS FOR INDIVIDUAL HORIZONTAL RUNS 20 FEET OR LONGER.
   D. PIPE ROLLER: MSS SP-58, TYPE 44 FOR MULTIPLE HORIZONTAL RUNS 20 FEET OR LONGER, SUPPORTED ON A TRAPEZE.
   E. SPRING HANGERS TO SUPPORT VERTICAL RUNS AND PIPING IN THE MECHANICAL ROOM.

3. PIPING INSULATION
   A. INSULATION SHALL BE OWENS-CORNING, CERTAINTEED, ARMSTRONG, OR GUSTIN-BACON.
   B. OVERLAP ALL SEAMS AND JOINTS AND SECURE WITH MANUFACTURER APPROVED ADHESIVE TO PROVIDE CONTINUITY OF INSULATION.
   C. HEATING HOT WATER PIPING SHALL BE INSULATED WITH 1-1/2" THICK GLASS FIBER INSULATION WITH VAPOR BARRIER AND FSK JACKET.
   D. DRAIN PIPING AND PUMPED CONDENSATE PIPING SHALL BE INSULATED WITH 1-1/2" THICK GLASS FIBER INSULATION WITH VAPOR BARRIER AND FSK JACKET.

4. BALL VALVES
   A. VALVES SHALL HAVE CAST BRONZE BODIES, REPLACEABLE TEFLON SEATS, CONVENTIONAL PORT, BLOWOUT-PROOF STEM, ADJUSTABLE PACKING GLAND, CHROME PLATED BALL AND THREADED ENDS. VALVES SHALL BE MANUFACTURES INCLUDE:
      a. CONBRACO INDUSTRIES, INC. APOLLO DIV
      b. STOCKHAM: CRANE ENERGY FLOW SOLUTIONS
      c. NIBO INC.

5. GATE VALVES
   A. CAST STEEL GATE VALVES SHALL BE CLASS 150. MANUFACTURERS INCLUDE:
      a. STOCKHAM: CRANE ENERGY FLOW SOLUTIONS
      b. MILWAUKEE VALVE
      c. NIBCO INC.

6. BUTTERFLY VALVES
   A. BUTTERFLY VALVES SHALL BE HIGH PERFORMANCE, CLASS 150. MANUFACTURERS INCLUDE:
      a. STOCKHAM: CRANE ENERGY FLOW SOLUTIONS
      b. MILWAUKEE VALVE
      c. BRAY CONTROLS

7. GAS SHUTOFF VALVES
   A. DISTRIBUTION AND BRANCH PIPING VALVES FOR PIPE SIZES NPS 2 (DN 50) AND SMALLER SHALL BE ONE OF THE FOLLOWING:
      a. ONE-PIECE, BRONZE BALL VALVE WITH BRONZE TRIM.
      b. TWO-PIECE, FULL PORT, BRONZE BALL VALVES WITH BRONZE TRIM.
      c. BRONZE PLUG VALVE.

8. PIPE REDUCING FITTINGS TO BE ECCENTRIC FITTINGS.

9. LABEL ALL PIPING AND INDICATE DIRECTION OF FLOW PER ANSI/ASME A 13.1 PIPE MARKING GUIDE INCONSPICUOUS LOCATIONS. FOR PIPE ROUTING THROUGH CONSPICUOUS LOCATION, COORDINATE WITH ARCHITECT FOR PIPE IDENTIFICATION TAG STYLE.
   A. PROVIDE SUBMITTAL FOR PIPING LABELING PRODUCT DATA AND IDENTIFICATION STYLE FOR ARCHITECT AND ENGINEERS REVIEW DURING CONSTRUCTION.

10. PROVIDE A CLEAN OUT AT EACH CONDENSATE PIPE CHANGE IN DIRECTION.

DUCTWORK:

1. DUCTWORK SHALL BE GALVANIZED STEEL CONSTRUCTED & INSTALLED IN ACCORDANCE WITH THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION.
   A. MEDIUM PRESSURE SUPPLY DUCT (UPSTREAM OF TERMINAL UNITS) SEAL CLASS A.
   B. LOW PRESSURE SUPPLY DUCT (DOWNSTREAM OF TERMINAL UNITS): SEAL CLASS B.

2. FOR FINAL CONNECTIONS TO DIFFUSERS, FLEXIBLE DUCTS EQUAL TO WIREMOLD TYPE WG MAY BE USED FOR A MAXIMUM OF FIVE FEET. FLEXIBLE DUCTS SHALL BE U.L. LISTED, WITH 1" THICK FIBERGLASS INSULATION W/ VAPOR BARRIER. INSTALL FULLY EXTENDED W/ MINIMUM CHANGES OF DIRECTION, IN LENGTHS NO GREATER THAN NECESSARY. USE GENEROUS RADIUS TURNS AND SUPPORT AS REQUIRED TO PREVENT EXCESSIVE SAGGING.

3. SIZES OF NEW DUCT SHOWN ON DRAWINGS ARE FREE AIRWAYS SIZES, NOT OUTSIDE DIMENSIONS.

4. PROVIDE ADJUSTABLE SPLITTER, OPPOSED BLADE, OR BUTTERFLY DAMPERS FOR ALL NEW SUPPLY, RETURN, & EXHAUST BRANCHES.

5. PROVIDE DOUBLE THICKNESS TURNING VANES AT ALL ABRUPT ELBOWS. RADIUSED ELBOWS SHALL HAVE CENTERLINE RADIUS AT LEAST AS GREAT AS THE DUCT WIDTH.

6. NEW DUCT CONNECTIONS TO MEDIUM PRESSURE MAINS SHALL BE PROVIDED WITH BELLMOUTH CONICAL FITTINGS.

7. SEAL ALL JOINTS OF NEW DUCTWORK W/UNITED DUCT-SEALER OR APPROVED EQUAL. ADDITIONALLY, SEAL SEAMS OF NEW DUCTWORK UPSTREAM OF BOXES. INSPECT EXISTING DUCTWORK FOR LEAKS & REPORT RESULTS BEFORE CONNECTING NEW DUCTWORK.

8. PROTECT NEW & EXISTING DUCT OPENINGS FROM DUST & DIRT. CLEAN INSIDE & OUTSIDE OF NEW & EXISTING DUCTWORK IN AREA OF NEW WORK. REPLACE FILTERS AS REQUIRED DURING CONSTRUCTION PERIOD AND PROVIDE NEW SETS OF FILTERS AFTER COMPLETION OF WORK.

9. ROUND AND FLAT OVAL:
   A. ROUND DUCTWORK SHALL BE LINDAB SAFE OR CLEATSEAL SPIRAL SELF SEALING W/EPDM GASKET. SNAPLOCK SEAMS ARE NOT PERMITTED.
   B. PROVIDE FLAT OVAL DUCTWORK PER ONE OF THE FOLLOWING TWO OPTIONS:
      a. SNAPLOCK SEAMS ARE NOT PERMITTED.
      b. DOUBLE WALL SPIRAL WITH 1" ANNULAR SPACE AND PREFABRICATED CONNECTION SYSTEMS CONSISTING OF TWO FLANGES AND ONE SYNTHETIC RUBBER GASKET. SNAPLOCK SEAMS ARE NOT PERMITTED.
   C. CRIMP JOINTS ARE NOT PERMITTED.
   D. PLEATED ELBOWS ARE NOT PERMITTED.
   E. ADJUSTABLE ELBOWS ARE NOT PERMITTED.

10. DUCTWORK INSULATION AND LINING:
   A. DUCTWORK INSULATION SHALL BE MIN. 1-1/2" THICK (UNLESS NOTED OTHERWISE), 1# DENSITY FIBERGLASS WRAP WITH FIRE RETARDANT VAPOR-BARRIER COVERING TO PROVIDE A MAXIMUM INSTALLED CONDUCTANCE OF 0.3. OVERLAP ALL SEAMS AND JOINTS & SECURE WITH MANUFACTURER APPROVED ADHESIVE TO PROVIDE CONTINUITY OF VAPOR BARRIER.
   B. DUCT LINING SHALL BE 1" THICK.
      PROVIDE DUCT INSULATION OR DUCT LINING PER THE FOLLOWING SCHEDULE:
      a. MEDIUM PRESSURE, RECTANGULAR, CONCEALED ABOVE CEILING-WRAPPED INSULATION.
      b. MEDIUM PRESSURE, ROUND, CONCEALED ABOVE CEILING - WRAPPED INSULATION.
      c. LOW PRESSURE, RECTANGULAR, CONCEALED ABOVE CEILING -PROVIDE 1" DUCT LINING.
      d. LOW PRESSURE, ROUND, CONCEALED ABOVE CEILING - WRAPPED INSULATION.
      e. TRANSFER DUCT: 1" LINED
      f. 1" LINING 10' DOWNSTREAM OF FAN POWERED BOXES.
      g. RE-INSULATE MEDIUM PRESSURE DUCT LOOP AFFECTED BY NEW CONSTRUCTION. MATCH NEW INSULATION TO EXISTING.

12. ELECTRONIC ACTUATORS
   A. ELECTRONIC ACTUATORS SHALL BE DIRECT-COUPLED TYPE DESIGNED FOR MINIMUM 60,000 FULL-STROKE CYCLES AT RATED TORQUE.
   B. POWER REQUIREMENTS (TWO POSITION): AS REQUIRED.
   C. POWER REQUIREMENTS (MODULATING): MAXIMUM 10 VA AT 24-V AC OR 8W AT 24-V DC.
   D. MANUFACTURER SHALL BE BELIMO OR APPROVED EQUIVALENT.

TESTING AND BALANCING OF SYSTEMS:

1. TESTING AND BALANCING OF AIR AND WATER SYSTEMS SHALL BE PERFORMED BY AN INDEPENDENT SUB-CONTRACTOR SPECIALIZING IN SUCH WORK AND IS A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL. TEST AND BALANCE CONTRACTOR SHALL CONTRACTED DIRECTLY BY OWNER.

2. BALANCE AND TESTING SHALL NOT BEGIN UNTIL EACH SYSTEM HAS BEEN COMPLETED AND IS IN FULL WORKING ORDER. CONTRACTORS SHALL PUT ALL THEIR EQUIPMENT INTO FULL OPERATION AND SHALL CONTINUE THE OPERATION OF SAME DURING EACH WORKING DAY OF TESTING AND BALANCING.

3. TESTING AND BALANCING SHALL BE PERFORMED IN COMPLETE ACCORDANCE WITH THE SMACNA MANUAL OR THE AABC NATIONAL STANDARDS FOR FIELD MEASUREMENT AND INSTRUMENTATION AND THE BASE BUILDING SPECIFICATION SECTION.

4. UPON COMPLETION OF THE WORK, THE BALANCE CONTRACTOR SHALL COMPILE ALL TEST DATA AND SUBMIT 8 TYPEWRITTEN COPIES OF THE COMPLETE TEST DATA TO THE ARCHITECT FOR EVALUATION AND APPROVAL. ALL REPORTS SHALL BE MADE ON FORMS AS RECOMMENDED BY EITHER AGENCY.

5. BALANCING
   A. TAB CONTRACTOR TO NOTIFY THE BUILDING ASSISTANT CHIEF ENGINEER PRIOR TO WORK. PROVIDE TESTING AND BALANCING REPORTS TO BUILDING FACILITIES.
   B. A QUALIFIED AND CERTIFIED MEMBER OF AABC OR NEBB SHALL COMPLETELY BALANCE AIR SYSTEMS AS REQUIRED. CONTRACTOR SHALL SUBMIT A BALANCE REPORT TO THE ARCHITECT FOR REVIEW BY THE ENGINEER.
   C. AFTER COMPLETION OF ALL REQUIRED WORK, THE CONTRACTOR SHALL OPERATE AND MAKE ANY REQUIRED ADJUSTMENTS TO EQUIPMENT, DUCTWORK, ETC., AS MAY BE NECESSARY TO PUT THE SYSTEMS IN PROPER OPERATING CONDITION. AFTER ALL ADJUSTMENTS HAVE BEEN COMPLETED, THE CONTRACTOR SHALL BALANCE EACH DEVICE TO WITHIN 10% OF VALUE SHOWN ON DRAWINGS.
   D. CONTRACTOR SHALL SUBMIT FOUR (4) COPIES OF CERTIFIED BALANCE REPORTS TO THE ARCHITECT FOR REVIEW BY THE ENGINEER. SUBMIT AS-BUILT DRAWINGS INDICATING A NUMBERING SYSTEM WHICH CORRELATED ITEMS ON THE PLAN WITH THE BALANCE REPORT. PROVIDE THE LANDLORD WITH A COPY OF THE BALANCE REPORTS.
   E. ADJUST MANUAL VOLUME DAMPERS, SPLITTER DAMPERS, & AIR EXTRACTORS AT BRANCH TAKEOFFS TO ACCOMPLISH BALANCING. VOLUME DAMPERS ON DIFFUSERS & REGISTERS SHALL BE USED FOR FINAL ADJUSTMENT ONLY.
   F. CALIBRATE FLOW SENSORS OF PRESSURE-INDEPENDENT TERMINAL BOX CONTROLS. COORDINATE WITH CONTROLS CONTRACTOR. SET TERMINAL BOXES BY MEASURING ACTUAL AIRFLOWS.

6. SET VARIABLE AIR VOLUME DEVICES TO MAXIMUM SETPOINT WHILE BALANCING SYSTEM.

7. THE BALANCE CONTRACTOR SHALL PERFORM THE FOLLOWING TESTS, AND BALANCE EACH SYSTEM IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
   A. ADJUST ALL SUPPLY, RETURN AND EXHAUST AIR DUCTS TO PROPER DESIGN AIR FLOWS.
   B. ADJUST AND RECORD ALL ZONES TO PROPER DESIGN AIR FLOWS, BY MEANS OF DUCT TRAVERSE METHOD.
   C. TEST AND ADJUST EACH DIFFUSER, GRILLE AND REGISTER TO WITHIN PLUS OR MINUS 10% OF DESIGN REQUIREMENTS. EACH GRILLE, DIFFUSER AND REGISTER SHALL BE IDENTIFIED AS TO LOCATION, SIZE, TYPE, MANUFACTURER OF AND ALL TESTED EQUIPMENT SHALL BE IDENTIFIED AND LISTED. MANUFACTURER'S RATINGS ON ALL EQUIPMENT SHALL BE USED TO MAKE REQUIRED CALCULATIONS AND FINAL DATE BALANCED.
   D. READINGS AND TEST OF DIFFUSERS, GRILLES AND REGISTERS SHALL INCLUDE REQUIRED FPM VELOCITY, TEST RESULTANT VELOCITY, REQUIRED CFM, TEST RESULTANT CFM AFTER ADJUSTMENTS AND FINAL DATE BALANCED.
   E. IN COOPERATION WITH THE EQUIPMENT OR CONTROL MANUFACTURER'S REPRESENTATIVE, ADJUST AUTOMATICALLY OPERATED DAMPERS TO OPERATE AS SPECIFIED, INDICATED AND/OR NOTED.
   F. ADJUST ALL DIFFUSERS, GRILLES AND REGISTERS TO PROVIDED PROPER AIR DISTRIBUTION AND TO MINIMIZE DRAFTS IN ALL AREAS.
   G. ADJUSTMENT OF ALL DAMPERS, FANS OR BLOWER SPEED, BELT TENSION, ETC., SHALL BE BY THIS CONTRACTOR. PROVIDE NEW SHEAVES OR BELTS IF REQUIRED FOR BALANCING.
   H. TEST, ADJUST, AND BALANCE HOT WATER WATER REHEAT COILS FOR FULLY OPERATIONAL SYSTEM.

TAB CONTRACTOR TO NOTIFY THE OCCUPANTS PRIOR TO WORK. PROVIDE TESTING AND BALANCING REPORTS TO GC, CONSULTING ENGINEERS, ARCHITECT AND OWNERS.

BAS - TEMPERATURE CONTROLS:

1. EXISTING TENANT TEMPERATURE CONTROL SYSTEM IS BY PRECISION CONTROL SYSTEMS. THE TEMPERATURE CONTROL SYSTEM SHALL UTILIZE DDC CONTROLS. TC CONTRACTOR SHALL BE UNDER THE CONTRACT OF THE HVAC CONTRACTOR. TC CONTRACTOR SHALL INCLUDE ALL WIRING NECESSARY FOR THE INSTALLATION OF HIS WORK.
2. COORDINATE ALL CONTROL WIRING AND POWER REQUIREMENTS WITH ELECTRICAL CONTRACTOR. CONTROL CONTRACTOR SHALL TERMINATE ALL POWER AND CONTROL WIRING TO CONTROL DEVICES.
3. TEMPERATURE CONTROL CONTRACTOR TO SUBMIT FOR REVIEW (BY ARCHITECT AND ENGINEER) PLANS, SENSOR AND CONTROL DEVICES AND SEQUENCES OF OPERATION FOR CONTROL SCOPE OF WORK.
4. TEMPERATURE SENSOR TO MATCH EXISTING.
5. COORDINATE NEW DDC INTEGRATION WITH EXISTING BASE BUILDING CONTROL SYSTEM BY PRECISION CONTROLS. CONTROL CONTRACTOR TO PROVIDE NEW TEMPERATURE SENSORS TO MATCH EXISTING. CONTRACTOR TO WIRE NEW AND
6. EXISTING THERMOSTATS TO ASSOCIATED TERMINAL BOXES PER PLANS.

BAS - TEMPERATURE CONTROL UPGRADES:

1. a. REPLACE EXISTING 'ENC' CONTROLLER WITH NEW N4 JACE.
   b. PROVIDE AND INSTALL NEW N4 SERVER SOFTWARE.
   c. PROVIDE ON SITE CUT OVER WITH NO DOWN TIME TO CONTROL SYSTEM.
   d. PROVIDE COMMISSIONING AND BACK UPS.
   e. CONTRACTOR TO INCLUDE NEW CONTROL WIRING FROM NEW N4 JACE CONTROL PANEL TO NEW PC WORK STATION IN SERVER ROOM #134. NEW PC PROVIDED BY OWNER.
   f. CONTRACTOR TO INCLUDE USER TRAINING.

CONTROL SEQUENCE:

FAN POWERED BOXES

1. OCCUPIED CONTROL:
   A. ZONE BOX CONTROLLER SHALL OPERATE TERMINAL UNIT TO MAINTAIN TEMPERATURE SENSOR SET POINTS. FAN POWERED BOX TO MODULATE PRIMARY AIR IN COOLING MODE TO MAINTAIN SPACE TEMPERATURE. BOX TO BE CAPABLE TO AUTOMATICALLY GO FROM COOLING TO HEATING. IN HEATING MODE BOX PRIMARY AIR GO TO MINIMUM AND HOT WATER CONTROL VALVE MODULATES TO MAINTAIN TEMPERATURE SET POINT.

   UNOCCUPIED CONTROL:
   A. ZONE BOX CONTROLLER TO MAINTAIN UNOCCUPIED TEMPERATURE SET POINT.

VARIABLE AIR VOLUME BOXES

1. OCCUPIED CONTROL:
   A. ZONE BOX CONTROLLER SHALL OPERATE TERMINAL UNIT TO MAINTAIN TEMPERATURE SENSOR SET POINTS. VAV BOX TO BE CONTROLLED TO MATCH EXISTING CONTROL SEQUENCE.

   UNOCCUPIED CONTROL:
   A. ZONE BOX CONTROLLER TO MAINTAIN UNOCCUPIED TEMPERATURE SET POINT.

SYSTEM COMMISSIONING AND VERIFICATION

SUMMARY:

THE GOAL OF THE COMMISSIONING PROCESS IS TO VERIFY ALL NEWLY INSTALLED AND RENOVATED SYSTEMS AND EQUIPMENT MEET THE DESIGN INTENT OF THE PROJECT AND OWNER'S EXPECTATIONS FOR OPERATIONS. THE COMMISSIONING SCOPE OF WORK WILL BE SUPPORTED BY A THIRD-PARTY COMMISSIONING TEAM (CXA).

SYSTEMS TO BE COMMISSIONED:

1. MECHANICAL: FANS (EF 1.1 & 2, TE 1.1 & 2), FAN POWER BOXS (FPB 1.01/1.02/1.03), VARIABLE AIR VOLUME BOX (VAV 1.1) AND ASSOCIATED CONTROLS.
2. ELECTRICAL: LIGHT FIXTURES AND ASSOCIATED CONTROLS.
3. PLUMBING: DOMESTIC PLUMBING FIXTURES AND ELECTRIC WATER HEATERS (EWH 1 & 2) AND ASSOCIATED CONTROLS.
4. SYSTEM TEST AND BALANCE: AIR AND HYDRONIC SYSTEMS.

CONTRACTOR SUPPORT:

THE GENERAL AND RESPONSIBLE CONTRACTORS SHALL SUPPORT THE COMMISSIONING PROCESS. THE SUPPORT SHALL INCLUDE THE ATTENDANCE AT THE COMMISSIONING KICKOFF MEETING, UP TO 1 HOUR OF FIELD SUPPORT DURING THE COMMISSIONING FUNCTIONAL TESTING PROCESS, AND ADDRESS ISSUES IDENTIFIED DURING THE COMMISSIONING PROCESS.

CONTRACTOR DOCUMENTATION:

THE RESPONSIBLE CONTRACTORS SHALL PROVIDE THE CXA WITH A FOLLOWING SYSTEM/EQUIPMENT DOCUMENTATION

1. TEST AND BALANCE (TAB) REPORT – AIR AND HYDRONIC.
2. EQUIPMENT STARTUP VERIFICATION.
3. APPROVED EQUIPMENT SUBMITS.
4. MANUFACTURE'S OPERATION AND MAINTENANCE MANUALS FOR SYSTEMS BEING COMMISSIONED.
5. OWNER TRAINING AND ACCEPTANCE VERIFIACTION OF SYSTEMS BEING COMMISSIONED.

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No.	Description	Date
CD-3	WCPR-1/CD-3 ISSUED FOR CONSTRUCTION	03.02.2022
3	ISSUED FOR BID AND PERMIT	11.19.2021
2	ISSUED FOR DESIGN DEVELOPMENT	09.08.2021
1	ISSUED FOR SCHEMATIC DESIGN	06.30.2021

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BID AND PERMIT

MECHANICAL SPECIFICATIONS

M002

SCALE: AS NOTED

Attachment E

FAN SCHEDULE

TAG	LOCATION	SERVICE	TYPE	CFM	ESP (IN. W.C.)	DRIVE	RPM	HP	VOLTS/PH/HZ	MANUFACTURER	MODEL	WEIGHT (LBS)	ROOF OPNG (IN.)	REMARKS
EF 1.1	STORAGE	EXHAUST	CEILING CABINET FAN	400	0.25	DIRECT	1400	130WATTS	120/1/60	COOK	GC-622			2,3,4.
EF 1.2	EMR	EXHAUST	INLINE	700	0.38	DIRECT	893	1/4	120/1/60	COOK	DB -08			2,3,4
TE 1.1	1st FLOOR	TOILET	INLINE	75	0.375	DIRECT	1075	45WATTS	120/1/60	COOK	GN-148			1,2,4.
TE 1.2	1st FLOOR	TOILET	INLINE	75	0.375	DIRECT	1075	45WATTS	120/1/60	COOK	GN-148			1,2,4

REMARKS:

1. FAN TO BE INTERLOCKED WITH LIGHTSWITCH.
2. PROVIDE WITH DISCONNECT SWITCH.
3. FAN TO BE INTERLOCKED WITH THERMOSTAT.
4. PROVIDE WITH BACKDRAFT DAMPER.

FAN POWERED BOX WITH HOT WATER REHEAT SCHEDULE (FPB)

TAG	LOCATION	UNIT	INLET	FAN DATA				HEATING COIL DATA					ELECTRICAL DATA		UNIT TOTAL WATER PD (IN.)	MANUFACTURER	MODEL	REMARKS
				MAX FAN AIRFLOW (CFM)	MIN FAN AIRFLOW (CFM)	HP	VOLTS/PH/HZ	MAX HEATING AIRFLOW (CFM)	GPM	EAT DB °F	LAT DB °F	STAGES	MCA	MOP				
FPB-1.1	FIRST FLOOR	C	8	600	120	0.25	120/1/60	600	1.5	67.0	95.0	N/A	N/A	N/A	0.50	TITUS	DTFS	ALL
FPB-1.2	FIRST FLOOR	B	8	400	80	0.25	120/1/60	400	1.5	67.0	95.0	N/A	N/A	N/A	0.50	TITUS	DTFS	ALL
FPB-1.3	FIRST FLOOR	D	12	1330	220	0.33	120/1/60	1100	2.5	67.0	95.0	N/A	N/A	N/A	0.50	TITUS	DTFS	ALL

REMARKS:

1. PROVIDE PRESSURE INDEPENDENT CONTROL.
2. PROVIDE DUST TIGHT CONSTRUCTION.
4. PROVIDE 1" ECOSHIELD LINER.
5. PROVIDE DISCONNECT SWITCH.
6. PROVIDE SINGLE-POINT POWER CONNECTION AND DOOR INTERLOCK DISCONNECT SWITCH.
7. UNIT ORIENTATION SHALL BE FIELD CONVERTIBLE.
8. TEMPERATURE CONTROL CONTRACTOR TO PROVIDE FIELD MOUNTED CONTROLLER.
9. PROVIDE 1" THROWAWAY FILTERS.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

TAG	SERVICE	TYPE	INLET SIZE (IN.)	CFM RANGE	FACE SIZE (IN.)	INSULATED PLENUM BOOT	NO. OF SLOTS	SLOT WIDTH (IN.)	DAMPER	MATERIAL / FINISH	MANUFACTURER	MODEL	REMARKS
AA	SUPPLY	SQUARE PLAQUE DIFFUSER	6	0-60	1'x1'	NA	NA	NA	N	STEEL/WHITE	TITUS	OMNI	1,2
A	SUPPLY	SQUARE PLAQUE DIFFUSER	6	0 - 125	2'x2"	NA	NA	NA	N	STEEL/WHITE	TITUS	OMNI	1,2
A	SUPPLY	SQUARE PLAQUE DIFFUSER	8	126 - 240	2'x2"	NA	NA	NA	N	STEEL/WHITE	TITUS	OMNI	1,2
A	SUPPLY	SQUARE PLAQUE DIFFUSER	10	241 - 325	2'x2"	NA	NA	NA	N	STEEL/WHITE	TITUS	OMNI	1,2
B	RETURN	SQUARE PLAQUE DIFFUSER	15 (U.N.O.)	0 - 700	2'X2'	NA	NA	NA	N	STEEL/WHITE	TITUS	OMNI	1,2
C	SUPPLY	LINEAR SLOT DIFFUSER	SEE PLAN	SEE PLAN	4'	N/A	1	1-1/2"	N	STEEL/WHITE	TITUS	TBDI-80	1,2
D	SUPPLY	LINEAR BAR SLOT	SEE PLAN	SEE PLAN	4'	N/A	2 1/2" WIDE	NA	N	ALUMINUM	TITUS	CT-480	1

REMARKS:

1. COORDINATE FINISH WITH ARCHITECT.
2. PROVIDE ACCESSORIES FOR HARD CEILING MOUNTING WHERE REQUIRED

1

VENTILATION SCHEDULE

ROOM #	ROOM NAME	IMC ROOM PURPOSE	FLOOR AREA SQ. FT.	OCCUPANCY	IMC - 2015 - CODE REQUIREMENTS		ACTUAL				FAN SYSTEM		REMARKS
					CFM OUTSIDE AIR	CFM EXHAUST	SUPPLY AIR CFM	OUTSIDE AIR CFM	EXHAUST AIR CFM	RETURN AIR CFM	SUPPLY/ RETURN	EXHAUST	
1ST FLOOR													
101	NORTH VESTIBULE	Main entry lobby	155	1	14	0	400	10	10	390	AHU-2 EAST	EF-2 EAST	
102	LOBBY	Lobby/prefunction	1283	3	99	0	900	100	100	800	AHU-2 WEST	EF-2 WEST	
103	BOOK RETURN ROOM	Office space	159	4	30	0	165	30	30	135	AHU-2 WEST	EF-2 WEST	
104	GENDER NEUTRAL RESTROOM	Toilet room	72	0	N.R.	75-EXH/FIXTURE	0	N.R.	75	0		TE1.1	
105	STUDY ROOM	Public Library	45	4	25	0	100	25	25	75	AHU-2 WEST	EF-2 WEST	
106	STUDY ROOM	Public Library	45	4	25	0	100	25	25	75	AHU-2 WEST	EF-2 WEST	
107	GENDER NEUTRAL RESTROOM	Toilet room-private	47	0	N.R.	75-EXH/FIXTURE	0	0	75	0		TE1.2	
108	EMR	Office space	127	0	8	0	60	10	10	50	AHU-2 EAST	EF-2 EAST	
109A	ADULT SERVICES NORTH	Public Library	2254	22	380	0	1630	380	380	1250	AHU-2 EAST	EF-2 EAST	
109	ADULT SERVICES SOUTH	Public Library	2195	0	263	0	790	265	265	525	AHU-2 EAST	EF-2 EAST	
110	CIRCULATION WORKROOM	Public Library	609	8	113	0	370	80	80	290	AHU-2 EAST	EF-2 EAST	
111	EMR-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
112	MEETING ROOM	Conference room	1427	35	261	0	3060	265	265	2795	AHU-1 EAST	EF-1 EAST	
112A	STORAGE-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
112B	STORAGE-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
112C	STORAGE-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
112D	PREP-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
113	MEETING ROOM VESTIBULE	Lobby/prefunction	479	0	29	0	300	30	30	270	AHU-2 EAST	EF-2 EAST	
114	LOUNGE	Office space	320	6	49	0	320	50	50	270	AHU-2 EAST	EF-2 EAST	
114A	STORAGE-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
115	CORRIDOR	Corridor	68	0	4	0	1465	5	5	1460	AHU-2 EAST	EF-2 EAST	
116	EAST MECHANICAL ROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
117	WOMENS RESTROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
118	MENS RESTROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
119	JAN CL-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
120	STUDY ROOM	Public Library	289	6	65	0	150	65	65	85	AHU-2 EAST	EF-2 EAST	
121	STUDY ROOM	Public Library	203	6	54	0	240	55	65	185	AHU-2 EAST	EF-2 EAST	
122	YOUTH SERVICES	Public Library	4673	45	786	0	3955	790	790	3165	AHU-2 WEST	EF-2 WEST	
122A	TEEN AREA	Public Library	470	12	116	0	550	120	120	430	AHU-2 WEST	EF-2 WEST	
122B	PLAY AREA	Public Library	622	0	75	0	1700	75	75	1625	AHU-2 WEST	EF-2 WEST	
123	YOUTH SERVICES WORKROOM	Public Library	615	9	119	0	495	120	120	375	AHU-2 WEST	EF-2 WEST	
124	STORAGE	Office space	88	0	5	0	75	5	5	70	AHU-2 WEST	EF-2 WEST	
125	FAMILY RESTROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
126	JAN CL-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
127	FAMILY RESTROOM- NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
128	VESTIBULE	Lobby/prefunction	60	0	4	0	50	5	5	45	AHU-2 EAST	EF-2 EAST	
129	ADMIN WORKROOM	Office space	447	5	52	0	360	55	55	305	AHU-1 WEST	EF-1 WEST	
130	OFFICE	Office space	78	1	10	0	75	10	10	65	AHU-1 WEST	EF-1 WEST	
131	OFFICE	Office space	132	2	18	0	125	20	20	105	AHU-1 WEST	EF-1 WEST	
132	OFFICE	Office space	247	5	40	0	200	40	40	160	AHU-1 WEST	EF-1 WEST	
133	RESTROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
134	SERVER ROOM	Office space	131	1	13	0	75	15	15	60	AHU-1 WEST	EF-1 WEST	
135	WORKROOM	Office space	169	0	10	0	150	10	10	140	AHU-1 WEST	EF-1 WEST	
136	STAFF LOUNGE	Office space	301	9	63	0	300	65	65	235	AHU-1 WEST	EF-1 WEST	
137	CORRIDOR	Corridor	137	0	8	0	75	10	10	65	AHU-1 WEST	EF-1 WEST	
138	STAFF RESTROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
139	WELLNESS ROOM	Office space	62	1	9	0	50	10	10	40	AHU-1 WEST	EF-1 WEST	
140	WEST MECHANICAL ROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
140A	FILE STORAGE-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AREA
140B	WEST MECHANICAL YARD-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
141	BOOK STORAGE ROOM-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
142	RECEIVING AREA-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
143	JAN CL-NOT IN CONTRACT												NO CHANGE TO ROOM USAGE OR AERA
144	TECHNICAL SERVICES WORKROOM	Office space	991	7	94	0	900	95	95	805	AHU-1 WEST	EF-1 WEST	
145	STORAGE-NOT IN CONTRACT											-	NO CHANGE TO ROOM USAGE OR AERA
2ND FLOOR													
201	SOUTH VESTIBULE	Main entry lobby	395	1	29	0	600	30	30	570	AHU-2 EAST	EF-2 EAST	
202	ADULT SERVICES	Public Library	4727	41	772	0	3955	775	775	3180	AHU-2 EAST	EF-2 EAST	
203	STUDY ROOM	Public Library	115	4	34	0	235	35	35	200	AHU-2 EAST	EF-2 EAST	
204	ELD LITERARY	Public Library	103	2	22	0	235	25	25	210	AHU-2 EAST	EF-2 EAST	
205	ADULT SERVICES WORKROOM	Public Library	561	10	117	0	560	120	120	440	AHU-2 EAST	EF-2 EAST	
206	GENDER NEUTRAL RESTROOM	Toilet room-private	47	0	N.R.	75-EXH/FIXTURE	0	0	75	0		EXISTING TE-1	

NOTES:

AS-BUILTS
JENSEN'S PLUMBING & HEATING
670 E. CALHOUN ST.
WOODSTOCK, IL 60098

OWNER
LISLE LIBRARY DISTRICT
777 FRONT STREET
LISLE, IL 60532

ARCHITECT
SHEEHAN NAGLE HARTRAY ARCHITECTS
30 WEST MONROE, SUITE 900
CHICAGO, IL 60603

MEP / TECHNOLOGY ENGINEER
SALAS O'BRIEN
expect a difference
SALAS O'BRIEN
815 SOUTH WABASH AVENUE
CHICAGO, IL 60605

STRUCTURAL ENGINEER
GRAEF
332 SOUTH MICHIGAN AVENUE, SUITE 1400
CHICAGO, IL 60604

CIVIL ENGINEER AND LANDSCAPE CONSULTANT
ERIKSSON ENGINEERING ASSOCIATES
145 COMMERCE DRIVE, SUITE A
GRAYSLAKE, IL 60030

LIGHTING CONSULTANT
GWEN GROSSMAN lighting design
GWEN GROSSMAN LIGHTING DESIGN
53 WEST JACKSON STREET, SUITE 1457
CHICAGO, IL 60604

No.	Description	Date
CD-3	WCPR-1/CD-3 ISSUED FOR CONSTRUCTION	03.02.2022
3	ISSUED FOR BID AND PERMIT	11.19.2021
2	ISSUED FOR DESIGN DEVELOPMENT	09.08.2021
1	ISSUED FOR SCHEMATIC DESIGN	06.30.2021

LISLE LIBRARY DISTRICT

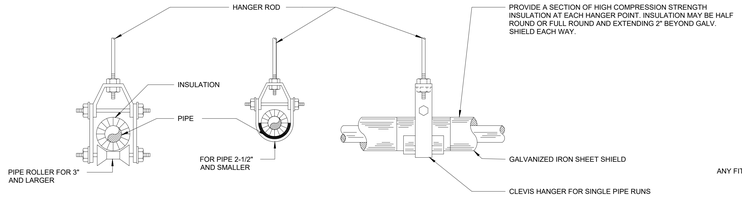
777 FRONT STREET
LISLE, IL 60532

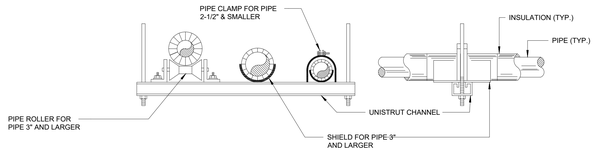
BID AND PERMIT

MECHANICAL SCHEDULES

M003

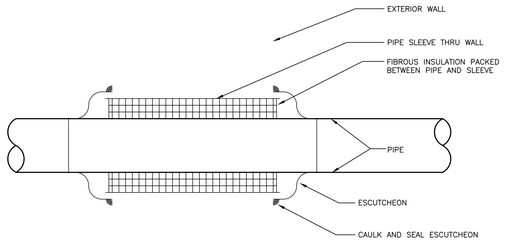
SCALE: AS NOTED





NOTE: PROVIDE SPRING VIBRATION INSOLATION HANGERS WITHIN MECHANICAL ROOMS

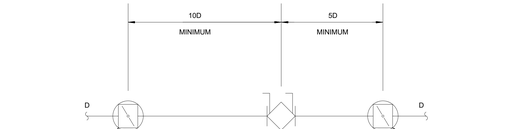
PIPE SUPPORT AND HANGERS
NO SCALE



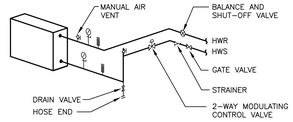
NOTE:

PIPE SHALL BE SUPPORTED ON EITHER SIDE OF WALL. PIPE SUPPORT SHALL BE COMPLETELY INDEPENDENT OF WALL.

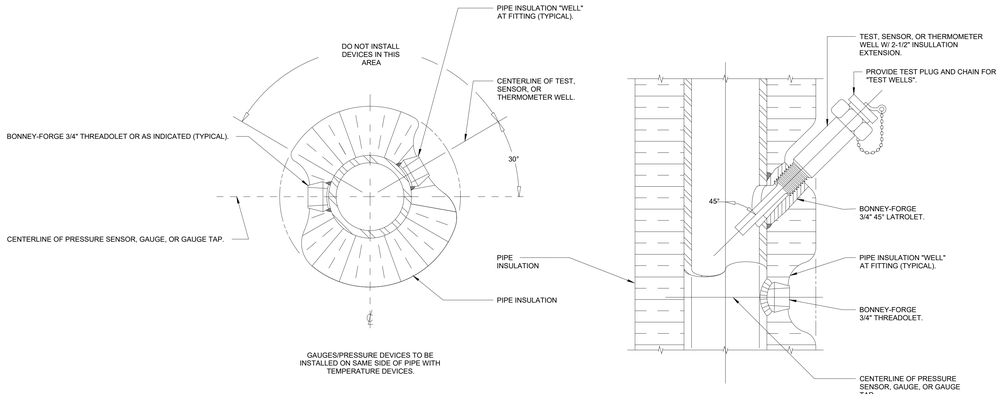
PIPE THRU WALL DETAIL
N.T.S.



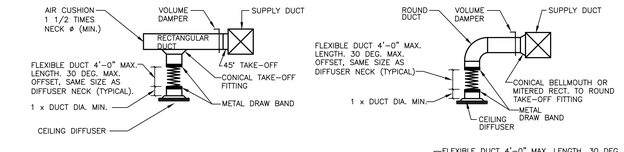
PIPING CIRCUIT SETTER
NO SCALE



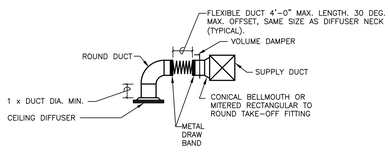
REHEAT COIL PIPING DIAGRAM WITH 2-WAY MODULATING CONTROL VALVE
N.T.S.



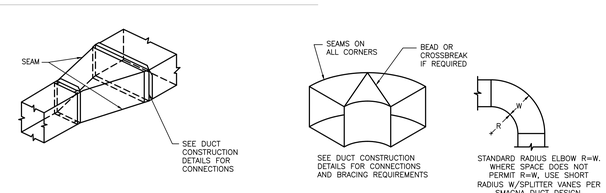
IMMERSION WELL
NO SCALE



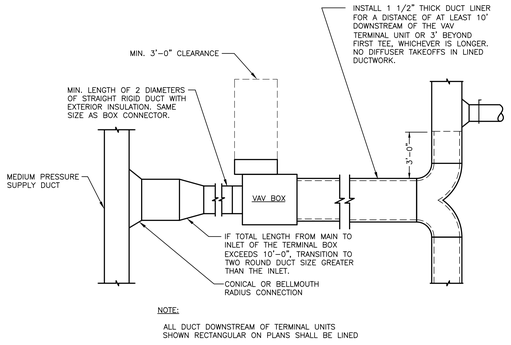
NOTE:
1. SPIN COLLARS SHALL NOT BE PERMITTED.
2. SPECIAL CONDITIONS THAT CAN NOT MEET ONE OF THESE STANDARDS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION ON A CASE BY CASE BASIS.
3. DETAILS ILLUSTRATE INSTALLATION WITH ROUND NECK DIFFUSERS AND DUCTS. SQUARE OR RECTANGULAR NECK DIFFUSERS AND DUCTS SHALL BE SIMILAR.



TYPICAL DIFFUSER INSTALLATION DETAIL
N.T.S.



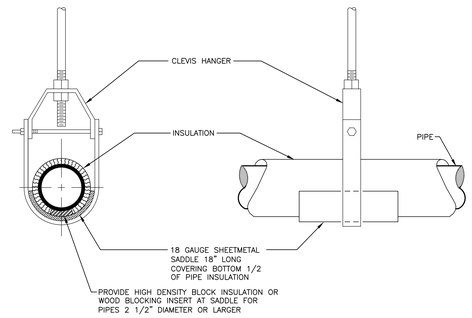
DUCT CONSTRUCTION DETAILS
N.T.S.



NOTE:

ALL DUCT DOWNSTREAM OF TERMINAL UNITS SHOWN RECTANGULAR ON PLANS SHALL BE LINED

VAV TERMINAL UNIT DETAIL
N.T.S.



CLEVIS HANGER PIPE SUPPORT DETAIL
N.T.S.

AS-BUILTS
JENSEN'S PLUMBING & HEATING
670 E. CALHOUN ST.
WOODSTOCK, IL 60098

OWNER
LISLE LIBRARY DISTRICT
777 FRONT STREET
LISLE, IL 60532

ARCHITECT
SHEEHAN NAGLE HARTRAY ARCHITECTS
30 WEST MONROE, SUITE 900
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MEP / TECHNOLOGY ENGINEER
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STRUCTURAL ENGINEER
GRAEF
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CIVIL ENGINEER AND LANDSCAPE CONSULTANT
ERIKSSON ENGINEERING ASSOCIATES
145 COMMERCE DRIVE, SUITE A
GRAYSLAKE, IL 60030

LIGHTING CONSULTANT
GWEN GROSSMAN LIGHTING DESIGN
53 WEST JACKSON STREET, SUITE 1457
CHICAGO, IL 60604

No.	Description	Date
CD-3	WCPR-1/CD-3 ISSUED FOR CONSTRUCTION	03.02.2022
3	ISSUED FOR BID AND PERMIT	11.19.2021
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1	ISSUED FOR SCHEMATIC DESIGN	06.30.2021

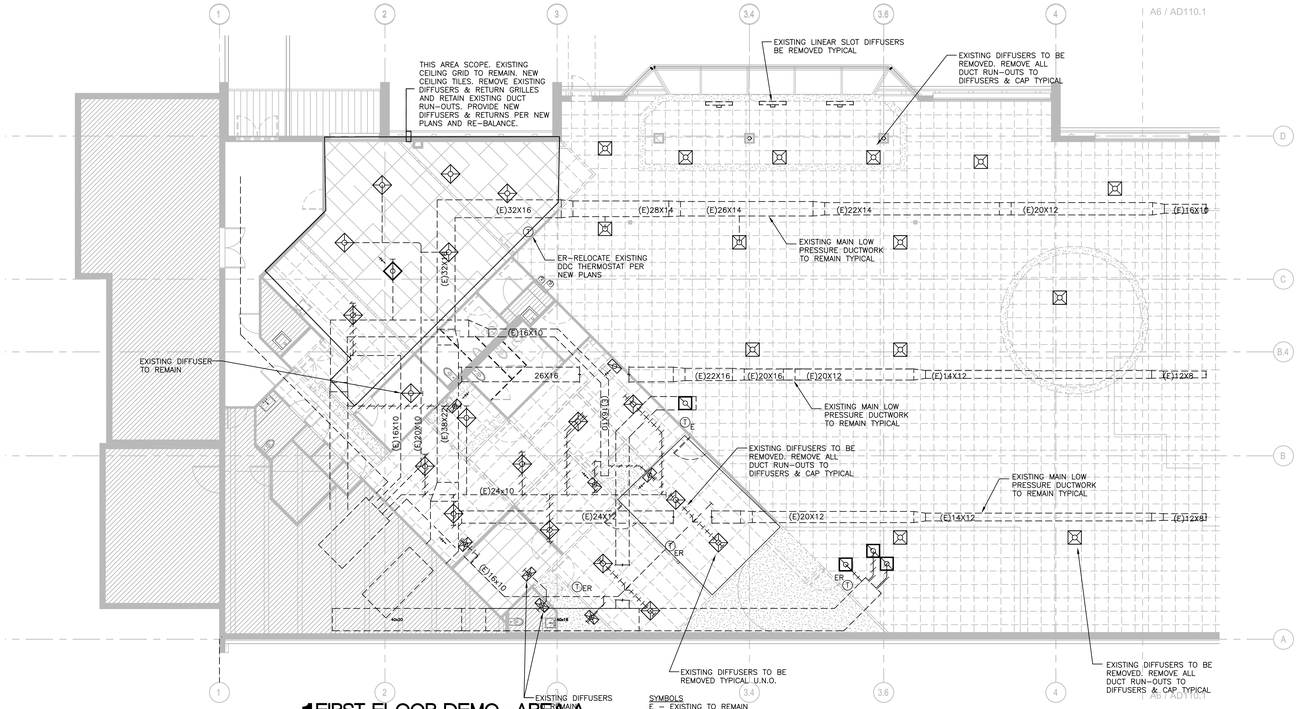
LISLE LIBRARY DISTRICT
777 FRONT STREET
LISLE, IL 60532

BID AND PERMIT

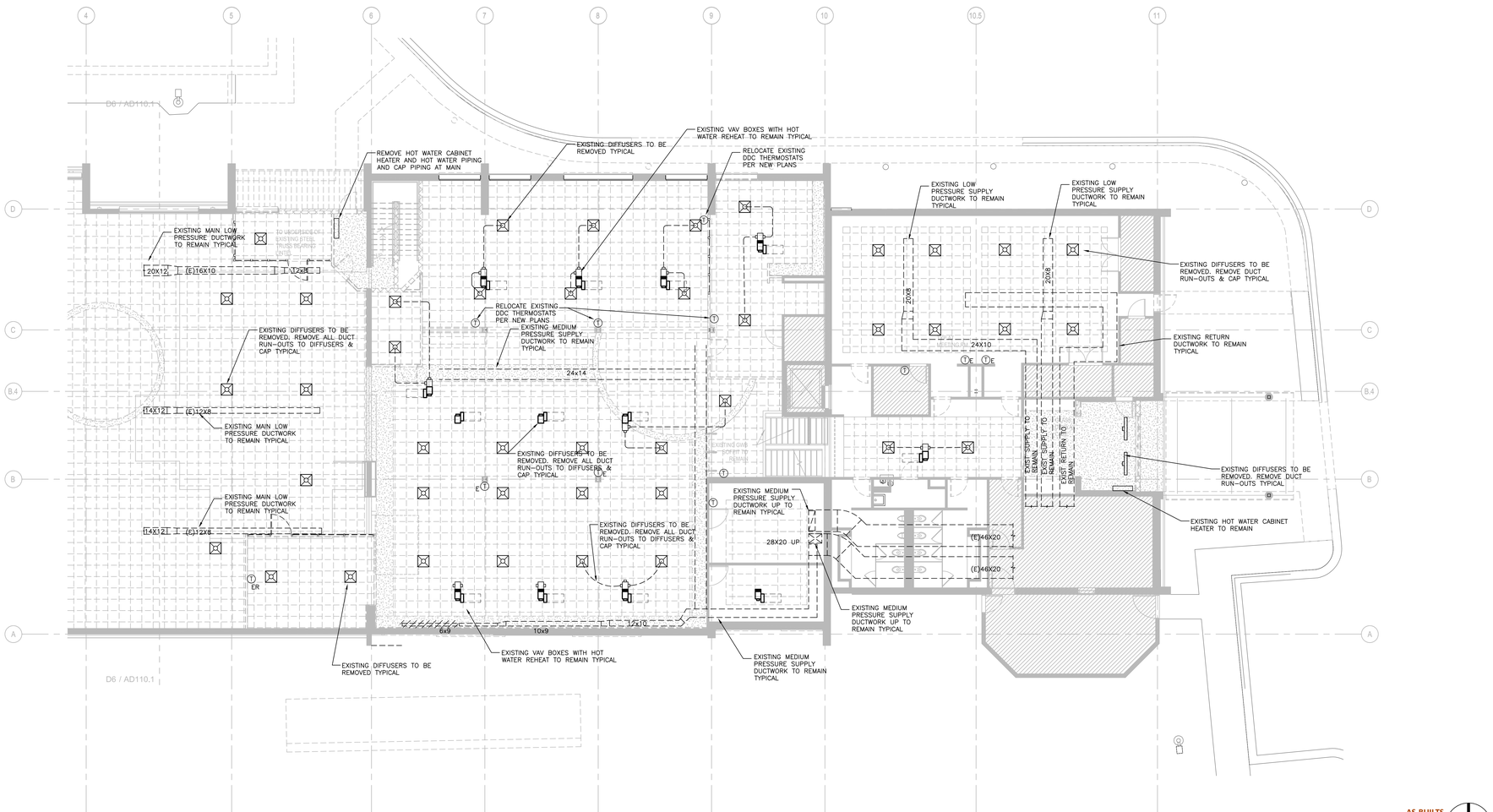
MECHANICAL DETAILS

M004

SCALE: AS NOTED



1 FIRST FLOOR DEMO -AREA A
1/8" = 1'-0"



2 FIRST FLOOR DEMO -AREA B
1/8" = 1'-0"

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STEVE J. SOVAK
062-041237
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

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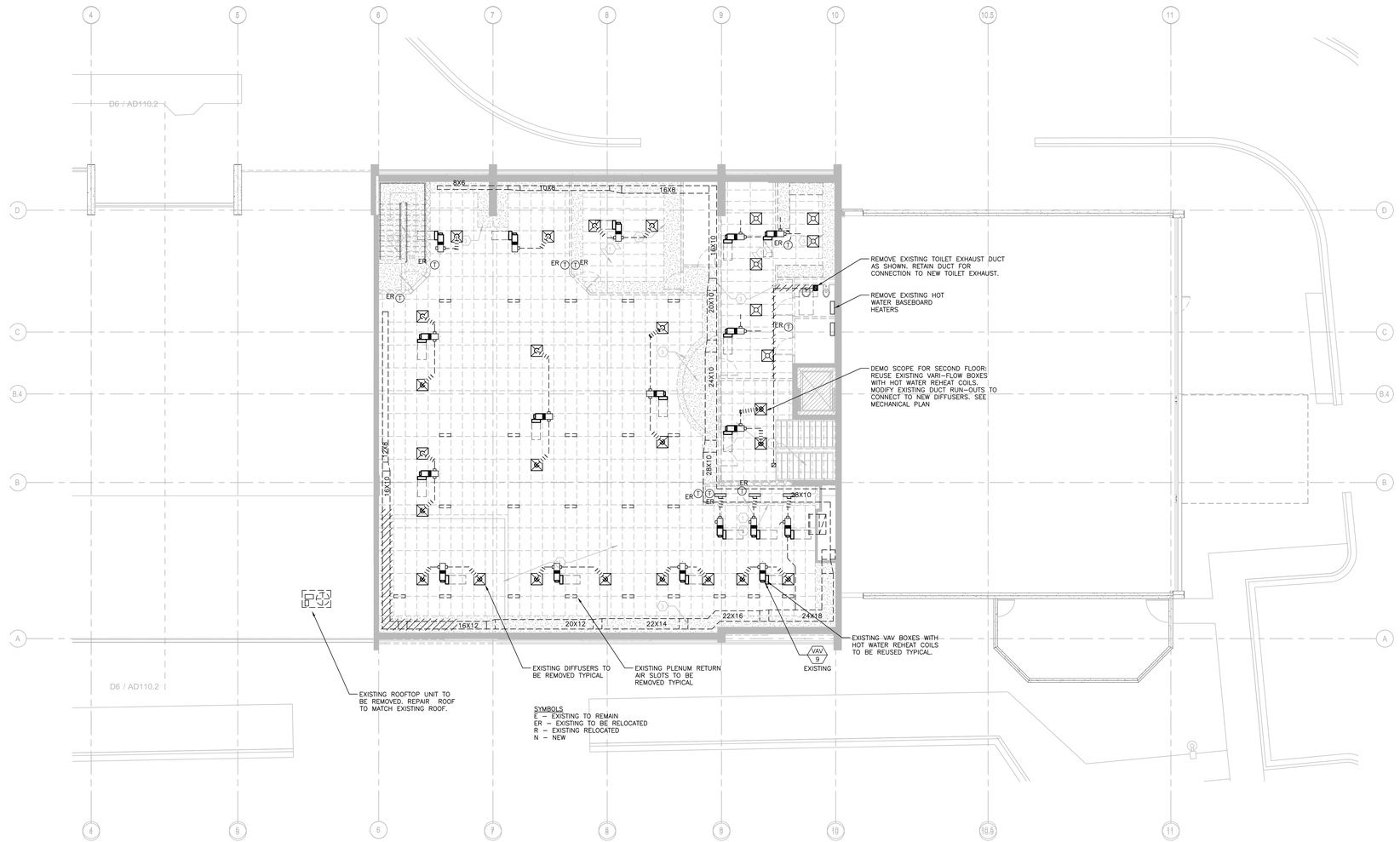
LISLE LIBRARY DISTRICT
777 FRONT STREET
LISLE, IL 60532

BID AND PERMIT

MECHANICAL FIRST FLOOR PLAN - DEMO

MD110.01

SCALE: AS NOTED



2 SECOND FLOOR DEMO -AREA B
1/8" = 1'-0"

AS-BUILTS
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WOODSTOCK, IL 60098

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STATE OF ILLINOIS

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LISLE LIBRARY DISTRICT
777 FRONT STREET
LISLE, IL 60532

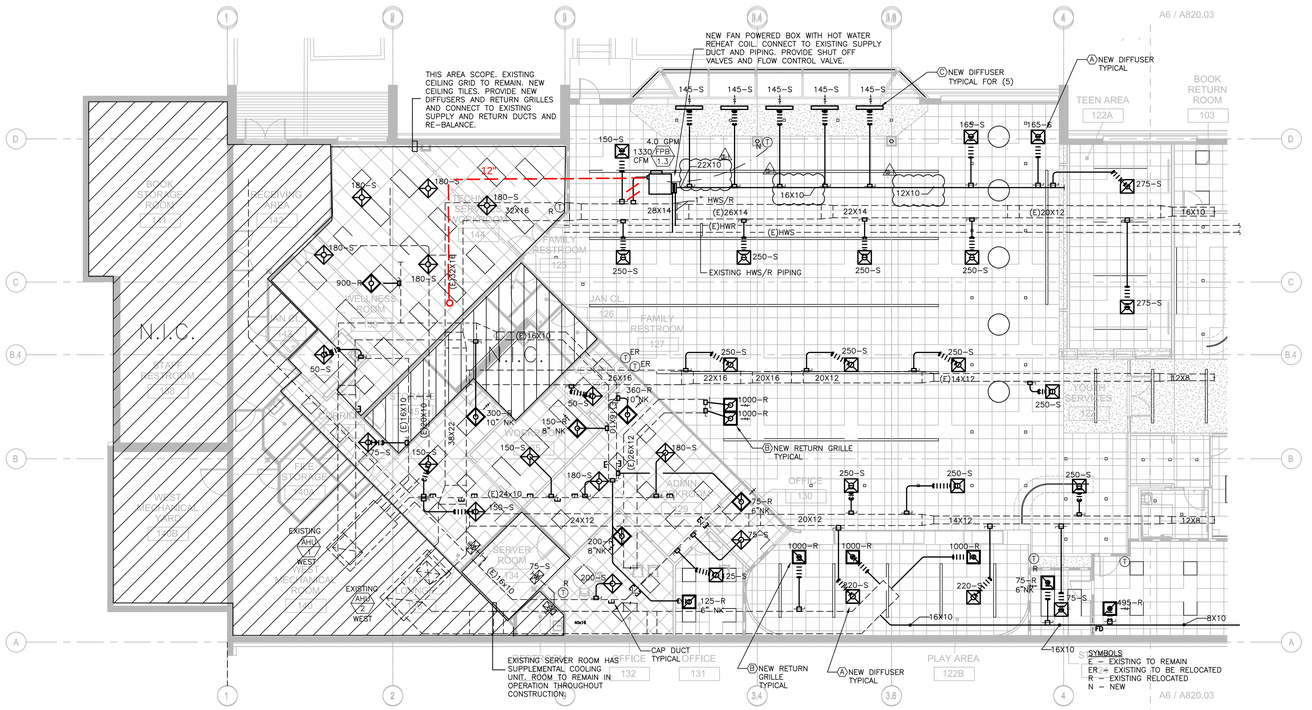
BID AND PERMIT

MECHANICAL SECOND FLOOR PLAN - DEMO

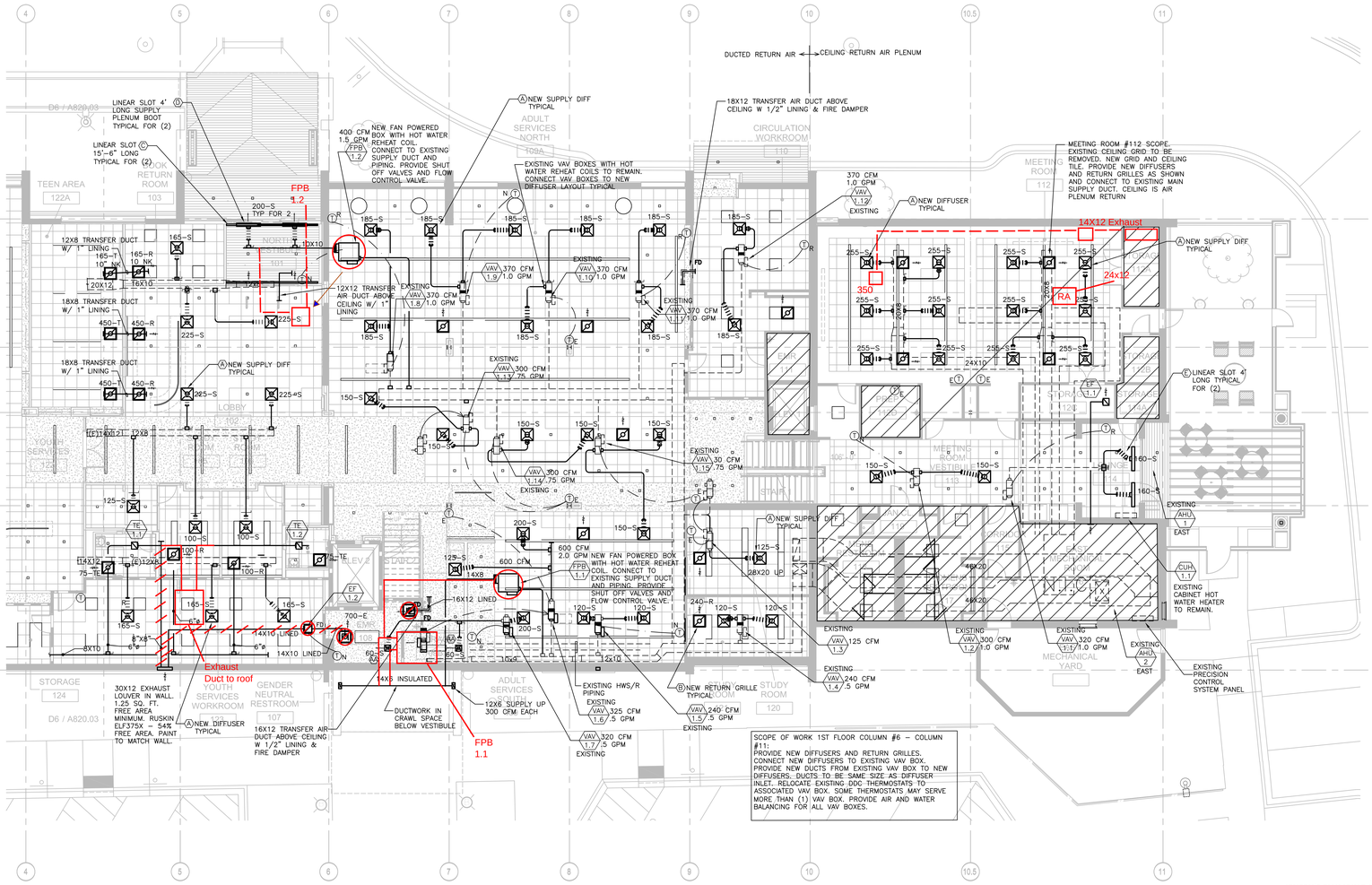
MD110.02

SCALE: AS NOTED

Attachment E



1 FIRST FLOOR -AREA A
1/8" = 1'-0"



2 FIRST FLOOR -AREA B
1/8" = 1'-0"

AS-BUILTS
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CHICAGO, IL 60603

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CHICAGO, IL 60605

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GRAEF
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STEVE J. SOVAK
062-041237
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

No.	Description	Date
CD-3	WCPR-1/CD-3 ISSUED FOR CONSTRUCTION	03.02.2022
2A	SI-1/CD-1 CITY REVIEW COMMENTS (PERMIT, ZONING, ENGINEERING)	01.07.2022
3	ISSUED FOR BID AND PERMIT	11.19.2021
2	ISSUED FOR DESIGN DEVELOPMENT	09.08.2021
1	ISSUED FOR SCHEMATIC DESIGN	06.30.2021

LISLE LIBRARY DISTRICT

777 FRONT STREET
LISLE, IL 60532

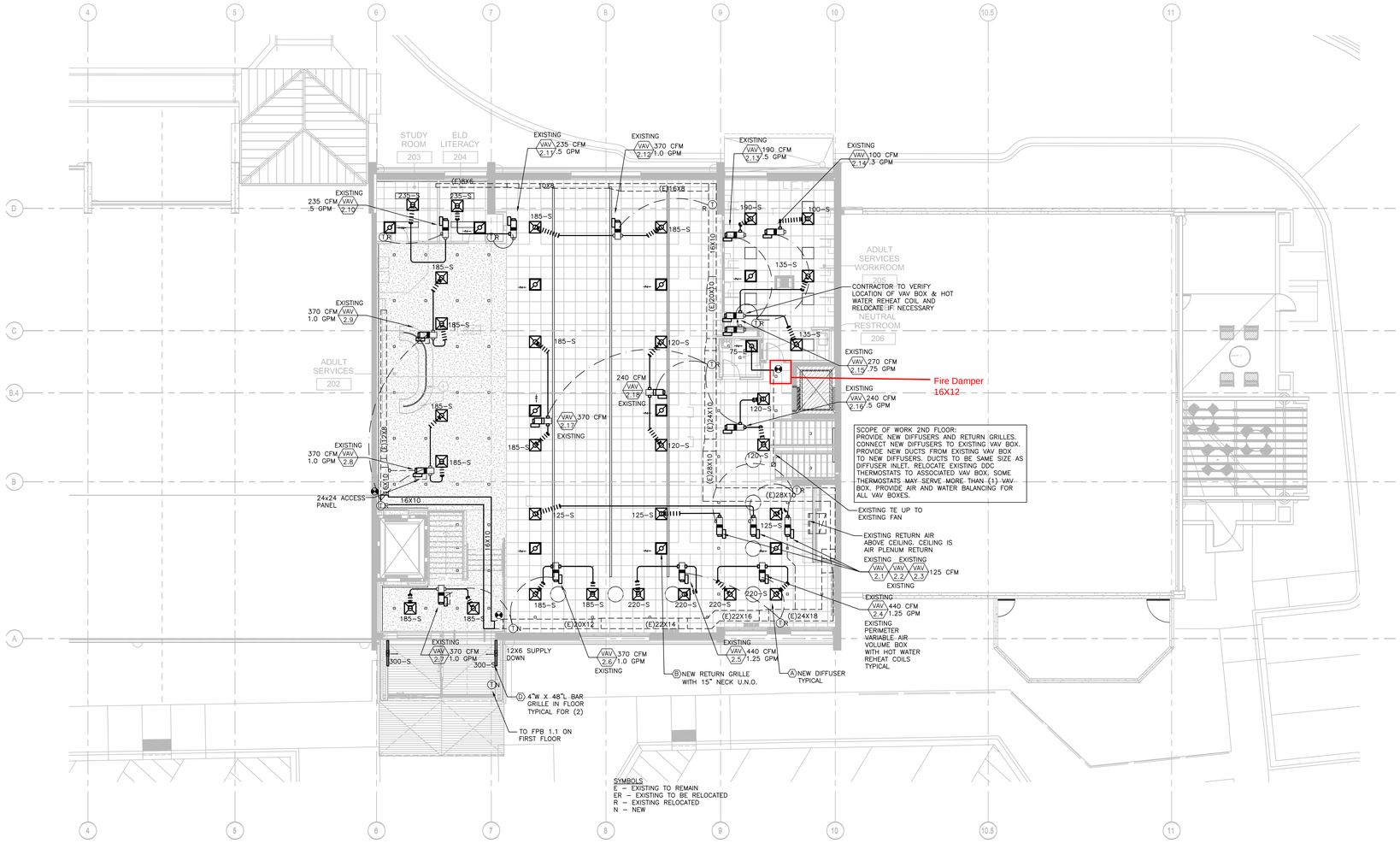
BID AND PERMIT

MECHANICAL FIRST FLOOR PLAN

M110.01

SCALE: AS NOTED

Attachment E



2 SECOND FLOOR - AREA B
1/8" = 1'-0"

AS-BUILTS
JENSEN'S PLUMBING & HEATING
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WOODSTOCK, IL 60098

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STATE OF ILLINOIS

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LISLE LIBRARY DISTRICT
777 FRONT STREET
LISLE, IL 60532

BID AND PERMIT

MECHANICAL SECOND FLOOR PLAN

M110.02

SCALE: AS NOTED