



STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

**INVITATION TO BID (ITB)
ITB No. 10-028-26**

DATE OF ISSUE: May 11, 2026

**TITLE:
Air Handler Replacement (Anchorage, Alaska)**

Important Notice: If you receive this solicitation from the State's Online Public Notice website you must register with the DNR Procurement Section to receive subsequent amendments. Registration must be in writing and may be made via email to christopher.brooks@alaska.gov. Failure to register with the DNR Procurement Section may result in rejection of your offer.

ADA: The State of Alaska complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services, and/or special modifications to submit a bid should contact the DNR Procurement Section via email to christopher.brooks@alaska.gov not later than 10 calendar days prior to the bid closing date to make necessary arrangements.

Procurement Officer: Chris Brooks
Email: christopher.brooks@alaska.gov

TABLE OF CONTENTS

1. <u>Invitation</u>			
	INVITATION FOR BIDS	25D-7DNR	(06/11)
2. <u>Bid Notices</u>			
	REQUIRED DOCUMENTS	25D-4DNR	(11/10)
3. <u>Forms</u>			
	SUBCONTRACTOR LIST	25D-5DNR	(10/12)
	CONTRACTOR'S QUESTIONNAIRE	25D-8DNR	(11/10)
	BID FORM	25D-9DNR	(06/11)
	ALASKA PRODUCTS PREFERENCE WORKSHEET	25D-20	(12/19)
	ALASKA BIDDER PREFERENCE CERTIFICATION	25D-19	(07/18)
	ALASKA VETERAN PREFERENCE CERTIFICATION	25D-17	(07/18)
	SCOPE OF WORK		
	BID SCHEDULE		
	CONSTRUCTION CONTRACT	25D-10ADNR	(06/11)
	PAYMENT BOND	25D-12DNR	(11/10)
	PERFORMANCE BOND	25D-13DNR	(11/10)
	BID BOND	25D-14DNR	(11/10)
	BID MODIFICATION	25D-16DNR	(11/10)
	APPENDIX B1 INDEMNITY AND INSURANCE		
	DRUGFREE WORKPLACE CERTIFICATION		
	FEDERAL DEBARMENT CERTIFICATION FORM		
4. <u>Contract Provisions and Specifications</u>			
	-Devise Engineering S101 (1 page) – dated March 23, 2026		
	-Devise Engineering Specifications (6 pages) – dated March 23, 2026		
	-T3 Alaska – Boiler Plant and RTU Replacement (8 pages) – dated February 18, 2026		
	-Superior – Innotech Building Automation (BAS) System (25 pages) – dated April 20, 2026		
5. <u>State Wage Rates (blue)</u>			
	State wage rates can be obtained at http://www.labor.state.ak.us/lss/pamp600.htm . Use the State wage rates that are in effect 10 days before Bid Opening.		

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

INVITATION TO BID
for Construction Contract

Date May 11, 2026

ITB No. 10-028-26 Air Handler Replacement (Anchorage, Alaska)

Project Name and Number

The Department invites bidders to submit bids for furnishing all labor, equipment, and materials and performing all work for the project described below. The Department will only consider bids received **before 2:00 PM local time (per the Department's time source) on the 1st day of June 2026.**

Location of Project: Anchorage, Alaska

Contracting Officer: Chris Brooks, Procurement Specialist 5

Issuing Office: DNR/SSD/Procurement Section – 550 W 7th Ave., Suite 1330, Anchorage, Alaska 99501

State Funded

Federal Aid

Description of Work:

See Scope of Work and associated attachments.

The Engineer's Estimate is between \$500,000 and \$1,000,000

All work shall be completed by 06/30/2027.

The Department will identify interim completion dates, if any, in the Special Provisions.

The apparent successful bidder must furnish a payment bond in the amount of 100% of the contract and a performance bond in the amount of 100% of the contract as security conditioned for the full, complete and faithful performance of the contract. The apparent successful bidder must execute the said contract and bonds within fifteen calendar days, or such further time as may be allowed in writing by the Contracting Officer, after receiving notification of the acceptance of their bid.

Submission of Bidding Documents

Bidders may submit bidding documents electronically, through the mail or hand delivered. For mailed or hand delivered bids and for electronically submitted bids with a paper bid guaranty, documents shall be submitted in a sealed envelope marked as follows:

Bidding Documents for Project:	ATTN:
ITB No. 10-028-26 Air Handler Replacement (Anchorage, Alaska)	State of Alaska Department of Natural Resources Procurement Section 550 W 7 th Ave., Suite 1330 Anchorage, Alaska 99501

It is incumbent upon the bidder to ensure its bid, any amendments, and/or withdrawal arrive, in its entirety, at the location and before the deadline stated above. A bidder sending a bid amendment or withdrawal via email must transmit its documentation to the Department at this email address: christopher.brooks@alaska.gov.

To be responsive, a bid must include a bid guaranty equal to 5% of the amount bid. (*When calculating the bid amount for purposes of determining the 5% value of the bid guaranty, a bidder shall include its base bid amount, plus the amount bid for alternate and supplemental bid items, if any.*)

The Department hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this Invitation, Disadvantaged Business Enterprises will be afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

REQUIRED DOCUMENTS

REQUIRED FOR BID. Bids will not be considered if the following documents are not completely filled out and submitted at the time of bidding:

1. **Bid Forms**
 - a. **Bid Form (Form 25D-9DNR)**
 - b. **Bid Schedule**
 - c. **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion**
 - d. **Certification Regarding Drugfree Workplace Requirements**
2. **Bid Security (Bid Bond) – (Form 25D-14DNR)**

REQUIRED FOR BID MODIFICATIONS. Any bid revisions must be submitted by the bidder prior to bid. Use the following form to modify Manual (paper) bids:

3. **Bid Modification (Form 25D-16)**

REQUIRED FOR CLAIMED PROCUREMENT PREFERENCE. The Department will not consider a claimed procurement preference unless a bidder submits the appropriate, signed certification(s) for the claimed preference at the time of bidding:

-
4. **Alaska Bidder Preference Certification (Form 25D-19)**
 5. **Alaska Products Preference Certification (Form 25D-20)**
 6. **Alaska Veteran Preference Certification (Form 25D-17)**
 7. **Alaska Military Skills Preference Certification (Form 25D-21)**

REQUIRED AFTER NOTICE OF APPARENT LOW BIDDER. The apparent low bidder is required to complete and submit the following document within 5 working days after receipt of written notification:

1. **Subcontractor List (Form 25D-5)**

REQUIRED FOR AWARD. In order to be awarded the contract, the successful bidder must completely fill out and submit the following documents within the time specified in the intent to award letter:

1. **Construction Contract (Form 25D-10A)**
2. **Payment Bond (Form 25D-12)**
3. **Performance Bond (Form 25D-13)**
4. **Contractor's Questionnaire (Form 25D-8)**
5. **Certificate of Insurance (from carrier)**



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

SUBCONTRACTOR LIST

Air Handler Replacement (Anchorage, Alaska) – ITB No. 10-028-26

Project Name and Number

The apparent low bidder shall complete this form and submit it so as to be received by the Contracting Officer prior to the close of business on the fifth working day after receipt of written notice from the Department.

An apparent low bidder who fails to submit a completed Subcontractor List form within the time allowed will be declared nonresponsible and may be required to forfeit the bid security.

Scope of work must be clearly defined. If an item of work is to be performed by more than one firm, indicate the portion or percent of work to be done by each.

Check as applicable: All Work on the above-referenced project will be accomplished without subcontracts

Or

List all first tier Subcontractors as follows:

FIRM NAME, ADDRESS, PHONE NO.	AK BUSINESS LICENSE NO., CONTRACTOR'S REGISTRATION NO.	SCOPE OF WORK TO BE PERFORMED

CONTINUE SUBCONTRACTOR INFORMATION ON REVERSE

For projects with federal-aid funding, I hereby certify Alaska Business Licenses and Contractor Registrations will be valid for all subcontractors prior to award of the subcontract. For projects without federal-aid funding (State funding only), I hereby certify the listed Alaska Business Licenses and Contractor Registrations were valid at the time bids were opened for this project.

Signature of Authorized Company Representative

Title

Company Name

Company Address (Street or PO Box, City, State, Zip)

Date

Phone Number

2. What percent of the total value of this contract do you intend to subcontract? _____%

3. Do you propose to purchase any equipment for use on this project?

NO YES If YES, describe type, quantity, and approximate cost:

4. Do you propose to rent any equipment for this work?

NO YES If YES, describe type and quantity:

5. Is your bid based on firm offers for all material necessary for this project?

NO YES If NO, explain:

C. EXPERIENCE

1. Have you had previous construction contracts or subcontracts with the State of Alaska?

NO YES If YES, explain:

2. List, as an attachment to this questionnaire, other construction projects you have completed, the dates of completion, scope of work, and total contract amount for each project completed in the past 12 months.

I hereby certify that the above statements are true and complete.

Name of Contractor

Name & Title of Person Signing

Signature

Date



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

BID FORM

for

Air Handler Replacement (Anchorage, Alaska) – ITB No. 10-028-26

Project Name and Number

by

Company Name

Company Address (Street or PO Box, City, State, Zip)

**TO THE CONTRACTING OFFICER,
DEPARTMENT OF NATURAL RESOURCES:**

In compliance with your Invitation for Bids dated May 11, 2026, the Undersigned proposes to furnish and deliver all the materials and do all the work and labor required in the construction of the above-referenced Project, located in Anchorage, Alaska, according to the plans and specifications and for the amount and prices named herein as indicated on the Bid Schedule consisting of **one** sheet, which is made a part of this Bid.

The Undersigned declares that he has carefully examined the contract requirements and that he has made a personal examination of the site of the work; that he understands that the quantities, where such are specified in the Bid Schedule or on the plans for this project, are approximate only and subject to increase or decrease, and that he is willing to perform increased or decreased quantities of work at unit prices bid under the conditions set forth in the Contract Documents.

The Undersigned hereby agrees to execute the said contract and bonds within fifteen calendar days, or such further time as may be allowed in writing by the Contracting Officer, after receiving notification of the acceptance of this bid, and it is hereby mutually understood and agreed that in case the Undersigned does not, the accompanying bid guarantee shall be forfeited to the State of Alaska, Department of Natural Resources as liquidated damages, and the said Contracting officer may proceed to award the contract to others.

The Undersigned agrees to commence the work within 10 calendar days, and to complete the work within **N/A** calendar days, after the effective date of the Notice to Proceed, or by **June 30, 2027**, unless extended in writing by the Contracting Officer.

The Undersigned proposes to furnish Payment Bond in the amount of **100%** (of the contract) and Performance Bond in the amount of **100%** (of the contract), as surety conditioned for the full, complete and faithful performance of this contract.

INSTRUCTIONS FOR ALASKA PRODUCTS PREFERENCE WORKSHEET

Special Notice: All procurements, except those funded from Federal sources, shall contain Contract provisions for the preference of Alaska products. To be considered for the Alaska Product Preference, each product listed by the Bidder on this worksheet must have current certification from the Alaska Products Preference Program at the time of Bid Opening or the proposal due date. A product with expired certification at the bid opening or proposal due date will not be considered eligible. Products that are not specified for use on the project will not be considered eligible.

The Alaska Product Preference Program List of certified products is available online at:

<https://www.commerce.alaska.gov/web/dcra/AlaskaProductPreferenceProgram.aspx> or may be obtained by contacting Dept. of Commerce & Economic Development Alaska Division of Community and Regional Affairs, Alaska Products Preference Program, 550 W. 7th Ave., Suite 1650, Anchorage AK 99501-3510; Phone: (907) 269- 4501 Fax: (907) 269-4563, E-mail: madeinalaska@alaska.gov

BIDDERS INSTRUCTIONS:

A. General. The contracting Agency may request documentation to support entries made on this form. False presentations may be subject to AS 36.30.687. All Bidder's entries must conform to the requirements covering bid preparations in general. Discrepancies in price extensions shall be resolved by multiplying the declared total value times the preference percentage and adjusting any resulting computation(s) accordingly.

B. Form Completion – BASIC BIDS.

- (1) Enter project number and name, the words "Basic Bid" and the CONTRACTOR'S name in the heading of each page as provided.
- (2) The Bidder shall compare those candidate products appearing on the preference listing (see Special Notice comments above) against the requirements of the technical specifications appearing in the contract documents. If the Bidder determines that a candidate product can suitably meet the contract requirements, then that product may be included in the worksheet as follows.
- (3) For each suitable product submitted under the "Basic Bid" enter:
 - The product name, generic description and its corresponding technical specification section number under the heading "PRODUCT",
 - The company name of the Alaska producer under the heading "Manufacturer", and
 - The product class (I, II, or III) and preference percentage (3, 5, or 7% respectively) under the "CLASS/% heading.
- (4) For each product appearing on the list and to be utilized by the CONTRACTOR enter:
 - Under the heading "TOTAL DECLARED VALUE" the manufacturer's quoted price of the product, (caution: this value is to be the manufacturer's quoted price at the place of origin and shall not include costs for freight, handling or miscellaneous charges of incorporating the product into the Work,) and
 - The resulting preference – i.e. the preference percentage times the total declared value amount – under the heading "REDUCTION AMOUNT".
- (5) Continue for all "suitable" basic bid products. If the listing exceeds one page enter the words "Page # __ SUB" in front of the word "TOTAL" and on the first line of the following pages enter "SUBTOTAL OF REDUCTION AMOUNT FROM PREVIOUS PAGE".
- (6) On the final page of the listing enter "BASIC BID PREFERENCE GRAND" immediately before the word "TOTAL".
- (7) Total the entries in the "REDUCTION AMOUNT" column for each page by commencing at the first entry for that page. If a continuation page exists, ensure that the subtotal from the previous page is computed into the running total. Number pages as appropriate.
- (8) Compute a Grand Total for the Basic Bid Preference. Enter the amount on the final page of the worksheet. (Note: When solicitations require written bids this amount should also be entered on line "C" of the Basic Bid Schedule.) Submit worksheet(s) with the Bid Schedule.

C. Form Completion – ALTERNATE BIDS.

- (1) Enter project number and name, the words "ALTERNATE BID # __", and CONTRACTOR'S name in the heading of each page as provided.
- (2) On the first entry line enter "ADDITIONAL ALASKA PRODUCTS FOR ALTERNATE BID # __", and repeat procedures 2 through 5 under part B these Bidder's instructions except that references to "Basic Bid" shall be replaced with the words "Alternate Bid # __."
- (3) Following the listing of all additional Alaska products enter the words "ADDITIONAL PRODUCTS PREFERENCE FOR ALTERNATE BID # __ - SUBTOTAL" and enter a subtotal amount for all additional products as listed. Subtotal amount to be determined by adding all additional product entries in the "REDUCTION AMOUNT" column.
- (4) Skip three lines and enter "LESS THE FOLLOWING NON-APPLICABLE ALASKA PRODUCTS:
- (5) Beginning on the next line, enter the product name and manufacturer of each Alaska Product appearing on the "Basic Bid" listing which would be deleted or reduced from the Project should the "Alternate Bid" be selected. Details of entry need only be sufficient to clearly reference the subject product. (i.e. "Pre-hung doors by Alaska Door Co., Anchorage.") Products being reduced shall specify the amount of the reduction. Should no products require deletion enter "None". When a product is listed as a "NON-APPLICABLE ALASKA PRODUCT" for this alternate bid and if under the basic bid the Bidder received a preference on his basic bid as a result of that product, then the applicable entries under the headings "TOTAL DECLARED VALUE" and "REDUCTION AMOUNT" (for each product and from the basic bid listing) shall also be entered into the corresponding headings of this form. Where only a portion of the products has been deleted, the entry (which will differ from those on the basic bid listing) may be "pro-rated" or as otherwise substantiated.
- (6) Following the listing of all non-applicable Alaska products enter the words "NON-APPLICABLE PRODUCTS PREFERENCE FROM BASIC BID __ SUBTOTAL" and enter a subtotal amount for all non-applicable products listed. Subtotal amount to be determined by adding all non-applicable entries in the "REDUCTION AMOUNT" column.
- (7) At the bottom of the final page enter the words "ALTERNATE BID # __ PREFERENCE GRAND" immediately before the word "TOTAL".
- (8) Compute a Grand Total for the Alternate Bid Preference (for Alternate # __) by subtracting the non-applicable product preference subtotal from the additional product preference subtotal. Enter on the final page. (Note: When solicitations require written bids this amount should also be entered on line "C" of the Alternate Bid Schedule.) Submit separate worksheet(s) with each Alternate Bid



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

ALASKA BIDDER PREFERENCE CERTIFICATION

In response to the advertised procurement for:

Project Name and Number: Air Handler Replacement (Anchorage, Alaska) ITB No. 10-028-26

Bidder/Proposer (company name): _____

Operation of Alaska Bidder Preference

Procurement preferences under the Alaska Procurement Code are benefits that the State grants only to qualified bidders. Under AS 36.30.990(2), if a bidder is an eligible "Alaska Bidder", the Department will apply a five percent preference to the price of the bidder's proposal.

Instructions regarding Alaska Bidder Preference

A bidder that claims the Alaska Bidder Preference must review and then certify that each statement appearing under the heading "Alaska Bidder Certification" is true. The individual that signs the certification shall include his/her printed name and position within bidder's organization, *e.g.*, sole proprietor, partner, etc. If a bidder fails to submit a signed certification, the Department will not apply the claimed preference.

Alaska Bidder Certification

The bidding entity for which I am the duly authorized representative:

- (A) Holds a current Alaska business license;
- (B) Is submitting a bid or proposal for goods, services, or construction under the name appearing on the bidder's current Alaska business license;
- (C) Has maintained a place of business in the State staffed by the bidder or an employee of the bidder for a period of six months immediately preceding the date of the proposal;
- (D) Is incorporated or qualified to do business under the laws of the State, is a sole proprietorship and the proprietor is a resident of the State, is a limited liability company organized under AS 10.50 and all members are residents of the State, or is a partnership under former AS 32.05, AS 32.06, or AS 32.11 and all partners are residents of the State; and
- (E) If a joint venture, is composed entirely of ventures that qualify under the four preceding paragraphs of this Alaska Bidder Certification.

By applying my signature below, I certify under penalty of perjury that I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning its proposal, and that the foregoing statements are true and correct.

By (signature)

Date

Printed name

Alaska Business License Number

Title:



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**ALASKA VETERAN PREFERENCE
CERTIFICATION**

In response to the advertised procurement for:

Project Name and Number: Air Handler Replacement (Anchorage, Alaska) ITB No. 10-028-26

Bidder (Contractor) _____

Operation of Alaska Veteran Preference

Procurement preferences under the Alaska Procurement Code are benefits that the State grants only to qualified bidders. Under AS 36.30.321, an eligible entity receives a five percent preference to the price of in the bidder's proposal if the bidder meets three requirements.

The bidder must be:

1. an "Alaska Veteran";
2. a "Qualifying Entity"; and
3. an "Alaska Bidder".

Unless a bidder satisfies all three requirements and furnishes corresponding certifications, it is not eligible for the Alaska Veteran Preference. This preference may not exceed \$5,000.

Instructions regarding Alaska Veteran Preference

A bidder that claims the Alaska Veteran Preference must review and complete the "Alaska Veteran Certification", the "Qualifying Entity Certification", and the "Alaska Bidder Certification". The individual that signs a certification shall include his/her printed name and position within bidder's organization, *e.g.*, sole proprietor, partner, etc. If a bidder fails to submit properly completed certifications, the Department will not apply the claimed preference.

Alaska Veteran Certification

(To be completed by individual(s) upon whom the bidder relies in claiming the Alaska Veteran status. If bidder is a partnership, limited liability company, or corporation, then a majority of partners, members, or shareholders who are Alaska Veterans must sign this Alaska Veteran Certification for the Bidder to be eligible for this preference.)

I hereby represent to the Department that:

I served in the armed forces of the United States, a reserve unit of the United States armed forces, the Alaska Territorial Guard, the Alaska Army National Guard, the Alaska Air National Guard, or the Alaska Naval Militia; and

I was separated from service under a condition that was not dishonorable; and

I am Alaska resident in that I am physically present in the State of Alaska with the intent to remain in the State indefinitely and to make a home in the State.

I certify under penalty of perjury that the foregoing statements are true and correct as they apply to me.

By (signature)

Date

Printed name

Title

Qualifying Entity Veteran Certification

The bidding entity for which I am the duly authorized representative is a:

(Check the appropriate box)

- sole proprietorship owned by an Alaska Veteran;
- partnership under AS 32.06 or AS 32.11 and a majority of the partners are Alaska Veterans;
- limited liability company organized under AS 10.50 and a majority of the members are Alaska Veterans;
or
- corporation that is wholly owned by individuals and a majority of the individuals are Alaska Veterans.

By applying my signature below, I certify under penalty of perjury that I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning the proposal and that the statement I have acknowledged above by checking the appropriate box is true and correct.

By (signature)

Date

Printed name

Title

Alaska Bidder Certification

(To complete your claim for the Alaska Veteran Preference, you must also submit an Alaska Bidder Certification).



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**ALASKA MILITARY SKILLS PREFERENCE
CERTIFICATION**

In response to the advertised procurement for:

Project Name and Number: Air Handler Replacement(Anchorage, Alaska)ITB No.10-028-26.

Bidder (Contractor) _____

Operation of Alaska Military Skills Preference

Procurement preferences under the Alaska Procurement Code are benefits that the State grants only to qualified bidders. Under AS 36.30.321, an eligible entity receives a two percent preference to the price in the bidder’s proposal if the bidder meets three requirements.

The bidder must be:

1. a “Qualifying Entity”; and
2. an “Alaska Bidder”

Unless a bidder satisfies all these requirements and furnishes corresponding certifications, it is not eligible for the Alaska Military Skills Preference. This preference may not exceed \$5,000.

Instructions regarding Alaska Military Skills Preference

A bidder that claims the Alaska Military Skills Preference must review and complete the “Alaska Military Skills Certification”, the “Qualifying Entity Certification”, and the “Alaska Bidder Certification”. The individual that signs a certification shall include their printed name and position within bidder’s organization, e.g., sole proprietor, partner, etc. If a bidder fails to submit properly completed certifications, the Department will not apply the claimed preference.

Alaska Military Skills Certification

(To be completed by individual(s) upon whom the bidder relies in claiming the Alaska Military Skills status. If bidder is a partnership, limited liability company, or corporation, then employee(s) who are claiming Alaska Military Skills must sign this Alaska Military Skills Certification for the Bidder to be eligible for this preference and provide proof of graduation of the qualifying employee(s) from an eligible program as described in AS 36.30.321).

I hereby represent to the Department that:

I have one or more employees who are currently enrolled in, or have graduated within the past two years from, a United States Department of Defense SkillBridge or United States Army Career Skills Program. These programs provide service members or their spouses with civilian work experience, industry training, pre-apprenticeships, registered apprenticeships, or internships during the final 180 days before separation or retirement from the military.

Alternatively, I maintain an active partnership with an entity that employs apprentices through a program as outlined in AS 36.30.321.

Additionally, I am a resident of Alaska, meaning I am physically present in the state with the intent to remain indefinitely and establish a permanent home here.

I certify under penalty of perjury that the foregoing statements are true and correct as they apply to me.

By (signature)

Date

Printed name

Title

Qualifying Entity Military Skills Certification

The bidding entity for which I am the duly authorized representative is a:

(Check the appropriate box)

- employs at least one person who is currently enrolled in, or within the previous two years graduated from, a United States Department of Defense SkillBridge or United States Army Career Skills Program for service members or spouses of service members that offers civilian work experience through specific industry training, pre-apprenticeships, registered apprenticeships, or internships during the last 180 days before a service member separates or retires from the service; or
- has an active partnership with an entity that employs an apprentice through a program described in AS 36.30.321.
- proof of graduation of the qualifying employee(s) from an eligible program as described in AS 36.30.321.

By applying my signature below, I certify under penalty of perjury that I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning the proposal and that the statement I have acknowledged above by checking the appropriate box is true and correct.

By (signature)

Date

Printed name

Title

Alaska Bidder Certification

(To complete your claim for the Alaska Military Skills Preference, you must also submit an Alaska Bidder Certification)

Scope of Work

Air Handler Replacement (Anchorage, Alaska)

Invitation to Bid # 10-028-26

Scope of Work

The Department of Natural Resources (DNR), Alaska Mental Health Trust Land Office (TLO) requires Air Handler Unit (AHU) replacement. The existing AHU is a custom rooftop penthouse system from Mammoth, Inc. which is rated at ~70 tons and 27,000 CFM. Cooling is provided via a combination of outside air and R-22 refrigerant. Existing controls associated with the AHU are stand-alone. The existing AHU penthouse enclosure includes a roof hatch, hydronic heater and fire sprinkler which will need to be accounted for during removal and replacement. The desired AHU scope of work will include the full removal of the existing AHU Penthouse Structure and components followed by the replacement with a new packaged rooftop unit including factory controls and natural gas heat (extension of gas line will be required and is indicated on the drawings). Structural engineering and upgrades to be required and a design from Devise Engineering is included in this scope of work dated March 23, 2026 and design from T3 Alaska dated February 18, 2026. Curb adapter and new roof hatch to be included. Integration into the newly installed BAS will be required. This scope of work would be part of the controls upgrade project that is referenced in the included controls design by The Superior Group, dated April 20, 2026.

Please note that all scopes of work identified above are to be turnkey, including, but not limited to, labor, materials, equipment, crane, structural upgrades, shipping/logistics, permitting, insurance, and general conditions/supervision. It is the intent of the client for the building to remain occupiable during construction. Bidders shall take this into consideration when proposing and planning this project. Value engineering Ideas and solutions are encouraged. While the overall mechanical equipment upgrade project is broken down into three separate projects, this ITB is for the AHU replacement scope of work only. For reference, the additional projects include 1) the controls upgrade, and 2) the boiler room upgrade, both of which are separate projects.

Attachments:

Devise Engineering S101 (1 page) – dated March 23, 2026

Devise Engineering Specifications (6 pages) – dated March 23, 2026

T3 Alaska – Boiler Plant and RTU Replacement (8 pages) – dated February 18, 2026

Superior – Innotech Building Automation (BAS) System (25 pages) – dated April 20, 2026

Construction Requirements:

- Construction methods, materials and systems shall meet code requirements and be appropriate for construction of this type and location;
- Material and equipment substitutions must be authorized by the DNR Project Manager;
- Quality control and assurance shall be monitored on a regular basis by the Contractor and DNR Project Manager. Any concerns shall be communicated in a timely manner with the DNR Project Manager;
- Proper safety regulations and procedures shall be followed at all times and PPE shall be worn and available while onsite;
- Regular weekly/bi-weekly attendance of progress meetings during construction as required (in-person and/or virtual);
- Provide copies of daily reports to DNR Project Manager throughout construction duration.

Project Location

3745 Community Park Loop, Anchorage, Alaska.

Worksite Inspection

Potential bidders are encouraged to visit the worksite so they can see the conditions and areas under which the work described will be performed. Bidder's failure to visit the worksite will in no way relieve the bidder of the responsibility of performing the work in strict compliance with the true intent and meaning of the terms, conditions and specifications of this Invitation to Bid. The worksite may be inspected by contacting David MacDonald (DNR Project Manager) david.macdonald@alaska.gov or (907)269-8751.

Project Completion Deadline

This project must be completed no later than June 30, 2027. The Contractor is responsible for notifying the DNR Project Manager or Designee prior to mobilization/beginning operations, any time operations shut down or begin during the contract period, following completion of operations, and when all equipment is demobilized from the project site. The Contractor can request an extension of time from the DNR Project Manager or Designee for completion of work, due to unforeseen weather conditions prohibiting work. Any extension for completion of services must be approved in writing by the Procurement Specialist via written change order to the contract.

Contractor Responsibilities

1. Provide all necessary materials, equipment, labor, maintenance, transportation, lodging, and per-diem to complete the scope of work;
2. Provide equipment and operator capable of performing work;
3. Mobilization/Demobilization;
4. Obtaining all required permits and licenses prior to beginning work;

5. Demobilize and clean-up of work site. All areas will be left in as clean or better condition than when the Contractor arrived. All construction debris is to be removed from the construction site;
6. Adhere to indemnification and insurance requirements outlined in this Invitation to Bid during the life of the contract.

Mobilization and Demobilization

Mobilization and demobilization costs must be included in the bid prices offered for this Invitation to Bid.

Problems and/or Discrepancies

If at any time contract operations do not meet DNR standards, the problem or discrepancy will be brought to the attention of the Contractor. Upon such notice, the Contractor will take expedient actions to remedy the discrepancy to standards using methods identified by DNR. Failure to correct operational problems in a timely manner will result in the termination of the Contractor on the project. DNR will then determine if any fiscal compensation for work completed is appropriate for payment to the Contractor.

Contractor Representative

During all periods of operation, the Contractor shall have a representative in the contract area authorized to act on his/her behalf in response to notices and instructions given by the DNR Project Manager or Designee regarding performance of this contract.

Contract Scheduling

Contractor will be required to submit an operating plan to the DNR Project Manager or Designee for approval prior to construction services beginning. The operating plan will identify all timelines, hours of operation, areas of concern, procedures for mitigating potential safety issues, equipment to be used, names of personnel working on the project, and contact numbers. The work schedule under this contract will be included in the operating plan and approved by the DNR Project Manager or Designee.

Subcontractors

A list of subcontractors must be provided along with the bidders bid.

Minimum Prior Experience Requirement

In order for a bid to be considered responsive, the bidder must meet the minimum prior experience requirement(s) identified below:

- Ten years of experience within the State of Alaska specific to mechanical equipment upgrades in occupied commercial buildings (excluding residential projects, which shall not be considered) of similar scale (minimum 15,000 SF).

Important: Bidders shall acknowledge on the Bid Schedule whether they meet the minimum prior experience requirement(s). Bids that fail to meet the minimum prior experience requirement(s) shall be deemed non-responsive.

Pre-Construction Meeting

A pre-construction meeting will be required before the Contractor begins construction services. The Contractor will coordinate a date/time with the DNR Project Manager or Designee to conduct the pre-construction meeting.

Contract Cost

The State is a government entity and it is understood and agreed that the State's payments herein provided for may be paid from Alaska State Legislative appropriations; and approval or continuation of a contract is contingent upon Legislative appropriation. The State reserves the right to terminate the contract in whole or part if, in its sole judgment, the Legislature of the State of Alaska fails, neglects, or refuses to appropriate sufficient funds as may be required for the State to continue such payments; or if the Executive Branch mandates any cuts or holdbacks in spending, or if funds are not budgeted or otherwise available. Further, in the event of non-appropriation, the State shall not be liable for any penalty, expense, or liability; or for general, special, incidental, consequential, or other damages resulting therefrom.

Bid Bond, Payment Bond, Performance Bond

A bid guaranty is required with the bid in the amount of 5% of the amount bid (alternate bid items as well as supplemental bid items appearing on the bid schedule shall be included as part of the total amount bid when determining the amount of bid guaranty required for the project.)

The apparent successful bidder must furnish a payment bond in the amount of 100% of the contract and a performance bond in the amount of 100% of the contract as security conditioned for the full, complete and faithful performance of the contract. The apparent successful bidder must execute the said contract and bonds within fifteen calendar days, or such further time as may be allowed in writing by the Procurement Specialist, after receiving notification of the acceptance of their bid.

Method of Award

Award shall be made based on the lowest responsive and responsible bid.

Invitation to Bid – Deadline for Receipt of Questions

Questions regarding this Invitation to Bid shall be sent to christopher.brooks@alaska.gov. The deadline for submission of questions is May 21, 2026 at 2:00 PM Alaska Time.

Invitation to Bid – Deadline for Receipt of Bids

Bids shall be sent to christopher.brooks@alaska.gov. The deadline for submission of bids is June 1, 2026 at 2:00 PM Alaska Time. Bids received after this deadline shall be deemed non-responsive.

Bidders are required to submit the following completed documents prior to the established deadline for bid submission:

Bid Form (Form 25D-9DNR)

Bid Schedule

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion

Certification Regarding Drug-Free Workplace Requirements

Bid Security (Bid Bond) – (Form 25D-14DNR)

Bidders who do not submit all required forms by the established deadline for bid submission will be considered non-responsive.

Bidders seeking to claim a preference must submit the relevant, fully completed preference certification form together with their bid prior to the deadline for submission of bids. Preference certification forms submitted after the established deadline for submission of bids will not be considered. The following is a list of preferences available under this Invitation to Bid:

- Alaska Bidder Preference Certification (Form 25D-19)
- Alaska Product Preference Certification (Form 25D-20)
- Alaska Veteran Preference Certification (Form 25D-17)
- Alaska Military Skills Preference Certification (Form 25D-21)

Contract Administration

Contract administration for issuing any written change orders to a contract resulting from this Invitation to Bid will be the responsibility of the DNR Procurement Specialist. The DNR Procurement Specialist may be contacted by email at christopher.brooks@alaska.gov. Only the Procurement Specialist has full authority to alter, amend, or change a contract resulting from this Invitation to Bid.

Day-to-day contract administration is the responsibility of the DNR Project Manager, David MacDonald, or Designee. David may be contacted by phone at (907)269-8751 or by email at david.macdonald@alaska.gov. Neither David nor Designee can substantially change or alter a contract resulting from this Invitation to Bid.

Inspection and Modification – Reimbursement for Unacceptable Deliverables

The Contractor is responsible for the completion of all work set out in the contract. All work is subject to inspection, evaluation, and approval by the DNR Project Manager or Designee, responsible for coordinating this project. DNR may employ all reasonable means to ensure that the work is progressing and being performed in compliance with the contract. DNR may instruct the Contractor to make corrections or modifications if needed in order to accomplish the contract's intent. The Contractor will not unreasonably withhold such changes. Substantial failure of the Contractor to perform the contract may cause DNR to terminate the contract. In this event, DNR may require the Contractor to reimburse monies paid (based on the identified portion of unacceptable work received) and may seek associated damages.

Contract Changes – Unanticipated Change Orders

During the course of the contract, the Contractor may be required to perform additional work. That work will be within the general scope of the initial contract. When additional work is required, the DNR Project Manager or Designee will provide the Contractor a written description of the additional work and request the Contractor to submit a firm time schedule and price for accomplishing the additional work. Cost and pricing data must be provided to justify the cost of such change orders per AS 36.30.400. The Contractor will not commence additional work until DNR has secured any required approvals necessary for the change order and issued a written change order.

Substantial Completion Inspection and Final Completion Inspection

The Contractor shall notify the DNR Procurement Specialist when the substantial completion inspection and final completion inspection process shall begin. The DNR Procurement Specialist will issue a substantial completion inspection form to the Contractor. The final completion inspection will occur once all physical work for the project has been completed. The DNR Project Manager or Designee will coordinate with the Contractor to conduct the final inspection.

Termination for Cause

The occurrence of any of the following events shall be an event of default under the contract and cause for termination:

- A material breach of any term or condition of the contract.
- Any representation or warranty by Contractor in its bid that proves to be untrue or materially misleading.
- Any default or non-compliance as otherwise specified in the contract.

DNR may terminate the contract if DNR provides the Contractor written notice of default and the Contractor has failed to cure the default within 30 calendar days. If DNR terminates the contract for default, DNR reserves the right to take any action it may deem necessary including, without limitation:

- Exercise any remedy provided by law or equity.

- Withhold payment until the default is remedied.
- Offset of damages against payment due.

Termination for Convenience

DNR may terminate the contract at its convenience, in whole or in part, by providing the Contractor written notice 30 calendar days prior to termination of the contract.

If DNR terminates the contract for convenience, DNR is liable only for payment in accordance with the payment provisions of this contract for goods or services provided before the effective date of termination.

Effect of Termination

Upon termination by DNR, the Contractor shall:

- Stop work as directed by DNR. Place no further orders or requests of subcontractors, if any, for goods or services;
- Take actions necessary, or that DNR may direct, for the protection and preservation of the goods or services;
- Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the termination notice;
- Deliver or otherwise make available to DNR all data, reports, estimates, confidential information, summaries and such other information and materials, as may have been accumulated by the Contractor in performing the contract, whether completed or in process.

Payment of Work

Complete payment will be made 1) upon completion of the project to the satisfaction of the DNR Project Manager or Designee 2) upon receipt of the Contractor's original, accurate and complete invoice, 3) upon receipt of an approved Notice of Completion from the Department of Labor and Workforce Development and 4) and a Final Completion letter issued by DNR.

DNR Invoice Recipient

Contractor shall send invoices to:

Attn: David MacDonald, Chief Real Estate Officer

2600 Cordova St, Ste 201

Anchorage, Alaska 99503

Phone: (907)269-8751

E-mail: david.macdonald@alaska.gov

Questions concerning payment must be addressed to the DNR point of contact identified above.

DNR Project Manager

The DNR Project Manager or Designee is responsible for monitoring the operations and performance of the Contractor for contract compliance, and to coordinate actions and communications between DNR and the Contractor. The DNR Project Manager for this project is:

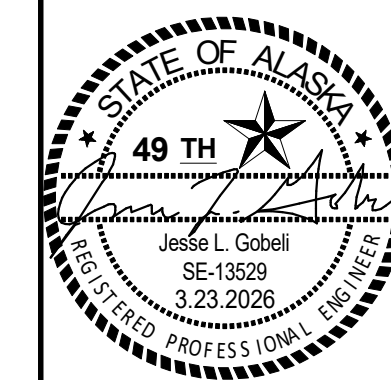
Attn: David MacDonald, Chief Real Estate Officer

2600 Cordova St, Ste 201

Anchorage, Alaska 99503

Phone: (907)269-8751

E-mail: david.macdonald@alaska.gov



BOILER PLANT AND RTU REPLACEMENT
Alaska Mental Health Trust Land Office
3745 Community Park Loop
RTU ATTACHMENT

REVISION SCHEDULE		
#	DESCRIPTION	DATE

PROJECT NO.	26.071
DATE	03.23.2026
DRAWN	JG
DESIGNED	JG
REVIEWED	JG

SHEET NO. **S101**

GENERAL

DEVISE ENGINEERING (DEVISE) DETERMINED THE WIND AND SEISMIC RESTRAINT BRACING REQUIREMENTS FOR SELECTED EQUIPMENT.
DEVISE EVALUATED THE EQUIPMENT RESTRAINT IN ACCORDANCE WITH ASCE 7.
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY DEVISE IN WRITING OF ANY DISCREPANCIES.

DO NOT SCALE DRAWINGS.

NOTIFY STRUCTURAL ENGINEER OF ALL FIELD CHANGES PRIOR TO INSTALLATION.

DESIGN CRITERIA

DESIGN CODES:

IBC-18: INTERNATIONAL BUILDING CODE
ASCE/SEI 7-16: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

LOADS:

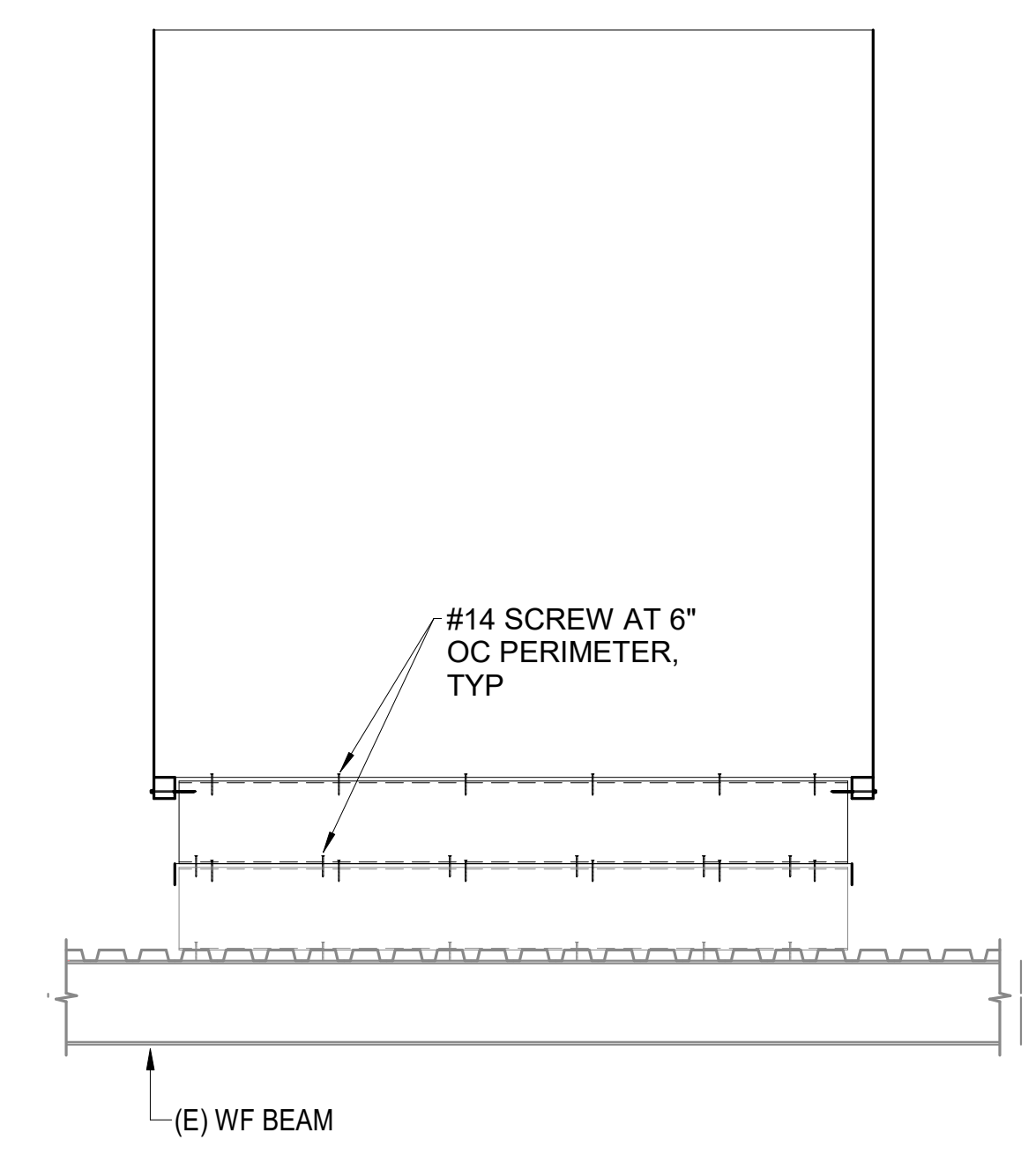
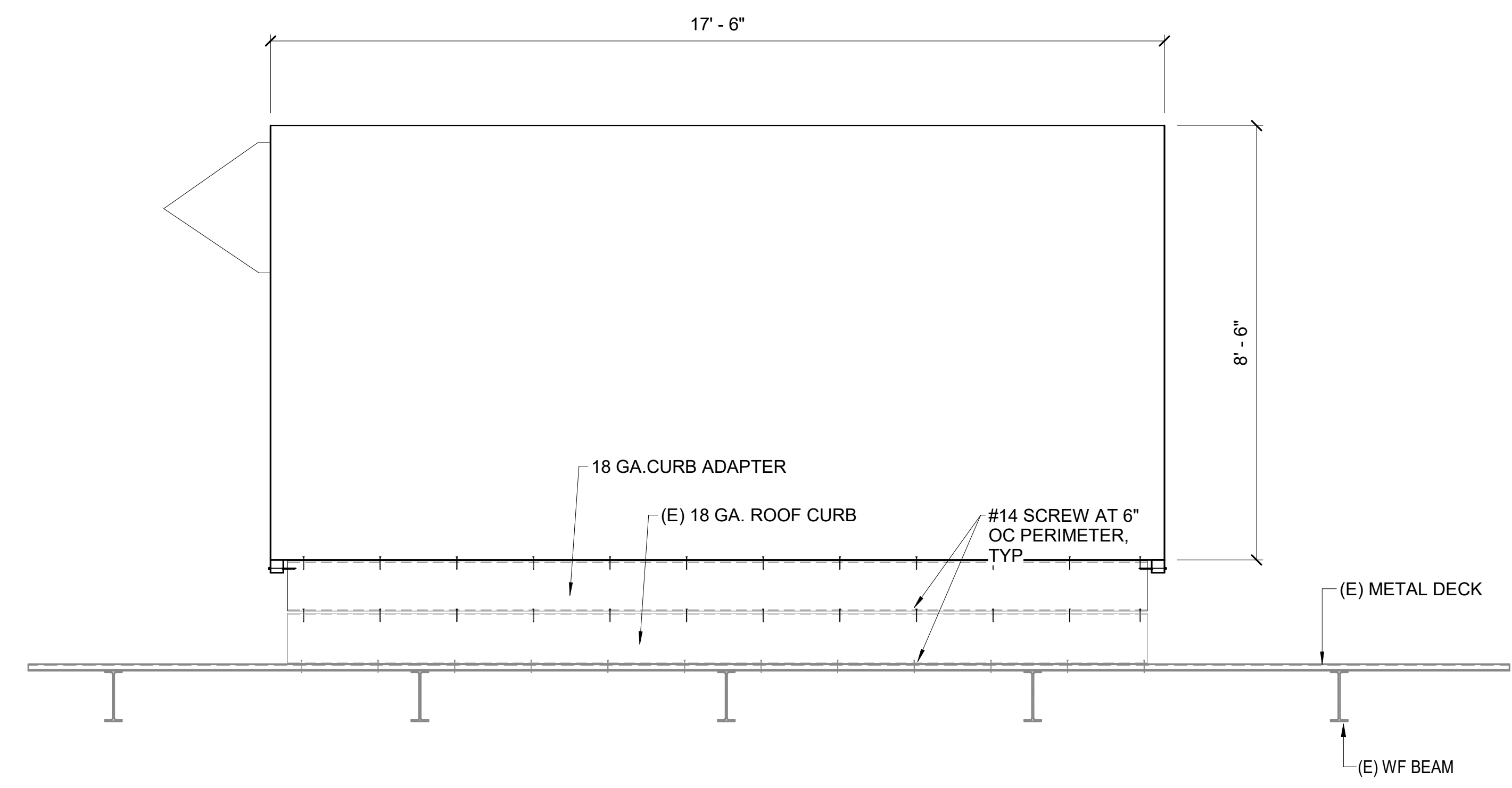
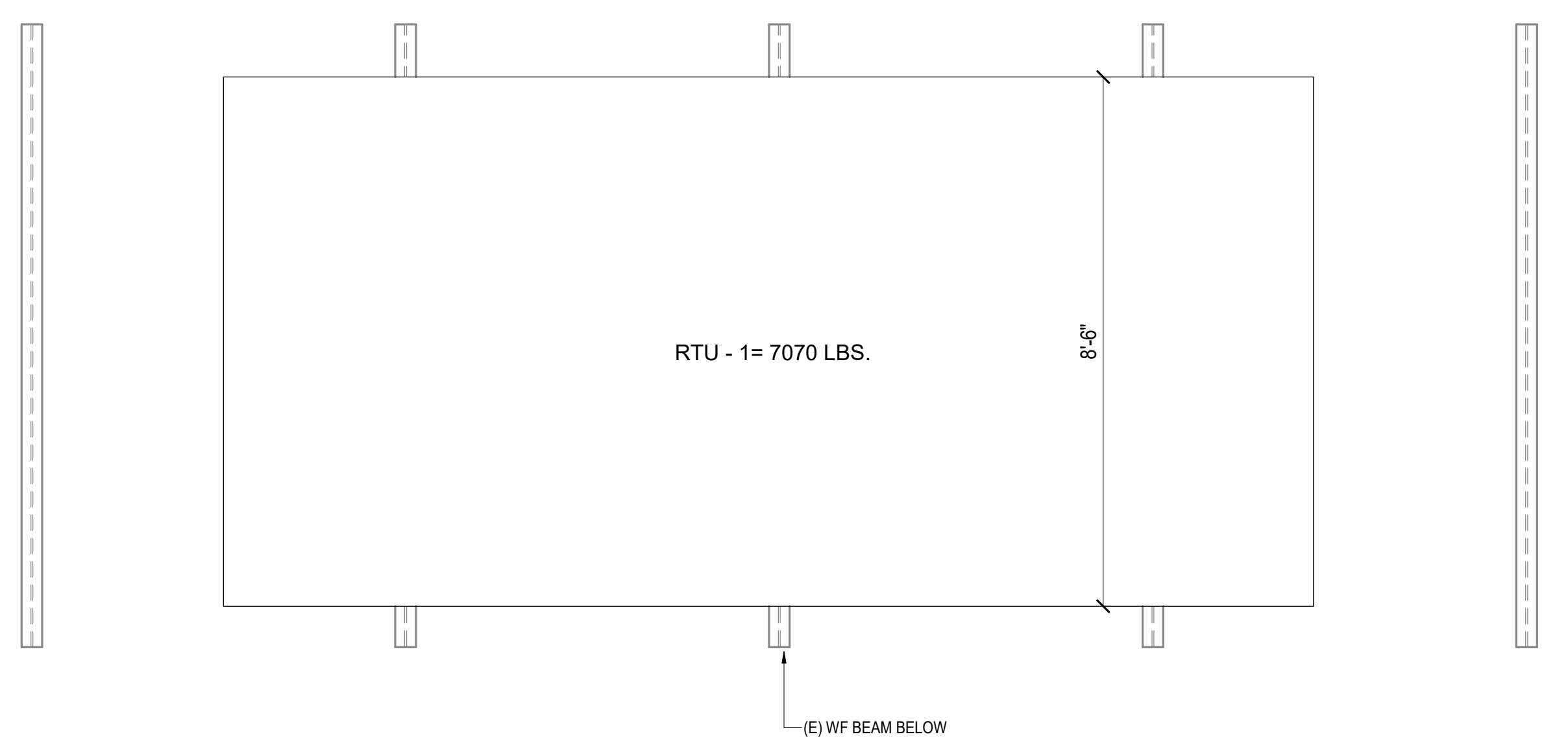
WIND:
MOA ZONE II
Vult = 145 MPH

SEISMIC:
SEISMIC DESIGN CATEGORY = D
SITE CLASS = D
Ss = 1.50 g, S1 = 0.68 g, Sds = 1.0

EQUIPMENT	Ap	Rp	Ip
RTU-1	2.5	6.0	1.0

MATERIAL CRITERIA

STEEL:
SCREWS - TEK SCREW ICC ESR-1976 ASTM A510 ZINC COATED



1 RTU PLAN AND ELEVATION - STEEL ROOF
SCALE: NTS



JOB NAME:	3645 Community Loop		
JOB NUMBER:		SHEET:	COVER
CALCULATED BY:	JG	DATE:	3-23-2026
CHECKED BY:		DATE:	

CLIENT:

PACWEST Consulting Group

PROJECT DESCRIPTION AND LOCATION:

RTU replacement – Alaska Mental Health Land Trust Office
3745 Community Park Loop

DESIGN CRITERIA:

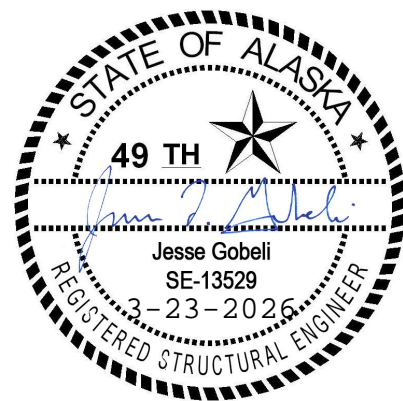
BUILDING CODE: 2018 International Building Code with Local Amendments

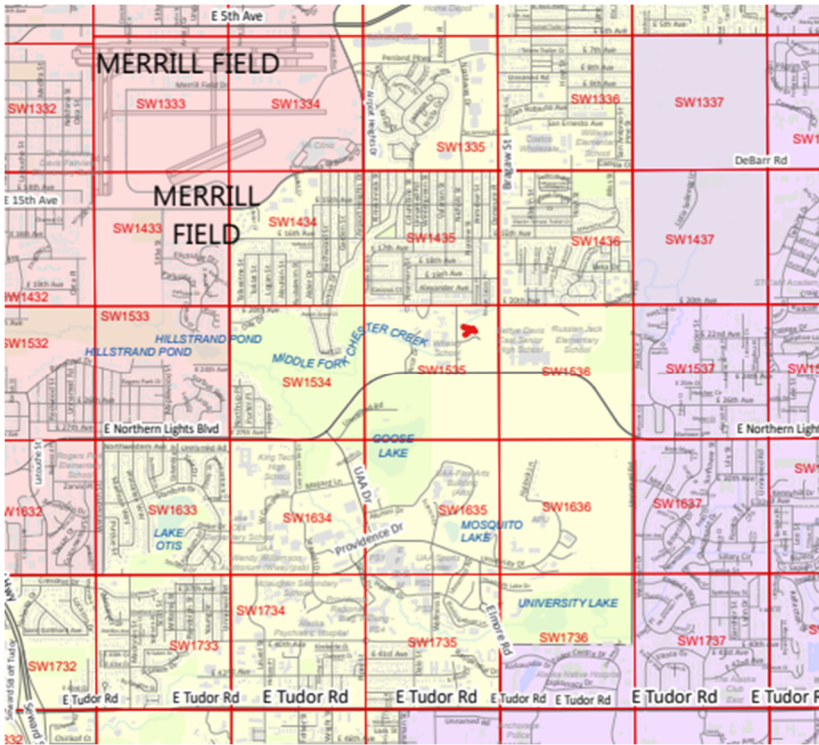
RISK CATEGORY: Risk Category II

SOIL CRITERIA: N/A

SNOW CRITERIA: N/A

WIND CRITERIA: MOA Zone II, Ultimate Wind Speed = 145 mph, Exposure B



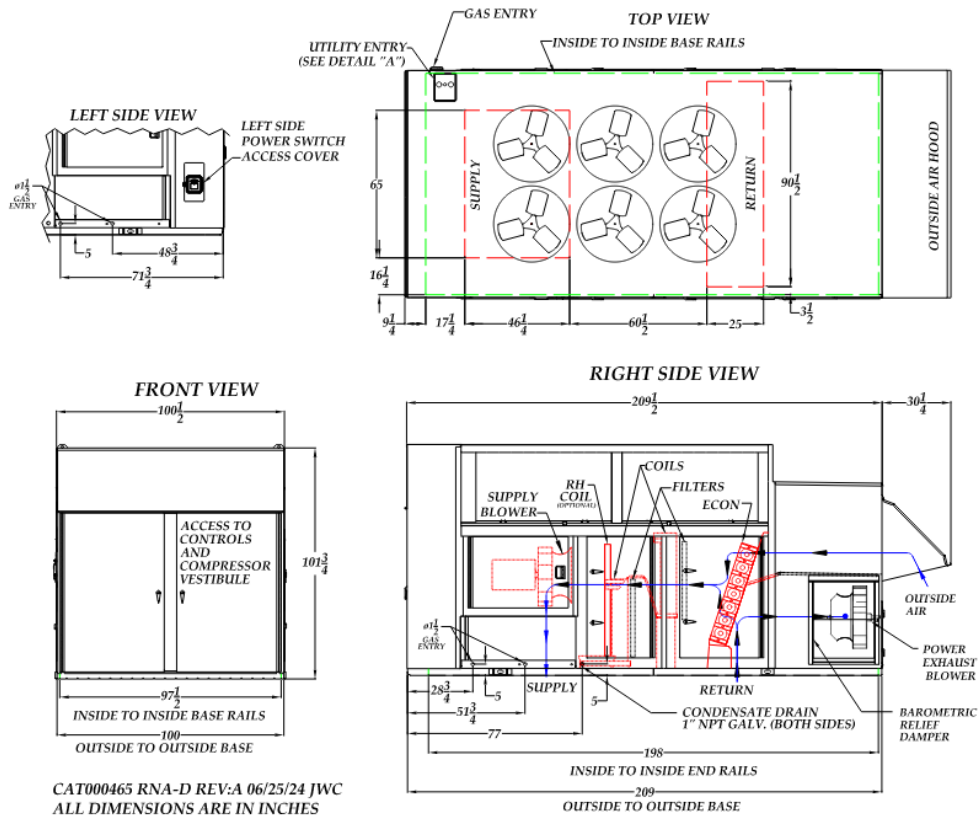


SEISMIC CRITERIA: Seismic Design Category D
 Site Class D
 $I_e = 1.0, S_s = 1.50g, S_{DS} = 1.20g, S_1 = 0.68g, S_{D1} = 0.68g$

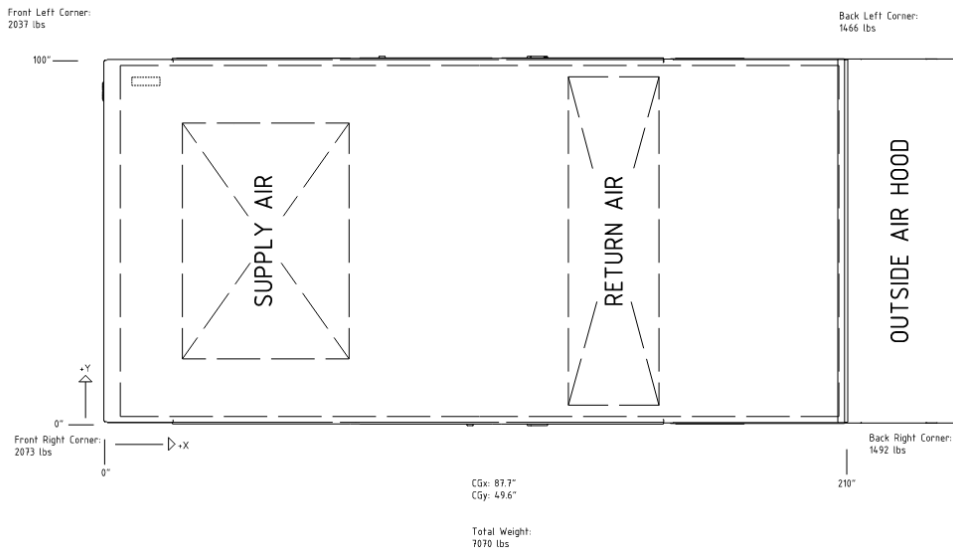
- NOTES:**

RTU-1

RTU-1



CAT000465 RNA-D REV:A 06/25/24 JWC
 ALL DIMENSIONS ARE IN INCHES



Equipment ID: RTU-1/2

Wind
 Chapters 26 & 29

Velocity Pressure: §26.10.2

$$q_z = 0.00256K_zK_{zt}K_dK_eV^2 \quad (26.10-1)$$

q_z = 33.91 psf

Where: K_z = 0.70 Table 26.10-1
 K_{zt} = 1.00 (26.8-1)
 K_d = 0.90 Table 26.6-1
 K_e = 1.00 Table 26.9-1
 V = 145 mph

Wind Loads: §29.4

$$F = q_zGC_fA_f \quad (29.4-1)$$

Location: Exterior - Roof

W_h = 9,490 lbf

W_v = 7,418 lbf

Where: GC_h = 1.90 Horizontal external pressure coefficients
 GC_{r,v} = 1.50 Vertical external pressure coefficients
 A_{r,h} = 147.29 sf Projected area normal to the wind, horizontal
 A_{r,v} = 145.83 sf Projected area normal to the wind, vertical

Seismic
 Chapter 13

Seismic Parameters

S_{DS} = 1.20 g

I_p = 1.00 §13.1.3

Equipment Type: Air-side HVACR, fans, air handlers, air conditioning units, cabinet heaters, air distribution boxes, and other mechanical components constructed of sheet metal framing

W_p = 7070 lbf

a_p = 2.50

R_p = 6.00 Table 13.5-1,

Ω_o = 2.00 Table 13.6-1

z/h = 1.00 ft Equipment Attachment Height / Structure Mean Roof Height

Seismic Loads

$$F_p = \frac{0.4a_pS_{DS}W_p}{\left(\frac{R_p}{I_p}\right)} \left(1 + 2\frac{z}{h}\right)$$

F_p = 4,242 lbf (13.3-1)

$$F_p \leq 1.6S_{DS}I_pW_p$$

F_{p,max} = 13,574 lbf (13.3-2)

$$F_p \geq 0.3S_{DS}I_pW_p$$

F_{p,min} = 2,545 lbf (13.3-3)

E_h = 4,242 lbf §13.3.1.1

$$F_{p,v} = \pm 0.2S_{DS}W_p$$

E_v = 1,697 lbf §13.3.1.2

Overturning and Anchor Loads

Sum of the moments about anchor group "B":

$$\sum M_y^B = \sum F_x d_z - \sum F_z d_x$$

Tension reaction at anchor group "A":

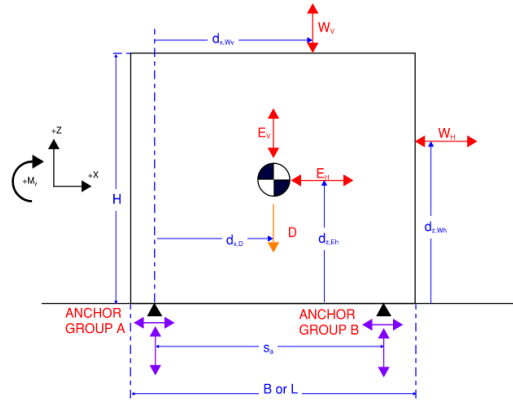
$$T_A^B = \frac{\sum M_y}{s_a}$$

Total shear reaction (Anchor groups A & B):

$$\sum V = \sum F_x$$

Spacing between anchor groups "A" and "B":

$$s_a = 100 \text{ in}$$



Load Type	Loads	Location	Moment About Anchor Group "B"
Dead	D = -7,070 lbf	d _x = 50 in	M _{y,D} = -353,500 lbf-in
Seismic	E _v = 1,697 lbf	d _x = 50 in	M _{y,Ev} = 84,840 lbf-in
	E _h = 4,242 lbf	d _z = 51 in	M _{y,Eh} = 214,221 lbf-in
Wind	W _v = 7,418 lbf	d _x = 50 in	M _{y,Wv} = 370,881 lbf-in
	W _h = 9,490 lbf	d _z = 51 in	M _{y,wh} = 479,225 lbf-in

Maximum Reactions					
Design Method	Anchor Group A		Anchor Group B		All
	Tension [lbf]	Comp. [lbf]	Tension [lbf]	Comp [lbf]	Shear [lbf]
ASD, Wind	2979.6	8635.6	2979.6	8635.6	5693.8
ASD, Seismic	0.0	5628.4	0.0	5628.4	2969.4
LRFD, Wind	5319.6	12743.1	5319.6	12743.1	9489.6
LRFD, Seismic	0.0	7232.6	0.0	7232.6	4242.0
LRFD with OS	2799.7	9162.7	2799.7	10223.2	8484.0

# of anchors ea side	Tension [lbf]	Shear [lbf]
17	175	167
17	0	87
17	313	279
17	0	125
17	165	250

Remarks:

0

Screw Attachment

AISI S100 - 2016

Description: Screws at Shear edge of unit (worst case).

Loads

$$V_{\text{asd}} = 0.167 \text{ kip}$$

Connection design shear load

$$T_{\text{asd}} = 0.175 \text{ kip}$$

Connection design tension load

Material In Contact With Screw Head

$$\text{Gauge: } 20$$

$$\text{Material: Grade 33}$$

$$t_1 = 0.0359 \text{ in}$$

Material Thickness

$$F_{u1} = 45 \text{ ksi}$$

Material ultimate strength

Material Not In Contact With Screw Head

$$\text{Gauge: } 20$$

$$\text{Material: Grade 33}$$

$$t_2 = 0.0359 \text{ in}$$

Material thickness

$$F_{u2} = 45 \text{ ksi}$$

Material ultimate strength

Screw Properties

$$\text{Size: } 12$$

$$N = 12$$

Number of screws at connection

$$d = 0.216 \text{ in}$$

Screw diameter

$$p = 1 \text{ in}$$

Screw penetration

$$d_h = 0.415 \text{ in}$$

Shear

$$t_2/t_1 = 1.00$$

$$P_{nv1} = 0.60 \text{ kip}$$

(J4.3.1-1-3)

$$P_{nv2} = 0.94 \text{ kip}$$

(J4.3.1-4-5)

$$P_{nv} = 0.60 \text{ kip}$$

Tension

Pullout Strength

$$t_c = 0.04 \text{ in}$$

$$P_{\text{not}} = 0.30 \text{ kip}$$

Pullover Strength

$$P_{\text{nov}} = 1.01 \text{ kip}$$

Screw Capacity (ASD)

$$\Omega = 3.00$$

J4

$$v_n/\Omega = 0.20 \text{ kip}$$

$$t_n/\Omega = 0.10 \text{ kip}$$

Demand-Capacity Ratios

$$\text{Shear: } 7\%$$

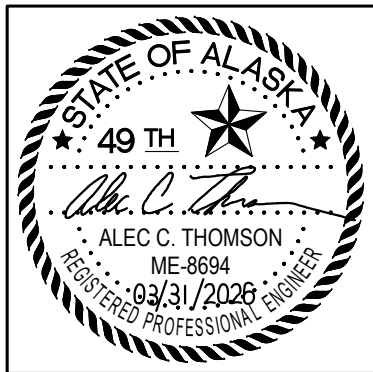
J4.3

$$\text{Tension: } 15\%$$

J4.4

$$\text{Combined: } 16\%$$

J4.5



T3 ALASKA LLC
 Mechanical & Electrical Engineering
 301 Calista Court, Suite 100
 Anchorage, AK 99518
 Ph: 907-865-7900 Fax: 907-865-7975 AEC L: 1625

BOILER PLANT AND RTU REPLACEMENT
 Alaska Mental Health Trust Land Office
 3745 Community Park Loop
 Anchorage, Alaska 99508

Revision Schedule		
No.	Description	Date
1	Boiler & RTU Change	03.09.26
2	Review Changes	03.31.26

Drawn: KMR
 Reviewed: ACT
 Date: 02/18/2026
 Job No: 2025.132.0

Sheet Contents
 MECHANICAL
 SCHEDULES

Drawing No.
M0.1
 1 of 8M

BOILER SCHEDULE										
TAG	MFGR / MODEL	TYPE	FLUID	FUEL	BURNER INPUT (MBH)	NET AHRI RATING (MBH)	ELECTRICAL DATA		LABEL	REMARKS
							FLA	VOLTS/PH		
BLR-1	LOCHINVAR / FX500N	CONDENSING	WATER	NATURAL GAS	500	425	6	120/1	ASME	WITH TRIM PER INTERNATIONAL MECHANICAL CODE CHAPTER 10, 30# RELIEF VALVE, 10:1 MODULATING BURNER, ROOM AIR INTAKE KIT, 180°F OPERATING SETPOINT, WITH VARIABLE SPEED BOILER CIRCULATOR
BLR-2	LOCHINVAR / FX500N	CONDENSING	WATER	NATURAL GAS	500	425	6	120/1	ASME	WITH TRIM PER INTERNATIONAL MECHANICAL CODE CHAPTER 10, 30# RELIEF VALVE, 10:1 MODULATING BURNER, ROOM AIR INTAKE KIT, 180°F OPERATING SETPOINT, WITH VARIABLE SPEED BOILER CIRCULATOR

AIR SEPARATOR SCHEDULE										
TAG	MFGR / MODEL	SERVICE	FLUID	FLOW RATE (GPM)	WPD (FT HD)	INLET/OUTLET SIZE	DIMENSIONS	WEIGHT (LBS)	LABEL	REMARKS
AS-1	SPIROTHERM / VDT-300	HEATING SYSTEM	WATER	90	<2.0'	2-1/2"	25.3"H x 6.3"Ø	695	ASME	COMBINATION AIR AND DIRT SEPARATOR WITH AUTO AIR VENT, WEIGHT ASSUMES FULL VOLUME OF WATER

PUMP SCHEDULE										
TAG	MFGR / MODEL	SERVICE	FLUID	FLOW RATE (GPM)	HEAD (FEET)	MOTOR DATA				REMARKS
						RPM	HP	WATTS	VOLTS/PH	
BC-1	PER BOILER MFGR	BOILER CIRCULATION	WATER	33.0	10'	4,680	---	643	120/1	SUPPLIED WITH BOILER
BC-2	PER BOILER MFGR	BOILER CIRCULATION	WATER	33.0	10'	4,680	---	643	120/1	SUPPLIED WITH BOILER
CP-1A	TACO / SKV2007D	BUILDING HEAT	WATER	90.0	40'	1,760	2	---	480/3	REMOTE MOUNT VFD, SELF SENSING
CP-1B	TACO / SKV2007D	BUILDING HEAT	WATER	90.0	40'	1,760	2	---	480/3	REMOTE MOUNT VFD, SELF SENSING, STANDBY FOR CP-1A

ROOFTOP HVAC UNIT SCHEDULE																					
TAG	MFGR / MODEL	SERVICE	AIRFLOW (CFM)	TSP / ESP (IN WG)	MINIMUM OUTSIDE AIRFLOW (CFM)	COOLING					HEATING			ELECTRICAL DATA			UNIT WEIGHT (LBS)	REMARKS			
						REFRIGERANT	TONS	EDB	EWB	LDB	AMB TEMP	FUEL TYPE	INPUT (MBH)	OUTPUT (MBH)	TEMP RISE	MCA			MFS	VOLTS/PH	SCCR RATING
RTU-1	AAON / RMA-070-D-B-3	BUILDING VENTILATION	27,000	4.47' / 2.00"	4,050	R-454B	70	75°F	62°F	55°F	75°F	NATURAL GAS	600.0	486.0	17°F	197	200	460/3	65 kA	7,279	VARIABLE AIR VOLUME (VAV), 100% ECONOMIZER, DRY BULB CONTROLLER, ROOF CURB ADAPTOR, INTEGRAL BAKNet CONTROLS, SMOKE SHUT DOWN AS REQUIRED BY IMC CHAPTER 6, CIRCUIT BREAKER, UNPOWERED CONVENIENCE OUTLET, POWERED VAV EXHAUST FAN, CURB AND CUSTOM CURB ADAPTER, MODULATING GAS BURNER

ABBREVIATIONS																																																																																																																																																																																																																																																																									
ADA	AMERICANS WITH DISABILITIES ACT	CONT	CONTINUED	E.G.	ETHYLENE GLYCOL	GPH	GALLONS PER HOUR	LFT	LEAVING FLUID TEMPERATURE	OSD	OVERFLOW STORM DRAIN	SS	STAINLESS STEEL	AAV	AUTOMATIC AIR VENT	CO	CLEANOUT	ESP	EXTERNAL STATIC PRESSURE	GPM	GALLONS PER MINUTE	LWT	LEAVING WATER TEMPERATURE	PD	PRESSURE DROP	SQ	SQUARE	AFF	ABOVE FINISHED FLOOR	COND	CONDENSATE	EWB	ENTERING WET BULB TEMPERATURE	H	HEIGHT	MAX	MAXIMUM	P.G.	PROPYLENE GLYCOL	T/A	TRANSFER AIR	AFT	AVERAGE FLUID TEMPERATURE	CONN	CONNECTION	EWT	ENTERING WATER TEMPERATURE	HD	HEAD	MBH	THOUSAND BTU PER HOUR	PH	PHASE	TEMP	TEMPERATURE	AL	ALUMINUM	Cu	COPPER	*F	DEGREES FAHRENHEIT	HGR	HEATING GLYCOL RETURN	MCA	MINIMUM CIRCUIT AMPACITY	PSI	POUNDS PER SQUARE INCH	TSP	TOTAL STATIC PRESSURE	ALT	ALTERNATE	CW	COLD WATER	FC	FORWARD CURVE	HGS	HEATING GLYCOL SUPPLY	MFGR	MANUFACTURER	PSIA	PSI ABSOLUTE	TSTAT	THERMOSTAT	AMB	AMBIENT	Ø	DIAMETER	FCO	FLOOR CLEAN OUT	HR	HOUR	MFS	MAXIMUM FUSE SIZE	PSIG	PSI GAUGE	TYP	TYPICAL	AMPS	AMPERES	DIA	DIAMETER	FD	FIRE DAMPER	HW	HOT WATER	MIN	MINIMUM	PW	PUMPED WASTE	UPC	UNIFORM PLUMBING CODE	APD	AIR PRESSURE DROP	DB	DRY BULB	FDC	FIRE DEPARTMENT CONNECTION	HWC	HOT WATER CIRCULATED	MOP	MAX OVERCURRENT PROTECTION	R/A	RETURN AIR	V	VENT	ARCH	ARCHITECTURAL	dB	DECIBELS	FLA	FULL LOAD AMPERES	HP	HORSEPOWER	MTD	MOUNTED	RH	RELATIVE HUMIDITY	VAV	VARIABLE AIR VOLUME	BDD	BACKDRAFT DAMPER	DEG	DEGREE	FPD	FLUID PRESSURE DROP	HWR	HEATING WATER RETURN	NC	NOISE CRITERIA	RHGR	RADIANT HEAT GLYCOL RETURN	VFD	VARIABLE FREQUENCY DRIVE	BLDG	BUILDING	DN	DOWN	FPF	FINS PER FOOT	HWS	HEATING WATER SUPPLY	N.C.	NORMALLY CLOSED	RHGS	RADIANT HEAT GLYCOL SUPPLY	VTR	VENT THROUGH ROOF	BOD	BOTTOM OF DUCT	DWG	DRAWING	FPM	FEET PER MINUTE	IE	INVERT ELEVATION	N.O.	NORMALLY OPEN	RPM	REVOLUTIONS PER MINUTE	WC	WATER COLUMN	BOP	BOTTOM OF PIPE	(E)	EXISTING	FOR	FUEL OIL RETURN	IN	INCH	NO.	NUMBER	RTU	ROOF TOP UNIT	WG	WATER GAUGE	BTU	BRITISH THERMAL UNIT	E/A	EXHAUST AIR	FOS	FUEL OIL SUPPLY	IMC	INTERNATIONAL MECHANICAL CODE	NSF	NATIONAL SANITARY FOUNDATION	S/A	SUPPLY AIR	WCO	WALL CLEAN OUT	BTUH	BRITISH THERMAL UNIT PER HOUR	EA	EACH	FSD	FIRE SMOKE DAMPER	LAT	LEAVING AIR TEMPERATURE	NTS	NOT TO SCALE	SD	STORM DRAIN	W	WASTE	C/A	COMBUSTION AIR	EAT	ENTERING AIR TEMPERATURE	FT	FEET	LBS	POUNDS	O/A	OUTSIDE AIR	SNGR	SNOWMELT GLYCOL RETURN	WB	WET BULB	CFM	CUBIC FEET PER MINUTE	EDB	ENTERING DRY BULB TEMPERATURE	G	NATURAL GAS	LDB	LEAVING DRY BULB TEMPERATURE	OD	OUTSIDE DIAMETER	SNGS	SNOWMELT GLYCOL SUPPLY	WPD	WATER PRESSURE DROP	CLG	CEILING	EFT	ENTERING FLUID TEMPERATURE	GA	GAUGE	LF	LINEAL FEET	OPD	OVERCURRENT PROTECTION DEVICE	SP	STATIC PRESSURE	YCO	YARD CLEAN OUT

SEQUENCE OF OPERATIONS		
<p>GENERAL</p> <p>THE BUILDING'S EXISTING PNEUMATIC CONTROL SYSTEM WILL BE CONVERTED TO A DIRECT DIGITAL CONTROL SYSTEM (DDC) UNDER A DIFFERENT PROJECT. THE DDC CONVERSION SHOULD BE TAKING PLACE CONCURRENT WITH THIS PROJECT. COORDINATE EQUIPMENT INSTALL UNDER THIS PROJECT REQUIRING DDC CONTROL WITH OWNER.</p> <p>BUILDING HEAT CIRCULATION PUMPS (CP-1A AND CP-1B)</p> <p>PUMPS SHALL OPERATE CONTINUOUSLY WHEN THE OUTSIDE AIR TEMPERATURE IS AT OR LESS THAN 65°F (ADJUSTABLE).</p> <p>PUMPS SHALL OPERATE IN A LEAD - STANDBY CONFIGURATION WHEN OUTSIDE AIR TEMPERATURE IS AT THE ON-OFF SETPOINT OR LESS. LEAD PUMP SHALL RUN CONTINUOUSLY. IF PUMP FAILS TO START AS COMMANDED, SIGNAL ALARM AND STANDBY PUMP SHALL OPERATE. LEAD - STANDBY PUMP DESIGNATION SHALL ROTATE AFTER PUMP ROTATION SETPOINT HAS BEEN MET.</p>	<p>ROOF TOP UNIT (RTU-1)</p> <p>THE ROOF TOP UNIT'S SEQUENCE OF OPERATION SHALL MATCH EXISTING SEQUENCE. CONTRACTOR TO FIELD VERIFY EXISTING SEQUENCE AND REPORT EXISTING SEQUENCE TO OWNER AND ENGINEER.</p> <p>WITH ADDITION OF A GAS BURNER TO THE ROOF TOP UNIT ADD A SUPPLY AIR TEMPERATURE CONTROL DURING HEATING SEASON TO THE SEQUENCE. WHEN OUTSIDE AIR TEMPERATURES ARE BELOW 60°F (ADJUSTABLE) AND ALL ZONES ARE IN HEATING MODE, THE BURNER SHALL FIRE AND MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE OF 65°F (ADJUSTABLE).</p> <p>BUILDING STATIC PRESSURE</p> <p>EXHAUST FAN SHALL MODULATE TO MAINTAIN BUILDING STATIC PRESSURE OF 0.02" W.G. (ADJUSTABLE). LOCATED STATIC PRESSURE SENSOR IN 2nd FLOOR RETURN AIR PLENUM.</p> <p>BUILDING HIGH OR LOW NEGATIVE PRESSURE</p> <p>ON HIGH (+0.08", ADJUSTABLE) OR LOW NEGATIVE (-0.05", ADJUSTABLE) BUILDING STATIC PRESSURE, THE UNIT SHALL SHUTDOWN. THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE. THE UNIT SHALL RESTART AFTER 5 MINUTES (ADJUSTABLE) IN THE CURRENT OPERATION MODE. IF THE BUILDING GOES BACK INTO HIGH OR LOW NEGATIVE BUILDING STATIC PRESSURE CONDITIONS THE UNIT SHALL SHUTDOWN. THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE. CRITICAL ALARM SHALL BE SENT AND MANUAL RESTART SHALL BE REQUIRED.</p> <p>FREEZE PROTECTION</p> <p>IF SUPPLY AIR TEMPERATURE IS BELOW FREEZE ALARM SETPOINT THE UNIT SHALL STOP, THE OUTSIDE AIR DAMPERS SHALL CLOSE. SIGNAL ALARM.</p> <p>SMOKE DETECTION</p> <p>PROVIDE SMOKE DETECTOR IN RETURN AIR DUCT WORK. IF SMOKE IS DETECTED, THE FAN SHALL STOP AND THE OUTSIDE AIR DAMPERS SHALL CLOSE. SIGNAL ALARM TO FIRE ALARM SYSTEM.</p>	<p>BOILERS AND BOILER CIRCULATION PUMPS (BLR-1, BLR-2, BC-1, & BC-2)</p> <p>BOILERS SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE IS AT OR LESS THAN 65°F (ADJUSTABLE) OR ON A CALL FOR HEAT FROM THE DOMESTIC HOT WATER SYSTEM.</p> <p>BOILERS SHALL BE DISABLED WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 65°F (ADJUSTABLE) AND WITH NO CALL FOR HEAT FROM THE DOMESTIC HOT WATER SYSTEM. BOILERS SHALL GO THROUGH THE CYCLE DOWN SEQUENCE BEFORE BEING DISABLED.</p> <p>BOILER'S INTEGRAL CONTROLS SHALL BE CAPABLE OF COMMUNICATING WITH EACH OTHER, ALLOWING SEQUENCING OF ALL BOILERS TO OPTIMIZE BOILER PLANT ENERGY EFFICIENCY. THE BOILER'S INTEGRAL CONTROLS SHALL BE CAPABLE OF PROVIDING CONTROL AS FOLLOWS.</p> <p>BOILERS SHALL MAINTAIN BUILDING SUPPLY TEMPERATURE SETPOINT. THE BUILDING SUPPLY TEMPERATURE SETPOINT SHALL RESET LINEARLY BETWEEN 130°F AND 180°F BASED ON AN OUTDOOR AIR RESET SCHEDULE BETWEEN 65°F AND 10°F RESPECTIVELY. ALL RESET TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE. BOILER'S CONTROLLERS SHALL ENABLE THE BOILERS ON OUTSIDE AIR TEMPERATURES OF 65°F AND LOWER.</p> <p>BOILER'S INTEGRAL CONTROLS SHALL MODULATE ITS BURNERS AND OPERATE THE BOILER'S CIRCULATION PUMPS TO MAINTAIN INTERNAL AQUASTAT TEMPERATURE. THE INTERNAL AQUASTAT TEMPERATURE SETPOINT SHALL RESET LINEARLY BETWEEN 140°F AND 190°F BASED ON AN OUTDOOR AIR RESET SCHEDULE BETWEEN 65°F AND 10°F RESPECTIVELY OR 180°F ON CALL FOR DOMESTIC HOT WATER HEAT. ALL RESET TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE.</p> <p>PROVIDE ALL TRIM AS REQUIRED BY THE INTERNATIONAL MECHANICAL CODE CHAPTER 10.</p>

MECHANICAL LEGEND

--- DENOTES DEMOLITION

--- XXX --- PIPING, SEE ABBREVIATIONS FOR MEDIA

→ DIRECTION OF FLOW

○ PIPE ANCHOR

○ PIPE UP

○ PIPE DOWN

○ TEE UP

○ TEE DOWN

○ CAP

○ UNION

○ ISOLATION VALVE

○ BALANCE VALVE

○ CHECK VALVE

○ STRAINER WITH BLOWDOWN

○ FLEXIBLE PIPING CONNECTOR

○ PRESSURE REDUCING VALVE

○ PRESSURE/TEMPERATURE RELIEF VALVE

○ QUARTER TURN BOILER DRAIN VALVE WITH CAP

○ THERMOMETER

○ PUMP

○ FLOOR DRAIN

□ SUPPLY AIR DUCT UP & DOWN (SQUARE)

□ RETURN AIR DUCT UP & DOWN (SQUARE)

□ EXHAUST AIR DUCT UP & DOWN (SQUARE)

○ DUCT UP & DOWN (ROUND)

28/14 RECTANGULAR DUCT SIZE (FIRST NUMBER - SIDE SHOWN) (SECOND NUMBER - SIDE NOT SHOWN)

○ SOUND LINED DUCTWORK

○ INSULATED DUCTWORK

○ TURNING VANES

○ FLEXIBLE DUCT CONNECTION

○ POINT OF CONNECTION TO EXISTING

○ KEY NOTE

○ X --- DETAIL NUMBER

○ MX --- SHEET LOCATED ON

MECHANICAL SHEET INDEX

M0.1 - MECHANICAL SCHEDULES
M0.2 - MECHANICAL SPECIFICATIONS
M1.1 - MECHANICAL ROOM PLANS
M2.1 - MECHANICAL ROOF DEMOLITION PLAN
M2.2 - MECHANICAL ROOF REMODEL PLAN
M3.1 - BOILER PIPING DIAGRAMS
M3.2 - GAS PIPING DIAGRAMS
M4.1 - SECTIONS

MECHANICAL SPECIFICATIONS

GENERAL

- .01 THE CONTRACTOR SHALL PROVIDE ALL THE MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY FOR THE INSTALLATION OF COMPLETE AND OPERABLE MECHANICAL SYSTEMS SHOWN OR DESCRIBED IN THE CONTRACT DOCUMENTS.
- .02 THE PLANS ARE PARTLY DIAGRAMMATIC, NOT NECESSARILY SHOWING ALL OFFSETS AND FITTINGS OR EXACT LOCATIONS OF PIPING AND DUCTS UNLESS SPECIFICALLY DIMENSIONED. PROVIDE FITTINGS, OFFSETS, AND ACCESSORIES AS REQUIRED TO INSTALL THE WORK.
- .03 COORDINATE ANY SERVICE DISRUPTION PERIODS WITH THE OWNER AND ANY AFFECTED TENANTS BEFORE THE START OF WORK. OBTAIN SPECIFIC AGREEMENT BY THE OWNER OF THE TIMES AND DURATION OF THE SYSTEM SHUT DOWN PERIODS BEFORE STARTING WORK.

EXISTING CONDITIONS

- .01 THE CONTRACTOR SHALL CLEAN AND INSPECT ALL EXISTING EQUIPMENT ASSOCIATED WITH REMODEL WORK PRIOR TO COMMENCING WORK AND NOTIFY OWNER OF ANY NONFUNCTIONAL EQUIPMENT.
- .02 THE CONTRACTOR SHALL VERIFY EXACT SIZE, QUANTITIES, LOCATION, ROUTING, SERVICE, ETC. OF ALL EXISTING SYSTEMS WHICH ARE TO BE REMOVED, REPLACED, ABANDONED, CONNECTED TO, OR REMODELED AS REQUIRED AND INDICATED ON THE PLANS.
- .03 THE CONTRACTOR SHALL BRING ALL SURFACES BACK TO ORIGINAL CONDITION AFTER ANY MODIFICATIONS HAVE BEEN MADE.

CODES AND STANDARDS

- .01 ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE FOLLOWING CODES AS AMENDED BY THE MUNICIPALITY OF ANCHORAGE, TITLE 23:
 - INTERNATIONAL BUILDING CODE (IBC), 2018 2021 EDITION.
 - INTERNATIONAL EXISTING BUILDING CODE (IEBC), 2018 2021 EDITION.
 - INTERNATIONAL MECHANICAL CODE (IMC), 2018 EDITION.
 - INTERNATIONAL FUEL GAS CODE (IFGC), 2018 EDITION.
 - INTERNATIONAL ENERGY CONSERVATION CODE (IECC), 2018 EDITION.
 - UNIFORM PLUMBING CODE (UPC), 2018 EDITION.
 - NATIONAL ELECTRICAL CODE (NEC), 2020 EDITION.
 - ALASKA STATUTES, TITLE 18, CHAPTER 60 - BOILER AND UNFIRED PRESSURE VESSELS.
- .02 AMERICAN SOCIETY OF CIVIL ENGINEERS, ASCE/SEI 7-10: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

PERMITS

- .01 THE CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS AND FEES.

COMPLETE PROJECT

- .01 THE INTENT OF THIS PROJECT IS TO LET ONE CONTRACT WHICH INCLUDES ALL WORK REQUIRED FOR A COMPLETE JOB. THIS INCLUDES ALL ELECTRICAL, CARPENTRY, PLUMBING, SHEET METAL, PAINTING, CLEAN UP, ETC. AS REQUIRED.

WARRANTY

- .01 ALL WORK PERFORMED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM ACCEPTANCE.
- .02 ANY FAULTY MATERIALS OR WORKMANSHIP SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER DURING THE GUARANTEE PERIOD.

SALVAGE EQUIPMENT AND MATERIALS

- .01 PRESENT ALL REMOVED EQUIPMENT AND MATERIALS TO THE OWNER. THE OWNER SHALL RETAIN THE RIGHT TO CLAIM ANY AND ALL SALVAGED EQUIPMENT AND MATERIALS.
- .02 ANY ITEMS THAT ARE NOT CLAIMED BY THE OWNER ARE TO BE HAULED OFF AND PROPERLY DISPOSED OF BY THE CONTRACTOR.

PRODUCTS

- .01 ALL PRODUCTS SHALL BE NEW AND UNUSED UNLESS INDICATED AS EXISTING TO BE REUSED IN THE DRAWINGS, INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND IN THE BEST PRACTICE OF THE CRAFT.
- .02 PRODUCTS INDICATED TO BE REUSED SHALL BE PROTECTED AND PROPERLY STORED DURING CONSTRUCTION AND CLEANED BEFORE REINSTALLATION.
- .03 PRODUCTS SHALL BE SPECIFICALLY DESIGNED AND LISTED FOR THE TYPE OF OPERATION OR SERVICE FOR THE SYSTEMS IN WHICH THEY ARE BEING INSTALLED.
- .04 ALL PRODUCTS SHALL BE ASBESTOS FREE AND LEAD FREE.
- .05 OBTAIN OWNER'S APPROVAL OF ALL PRODUCTS PRIOR TO ORDERING OR INSTALLING ANY PART OF ANY SYSTEM.

PRODUCT SUBSTITUTIONS

- .01 ALL EQUIPMENT LISTED IS REPRESENTATIVE OF THE STANDARD OF QUALITY AND PERFORMANCE REQUIRED.
- .02 SUBSTITUTED EQUIPMENT SHALL BE SELECTED IN THE MIDDLE OF THE EQUIPMENT'S RECOMMENDED OPERATION RANGE TO ALLOW INCREASE OR DECREASE FIELD ADJUSTMENTS OF UNIT'S OPERATION IF NEEDED.
- .03 "APPROVED EQUAL" SUBSTITUTIONS WILL BE CONSIDERED IF THE SUBSTITUTES ARE SHOWN TO BE OF EQUAL OR BETTER QUALITY, INCLUDING EFFICIENCY OF PERFORMANCE, SIZE AND WEIGHT.
- .04 WHERE ACCEPTED SUBSTITUTED EQUIPMENT VARIES IN SIZE AND/OR CONFIGURATION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE CHANGES.

SUBMITTALS

- .01 THE CONTRACTOR SHALL SUBMIT THE MECHANICAL SYSTEMS EQUIPMENT AND MATERIALS AS AN ELECTRONIC PDF FILE FOR REVIEW. THE SUBMITTAL PRODUCT DATA PDF SHALL BE ARRANGED IN BASIC CSI CATEGORIES AND BOOKMARKED SEPARATING CATEGORIES, EQUIPMENT, AND DRAWINGS UNDER BASIC CATEGORIES. THE PDF SHALL BE LIMITED ONLY TO PRODUCT DATA RELEVANT FOR REVIEW.
- .02 THE PRODUCT DATA SHALL BE CLEARLY MARKED TO INDICATE THE PROPOSED PRODUCT.
- .03 THE PRODUCT DATA SHALL CLEARLY IDENTIFY AND INDICATED VARIATIONS OR DEVIATIONS FROM SPECIFIED OR SCHEDULED EQUIPMENT INCLUDING DEVIATIONS FROM ANY REQUIRED SEQUENCE OF OPERATION.
- .04 ALL PRODUCT DATA SHALL BE SUBMITTED AT ONE TIME. PARTIAL SUBMITTALS WILL BE RETURNED WITHOUT REVIEW.
- .05 PROVIDE A SUBMITTAL REGISTER FOR REVIEW AND APPROVAL AT START OF PROJECT.

OPERATION AND MAINTENANCE MANUAL

- .01 PROVIDE THE OWNER WITH AN OPERATION AND MAINTENANCE MANUAL.
- .02 INCLUDE MANUFACTURER'S SPECIFICATIONS, OPERATING AND MAINTENANCE INSTRUCTIONS, WARRANTY INFORMATION ON EACH PIECE OF EQUIPMENT, START-UP REPORTS, TESTING REPORTS, BALANCE REPORT, SCHEMATIC DIAGRAMS OF CONTROL SYSTEMS, A SOURCE OF SUPPLY FOR SPARE PARTS AND SERVICE, AND AS-BUILTS.

EQUIPMENT INSTALLATION

- .01 INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND RECOMMENDED SERVICE CLEARANCES.
- .02 PROVIDE ALL MISCELLANEOUS MATERIALS, APPURTENANCES, ACCESSORIES, SUPPORTS, AND CONTROL CONNECTIONS AS REQUIRED FOR A COMPLETE AND OPERATING PIECE OF EQUIPMENT.

SUPPORTS AND ANCHORS

- .01 PIPING, DUCTWORK, AND EQUIPMENT SHALL BE ADEQUATELY SUPPORTED IN ACCORDANCE WITH CODE REQUIREMENTS, SEISMIC REQUIREMENTS AND GOOD PRACTICE.
- .02 PIPING SUPPORTS SHALL BE CARBON STEEL, ADJUSTABLE SWIVEL HANGERS WITH THREADED ROD SUPPORT.
- .03 INSULATED PIPING SHALL BE ROUTED THROUGH HANGERS AND PROVIDED WITH SHEET METAL INSULATION PROTECTION SADDLES.
- .04 ALL SUPPORTS SHALL BE SECURED TO BUILDING STRUCTURAL ELEMENTS.
- .05 EQUIPMENT CURBS SHALL BE PREMANUFACTURED OR CONTRACTOR FABRICATED WITH APPROPRIATE FLASHING IN ACCORDANCE WITH ROOFING SYSTEM MANUFACTURER'S REQUIREMENTS.
- .06 PIPE ANCHORS SHALL BE CONTRACTOR FABRICATED AND SECURED TO BUILDING STRUCTURE TO RESIST PIPING MOVEMENT.

SEISMIC RESTRAINT

- .01 EQUIPMENT, PIPING, AND DUCTWORK SYSTEMS SHALL BE SEISMICALLY RESTRAINED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE AND ASCE 7-10, CHAPTER 13; AND THE MUNICIPALITY OF ANCHORAGE REQUIREMENTS.
- .02 THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEISMIC RESTRAINT DESIGN FOR ALL EQUIPMENT, PIPING, AND DUCTWORK SYSTEMS USING PREMANUFACTURED SYSTEMS, AMBER BOOTH OR APPROVED EQUAL, OR BY RETAINING THE SERVICES OF A PROFESSIONAL STRUCTURAL ENGINEER LICENSED BY THE STATE OF ALASKA.
- .03 THE CONTRACTOR SHALL PROVIDE STRUCTURAL ENGINEERING CALCULATIONS AND SHOP DRAWINGS OF THE PROPOSED RESTRAINT SYSTEMS FOR REVIEW AND APPROVAL BASED ON ACTUAL EQUIPMENT, ACTUAL PIPING LAYOUT, AND ACTUAL DUCT LAYOUT TO BE USED ON THE PROJECT TO THE MUNICIPALITY OF ANCHORAGE AS A DEFERRED SUBMITTAL.

SHOP DRAWINGS

- .01 THE CONTRACTOR SHALL PREPARE SCALED SHOP DRAWINGS FOR CURB AND CURB ADAPTER.

MECHANICAL IDENTIFICATION

- .01 PIPING SHALL BE PROVIDED WITH IDENTIFICATION.
- .02 EQUIPMENT IN MECHANICAL SPACES, NORMALLY NON-OCCUPIED SPACES OR CONCEALED IN NORMALLY OCCUPIED SPACES SHALL BE PROVIDED WITH IDENTIFICATION.
- .03 PIPING, CONCEALED OR EXPOSED, SHALL BE LABELED WITH ADHESIVE BACKED WRAP AROUND PIPE MARKERS, INDICATING SERVICE AND FLOW DIRECTION. LABELS SHALL BE READABLE FROM FLOOR, AT LEAST ONCE IN EVERY ROOM, NOT MORE THAN 20 FEET ON CENTER AND AT EACH SIDE OF WALL, FLOOR, AND CEILING PENETRATIONS. COLOR SCHEME IN ACCORDANCE WITH ANSI A13.1.
- .04 EQUIPMENT SHALL BE LABELED WITH HEAT RESISTANT LAMINATED THREE LAYER PLASTIC NAMEPLATES. PROVIDE WITH ENGRAVED BLACK LETTERS ON LIGHT CONTRASTING BACKGROUND COLOR.

PIPING

- .01 HEATING WATER SHALL BE ASTM B88 TYPE L COPPER FOR SIZES. JOINTS FOR COPPER PIPING SHALL BE SOLDERED ASTM B32 95-5 TA OR LEAD-FREE OR BRAZED ANSIAWS A5.8 BCuP. PROGRESS STYLE FITTINGS/JOINTS ALLOWED. VICTALIC NOT ALLOWED.
- .02 CONDENSATE PIPING FROM AIR HANDLING UNIT COOLING COIL SECTION DRAINS SHALL BE SHALL BE ASTM B88 TYPE L COPPER, HARD DRAWN OR ASTM D1784 SCHEDULE 40 PVC PIPE. JOINTS FOR COPPER PIPES SHALL BE SOLDERED ASTM B32 95-5 TA OR LEAD-FREE OR BRAZED ANSIAWS A5.8 BCuP.
- .03 CONDENSATE PIPING FROM CONDENSING APPLIANCES SHALL BE SHALL BE ASTM D1784 SCHEDULE 40 PVC PIPE OR PER APPLIANCE MANUFACTURER'S REQUIREMENTS.
- .04 ABOVEGROUND NATURAL GAS PIPING SHALL BE ASTM A53 SCHEDULE 40 STEEL THREADED FITTINGS FOR LOW PRESSURE OR WIEGA MEGAPRESS-G SYSTEM.
- .05 PROVIDE DIELECTRIC UNIONS OR NIPPLES AT PIPING JOINTS BETWEEN DISSIMILAR METALS.

VALVES

- .01 ISOLATION VALVES SHALL BE BALL VALVES OR BUTTERFLY VALVES. GATE VALVES AND GLOBE VALVES ARE NOT ACCEPTABLE.
- .02 ISOLATION VALVES SHALL BE FULL LINE SIZE AND FULL PORT.
- .03 VALVES FOR GAS SERVICE SHALL BE CSA/ANSI Z21.15-21 / CSA 9.1.21 APPROVED.
- .04 BALANCE VALVES SHALL BE B&G CIRCUIT SETTER OR APPROVED EQUAL.
- .05 PROVIDE ISOLATION VALVES AT PUMPS AND WHERE INDICATED ON DRAWINGS.
- .06 PROVIDE GAS ISOLATION VALVES AT EACH GAS APPLIANCE.
- .07 PROVIDE BALANCE VALVES AT PUMPS AND WHERE INDICATED ON DRAWINGS. INSTALL PER MANUFACTURER'S REQUIREMENTS.

HEATING

- .01 HEATING EQUIPMENT SHALL BE COMMERCIAL GRADE WITH MANUFACTURER AND MODEL AS INDICATED ON THE EQUIPMENT SCHEDULES OR APPROVED EQUAL.
- .02 AUTOMATIC AIR VENTS SHALL BE PROVIDED AT ALL HIGH POINTS OF THE PIPING SYSTEM.
- .03 LOW POINT DRAINS SHALL BE PROVIDED AT ALL LOW POINTS OF THE PIPING SYSTEMS.
- .04 VENTING PER EQUIPMENT MANUFACTURER'S REQUIREMENTS. FLUE PIPING SHALL BE UL1738/ULC S636 AL29-4C DOUBLE WALL LISTED FOR USE WITH CATEGORY IV CONDENSING APPLIANCES WITH FLUE GAS TEMPERATURES UP TO 230°F AND AS APPROVED BY EQUIPMENT MANUFACTURER.

VENTILATION

- .01 VENTILATION SYSTEM SHALL BE PROTECTED DURING CONSTRUCTION PER SMACNA RECOMMENDATIONS. DUCT OPENINGS SHALL BE COVERED DURING CONSTRUCTION TO PREVENT THE ENTRANCE OF DUST AND DEBRIS.
- .02 VENTILATION EQUIPMENT SHALL BE COMMERCIAL GRADE WITH MANUFACTURER AND MODEL AS INDICATED ON THE EQUIPMENT SCHEDULES OR APPROVED EQUAL.

INSULATION

- .01 ALL INSULATION INSTALLED INSIDE THE BUILDING SHALL HAVE 25 OR LESS FLAME SPREAD, 50 OR LESS SMOKE DEVELOPED RATING.
- .02 FIBERGLASS PIPING INSULATION, ASTM C547, SHALL HAVE A MAXIMUM K VALUE OF 0.23 AT 75°F MEAN TEMPERATURE, ASTM C1045.
- .03 HEATING WATER PIPING SHALL BE INSULATED WITH PRE-FORMED FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER ALL SERVICE JACKET AND PREMANUFACTURED PLASTIC FITTING INSULATION. MECHANICAL ROOM SHALL BE INSULATED WITH PRE-FORMED FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER AND CANVAS JACKET TO A POINT 8' AFF.
 - 1-1/2" INSULATION THICKNESS FOR PIPE 1-1/4" AND SMALLER.
 - 2" INSULATION THICKNESS FOR PIPE 1-1/2" AND LARGER.

CONTROLS

- .01 THE BUILDING'S EXISTING PNEUMATIC CONTROL SYSTEM WILL BE CONVERTED TO A DIRECT DIGITAL CONTROL SYSTEM (DDC) UNDER A DIFFERENT PROJECT. THE DDC CONVERSION SHOULD BE TAKING PLACE CONCURRENT WITH THIS PROJECT.
- .02 COORDINATE EQUIPMENT INSTALL UNDER THIS PROJECT REQUIRING DDC CONTROL WITH OWNER.

TEST AND START-UP

- .01 TEST ALL GAS PIPING SYSTEMS IN ACCORDANCE WITH THE INTERNATIONAL FUEL GAS CODE.
- .02 TEST ALL HYDRONIC PIPING SYSTEMS IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE.
- .03 FLUSH AND CLEAN HYDRONIC PIPING SYSTEMS IN ACCORDANCE WITH WATER TREATMENT RECOMMENDATIONS AND GOOD PRACTICE.
- .04 PROVIDE BOILER START-UP WITH THE SERVICES OF THE BOILER MANUFACTURER'S AUTHORIZED REPRESENTATIVE. PERFORM PROCEDURES AND TESTS REQUIRED BY THE MANUFACTURER AND PROVIDE THE OWNER WITH A COPY OF THE START-UP REPORT AT END OF PROJECT.

TESTING, ADJUSTING, AND BALANCING (TAB)

- .01 AIR AND HYDRONIC FLOWS ARE TO BE BALANCED TO WITHIN +10% OF DESIGN VALUES. BALANCING PROCEDURES SHALL BE IN ACCORDANCE WITH NEBB OR AABC REQUIREMENTS.
- .02 PRIOR TO START OF TAB, ADJUST ALL AIR PATTERN CONTROLLERS, GRILLES AND REGISTER BLADES FOR PROPER AIR DIFFUSION PATTERNS.
- .03 PRIOR TO START OF TAB, VERIFY THE SYSTEMS AND EQUIPMENT ARE READY FOR THIS WORK.
- .04 CORRECT ANY AIR AND/OR HYDRONIC DEFICIENCIES FOUND DURING INITIAL TESTING PRIOR TO FINAL TESTING.
- .05 NOTIFY THE ENGINEER OF ANY PROBLEMS ENCOUNTERED DURING THE BALANCING PROCEDURE.
- .06 PERMANENTLY MARK THE FINAL SETTING OF VALVES, DAMPERS AND OTHER ADJUSTMENT DEVICES.
- .07 COMPLETE AND SUBMIT NEBB OR AABC OR SIMILAR TEST REPORT FORMS AT CONCLUSION OF TAB FOR REVIEW AND APPROVAL. REPORT SHALL INCLUDE A "% OF DESIGN" VALUE FOR EACH AIR AND HYDRONIC DEVICE BALANCED.

RECORD DRAWINGS

- .01 MAINTAIN ACCURATE PROJECT RECORD DRAWINGS INDICATING ALL FIELD CHANGES IN RED INK FROM THE ORIGINAL PLANS MADE DURING INSTALLATION OF WORK.
- .02 SUBMIT RECORD DRAWINGS TO OWNER AT COMPLETION OF PROJECT.

TRAINING

- .01 PROVIDE ON-SITE INSTRUCTION FOR THE OWNER'S PERSONNEL IN THE OPERATION, CARE AND MAINTENANCE OF ALL SYSTEMS AND EQUIPMENT.



T3 ALASKA LLC

Mechanical & Electrical Engineering

301 Calista Court, Suite 100
Anchorage, AK 99518
PH: 907-865-7900 Fax: 907-865-7975 AEC L: 1625

BOILER PLANT AND RTU REPLACEMENT

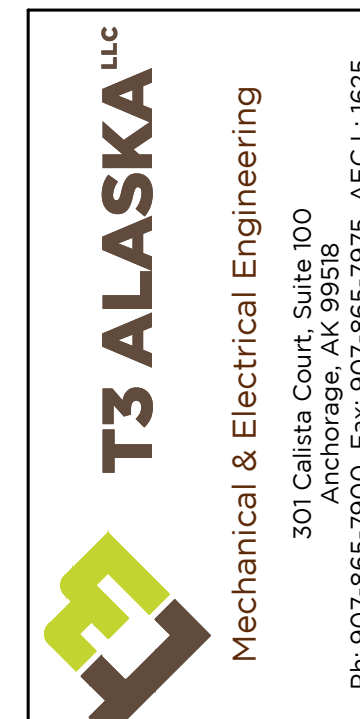
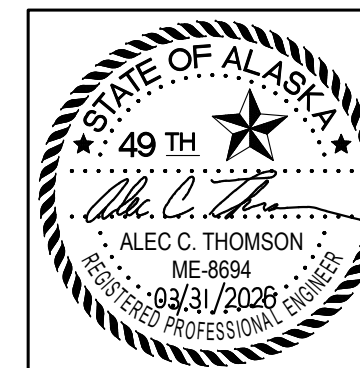
Alaska Mental Health Trust Land Office
3745 Community Park Loop
Anchorage, Alaska 99508

Revision Schedule		
No.	Description	Date
1	Boiler & RTU Change	03.09.26
2	Review Changes	03.31.26

Drawn:	KMR
Reviewed:	ACT
Date:	02/18/2026
Job No:	2025.132.0

Sheet Contents
MECHANICAL SPECIFICATIONS AND SEQUENCE OF OPERATIONS

Drawing No.
M0.2
2 of 8M
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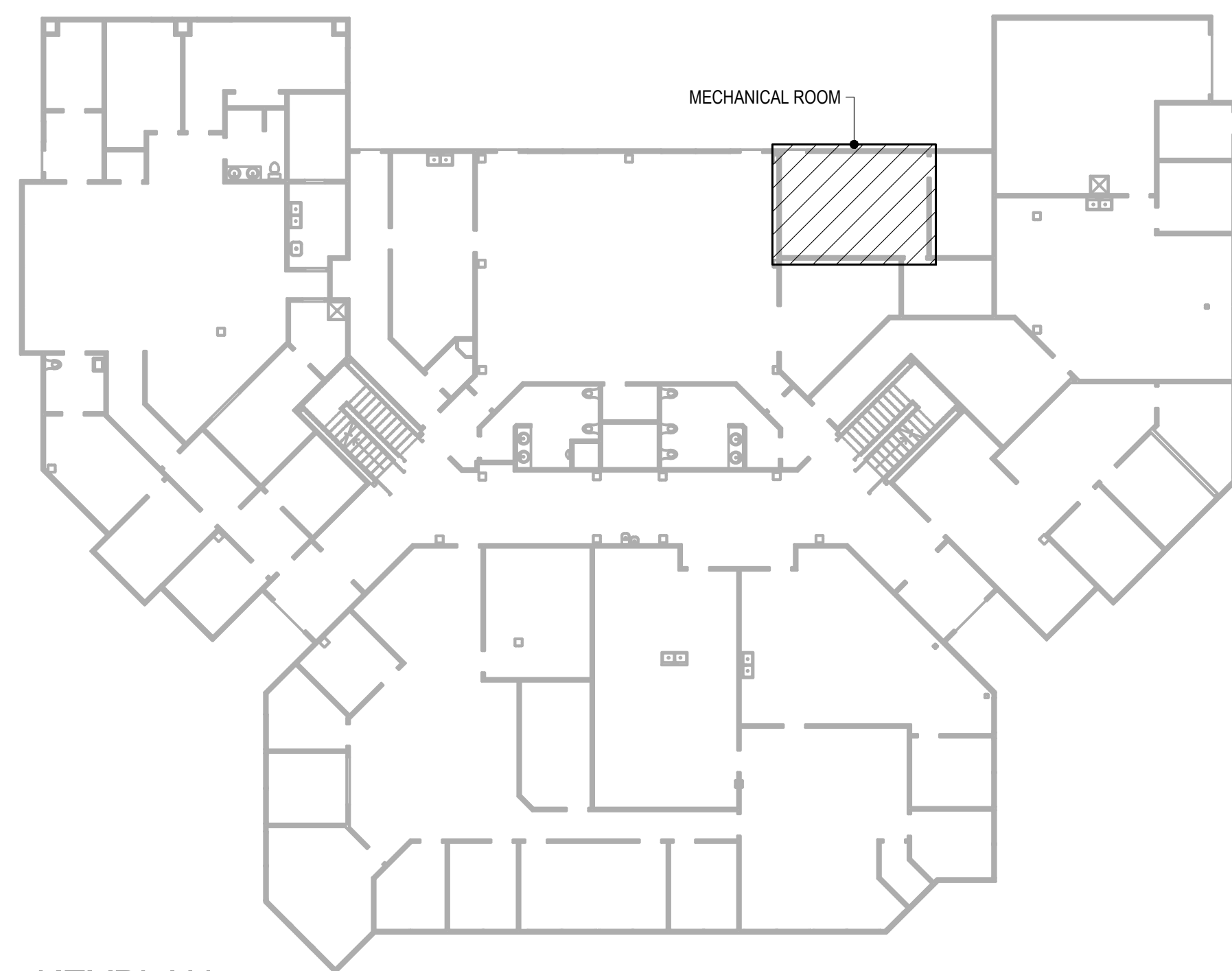
BOILER PLANT AND RTU REPLACEMENT
 Alaska Mental Health Trust Land Office
 3745 Community Park Loop
 Anchorage, Alaska 99508

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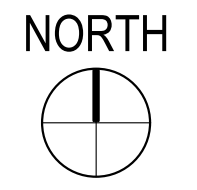
Drawn: KMR
 Reviewed: ACT
 Date: 02/18/2026
 Job No: 2025.132.0

Sheet Contents
 MECHANICAL
 ROOM PLANS

Drawing No.
M1.1
 3 of 8M
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KEYPLAN

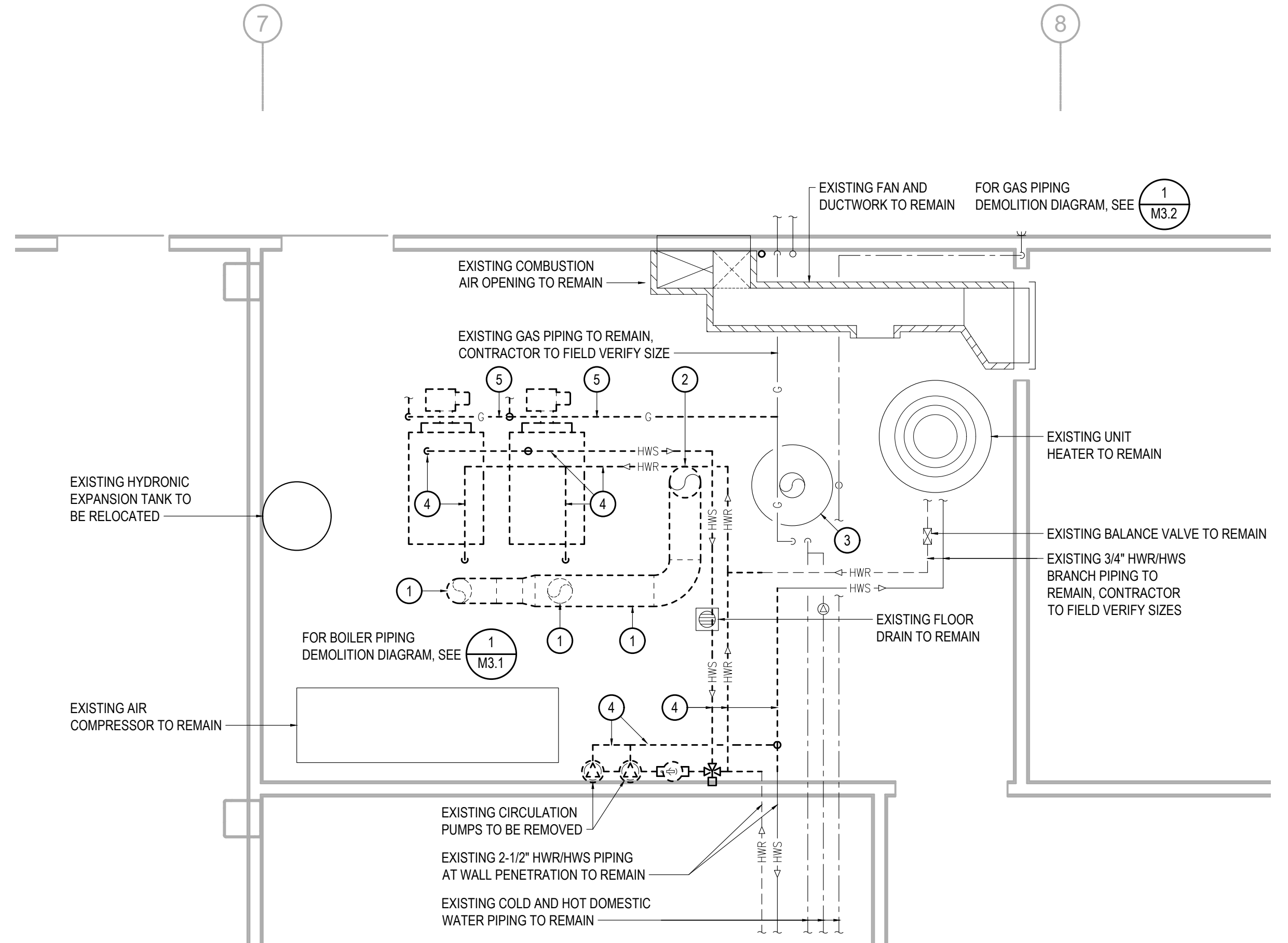


SHEET NOTES

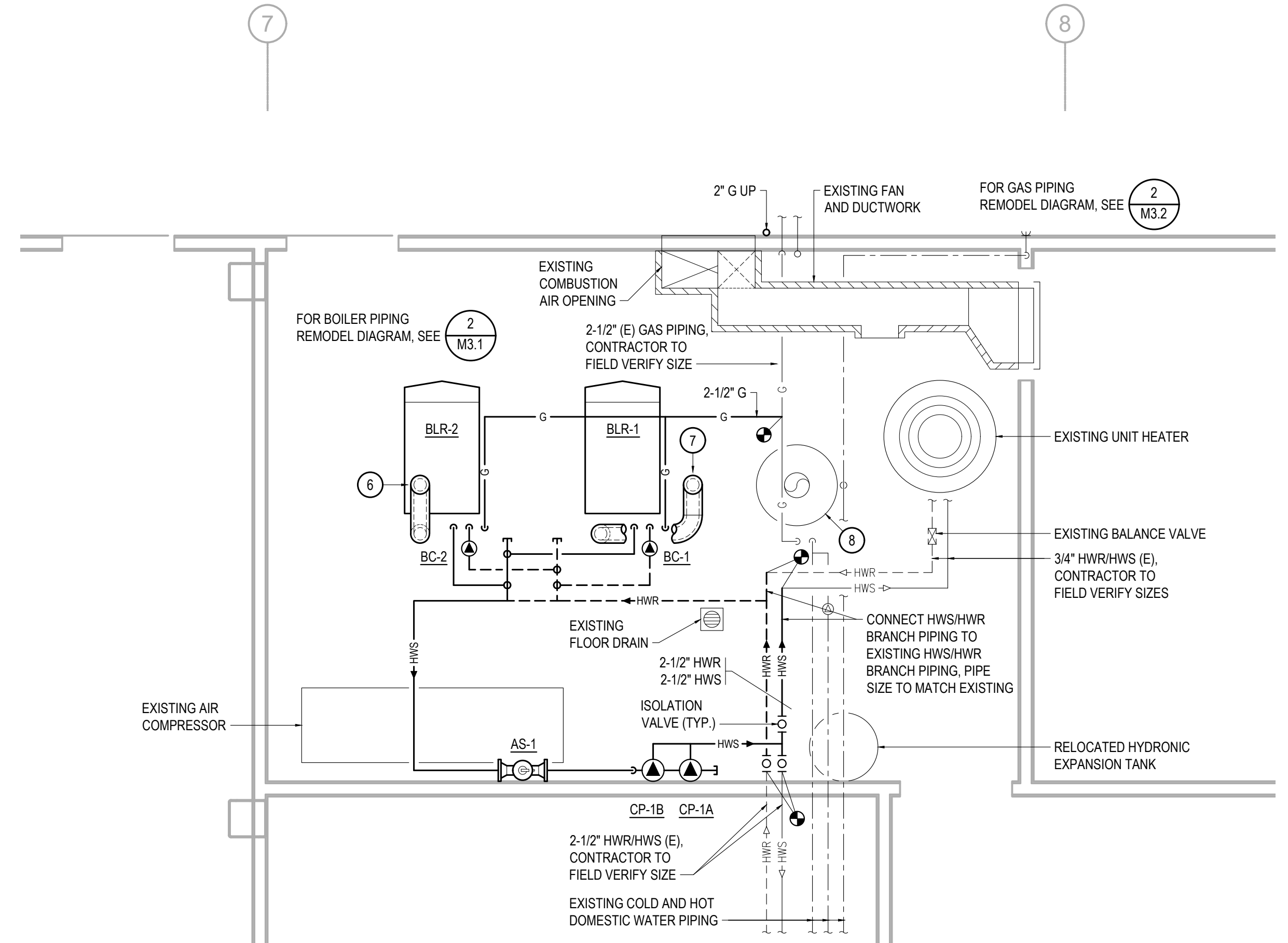
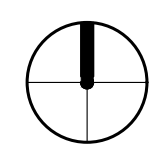
- EXISTING SYSTEMS SHOWN ON THE DRAWINGS ARE FROM RECORD DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE SPACE. ACTUAL SYSTEMS MAY VARY FROM THE INFORMATION INDICATED ON THE DRAWINGS. THE DRAWINGS MAY NOT SHOW ALL EXISTING SYSTEMS. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, LOCATIONS, SERVICE, AND SIZES BEFORE START OF WORK.
- COORDINATE WITH BUILDING OWNER FOR ALL WORK TAKING PLACE IN OCCUPIED TENANT SPACES AND FOR WORK REQUIRING SHUT DOWN OF BUILDING SYSTEMS.

KEY NOTES

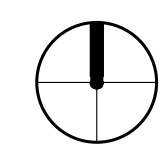
- EXISTING BOILER FLUE TO BE REMOVED.
- EXISTING FLUE UP TO BE REMOVED. EXISTING ROOF PENETRATION TO REMAIN.
- EXISTING WATER HEATER, ASSOCIATED FLUE UP, DOMESTIC WATER PIPING, DOMESTIC HOT WATER CIRCULATION PUMP, AND GAS PIPING TO REMAIN.
- EXISTING HYDRONIC PIPING TO BE REMOVED TO THE EXTENT SHOWN OR AS REQUIRED TO COMPLETE ALL REMODEL WORK.
- EXISTING GAS PIPING TO BE REMOVED.
- 4" BOILER FLUE UP THROUGH ROOF. SEE 5/M4.1.
- 4" BOILER FLUE UP THROUGH EXISTING FLUE PENETRATION. PATCH AND REPAIR ROOF AS REQUIRED TO MATCH EXISTING. SEE 5/M4.1.
- EXISTING WATER HEATER.

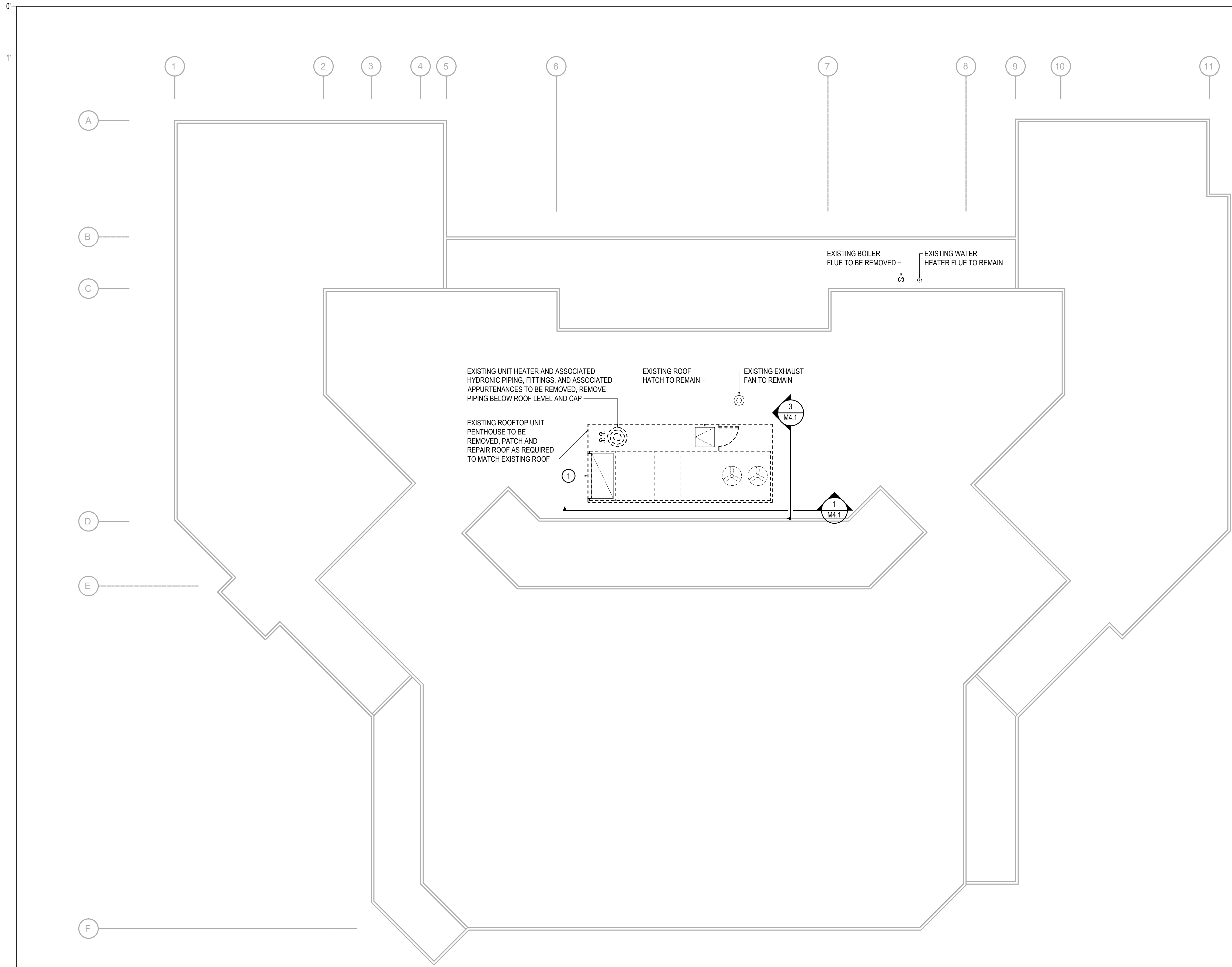


1 MECHANICAL ROOM DEMOLITION PLAN
 SCALE: 3/8" = 1'-0"



2 MECHANICAL ROOM REMODEL PLAN
 SCALE: 3/8" = 1'-0"





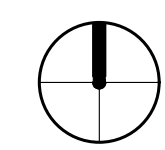
SHEET NOTES

- EXISTING SYSTEMS SHOWN ON THE DRAWINGS ARE FROM RECORD DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE SPACE. ACTUAL SYSTEMS MAY VARY FROM THE INFORMATION INDICATED ON THE DRAWINGS. THE DRAWINGS MAY NOT SHOW ALL EXISTING SYSTEMS. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, LOCATIONS, SERVICE, AND SIZES BEFORE START OF WORK.
- COORDINATE WITH BUILDING OWNER FOR ALL WORK TAKING PLACE IN OCCUPIED TENANT SPACES AND FOR WORK REQUIRING SHUT DOWN OF BUILDING SYSTEMS.

KEY NOTES

- EXISTING AIR HANDLING UNIT TO BE REMOVED. ASSOCIATED SUPPLY AIR FANS, CONDENSER, OUTSIDE AIR LOUVER, AND ROOF CURB TO BE REMOVED. ASSOCIATED EXISTING SUPPLY AIR DUCTWORK TO BE REMOVED AS REQUIRED TO COMPLETE ALL REMODEL WORK. EXISTING RETURN AIR OPENING TO AIR HANDLING UNIT TO REMAIN. ASSOCIATED EXISTING ROOF CURB TO REMAIN.

1 MECHANICAL ROOF DEMOLITION PLAN
SCALE: 3/8" = 1'-0"



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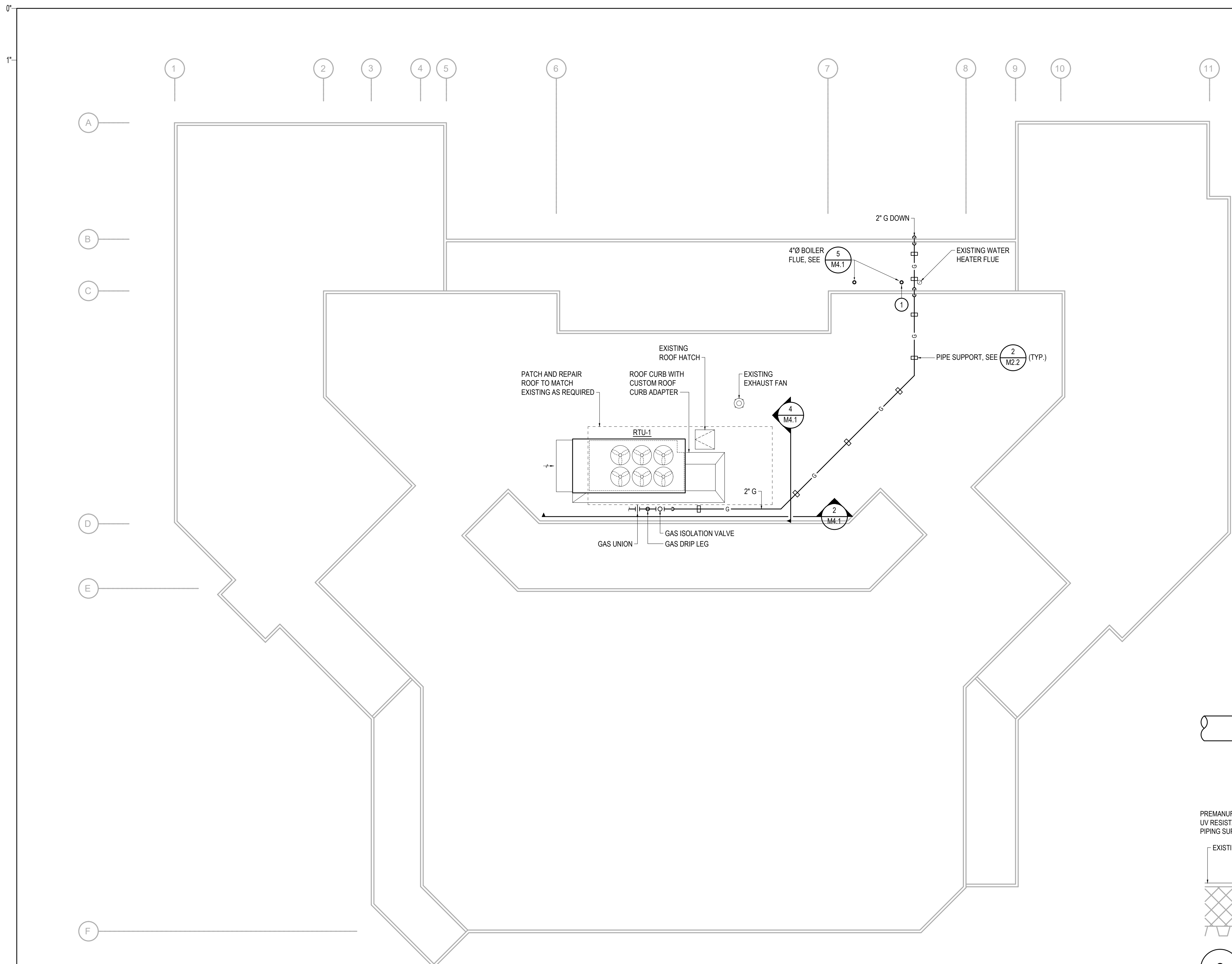
BOILER PLANT AND RTU REPLACEMENT
Alaska Mental Health Trust Land Office
3745 Community Park Loop
Anchorage, Alaska 99508

Revision Schedule		
No.	Description	Date

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Date:	02/18/2026
Job No:	2025.132.0

Sheet Contents
MECHANICAL ROOF DEMOLITION PLAN

Drawing No.
M2.1
4 of 8M
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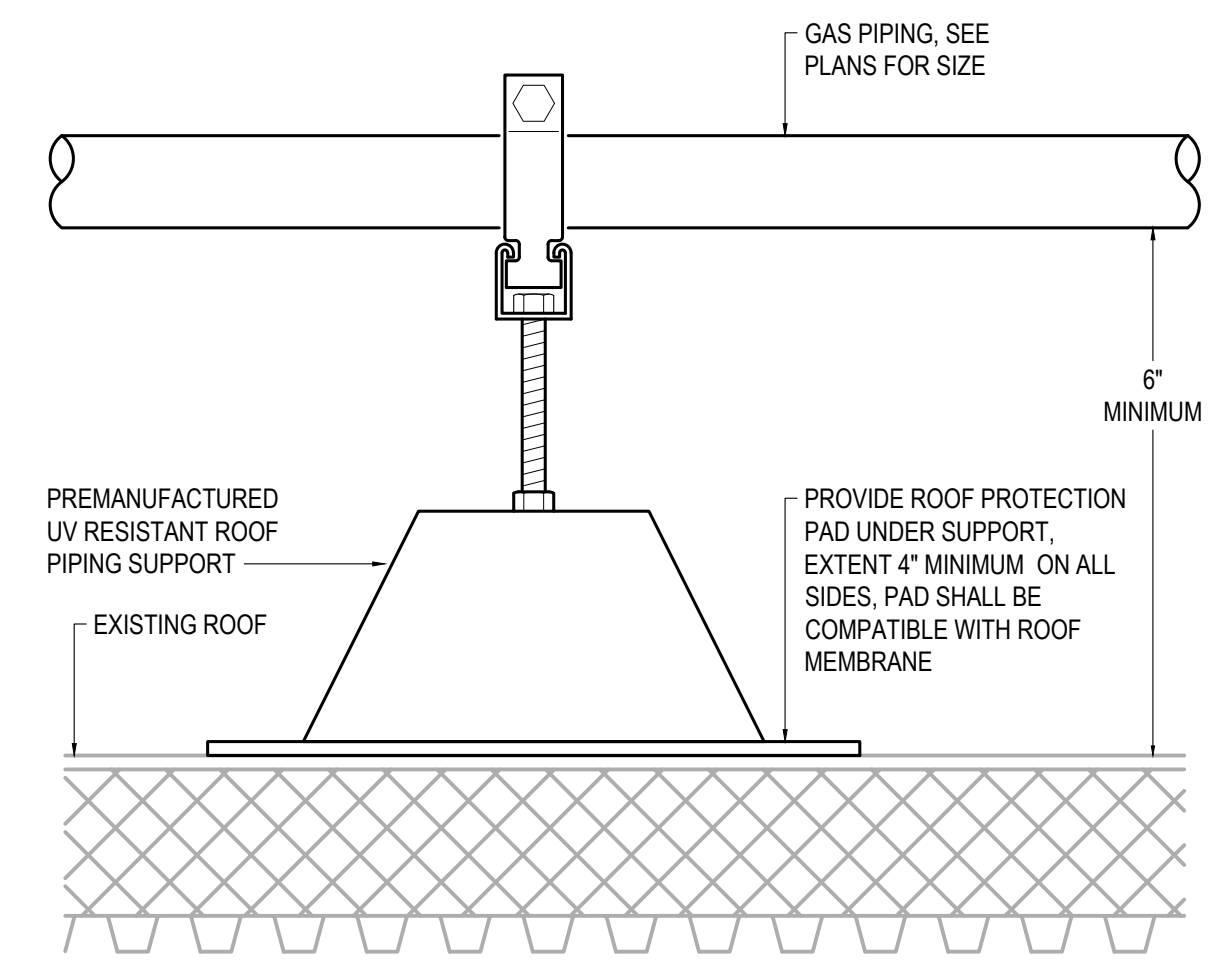


SHEET NOTES

- EXISTING SYSTEMS SHOWN ON THE DRAWINGS ARE FROM RECORD DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE SPACE. ACTUAL SYSTEMS MAY VARY FROM THE INFORMATION INDICATED ON THE DRAWINGS. THE DRAWINGS MAY NOT SHOW ALL EXISTING SYSTEMS. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, LOCATIONS, SERVICE, AND SIZES BEFORE START OF WORK.
- COORDINATE WITH BUILDING OWNER FOR ALL WORK TAKING PLACE IN OCCUPIED TENANT SPACES AND FOR WORK REQUIRING SHUT DOWN OF BUILDING SYSTEMS.
- SUPPORT GAS PIPING ON ROOF AS REQUIRED BY THE IFGC.

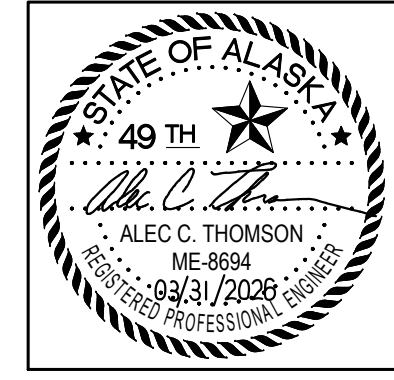
KEY NOTES

- REMOVE ROOF AS REQUIRED FOR BOILER'S FLUES ROOF PENETRATIONS. PATCH AND REPAIR ROOF AS REQUIRED TO MATCH EXISTING. FOR ROOF PENETRATION DETAIL, SEE 5/M4.1.



2 ROOF GAS PIPING SUPPORT DETAIL
SCALE: NONE

1 MECHANICAL ROOF REMODEL PLAN
SCALE: 3/8" = 1'-0"



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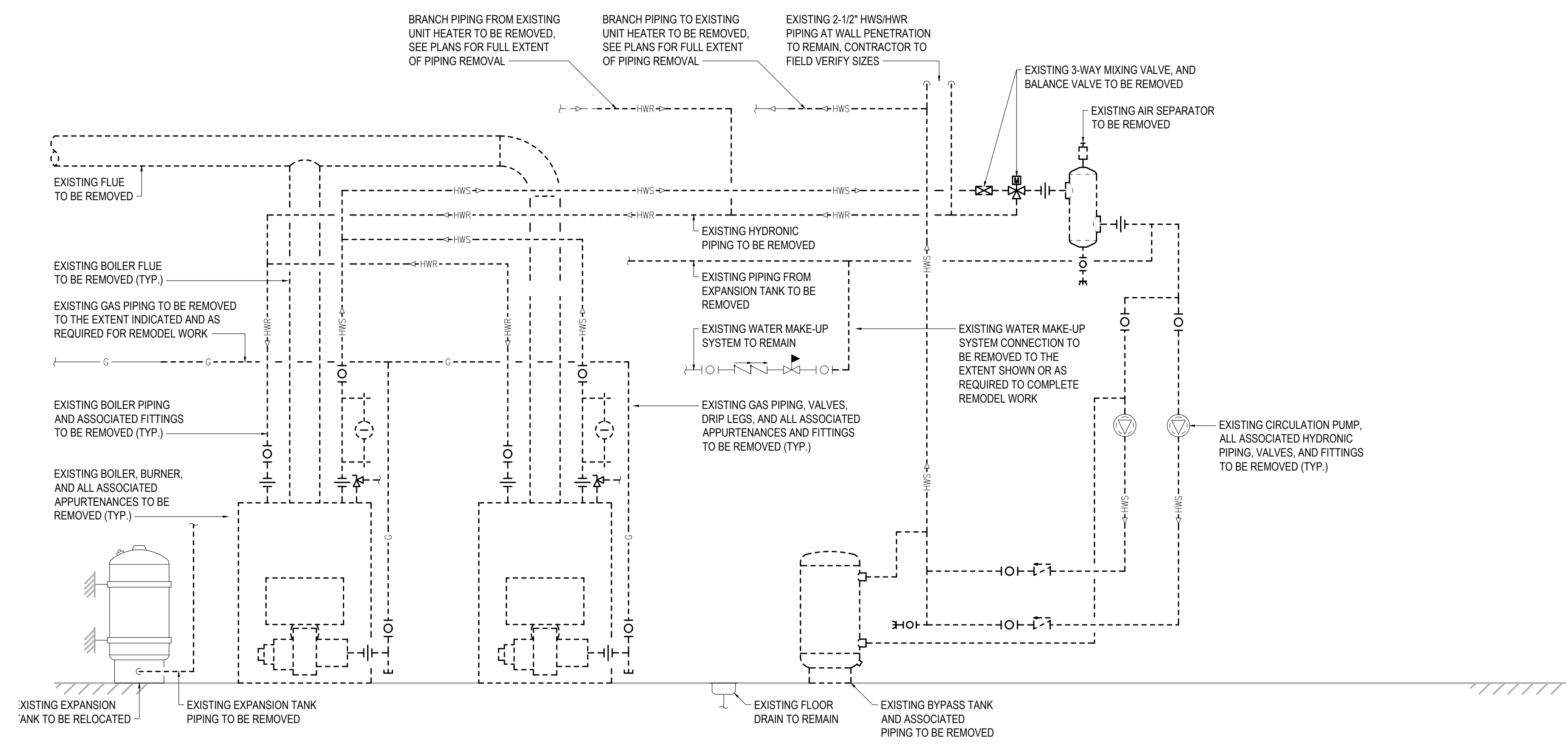
BOILER PLANT AND RTU REPLACEMENT
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Anchorage, Alaska 99508

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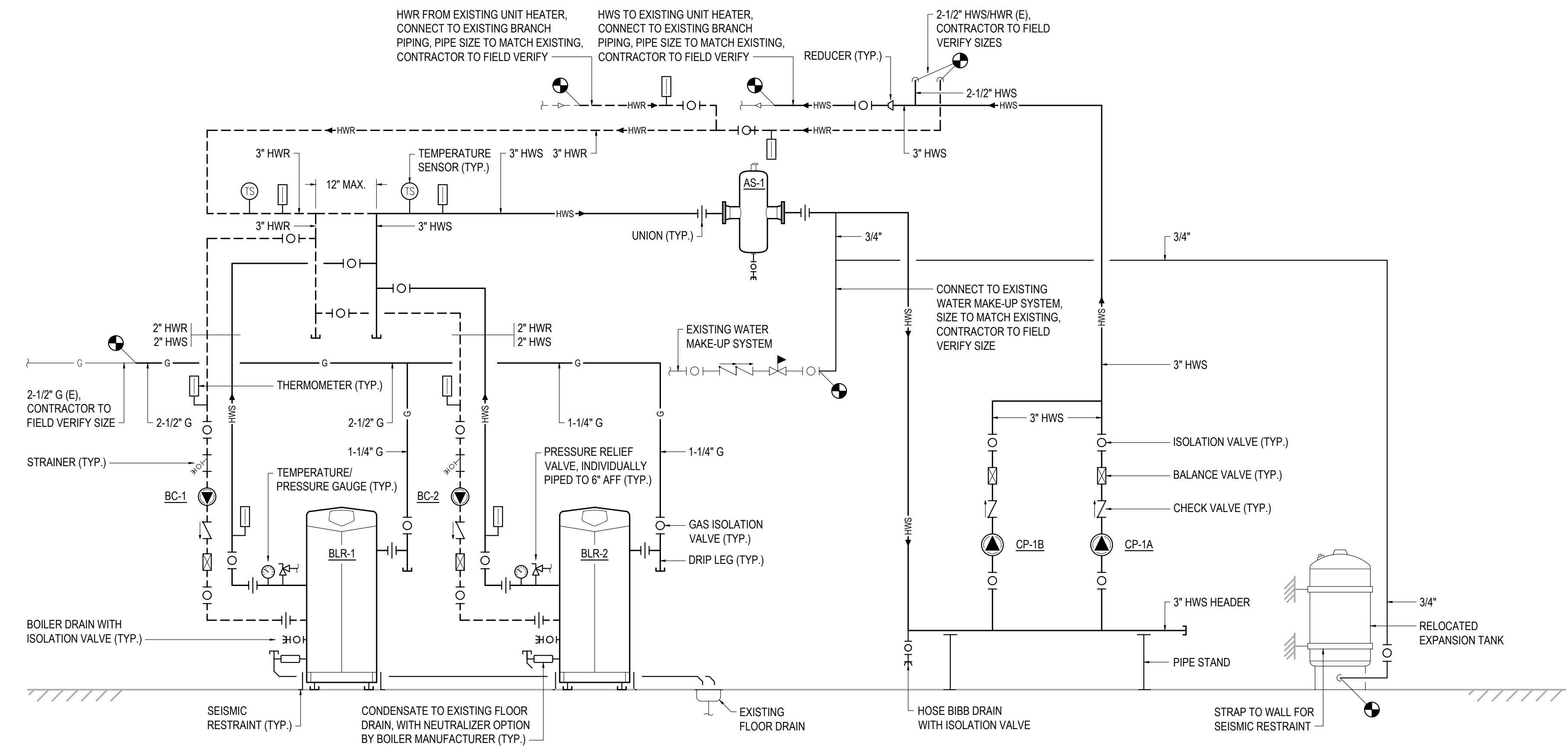
Drawn: KMR
Reviewed: ACT
Date: 02/18/2026
Job No: 2025.132.0

Sheet Contents
MECHANICAL ROOF
REMODEL PLAN

Drawing No.
M2.2
5 of 8M
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1 BOILER PIPING DEMOLITION DIAGRAM
SCALE: NONE



2 BOILER PIPING REMODEL DIAGRAM
SCALE: NONE

SHEET NOTES

- AIR SEPARATORS ARE TO BE SUPPORTED AND RESTRAINED FOR UNIT WEIGHT AND FULL WATER CAPACITY.



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301 Calista Court, Suite 100
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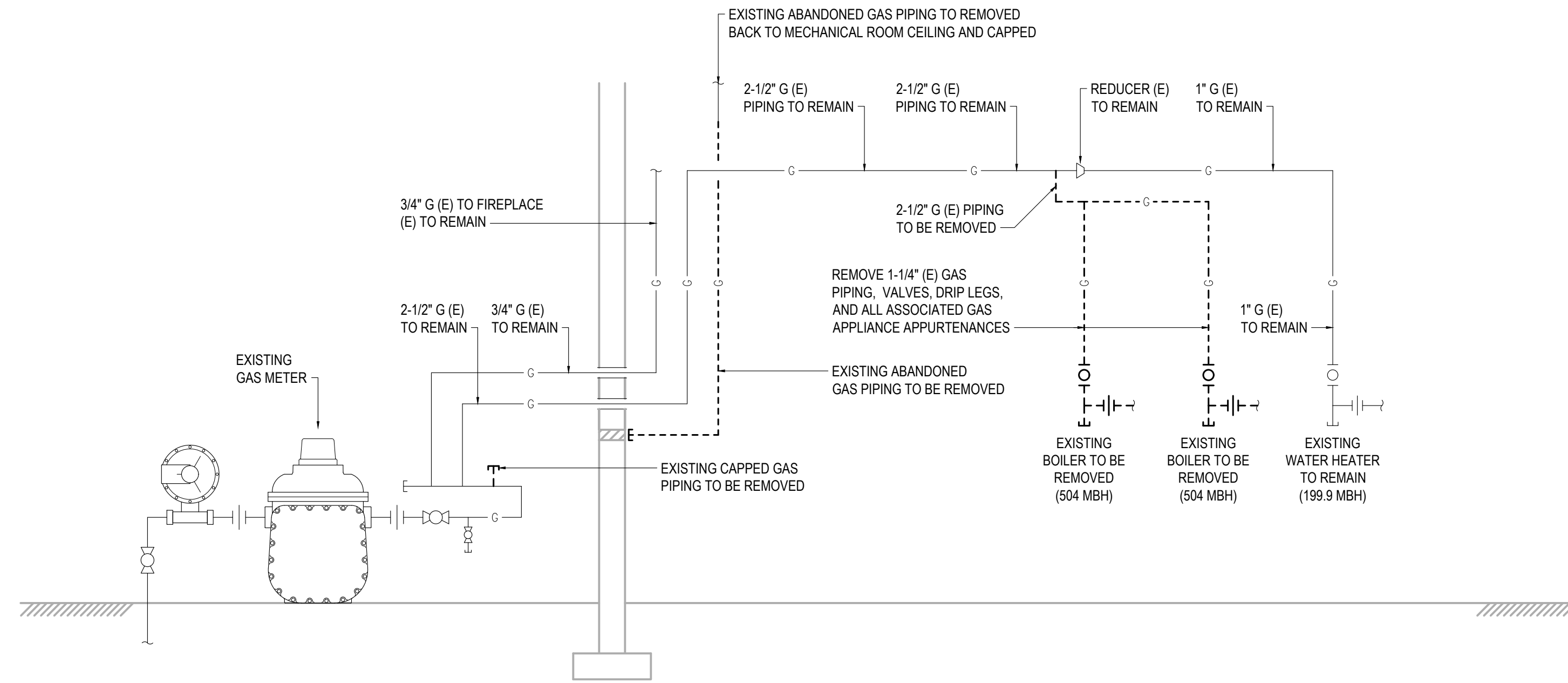
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3745 Community Park Loop
Anchorage, Alaska 99508

Revision Schedule		
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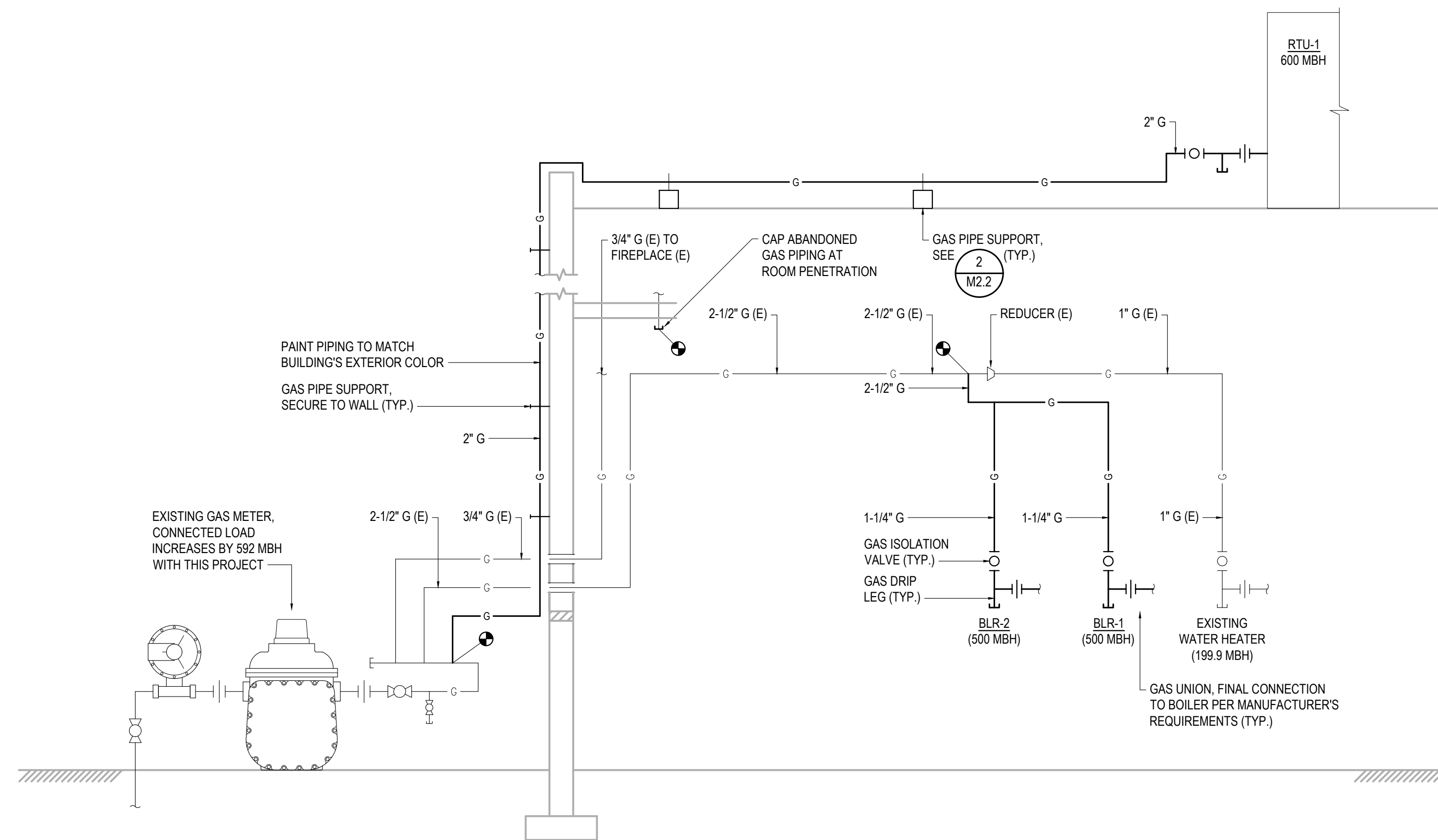
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Job No: 2025.132.0

Sheet Contents
BOILER PIPING
DIAGRAMS

Drawing No.
M3.1
6 of 8M
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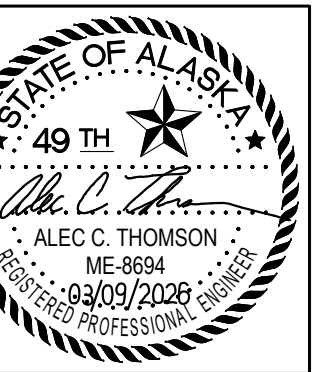
1 GAS PIPING DEMOLITION DIAGRAM
SCALE: NONE



2 GAS PIPING REMODEL DIAGRAM
SCALE: NONE

SHEET NOTES

- EXISTING SYSTEMS SHOWN ON THE DRAWINGS ARE FROM RECORD DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE SPACE. ACTUAL SYSTEMS MAY VARY FROM THE INFORMATION INDICATED ON THE DRAWINGS. THE DRAWINGS MAY NOT SHOW ALL EXISTING SYSTEMS. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, LOCATIONS, SERVICE, AND SIZES BEFORE START OF WORK.
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- SUPPORT GAS PIPING ON ROOF AS REQUIRED BY THE IFGC.



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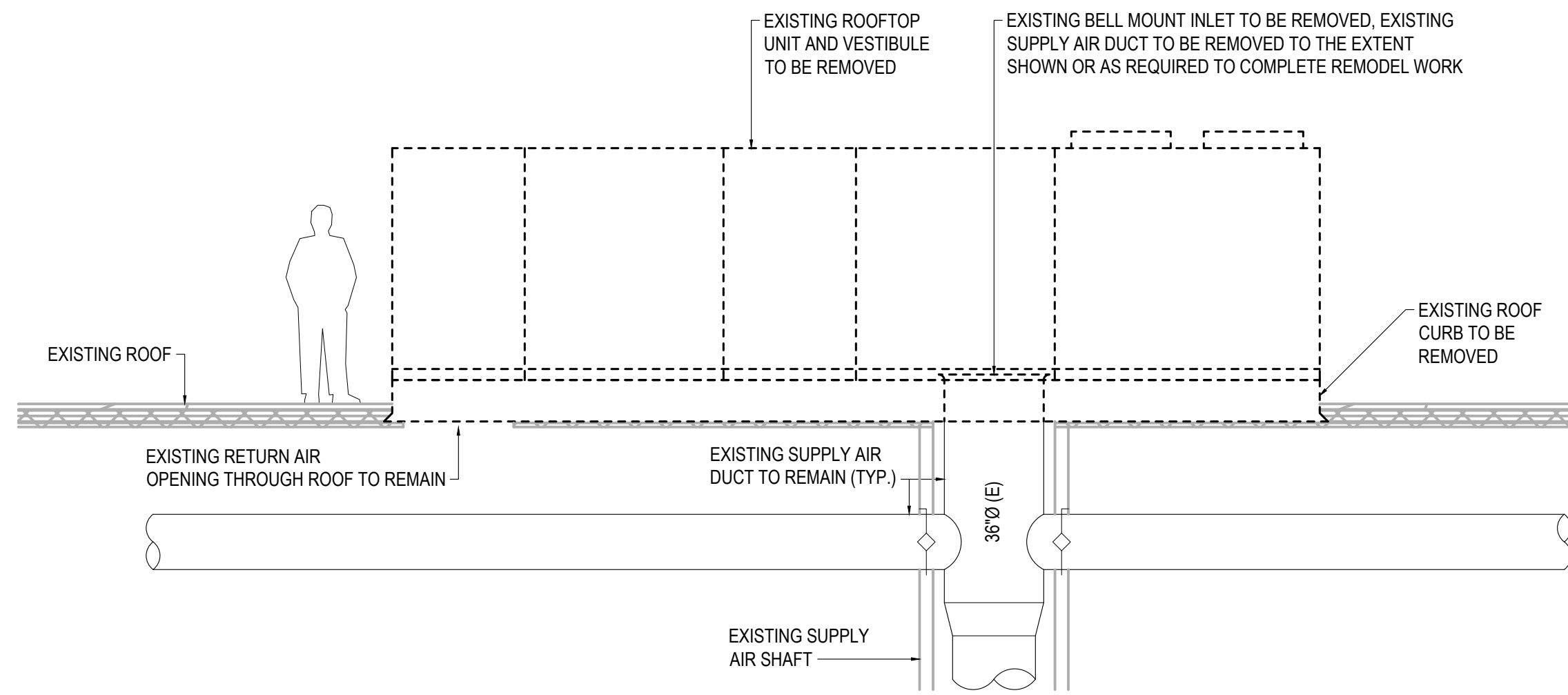
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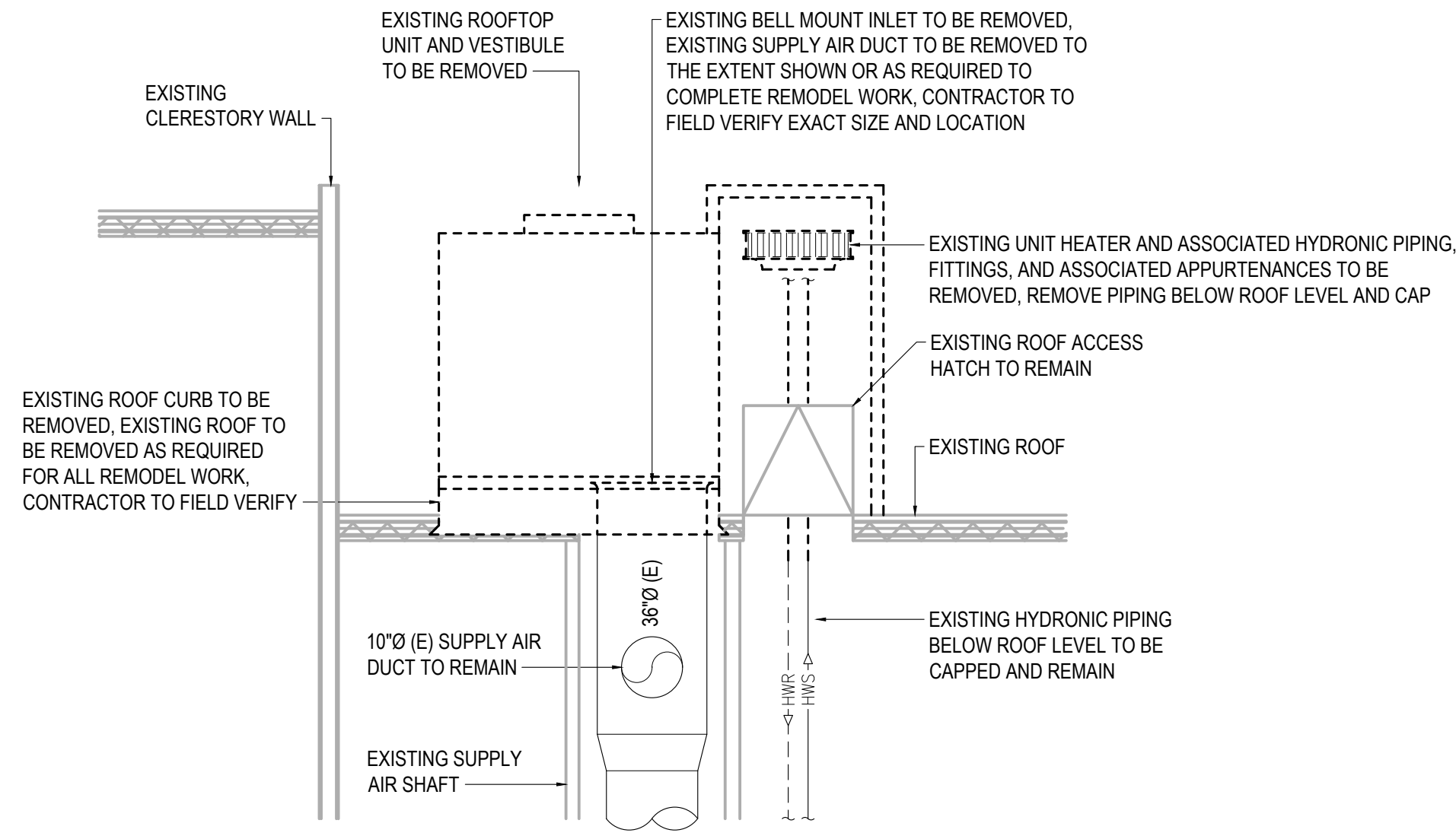
Drawn: KMR
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Date: 02/18/2026
Job No: 2025.132.0

Sheet Contents
GAS PIPING
DIAGRAMS

Drawing No.
M3.2
7 of 8M
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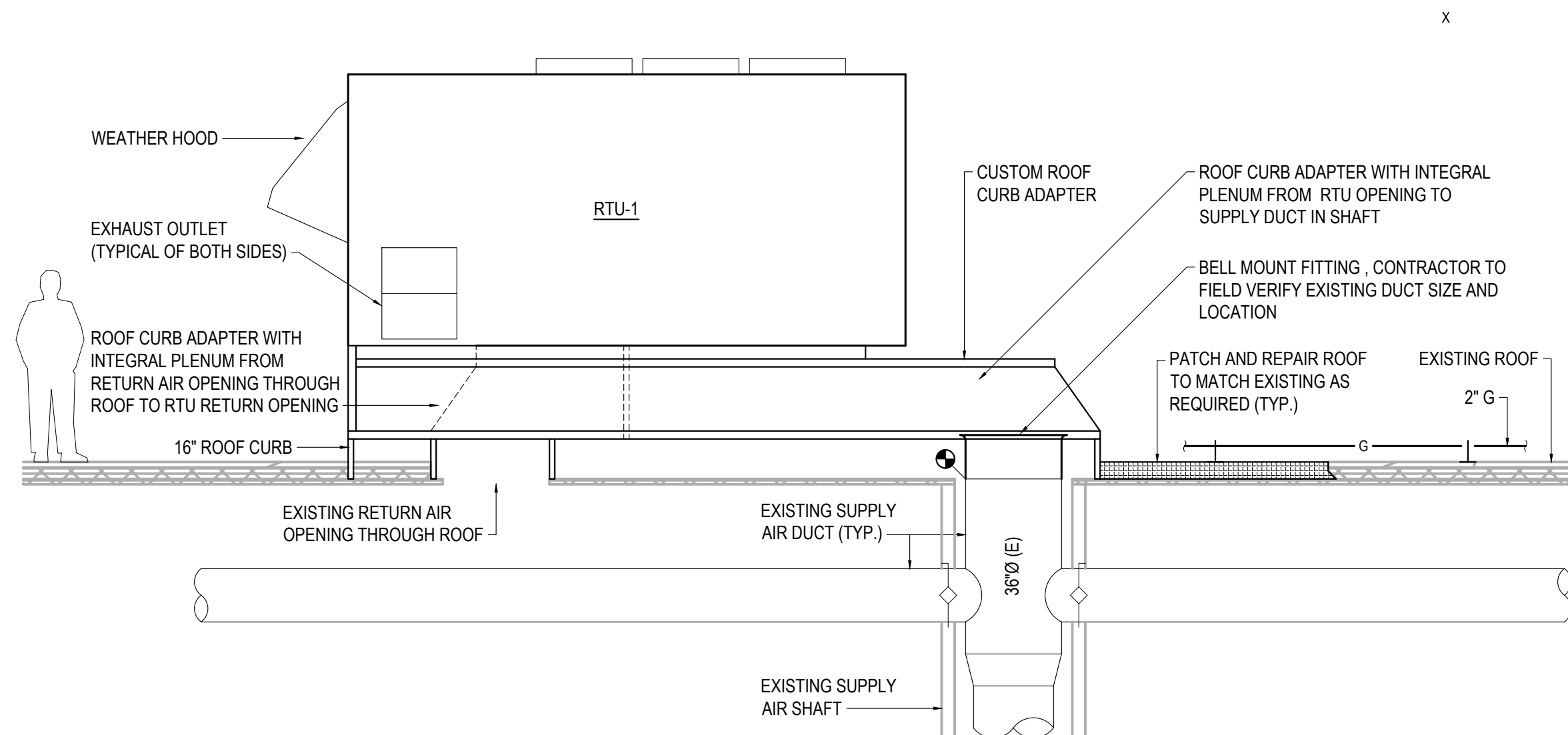
1 RTU DEMOLITION NORTH SECTION
SCALE: 1/4" = 1'-0"



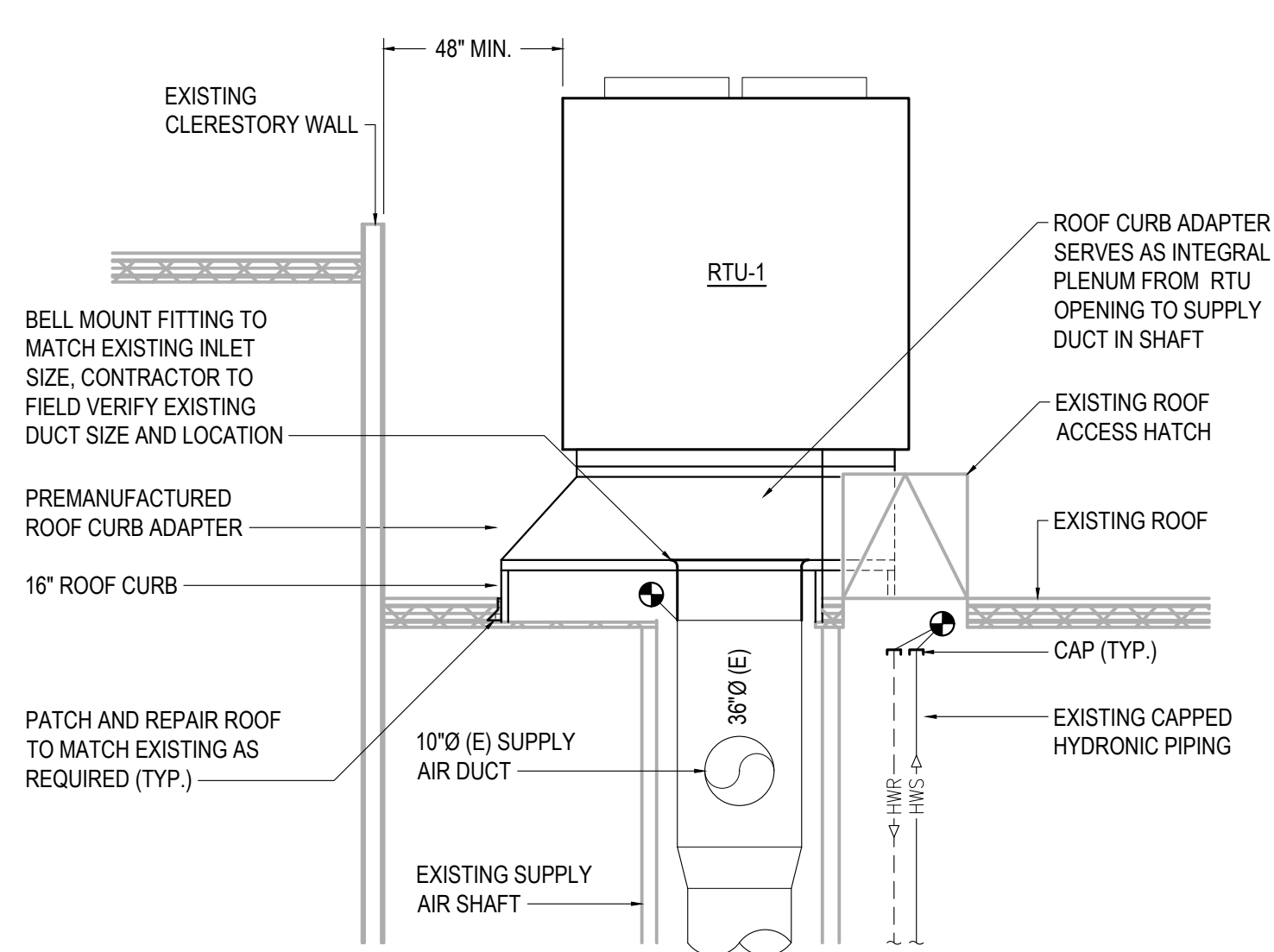
3 RTU DEMOLITION WEST SECTION
SCALE: 1/4" = 1'-0"

SHEET NOTES

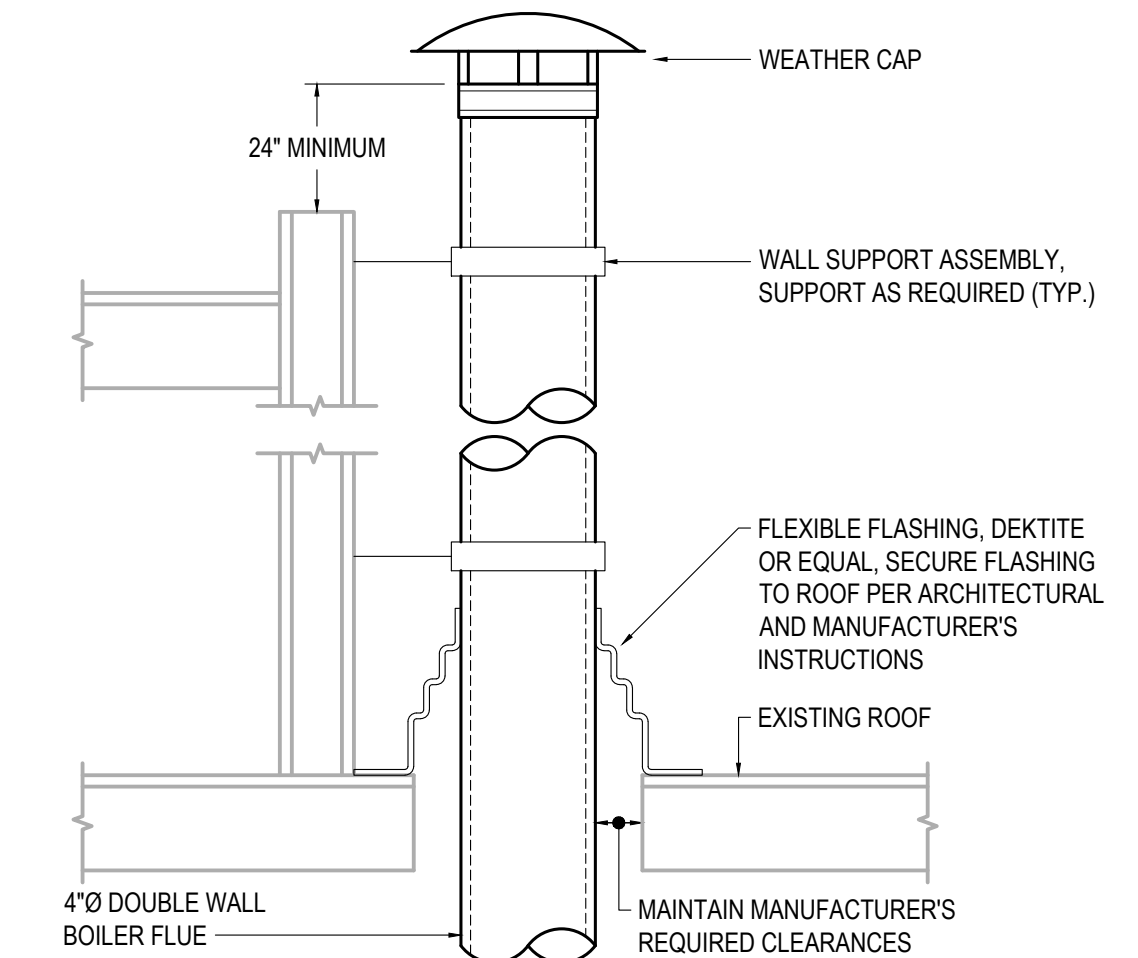
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- PATCH AND REPAIR ROOF AS REQUIRED TO MATCH THE EXISTING ROOF AT ALL AREAS OF REMODEL WORK.



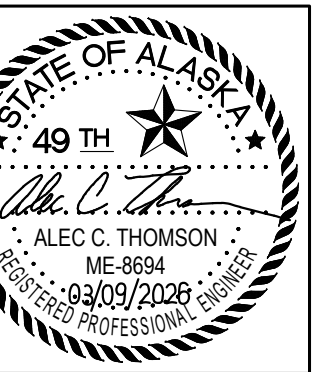
2 RTU REMODEL NORTH SECTION
SCALE: 1/4" = 1'-0"



4 RTU REMODEL WEST SECTION
SCALE: 1/4" = 1'-0"



5 BOILER FLUE DETAIL
SCALE: NONE



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Job No:	2025.132.0

Sheet Contents
SECTIONS

Drawing No.
M4.1
8 of 8M
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3745 COMMUNITY PARK LOOP, ANCHORAGE

INNOTECH[®]

AMERICA

4901 NW CAMAS MEADOWS DR

CAMAS, WA 98607

Ph: (360) 892-1299

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Client

Contractor:  **SUPERIOR**
Mechanical & Electrical

The Superior Group, Inc.

2220 E 88th Avenue

Anchorage, Alaska 99507

INNOTECH BUILDING AUTOMATION (BAS) SYSTEM

Revision Data

No	Date	Description	By
4/20/26	4/20/26	Design REV1	SG

File Name: 3745 Community Park 4.17.26.vsdX

Project

3745 Community Park Loop
Anchorage, Alaska 99508

SG

Project Manager

JP

Project Engineer

Job Number

As Prepared By

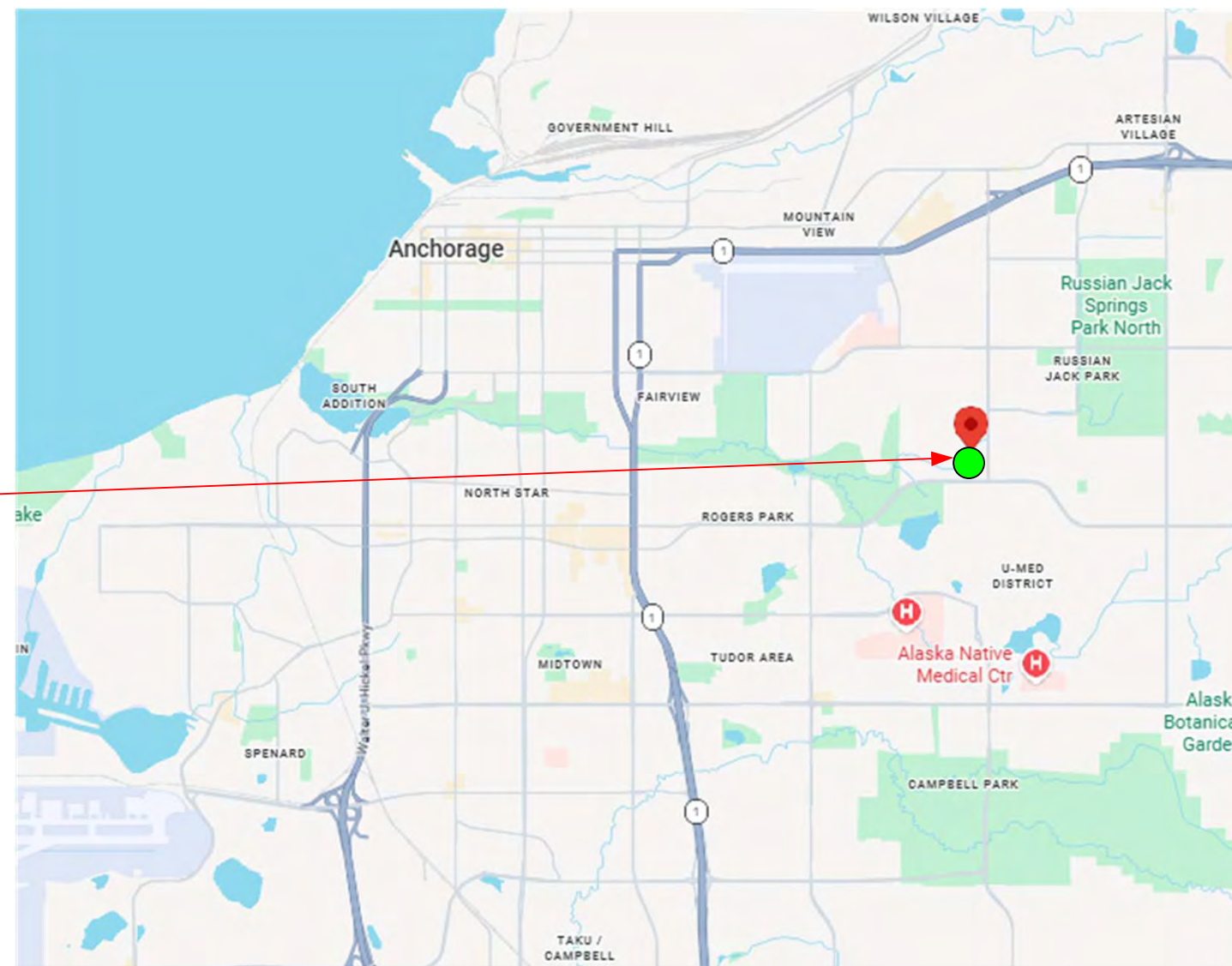
Control Systems America

4901 NW Camas Meadows DR

Camas, WA 98607

Phone Number: 360 892 1299


Location:



3745 Community Park Loop
Anchorage, Alaska 99508


NETWORK INFO- Page 1

Associated With	Model	IP Address	Subnet Mask	Gateway	BACnet Instance	BACnet Type	Local IP Network Number	BACnet UDP Port	BACnet Node/MAC (if MSTP)	Baud Rate (if MSTP)	VAV Max Cooling Airflow CFM	VAV Min Cooling Airflow CFM	VAV Max Heating Airflow CFM	VAV Min Heating Airflow CFM
GRAPHICS	WORKSTATION	192.168.2.100	255.255.255.0	192.168.2.1	2100	BACnet IP/MSTP	1	47808	N/A	N/A	N/A	N/A	N/A	N/A
RTU-1	AAON	192.168.2.101	255.255.255.0	192.168.2.1	2101	BACnet IP/MSTP	1	47808	N/A	115200	N/A	N/A	N/A	N/A
PLANT	OMC40D	192.168.2.102	255.255.255.0	192.168.2.1	2102	BACnet IP/MSTP	1	47808	N/A	115200	N/A	N/A	N/A	N/A
VAV1-1	SK8VD	192.168.2.103	255.255.255.0	192.168.2.1	2103	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-1-1	SS-M-W	N/A	N/A	N/A	21031	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 1-1-2	SS-M-W	N/A	N/A	N/A	21032	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 1-1-3	SS-M-W	N/A	N/A	N/A	21033	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	TBA
VAV1-2	SK8VD	192.168.2.104	255.255.255.0	192.168.2.1	2104	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-2-1	SS-M-W	N/A	N/A	N/A	21041	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 1-2-2	SS-M-W	N/A	N/A	N/A	21042	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 1-2-3	SS-M-W	N/A	N/A	N/A	21043	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	TBA
VAV1-3	SK8VD	192.168.2.105	255.255.255.0	192.168.2.1	2105	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-3-1	SS-M-W	N/A	N/A	N/A	21051	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV1-4	SK8VD	192.168.2.106	255.255.255.0	192.168.2.1	2106	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-4-1	SS-M-W	N/A	N/A	N/A	21061	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 1-4-2	SS-M-W	N/A	N/A	N/A	21062	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
VAV1-5	SK8VD	192.168.2.107	255.255.255.0	192.168.2.1	2107	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-5-1	SS-M-W	N/A	N/A	N/A	21071	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV1-6	SK8VD	192.168.2.108	255.255.255.0	192.168.2.1	2108	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-6-1	SS-M-W	N/A	N/A	N/A	21081	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
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SENSOR 1-7-1	SS-M-W	N/A	N/A	N/A	21091	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 1-7-2	SS-M-W	N/A	N/A	N/A	21092	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
VAV1-8	SK8VD	192.168.2.110	255.255.255.0	192.168.2.1	2110	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-8-1	SS-M-W	N/A	N/A	N/A	21101	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV1-9	SK8VD	192.168.2.111	255.255.255.0	192.168.2.1	2111	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-9-1	SS-M-W	N/A	N/A	N/A	21111	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 1-9-2	SS-M-W	N/A	N/A	N/A	21112	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 1-9-3	SS-M-W	N/A	N/A	N/A	21113	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	TBA
VAV1-10	SK8VD	192.168.2.112	255.255.255.0	192.168.2.1	2112	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-10-1	SS-M-W	N/A	N/A	N/A	21121	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV1-11	SK8VD	192.168.2.113	255.255.255.0	192.168.2.1	2113	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 11-1-1	SS-M-W	N/A	N/A	N/A	21131	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV1-12	SK8VD	192.168.2.114	255.255.255.0	192.168.2.1	2114	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-12-1	SS-M-W	N/A	N/A	N/A	21141	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 1-12-2	SS-M-W	N/A	N/A	N/A	21142	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
VAV1-13	SK8VD	192.168.2.115	255.255.255.0	192.168.2.1	2115	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-13-1	SS-M-W	N/A	N/A	N/A	21151	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV1-14	SK8VD	192.168.2.116	255.255.255.0	192.168.2.1	2116	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 1-14-1	SS-M-W	N/A	N/A	N/A	21161	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 1-14-2	SS-M-W	N/A	N/A	N/A	21162	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 1-14-3	SS-M-W	N/A	N/A	N/A	21163	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	N/A

3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
NETWORK INFO- Page 1			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654


NETWORK INFO- Page 2

Associated With	Model	IP Address	Subnet Mask	Gateway	BACnet Instance	BACnet Type	Local IP Network Number	BACnet UDP Port	BACnet Node/MAC (if MSTP)	Baud Rate (if MSTP)	VAV Max Cooling Airflow CFM	VAV Min Cooling Airflow CFM	VAV Max Heating Airflow CFM	VAV Min Heating Airflow CFM
VAV2-1	SK8VD	192.168.2.117	255.255.255.0	192.168.2.1	2117	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-1-1	SS-M-W	N/A	N/A	N/A	21171	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV 2-2	SK8VD	192.168.2.118	255.255.255.0	192.168.2.1	2118	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-2-1	SS-M-W	N/A	N/A	N/A	21181	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 2-2-2	SS-M-W	N/A	N/A	N/A	21182	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 2-2-3	SS-M-W	N/A	N/A	N/A	21183	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	N/A
VAV 2-3	SK8VD	192.168.2.119	255.255.255.0	192.168.2.1	2119	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-3-1	SS-M-W	N/A	N/A	N/A	21191	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV 2-4	SK8VD	192.168.2.120	255.255.255.0	192.168.2.1	2120	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-4-1	SS-M-W	N/A	N/A	N/A	21201	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 2-4-2	SS-M-W	N/A	N/A	N/A	21202	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 2-4-3	SS-M-W	N/A	N/A	N/A	21203	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	N/A
SENSOR 2-4-4	SS-M-W	N/A	N/A	N/A	21204	MSTP	N/A	47808	5	115200	N/A	N/A	N/A	N/A
VAV2-5	SK8VD	192.168.2.121	255.255.255.0	192.168.2.1	2121	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-5-1	SS-M-W	N/A	N/A	N/A	21211	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 2-5-2	SS-M-W	N/A	N/A	N/A	21212	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 2-5-3	SS-M-W	N/A	N/A	N/A	21213	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	TBA
VAV2-6	SK8VD	192.168.2.122	255.255.255.0	192.168.2.1	2122	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-6-1	SS-M-W	N/A	N/A	N/A	21221	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 2-6-2	SS-M-W	N/A	N/A	N/A	21222	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 2-6-3	SS-M-W	N/A	N/A	N/A	21223	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	TBA
VAV2-7	SK8VD	192.168.2.123	255.255.255.0	192.168.2.1	2123	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-7-1	SS-M-W	N/A	N/A	N/A	21231	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV2-8	SK8VD	192.168.2.124	255.255.255.0	192.168.2.1	2124	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-8-1	SS-M-W	N/A	N/A	N/A	21241	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV2-9	SK8VD	192.168.2.125	255.255.255.0	192.168.2.1	2125	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-9-1	SS-M-W	N/A	N/A	N/A	21251	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV2-10	SK8VD	192.168.2.126	255.255.255.0	192.168.2.1	2126	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-10-1	SS-M-W	N/A	N/A	N/A	21261	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV2-11	SK8VD	192.168.2.127	255.255.255.0	192.168.2.1	2127	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-11-1	SS-M-W	N/A	N/A	N/A	21271	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV2-12	SK8VD	192.168.2.128	255.255.255.0	192.168.2.1	2128	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-12-1	SS-M-W	N/A	N/A	N/A	21281	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
VAV2-13	SK8VD	192.168.2.129	255.255.255.0	192.168.2.1	2129	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-13-1	SS-M-W	N/A	N/A	N/A	21291	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 2-13-2	SS-M-W	N/A	N/A	N/A	21292	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
VAV2-14	SK8VD	192.168.2.130	255.255.255.0	192.168.2.1	2130	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 2-14-1	SS-M-W	N/A	N/A	N/A	21301	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A

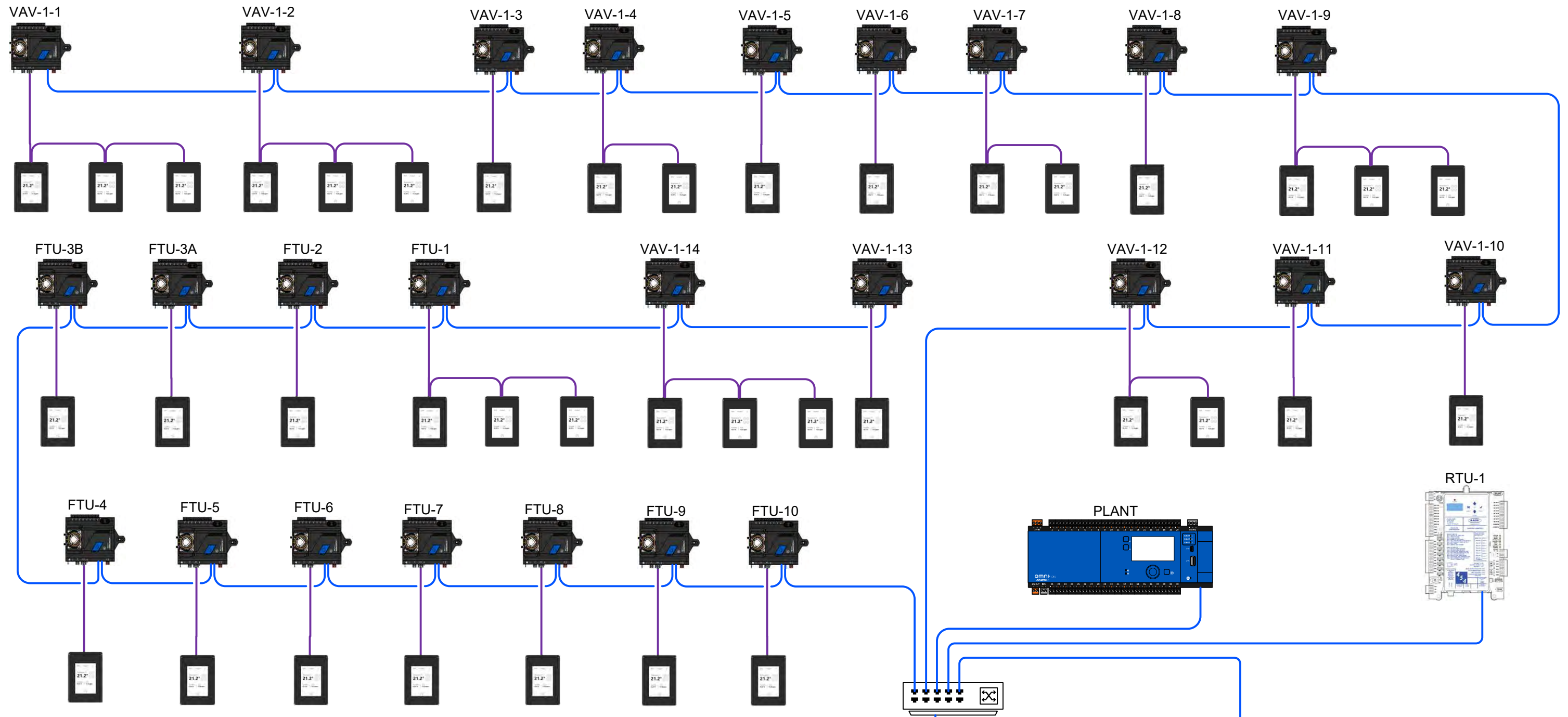
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
NETWORK INFO- Page 2			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

NETWORK INFO- Page 3

Associated With	Model	IP Address	Subnet Mask	Gateway	BACnet Instance	BACnet Type	Local IP Network Number	BACnet UDP Port	BACnet Node/MAC (if MSTP)	Baud Rate (if MSTP)	VAV Max Cooling Airflow CFM	VAV Min Cooling Airflow CFM	VAV Max Heating Airflow CFM	VAV Min Heating Airflow CFM
FTU-1	SK8VD	192.168.2.131	255.255.255.0	192.168.2.1	2131	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-1	SS-M-W	N/A	N/A	N/A	21311	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 3-2	SS-M-W	N/A	N/A	N/A	21312	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 3-3	SS-M-W	N/A	N/A	N/A	21313	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	TBA
FTU-2	SK8VD	192.168.2.132	255.255.255.0	192.168.2.1	2132	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-2	SS-M-W	N/A	N/A	N/A	21321	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-3A	SK8VD	192.168.2.133	255.255.255.0	192.168.2.1	2133	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-3A	SS-M-W	N/A	N/A	N/A	23331	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-3B	SK8VD	192.168.2.134	255.255.255.0	192.168.2.1	2134	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-3B	SS-M-W	N/A	N/A	N/A	21341	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-4	SK8VD	192.168.2.135	255.255.255.0	192.168.2.1	2135	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-4	SS-M-W	N/A	N/A	N/A	21351	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-5	SK8VD	192.168.2.136	255.255.255.0	192.168.2.1	2136	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-5	SS-M-W	N/A	N/A	N/A	21361	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-6	SK8VD	192.168.2.137	255.255.255.0	192.168.2.1	2137	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-6	SS-M-W	N/A	N/A	N/A	21371	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-7	SK8VD	192.168.2.138	255.255.255.0	192.168.2.1	2138	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-7	SS-M-W	N/A	N/A	N/A	21381	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-8	SK8VD	192.168.2.139	255.255.255.0	192.168.2.1	2139	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-8	SS-M-W	N/A	N/A	N/A	21391	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-9	SK8VD	192.168.2.140	255.255.255.0	192.168.2.1	2140	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-9	SS-M-W	N/A	N/A	N/A	21401	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-10	SK8VD	192.168.2.141	255.255.255.0	192.168.2.1	2141	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 3-10	SS-M-W	N/A	N/A	N/A	21411	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-11	SK8VD	192.168.2.142	255.255.255.0	192.168.2.1	2142	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 4-11	SS-M-W	N/A	N/A	N/A	21421	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-12	SK8VD	192.168.2.143	255.255.255.0	192.168.2.1	2143	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 4-12-1	SS-M-W	N/A	N/A	N/A	21431	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 4-12-2	SS-M-W	N/A	N/A	N/A	21432	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
FTU-13	SK8VD	192.168.2.144	255.255.255.0	192.168.2.1	2144	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 4-13-1	SS-M-W	N/A	N/A	N/A	21441	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 4-13-2	SS-M-W	N/A	N/A	N/A	21442	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
FTU-14	SK8VD	192.168.2.145	255.255.255.0	192.168.2.1	2145	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 4-14-1	SS-M-W	N/A	N/A	N/A	21451	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 4-14-2	SS-M-W	N/A	N/A	N/A	21452	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A
SENSOR 4-14-3	SS-M-W	N/A	N/A	N/A	21453	MSTP	N/A	47808	4	115200	N/A	N/A	N/A	N/A
FTU-15	SK8VD	192.168.2.146	255.255.255.0	192.168.2.1	2146	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 4-15-1	SS-M-W	N/A	N/A	N/A	21461	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
FTU-16	SK8VD	192.168.2.147	255.255.255.0	192.168.2.1	2147	BACnet IP/MSTP	1	47808	1	115200	TBA	TBA	TBA	TBA
SENSOR 4-16-1	SS-M-W	N/A	N/A	N/A	21471	MSTP	N/A	47808	2	115200	N/A	N/A	N/A	N/A
SENSOR 4-16-2	SS-M-W	N/A	N/A	N/A	21472	MSTP	N/A	47808	3	115200	N/A	N/A	N/A	N/A

3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
NETWORK INFO- Page 3			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

LEVEL 1 NETWORK LAYOUT



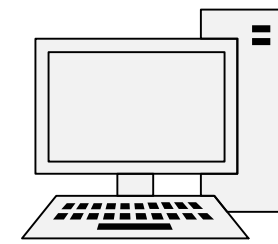
Notes:

- Network layout is only indicative .

WIRING KEY:

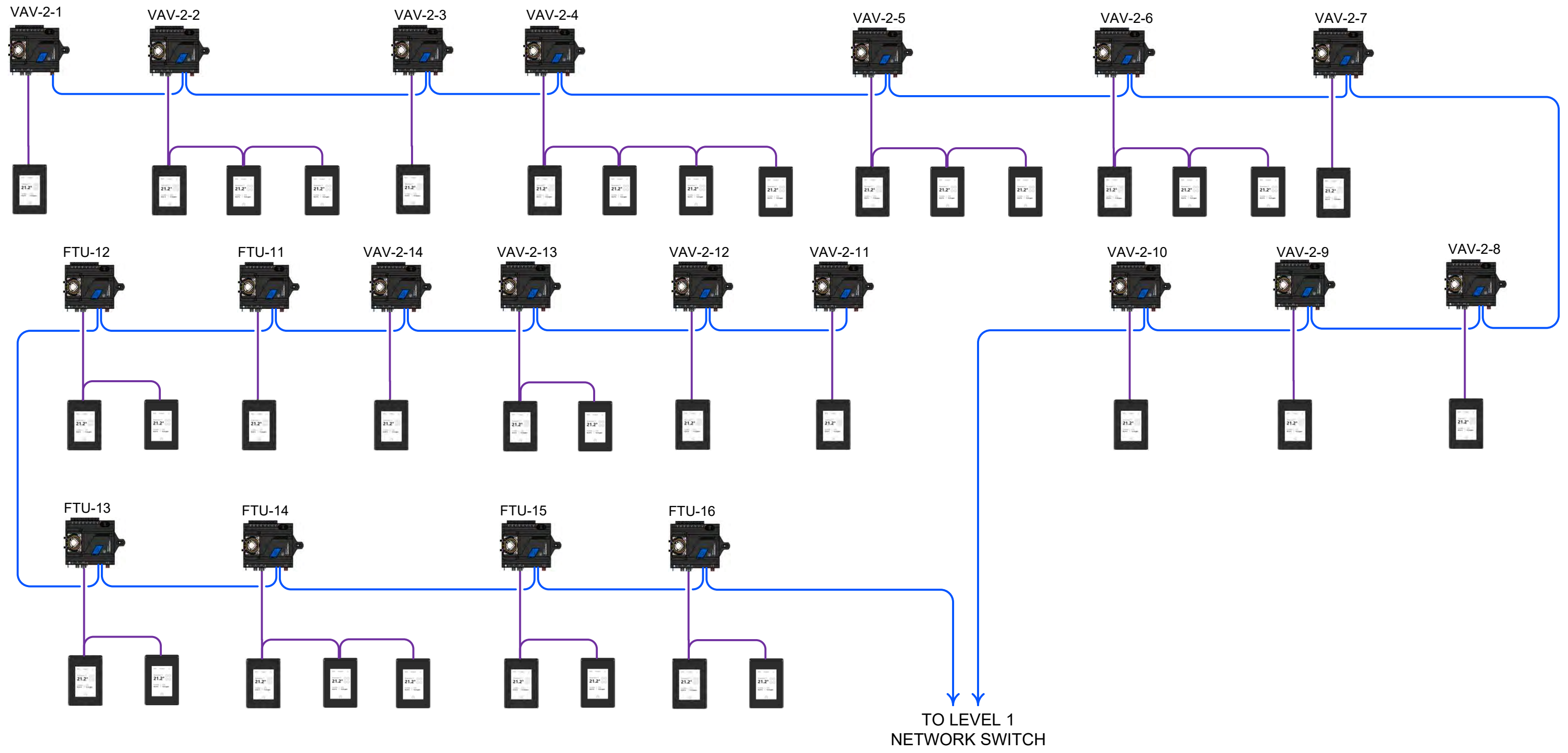
- BACNET MSTP - 22/2C TWISTED RS484, SHIELDED PLENUM RATED COMMUNICATION CABLE
- BACNET IP - CAT 6 ETHERNET CABLE

TO BUILDING NETWORK



3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
LEVEL 1 NETWORK LAYOUT			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

LEVEL 2 NETWORK LAYOUT



TO LEVEL 1 NETWORK SWITCH

Notes:

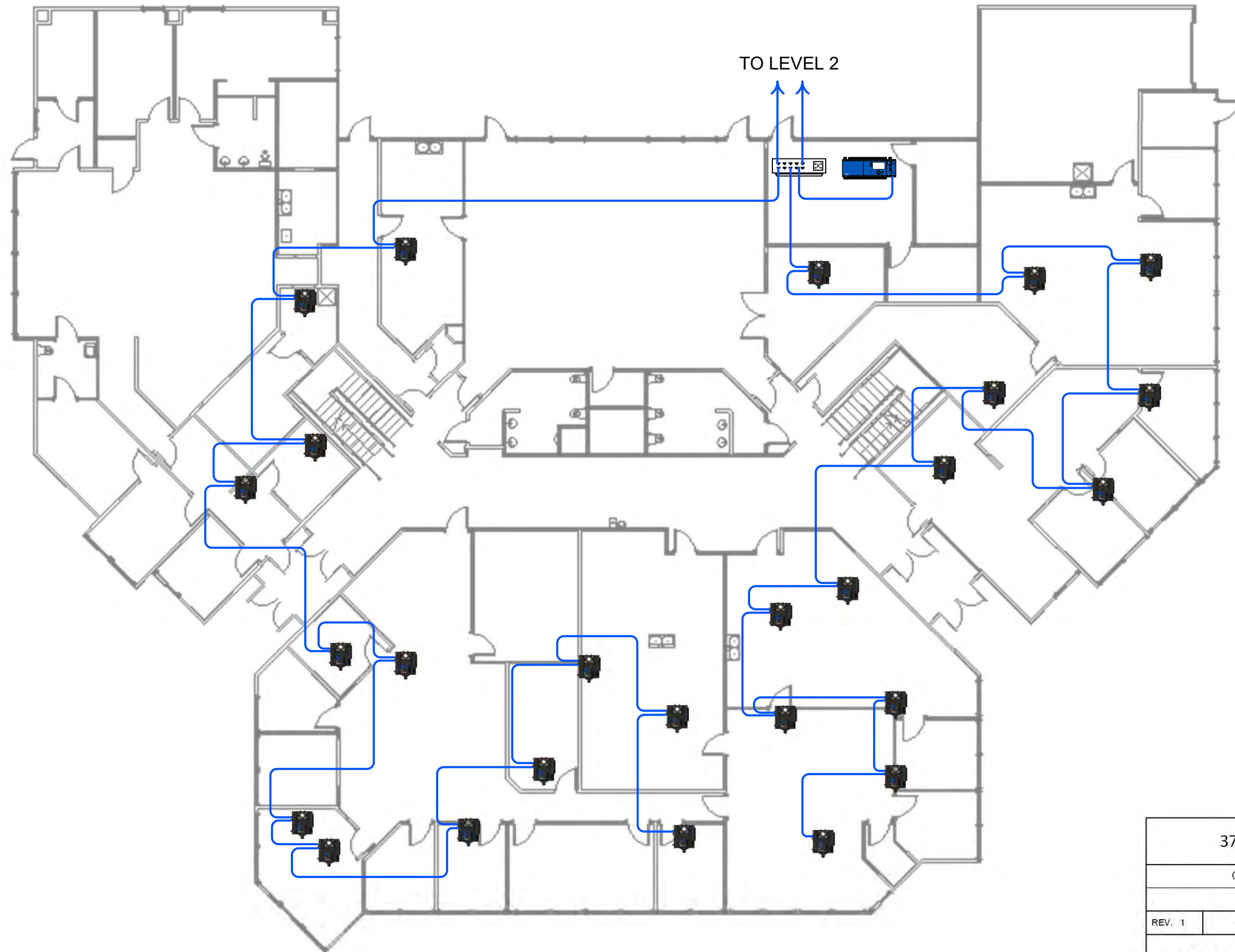
- Network layout is only indicative .

WIRING KEY:

— BACNET MSTP - 22/2C TWISTED RS484, SHIELDED PLENUM RATED COMMUNICATION CABLE
— BACNET IP - CAT 6 ETHERNET CABLE

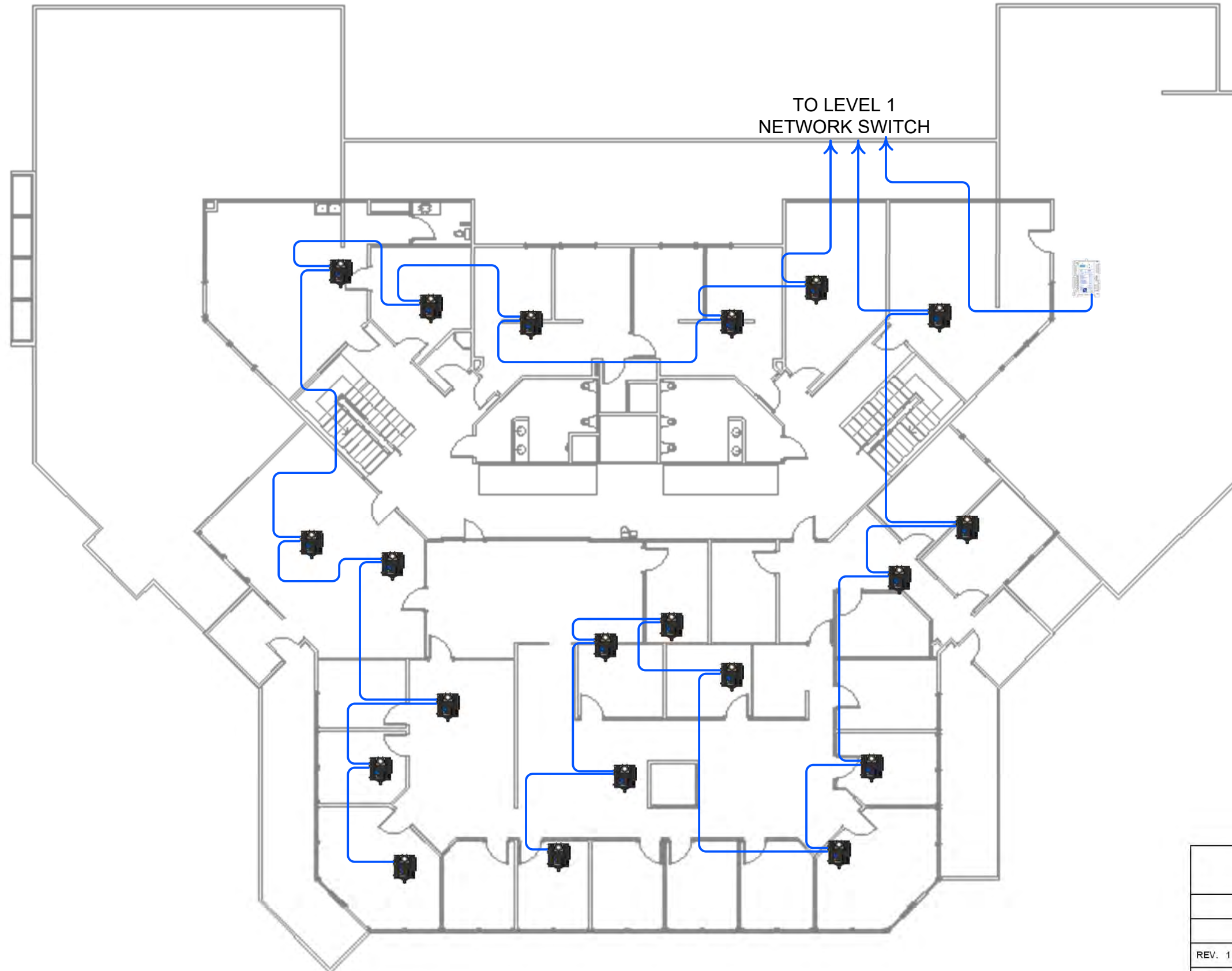
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
LEVEL 2 NETWORK LAYOUT			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
INNOTECH AMERICA			CHECK BY: JP CSA NUMBER: 138654

LEVEL 1 CONTROLLERS



3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
LEVEL 1 CONTROLLERS			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
INNOTECH AMERICA			CHECK BY: JP CSA NUMBER: 138654

LEVEL 2 CONTROLLERS



3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
LEVEL 2 CONTROLLERS			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
INNOTECH AMERICA			CHECK BY: JP CSA NUMBER: 138654

BUILDING AUTOMATION SYSTEM (BAS) – Head End

Platform: Tridium Niagara (Supervisor)

1. System Overview

The Building Automation System (BAS) shall be based on the Tridium Niagara framework, consisting of a networked DDC controllers and a Supervisor-level head end for centralized monitoring, control, trending, and alarming.

The system shall provide full integration and control of the following equipment:

- 28 VAV terminal units
- 16 fan-powered terminal units
- 54 radiant reheat zones
- 1 rooftop unit (RTU)
- Hot water plant:
 - 2 boilers
 - Boiler pumps
 - 2 hot water circulation pumps

2. System Architecture

Field Level: Unit controllers (VAVs, fan boxes, radiant zones, plant equipment) communicating via BACnet MS/TP or BACnet/IP

Supervisory Level:

- Innotech Omni for real-time control and integration
- Tridium Niagara Supervisor (head end) for system-wide interface
- Network: Ethernet TCP/IP backbone connecting Omni to Supervisor

3. Head End (Supervisor) Capabilities

The Niagara Supervisor shall provide:

- Web-based user interface accessible via standard browsers
- Centralized system graphics and navigation
- Alarm management and routing
- Historical data trending and archiving
- Scheduling and calendar functions
- User account management with role-based access
- System-wide setpoint adjustment and override capability

4. Graphics

Custom graphics shall be developed for intuitive system operation, including:

4.1 System Overview Graphics

- Building overview with system status summary
- Navigation links to all subsystems

4.2 Equipment-Level Graphics

- VAV boxes (28 total)
- Fan-powered boxes (16 total)
- Radiant reheat zones (grouped logically by area)
- RTU system graphic
- Boiler plant graphic including:
 - Boilers (2)
 - Boiler pumps
 - Circulation pumps (2)

Each graphic shall display:

- Real-time values (temperature, airflow, status)
- Commandable setpoints (based on user access level)
- Equipment status and alarms

5. Alarming

The BAS shall generate and manage alarms including, but not limited to:

- Equipment failure (fan status, pump status, boiler faults)
- Temperature deviations (high/low limits)
- Communication loss
- Airflow faults (VAV boxes)

Alarm features:

- Alarm prioritization (critical, major, minor)
- Time/date stamping
- Alarm acknowledgment and comments
- Email notification (if configured)

6. Trending

The system shall provide historical trending for key points, including:

- Zone temperatures (VAVs, fan boxes, radiant zones)
- Airflow values
- Valve positions
- Boiler temperatures and statuses
- Pump statuses

Trend data shall be:

- Stored locally at the Supervisor
- Configurable for interval and duration
- Exportable for analysis

7. Scheduling

The Supervisor shall provide:

- Centralized scheduling for occupied/unoccupied modes
- Holiday calendar configuration
- Equipment scheduling (RTU, plant enable/disable)
- Zone group scheduling where applicable

8. User Access

The system shall support multiple user levels:

- Administrator (full access)
- Operator (adjust setpoints, acknowledge alarms)
- Read-only (view only)

User authentication shall be password protected.

9. Integration

The BAS shall utilize open protocols:

- BACnet (primary protocol for field devices)
- Niagara framework for integration and scalability

10. Boiler Plant Control (Summary)

The BAS shall control and monitor:

- Lead/lag boiler rotation
- Boiler enable based on heating demand
- Pump staging and status monitoring
- Hot water supply temperature control

11. VAV and Zone Control (Summary)

VAV boxes: airflow and temperature control

Fan-powered boxes: fan operation and duct reheat control

Radiant zones: independent temperature control via modulating valves

12. Commissioning & Deliverables

The following shall be provided:

- Fully programmed and tested BAS
- Graphics and navigation package
- Alarm and trend configuration
- Operator training
- As-built documentation

3745 Community Park Loop

CONTROL SYSTEMS AMERICA

BUILDING AUTOMATION SYSTEM (BAS) – Head End

REV. 1	DESIGN	4/20/2026	JOB NO: 42199
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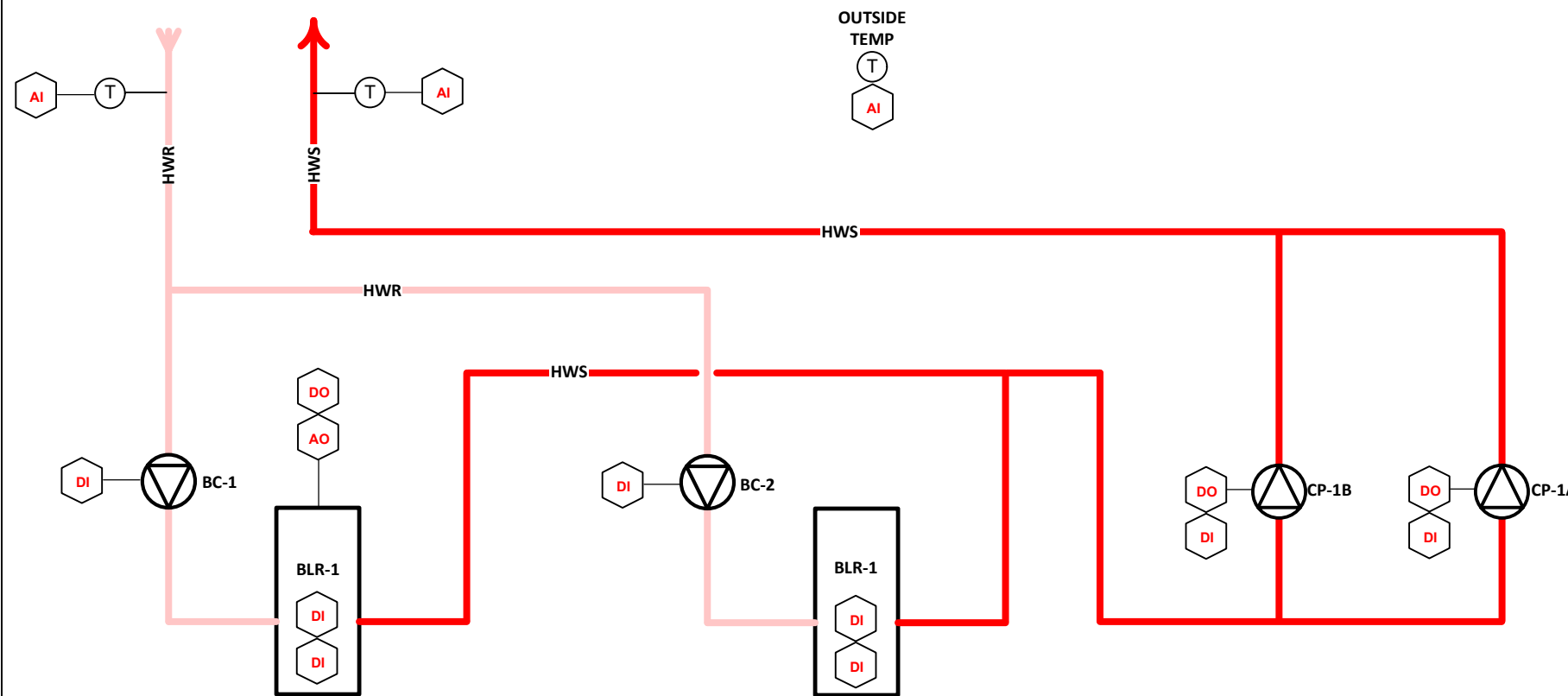
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CSA NUMBER: 138654

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BOILER PLANT



The boilers and building heating pumps shall be enabled when the outside air temperature is at or below 60° F (adjustable).

The boilers (BLR-1 and BLR-2) are equipped with integral controls which allow for communication and cascade operation. The integral boiler controls shall modulate burners and boiler circulating pumps BC-1 and BC-2 to achieve the heating system setpoint. The DDC system shall provide the boiler system enable, heating system setpoint, boiler pump status (on/off indication), and alarm contact monitoring for each boiler. Refer to boiler manufacturer's information for further boiler system operation.

The boilers shall maintain the heating system supply temperature setpoint. The setpoint shall be reset between 130° F and 190° F based on the respective outdoor air temperatures of 60° F to 10° F. Reset limits shall be adjustable on the system graphics.

The heating system pumps (CP-1A and CP-1B) shall operate in a primary/backup configuration when the system is enabled. Pump status shall be monitored to indicate on/off status. If the lead pump fails to prove operation after 30 seconds an alarm condition shall be activated and the lag pump shall be enabled. Pump speed is self-sensing and controlled by the pump manufacturer.

ALARMS

1. BLR-1 and BLR-2 alarm status via relay contact
2. CP-1A and CP-1B status; activate alarm if pump status does not activate 30 seconds after an enable
3. Heating System Supply Temperature; activate alarm if temperature is $\geq 20^{\circ}$ F less than setpoint for 10 minutes
4. Boiler Room Temperature; activate if temperature drops below 55° F

ROOF TOP UNIT (RTU-1)

The rooftop unit shall be equipped with factory controls capable of BACnet integration for monitoring and supervision by the DDC. Refer to the AAOB Controller Sequence of Operations – RN Series for specific details.

The DDC system shall enable RTU-1 based on the occupied/unoccupied schedule via the Schedule Force AV:67, 1=Occupied, 2=Unoccupied. Upon Occupied enable the RTU factory controls will determine and execute morning warmup based on the parameters set within the RTU controls. Otherwise, the unit shall operate in Cooling Mode.

The DDC system shall determine the supply air setpoint. The setpoint shall be reset between 55° F and 65° F based on the respective outdoor air temperatures of 70° F and 45° F. Reset limits shall be adjustable on the system graphics. The RTU factory controls will maintain the supply air temperature based on factory controls.

The DDC system shall provide the following adjustable static settings via BACnet AV:

1. Warmup-Up Mode Supply Air Setpoint (AV:17) adjustable; initial set at 100° F
2. Mechanical Cooling Outdoor Air Lockout (AV:19) adjustable; initial at 55° F
3. Economizer Enable Setpoint (AV:27) adjustable; initial set at 65° F
4. Minimum Economizer Position (AV:49) adjustable; initial set at 20%
5. Duct Static Pressure Setpoint (AV:55) adjustable; initial set at 1.00" wg
6. Building Pressure Control Setpoint (AV:57) adjustable; initial set at .05" wg

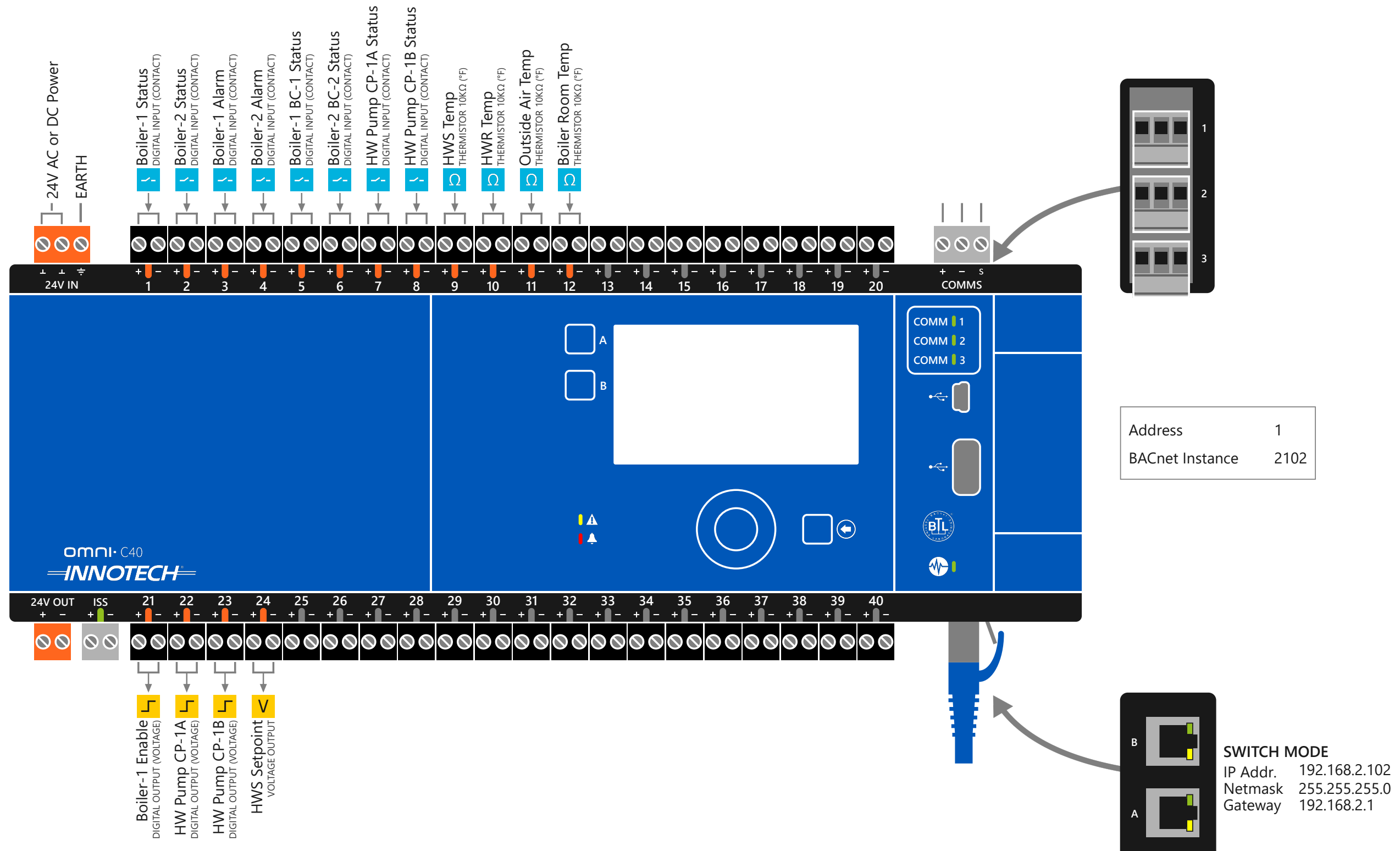
Additional BACnet points will be monitored as indicated in the points list. All safety functions are provided by the factory controls.

ALARMS

The following BI alarm points shall be monitored by the DDC and reflected on the graphics:

1. Mechanical Cooling Alarm; BI: 22
2. Mechanical Heating Alarm; BI: 23
3. Fan Proving Alarm; BI: 24
4. Emergency Shutdown Alarm; BI: 26
5. High Supply Temp Cutoff; BI 34
6. Low Supply Temp Cutoff; BI: 35

3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
PLANT			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654



OMNI C40D FIRMWARE V3.14

RTU SEQUENCE OF OPERATION- Page 1

Supply Fan Operation

- A. Anytime the Supply Fan is requested to start, a 1 minute minimum off timer must be satisfied. If the timer is satisfied, the Supply Fan relay is activated while all other outputs are held off until their minimum off timers have been met.
- B. Upon going into the Occupied Mode or upon power-up, the controller will initiate a user-adjustable Fan Starting Delay to provide a staggered start for systems with several HVAC units.
- C. In Fan Cycle Mode or when going unoccupied, the Supply Fan is held on for 10 seconds after Cooling has staged off or after Leaving Vent mode and 90 seconds after the Heating has staged off.

Purge Mode

- A. When going into Occupied Mode, an optional "Purge Mode" is initiated. The fan runs with the Economizer closed, and all Cooling and Heating is de-energized. The length of the Purge Mode is user-adjustable.

Occupied Mode

- A. The Supply Fan can be configured to run continuously (default) or to cycle with the following modes:
 1. [RTU_1] Cooling Mode
 2. [RTU_1] Heating Mode

Unoccupied Mode

- A. Upon going Unoccupied, the Cooling or Heating will turn off immediately. The Fan will then turn off in 30 to 60 seconds. Typically, thereafter, the Supply Fan will cycle on a call for Heating, Cooling, or Dehumidification. The Supply Fan can also be configured for continuous operation during Unoccupied Mode.

HVAC Source

Configuration Options

- A. The VCCX2 Controller can be configured to have various HVAC Source options that will determine the mode of operation (Heating, Cooling, or Vent Mode) of the unit. The available options are:
 1. [RTU_1] Supply Air Temperature—Selected for Cooling Only VAV units with optional Morning Warm-Up/Cool-Down.
 2. [RTU_1] Supply Air Tempering—Selected for VAV units maintaining a Cooling Setpoint with Cooling or Heating as required that may need Heat to temper the Supply Air Temperature during very cold conditions.

Occupied/Unoccupied

Mode of Operation

- A. The VCCX2 Controller can utilize the following methods for determining the Occupied Mode of Operation:

Forced Schedule

- A. The VCCX2 Controller can be forced into the Occupied Mode by inputting a Forced Schedule from any operator interface.

Internal Week Schedule

- A. An Internal Week Schedule, which supports up to two start/stop events per day and allows scheduling of up to 14 holiday periods per year is available for determining Occupied and Unoccupied Schedules. It also allows for daylight savings configuration.

Push-Button Override Signal

- A. If the unit has a space sensor with a push-button override and the unit is currently in the Unoccupied Mode, then pushing the override button will put the controller back into the Occupied Mode until the override timer expires or the button is depressed again to cancel the override.

Unoccupied Operation

- A. Uses Unoccupied Setback Offset Setpoints for heating and cooling calls. If Unoccupied Setback Setpoints are left at the default 30°F, no Unoccupied Setback operation will occur and the unit will be off. The Outdoor Air Damper will be closed except if the unit is in unoccupied Economizer Free Cooling Mode. If there is no call for Heating or Cooling, the unit will be off.

HVAC Modes

Modes of Operation

- A. The possible HVAC Modes of Operation are:

1. [RTU_1] Cooling Mode
2. [RTU_1] Heating Mode
3. [RTU_1] Vent Mode
4. [RTU_1] Purge Mode
5. [RTU_1] Warm-Up Mode / Cool-Down Mode
6. [RTU_1] Off Mode

Cooling

Cooling Mode

- A. Occupied Cooling is enabled when the temperature at the Mode Enable Sensor rises one deadband above the Cooling Setpoint. Cooling is disabled when the Mode Enable temperature falls one deadband below the Cooling Setpoint. The setpoint and deadband are user-adjustable.
- B. Unoccupied Cooling operation is enabled when the Space Temperature rises above the Cooling Mode Enable Setpoint plus the Unoccupied Cooling Offset.
- C. Mechanical cooling is disabled if the Outdoor Air Temperature (OAT) falls 1° below the Cooling Lockout Setpoint and will remain disabled until the OAT rises 1° above the Cooling Lockout Setpoint. If the OAT disables mechanical cooling while it is currently operating, mechanical cooling will stage off as minimum run times and stage down delays are satisfied.
- D. [RTU_1] The economizer will function as the first stage of cooling (see Economizer section).

Cooling with Refrigerant System Modules (RSMs)


Economizer Operation

Standard Economizer

- A. [RTU_1] Sensible Economizer operation is enabled when the Outdoor Air (OA) drybulb temperature falls below the Economizer Enable Setpoint by 1°F. Economizer operation is disabled when the OA temperature rises 1°F above the Economizer Enable Setpoint.
- B. Economizer operation is disabled when the OA temperature rises 1°F above the Economizer Enable Setpoint.
- C. The Economizer acts as the 1st stage of cooling and controls to the Active Supply Air Cooling Setpoint. An Economizer Minimum Position can be programmed into the controller.
- D. [RTU_1] During Economizer Operation, the economizer will modulate between the minimum position and 100%.
- E. [RTU_1] If the economizer reaches 100% and the Supply Air Temperature is still above setpoint, mechanical cooling is then allowed to stage up while the economizer is held at the full open position. Any time cooling stages are currently running, and the economizer becomes enabled, it will immediately open to 100%.
- F. [RTU_1] During Heat and Vent Modes, the Economizer will remain at its minimum position. During Unoccupied Mode, the Economizer can be used for night setback free cooling; otherwise it will remain closed.

Heating

- A. Heating option selected is Staged Gas.
- B. [RTU_1] Heating option selected is Modulating Gas.
- C. Heating option selected is Steam Coil.
- D. Heating is enabled when the temperature at the Mode Enable Sensor falls one deadband below the Heating Setpoint. Heating is disabled when the Mode Enable temperature raises one deadband above the Heating Setpoint.
 1. Each stage must meet its Minimum Off Time (adj.) before it is allowed to energize, and successive stages are subject to a Heating Stage Up Delay (adj).
- E. Mechanical heating is disabled if the Outdoor Air Temperature (OAT) rises 1° above the Heating Lockout Setpoint and will remain disabled until the OAT falls 1° below the Heating Lockout Setpoint. If the OAT disables mechanical heating while it is currently operating, mechanical heating will stage off as minimum run times and stage down delays are satisfied.

3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
RTU SEQUENCE OF OPERATION- Page 1			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

RTU SEQUENCE OF OPERATION- Page 2

Modulating Heating

- A. [RTU_1] Modulating gas heat uses an additional module, MODGAS, to control the heat output rate. This module communicates with the VCCX2 controller through the E-BUS connection. See the appropriate MODGAS manual for more information.
- B. [RTU_1] Modulating heat is controlled with a user-adjustable voltage range between 0-10 VDC. The VCCX2 will modulate the Heat Source to achieve the Active Supply Air Temperature Setpoint.
- C. The Modulating Heating Proportional Window is used to determine the signal to the Modulating Heating Source and is user-adjustable. The Modulating Heating Signal is calculated by the differential between the Supply Air Temperature and the Active Supply Air Temperature Setpoint based on the Modulating Heating Proportional Window. The maximum signal adjustment per Time Period is 10% and is not user-adjustable. The minimum signal adjustment per Time Period is based on the Modulating Heating Proportional Window. The larger the Modulating Heating Proportional Window, the smaller the signal adjustment will be per Time Period. The Time Period is the delay between another increase or decrease in the Modulating Heating source signal and is user-adjustable.
- D. For example, if the Modulating Heating Proportional Window is 5°F, the signal will be adjusted 2% per °F each Time Period above or below the Active Supply Air Temperature Setpoint. When the Supply Air Temperature is above or below the Active Supply Air Temperature Setpoint by 5°F or more, the signal will adjust 10% each Time Period.

Ventilation Mode Operation

- A. This mode occurs in the Occupied Mode of operation on units configured for continuous Supply Fan operation and is generated anytime there is no demand for heating or cooling. The fan will operate at the configured Minimum Vent speed.

Off Mode Operation

- A. Off Mode occurs in the Unoccupied Mode when there is no heating or cooling demand. The Supply Fan is off and the outside air damper is closed.
- B. Off Mode can only occur in the Occupied Mode if the fan is configured to cycle with heating and cooling and there is no call for heating or cooling.

Space Sensor Operation

- A. [RTU_1] The space sensor used is the Space Sensor with Override and Slide Adjust.
- B. [RTU_1] Sensors with Setpoint Slide Adjust can be programmed to allow Space Setpoint adjustment of up to +/- 10 degrees Fahrenheit.
- C. [RTU_1] If the Space Temperature is the SAT/Reset Source, then the Slide Adjust will adjust the HVAC Mode Enable Setpoints and the SAT/Reset Source Setpoints simultaneously.
- D. [RTU_1] During Unoccupied hours, the Override Button can be used to force the unit back into the Occupied Mode (by pressing the button for less than 3 seconds) for a user-defined override duration of up to 8.0 hours. Pressing the button between 3 to 10 seconds cancels the override.

Morning Warm-Up Mode of Operation

- A. [RTU_1] When the VCCX2 Controller switches to the Occupied Mode of Operation (not Override or a Forced Mode from an Operator Interface Device), the unit compares the Return Air Temperature to a Morning Warm-Up Target Temperature. If the Return Air Temperature is below this Setpoint, the Warm-Up Mode is initiated. Heating will then be controlled to the Warm-Up Supply Air Temperature Setpoint.
- B. [RTU_1] This Mode remains in effect until the Return Air Temperature rises above the Target Temperature or a user-adjustable Time Period expires. Warm-Up Mode is not initiated by Push-Button Overrides or Unoccupied Heating demands. The Outdoor Air Damper remains closed during Warm-Up Mode.
- C. [RTU_1] Once the Warm-Up Mode has been terminated, it cannot resume until the unit has been through a subsequent Unoccupied Mode. Only one Warm-Up Mode is allowed per Occupied cycle.
- D. [RTU_1] For VAV boxes that need to be forced wide open during the Warm-Up Mode, you can configure one of the relay outputs to be used during this Mode. If the Warm-Up Mode is active, the relay is activated. This relay then becomes the Force Open Command for all VAV boxes to which it is wired.

Morning Cool-Down

Mode of Operation

- A. [RTU_1] When the VCCX2 Controller switches to the Occupied Mode of Operation (not Override or a Forced Mode from an Operator Interface Device), the unit compares the Return Air Temperature to a Morning Cool-Down Target Temperature. If the Return Air Temperature is above this Setpoint, the Cool-Down Mode is initiated. Cooling will then be controlled to the Cool-Down Supply Air Temperature Setpoint.
- B. [RTU_1] This Mode remains in effect until the Return Air Temperature drops below the Target Temperature or a user-adjustable Time Period expires. Cool-Down is not initiated by Push-Button Overrides or Unoccupied Cooling demands. The Outdoor Air Damper remains closed during Cool-Down Mode.
- C. [RTU_1] Once the Cool-Down Mode has been terminated, it cannot resume until the unit has been through a subsequent Unoccupied Mode. Only one Cool-Down Mode is allowed per Occupied cycle.
- D. [RTU_1] For VAV boxes that need to be forced wide open during the Cool-Down Mode, you can configure one of the relay outputs to be used during this Mode. If the Cool-Down Mode is active, the relay is activated. This relay then becomes the Force Open Command for all VAV boxes to which it is wired.


Supply Air Temperature Setpoint Reset Operation

- A. Various sources can be configured to reset the Supply Air Temperature (SAT) Setpoint. Since the Supply Air Temperature Setpoints are not fixed during reset, we refer to them as "Active Supply Air Temperature Setpoints."
- B. The following Reset Source options are available in this release:
 - 1. [RTU_1] Space Temperature
 - 2. [RTU_1] Outdoor Air Temperature
 - 3. [RTU_1] Return Air Temperature
 - 4. [RTU_1] Fan VFD Signal
 - 5. [RTU_1] Remote SAT Reset Signal
- C. For whatever option is selected, a High and a Low Reset Source Setpoint must be configured that will correspond to configured Low and High SAT Setpoints. This must be done separately for the Cooling Mode Setpoints and for the Heating Mode Setpoints.
- D. When the Reset Source is at its highest configured setpoint, the SAT Setpoint will be reset to its lowest configured setpoint. When the Reset Source is at its lowest configured setpoint, the SAT Setpoint will be reset to its highest configured setpoint.
- E. In all cases, as the Reset Source value moves within its range established by the configured High and Low Reset Setpoints, the Supply Air Setpoint will be proportionally reset within its range established by the configured Low and High SAT Setpoints.
- F. If a Remote SAT Reset Signal is configured as the Reset Source, a configurable voltage signal (between 0 and 10 VDC, direct or reverse acting) can be used to reset the Supply Air Temperature Setpoint. You can configure what voltage will correspond to the Low SAT Setpoint and what voltage will correspond to the High SAT Setpoint in both the Heating and the Cooling Modes.

Duct Static Pressure Control

[RTU_1] Operation

- A. If the VCCX2 Controller has been configured for Duct Static Pressure Control, then anytime the Supply Fan is operating, the unit will be controlling to a Duct Static Pressure Setpoint. The Static Pressure Control Output Signal can be used to control a Supply Fan VFD (Direct Acting Operation).
- B. The Duct Static Pressure Setpoint, the Setpoint Deadband, the Static Pressure Control Signal, and the Static Control Rate are all user-adjustable. The Static Control Rate is the amount of time that elapses between each adjustment to the Duct Static Pressure Control Output Signal. The default period is 10 seconds and should not be changed unless close observation reveals that the Supply Fan or Bypass Damper is hunting and not maintaining a stable pressure reading.

3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
RTU SEQUENCE OF OPERATION- Page 2			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

RTU SEQUENCE OF OPERATION- Page 3

- C. During Supply Fan VFD operation, the Output Signal increases (increases the VFD speed) if the Duct Static Pressure is below the Duct Static Pressure Setpoint by the Deadband amount, and the Output Signal decreases (decreases VFD Speed) if the Static Pressure is above the Setpoint by the Deadband amount.
- D. If the Static Pressure ever rises 0.5" above the Duct Static Pressure Setpoint, the Duct Static Pressure Control Output Signal will be cut in half every control period until the Static Pressure is brought under control. This is to prevent damage to the ductwork if all the VAV boxes are closed or some other blockage occurs in the ductwork.
- E. WARNING: The manufacturer does not assume responsibility for protecting the equipment from over-pressurization! You should always install mechanical high static protection cutoffs to protect your system!
- F. Any time the Supply Fan is off, the Duct Static Pressure Control Output Signal will remain at zero volts. If Duct Static Pressure Control is not configured, the Static Pressure can still be monitored if a Static Sensor is installed, however, no control will occur.

Duct Static Setpoint Reset

- A. If the VCCX2 Controller is being used with AAON VAV box controllers in a VAV system, the Duct Static Pressure Setpoint can be dynamically reset based on the most-open VAV box associated with that unit. As long as the most-open box is less than 80% open, the Duct Static Setpoint will be reset downward at a user-adjustable Reset Rate from the Max Static Pressure Reset Limit Setpoint down to the Minimum Static Pressure Reset Limit. Once the most-open box exceeds 80%, the setpoint will begin to be reset back up toward the Maximum Static Pressure Reset Limit Setpoint. A MiniLink PD 5 is required in order to poll the VAV boxes for their damper position.

Building Pressure Control

Operation

- A. The VCCX2 can maintain Building Static Pressure anytime the Supply Fan is operating. A Building Pressure Transducer must be connected to the VCCX2 Controller. The following are the available control options.

Direct Acting Building Pressure Control

- A. [RTU_1] Modulating Exhaust Fan
 - 1. For a Modulating Exhaust Fan, a user-adjustable voltage output will be used to control the Exhaust Fan. An Exhaust Relay is configured to enable the fan.
 - 2. Whenever the Building Pressure rises above the Building Pressure Setpoint by the Deadband amount, the Exhaust Fan Relay will energize and the Modulating Signal will activate to control to the Building Pressure Setpoint.
 - 3. If the Building Pressure falls below the Building Pressure Setpoint by the Deadband amount, the Modulating Signal will modulate towards 0% as it attempts to maintain the Building Pressure Setpoint.
 - 4. The Exhaust Fan Relay is energized whenever the Modulating Signal is above 0%.

Head Pressure Control

Operation

- A. [RTU_1] The Refrigerant System Module (RSM) monitors a Head Pressure Transducer and controls the Condenser Fan to maintain a Head Pressure Setpoint.
- B. [RTU_1] In Cooling Mode, the Condenser Signal will modulate to maintain the Cooling Head Pressure Setpoint.
- C. [RTU_1] See the appropriate RSM Technical Guide for a more detailed sequence of operation.

Temperature Protection

Operation

- A. Temperature Protection is activated when the Supply Air Temperature (SAT) rises above the High Cutoff Temperature (immediate) or drops below the Low Cutoff Temperature (for 10 minutes). Both cutoff setpoints are user-adjustable. A Low Supply Air Cutoff will shut the unit off. A High Supply Air Cutoff will disable heating but leave the supply fan on.
- B. This mode is cancelled when the SAT drops 5 degrees below the High Cutoff Temperature Setpoint or rises 5 degrees above the Low Temp Cutoff Temperature Setpoint or when the unit changes back into Occupied Operation.

Outdoor Air Lockouts

Operation

- A. [RTU_1] The compressors are disabled during Cooling Mode when the Outdoor Air Temperature is below the Compressor Cooling Lockout Setpoint.
- B. [RTU_1] Mechanical heating is disabled when the Outdoor Air Temperature is above the Heating Lockout Setpoint.

System Broadcasts

Configuration

- A. You can configure the VCCX2 Controller to broadcast the following sensor readings to any VCCX2 Controller that does not have one or more of these sensors.
 - 1. [RTU_1] Building Pressure
 - 2. [RTU_1] Outdoor Air Temperature
 - 3. [RTU_1] Space Temperature
- B. A CommLink 5 or MiniLink PD 5 is required to broadcast these values.

Alarms

Detection and Reporting

- A. The VCCX2 Controller continuously performs self-diagnostics during normal operation to determine if any operating failures have occurred.
- B. These failures (alarms) can be reported to a Touch Screen System Manager, a Hand Held Modular Service Tool, or to a computer running Prism 2 software.
- C. The following are the available alarm designations for the VCCX2 Controller:
 - 1. [RTU_1] Bad SAT Sensor
 - 2. [RTU_1] Bad RAT Sensor
 - 3. [RTU_1] Bad OAT Sensor
 - 4. [RTU_1] Bad Space Sensor
 - 5. [RTU_1] Mechanical Cooling Failure
 - 6. [RTU_1] Mechanical Heating Failure
 - 7. [RTU_1] Fan Proving Alarm
 - 8. [RTU_1] Emergency Shutdown
 - 9. [RTU_1] Relay Runtime
 - 10. [RTU_1] High Supply Air Temperature Cutoff
 - 11. [RTU_1] Low Supply Air Temperature Cutoff
 - 12. [RTU_1] Missing MODGAS Module

Sensor Failure Alarms

[RTU_1] Supply Air Temperature Sensor Alarm

- A. The Supply Air Temperature Sensor Failure Alarm is generated when the controller detects an open or short circuit on the Supply Air Temperature Sensor input. Once the alarm is generated, the unit will completely shut down. If a sensor is properly detected after the unit has alarmed, the alarm will be cleared and the unit will restart operations.

[RTU_1] Space Temperature Sensor Failure


- A. When the Space Sensor is configured as the Controlling Sensor (Mode Enable Sensor) or as the Reset Sensor, and if the controller detects an open or short circuit on the Space Sensor input, then a Space Temperature Sensor Failure Alarm is generated.
- B. When the Space Sensor is configured as the Controlling Sensor and the Failure Alarm is generated, the unit will shut down.
- C. When the Space Sensor is configured as a Reset Sensor only and the Failure Alarm is generated, the Space Temperature will default to a value half way between the Heating and Cooling Mode Enable Setpoints, and the unit will continue to run.

[RTU_1] Outdoor Air Temperature Sensor Failure Alarm

- A. The Outdoor Air Temperature Sensor Failure Alarm is generated when the controller detects an open or short circuit on the Outdoor Air Temperature Sensor input. When this occurs, the Outdoor Air reading will be artificially set to the half point of between the Cooling and Heating Lockout Setpoints. This will allow the cooling and the heating to continue operating.

[RTU_1] Return Air Sensor Failure Alarm

- A. This alarm is generated if the controller does not detect the Return Air Temperature Sensor.

3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
RTU SEQUENCE OF OPERATION- Page 3			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP CSA NUMBER: 138654

RTU SEQUENCE OF OPERATION- Page 4

Missing Expansion Module Alarm

- A. The alarms that can occur from missing modules are:
1. [RTU_1] ModGas Board Missing
- B. If the controller is configured to have any of the above Expansion Boards (Modules), but the controller does not detect that board, then the applicable alarm will occur. If the board is properly detected after the unit has alarmed, the alarm will be cleared.

Mechanical Failure Alarms

Mechanical Cooling Failure

Mechanical Heating Failure

- A. [RTU_1] The Mechanical Heating Failure Alarm is generated if the Supply Air Temperature fails to rise 5 degrees (within a user-adjustable time period) from the temperature the supply air was at when the heating was activated and the Supply Air Temperature is not within 5 degrees of Setpoint. The alarm will be cleared when the Supply Air Temperature rises the 5 degrees and sets the failure timer back to zero.

Proof of Flow Interlock Alarm

- A. [RTU_1] A Proof of Flow switch provides a 24 VAC wet contact closure when the Supply Fan is operating. If this contact opens while the fan is being called to run, all heating and cooling is disabled and a Fan Proving Alarm is generated.
- B. [RTU_1] The Outdoor Air Damper will close if the Proof of Flow contact opens.
- C. [RTU_1] Fan Proving needs to be configured for this alarm to occur.

Emergency Shutdown Alarm

- A. A 24 VAC wet contact input is used for the following N.C. safety devices:
1. [RTU_1] Supply Fan VFD Fault Relay
 2. [RTU_1] Return Air Smoke Detector
 3. [RTU_1] Phase Brown Out Monitor
- B. If this contact opens, it will initiate shutdown of the VCCX2 and will generate an alarm condition. If an Occupied relay is configured, it will remain energized.

Failure Mode Alarms

[RTU_1] High Supply Air Temperature Alarm

- A. If the Supply Air Temperature rises above the user-adjustable High Supply Air Temperature Cutoff Setpoint, heating will be immediately deactivated, and a High Supply Air Temperature Cutoff Alarm will be generated. The fan will continue to run. This mode and alarm will be cancelled if the Supply Air Temperature falls below the High Supply Air Temperature Cutoff Setpoint by 5 degrees.

[RTU_1] Low Supply Air Temperature Alarm

- A. If the Supply Air Temperature falls below the user-adjustable Low Supply Air Temperature Cutoff Setpoint, all mechanical cooling will be immediately deactivated. If, after 10 minutes, the Supply Air Temperature is still below this setpoint, the fan will be deactivated, the outside air damper will close, and a Low Supply Air Temperature Cutoff Alarm will be generated. This mode and alarm will be cancelled if the Supply Air Temperature rises above the Low Supply Air Temperature Cutoff Setpoint by 5 degrees.

High and Low Control Temp Failure

- A. [RTU_1] When the Space Temperature rises above the Cooling Mode Enable Setpoint plus the Control Mode High Alarm Offset setpoint for 30 seconds, the controller will generate a High Control Temp Failure Alarm.
- B. [RTU_1] When the Space Temperature drops below the Heating Mode Enable Setpoint minus the Control Mode Low Alarm Offset setpoint for 30 seconds, the controller will generate a Low Control Temp Failure Alarm.
- C. [RTU_1] Both offset setpoints are user-adjustable.

Trend Logging

Operation

- A. The VCCX2 Controller continuously maintains an Internal Trend Log in memory which records a fixed set of values at a user-defined interval.
- B. 120 log positions (timed intervals are available on the controller. Once these positions are full, the controller begins overwriting the oldest data.
- C. Values can be retrieved using the Prism 2 software program. With Prism 2 running continuously, values can be saved to the computer hard drive at regular intervals to from losing data.

VCCX2 Controller Trend Logs


- A. The following are the fixed items that are able to be logged for each unit;
1. [RTU_1] Date
 2. [RTU_1] Time
 3. [RTU_1] Mode of Operation (Occupied / Override / Unoccupied)

4. [RTU_1] HVAC Mode
 5. [RTU_1] Space Temperature
 6. [RTU_1] Mode Cooling Setpoint
 7. [RTU_1] Mode Heating Setpoint
 8. [RTU_1] Supply Air Temperature
 9. [RTU_1] Supply Air Setpoint
 10. [RTU_1] Coil Temperature Setpoint
 11. [RTU_1] Return Air Temperature
 12. [RTU_1] Outdoor Air Temperature
 13. [RTU_1] Building Pressure
 14. [RTU_1] Duct Static Pressure
 15. [RTU_1] MODGAS Valve Position
 16. [RTU_1] Main Fan Speed VFD Signal
 17. [RTU_1] Economizer Position
 18. [RTU_1] Modulating Heat Signal
 19. [RTU_1] Building Pressure Relief VFD Signal
 20. [RTU_1] Missing Module Alarms
 21. [RTU_1] Temperature Limit Alarms
 22. [RTU_1] Mechanical Alarms
1. [RTU_1] Sensor Alarms
 2. [RTU_1] Binary Inputs
 3. [RTU_1] Relays Status

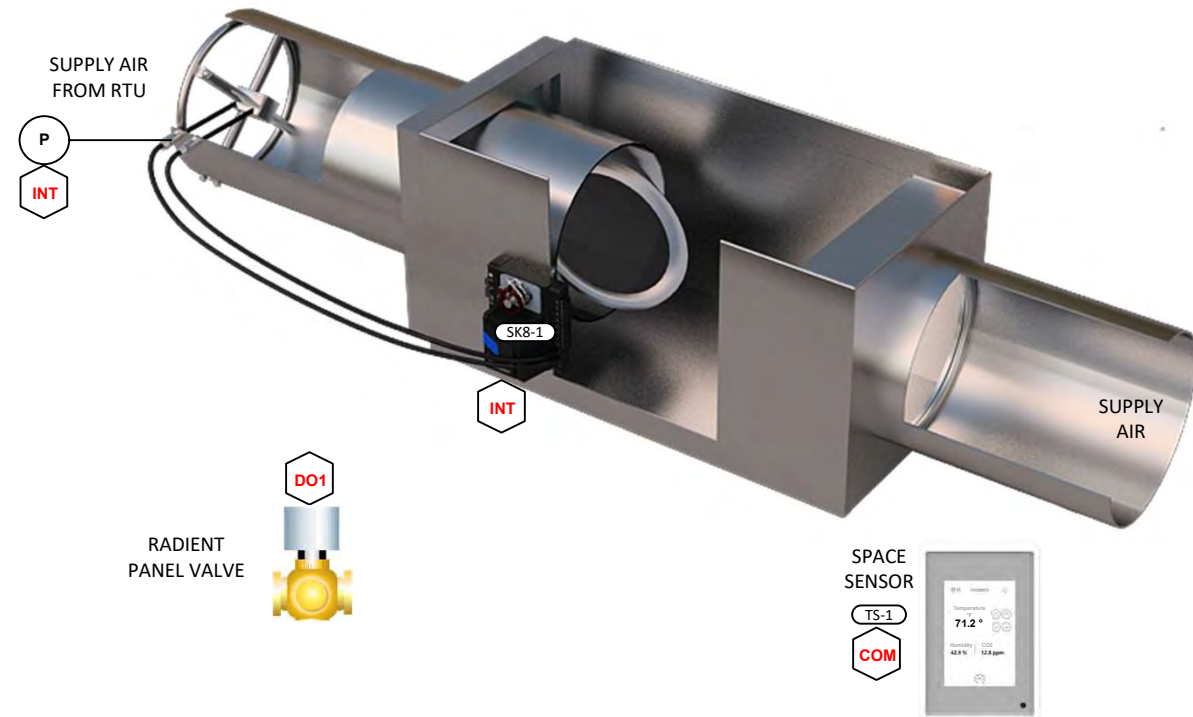
Additional Field Configurable Options

[RTU_1] VAV Operation with Supply Air Tempering (VAV Operation with Outdoor Air Temperature Control)

- A. On a VAV unit that may need daytime heating in order to maintain the Cooling Supply Air Setpoint, previous controllers used a Supply Air Tempering sequence with the Supply Air Temperature Sensor configured as the Controlling Sensor. The VCCX2 Controller accomplishes the same result using the Hood-On Outdoor Air (OA) Setpoints to initiate Cooling and Heating.
- B. To utilize this sequence, the HVAC Mode Enable Source must be configured as Supply Air Tempering. Then, configure the Hood On HVAC Setpoints for the OA temperature values that will enable Cooling and Heating. The Hood On Heating Setpoint should be set at or above the OA Temperature, that when mixed with the Return Air (with the economizer at its minimum position), will require Heating in order to achieve the Heating Supply Air Setpoint. The Hood On Cooling Setpoint would be set above that, which will allow a Vent Mode in between.
- C. Then, configure the Cooling and Heating Supply Air Setpoints. While not set at the same value (see below), those would normally both be set at or near 55°F to allow the box heat to keep spaces comfortable.
- D. With this configuration, as the OA Temperature rises above the Hood On Cooling Setpoint, the unit will be in Cooling Mode, controlling to the Cooling Supply Air Setpoint. The economizer can operate as normal for free cooling to maintain the Cooling Supply Air Setpoint.
- E. During the Vent Mode, when the OA Temperature is between the Hood On Cooling and Heating Setpoints, the economizer can modulate if necessary to maintain the Cooling Supply Air Setpoint.
- F. Whenever the OA Temperature falls below the Hood On Heating Setpoint, the unit will be in Heating Mode controlling to the Heating Supply Air Setpoint. The Economizer can still modulate during Heating Mode if the Supply Air Temperature is too warm, and it will control to a setpoint calculated to be 2° above the Heating Supply Air Setpoint. In this way, the Economizer will have time to close to its minimum position before the Supply Air Temperature falls below the Heating Supply Air Setpoint and Heating is initiated. During Morning Warm-Up, heating will be controlled to the Morning Warm-Up Supply Air Setpoint (see the Morning Warm-Up/Cool-Down Mode Operation section for complete details). In this operation, if Night Setback operation will be initiated by a space sensor connected to the VCCX2 Controller, then the Night Setback Cooling and Heating Offsets will be applied to the normal Occupied HVAC Mode Enable
- G. Setpoints (not the Hood On Setpoints).
During Night Setback operation, Heating will be controlled to the Morning Warm-Up Supply Air Setpoint.
- H. Finally, configure the VCCX2 for Duct Static Pressure Control (see the Duct Static Pressure Control section for complete details).

3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
RTU SEQUENCE OF OPERATION- Page 4			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL VAV SEQUENCE



1. General

This sequence controls a single VAV terminal unit with:

- Modulating primary air damper
- Airflow measurement (CFM)
- Zone temperature sensor
- Radiant reheat system (control valve)

The system maintains zone temperature using cooling via primary air and heating via radiant reheat, minimizing simultaneous heating and cooling.

2. Occupied Mode

2.1 Cooling Operation

When Zone Temp > Cooling Setpoint:

- VAV damper modulates between minimum airflow and maximum cooling airflow
- Control loop maintains zone temperature at cooling setpoint
- Radiant heating valve = 0% (closed)

2.2 Deadband Operation

When Zone Temp is between Heating and Cooling Setpoints:

- VAV damper maintains minimum airflow
- Radiant valve = 0%
- No active heating or cooling

2.3 Heating Operation (Radiant Priority)

When Zone Temp < Heating Setpoint:

- VAV damper remains at minimum airflow
- Radiant valve opens/closes to maintain heating setpoint
- Primary air is not used for heating

3. Radiant System Control

Radiant valve is controlled via a PID loop based on zone temperature

Optional:

- Enable only when hot water supply temperature is proven available
- Limit valve position if floor/space temperature limits are approached

4. Ventilation Control

Minimum airflow setpoint is maintained during occupied mode to satisfy ventilation requirements

5. Unoccupied Mode

VAV damper = closed (0% or minimum configurable)

Radiant valve = 0% (closed) unless:

- Zone temperature falls below unoccupied heating setpoint → radiant heating enabled
- Zone temperature rises above unoccupied cooling setpoint → optional purge cooling (if allowed)

6. Warm-Up / Cool-Down Mode (Optional)

Upon occupancy start:

- If Zone Temp < Heating Setpoint:
 - Radiant valve modulates to bring zone up to setpoint
 - Damper remains at minimum
- If Zone Temp > Cooling Setpoint:
 - Damper modulates to max cooling airflow
 - Radiant valve closed

7. Safeties & Limits

Radiant valve disabled if:

- No hot water proof
- High temperature limit reached (floor or zone)

VAV airflow alarm if:

- Measured airflow deviates from setpoint beyond threshold
- Zone temperature alarm for high/low limits

8. Lead Control Logic Summary

Cooling = air (VAV damper)

Heating = radiant only

Deadband = ventilation only (minimum air)

No simultaneous heating and cooling

9. Optional Enhancements (Recommended)

Supply air temperature reset coordination with AHU

Radiant lockout above outdoor air temperature (e.g., 65°F)

Adaptive deadband to reduce short cycling

Runtime balancing if multiple radiant zones share a system

3745 Community Park Loop

CONTROL SYSTEMS AMERICA

TYPICAL VAV SEQUENCE

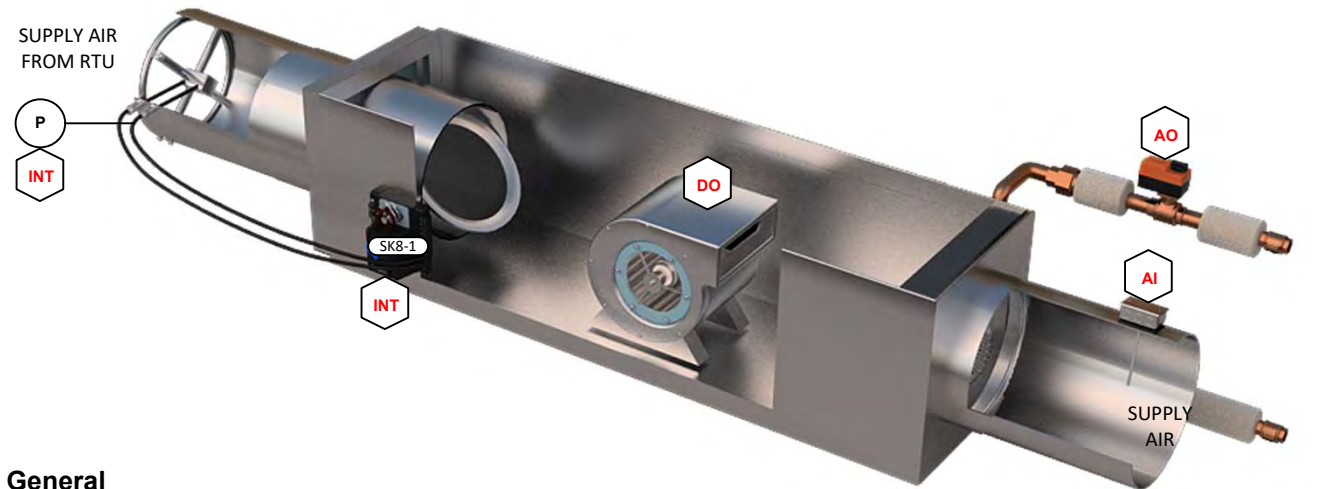
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
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INNOTECH
AMERICA

CHECK BY: JP

CSA NUMBER: 138654

TYPICAL FTU w/ REHEAT & ZONE HEAT SEQUENCE



1. General

Each terminal unit shall control:

- Primary air damper (VAV control)
- Fan (parallel or series)
- Duct reheat coil (modulating hot water valve)
- Radiant zone reheat (Open/Close hot water valve)
- Zone temperature sensor
- Airflow measurement

The sequence shall maintain zone temperature while minimizing simultaneous heating and cooling and prioritizing efficient heat sources.

2. Occupied Mode

2.1 Cooling Operation

When Zone Temp > Cooling Setpoint:

- Primary air damper modulates between minimum and maximum cooling airflow
- Fan operation:
 - Series fan: runs continuously
 - Parallel fan: OFF
- Duct reheat valve = 0%
- Radiant valve = 0%

2.2 Deadband Operation

When Zone Temp is between Heating and Cooling Setpoints:

- Damper maintains minimum airflow (ventilation)
- Fan:
 - Series: ON
 - Parallel: OFF
- Duct reheat = 0%
- Radiant reheat = 0%

2.3 Stage 1 Heating – Radiant (Primary Heating)

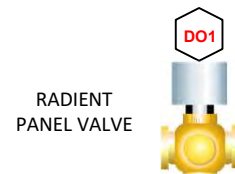
When Zone Temp < Heating Setpoint:

- Damper remains at minimum airflow
- Radiant valve modulates (0–100%) to maintain setpoint
- Fan:
 - Series: ON
 - Parallel: OFF
- Duct reheat valve = 0%

2.4 Stage 2 Heating – Fan + Duct Reheat (Supplemental)

If radiant heating is at 100% and:

- Zone Temp continues to drop or
- Zone Temp is below setpoint by configurable offset (e.g., 2°F)
- Then:
 - Enable fan (if parallel unit)
 - Enable duct reheat coil:
 - Valve modulates to maintain heating setpoint
 - Damper remains at minimum airflow



3. Radiant Heating Control

Controlled via PID loop from zone temperature

Enabled only when:

- Heating mode active
- Hot water supply is proven available

Optional limits:

- Floor/space high temperature limit
- Outdoor air lockout (e.g., disable above 60–65°F)

4. Duct Reheat Control

Enabled only after radiant is fully utilized (or based on staging logic)

Modulating valve maintains zone temperature

Disables when:

- Zone reaches setpoint
- Cooling mode is active

5. Fan Operation

Series Fan Box:

- Fan runs continuously during occupied mode

Parallel Fan Box:

- Fan OFF during cooling and deadband
- Fan ON during Stage 2 heating (duct reheat enabled)

6. Ventilation Control

Minimum airflow maintained during occupied mode

May be reset based on Occupancy status

7. Unoccupied Mode

Damper = closed or minimum configurable

Fan = OFF

Duct reheat = OFF

Radiant reheat:

- Enabled only if Zone Temp < Unoccupied Heating Setpoint

Optional cooling if:

Zone Temp > Unoccupied Cooling Setpoint

8. Warm-Up / Cool-Down Mode

Warm-Up:

- Radiant enabled first
- If insufficient → duct reheat + fan enabled

Cool-Down:

- Damper modulates to maximum cooling airflow
- All heating disabled

9. Safeties & Alarms

Duct high temperature limit → closes reheat valve

Airflow proving / low airflow alarm

Fan status proof (if available)

Hot water proof required for heating enable

Zone high/low temperature alarms

10. Control Philosophy Summary

Cooling: Primary air (VAV damper)

Heating priority:

- Radiant zone heat (most efficient/comfortable)
- Fan + duct reheat (supplemental)

Deadband: ventilation only

Goal: minimize simultaneous heating and cooling

11. Optional Enhancements

Supply air temperature reset coordination with AHU

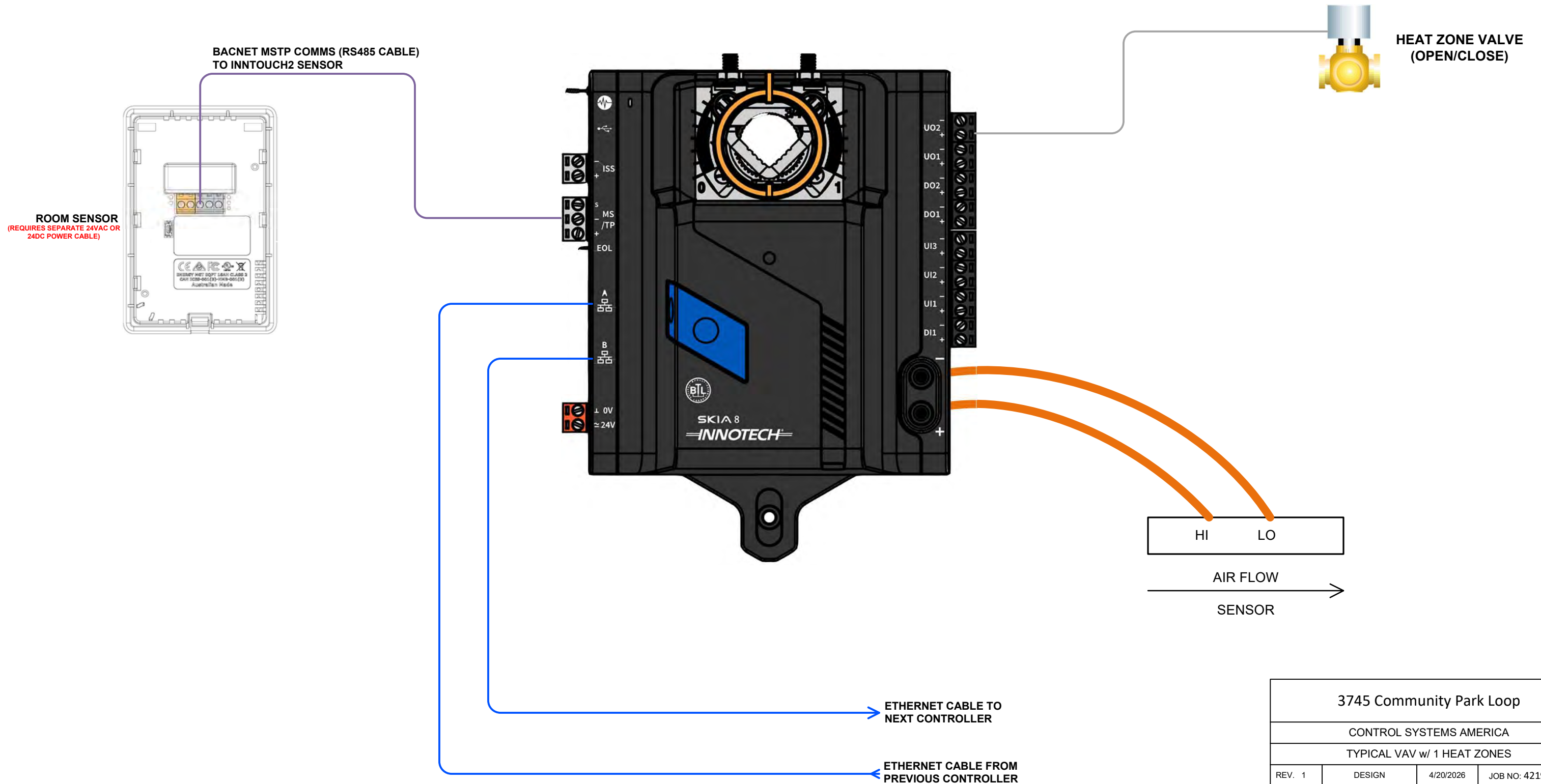
Radiant vs duct reheat optimization (energy-based switchover)

Adaptive staging (based on rate of temperature change)

Runtime balancing for shared hot water system

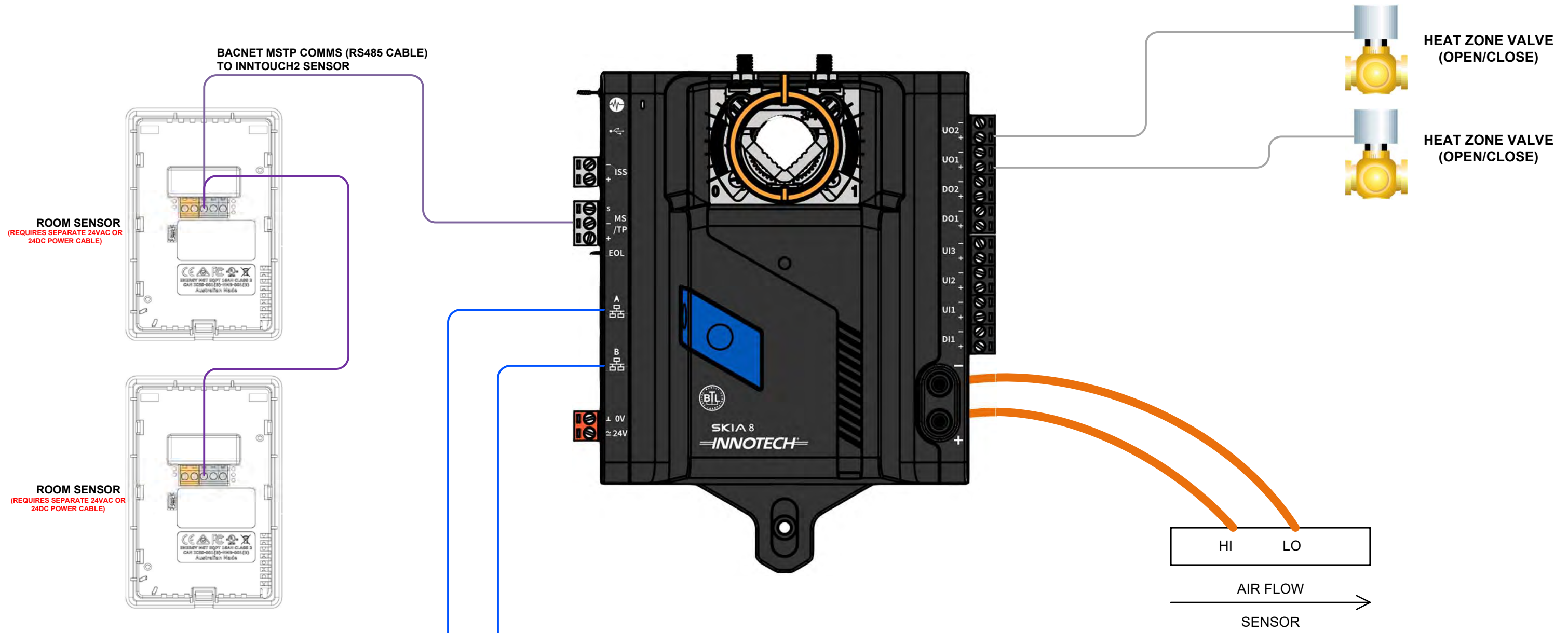
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL FTU w/ REHEAT & ZONE HEAT SEQUENCE			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
INNOTECH AMERICA			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL VAV w/ 1 HEAT ZONES



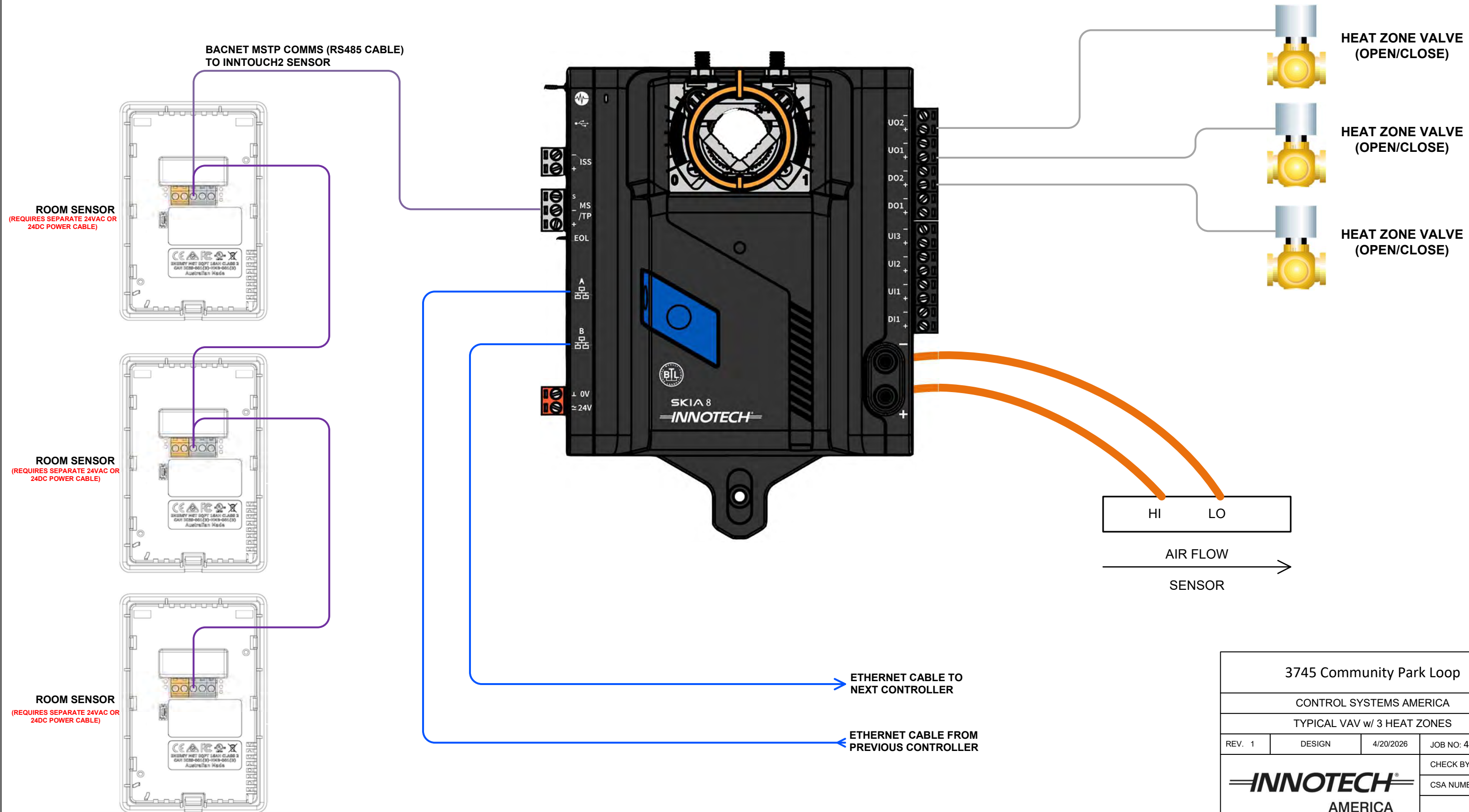
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL VAV w/ 1 HEAT ZONES			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL VAV w/ 2 HEAT ZONES



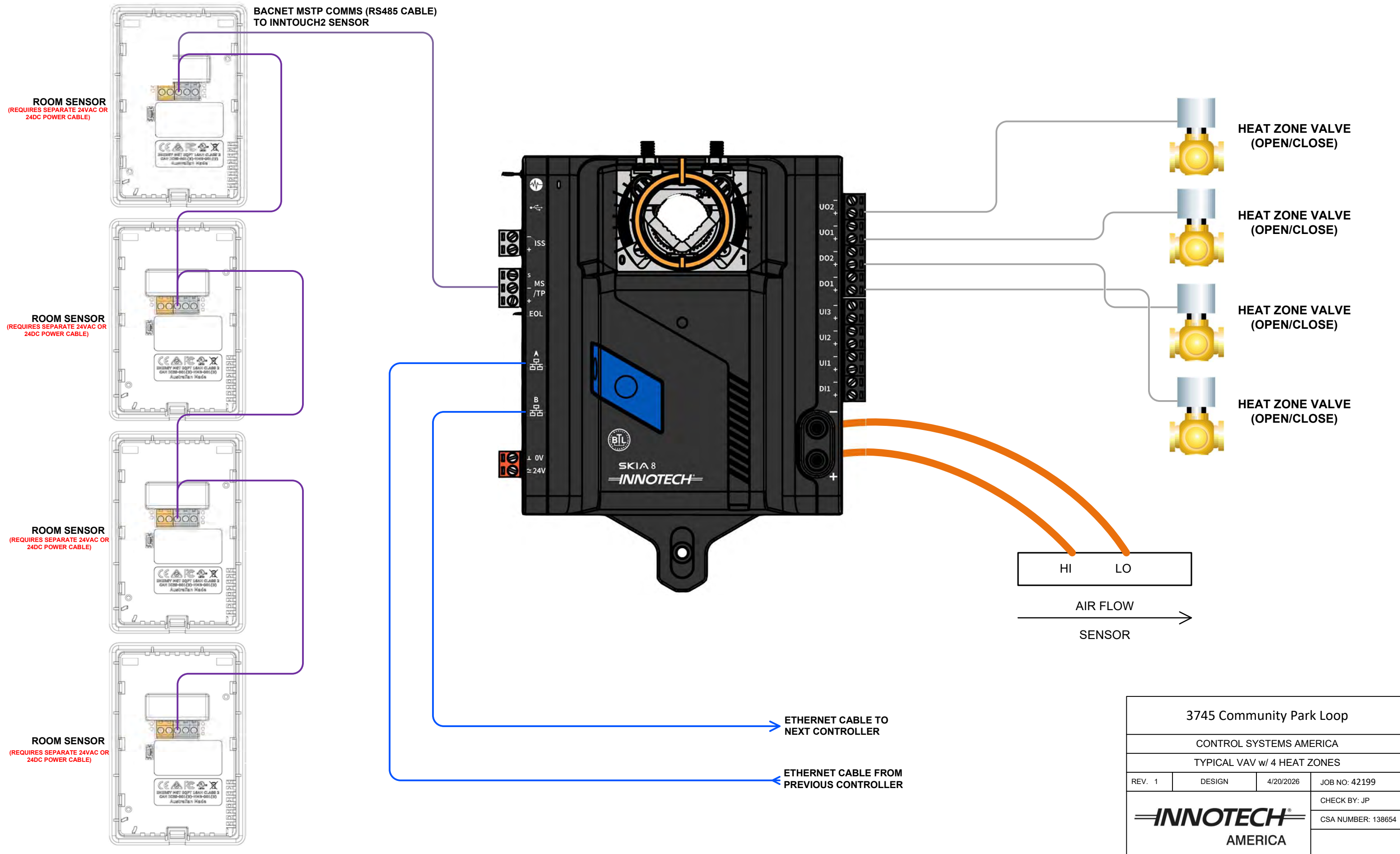
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL VAV w/ 2 HEAT ZONES			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
INNOTECH AMERICA			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL VAV w/ 3 HEAT ZONES



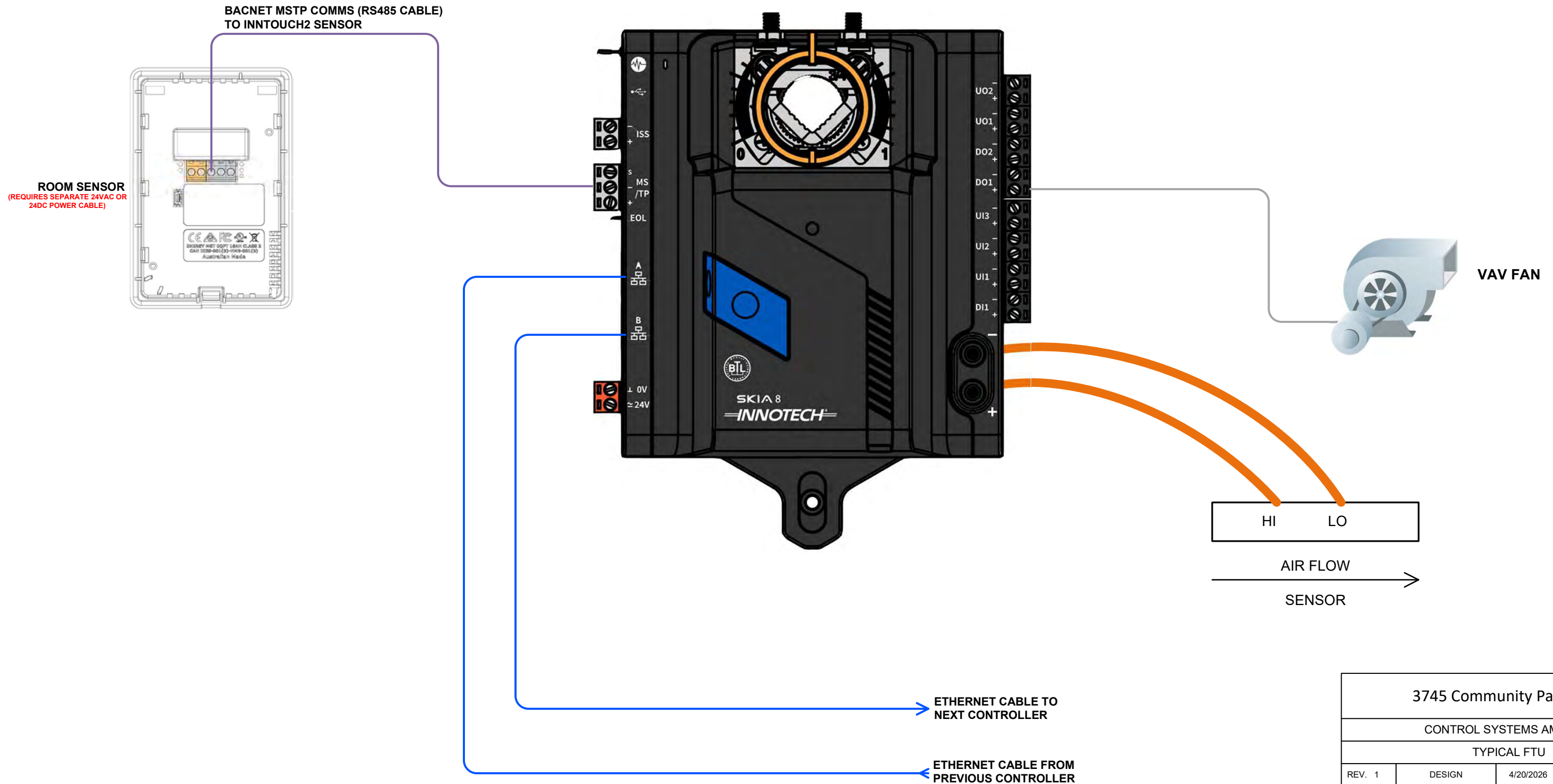
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL VAV w/ 3 HEAT ZONES			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL VAV w/ 4 HEAT ZONES



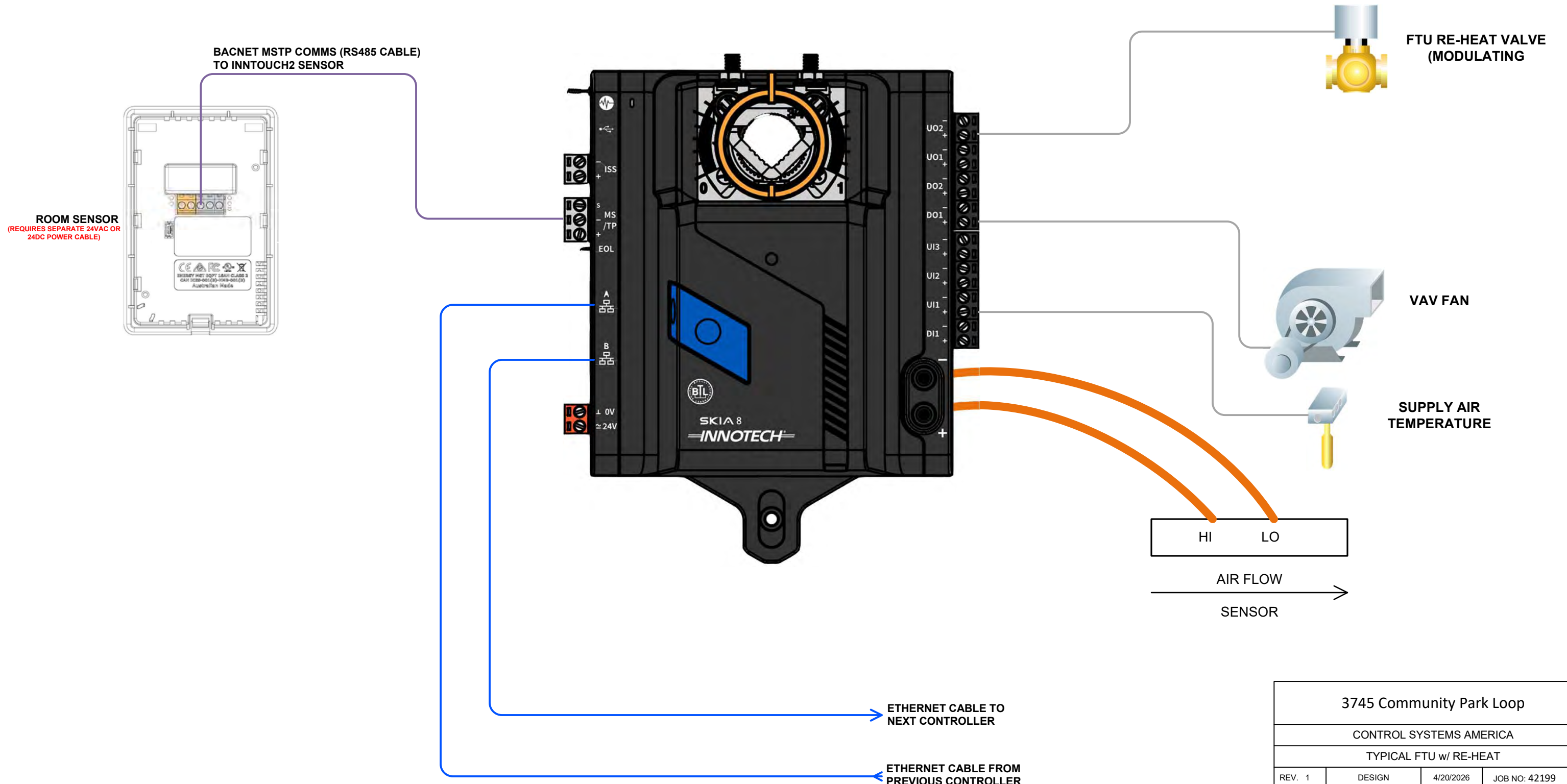
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL VAV w/ 4 HEAT ZONES			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
INNOTECH AMERICA			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL FTU



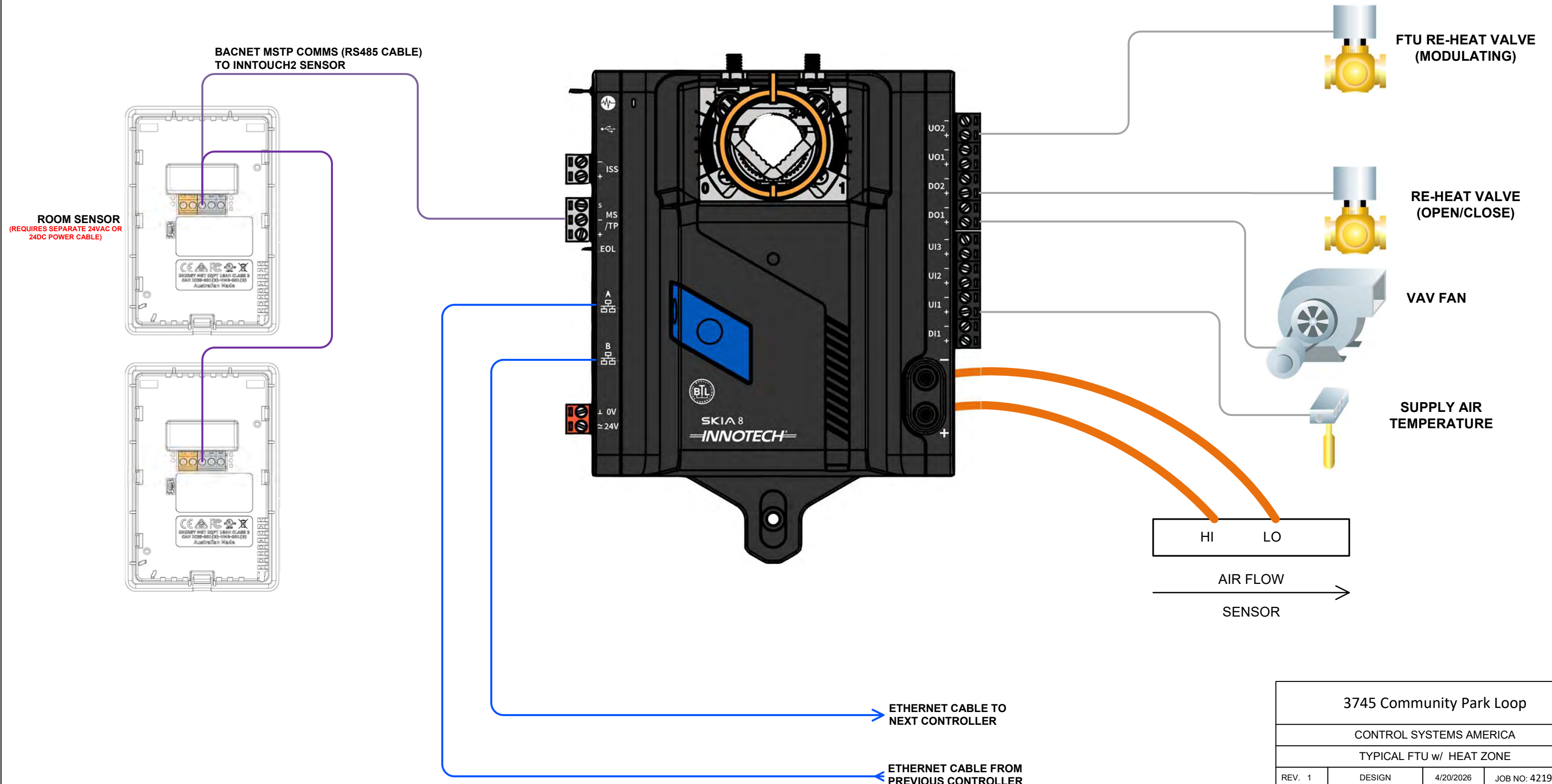
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL FTU			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL FTU w/ RE-HEAT



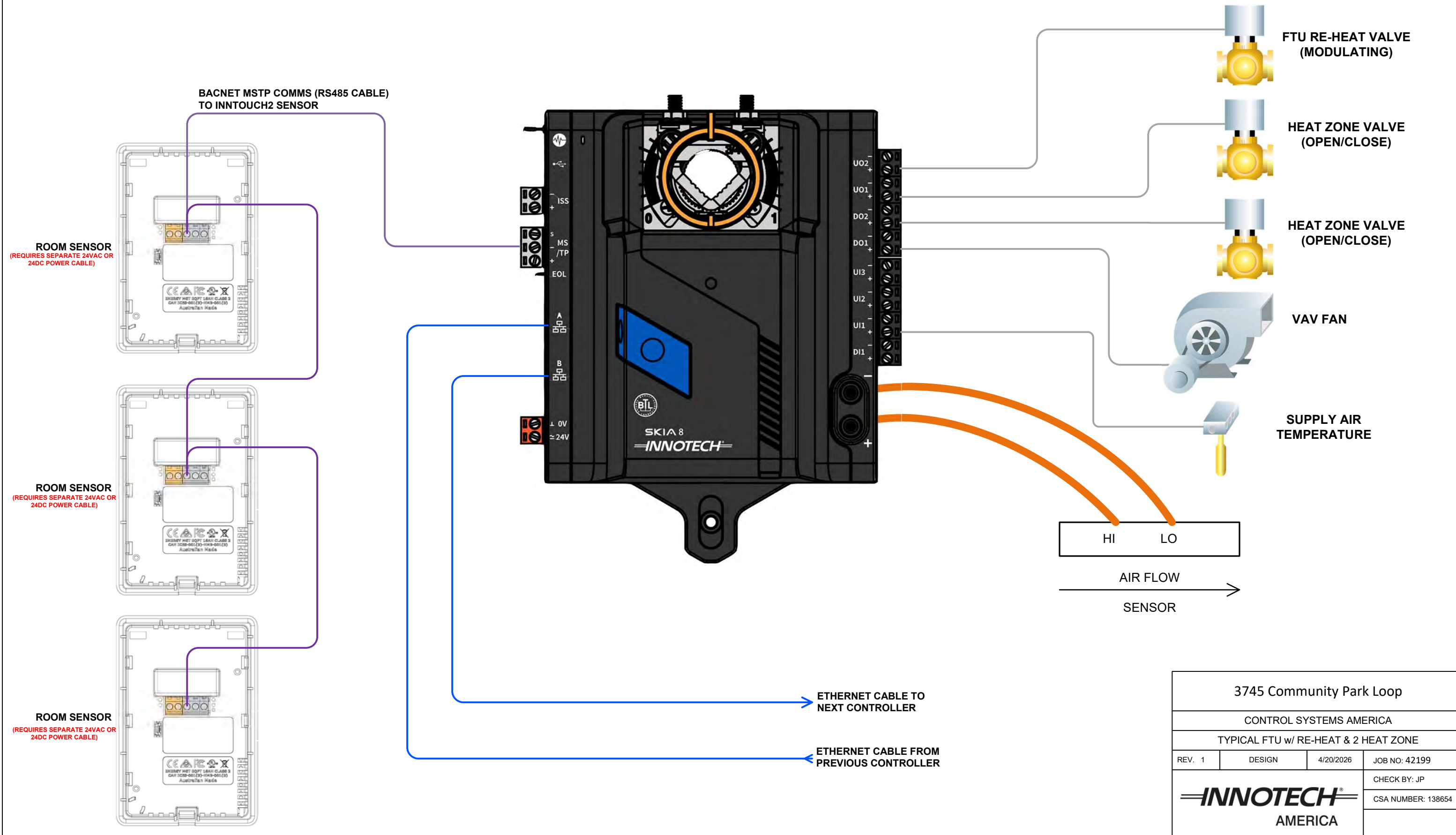
3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL FTU w/ RE-HEAT			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL FTU w/ HEAT ZONE



3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL FTU w/ HEAT ZONE			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
INNOTECH AMERICA			CHECK BY: JP
			CSA NUMBER: 138654

TYPICAL FTU w/ RE-HEAT & 2 HEAT ZONE



3745 Community Park Loop			
CONTROL SYSTEMS AMERICA			
TYPICAL FTU w/ RE-HEAT & 2 HEAT ZONE			
REV. 1	DESIGN	4/20/2026	JOB NO: 42199
			CHECK BY: JP
			CSA NUMBER: 138654



BID SCHEDULE
STATE OF ALASKA – DEPARTMENT OF NATURAL RESOURCES

Project Name: Air Handler Replacement (Anchorage, Alaska)

Project Number: ITB No. 10-028-26

The Bidder shall insert, as called for, a lump sum price in figures opposite each pay item as it appears on the bid schedule. A lump sum price is not to be entered or tendered for any pay item not appearing in the Bid Schedule.

Conditioned or qualified bids or a bidders failure to provide pricing for the Basic Bid will be considered non-responsive.

Notice: Contract award will be made on the basis of Basic Bid and to the extent of available funding.

The bidder shall insert a bid price for each pay item listed below. Type or print legibly.

Pay Item Number	Pay Item Description	Pay Unit	Quantity	Bid Price
-----------------	----------------------	----------	----------	-----------

BASIC BID

1A	Air Handler Replacement (Anchorage, Alaska)	LS	ALL REQ'D	\$
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Total Bid Price of Basic Bid (1A)

\$ _____.

Written Amount: _____ DOLLARS

Bidder acknowledges they meet the Minimum Prior Experience Requirement identified in the Scope of Work:

Yes No

Company Name:
Authorized Representative's Printed Name:
Authorized Representative's Signature:
Date Bid Schedule Signed:



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION CONTRACT

Air Handler Replacement (Anchorage, Alaska) – ITB No. 10-028-26

Project Name and Number

This CONTRACT, between the STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES, herein called the Department, acting by and through its Contracting Officer, and

Company Name

Company Address (Street or PO Box, City, State, Zip)

a/an Individual Partnership Joint Venture Sole Proprietorship Corporation incorporated under the laws of the State of _____ its successors and assigns, herein called the Contractor, is effective the date of the signature of the Contracting Officer on this document.

WITNESSETH: That the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the Department, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work and labor required in the construction of the above-referenced project at the prices bid by the Contractor for the respective estimated quantities aggregating approximately the sum of

_____ Dollars

(\$ _____), and such other items as are mentioned in the original Bid, which Bid and prices named, together with the Contract Documents are made a part of this Contract and accepted as such.

It is distinctly understood and agreed that no claim for additional work or materials, done or furnished by the Contractor and not specifically herein provided for, will be allowed by the Department, nor shall the Contractor do any work or furnish any material not covered by this Contract, unless such work is ordered in writing by the Department. In no event shall the Department be liable for any materials furnished or used, or for any work or labor done, unless the materials, work, or labor are required by the Contract or on written order furnished by the Department. Any such work or materials which may be done or furnished by the Contractor without written order first being given shall be at the Contractor's own risk, cost, and expense and the Contractor hereby covenants and agrees to make no claim for compensation for work or materials done or furnished without such written order.

The Contractor further covenants and agrees that all materials shall be furnished and delivered and all labor shall be done and performed, in every respect, to the satisfaction of the Department, on or before: **June 30, 2027.**

The bonds given by the Contractor in the sum of \$ _____ Payment Bond, and \$ _____ Performance Bond, to secure the proper compliance with the terms and provisions of this Contract, are submitted herewith and made a part hereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contract and hereby agree to its terms and conditions.

CONTRACTOR

Company Name

Signature of Authorized Company Representative

Typed Name and Title

Email Address

Date

(Corporate Seal)

**STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES**

Signature of Contracting Officer

Date

Typed Name



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

PAYMENT BOND

Bond No. _____

For

Air Handler Replacement (Anchorage, Alaska) ITB No. 10-028-26

Project Name and Number

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That _____
of _____ as Principal,
and _____
of _____ as Surety,
firmly bound and held unto the State of Alaska in the penal sum of _____ Dollars

(\$ _____) good and lawful money of the United States of America for the payment whereof, well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the _____ of _____ A.D., 20____, for construction of the above-referenced project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall comply with all requirements of law and pay, as they become due, all just claims for labor performed and materials and supplies furnished upon or for the work under said contract, whether said labor be performed and said materials and supplies be furnished under the original contract, any subcontract, or any and all duly authorized modifications thereto, then these presents shall become null and void; otherwise they shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at _____, this _____ day of _____ A.D., 20____.

Principal: _____
Address: _____
By: _____
Contact Name: _____
Phone: () _____

Surety: _____
Address: _____
By: _____
Contact Name: _____
Phone: () _____

The offered bond has been checked for adequacy under the applicable statutes and regulations:

Alaska Department of Natural Resources Authorized Representative _____ Date _____

See Instructions on Reverse

INSTRUCTIONS

1. This form, for the protection of persons supplying labor and material, shall be used whenever a payment bond is required. There shall be no deviation from this form without approval from the Contracting Officer.
2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.
3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.
4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.
5. The bond shall be signed by authorized persons. Where such persons are signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

PERFORMANCE BOND

Bond No. _____

For

Air Handler Replacement (Anchorage, Alaska) ITB No. 10-028-26

Project Name and Number

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That _____
of _____ as Principal,
and _____
of _____ as Surety,
firmly bound and held unto the State of Alaska in the penal sum of _____ Dollars

(\$ _____) good and lawful money of the United States of America for the payment whereof, well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the _____ of _____ A.D., 20____, for construction of the above-named project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall well and truly perform and complete all obligations and work under said contract and if the Principal shall reimburse upon demand of the Department of Natural Resources any sums paid him which exceed the final payment determined to be due upon completion of the project, then these presents shall become null and void; otherwise they shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at _____, this _____ day of _____ A.D., 20____.

Principal: _____

Address: _____

By: _____

Contact Name: _____

Phone: () _____

Surety: _____

Address: _____

By: _____

Contact Name: _____

Phone: () _____

The offered bond has been checked for adequacy under the applicable statutes and regulations:

Alaska Department of Natural Resources Authorized Representative

Date

See Instructions on Reverse

INSTRUCTIONS

1. This form shall be used whenever a performance bond is required. There shall be no deviation from this form without approval from the Contracting Officer.
2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.
3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.
4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.
5. The bond shall be signed by authorized persons. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

BID BOND

For

Air Handler Replacement (Anchorage, Alaska) ITB No. 10-028-26

Project Name and Number

DATE BOND EXECUTED: _____

PRINCIPAL (Legal name and business address):

TYPE OF ORGANIZATION:

	[<input type="checkbox"/>] Individual	[<input type="checkbox"/>] Partnership
	[<input type="checkbox"/>] Joint Venture	[<input type="checkbox"/>] Corporation
STATE OF INCORPORATION: _____		

SURETY(IES) (Name and business address):

A.	B.	C.
PENAL SUM OF BOND: _____		DATE OF BID: _____

We, the PRINCIPAL and SURETY above named, are held and firmly bound to the State (State of Alaska), in the penal sum of the amount stated above, for the payment of which sum will be made, we bind ourselves and our legal representatives and successors, jointly and severally, by this instrument.

THE CONDITION OF THE FOREGOING OBLIGATION is that the Principal has submitted the accompanying bid in writing, date as shown above, on the above-referenced Project in accordance with contract documents filed in the office of the Contracting Officer, and under the Invitation for Bids therefor, and is required to furnish a bond in the amount stated above.

If the Principal's bid is accepted and he is offered the proposed contract for award, and if the Principal fails to enter into the contract, then the obligation to the State created by this bond shall be in full force and effect.

If the Principal enters into the contract, then the foregoing obligation is null and void.

PRINCIPAL

Signature(s)	1.	2.	3.
Name(s) & Title(s) (Typed)	1.	2.	3.

Corporate Seal

See Instructions on Reverse

CORPORATE SURETY(IES)

Surety A	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

Surety B	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

Surety C	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

INSTRUCTIONS

1. This form shall be used whenever a bid bond is submitted.
2. Insert the full legal name and business address of the Principal in the space designated. If the Principal is a partnership or joint venture, the names of all principal parties must be included (e.g., "Smith Construction, Inc. and Jones Contracting, Inc. DBA Smith/Jones Builders, a joint venture"). If the Principal is a corporation, the name of the state in which incorporated shall be inserted in the space provided.
3. Insert the full legal name and business address of the Surety in the space designated. The Surety on the bond may be any corporation or partnership authorized to do business in Alaska as an insurer under AS 21.09. Individual sureties will not be accepted.
4. The penal amount of the bond may be shown either as an amount (in words and figures) or as a percent of the contract bid price (a not-to-exceed amount may be included).
5. The scheduled bid opening date shall be entered in the space marked Date of Bid.
6. The bond shall be executed by authorized representatives of the Principal and Surety. Corporations executing the bond shall also affix their corporate seal.
7. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
8. The states of incorporation and the limits of liability of each surety shall be indicated in the spaces provided.
9. The date that bond is executed must not be later than the bid opening date.

APPENDIX B¹ **INDEMNITY AND INSURANCE**

Article 1. Indemnification

The Contractor shall indemnify, hold harmless, and defend the contracting agency from and against any claim of, or liability for error, omission or negligent act of the Contractor under this agreement. The Contractor shall not be required to indemnify the contracting agency for a claim of, or liability for, the independent negligence of the contracting agency. If there is a claim of, or liability for, the joint negligent error or omission of the Contractor and the independent negligence of the Contracting agency, the indemnification and hold harmless obligation shall be apportioned on a comparative fault basis. "Contractor" and "Contracting agency", as used within this and the following article, include the employees, agents and other contractors who are directly responsible, respectively, to each. The term "independent negligence" is negligence other than in the Contracting agency's selection, administration, monitoring, or controlling of the Contractor and in approving or accepting the Contractor's work.

Article 2. Insurance

Without limiting contractor's indemnification, it is agreed that contractor shall purchase at its own expense and maintain in force at all times during the performance of services under this agreement the following policies of insurance. Where specific limits are shown, it is understood that they shall be the minimum acceptable limits. If the contractor's policy contains higher limits, the state shall be entitled to coverage to the extent of such higher limits. Certificates of Insurance must be furnished to the contracting officer prior to beginning work and must provide for a notice of cancellation, non-renewal, or material change of conditions in accordance with policy provisions. Failure to furnish satisfactory evidence of insurance or lapse of the policy is a material breach of this contract and shall be grounds for termination of the contractor's services. All insurance policies shall comply with and be issued by insurers licensed to transact the business of insurance under AS 21.

2.1 Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees engaged in work under this contract, coverage as required by AS 23.30.045, and; where applicable, any other statutory obligations including but not limited to Federal U.S.L. & H. and Jones Act requirements. The policy must waive subrogation against the State.

2.2 Commercial General Liability Insurance: covering all business premises and operations used by the Contractor in the performance of services under this agreement with minimum coverage limits of \$300,000 combined single limit per claim.

2.3 Commercial Automobile Liability Insurance: covering all vehicles used by the Contractor in the performance of services under this agreement with minimum coverage limits of \$300,000 combined single limit per claim.

CERTIFICATION REGARDING DRUG-FREE WORKPLACE REQUIREMENTS

The grantee certifies that it will provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing a drug-free awareness program to inform employees about—
 - (1) The dangers of drug abuse in the workplace;
 - (2) The grantee's policy of maintaining a drug-free workplace;
 - (3) Any available drug counseling, rehabilitation and employee assistance programs, and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will—
 - (1) Abide by the terms of the statement; and
 - (2) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after each conviction;
- (e) Notifying the agency within ten days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction;
- (f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted—
 - (1) Taking appropriate personnel action against such an employee, up to and including termination; or
 - (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

Typed Name and Title of Certification Official

Signature

Date

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY,
AND VOLUNTARY EXCLUSION
LOWER TIER COVERED TRANSACTIONS**

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 29 CFR Part 98, Section 98.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988, Federal Register (pages 19160-19211).

**(BEFORE COMPLETING CERTIFICATION, READ THE INSTRUCTIONS ON THE FOLLOWING PAGE
WHICH ARE AN INTEGRAL PART OF THE CERTIFICATION)**

The prospective recipient of federal assistance funds certifies, by submission of this bid, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

Where the prospective recipient of federal assistance funds is unable to certify to any of the Statements in this certification, such prospective participant shall attach an explanation to this Proposal.

Name of Representative: _____.

Title of Representative: _____.

Signature: _____.

Date: _____.

1. Is this company enrolled in the Federal System for Awards Management (SAM)? YES NO
2. If Yes, please provide either the DUNS Number _____ or the Cage Code _____.
3. If No, the company must be enrolled in SAM before a contract can be signed or payment made on a contract involving federal funds. Failure to do so will result in cancellation of the contract.

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this Proposal, the prospective recipient of federal assistance funds is providing the certification as set out below.
2. The certification in this class is a material representation of the fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective recipient of federal assistance funds knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the Department of Labor (DOL) may pursue available remedies, including suspension and/or debarment.
3. The prospective recipient of federal assistance funds shall provide immediate written notice to the person to whom this Proposal is submitted if at any time the prospective recipient of federal assistance funds learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "Proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this Proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective recipient of federal assistance funds agrees by submitting this Proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the DOL.
6. The prospective recipient of federal assistance funds further agrees by submitting this Proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may but is not required to check the List of Parties Excluded from Procurement or Non-procurement Programs.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the DOL may pursue available remedies, including suspension and/or debarment.