



BONNYVILLE & DISTRICT CENTENNIAL CENTRE

2025 REQUEST FOR TENDER

Air Conditioning & Heat Recovery Retrofit (RFT)

RFP No: 2025.04

Opening Date: April 2, 2025

Closing Date: April 24, 2025, at 2:00 p.m. local time.

Bids must be submitted in its entirety before the submission deadline to:

Bonnyville & District Centennial Centre

Unit 1003, 4313 – 50 Avenue

Bonnyville, AB T9N 0B4

bid@ibstorey.ca

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1. OPPORTUNITY

The Bonnyville & District Centennial Centre is inviting contractors to submit a bid for the tender on the following:

- Provide Air Conditioning and cooling to Fieldhouse.
- Make modifications to heat recovery system serving the Bonnyville & District Centennial Centre.
- Provide an electrical design-build for the AC and Heat Recovery retrofit.
- Coordinate the installation of all automation components with the Automation Contractor.

2. SITE VISIT

Interested parties are invited to come to the Bonnyville & District Centennial Centre for a site visit with Project Engineer for project, I.B. Storey Inc. on the following date and times:

Date: Wednesday, April 16, 2025

Times: 9:00am – 11:00am First Visit Scheduled

1:30pm – 3:30pm Second Visit Scheduled

*Please email to indicate which session that you or your representative will be attending to: knaylor@centennialcentre.ca

3. SCHEDULE

The proposed schedule is as follows:

Publication of Tender:	April 2, 2025
Deadline for Submissions:	April 24, 2025, at 2:00 p.m.
Engagement of Agreement by:	April 28, 2025

It is the Centennial's Centre intent to enter into an Agreement with the Successful Bidder no later than April 28, 2025

3. RFP SUBMISSION REQUIREMENTS

All submissions should contain the following items:

- a) Bidder Contact Information
- b) Quotation with exact specifications defined
- c) Timeline for supply and installation

The Centennial Centre reserves the right to contact the Bidder for clarification of submission.

4. SUBMISSION INSTRUCTIONS

When submitting your bid, please be aware of the following:

- A. The bid must be received in its entirety before the submission deadline of 2:00 p.m. local time, April 24, 2025 to:

bid@ibstorey.ca Project Engineer
or alternately, by post to:
Bonnyville & District Centennial Centre
Attention: General Manager
Unit 1003 – 4313 50 Avenue, Bonnyville, AB, T9N 0B4
- B. The Bonnyville & District Centennial Centre will not accept liability for any late, lost, or improperly delivered email, parcel or facsimile. We recommend that you contact the Centennial Centre to verify successful delivery.
- C. Questions or inquiries concerning this RFT shall be directed to the General Manager for the Bonnyville & District Centennial Centre and can be submitted via email which will then be forwarded onto the Owner's Engineer, I.B. Storey Inc.
- D. Bidders must use SCHEDULE "A" as included in this RFT.
- E. It is the responsibility of the Bidder to frequently visit the Bonnyville & District Centennial Centre tender webpage for any updates, additional instructions, clarifications, and any other materials related to this tender. Once published, any and all information pertaining to this tender will form part of this RFT.
- F. The Bonnyville & District Centennial Centre is not bound to accept the lowest price bid. By submitting and participating in the process as outlined in this RFT, bidders expressly agree that no contract of any kind is formed under, or arises from, RFT, prior to the signing of a formal written agreement.
- G. At the appointed closing time, all submissions become irrevocable. By responding to this RFT, the applicant agrees that, should its submission be selected, the bidder agrees to enter into an agreement with the Bonnyville & District Centennial Centre for the supply and installation of an Arena Header.
- H. The Successful Bidder will engage in the Agreement which consists of all the relevant provisions of this Request for Tender. This Agreement will not be binding until it has been approved by the Board of Directors of the Bonnyville & District Centennial Centre and signed by both parties. If at any time the Bonnyville & District Centennial Centre reasonably forms the opinion that a mutually acceptable agreement is not likely to be reached within a reasonable time, the preferred Bidder will be given written notice to terminate discussions. In this event, The Bonnyville & District Centennial Centre may then either open discussions with another Bidder or terminate this RFT.
- I. Bidders are solely responsible for their own expenses in preparing, and submitting Bids, and for any meetings, negotiations or discussions with the Town or its consultants, relating to or arising from this RFT. The Bonnyville & District Centennial Centre and its representative, agents, consultants and advisors will not be liable to any Bidder for any claims, whether for costs, expenses, losses or damages, or loss of anticipated profits, or for any other matter whatsoever, incurred by

the Bidder in preparing and submitting a submission, or participating in negotiations for a contract, or other activity related to or arising out of this RFT.

- J. Information pertaining to any properties obtained by the Bidder as a result of participation in this Tender is confidential and must not be disclosed without written permission from the Bonnyville & District Centennial Centre. All information provided by the Bonnyville & District Centennial Centre is considered to be Bonnyville & District Centennial Centre property and shall not be used in whole or in part for any other purpose than to assist with the development of a submission under this RFT.
- K. The Bonnyville & District Centennial Centre reserves the right to withdraw this RFT at any time prior to the signing of an agreement.
- L. The bids and accompanying documentation submitted by all Bidders become the property of the Bonnyville & District Centennial Centre and will not be returned.

5. EVALUATION

Submissions to the RFT will be reviewed by an adjudication committee. The winning Bidder will be selected based on the following criteria:

- a) Cost for Goods and Services
 - Provide breakdown cost to provide supplies according to the minimum specifications listed.
- b) Specifications of the
 - a) Submit all specifications of unit proposed. If any specifications are different than what is defined in this tender, please include any and all specifications of the unit proposed in your bid.
- c) Timeline for Supply and Installation
- d) References for Similar Projects

SCHEDULE "A"

2025 AC & Heat Recovery Retrofit Tender Submission Form

Name of Bidder: _____

Contact Phone Number: _____

Email Address: _____

Mailing Address: _____

Total Cost for Part 1- Ice Rink General: _____

Total Cost for Part 2 - AC & Heat Recovery: _____

Total Cost for Part 3 – Process Piping: _____

Total Cost for Part 4 – Electrical Design Build: _____

TOTAL COST OF PROJECT:

_____ / 100 dollars in Canadian funds.

Any additional costs shall be itemized in the Quotation to include:

- a) Freight
- b) Taxes
- c) Any other additional costs not listed
 - i) Include estimated food/lodge and travel in RFT, as well as any additional expenses that may occur during installation and making unit operational.

Project Timeline

Expected Date of Completion: _____

*Please attach summary of project timeline

References for Similar Projects (Experience)

List 2 completed projects similar in scope, including contact information for each project:

1. _____

Email: _____ Phone: _____

2. _____

Email: _____ Phone: _____

SCHEDULE "B" SIGNATORIES
2025 AC & Heat Recovery Tender
Project No. 2025.04

The undersigned Bidder, having carefully examined this Request for Tender, and having full knowledge of the Tender, hereby agrees to submit this Bid Form.

The Bidder agrees:

1. That the Bonnyville & District Centennial Centre is in no way obligated to accept this bid.
2. That the Bonnyville & District Centennial Centre, has discretion, to accept any bid other than the highest bid.
3. That should the Submission Form be improperly completed or be incomplete, Bonnyville & District Centennial Centre shall have the right to disqualify and/or reject this bid.
4. That this bid is made without knowledge of the bid prices to be submitted by any other company, firm, or person.
5. That this bid is made without any connection or arrangement with any company, firm, or person submitting a bid.
6. That this bid is made without any undisclosed connection or arrangement with any other company, firm, or person having an interest in this bid.
7. That payment for the supply and installation of this Tender will be made in accordance with the executed agreement documents at the prices shown in the Submission Form.

SIGNATORIES

This bid is executed under seal at _____ this _____ day of _____, 2025

BIDDER

Print Name

Name of Signing Authority (printed)

(Apply STAMP/SEAL above)

Signature of Signing Authority

WITNESS

Witness Name (printed)

Witness Name (signature)

Schedule C

- Includes:
 - Part 1: Ice Rink General Specifications
 - Part 2: AC and Heat Recovery Specifications
 - Part 3: Process Piping Specifications
 - Part 4: Electrical Design Build Specifications

PART 1 – ICE RINK
GENERAL

1.1 Scope of Work

- .1 The objectives of this project encompass the following:
 - .1 Provide air conditioning functionality to the air handling unit serving the field house at the Bonnyville & District Centennial Centre located at 4313 50 Ave, Bonnyville, AB T9N 0B4.
 - .2 Provide modifications to the heat recovery system serving the Bonnyville & District Centennial Centre.
 - .3 Provide an electrical design-build for the AC and Heat Recovery Retrofit project.
 - .4 Coordinate the installation of all automation components with the Owner's Automation Contractor.
 - .1 Automation components will be supplied by the Owner's Automation Contractor and installed by the Contractor of this scope as required.
 - .5 Execute work using the most effective use of time and resources.
 - .6 Minimize disruption of arena operation, and co-ordinate any required service disruption with the Owner and the Owner's Engineer.
 - .7 Work may commence, at the earliest, by 28-Apr-25.
 - .8 All work is to be substantially completed by 04-Aug-25.

1.2 Definitions

- .1 AC and Heat Recovery Retrofit: This retrofit consists of the addition of air conditioning in the field house via modifications to an existing air handling unit as well as modifications to the existing facility heat recovery system. It comprises all fully operational and functional elements, including equipment interfaced to the associated work of other related trades. This includes a hydronic coil, a heat exchanger, pumps, ducting, destratification fans, field piping, valves, and electrical components.
 - .2 Contractor: The single Contractor to provide the work of this Bid Document. This Contractor shall be the supplier, installer, and commissioner. This party shall be the contractor signatory to the contract, and shall take on all responsibilities therein. The Contractor shall supply all materials, labour, and equipment required to complete all work and provide all fully functional deliverables.
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- .3 The Owner: For the specifications herein Bonnyville DCLFC shall be referred to as The Owner.
- .4 The Owner’s Engineer: For the specifications herein I.B. Storey Inc. shall be referred to as the Owner’s Engineer.

1.3 AC and Heat Recovery Retrofit Description

- .1 The removal and disposal of existing, supply, and installation of equipment, testing, start-up and warranty of an AC and heat recovery retrofit as outlined.
- .2 Automation work is by others. The Contractor of this scope is required to coordinate site activities and work.
- .3 Supply and install components, including fans, cooling coils, pumps, valves, ducting, piping, and insulation.
- .4 Receive and install preordered components including heat exchangers.
- .5 The work shall consist of the provision of all labour, materials, tools, equipment, testing, commissioning, training services, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, removal, installation, cutting and patching, warranties, services, and items, even though these may not be specifically mentioned in this documents which are required for the complete, fully functional and commissioned retrofit.
- .6 Provide a complete, neat and workmanlike installation. Use only employees who are certified Red Seal journeyman or registered apprentices (under the supervision of a journeyman). The labour used to carry out the work shall be skilled, experienced, trained, and familiar with the specific equipment, standards and configurations to be provided for this Project. Contractors must submit registration numbers for key personnel that are certified journeyman.
- .7 Manage and coordinate the work in a timely manner in consideration of the Project schedule.

1.4 Drawings Package

- .1 Drawings packages have been issued with this specifications document and are referred to as 25-005 PKG01 Bonnyville Mechanical Drawing Package.
 - .2 In the event of discrepancy between the drawings package and this specifications document, the specifications document shall prevail unless otherwise noted. Any discrepancies should be brought to the Owner’s attention prior to proceeding.
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1.5 Quality Assurance

.1 General

- .1 The Contractor shall be regularly engaged in the installation and service of mechanical, refrigeration, heating, and ventilation systems in Alberta.
- .2 The system components included in this project shall consist of the products from manufacturers regularly engaged in the production of mechanical equipment, and shall be the manufacturer's latest standard of design at the time of bid.

.2 Workplace Safety and Hazardous Materials

- .1 Provide a safety program in compliance with the Contract Documents.
 - .2 Contractor shall have a corporately certified comprehensive Safety Manual and a designated Safety Supervisor for the Project.
 - .3 The Contractor and its employees and subtrades comply with local, provincial, and federal safety regulations.
 - .4 The Contractor shall ensure that all subcontractors and employees have written safety programs in place that covers their scope of work, and that their employees receive the training required by the Occupational Health & Safety Act for the Province of Alberta for at least each topic listed.
 - .5 Hazards created by the Contractor or its subcontractors shall be eliminated before any further work proceeds.
 - .6 Hazards observed but not created by the Contractor or its subcontractors shall be reported to the Owner's Engineer and the Owner within the same day. The Contractor shall be required to avoid the hazard area until the hazard has been eliminated.
 - .7 The Contractor shall sign and date a safety certification form prior to any work being performed, stating that the Contractors' company is in full compliance with the Project safety requirements.
 - .8 The Contractor's safety program shall include written policy and arrangements for the handling, storage and management of all hazardous materials to be used in the work in compliance with the requirements of the Authorities Having Jurisdiction at the Project site.
 - .9 The Contractor's employees and subcontractor's staff shall have received training as applicable in the use of hazardous materials and shall govern their actions accordingly.
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- .3 Quality Management Program
 - .1 Designate a competent and experienced employee to provide Project Management. The designated Project Manager shall be empowered to make technical, scheduling and related decisions on behalf of the Contractor. At minimum, the Project Manager shall:
 - .1 Manage the scheduling of the work to ensure that adequate materials, labour and other resources are available as needed
 - .2 Manage the financial aspects of the Contract, with respect to the budget and payment applications.
 - .1 Be responsible for the work and actions of the workforce on site

1.6 References

- .1 The Contractor shall fully comply with all codes and standards applicable to this type of work, including;
 - .1 Occupational Health and Safety Act (OH&S)
 - .2 The National Electrical Code
 - .3 The National Fire Code
 - .4 CSA B52-18 Mechanical Refrigeration Code
 - .5 CSA B51-19 Boiler, Pressure Vessel, and Pressure Piping Code
 - .6 ASME Boiler and Pressure Vessel Code (BPVC)
 - .7 Underwriters Laboratories (UL) listing and labels
 - .8 American National Standards Institute (ANSI)
 - .9 American Society for Testing and Materials (ASTM)
 - .10 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
 - .11 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standards
- .2 In the case of conflicts or discrepancies, the more stringent regulation shall apply
- .3 All work shall meet the approval of the Authorities Having Jurisdiction at the project site

1.7 Shop Drawings

- .1 Manufacturer's data sheets must be used for each product included as part of the scope of work. The submittal package must include:
 - .1 Install preparation instructions, methods, and recommendations.
 - .2 Safety requirements and details.
 - .3 Operating and design parameters such as temperatures, pressures, RPM, and physical size.
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- .4 Performance and equipment specifications.
- .5 Storage and handling requirements and recommendations.
- .2 All specifications for equivalents being offered must be received electronically by the Owner's Engineer for review no later than the question deadline during the bidding process.
 - .1 For maintenance purposes, equivalents for equipment will only be approved if all equipment of a similar type meet the specifications (such as pumps).
- .3 Shop drawings must also contain complete wiring and schematic diagrams, sequences of operation, control system bus layouts, and any other details required to demonstrate that the system has been coordinated and will properly function as a system.

1.8 Record
Documentation

- .1 Provide two (2) paper copies and one (1) USB digital copy of operating and maintenance manuals for all installed equipment pertaining to this contract, including as-built drawings
 - .2 After completion of all tests and adjustments, the contractor shall provide a copy of all as-built information and product data.
 - .3 On Site documents: Maintain at job site, one copy each of the following (but is not limited to):
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed shop drawings.
 - .5 List of outstanding shop drawings.
 - .6 Change orders.
 - .7 Other modifications to Contract.
 - .8 Copy of approved Work schedule.
 - .9 Health and Safety Plan and other Safety related documents.
 - .10 Manufacturers' installation and application instructions.
 - .11 Labour conditions and wage schedules.
 - .12 Other documents as specified.
 - .4 Manual shall be bound in three (3) ring binders and contain, as a minimum, the following:
 - .1 System operation and maintenance instructions, trouble shooting guidelines and operating log.
 - .2 Safety bulletins and material safety data sheets.
 - .3 Reviewed and approved (stamped) shop drawings
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- .4 Completed and approved Application for water connection form (As Required). Contractor to comply with all local and state backflow prevention requirements, where applicable
- .5 Approvals by all Authorities having jurisdiction.
- .6 Equipment operation and maintenance instructions
- .5 As-built drawings must contain, as a minimum, the following;
 - .1 Mechanical equipment layout and schedule
 - .2 Structural Drawings and Plans
 - .3 Electrical Wiring Diagrams, Layouts and Schematics
 - .4 All flow schematics
- .6 Prepare an index of all submittals and shop drawings for the installation. Index shall include a shop drawing identification number, Contract Documents reference and item description.
 - .1 Electrical and structural design, as required in this scope of work, will be provided by the Contractor. I.B. Storey Inc. will not review, comment, or approve any documentation related to these aspects of the project.
- .7 The contractor shall correct any errors or omissions noted in the first review.
- .8 Within two (2) weeks of contract award the contractor shall provide a schedule, in a Gantt Chart to the Owner and the Owner's Engineer, which summarizes all construction timelines and milestone dates. Including, but not limited to:
 - .1 Shop drawing submittal and review time;
 - .2 Equipment order dates;
 - .3 Lead time;
 - .4 Site construction milestones (equipment placement, etc.)
 - .5 On-site completion;
 - .6 System start-up;
 - .7 Substantial completion;
 - .8 Training and owner turnover.

1.9 Commissioning

- .1 Upon completion of the work, the contractor shall start up and calibrate the system to ensure all installed components start, and are installed properly.
 - .2 The contractor shall provide the Owner's Engineer with a Start Up checklist four (4) weeks prior to project start up for review and approval. The checklist shall include, but is not limited to, the following elements:
 - .1 Equipment status
 - .2 Time of day
 - .3 Inlet temperatures
-

- .4 Outlet temperatures
 - .5 Suction pressures
 - .6 Discharge pressures
 - .7 Liquid flow rates
 - .8 Oil temperatures
 - .9 Valve positions
 - .10 Power reading including: power draw, voltage, current, power factor
- .3 An initial equipment check shall occur three (3) days prior to start up to ensure functionality of all components. Prior to this check, all equipment shall be visually inspected.
 - .4 Once start-up has occurred, the Start-Up Checklist shall be completed. The checklist shall be completed when the system is under load and at steady state to ensure all equipment is running. The contractor shall be immediately available in the hours following start up to provide start up services and to rectify issues immediately as they arise.
 - .5 After substantial completion independent performance commissioning shall be completed by I.B. Storey and a deficiency list shall be provided to the contractor. Following receipt of the deficiency list the contractor shall provide weekly updates in writing of the completion status of the deficiencies, including proof of completion. After completion of all deficiencies the Owner's Engineer shall perform one final inspection, any requisite subsequent inspections shall be at the cost of the contractor (\$1,200 per inspector per occurrence.)

1.10 Training

- .1 The contractor shall provide the owner's staff with two (2) up to four (4) hour training sessions in coordination with the Owner's staff.
 - .1 First Session – to occur at system start-up, with training specifically geared toward system start-up
 - .2 Second Session – to occur at a later time for other arena staff in the event they are unable to attend, and to address any operational issues that arise during regular operation
- .2 The date and time of the training sessions shall be at the option of the Owner, and shall be coordinated by the contractor.

1.11 Warranty

- .1 Standard Material and Labour Warranty:
 - .1 Provide a one-year labour and material warranty on the refrigeration system following substantial completion unless otherwise noted.

- .2 If within twelve (12) months from the date of acceptance of a product, upon written notice from the Owner, it is found to be defective in operation, workmanship, or materials, it shall be replaced, repaired, or adjusted at the option of the Contractor at the cost of the Contractor.

PART 2 – AC AND HEAT
RECOVERY

2.1 Demolition Scope of
Work

- .1 The Contractor is to remove and dispose of the existing P-14 pump and its VFD.
- .2 The Contractor is to remove the existing RTU-2 return air plenum.
 - .1 The return air plenum is to be reinstalled as indicated in the drawing package.

2.2 AC and Heat Recovery
Scope of Work

- .1 Supply and Install (1) cooling coil for the existing RTU-2 unit. (CC-1)
 - .1 Total Capacity: 366.1 MBH
 - .2 Sensible Capacity: 267.7 MBH
 - .3 Side 1:
 - .1 Fluid: 45% Ethylene Glycol
 - .2 Flow Rate: 57 GPM
 - .3 Entering Glycol Temperature: 40°F
 - .4 Leaving Glycol Temperature: 55.1°F
 - .5 Maximum Pressure Drop: 13.95 ft. H2O
 - .4 Side 2:
 - .1 Fluid: Air
 - .2 Airflow: 12,970 CFM
 - .3 Entering Air Dry Bulb Temperature: 68.3°F
 - .4 Entering Air Wet Bulb Temperature: 59.7°F
 - .5 Leaving Air Dry Bulb Temperature: 49.5°F
 - .6 Leaving Air Wet Bulb Temperature: 49.3°F
 - .7 Maximum Pressure Drop: 0.795 in. H2O
 - .5 Dimensions:
 - .1 Coil Width: 17.5"
 - .2 Coil Length: 78"
 - .3 Coil Height: 60"
 - .6 Coils per Bank: 1
 - .7 Dry Weight: 805 lbs
 - .8 Operating Weight: 1,092 lbs
 - .9 Contractor is responsible for all structural design and structural work required to install the coil. Contractor to ensure the coil is properly supported.
 - .10 Standard of Acceptance, USA Coil & Air CW58SHM07505700023R, or approved equivalent.
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- .2 Supply and Install (1) Inline Booster Fan complete with VFD (BF-1)
 - .1 Drive Type: Direct
 - .2 CFM: 13,798
 - .3 Total External SP: 1.867 in. H2O
 - .4 Fan RPM: 1,160
 - .5 Motor: 10 HP
 - .6 Operating BHP: 6.97 HP
 - .7 Power: 575/3/60
 - .8 Sones (Radiated): 16.8
 - .9 Dimensions:
 - .1 Length: 39"
 - .2 Width: 42"
 - .3 Height: 42"
 - .10 Weight: 526 lbs
 - .11 Fan to be outdoor rated.
 - .12 Contractor to include optional manufacturer supplied VFD with the fan.
 - .13 Contractor is responsible for all structural design and structural work required to install the fan. Contractor to ensure fan is properly supported.
 - .14 Standard of Acceptance: Greenheck SQ-27-M2-X, or approved equivalent.
 - .3 Supply and install one (1) Control Damper
 - .1 Damper Size: 34" x 33"
 - .2 Temperature Range: -40°C to 121°C
 - .3 Damper is to be installed with an actuator.
 - .1 Actuator will be supplied by the Owner's Automation Contractor and installed by the Contractor of this scope.
 - .4 Standard of Acceptance: Greenheck VCD-33, or approved equivalent.
 - .4 Supply and install two (2) industrial ceiling fans (BAF-1, BAF-2)
 - .1 Size: 20'
 - .2 Power: 575/3/60
 - .3 # of Airfoils: 8
 - .4 Weight: 290 lbs
 - .5 Sound Level (dBA): 55
 - .6 Motor: 2.5 HP
 - .7 RPM: 76
 - .8 Contractor to include one (1) manufacturer supplied BAFCon controller.
-

- .1 Only one (1) BAFCon controller is required to control the two (2) industrial ceiling fans.
 - .9 Contractor is responsible for all structural design and structural work required to install the fans. Contractor to ensure fans are properly supported.
 - .10 Standard of Acceptance: Big Ass Fans POWERFOIL X4, or approved equivalent.

 - .5 Receive and Install one (1) heat exchanger (CHX-1)
 - .1 This equipment will be pre-ordered by the Owner. The Contractor is required to assign POs to contract, receive, unload, install, maintain warranty, and commission all pre-ordered equipment.
 - .2 Capacity: 368 MBH
 - .3 Side 1:
 - .1 Fluid: 45% Ethylene Glycol
 - .2 EFT: 50°F
 - .3 LFT: 40°F
 - .4 Flow Rate: 84.2 USGPM
 - .5 Max Pressure Drop: 1 ft. H₂O
 - .4 Side 2:
 - .1 Fluid: 21% Calcium Chloride
 - .2 EFT: 16°F
 - .3 LFT: 26°F
 - .4 Flow Rate: 84.9 USGPM
 - .5 Max Pressure Drop: 1 ft. H₂O
 - .5 Material: Titanium
 - .6 Dry Weight: 575 lbs
 - .7 Operating Weight: 689 lbs
 - .8 Standard of Acceptance: Alfa Laval T8-MFG, or approved equivalent.

 - .6 Supply and install one (1) Cold Glycol Pump complete with VFD (CP-1)
 - .1 Flow rate: 86 USGPM
 - .2 Pumping head: 21 ft. H₂O
 - .3 Pump speed: 1,760 RPM
 - .4 Working fluid: 21% CaCl Brine
 - .5 Motor: 1.5 HP, premium efficiency
 - .6 Butterfly-style isolation valves shall be installed on the inlet of the pump.
 - .7 Include manufacturer suction guide for the pump.
-

- .1 Body: Cast Iron
 - .2 Cover Gasket: Synthetic fibre
 - .3 Strainer: Stainless Steel, 0.125" Perf.
 - .4 Standard of Acceptance: Armstrong SG-32, or approved equivalent.
 - .8 Include non-slam check valve with manual isolation for the pump.
 - .1 Valve Style: Silent check valve
 - .2 Valve size: 3"
 - .3 Body Style: Globe
 - .4 End Connection: Flanged
 - .5 Body Material: Cast Iron
 - .6 Seat Material: EPDM
 - .7 Seating Surface: Acrylonitrile-Butadiene
 - .8 Standard of Acceptance: Armstrong Flo-Trex FTV 3FA, or approved equivalent.
 - .9 Dial type pressure gauges shall be **supplied and installed** on the inlet and outlet of the pump.
 - .1 Refer to specifications below for pressure gauge requirements.
 - .10 One (1) Variable frequency drive:
 - .1 Power: 575/3/60
 - .2 VFD to be supplied by Automation Contractor and installed by Mechanical Contractor.
 - .11 Standard of Acceptance: Armstrong 4380 2x2x6, or approved equivalent.
 - .7 Supply and install one (1) AC Pump (P-14)
 - .1 Flow rate: 430 USGPM
 - .2 Pumping head: 85 ft. H₂O
 - .3 Pump speed: 1,768 RPM
 - .4 Working fluid: 45% Ethylene Glycol
 - .5 Motor: 15 HP, premium efficiency
 - .6 Butterfly-style isolation valves shall be installed on the inlet of the pump.
 - .7 Include manufacturer suction guide for the pump.
 - .1 Body: Cast Iron
 - .2 Cover Gasket: Synthetic fibre
 - .3 Strainer: Stainless Steel, 0.125" Perf.
 - .4 Standard of Acceptance: Armstrong SG-64, or approved equivalent.
 - .8 Include non-slam check valve with manual isolation for the pump.
-

- .1 Valve Style: Silent check valve
 - .2 Valve size: 6"
 - .3 Body Style: Globe
 - .4 End Connection: Flanged
 - .5 Body Material: Cast Iron
 - .6 Seat Material: EPDM
 - .7 Seating Surface: Acrylonitrile-Butadiene
 - .8 Standard of Acceptance: Armstrong Flo-Trex FTV 6FS, or approved equivalent.
 - .9 Dial type pressure gauges shall be **supplied and installed** on the inlet and outlet of the pump.
 - .1 Refer to specifications below for pressure gauge requirements.
 - .10 One (1) Variable frequency drive:
 - .1 Power: 575/3/60
 - .2 VFD to be supplied by Automation Contractor and installed by Mechanical Contractor.
 - .11 Standard of Acceptance: Armstrong 4030 4x3x10, or approved equivalent.
 - .8 Supply and install one (1) Cooling Coil Pump (ACP-1)
 - .1 Flow rate: 57 USGPM
 - .2 Pumping head: 29 ft. H₂O
 - .3 Working fluid: 45% Ethylene Glycol
 - .4 Maximum power input: 643 W
 - .5 Butterfly-style isolation valves shall be installed on the inlet and outlet of the pump.
 - .6 Dial type pressure gauges shall be **supplied and installed** on the inlet and outlet of the pump.
 - .1 Refer to specifications below for pressure gauge requirements.
 - .7 Standard of Acceptance: Grundfos MAGNA3 50-150 GF, or approved equivalent.
 - .9 Supply and install one (1) AC Expansion Tank (EX-1)
 - .1 Acceptance Volume: 8.8 gal.
 - .2 Total Volume: 11 USGAL
 - .3 Type: Pre-charged heavy-duty butyl diaphragm.
 - .4 Shell Material: Carbon Steel
 - .5 Head Material: Carbon Steel
 - .6 Working Temperature: 240°F
 - .7 Working Pressure: 150 PSI
 - .8 ASME Certified Construction
-

- .9 Standard of Acceptance: Armstrong AX-20V, or approved equivalent
 - .10 Supply and install one (1) Glycol Relief High Capacity Air Vent
 - .1 Install one on the AC loop at the highest point of piping.
 - .2 Provide manual isolation valves before the high capacity air vents.
 - .3 Pressure Range: 30-150 PSI
 - .4 Pressure Setting: 110 PSI
 - .5 Maximum Temperature: 250°F
 - .6 Standard of Acceptance: Watts 174A, or approved equivalent.
 - .11 Where noted in the specifications or the drawings, pressure gauges must meet the following requirements:
 - .1 Pressure Range: 0 – 100 PSI
 - .2 Standard of Acceptance: Kodiak Controls Inc. KC201 D25 100
 - .12 Where noted in the specifications or the drawings, analog thermometers must meet the following requirements:
 - .1 Type: Adjustable angle liquid-in-glass thermometer.
 - .2 Range: 0°F to 160°F
 - .3 Contractor to include all thermowells as required.
 - .4 Standard of Acceptance: Trerice, or approved equivalent.
 - .13 Supply and install a new charge of glycol for the existing AC system.
 - .1 Contractor to carry all procurement, transportation, testing, and labour required to provide the glycol charge.
 - .2 Fluid: 45% Ethylene Glycol, including all required additives and inhibitors
 - .3 After charging of the system, the Contractor is required to adjust the concentration to the desired amount. Testing must be completed demonstrating that the required concentration has been achieved. Provide all testing reports to the Owner's Engineer.
 - .14 All metal ducting is to be provided by the Contractor and must conform to the following requirements:
 - .1 All ducts are to be a minimum 22 gauge galvanized sheet metal ducts
 - .2 All round ducts, where noted, are to be spiral ducts.
 - .3 90° duct turns and elbow fittings must have minimum of 1.5D center radius except where space constraints do not allow. Radii to be as large as possible.
 - .4 Run all ducts level unless otherwise noted.
-

- .5 Duct sizes shown on drawings are clear inside dimensions. Installed dimensions must not be less than 1/16" smaller. Internal liners, where used, shall not reduce the clear interior dimensions.
 - .6 Maintain minimum distances between outdoor air intakes, exhaust outlets, and plumbing vents as outlined in the drawings. Any deviations must be reported prior to commencing work on the inlet/outlet.
 - .7 Install insulation and vapour barrier for all outdoor air ducts and plenums. Insulation is to be outdoor rated with minimum R-12.
- .15 Housekeeping pads
- .1 Housekeeping pad structural design is the responsibility of the Contractor.
 - .2 The contractor is to form and pour new concrete housekeeping pads with steel reinforcing as required, for all new base/floor mounted equipment, including heat exchangers and pumps.
 - .3 Concrete pads are to be a minimum of 4" tall, unless otherwise noted.
 - .4 Steel bases of the equipment are to be grouted and/or filled with concrete as required to limit noise and vibration. The foundation should be sufficiently substantial to absorb any excessive vibration and permanently support the base at all times.
 - .5 Concrete pads are to be finished level.
 - .6 The foundation must be poured well in advance of the installation to allow proper time for drying and curing.
 - .7 The elevations of all concrete pads are to be painted high visibility safety yellow, using one coat of primer and two coats of paint.
- .16 Coordinate the installation of all automation components with the Owner's Automation Contractor.
- .1 The Contractor of this scope will be responsible for installing sensors, instrumentation, and VFDs as required.
 - .2 Automation components will be supplied by the Owner's Automation Contractor.
- .17 Reinstall the existing RTU-2 return air plenum in the location indicated in the drawing package.
-

2.3 Additional AC and
Heat Recovery Items

- .1 Any electrical or fire alarm shutdowns required by the Contractor for the scope of work must be approved by the Owner two (2) weeks prior to being performed for coordination purposes.
 - .2 All valves and controls should be located at ergonomic heights unless technically unfeasible.
 - .3 The contractor shall install thermometers on the inlets and outlets of the heat exchanger and pressure gauges on all pumps. Pressure gauges are to be dial type and temperature gauges are analog type as specified.
 - .4 Contractor to provide structural steel support members as required for hanging equipment, fans, pipes, and ductwork.
 - .5 Cutting, patching, sleeving, sealing, and fireproofing of floor, wall and ceiling necessary for all delivery and installation of refrigeration system shall be provided by the contractor.
 - .6 The contractor shall install dust enclosures while performing work in occupied facility zones, which generates large amounts of particulates.
 - .7 The contractor shall carry the cost of all piping, valves, fittings, and adaptors required to make a fully functional system as outlined in the specification herein, even if not specifically mentioned.
 - .8 Site cleanup and removal of construction/demolition debris is the responsibility of the contractor.
 - .9 Equipment layout shall allow adequate clearances for cleaning and maintenance purposes. The proposed clearances must be documented on a Clearance and Interface drawing and submitted to the Owner and the Owner's Engineer for comment, prior to commencing work.
 - .10 All installed equipment shall be labelled with placards, and shall be labelled by equipment type in sequential order (Pumps, Heat Exchangers, etc.).
 - .11 All inlets and outlets to heat exchangers shall be labelled with placards indicating flow medium and whether the connection is an inlet or outlet.
 - .12 Contractor shall seal all building penetrations created/modified under the scope of this contract with a watertight sealant; the penetration shall be painted to match the surrounding building finishes.
-

- .13 The contractor shall furnish, supply and install all required refrigerant isolation and control valves in accordance with all applicable codes and standards.
- .14 The contractor shall provide all required fluids required for a fully functional and operational system including:
 - .1 Ethylene Glycol Charge
 - .2 Calcium Chloride Brine Charge
- .15 All equipment installations must be constructed in conformance with the all local, provincial, and national code. Any additional requirements from the latest codes and standards supersede any requirements as written in this document.
- .16 All equipment shall be installed such that it meets or exceeds the manufacturer's recommended installation practices and requirements.
- .17 Prior to commencing work the contractor shall determine the location of any utility entrances (power, water, sewer), which may interfere with carrying out this work. This shall be done in conjunction with the utility companies, and shall be at the cost of the contractor.
- .18 Contractor must pay for all local inspections, approvals, and permits as required for the AC and Heat Recovery Retrofit project.
- .19 Supply and install a drain/charge valve on each pump and heat exchanger in the system.

PART 3 – PROCESS PIPING

3.1 Process Piping General
Comments

- .1 All work of this Division shall be coordinated and provided by the Mechanical Contractor.
- .2 All materials shall be first class and new.
- .3 The Mechanical Contractor shall work with the facility, and the Consulting Engineer to provide completed hydronic piping in a timely manner.
- .4 The work of this Division shall be as required by the Specifications and Schematic.
- .5 If the Contractor believes there are conflicts or missing information in the project documents, the Contractor shall promptly request clarification and instruction from the Owner's Engineer.

3.2 Process Piping
Definitions

- .1 Process Piping: Piping which contains a glycol or brine mixture for the purpose of distribution to loads.
- .2 Mechanical Contractor (or Contractor): The Contractor responsible for supply and installation of all process piping components and requirements as specified.

3.3 Process Piping
Description

- .1 The supply and installation of piping, labeling, identification and insulation as outlined.
 - .2 The work shall consist of the provision of all labour, materials, tools, equipment, testing, commissioning, training services, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, cutting and patching, warranties, services, and items, even though these may not be specifically mentioned in this documents which are required for the complete, fully functional and commissioned process piping system.
 - .3 Provide a complete, neat and workmanlike installation. Use only manufacturers and employees who are skilled, experienced, trained, and familiar with the specific equipment, software, standards and configurations to be provided for this Project.
 - .4 Manage and coordinate the work in a timely manner in consideration of the Project schedules. Coordinate with the associated work of other trades so as to not impede or delay the work of associated trades.
-

3.4 Process Piping Quality Assurance

- .1 General
 - .1 The Contractor shall be a recognized national supplier, installer and service provider for process piping.
 - .2 As part of Risk Management and evidence and assurance of the contractor's ability to support the Owner's system with service and parts, the Contractor must have been in the business for at least the last ten (10) years and have successfully completed a total of ten (10) piping systems in the preceding five (5) years.
- .2 Workplace Safety and Hazardous Materials
 - .1 Provide a safety program in compliance with the Contract Documents.
 - .2 The Contractor shall have a corporately certified comprehensive Safety Certification Manual and a designated Safety Supervisor for the Project.
 - .3 The Contractor and its employees and subtrades comply with federal, state and local safety regulations.
 - .4 The Contractor shall ensure that all subcontractors and employees have written safety programs in place that covers their scope of work, and that their employees receive the training required by the Health and Safety Commission in the jurisdiction for at least each topic listed in the Safety Certification Manual.
 - .5 Hazards created by the Contractor or its subcontractors shall be eliminated before any further work proceeds.
 - .6 Hazards observed but not created by the Contractor or its subcontractors shall be reported to either the Engineer or the Owner within the same day. The Contractor shall be required to avoid the hazard area until the hazard has been eliminated.
 - .7 The Contractor shall sign and date a safety certification form prior to any work being performed, stating that the Contractors' company is in full compliance with the Project safety requirements.
 - .8 The Contractor's safety program shall include written policy and arrangements for the handling, storage and management of all hazardous materials to be used in the work in compliance with the requirements of the Authorities Having Jurisdiction at the Project site.
 - .9 The Contractor's employees and subcontractor's staff shall have received training as applicable in the use of hazardous materials and shall govern their actions accordingly.
- .3 Quality Management Program

- .1 Designate a competent and experienced employee to provide Project Management. The designated Project Manager shall be empowered to make technical, scheduling and related decisions on behalf of the Contractor. At minimum, the Project Manager shall:
 - .1 Manage the scheduling of the work to ensure that adequate materials, labour and other resources are available as needed.
 - .2 Manage the financial aspects of the Contract.
 - .3 Coordinate as necessary with other trades.
 - .4 Be responsible for the work and actions of the workforce on site.

3.5 Process Piping Codes and Standards

- .1 Contractor to comply with all codes and standards applicable to this type of work, including;
 - .1 ASME B31.9 Building Service Piping
 - .2 ASME Boiler and Pressure Vessel Code
 - .3 Local, Provincial and National Building Codes
 - .4 ASHRAE Standards
 - .5 OH&S Regulations
- .2 In the case of conflicts or discrepancies, the more stringent regulation shall apply.
- .3 All work shall meet the approval of the Authorities Having Jurisdiction at the project site.

3.6 Process Piping Record Documentation

- .1 Provide two (2) paper copies and one (1) electronic copy of as-built process piping schematics and layouts for all installed piping covered under this contract.
- .2 Manual shall be bound in 3 ring binders and contain, as a minimum, the following:
 - .1 System operation and maintenance instructions, trouble shooting guidelines and operating log.
 - .2 Safety bulletins and material safety data sheets.
 - .3 Equipment operation and maintenance instructions.
 - .4 Signed Dept. of Labour (or equivalent) Pressure Tests Data Reports
 - .5 Shop drawings of all supplied equipment
- .3 As-built drawings shall contain, typical piping layout, material details, piping connection details, and any additional pertinent details regarding the piping.

3.7 Process Piping
Warranty

- .1 Standard Material and Labour Warranty:
 - .1 The Contractor shall provide a one-year labour and material warranty from the date of substantial completion on the process piping system including all valves and fittings.
 - .2 If within twelve (12) months from the date of acceptance of product, upon written notice from the owner, any portion of the Process Piping system is found to be defective in operation, workmanship or materials, it shall be replaced, repaired or adjusted at the option of the Contractor and at the cost of the Contractor.

3.8 Process Piping Scope
of Work

- .1 Piping shall conform to ASME B31.9 Building Service Piping.
- .2 Piping shall be as follows
 - .1 All Process Piping
 - .1 Up to 1 1/2" IPS
 - .1 Schedule 40 ERW OR
 - .2 Schedule 40 Seamless Black Steel Pipe With 150 LB Threaded, OR
 - .3 Schedule 40 3M Socket Weld
 - .2 2" IPS and up
 - .1 Schedule 40 ERW Black Steel Pipe with Standard Butt Weld Fittings,
 - .3 Pipe fittings shall be as follows
 - .1 Steel Piping
 - .1 Flanges ANSI & RF
 - .1 ASTM A105
 - .2 Pressure Rating to Match Design Working Pressure
 - .2 Up to 1 1/2" IPS
 - .1 Threaded – Forged Steel, ASTM A105, 3000 LBS
 - .2 Socket Weld – Forged Steel, ASTM A105, 3000 LBS
 - .3 Butt Weld – Carbon Steel, ASTM SA-234-WPB E.H.
 - .3 2" and Up
 - .1 Socket Weld – Forged Steel, ASTM A105, 3000 LBS
 - .2 Butt Weld – Carbon Steel, ASTM SA-234-WPB STD
 - .4 Piping shall be identified as per Owner's Current Labeling Standards. In the event that no standard is currently in place, labeling shall be as follows.
 - .1 Labeling body shall be Black on Safety Yellow
 - .2 Labeling shall indicate flow of fluid
 - .3 Label Size, text height and placement should conform to ASME A13.1
 - .1 Labels shall be adjacent to all valves and flanges

- .2 Adjacent to all changes of direction
- .3 On both sides of a wall or floor penetration
- .4 At regular intervals on straight runs (maximum 50 feet spacing)
- .4 Label Size, and Letter Size

Outside Pipe Diameter, including insulation (in.)	Minimum Label Length (in.)	Minimum Letter Height (in.)
< 1.25	8	0.5
1.5 – 2	8	0.75
2.5 – 6	12	1.25
8 – 10	24	2.5
> 10	32	3.5

- .5 To further protect the piping system, the piping shall be painted.
 - .1 All insulated field fabricated steel piping shall be painted with a rust resistant primer prior to insulation.
 - .2 Colors shall match existing color scheme currently utilized at the facility. If no color scheme is present, the following shall be used
 - .1 Light Blue Cold Glycol
 - .2 Dark Blue Warm Glycol
 - .3 Green Domestic Hot and Cold Water
 - .6 Piping shall be supported as follows

Nominal Diameter Pipe NPS (in.)	Recommended Spacing Between Hangers (ft.)	Minimum Rod Size (in.)
1/2	7	3/8
3/4	7	3/8
1	7	3/8
1-1/2	9	3/8
2	10	3/8
2-1/2	11	1/2
3	12	1/2
4	14	5/8
6	17	3/4
8	19	3/4
10	22	7/8
12	23	7/8
14	25	1
16	27	1
18	28	1

20	30	1-1/4
24	32	1-1/4

- .7 Pipe hangers must include rubber lining on the inside of the clamp to prevent pipe wear, unless the pipe is insulated.
- .8 Mechanical system shut-off valves :
 - .1 All hand shutoff valves shall be ball valves or butterfly valves.
 - .2 Valve type used:
 - .1 ¼" to 2", threaded full port ball valves
 - .2 2 ½" to 8", full lug type butterfly valves
 - .3 Ball valves to be two (2) piece construction with bronze or steel body, stainless steel ball and manual lever actuator with stem extension. Ball valves to have a rated working pressure or 600 PSIG.
 - .4 Butterfly valves to be full lug style and constructed with ductile iron body, ductile iron nickel plated disc, stainless steel shaft, and BUNA-N seat. Butterfly valve to have rated working pressure of 225 PSIG.
- .8 Valve flow coefficient shall be, at minimum, as per the following. Pressure drop across any fully open valve shall be at maximum 1.5 psi.

Pipe Size (in.)	CV
1-1/2	45
2	75
2-1/2	140
3	240
4	400
5	700
6	1000
8	2100
10	3100
12	4500

- .9 Process Piping Insulation
 - .1 Temperature range: Any
 - .2 Insulation Type: Polyiso
 - .3 Thickness: 1"
 - .4 Jacket Type: PVC
 - .1 Single piece, pre-curved for insulation thickness
- .10 Unless otherwise indicated, all materials must be new, first quality and approved by at least one of the following organizations: ULC,

ARI, AMCA, ASME or any other body with jurisdiction in the area concerned.

.11 Piping system test pressures:

- .1 All new piping to be pressure tested. Provide all test results to Owner upon completion.
- .2 Type of test: Hydronic
- .3 Cold Glycol System: 80 PSI.
- .4 Warm Glycol System: 100 PSI.

3.9 Specific Requirements

- .1 The proponent is responsible for:
 - .1 All pipe, valves and fittings shall be installed as per Local, Provincial, and National Code.
 - .2 Construction is to be completed in conjunction with owner.

3.10 Installation Practices

- .1 All piping shall be installed as per manufacturer's specifications in accordance with ASME B31.9 as required.
 - .2 All piping shall be installed straight and true, and parallel to all walls.
 - .3 All valves and controls should be located at ergonomic heights unless technically unfeasible.
 - .4 All valves shall be tagged with identification tags, and a reference key identifying each valve shall be provided with the as-built drawings.
 - .5 Piping shall be installed as per the drawing package.
-

PART 4 - ELECTRICAL
DESIGN-BUILD

4.1 Electrical Design-Build
Description

- .1 The design-build of an electrical system as outlined.
- .2 This contractor must be able to demonstrate to the Owner that a proper plan be implemented such that the allotted time for installation is satisfied.
- .3 Supply and install electrical design-build components, including wiring, panels, labour, and other electrical equipment.
- .4 The work shall consist of the provision of all labour, materials, tools, equipment, testing, commissioning, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, removal, installation, cutting and patching, warranties, services, and items, even though these may not be specifically mentioned in these documents which are required for the complete, fully functional, and commissioned electrical system.
- .5 Provide a complete, neat, and workmanlike installation. Use only employees who are certified journeyman or registered apprentices (under the supervision of a journeyman). The labour used to carry out the work shall be skilled, experienced, trained, and is to be familiar with the specific equipment, software, standards, and configurations to be provided for this Project. Contractors must submit registration numbers for key personnel that are certified journeyman.
- .6 Manage and coordinate the work in a timely manner in consideration of the Project schedule.

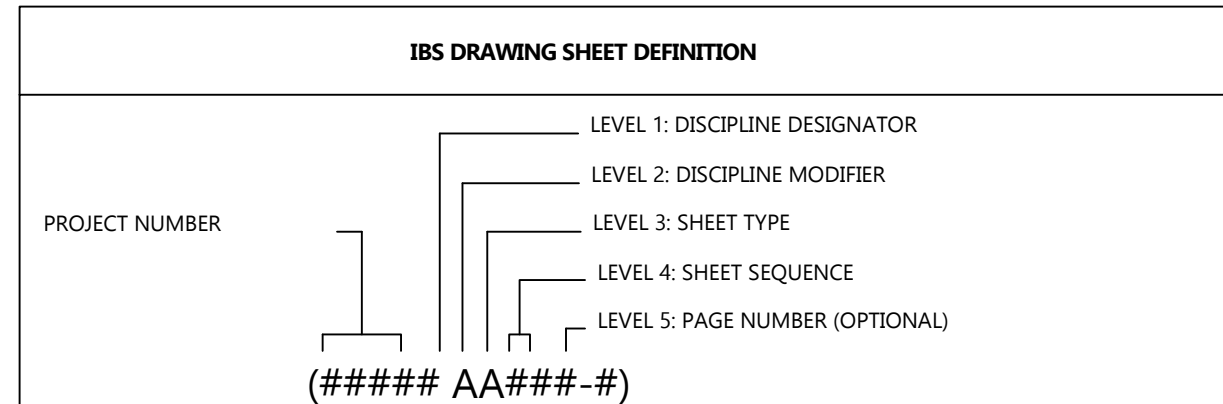
4.2 Electrical Design-Build
Scope of Work

- .1 The Contractor shall provide a design-build electrical scope to provide all required electrical feed for the AC and Heat Recovery Retrofit project.
 - .1 The Contractor is to confirm that the existing service is large enough for the new equipment as part of the electrical design-build.
 - .2 In the event that the existing service is not large enough for the new equipment the Contractor is to upgrade the service as required for the new equipment in coordination with other work onsite.
-

- .2 The electrical requirements of the project are provided in drawing 25005 E-601.
 - .3 The Contractor is to pull from the main building electrical a new feed sized and verified by the Contractor's team for the new equipment.
 - .4 All wiring and conduit from electrical panels directly to equipment is the responsibility of the Contractor of this division.
 - .1 The Contractor is responsible for verifying the existing electrical system on-site prior to bidding and determining what is required electrically to install the new system.
 - .5 Power wiring as much as possible is to be run through the building in non-accessible locations to the building occupants in the most aesthetically pleasing method as reasonable.
 - .1 Power wiring shall be run in conduit as much as possible
 - .2 Power wiring shall be firmly secured to surfaces, walls, cable trays or other.
 - .3 Power wiring is to be run parallel along walls at a minimum elevation of 7 ft in occupied corridors or along the ceiling of these zones to prevent interference with building occupants.
 - .6 Any disagreements between these requirements and relevant Electrical Codes for the local municipality are trumped by the Electrical Codes.
 - .7 The contractor is responsible for all required new electrical equipment. Reconfiguration is required to provide adequate power to the new equipment.
 - .8 All MCC's, VFD's, and starters are to be clearly labelled detailing:
 - .1 Equipment name
 - .2 Source of electrical
 - .3 Voltage and amps
-



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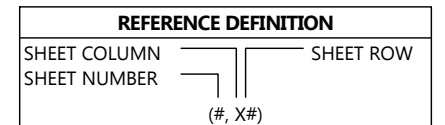
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A	ARCHITECTURAL	-	MODIFIER NOT USED	0	GENERAL	01-99	SEQUENTIAL VALUE
B	GEOTECHNICAL	M	B	1	PLANS	ODD	DISTINCT DRAWINGS
C	CIVIL		D	2	ELEVATIONS	EVEN	MIRROR DRAWINGS
D	PROCESS		H	3	SECTIONS		
E	ELECTRICAL		I	4	LARGE-SCALE VIEWS		
F	FIRE PROTECTION		P	5	DETAILS		
H	HAZARDOUS MATERIALS		R	6	SCHEDULES & DIAGRAMS		
I	INTERIORS			7	COORDINATION		
L	LANDSCAPE			8	DESIGN STANDARD		
M	MECHANICAL			9	3D REPRESENTATIONS		
O	OPERATIONS						
P	PLUMBING						
Q	EQUIPMENT						
R	RESOURCE						
S	STRUCTURAL						
T	TELECOMMUNICATIONS						
V	SURVEY/MAPPING						
W	DISTRIBUTED ENERGY						
X	OTHER DISCIPLINES						
Z	CONTRACTOR/SHOP DRAWINGS						

REVISION LOG				
DRAWING #	DRAWING NAME	VER:	REVISION	DATE
25005 M-101	BUILDING PLAN	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25
25005 M-601	SCHEMATIC & SCHEDULES	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25
25005 M-401	EQUIPMENT LARGE-SCALE VIEW	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25
25005 MP401	PIPING LARGE-SCALE VIEWS	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25
25005 MP301	PIPING SECTIONS	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25
25005 MH401	DUCTING LARGE-SCALE VIEWS	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25
25005 MH301	DUCTING SECTIONS	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25
25005 E-601	ELECTRICAL SINGLE LINE DIAGRAM	VER: 1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25

REVISION LOG

NOTES

25005 RL001



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VER #	REVISIONS	DATE	BY
1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25	H.A.



CHARLOTTETOWN PE
 VAUGHAN ON
 REDINGTON SHORES FL
 PLANO TX

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STAMP

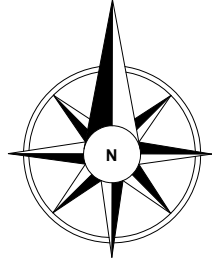
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DRAWING NAME: REVISION LOG

CLIENT: BONNYVILLE DCLFC

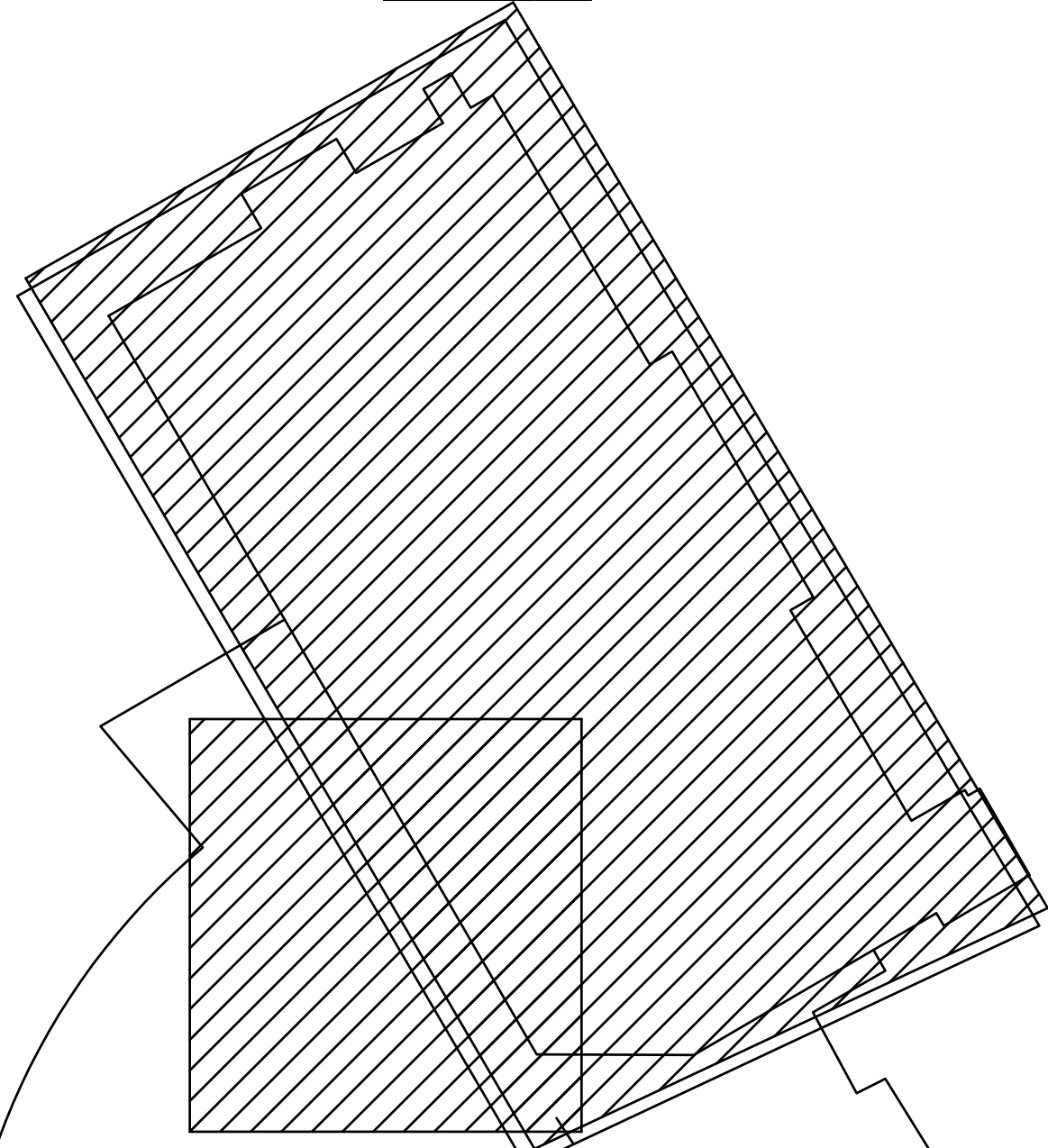
PROJECT: BONNYVILLE - ARP IMPLEMENTATION

DRAWN BY: H.AKAR	CHECKED BY: J.RITCHIE
DATE: 28-MAR-25	REVISION: 1.0
SHEET SIZE: C	SHEET NO.: 1 OF 1



NOTE:
 •BUILDING LAYOUT PREPARED BASED ON A1.1A: OVERALL MAIN FLOOR PLAN CREATED BY THE WORKUN GARRICK PARTNERSHIP.

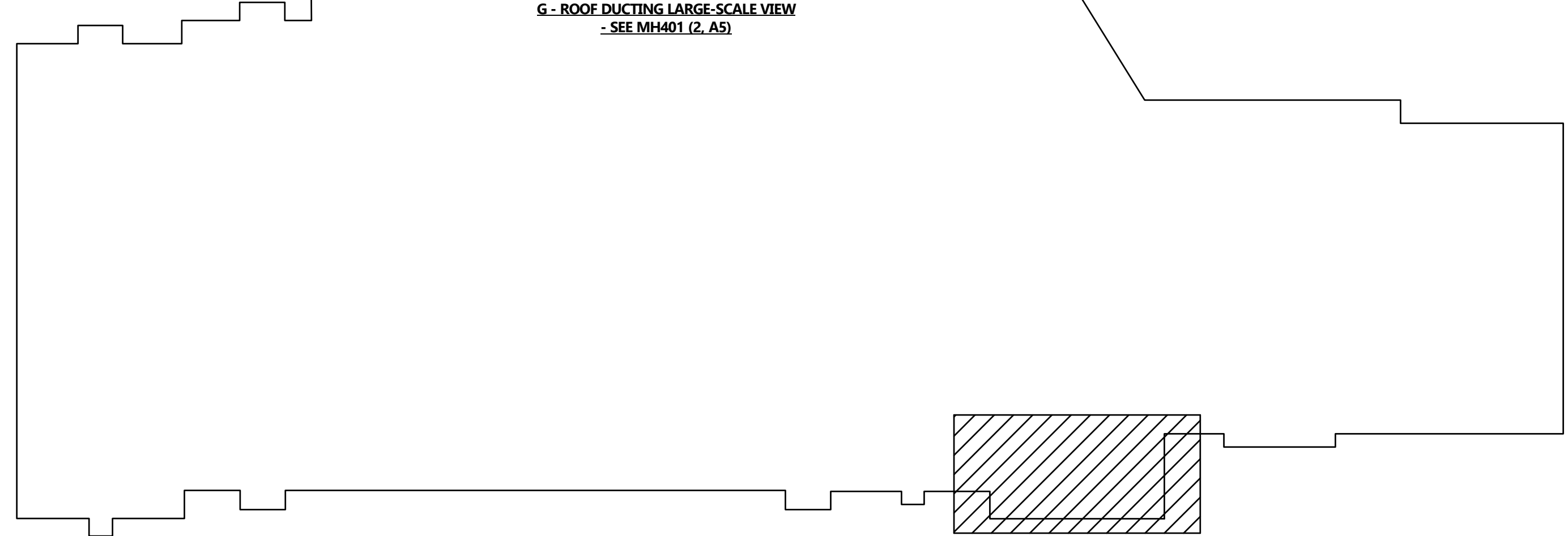
F - FIELD HOUSE DUCTING LARGE-SCALE VIEW
 - SEE MH401 (1, A5)



C - SECOND LEVEL PIPING LARGE-SCALE VIEW
 - SEE MP401 (2, A5)

E - ROOFTOP PIPING LARGE-SCALE VIEW
 - SEE MP401 (3, A5)

G - ROOF DUCTING LARGE-SCALE VIEW
 - SEE MH401 (2, A5)



BUILDING PLAN
 SCALE 1"=40'-0"

A - MECHANICAL ROOM EQUIPMENT
LARGE-SCALE VIEW - SEE M-401 (1, A5)

B - MECHANICAL ROOM PIPING
LARGE-SCALE VIEW - SEE MP401 (1, A5)

NOTES

REFERENCE DEFINITION	
SHEET COLUMN	SHEET ROW
SHEET NUMBER	(#, X#)

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DRAWING NUMBER 25005 M-101	
DRAWING NAME BUILDING PLAN	
CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY H.AKAR	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 1 OF 1

25005 M-101

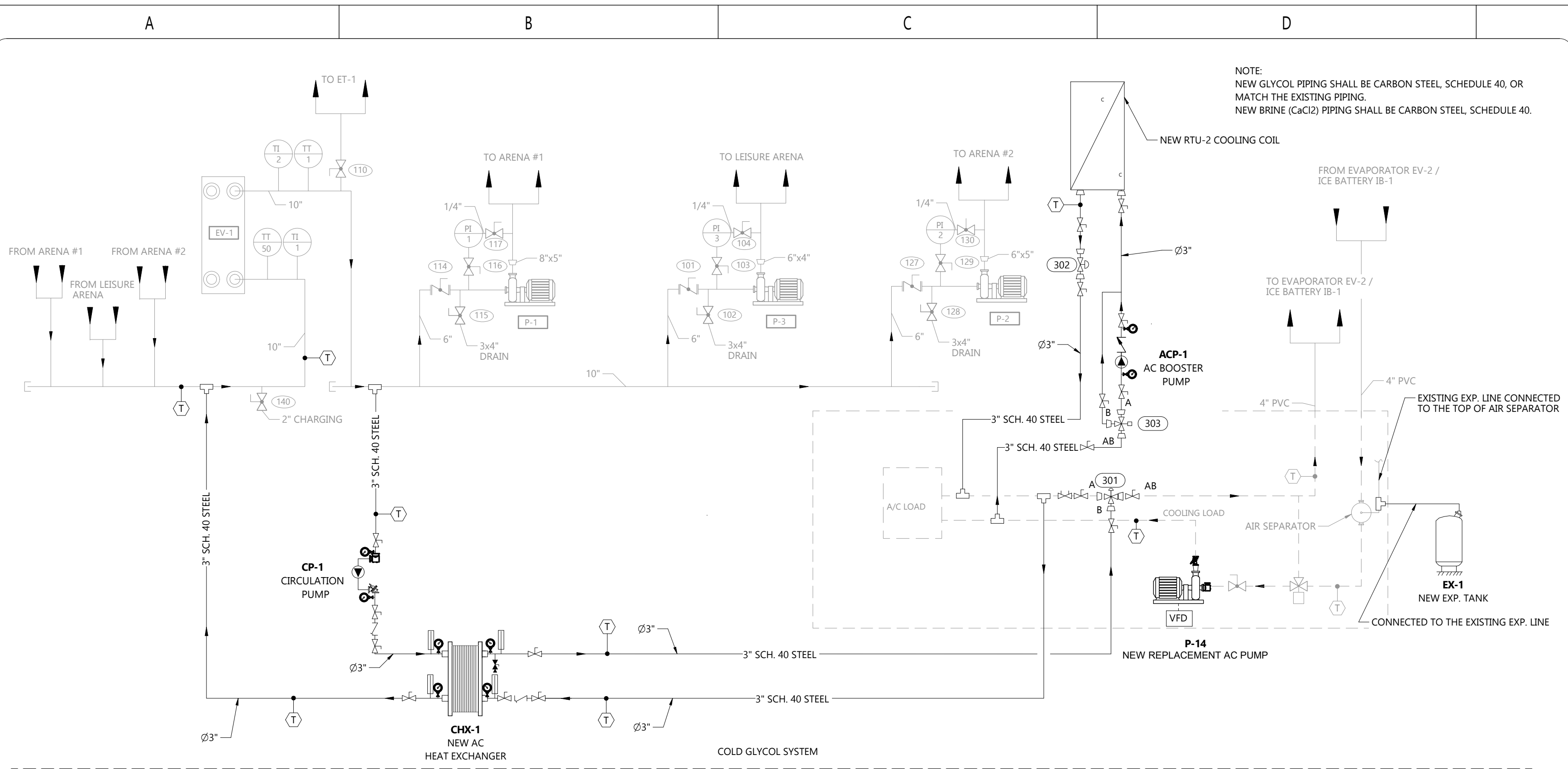
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2

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4

5



NOTE:
 NEW GLYCOL PIPING SHALL BE CARBON STEEL, SCHEDULE 40, OR MATCH THE EXISTING PIPING.
 NEW BRINE (CaCl₂) PIPING SHALL BE CARBON STEEL, SCHEDULE 40.

NOTES

	NEW
	EXISTING

REFERENCE DEFINITION

SHEET COLUMN	SHEET ROW
SHEET NUMBER	(#, X#)

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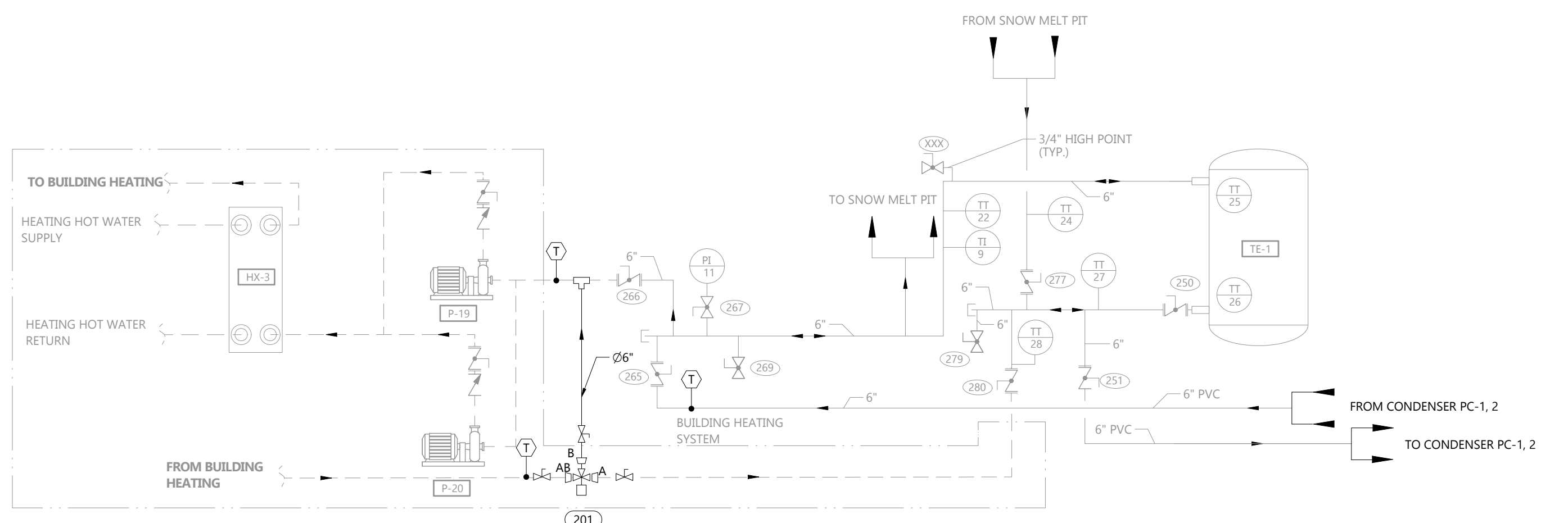
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GLYCOL SYSTEM

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DRAWING NUMBER	25005 M-601		
DRAWING NAME	SCHEMATIC & SCHEDULES		
CLIENT	BONNYVILLE DCLFC		
PROJECT	BONNYVILLE - ARP IMPLEMENTATION		
DRAWN BY	V.KOFANOV	CHECKED BY	J.RITCHIE
DATE	28-MAR-25	REVISION	1.0
SHEET SIZE	C	SHEET NO.	1 OF 3

25005 M-601

NOTES

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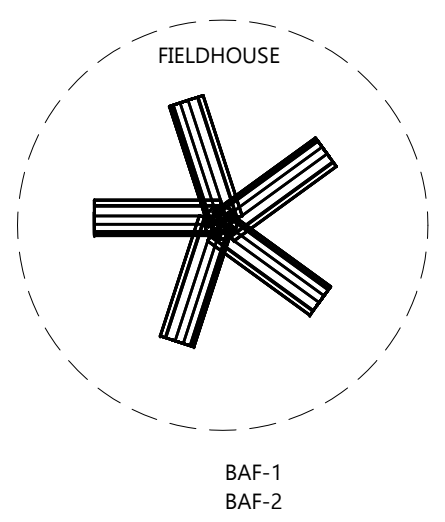
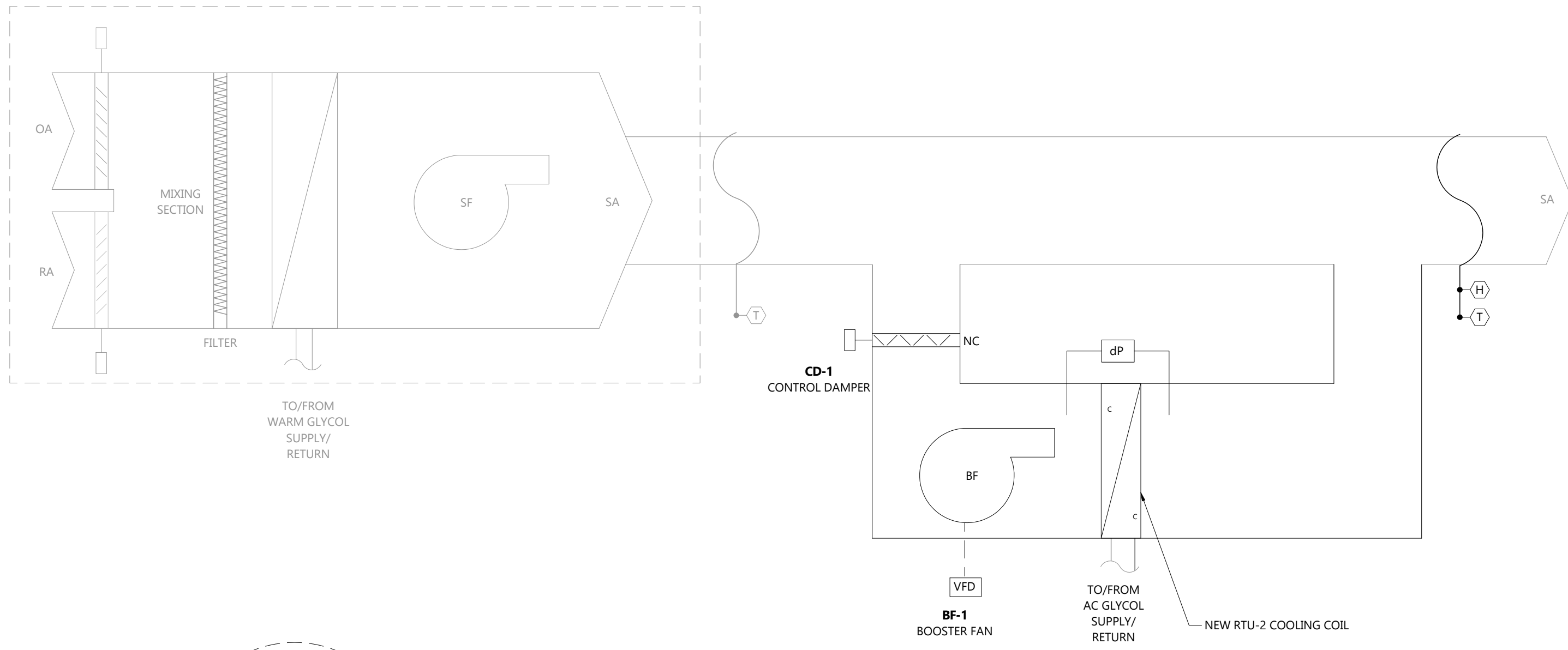
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DRAWING NUMBER 25005 M-601	
DRAWING NAME SCHEMATIC & SCHEDULES	
CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY V.KOFANOV	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 2 OF 3



DAMPER ACTUATORS, SENSORS TO BE SUPPLIED AUTOMATION CONTRACTOR AND INSTALLED BY MECHANICAL

AIR HANDLING RTU-2

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NOTES

_____	NEW
_____	EXISTING

REFERENCE DEFINITION	
SHEET COLUMN	SHEET ROW
SHEET NUMBER	(#, X#)

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DRAWING NUMBER 25005 M-601	
DRAWING NAME SCHEMATIC & SCHEDULES	
CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY V.KOFANOV	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 3 OF 3

RTU-2 COIL DATA

FUNCTION	AIRFLOW	FACE VELOCITY (FT/MIN)	A.P.D (IN. WG)	EAT-DB (°F)	EAT-WB (°F)	LAT-DB (°F)	LAT-WB (°F)	TMBH	SMBH	FLOW RATE (GPM)	EWT (°F)	LWT (°F)	WPD (FT)	ROWS	FPI	FLUID	MODEL
COOLING COIL	12,970	436.88	0.795	68.3	59.7	49.5	49.3	366.1	267.7	57	40	55.1	13.95	8	12	45% E. GLYCOL	USA COIL&AIR CW58SHM07505700023R

PUMPS SCHEDULE

TAG	SERVICE	QTY.	FLUID	FLOW, GPM	FT. H2O	MOTOR HP	RPM	V/PH/HZ	VFD	EST. WEIGHT, LB	LxWxH, IN	MANUFACTURER AND MODEL NO.	SUCTION GUIDE	FLO TREX
P-14	AC PUMP	1	45% E. GLYCOL	430	85	15	1768	575/3/60	YES	700	37.89 x 16 x 20.75	ARMSTRONG 4030-4x3x10	SG-64	FTV-6FS
CP-1	CIRCULATION PUMP	1	21% CaCl2	86	21	1.5	1760	575/3/60	NO	261	15x9.13x17.25	ARMSTRONG 4380 - 2x2x6	SG-32	FTV-3FA
ACP-1	AC BOOSTER PUMP	1	45% E. GLYCOL	57	29	0.8	3636	115/1/60	NO	43.7	--	GRUNDFOS MAGNA3 50-150 GF	--	--

HEAT EXCHANGER SCHEDULE

UNIT NO.	SERVICE	CAPACITY	SIDE 1					SIDE 2					MANUFACTURER AND MODEL NO
			MBH	USGPM	FLUID	EFT, F	LFT, F	FT. H2O	USGPM	FLUID	EFT, F	LFT, F	
CHX-1	AC HEAT EXCHANGER	368	84.2	45% E. GLYCOL	50	40	1	84.9	21% CaCl2	16	26	1	ALFA LAVAL T8-MFG

DESTRATIFICATION FAN SCHEDULE

TAG	DESCRIPTION	MODEL #	MANUFACTURER	HP	MAX RPM	EWIGHT (LBS)	EXTENSION TUBE (FT)	NOTE
BAF-1	FIELD HOUSE	20' PFX4	BIG ASS FAN	2.5	76	290	10	SUPPLIED WITH BAFcon CONTROLLER
BAF-2	FIELD HOUSE	20' PFX4	BIG ASS FAN	2.5	76	290	10	SUPPLIED WITH BAFcon CONTROLLER

BOOSTER FAN SCHEDULE

TAG	AREA SERVED	MFG	MODEL	DRIVE TYPE	CFM	TOTAL EXTERNAL SP	FAN RPM	BHP	HP	V/C/P	SONES	DBA	VFD
BF-1	FIELD HOUSE	GREENHECK	SQ-27-M2-X	DIRECT	13,798	1.867	1160	6.97	10	575/60/3	16.8	67	SUPPLIED WITH FAN

VALVE SCHEDULE FOR REFERENCE

TAG	VALVE PATTERN	REQ. FLOW	DN SIZE	VALVE CV	VALVE MATERIAL NO.	ACTUATOR MATERIAL NO.	ACTUATOR TYPE	FAIL STATE
301	3-WAY	430	4	230	F7100HD	PKRXUP-MFT-T	MODUL	A-AB OPEN
302	2-WAY	56	1	30	B225	NRX24-MFT-T N4	MODUL	OPEN
303	3-WAY	56	2	57	B350	AFRX24-MFT N4	ON/OFF	A-AB OPEN
201	3-WAY	677	5	1022	F7125HD	PKRXUP-MFT-T	ON/OFF	B-AB OPEN

NOTE:
CONTROL VALVES ARE TO BE SUPPLIED BY THE AUTOMATION CONTRACTOR AND INSTALLED BY THE MECHANICAL CONTRACTOR.

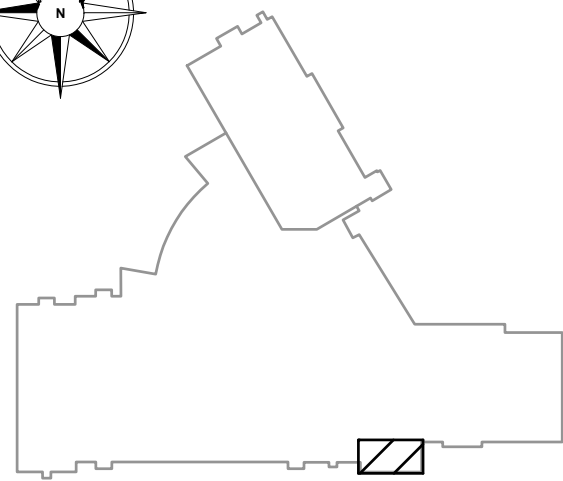
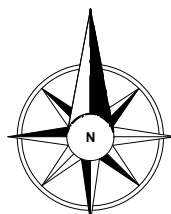
DAMPER SCHEDULE

TAG	DESCRIPTION	QTY.	SIZE	MANUFACTURER AND MODEL NO.	ACTUATOR
CD-1	RTU-2 SA	1	34x33	GREENHECK VCD-33	NFX24-MFT N4

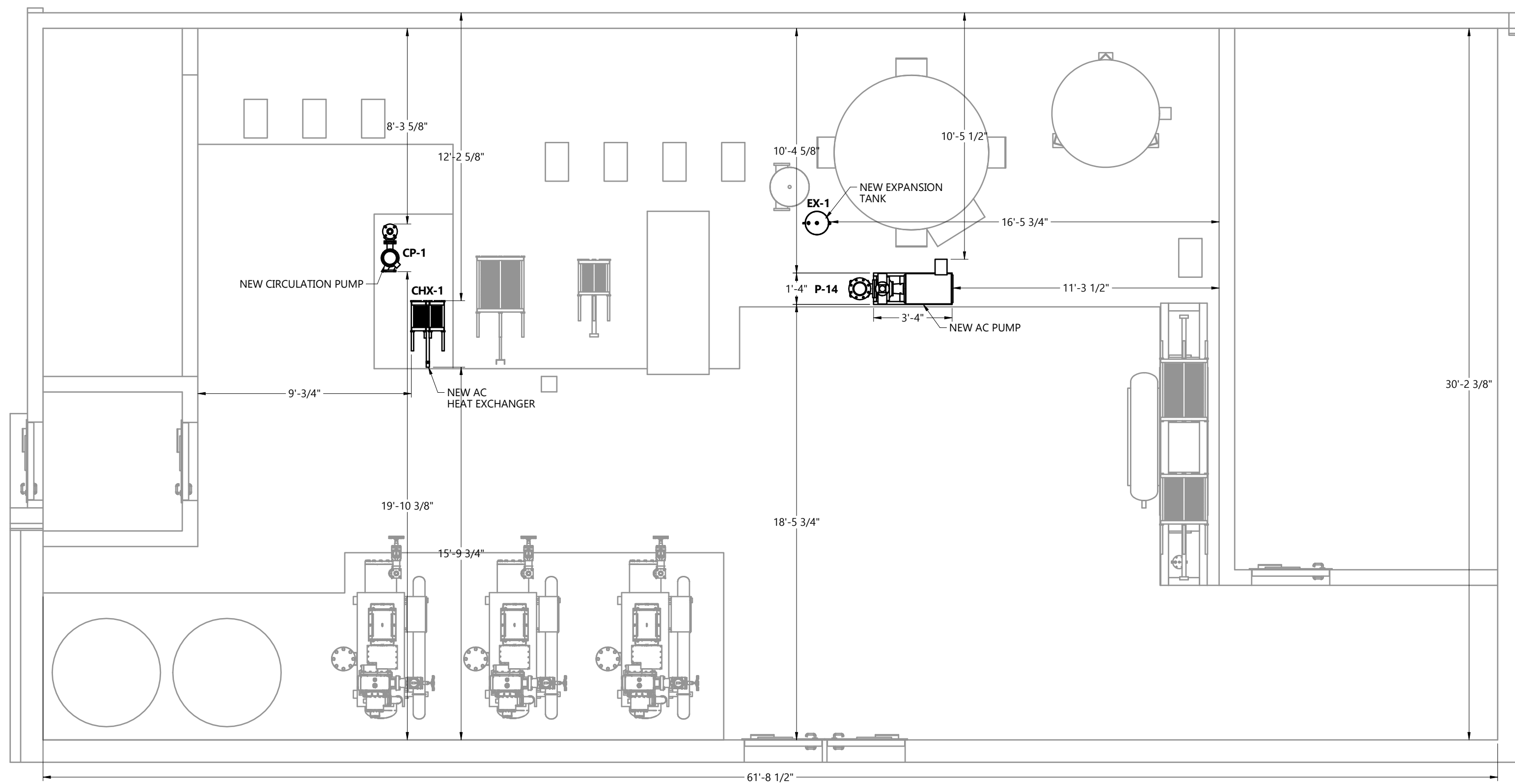
EXPANSION TANK SCHEDULE

TAG	DESCRIPTION	QTY.	SERVICE/LOCATION ID	MAX.FLOW, USGPM	MANUFACTURER AND MODEL NO.	ACCEPTANCE VOLUME, USGAL	VOLUME, USGAL	SHIPPING WEIGHT, LB
EX-1	EXP. TANK	1	AC LOOP SIDE	-	ARMSTRONG AX-20V	8.8	11.0	52

EQUIPMENT SCHEDULES



SITE KEY



MECHANICAL ROOM EQUIPMENT LARGE-SCALE VIEW - SEE M-101 (1,C5)
SCALE 1/4" = 1'-0"

NOTES

---	EXISTING
---	NEW

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SHEET NUMBER	(#, X#)

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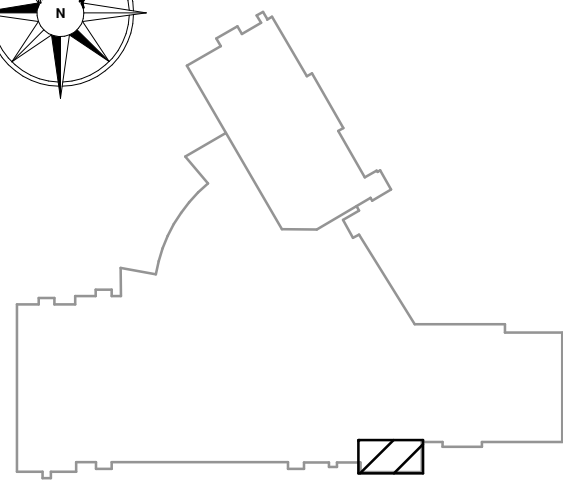
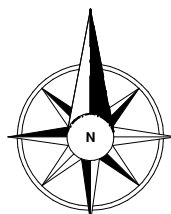
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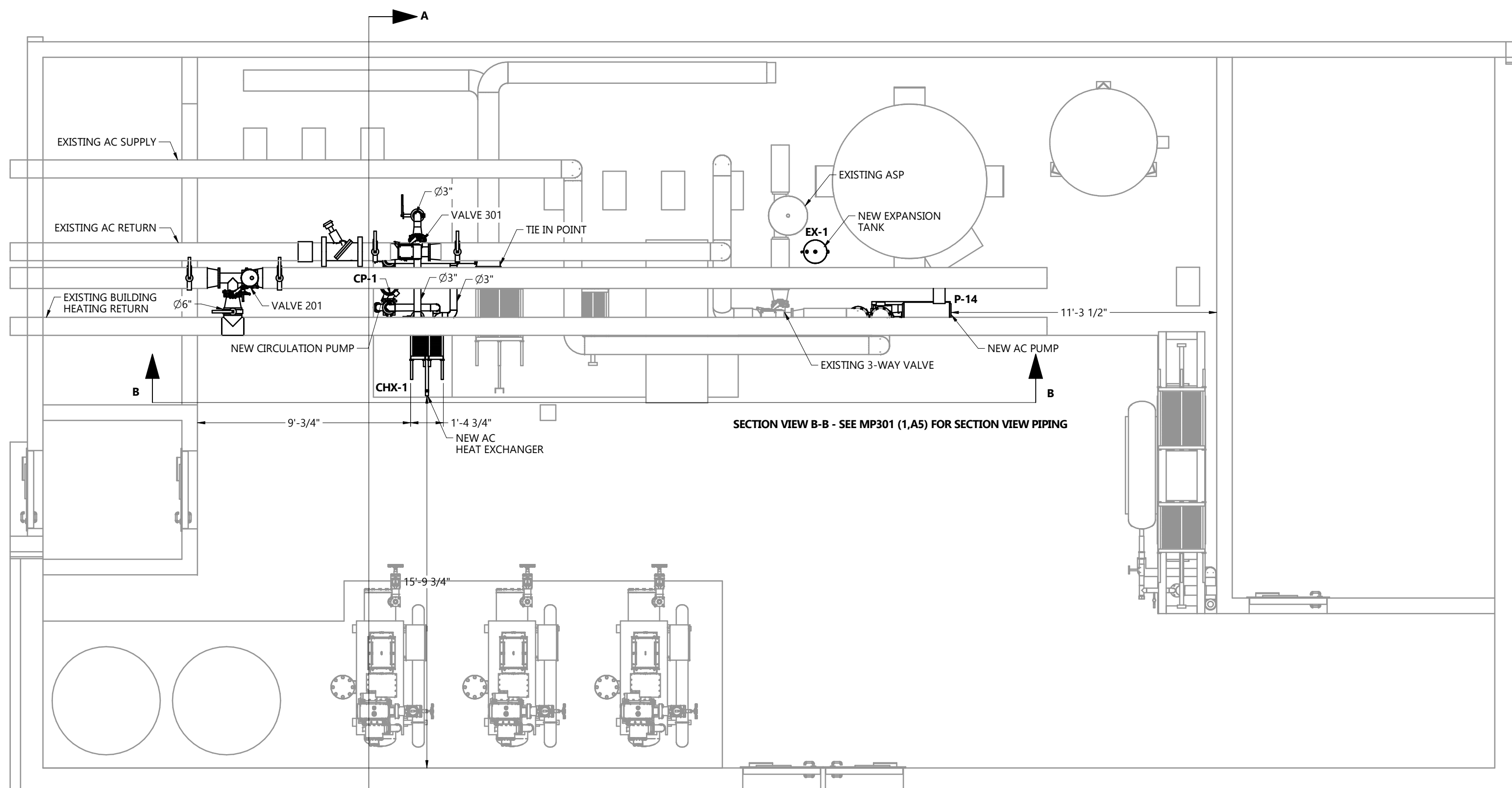
DRAWING NUMBER	25005 M-401		
DRAWING NAME	EQUIPMENT LARGE-SCALE VIEW		
CLIENT	BONNYVILLE DCLFC		
PROJECT	BONNYVILLE - ARP IMPLEMENTATION		
DRAWN BY	R.THOMAS	CHECKED BY	J.RITCHIE
DATE	28-MAR-25	REVISION	1.0
SHEET SIZE	C	SHEET NO.	1 OF 1

25005 M-401



SITE KEY

SECTION VIEW A-A - SEE MP301 (1,B3) FOR SECTION VIEW PIPING



MECHANICAL ROOM PIPING LARGE-SCALE VIEW - SEE M-101 (1,C5)
SCALE 1/4"=1'-0"

- NOTE:**
- NEW EXPANSION TANK SHOULD BE CONNECTED TO THE EXISTING EXPANSION TANK CONNECTION.
 - CONTRACTOR ON SITE TO CONFIRM AVAILABLE SPACE ON ROOF LEVEL FOR NEW PIPING.
 - ALL PIPING IS TO BE INSULATED.

NOTES

	EXISTING
	NEW

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DRAWING NUMBER		25005 MP401	
DRAWING NAME			
PIPING LARGE-SCALE VIEWS			
CLIENT			
BONNYVILLE DCLFC			
PROJECT			
BONNYVILLE - ARP IMPLEMENTATION			
DRAWN BY	CHECKED BY		
R.THOMAS	J.RITCHIE		
DATE	REVISION		
28-MAR-25	1.0		
SHEET SIZE	SHEET NO.		
C	1 OF 3		

25005 MP401

NOTES

	EXISTING
	NEW

REFERENCE DEFINITION	
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SHEET NUMBER	(#, X#)

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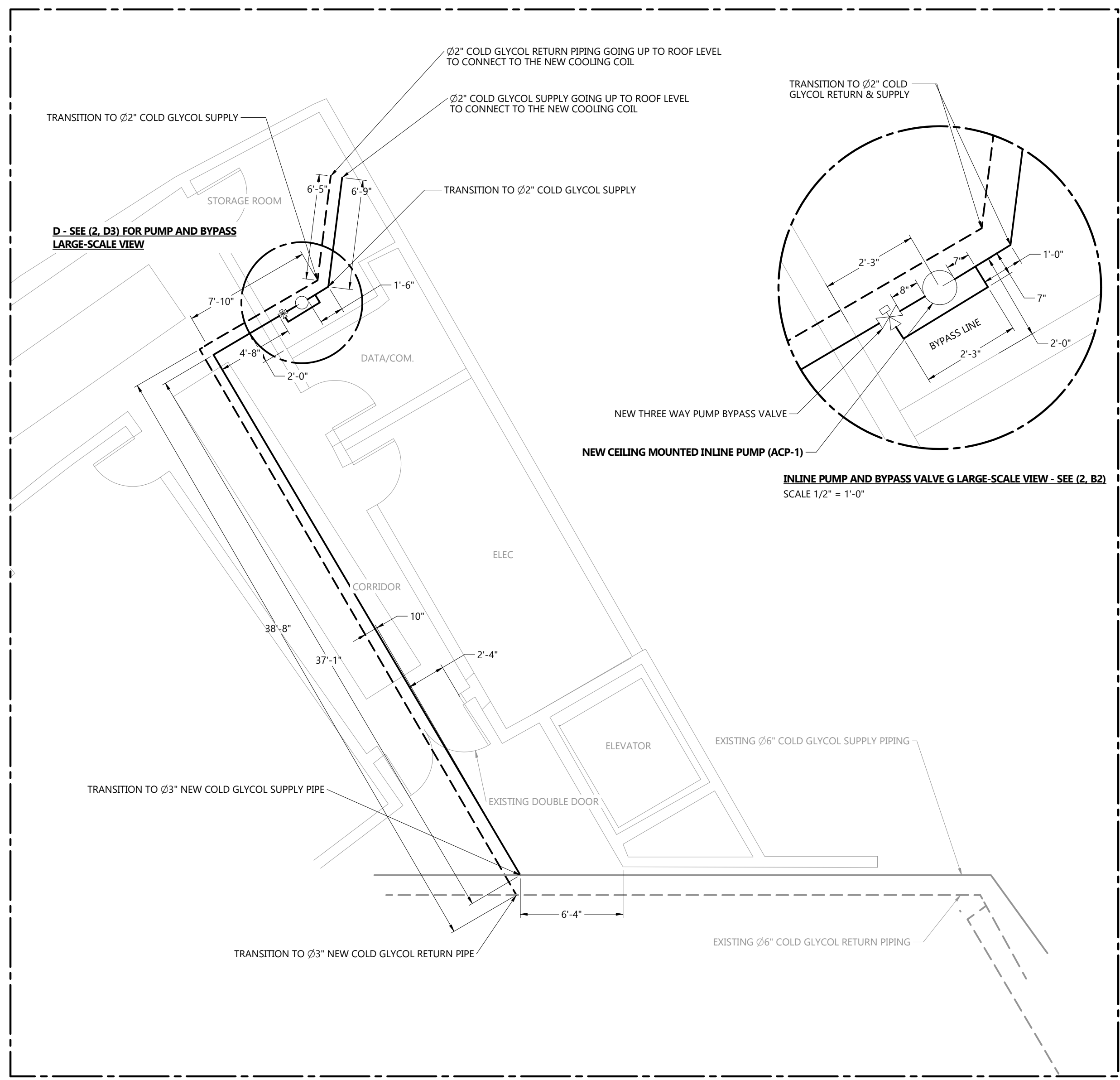
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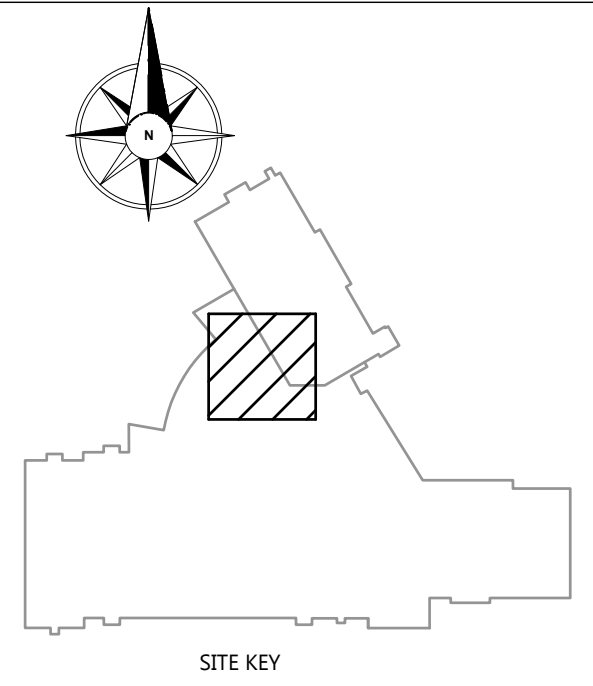
DRAWING NUMBER 25005 MP401	
DRAWING NAME PIPING LARGE-SCALE VIEWS	
CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY H.AKAR	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 2 OF 3



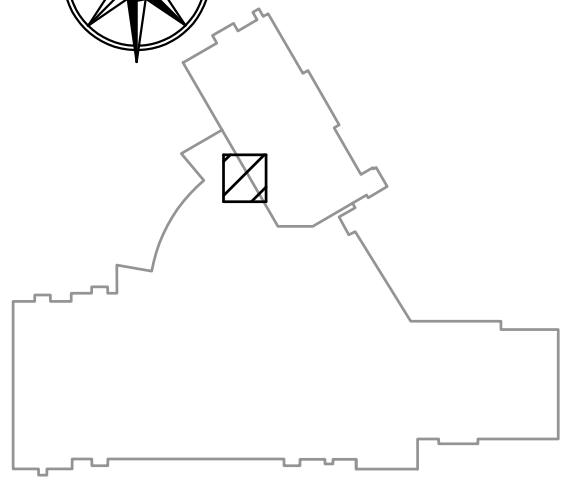
SECOND LEVEL PIPING LARGE-SCALE VIEW - SEE M-101 (2, B3)
 SCALE 3/16" = 1'-0"

INLINE PUMP AND BYPASS VALVE G LARGE-SCALE VIEW - SEE (2, B2)
 SCALE 1/2" = 1'-0"

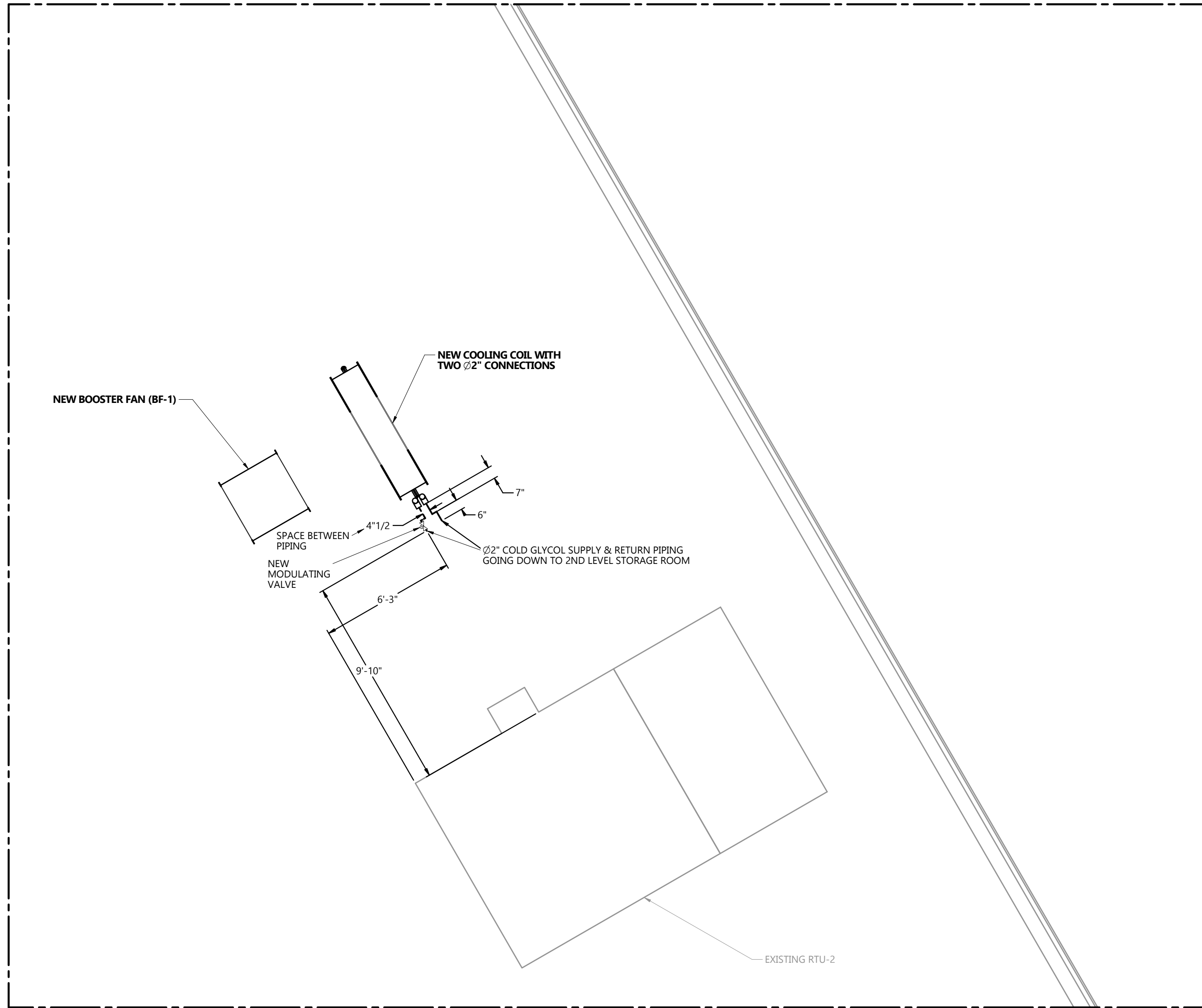
D - SEE (2, D3) FOR PUMP AND BYPASS LARGE-SCALE VIEW



- NOTES:**
- DRAWING BASED ON M4.7 PARTIAL SECOND FLOOR PLAN PLUMBING AND HEATING BY THE WORKUN GARRICK PARTNERSHIP.
 - CONTRACTOR ON SITE TO CONFIRM AVAILABLE SPACE ON SECOND LEVEL FOR NEW PIPING.
 - ALL PIPING IS TO BE INSULATED.



SITE KEY



ROOFTOP PIPING LARGE-SCALE VIEW - SEE M-101 (1, B3)
SCALE 3/16" = 1'-0"

- NOTES:**
- CONTRACTOR ON SITE TO CONFIRM AVAILABLE SPACE ON ROOF LEVEL FOR NEW PIPING.
 - ALL PIPING IS TO BE INSULATED.

ROOFTOP PIPING

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---	EXISTING

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CLIENT BONNVILLE DCLFC	
PROJECT BONNVILLE - ARP IMPLEMENTATION	
DRAWN BY H.AKAR	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 3 OF 3

25005 MP401

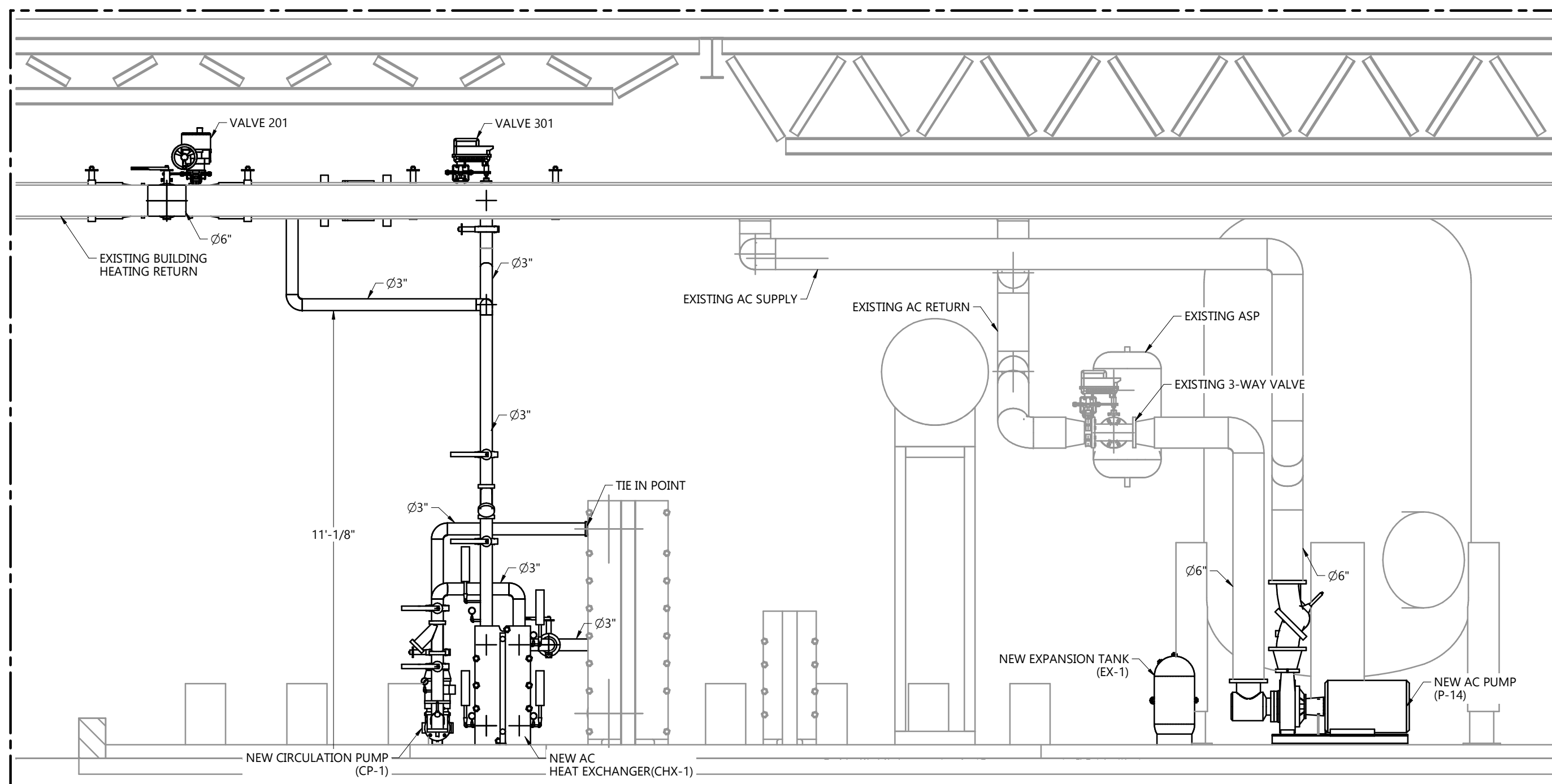
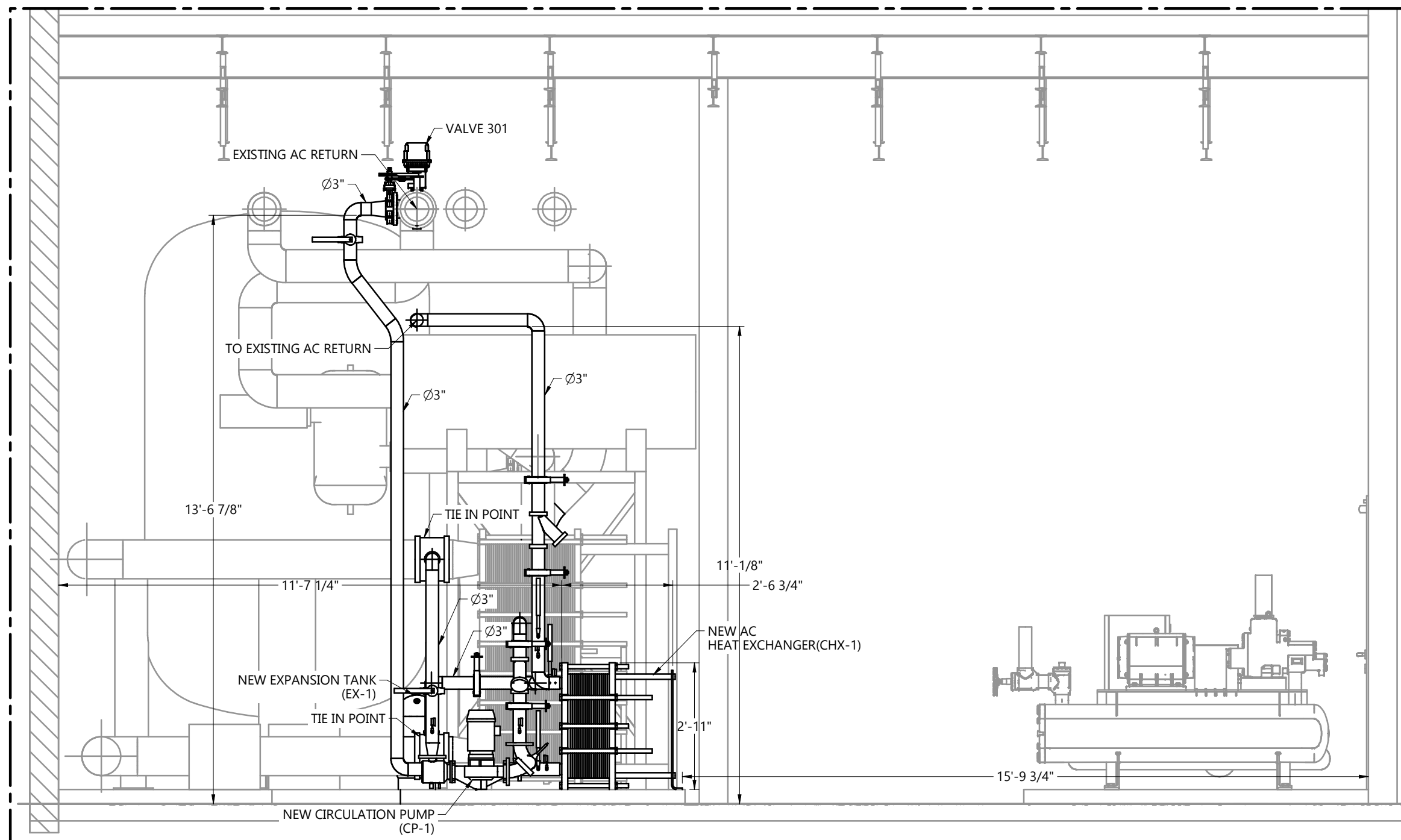
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DRAWING NUMBER		25005 MP301	
DRAWING NAME		PIPING SECTIONS	
CLIENT		BONNYVILLE DCLFC	
PROJECT		BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY	CHECKED BY		
R.THOMAS	J.RITCHIE		
DATE	REVISION		
28-MAR-25	1.0		
SHEET SIZE	SHEET NO.		
C	1 OF 1		

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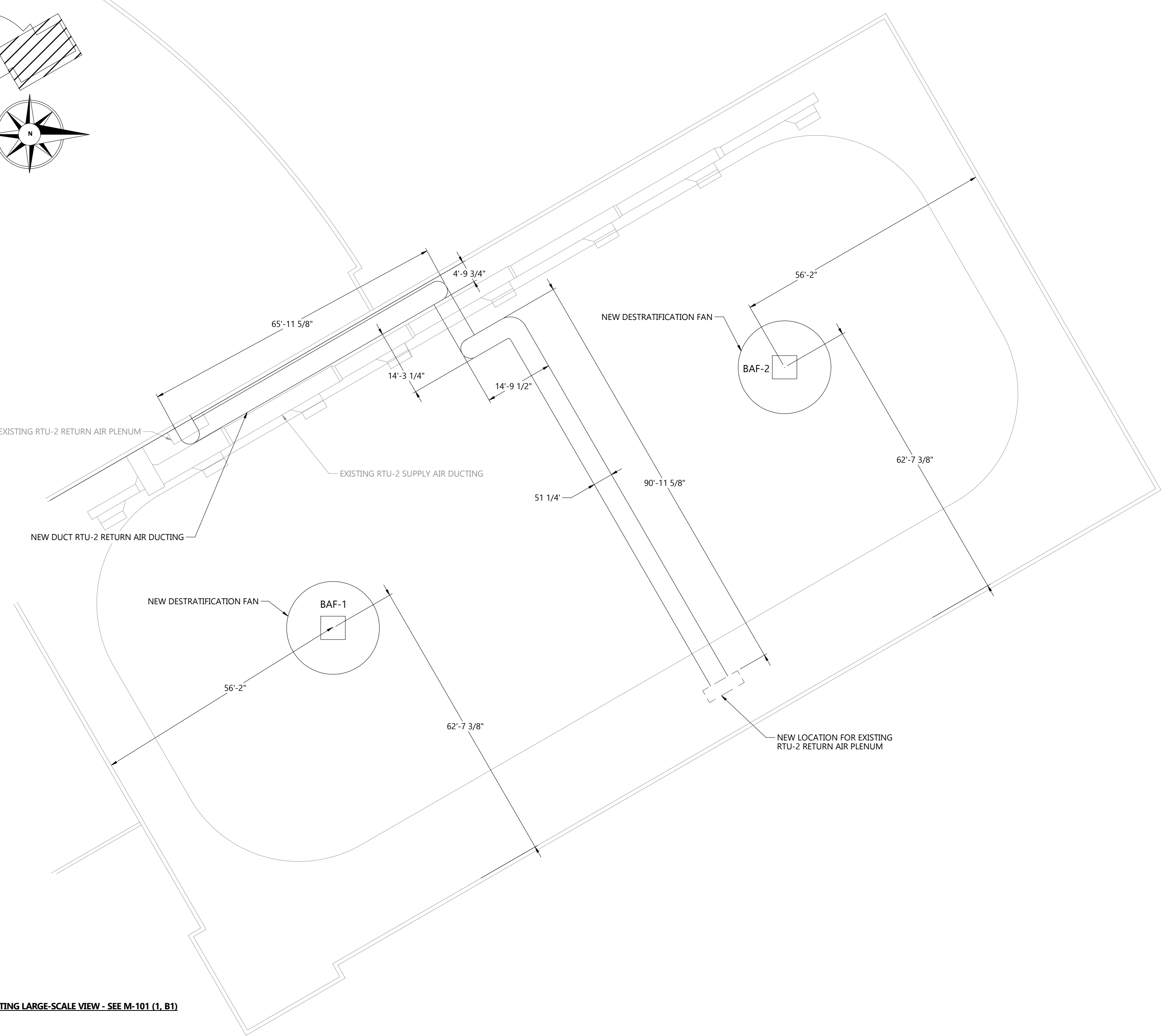
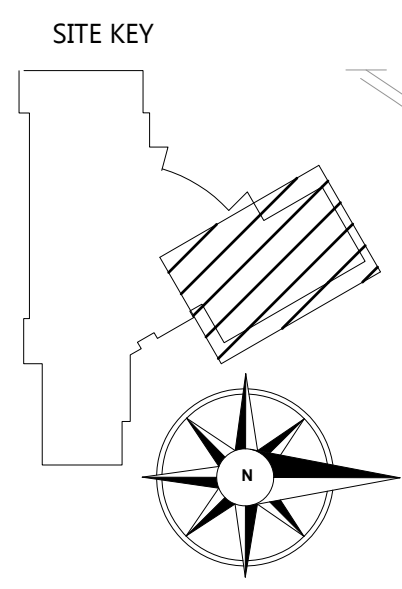
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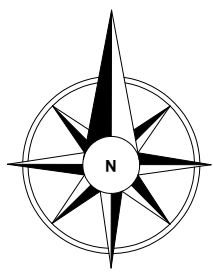
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DRAWING NUMBER 25005 MH401	
DRAWING NAME DUCTING LARGE-SCALE VIEWS	
CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY V.KOFANOV	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 1 OF 2

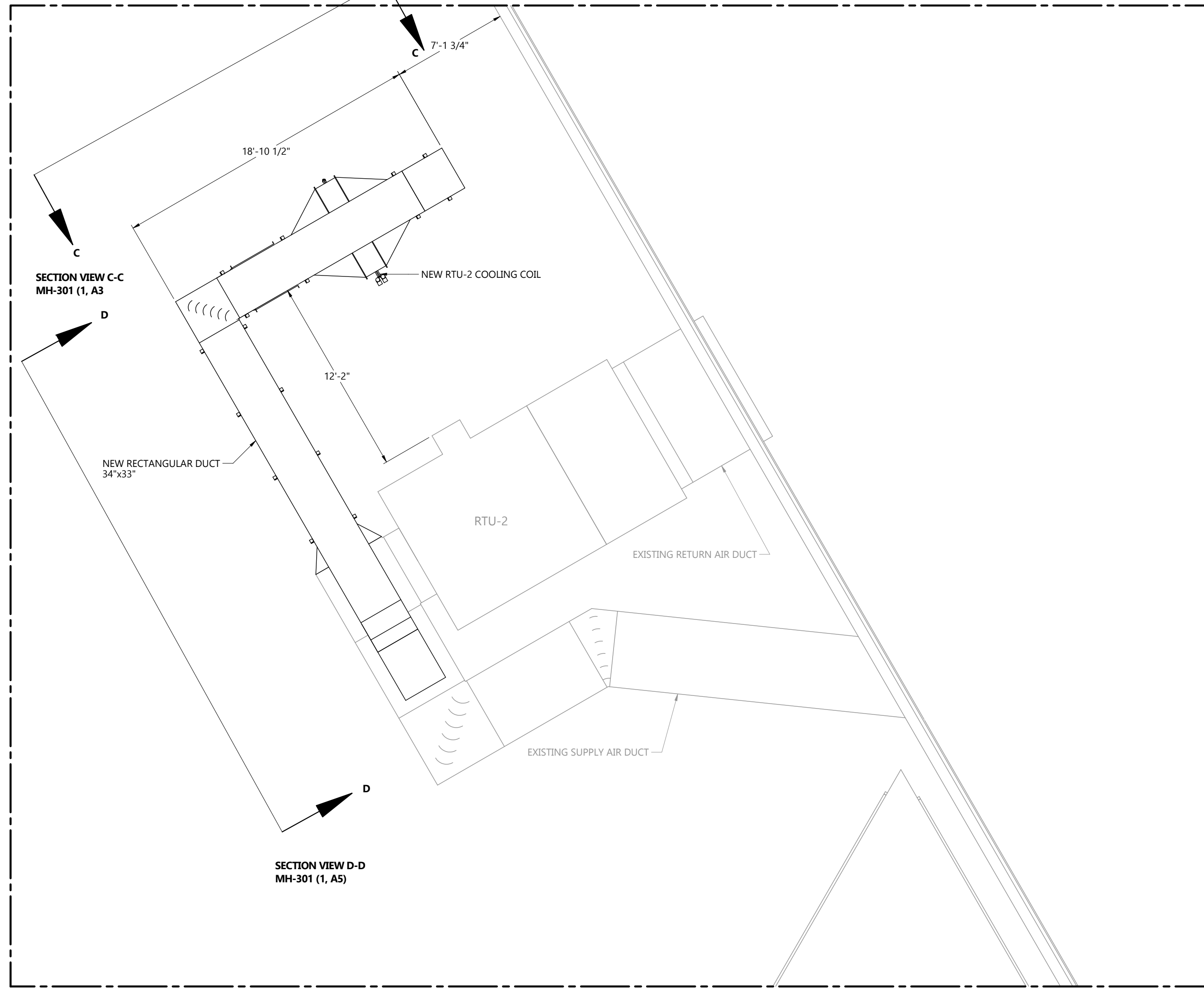
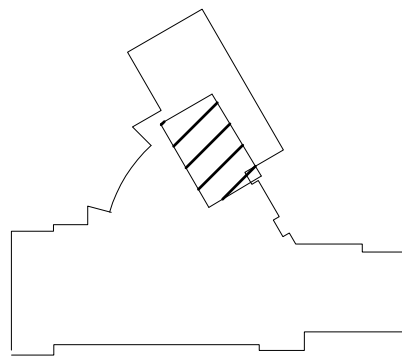
NOTE:
 CONTRACTOR IS TO VERIFY ON-SITE THE APPROPRIATE MOUNTING METHOD FOR THE FAN AND OBTAIN STRUCTURAL CONFIRMATION.



FIELDHOUSE DUCTING LARGE-SCALE VIEW - SEE M-101 (1, B1)
 SCALE 1/16"=1'-0"



SITE KEY



ROOF DUCTING LARGE-SCALE VIEW - SEE M-101 (1, B3)
SCALE 3/16"=1'-0"

NOTES

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CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY V.KOFANOV	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 2 OF 2

25005 MH401

1

2

3

4

5

NOTES

_____	NEW
_____	EXISTING

REFERENCE DEFINITION	
SHEET COLUMN	SHEET ROW
SHEET NUMBER	(#, X#)

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 CONFIDENTIAL & PROPRIETARY

VER #	REVISIONS	DATE	BY
1.0	ISSUED FOR CLIENT REVIEW	28-MAR-25	V.K.

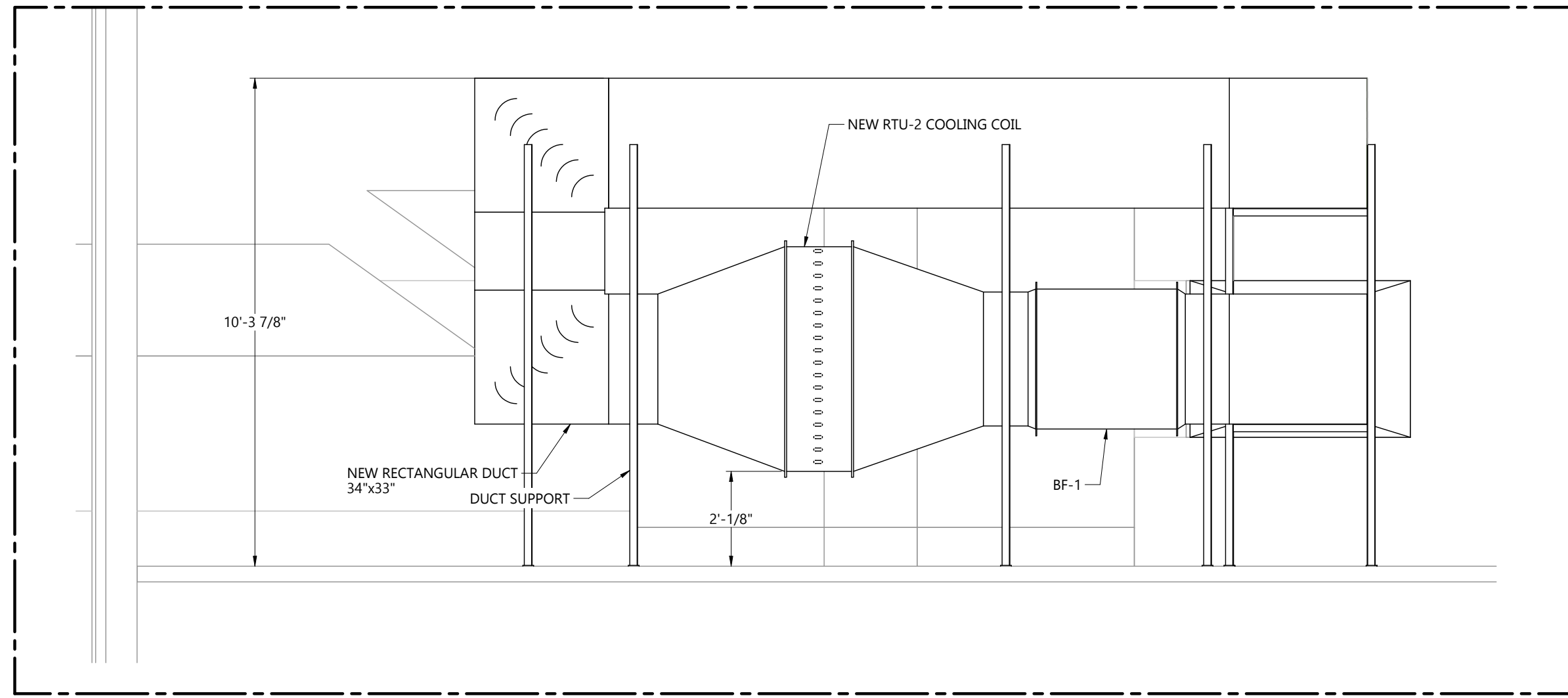


CHARLOTTETOWN PE
 VAUGHAN ON
 REDINGTON SHORES FL
 PLANO TX

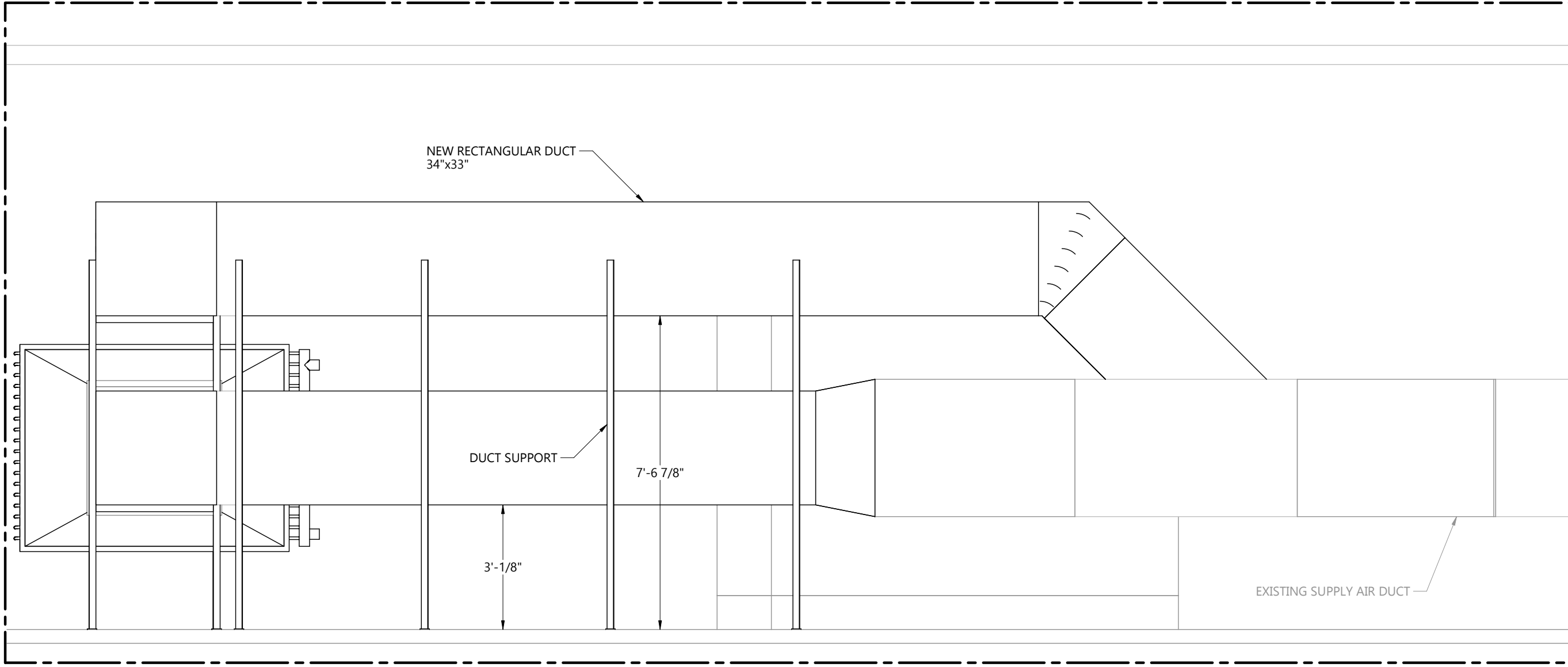
WWW.IBSTOREY.COM

STAMP

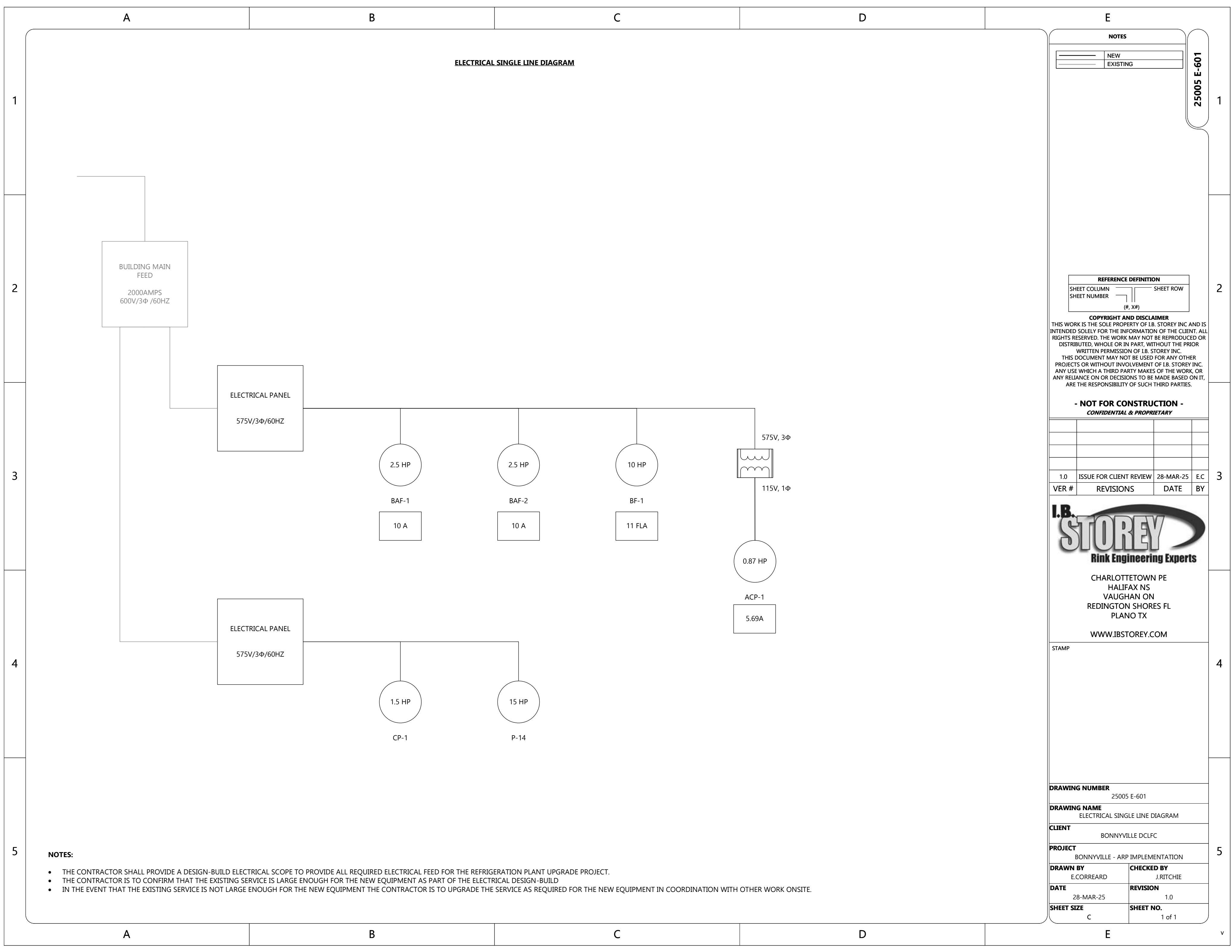
DRAWING NUMBER 25005 MH301	
DRAWING NAME DUCTING SECTIONS	
CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY V.KOFANOV	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 1 OF 1



SECTION VIEW C-C (MH-401-2, A2)
 SCALE 3/8"=1'-0"



SECTION VIEW D-D (MH-401-2, A5)
 SCALE 3/8"=1'-0"



ELECTRICAL SINGLE LINE DIAGRAM

NOTES

	NEW
	EXISTING

25005 E-601

REFERENCE DEFINITION

SHEET COLUMN		SHEET ROW
SHEET NUMBER	(#, X#)	

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VER #	REVISIONS	DATE	BY
1.0	ISSUE FOR CLIENT REVIEW	28-MAR-25	E.C

I.B. STOREY
 Risk Engineering Experts

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DRAWING NUMBER 25005 E-601	
DRAWING NAME ELECTRICAL SINGLE LINE DIAGRAM	
CLIENT BONNYVILLE DCLFC	
PROJECT BONNYVILLE - ARP IMPLEMENTATION	
DRAWN BY E.CORREARD	CHECKED BY J.RITCHIE
DATE 28-MAR-25	REVISION 1.0
SHEET SIZE C	SHEET NO. 1 of 1

- NOTES:**
- THE CONTRACTOR SHALL PROVIDE A DESIGN-BUILD ELECTRICAL SCOPE TO PROVIDE ALL REQUIRED ELECTRICAL FEED FOR THE REFRIGERATION PLANT UPGRADE PROJECT.
 - THE CONTRACTOR IS TO CONFIRM THAT THE EXISTING SERVICE IS LARGE ENOUGH FOR THE NEW EQUIPMENT AS PART OF THE ELECTRICAL DESIGN-BUILD
 - IN THE EVENT THAT THE EXISTING SERVICE IS NOT LARGE ENOUGH FOR THE NEW EQUIPMENT THE CONTRACTOR IS TO UPGRADE THE SERVICE AS REQUIRED FOR THE NEW EQUIPMENT IN COORDINATION WITH OTHER WORK ONSITE.