THE CITY OF DULUTH MINNESOTA

Purchasing Division
Finance Department

Room 120
411 West First Street
Duluth, Minnesota 55802

218-730-5340
purchasing@duluthmn.gov

Addendum 3
Solicitation 22-99418
City Hall MEP Renewal Project

This addendum serves to notify all bidders of the following changes to the solicitation documents:

1. Bidders must provide a bid amount for each unit price, alternate, and lump sum bid within Bid Express in order to have a responsive bid. If you are not bidding a particular work scope, enter $0.00 for those bid amounts. Any work scope that has alternates or unit prices must have all prices for that work scope completed.

2. Test results from previous lead and asbestos testing in 2018 and 2021 is attached. If a contractor encounters what is suspected to be hazardous materials, it is the contractor's responsibility to immediately notify the City. The City will contract for the testing and removal of hazardous material.

3. As an alternate, the general conditions contractor will be responsible for moving and protecting furniture, and removing and replacing acoustical ceiling. This will include but not be limited to desks/work stations, filing cabinets and other officer furniture (conference tables, etc.). If the alternate is included, it is the general conditions contractor's responsibility to protect all furniture, whether moved or left in place, and to return any moved furniture to its original location and status. Contractor shall be responsible for damage. City staff will be responsible for their own personal belongings. An alternate bid item has been added to the solicitation for contractors to include the lump sum for this item, as well as an hourly rate in the event of any scope change. A layout of the furniture was included in Addendum 2.

4. Piping & Wiring Submittal and Equipment Submittal received from Trane are attached.

5. The awarded mechanical contractor installing the VRF equipment must have successfully completed the CIT MULTI MEUS approved training course prior to installation. The contractor must also submit a completed and approved MEUS Extended Warranty Process report. Per Trane, the cost as of 5/26/22 for this training is $480/person. Trane recommends more than one installer be trained. Trane will assist the contractor with submitting the approved MEUS extended warranty process report.

6. Acoustical ceiling tiles are USG Eclipse 78775. General conditions contractor is responsible for the removal as needed and replacement of the acoustical ceiling. Contractor shall be responsible for damage.

7. The Luminaire Schedule, electrical sheet E500, is attached.

8. Some activities due to noise level, may require scheduling outside of City Hall operational hours (8am-4:30pm, M-F).

9. Project shutdown instructions are attached.

10. Additional changes and clarifications are included in KFI's Addendum 3 attached.

Please acknowledge receipt of this Addendum by checking the acknowledgment box within the www.bidexpress.com solicitation. Posted: **June 2, 2022**

Attachments:

Lead/Asbestos Test Results
Piping & Wiring Submittal
Equipment Submittal
Electrical Sheet E500
Project Shutdown Instructions
KFI's Addendum 3

Twin Ports Testing Inc.

PRE-RENOVATION LIMITED ASBESTOS & LEAD INSPECTION REPORT

City Hall
2nd & 3rd Floors
Duluth, Minnesota

TPT#18A0136

Prepared for:

Mr. Rob Hurd
City of Duluth Property & Facilities Management
1532 West Michigan Street
Duluth, Minnesota 55806

April 19, 2018

Twin Ports Testing Inc.
1301 N 3rd St. • Superior WI 54880 • 715-392-7114 • 1-800-373-2562 • F 715-392-7163 • www.twinportstesting.com

April 19, 2018 TPT#18A0136

Mr. Rob Hurd
City of Duluth Property & Facility Management
1532 West Michigan Street
Duluth, Minnesota 55806

Re: Pre-Renovation Limited Asbestos Bulk & Lead Sampling
City Hall
2nd & 3rd Floors
Duluth, Minnesota

Dear Mr. Hurd,

The following is a report outlining the asbestos bulk & lead sampling conducted at the above referenced site. This report contains the following information:

- Introduction
- Asbestos
- Lead
- Recommendation

INTRODUCTION

Twin Ports Testing II, Inc. (TPT) was contacted by Mr. Rob Hurd, of the City of Duluth, regarding asbestos bulk and lead sampling at the above mentioned property. The sampling was conducted prior to proposed renovation. Ms. Tracy Jacobs, of TPT, a Minnesota Department of Health (MDH) certified Asbestos Inspector did the asbestos inspection on April 13, 2018. Mr. Gary Christner, of TPT, a Minnesota Department of Health (MDH) certified Lead Risk Assessor conducted the partial lead renovation inspection on April 17, 2018. TPT personnel certification are attached as Appendix A.

ASBESTOS

TPT collected a total of thirty-five samples. These samples included: floor filler, mastic, ceiling tile, carpet glue, flooring (black layer), adhesive, plaster wall, brick wall, plaster (skim coat), plaster ceiling flooring (brown layer), flooring (brown fibrous layer), sheetrock wall, ceiling material and baseboard and base adhesive that were potentially asbestos containing materials (ACMs). The samples were sent to EMSL Analytical, Inc. in Minneapolis, Minnesota for analysis by polarized light microscopy (PLM). The table on the following page lists the areas that were sampled for asbestos (bold and shading indicates positive results), sample number, sample description, sample location and asbestos percent (if applicable). Laboratory analytical results are attached as Appendix B.

Table 1 – Sampled Suspect Asbestos Containing Materials (ACM)

Sample #	Sample Description	Sample Location	Asbestos %Type
1	Filler	Threshold filler, 3rd floor, gray	None Detected
	Carpet mastic	Under carpet, 3rd floor, tan	None Detected
2	Ceiling tile, solid	3rd floor above grid, brown	None Detected
3	Ceiling tile, (2'x 4'), (snakes & pin-holed)	3rd floor, gray	None Detected
4	Carpet glue	3rd floor under carpet, (tan/red/green)	None Detected
5	Flooring	3rd floor human resources office under carpet, black	None Detected
5	Adhesive	3rd floor human resources office under flooring, tan	None Detected
6	Ceiling tile, (2'x 4')	3rd floor lunchroom, gray	None Detected
7a	Plaster wall	3rd floor, gray	None Detected
	Brick wall	3rd floor, red	None Detected
7b	Plaster wall	3rd floor lunchroom, gray	None Detected
	Plaster wall, (skim coat)	3rd floor lunchroom, white	None Detected
7c, 7d, 7e	Plaster wall	2nd floor west side, gray	None Detected
	Plaster wall, (skim coat)	2nd floor west side, white	None Detected
7f	Plaster wall	2nd floor SE side, (gray/beige)	None Detected
7g	Plaster wall	2nd floor SE side, gray	None Detected
	Plaster wall, (skim coat)	2nd floor SE side, white	None Detected
8a	Flooring	3rd floor SW side, under carpet, brown	None Detected
	Adhesive	3rd floor SW side, under carpet, tan	None Detected
	Fibrous layer	3rd floor SW side, under carpet, tan	None Detected
8b	Flooring	3rd floor east side, under carpet, brown	None Detected
	Adhesive	3rd floor east side, under carpet, tan	None Detected
	Fibrous material	3rd floor east side, under carpet, tan	None Detected
	Adhesive	3rd floor east side, under carpet, brown	None Detected
8c	Mastic	2nd floor west side, under carpet, green	None Detected

Table 1 – Sampled Suspect Asbestos Containing Materials (ACM)

Sample #	Sample Description	Sample Location	Asbestos %Type
8c	Flooring	2nd floor west side, under carpet, brown	None Detected
	Fibrous material	2nd floor west side, under carpet, tan	None Detected
	Mastic	2nd floor west side, under carpet, brown	None Detected
8d	Mastic	2nd floor SE side, under carpet, tan	None Detected
	Flooring	2nd floor SE side, under carpet, brown	None Detected
	Fibrous material	2nd floor SE side, under carpet, tan	None Detected
9a	Sheetrock walls	2nd floor west side, (tan/white)	None Detected
9b, 9c	Sheetrock walls	2nd floor west side, (tan/white)	<1% Chrysotile
9d	Sheetrock wall	2nd floor north side, (brown/white)	None Detected
	Plaster wall	2nd floor north side, white	None Detected
9e	Sheetrock walls	2nd floor south side, (brown/white	None Detected
10a,b,c	**Ceiling material**	**2nd floor north side, above grid, (tan/white)**	**35% Chrysotile**
11	Ceiling tile, (2'x 2'), solid	2nd floor, white	None Detected
12	Ceiling tile, (1'x 1'), large holes	2nd floor west side, brown	None Detected
13	Ceiling tile, (2'x 2')	2nd floor NW side, (gray/white)	None Detected
14	Adhesive	2nd floor NW side closet, green	None Detected
	Flooring	2nd floor NW side closet, beige	None Detected
	Adhesive	2nd floor NW side closet, tan	None Detected
15	Ceiling tile, (2'x 4')	2nd floor SE side, (gray/white)	None Detected
16	Filler	2nd floor north side threshold under carpet, white	None Detected
	Adhesive	2nd floor north side threshold under carpet, (tan/green)	None Detected
17	Ceiling tile, (2'x 4')	2nd floor north side, white	None Detected
18	Baseboard	2nd floor south side, brown	None Detected
	Adhesive	2nd floor south side, tan	None Detected
19	Floor tile, (12"x 12")	2nd floor south side, white	None Detected
	Mastic	2nd floor south side under tile, black	None Detected
20	Base	2nd floor south side, white	None Detected

Table 1 – Sampled Suspect Asbestos Containing Materials (ACM)

Sample #	Sample Description	Sample Location	Asbestos %Type
20	Adhesive	2nd floor south side, tan	None Detected

By the MDH rules and regulations, asbestos containing materials are materials that contain greater than 1% asbestos. One of the materials tested is considered to be an Asbestos Containing Material (ACM).

Table 2 – Asbestos Containing Materials Summary

Sample #'s	Sample Description	Location	Friability	Approximate Amount
10	Ceiling material	2nd floor north side, above grid, (tan/white)	Friable	~225 square feet

Lead (XRF)

Samples of painted surfaces were tested for lead content using a NITON XLp-303A X-Ray Fluorescence (XRF) Lead Paint Analyzer, Serial Number 22293. Components were tested starting on the 1st Avenue Side of each room (Side A) going clockwise around the room from side A to side D. Twenty sampled components were above the MDH limit of 1.0 mg/cm^2 for painted surfaces and are considered positive for lead content. These components include:

- White plaster walls in room 330 north and south side rooms;
- White plaster walls in room 317;
- White plaster wall by elevator 3rd floor;
- White plaster column in room 210;
- White plaster ceiling in room 210;
- White plaster ceiling in room 210, south side room;
- Gray plaster wall in room 210, west side room;
- White plaster walls in room 210, west side rooms;
- White plaster walls in room 210/209, west side;
- White plaster ceiling in room 208;
- White plaster wall in room 211 center; and
- White plaster wall in room 211 hallway.

The Niton results are included for reference in Appendix B.

DISCUSSION/RECOMMENDATIONS

TPT recommends the abatement of the (tan/white) ceiling material on 2nd floor north side if this item is planned to be disturbed during renovation. If abatement is to be conducted, it must be completed by a Minnesota Certified Asbestos Abatement Company.

TPT recommends that lead safe work practices be utilized when working with the materials that tested positive for lead content if they are to be disturbed during renovation.

If additional materials are found during renovation that may contain asbestos and have not been sampled, the material must be sampled or assumed to be ACM and treated as such.

This inspection was conducted according to federal, state and local regulations. If you have any questions regarding this report, please feel free to contact me at (715) 392-7114 (office). Thank you for the opportunity to conduct this work.

Sincerely,

Twin Ports Testing II, Inc.

Tracy Jacobs, CHMM
Industrial Hygiene Services Manager
Inspector# AI3694

4/23/18
Date

Gary Christner
Industrial Hygiene Technician
Lead Risk Assessor LR3101

4-23-18
Date

Appendix A

Licenses

MDH MINNESOTA DEPARTMENT of HEALTH

ASBESTOS INSPECTOR

Certified by:
State of Minnesota
Department of Health
Expires: 04/21/2018

Tracy L Jacobs
4748 Lavaque Bypass Rd
Duluth, MN 55811

Director, Env. Health Div.

No. AI7964 Issued: 05/01/2017

Director, Env. Health Div.

MINNESOTA MDH DEPARTMENT of HEALTH

LEAD
Risk Assessor

Licensed by:
State of Minnesota
Department of Health

License No. LR3101
Expires 04/10/2018

Gary J Christner
2337 Pershing Street
Duluth, MN 55811

Appendix B

Asbestos Lab Results

EMSL Analytical, Inc.
14375 23rd Avenue North Minneapolis, Mn 55447
Tel/Fax: (763) 449-4922 / (763) 449-4924
http://www.EMSL.com / minneapolislab@emsl.com

EMSL Order: 351802689
Customer ID: TWNT42
Customer PO:
Project ID:

Attention: Tracy Jacobs
Twin Ports Testing II, Inc.
1301 North Third Street
Superior, WI 54880

Project: 18A0136/ City Hall 2nd & 3rd

Phone: (218) 390-0162
Fax:
Received Date: 04/16/2018 10:05 AM
Analysis Date: 04/18/2018 - 04/19/2018
Collected Date:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1-Filler *351802689-0001*	Threshold filler & carpet mastic (3rd floor)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1-Mastic *351802689-0001A*	Threshold filler & carpet mastic (3rd floor)	Tan Non-Fibrous Homogeneous	3% Synthetic	97% Non-fibrous (Other)	None Detected
2 *351802689-0002*	CT above grid (solid white) (3rd floor)	Brown Fibrous Homogeneous	99% Cellulose	1% Non-fibrous (Other)	None Detected
3 *351802689-0003*	2x4 CT (snakes & pin holes) (3rd floor)	Gray Fibrous Homogeneous	30% Cellulose 55% Min. Wool	10% Perlite 5% Non-fibrous (Other)	None Detected
4 *351802689-0004* *Could not separate paint layer -- included in analysis.*	Carpet glue (3rd floor)	Tan/Red/Green Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
5-Flooring *351802689-0005*	Flooring (under carpet) black (3rd floor human resources)	Black Non-Fibrous Homogeneous	8% Cellulose	92% Non-fibrous (Other)	None Detected
5-Adhesive *351802689-0005A*	Flooring (under carpet) black (3rd floor human resources)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6 *351802689-0006*	2x4 CT (lunchroom 3rd floor)	Gray Fibrous Homogeneous	65% Cellulose 15% Min. Wool	15% Perlite 5% Non-fibrous (Other)	None Detected
7a-Plaster *351802689-0007*	Plaster wall & brick (3rd floor)	Gray Non-Fibrous Homogeneous	3% Cellulose	97% Non-fibrous (Other)	None Detected
7a-Brick *351802689-0007A*	Plaster wall & brick (3rd floor)	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7b-Plaster *351802689-0008*	Plaster ceiling (3rd floor lunchroom)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7b-Skim Coat *351802689-0008A*	Plaster ceiling (3rd floor lunchroom)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7c-Plaster *351802689-0009*	Plaster wall (2nd floor west side)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7c-Skim Coat *351802689-0009A*	Plaster wall (2nd floor west side)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7d-Plaster *351802689-0010*	Plaster ceiling (2nd floor West Side)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 04/19/2018 10:31:08

EMSL Analytical, Inc.
14375 23rd Avenue North Minneapolis, Mn 55447
Tel/Fax: (763) 449-4922 / (763) 449-4924
http://www.EMSL.com / minneapolislab@emsl.com

EMSL Order: 351802689
Customer ID: TWNT42
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
7d-Skim Coat *351802689-0010A*	Plaster ceiling (2nd floor West Side)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7e-Plaster *351802689-0011*	Plaster wall (2nd floor - west side)	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7e-Skim Coat *351802689-0011A*	Plaster wall (2nd floor - west side)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7f *351802689-0012*	Plaster ceiling (2nd floor - SE side)	Gray/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7g-Plaster *351802689-0013*	Plaster wall (2nd floor - SE side)	Gray Fibrous Homogeneous	1% Hair	1% Ca Carbonate 98% Non-fibrous (Other)	None Detected
7g-Skim Coat *351802689-0013A*	Plaster wall (2nd floor - SE side)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8a-Flooring *351802689-0014*	Flooring (under carpet) brown (3rd floor - SW side)	Brown Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
8a-Adhesive *351802689-0014A*	Flooring (under carpet) brown (3rd floor - SW side)	Tan Non-Fibrous Homogeneous	2% Synthetic	98% Non-fibrous (Other)	None Detected
8a-Fibrous Layer *351802689-0014B*	Flooring (under carpet) brown (3rd floor - SW side)	Tan Fibrous Homogeneous	99% Cellulose	1% Non-fibrous (Other)	None Detected
8b-Flooring *351802689-0015*	Flooring (under carpet) brown (3rd floor - East side)	Brown Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
8b-Tan Adhesive *351802689-0015A*	Flooring (under carpet) brown (3rd floor - East side)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8b-Fibrous Material *351802689-0015B*	Flooring (under carpet) brown (3rd floor - East side)	Tan Fibrous Homogeneous	99% Cellulose	1% Non-fibrous (Other)	None Detected
8b-Brown Adhesive *351802689-0015C*	Flooring (under carpet) brown (3rd floor - East side)	Brown Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
8c-Green Mastic *351802689-0016*	Flooring (under carpet) brown (2nd floor - west side)	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8c-Flooring *351802689-0016A*	Flooring (under carpet) brown (2nd floor - west side)	Brown Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
8c-Fibrous Material *351802689-0016B*	Flooring (under carpet) brown (2nd floor - west side)	Tan Fibrous Homogeneous	99% Cellulose	1% Non-fibrous (Other)	None Detected
8c-Brown Mastic *351802689-0016C*	Flooring (under carpet) brown (2nd floor - west side)	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8d-Tan Mastic *351802689-0017*	Flooring (under carpet) brown (2nd floor - SE side)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8d-Flooring *351802689-0017A*	Flooring (under carpet) brown (2nd floor - SE side)	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 04/19/2018 10:31:08

EMSL Analytical, Inc.
14375 23rd Avenue North Minneapolis, Mn 55447
Tel/Fax: (763) 449-4922 / (763) 449-4924
http://www.EMSL.com / minneapolislab@emsl.com

EMSL Order: 351802689
Customer ID: TWNT42
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
8d-Fibrous Material *351802689-0017B*	Flooring (under carpet) brown (2nd floor - SE side)	Tan Fibrous Homogeneous	99% Cellulose	1% Non-fibrous (Other)	None Detected
9a *351802689-0018* *This sample only contains sheetrock.*	Sheetrock wall (2nd floor - west side)	Tan/White Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
9b *351802689-0019* *This is a composite result of sheetrock, joint compound, and tape.*	Sheetrock wall (2nd floor - west side)	Tan/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	<1% Chrysotile
9c *351802689-0020* *This is a composite result of sheetrock, joint compound, and tape.*	Sheetrock wall (2nd floor - west side)	Tan/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	<1% Chrysotile
9d-Sheetrock *351802689-0021*	Sheetrock wall (2nd floor north side)	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
9d-Plaster *351802689-0021A*	Sheetrock wall (2nd floor north side)	White Non-Fibrous Homogeneous		15% Perlite 85% Non-fibrous (Other)	None Detected
9e *351802689-0022*	Sheetrock wall (2nd floor south side)	Brown/White Fibrous Heterogeneous	10% Cellulose 1% Glass	89% Non-fibrous (Other)	None Detected
10a *351802689-0023*	Ceiling (above grid) 2nd floor - north side)	Tan/White Fibrous Homogeneous		45% Mica 20% Non-fibrous (Other)	35% Chrysotile
10b *351802689-0024*	Ceiling (above grid) 2nd floor - north side)				Positive Stop (Not Analyzed)
10c *351802689-0025*	Ceiling (above grid) 2nd floor - north side)				Positive Stop (Not Analyzed)
11 *351802689-0026*	2x2 ceiling tile (2nd floor - solid)	White Fibrous Homogeneous	95% Min. Wool	5% Non-fibrous (Other)	None Detected
12 *351802689-0027*	1x1 ceiling tile (large holes) 2nd floor west side	Brown Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
13 *351802689-0028*	2x2 ceiling tile (2nd floor - NW side)	Gray/White Fibrous Homogeneous	95% Min. Wool	5% Non-fibrous (Other)	None Detected
14-Green Adhesive *351802689-0029*	floor filler (2nd floor - NW side) closet	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14-Flooring *351802689-0029A*	floor filler (2nd floor - NW side) closet	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14-Tan Adhesive *351802689-0029B*	floor filler (2nd floor - NW side) closet	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15 *351802689-0030*	2x4 CT (2nd floor - SE side)	Gray/White Fibrous Homogeneous	50% Cellulose 30% Min. Wool	15% Perlite 5% Non-fibrous (Other)	None Detected
16-Filler *351802689-0031*	filler under carpet (threshold) (2nd fl. north side)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 04/19/2018 10:31:08

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EMSL Order: 351802689
Customer ID: TWNT42
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
16-Adhesive *351802689-0031A*	filler under carpet (threshold) (2nd fl. north side)	Tan/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17 *351802689-0032*	2x4 CT (2nd floor - north side)	White Non-Fibrous Homogeneous	95% Min. Wool	5% Non-fibrous (Other)	None Detected
18-Baseboard *351802689-0033*	base & adhesive (2nd floor - south side)	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
18-Adhesive *351802689-0033A*	base & adhesive (2nd floor - south side)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-Floor Tile *351802689-0034*	12x12 FT (2nd floor - south side)	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-Mastic *351802689-0034A*	12x12 FT (2nd floor - south side)	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-Base *351802689-0035*	base adhesive (2nd floor - south side)	White Fibrous Heterogeneous	8% Cellulose	92% Non-fibrous (Other)	None Detected
20-Adhesive *351802689-0035A*	base adhesive (2nd floor - south side)	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)
George Sullivan (15)
Michael Felzan (43)

Rachel Travis, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Minneapolis, Mn NVLAP Lab Code 200019-0

Initial report from: 04/19/2018 10:31:08

OrderID: 351802689

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 2689

EMSL Analytical, Inc.
14375 23rd Avenue North
Minneapolis, MN 55447
PHONE: (763) 449-4922
FAX: (763) 449-4924

Company Name : Twin Ports Testing II		**EMSL Customer ID:**	
Street: 1301 North 3rd Street		**City:** Superior	**State/Province:** WI
Zip/Postal Code: 54880	**Country:** US	**Telephone #:** (218) 390-0162	**Fax #:** 7153927163
Report To (Name): Tracy Jacobs		**Please Provide Results:** ☐ Fax ☑ Email	
Email Address: tracy.jacobs@twinportstesting.com		**Purchase Order:**	
Project Name/Number: 18A0136 / City Hall 2nd & 3rd		**EMSL Project ID** *(Internal Use Only)*:	
U.S. State Samples Taken: MN		**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt	

EMSL-Bill to: ☑ Same ☐ Different - If Bill to is Different note instructions in Comments**
Third Party Billing requires written authorization from third party

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☒ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air ☐ Check if samples are from NY
☐ NIOSH 7400
☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
☒ PLM EPA 600/R-93/116 (<1%)
☐ PLM EPA NOB (<1%)
Point Count
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
Point Count w/Gravimetric
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
☐ NYS 198.1 (friable in NY)
☐ NYS 198.6 NOB (non-friable-NY)
☐ NYS 198.8 SOF-V
☐ NIOSH 9002 (<1%)

TEM – Air ☐ 4-4.5hr TAT (AHERA only)
☐ AHERA 40 CFR, Part 763
☐ NIOSH 7402
☐ EPA Level II
☐ ISO 10312

TEM - Bulk
☐ TEM EPA NOB
☐ NYS NOB 198.4 (non-friable-NY)
☐ Chatfield SOP
☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
Fibers >10µm ☐ Waste ☐ Drinking
All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
☐ Microvac - ASTM D 5755
☐ Wipe - ASTM D6480
☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
☐ PLM EPA 600/R-93/116 with milling prep (<1%)
☐ PLM EPA 600/R-93/116 with milling prep (<0.25%)
☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
☐ TEM Qualitative via Filtration Prep
☐ TEM Qualitative via Drop Mount Prep
☐ Cincinnati Method EPA 600/R-04/004 – PLM/TEM (BC only)

Other:
☐

☒ Check For Positive Stop – Clearly Identify Homogenous Group

Filter Pore Size (Air Samples): ☐ 0.8µm ☐ 0.45µm

Samplers Name: Tracy Jacobs **Samplers Signature:** Tracy Jacobs

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
1	Threshold filler & carpet mastic (3rd floor)		4/13/18
2	CT above grid (solid white) (3rd floor)		"
3	2x4 CT ([illegible] snakes & pin holes) (3rd floor)		"
4	Carpet glue (3rd floor)		"
5	Flooring (undercarpet) black (3rd floor human resources)		"

Client Sample # (s): [illegible] 1 - 20 **Total # of Samples:** ~~25~~ 35

Relinquished (Client): Tracy Jacobs **Date:** 4/13/18 **Time:** 3:00

Received (Lab): [signature] FE **Date:** 4/16/18 **Time:** 10:05 am

Comments/Special Instructions:

Controlled Document – Asbestos COC – R19 – 05/09/2016

7954 2437 3045

EMSL Analytical, Inc.
14375 23rd Avenue North

Minneapolis, MN 55447
PHONE: (763) 449-4922
FAX: (763) 449-4924

EMSL ANALYTICAL, INC.

Asbestos Chain of Custody

EMSL Order Number (*Lab Use Only*): 2689

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
6	2x4 CT (lunchroom 3rd floor)		4/13/18
7a	Plaster wall & brick (3rd floor)		
7b	Plaster ceiling (3rd floor lunchroom)		
7c	Plaster walls (2nd floor west side)		
7d	Plaster ceiling (2nd floor west side)		
7e	Plaster walls (2nd floor - west side)		
7f	Plaster ceiling (2nd floor - SE side)		
7g	Plaster walls (2nd floor - SE side)		
8a	Flooring (under carpet) brown (3rd floor - SW side)		
8b	" " " "	" - East side)	
8c	Flooring (under carpet) brown (2nd floor - west side)		
8d	Flooring (" ") " (2nd floor - SE side)		
9a	Sheetrock wall (2nd floor - west side)		
9b	" " (" - "	")	
9c	" " (" - "	")	
9d	" " (" - north side)		
9e	" " (" - south ")		
10a	Ceiling (above grid) 2nd floor - north side		
10b	" "	"	
10c	" "	"	
11	2x2 Ceiling tile (2nd floor - solid)		
12	1x1 Ceiling tile (large holes) 2nd floor west side)		
13	2x2 ceiling tile (2nd floor - NW side)		

***Comments/Special Instructions:**

Controlled Document – Asbestos COC – R10 – 05/09/2016

OrderID: 351802689

EMSL Analytical, Inc.
14375 23rd Avenue North

Minneapolis, MN 55447
PHONE (763) 449-4922
FAX (763) 449-4924

EMSL ANALYTICAL, INC.

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 2689

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
14	floor filler (2nd floor - NW side)	closet	4/13/18
15	2x4 CT (2nd floor - SE side)		
16	filler under carpet (threshold)	2nd fl. north side	
17	2x4 CT (2nd floor - north side)		
18	base & adhesive (2nd floor - south side)		
19	12x12 FT (2nd floor - south side)		
20	base adhesive (2nd floor - south side)		

***Comments/Special Instructions:**

Page 3 of 3 pages

Appendix C

XRF Lead Results

Reading No	Time	Units	Component	Substrate	Side	Color	Room	Misc 1	M	Results	Action Level	PbC	PbC Error
1	4/17/2018 13:01	cps										8.44	0
2	4/17/2018 13:03	mg / cm ^2	cal.Check 3.58							Positive	1	3.4	1.2
3	4/17/2018 13:04	mg / cm ^2	cal.Check 1.53							Positive	1	1.5	0.1
4	4/17/2018 13:04	mg / cm ^2	cal.Check 0.31							Negative	1	0.29	0.13
5	4/17/2018 13:06	mg / cm ^2	WALL	Plaster	A	White	330	N. Side		Positive	1	13.7	5.1
6	4/17/2018 13:06	mg / cm ^2	WALL	Plaster	C	White	330	N. Side		Positive	1	13.6	4.8
7	4/17/2018 13:08	mg / cm ^2	WALL	Plaster	C	White	330	S. Side		Positive	1	16.9	5.4
8	4/17/2018 13:09	mg / cm ^2	WALL	Plaster	A	White	330	S. Side		Positive	1	16.5	4.7
9	4/17/2018 13:09	mg / cm ^2	WALL	Plaster	A	White	330	S. Side		Positive	1	18.2	5.6
10	4/17/2018 13:12	mg / cm ^2	WALL	Plaster	C	White	315			Negative	1	< LOD	0.12
11	4/17/2018 13:13	mg / cm ^2	WALL	Plaster	A	White	317			Positive	1	1.8	0.5
12	4/17/2018 13:16	mg / cm ^2	WALL	Plaster	D	White	By Elevator			Positive	1	11.7	4.6
13	4/17/2018 13:17	mg / cm ^2	Door Trim	Wood	D	Brown	Elevator			Negative	1	< LOD	0.13
14	4/17/2018 13:19	mg / cm ^2	WALL	Sheetrock	D	White	210			Negative	1	< LOD	0.03
15	4/17/2018 13:19	mg / cm ^2	WALL	Sheetrock	B	White	210			Negative	1	< LOD	0.03
16	4/17/2018 13:21	mg / cm ^2	WALL	Sheetrock	C	White	210			Negative	1	< LOD	0.03
17	4/17/2018 13:21	mg / cm ^2	WALL	Sheetrock	A	White	210			Negative	1	< LOD	0.03
18	4/17/2018 13:22	mg / cm ^2	WALL	Ceiling		White	210			Negative	1	< LOD	0.03
19	4/17/2018 13:23	mg / cm ^2	WALL	Sheetrock	D	White	210			Negative	1	< LOD	0.26
20	4/17/2018 13:25	mg / cm ^2	WALL	Sheetrock	B	White	210			Negative	1	< LOD	0.03
21	4/17/2018 13:25	mg / cm ^2	WALL	Sheetrock	D	White	210			Negative	1	< LOD	0.03
22	4/17/2018 13:26	mg / cm ^2	Column	Plaster	D	White	210			Positive	1	9.6	4.1
23	4/17/2018 13:28	mg / cm ^2	WALL	Sheetrock	C	White	210	S. Side		Negative	1	< LOD	0.03
24	4/17/2018 13:28	mg / cm ^2	WALL	Sheetrock	A	White	210	S. Side		Negative	1	< LOD	0.03
25	4/17/2018 13:30	mg / cm ^2	Ceiling	Plaster		White	210	S. Side		Positive	1	13.1	4.8
26	4/17/2018 13:33	mg / cm ^2	WALL	Sheetrock	C	White	210	S. Side		Negative	1	< LOD	0.13
27	4/17/2018 13:33	mg / cm ^2	WALL	Sheetrock	A	White	210	S. Side		Negative	1	< LOD	0.03
28	4/17/2018 13:34	mg / cm ^2	WALL	Plaster	C	Gray	210	W. Side		Positive	1	7.2	2.5
29	4/17/2018 13:35	mg / cm ^2	WALL	Plaster	C	White	210	W. Side		Positive	1	8.1	3.8
30	4/17/2018 13:35	mg / cm ^2	WALL	Plaster	A	White	210	W. Side		Positive	1	13.6	4.1
31	4/17/2018 13:36	mg / cm ^2	WALL	Plaster	A	White	210	W. Side		Positive	1	14.8	4.9
32	4/17/2018 13:37	mg / cm ^2	WALL	Plaster	D	White	210/209	W. Side		Positive	1	9.7	3.4
33	4/17/2018 13:37	mg / cm ^2	WALL	Plaster	D	White	210/209	W. Side		Positive	1	10.6	3.7

34	**4/17/2018 13:38**	**mg / cm ^2**	**WALL**	**Plaster**	**C**	**White**	**210/209 W. Side**		**Positive**	**1**	**14.9**	**5**
35	4/17/2018 13:39	mg / cm ^2	WALL	Sheetrock	C	Gray	210	Closet	Negative	1	< LOD	0.03
36	4/17/2018 13:41	mg / cm ^2	WALL	Sheetrock	C	White	208		Negative	1	< LOD	0.17
37	4/17/2018 13:41	mg / cm ^2	WALL	Sheetrock	A	White	208		Negative	1	< LOD	0.03
38	4/17/2018 13:42	mg / cm ^2	WALL	Sheetrock	B	White	208		Negative	1	< LOD	0.03
39	4/17/2018 13:42	mg / cm ^2	WALL	Sheetrock	C	White	208		Negative	1	< LOD	0.03
40	**4/17/2018 13:44**	**mg / cm ^2**	**Ceiling**	**Plaster**		**White**	**208**		**Positive**	**1**	**7.8**	**3.7**
41	4/17/2018 13:46	mg / cm ^2	WALL	Sheetrock	D	White	210-A		Negative	1	< LOD	0.03
42	4/17/2018 13:47	mg / cm ^2	Window Frame	Metal	D	Brown	210-A		Negative	1	< LOD	0.03
43	4/17/2018 13:48	mg / cm ^2	WALL	Sheetrock	B	White	210-A		Negative	1	< LOD	0.03
44	4/17/2018 13:49	mg / cm ^2	WALL	Sheetrock	C	White	210-A	Partician	Negative	1	< LOD	0.03
45	4/17/2018 13:49	mg / cm ^2	WALL	Sheetrock	A	White	210-A	Partician	Negative	1	< LOD	0.03
46	4/17/2018 13:51	mg / cm ^2	WALL	Sheetrock	D	Gray	211	Overhang	Negative	1	< LOD	0.03
47	4/17/2018 13:52	mg / cm ^2	WALL	Sheetrock	C	Gray	211	Overhang	Negative	1	< LOD	0.03
48	4/17/2018 13:54	mg / cm ^2	WALL	Sheetrock	D	White	211		Negative	1	< LOD	0.03
49	**4/17/2018 13:56**	**mg / cm ^2**	**WALL**	**Plaster**	**A**	**White**	**211**	**Center**	**Positive**	**1**	**10.4**	**3.9**
50	4/17/2018 13:56	mg / cm ^2	WALL	Sheetrock	B	White	211	Center	Negative	1	< LOD	0.03
51	4/17/2018 13:56	mg / cm ^2	WALL	Sheetrock	C	White	211	Center	Negative	1	< LOD	0.03
52	**4/17/2018 13:56**	**mg / cm ^2**	**WALL**	**Plaster**	**A**	**White**	**211**	**Center**	**Positive**	**1**	**11**	**4.3**
53	**4/17/2018 13:58**	**mg / cm ^2**	**WALL**	**Plaster**	**D**	**White**	**211**	**Hallway**	**Positive**	**1**	**3.2**	**1.8**
54	4/17/2018 13:59	mg / cm ^2	WALL	Sheetrock	B	White	211-C		Negative	1	< LOD	0.03
55	4/17/2018 14:00	mg / cm ^2	WALL	Sheetrock	D	White	211-C		Negative	1	< LOD	0.03
56	4/17/2018 14:00	mg / cm ^2	WALL	Sheetrock	B	White	211-C		Negative	1	< LOD	0.03
57	4/17/2018 14:00	mg / cm ^2	WALL	Sheetrock	D	White	211-C		Negative	1	< LOD	0.03
58	4/17/2018 14:04	mg / cm ^2	Ceiling	Concrete		Gray	211-C		Negative	1	< LOD	0.4
59	4/17/2018 14:05	mg / cm ^2	Ceiling	Concrete		Gray	211-C		Negative	1	0.6	0.3
60	4/17/2018 14:07	mg / cm ^2	WALL	Sheetrock	B	White	205		Negative	1	< LOD	0.03
61	4/17/2018 14:08	mg / cm ^2	WALL	Sheetrock	D	White	205		Negative	1	< LOD	0.03
62	4/17/2018 14:12	mg / cm ^2	cal. check 3.58						Positive	1	3.7	1.3
63	4/17/2018 14:12	mg / cm ^2	cal. check 1.53						Positive	1	1.3	0.2
64	4/17/2018 14:13	mg / cm ^2	cal. check 0.31						Negative	1	0.3	0.14

= Positive for Asbestos

Positive for Lead: All Plaster Walls & Ceilings

1 A5 PARTIAL 2ND FLOOR DEMO PLAN
NORTH END- PHASE 5A 1/8"=1'-0"

2 A5 PARTIAL 2ND FLOOR DEMO CLG PLAN
NORTH END- PHASE 5A 1/8"=1'-0"

3 A5 PARTIAL 2ND FLOOR DEMO PLAN
NORTH & SOUTH EAST- PHASE 5B & C 1/8"=1'-0"

4 A5 PARTIAL 2ND FLOOR DEMO CLG PLAN
NORTH & SOUTH EAST- PHASE 5B &5C 1/8"=1'-0"

PHASE 5A, 5B & 5C

PHASE 5- 2ND FLOOR - WEST SIDE DEMO EXISTING

RW Fern Associates Inc. Architect, 413 East Superior Street, Duluth, Minnesota 55802 (218) 722-8271

DULUTH CITY HALL - PROJECT # 17-426
INTERIOR RENOVATIONS
411 WEST FIRST STREET, DULUTH, MN. 55802

A5

Twin Ports Testing
1301 N3rd St. • Superior WI 54880 • 715-392-7114 • 1-800-373-2562 • F 715-392-7163 • www.twinportstesting.com

April 26, 2021

TPT #21A0192

Mr. Randy Rosandich
Property & Facilities Management
1532 West Michigan Street
Duluth, MN 55806

Re: **Asbestos & Lead Sampling**
Duluth City Hall, 4th, 3rd & Ground Floor
Duluth, Minnesota

Dear Mr. Rosandich:

The following is a final report outlining the asbestos bulk sampling and lead XRF sampling conducted at the subject site for renovation purposes. This report contains the following information:

- Introduction
- Results
- Recommendations

INTRODUCTION

Twin Ports Testing II, Inc. (TPT) was contacted by Mr. Randy Rosandich, Property & Facilities Management Department for the City of Duluth, to conduct asbestos bulk sampling and lead XRF sampling prior to renovation of the 4th, 3rd & Ground floors of the City Hall Building located in Duluth, Minnesota. On April 9, 2021, Mr. Gary Christner and Mr. Reis Trenary, Minnesota Department of Health (MDH) Certified Asbestos Inspectors and Lead Risk Assessor were on-site to collect material samples that potentially contain asbestos. Copies of the inspector's MDH hard cards are included in Appendix A.

RESULTS

Asbestos

TPT collected forty-two samples that were potentially asbestos containing materials (ACMs). These building materials included: carpet adhesive, plaster, skim coat, ceiling tile, adhesive, sink undercoating, wallboard, floorboard, concrete, mastic, floor tile, clay wall tile and sheetrock. TPT staff collected bulk samples from the suspect building components in accordance with the Minnesota Department of Health (MDH) regulations pertaining to asbestos inspections.

The table on the following page lists the areas that were sampled for asbestos (bold and shading indicates positive results), sample ID, location, and percent (%) asbestos (if applicable). Laboratory analytical results are included in Appendix B.

Table 1 – Sampled Material

Object or Item	Sample ID	Location	% Asbestos
Carpet adhesive	1	Ground floor lunchroom under carpet (tan)	None Detected
Plaster wall	2	Ground floor lunchroom, (brown/gray/tan)	None Detected
Skim coat		Ground floor lunchroom wall (tan)	None Detected
Ceiling tile (1' x 1')	3	Ground floor lunchroom, (gray/white)	None Detected
Carpet adhesive	4	Ground floor training room under carpet (tan)	None Detected
Ceiling tile (1' x 1')	5	Ground floor Parks & Recreation hallway (gray/white)	None Detected
Adhesive		Ground floor Parks & Recreation hallway under tile (brown)	None Detected
Sink undercoating	6	Ground floor Parks & Recreation Room #6 (gray)	None Detected
Wallboard	7	Ground floor Parks & Recreation Room #6 North wall, (brown/white)	None Detected
Ceiling tile (2' x 4'), (textured)	8	Ground floor Parks & Recreation Room #6, (gray/white)	None Detected
Plaster wall	9	Ground floor Parks & Recreation Room #9 (gray)	None Detected
Skim coat		Ground floor Parks & Recreation Room #9 (white)	None Detected
Ceiling tile (2' x 4')	10	Ground floor Parks & Recreation Room #9, (gray/white)	None Detected
Plaster ceiling	11	Ground floor Parks & Recreation Room #9 (gray)	None Detected
Skim coat		Ground floor Parks & Recreation Room #9 (white)	None Detected
Carpet adhesive	12	Ground floor Parking Services office under carpet (tan)	None Detected
Wallboard	13	Ground floor Parking Service hallway (brown/white)	None Detected
Wallboard	14	Ground floor North entrance wall (brown/white)	None Detected
Ceiling tile (2' x 2'), (Pin-holed & fissured)	15	Ground floor room across from Parking Service window, (gray/white)	None Detected
Ceiling tile (2' x 2')	16	Room in hall across from Parking Service window, (gray/white)	None Detected
Floor board	17	3rd floor Human Resource area, Safety Office, (brown/tan)	None Detected
Adhesive		3rd floor Human Resource area, Safety Office under floor board (tan)	None Detected

Table 1 – Sampled Material

Object or Item	Sample ID	Location	% Asbestos
Adhesive	17	3rd floor Human Resource area, Safety Office, (brown)	None Detected
Wallboard	18	3rd floor Safety Office north and east walls, (brown/white)	None Detected
White layer		3rd floor Safety Office north and east walls (white)	None Detected
Concrete	19	3rd floor north side hallway, west wall, (gray)	None Detected
Gray layer		3rd floor north side hallway, west wall, (gray)	None Detected
Plaster	20	3rd floor north side hallway, south wall, (gray/white)	None Detected
Ceiling tile (2' x 2'), Pin-holed & fissured)	21	3rd floor hallway by safety office, (gray/white)	None Detected
Wall plaster	22	3rd floor east side closet, east wall, (gray)	None Detected
Skim coat		3rd floor east side closet, east wall, (white)	None Detected
Ceiling tile (2' x 4'), Pin-holed & fissured	23	3rd floor Northwest side conference room, (gray/white)	None Detected
Floor board	24	3rd floor Human Resource area, corner office, (brown/tan)	None Detected
Adhesive		3rd floor Human Resource area, corner office under floor board, (green)	None Detected
Wall plaster	25	3rd floor Northwest side East wall, (gray/white)	None Detected
Ceiling tile (2' x 2'), (textured)	26	3rd floor Human Resource area, northwest room, (brown/gray/silver)	None Detected
Floor board	27	3rd floor Human Resource area, big office space, (black)	None Detected
Mastic		3rd floor Human Resource area, big office space under floor board, (tan)	None Detected
Wall plaster	28	3rd floor Human Resource area, west Room #358, top layer, (gray)	None Detected
Skim coat		3rd floor Human Resource area, west Room #358, (white)	None Detected
Clay tile	29	3rd floor Human Resource area, west Room #358, bottom layer, (red)	None Detected
Ceiling tile (2' x 4'), (pin-holed)	30	3rd floor east most room, (gray/white)	None Detected
Floor board	31	4th floor Room #430, (brown/tan)	None Detected
Adhesive		4th floor Room #430 under floor board (green)	None Detected
Mastic		4th floor Room #430 under floor board (brown)	None Detected

Table 1 – Sampled Material

Object or Item	Sample ID	Location	% Asbestos
Floor tile (1' x 1')	**32**	**4th floor Mayor's office breakroom (gray)**	**3% Chrysotile**
Adhesive		4th floor Mayor's office breakroom, (tan/black)	None Detected
Floor tile	33	4th floor Noah's office (tan/green)	None Detected
Wall plaster	34	4th floor Human Rights Office, east side south wall, (gray)	None Detected
Skim coat		4th floor Human Rights Office, east side south wall, (white)	None Detected
Clay tile	35	4th floor Human Rights Office, east side south wall, (red)	None Detected
Gray layer		4th floor Human Right Office, east side south wall, (gray)	None Detected
Wall plaster	36	4th floor Mayor's office breakroom north wall, (gray)	None Detected
Skim coat		4th floor Mayor's office breakroom north wall, (white)	None Detected
Wall sheetrock	37	4th floor Mayor's office breakroom west wall, (brown/white)	None Detected
Wall sheetrock	38	4th floor west office area, south wall, (brown/white)	None Detected
Skim coat		4th floor west office area, south wall, (white)	None Detected
Wall plaster	39	4th floor west office area, north wall, (gray)	None Detected
Skim coat		4th floor west office area, north wall, (white)	None Detected
Ceiling tile (2' x 4'), (textured)	40	4th floor (gray/white)	None Detected
Ceiling tile (2' x 4'), (textured)	41	4th floor west office area, (gray/white)	None Detected
Ceiling tile (2' x 2'), (textured)	42	4th floor conference room, (gray/white)	None Detected

By the MDH and MPCA rules and regulations, asbestos containing materials are materials that contain greater than 1% asbestos. One of the materials tested is considered to be an Asbestos Containing Material (ACM).

Table 2 – Asbestos Containing Materials Summary

Sample #'s	Sample Description	Location	Friability	Approximate Amount
Floor tile (1' x 1')	32	4th floor Mayor's office breakroom (gray)	Non-Friable	~148 square feet

Lead

Samples of painted surfaces were tested for lead content using a NITON XLp-303A X-Ray Fluorescence (XRF) Lead Paint Analyzer, Serial Number 22293. Fourteen sampled component were above the MDH limit of 1.0 mg/cm^2 for painted surfaces and are considered positive for lead content. The following items tested positive for lead.

- Purple plaster wall located on the south wall in the lunchroom on the ground floor;
- Purple metal radiator located on the east side of the lunchroom on the ground floor;
- White plaster ceiling located in the hallway by the lunchroom on the ground floor;
- Brown plaster ceiling located in the hallway by the lunchroom on the ground floor;
- White plaster wall located on the south wall in room #9 in the Parks & Rec. area on the ground floor;
- White plaster wall located on the east wall in the hallway of the Parks & Rec. area on the ground floor;
- White plaster wall located on the east wall by the parking ticket window on the ground floor;
- White plaster wall located on the west wall in the Human Resource room #1 on the 3rd floor;
- White plaster wall located on the east wall in room #358 on the 3rd floor;
- White plaster wall located on the west wall in room west of room #358 on the 3rd floor;
- White plaster wall located on the south wall in room #430 on the 4th floor;
- White plaster wall located on the west wall in room #430 (safe room) on the 4th floor; and
- White plaster wall located on the north wall in the open area west of room 418 on the 4th floor.

The Niton results are located in Appendix C.

RECOMMENDATIONS

TPT recommends the abatement of the asbestos containing material if the material is to be disturbed during renovation. This material included:

- Gray floor tile located in the Mayor's office breakroom located on the 4th floor.

The abatement must be completed by a State of Minnesota licensed asbestos abatement contractor. If additional materials are discovered that may be asbestos containing during renovation, the material must be tested or assumed to be asbestos containing and treated as such.

TPT recommends that lead safe work practices be utilized when working with the materials that tested positive for lead content if they to be disturbed during demolition.

This inspection was conducted according to federal, state and local regulations. If you have any questions regarding this report, please feel free to contact me at (715) 392-7114 (office). Thank you for the opportunity to conduct this work.

Sincerely,

Twin Ports Testing II, Inc.

Gary J. Christner

Gary Christner
Industrial Hygiene Technician
Inspector #AI3694

Date 4/24/2021

Attachments: Appendix A: Inspector Certifications
Appendix B: Asbestos Laboratory Analytical Results
Appendix C: Niton XRF Lead Results

Appendix A

Inspector Certifications

LEAD
Risk Assessor
Licensed by:
State of Minnesota
Department of Health
License No. LR3101
Expires 02/26/2021

Gary J Christner
2337 Pershing Street
Duluth, MN 55811

Director, Env. Health Div.

ASBESTOS
INSPECTOR
Certified by:
State of Minnesota
Department of Health
Expires: 01/04/2022

Gary J Christner
2337 Pershing Street
Duluth, MN 55811

Director, Env. Health Div.

No. AI3694

Issued: 02/09/2021

Appendix B

Asbestos Laboratory Analytical Results

EMSL Analytical, Inc.
3410 Winnetka Avenue North New Hope, MN 55427
Tel/Fax: (763) 449-4922 / (763) 449-4924
http://www.EMSL.com / minneapolislab@emsl.com

EMSL Order: 352103176
Customer ID: TWNT42
Customer PO:
Project ID:

Attention: Tracy Jacobs
Twin Ports Testing II, Inc.
1301 North Third Street
Superior, WI 54880

Project:

Phone: (715) 392-7114
Fax:
Received Date: 04/15/2021 8:52 AM
Analysis Date: 04/22/2021
Collected Date:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
1 *352103176-0001*	Lunch Room Carpet Adhesive	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2-Plaster *352103176-0002*	Lunch Room Wall Plaster	Brown/Gray/Tan Non-Fibrous Heterogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
2-Skim Coat *352103176-0002A*	Lunch Room Wall Plaster	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3 *352103176-0003*	Lunch Room 1'x1' Ceiling Tile	Gray/White Fibrous Heterogeneous	40% Cellulose 40% Min. Wool	10% Perlite 10% Non-fibrous (Other)	None Detected
4 *352103176-0004*	Training Room Carpet Adhesive	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
5-Ceiling Tile *352103176-0005*	Parks & Rec Hallway 1'x1' C.T. w/ Adhesive	Gray/White Fibrous Heterogeneous	80% Min. Wool	20% Non-fibrous (Other)	None Detected
5-Adhesive *352103176-0005A*	Parks & Rec Hallway 1'x1' C.T. w/ Adhesive	Brown Non-Fibrous Homogeneous	<1% Fibrous (Other)	100% Non-fibrous (Other)	None Detected
6 *352103176-0006*	Parks & Rec Room #6 Sink undercoat	Gray Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
7 *352103176-0007*	Parks & Rec Room #6 N. Wall Wallboard	Brown/White Fibrous Heterogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
8 *352103176-0008*	Parks & Rec Room #6 2'x4' Textured C.T.	Gray/White Fibrous Heterogeneous	90% Min. Wool	10% Non-fibrous (Other)	None Detected
9-Plaster *352103176-0009*	Parks & Rec Room #9 Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
9-Skim Coat *352103176-0009A*	Parks & Rec Room #9 Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10 *352103176-0010*	Parks & Rec Room #9 2'x4' C.T.	Gray/White Fibrous Heterogeneous	90% Min. Wool	10% Non-fibrous (Other)	None Detected
11-Plaster *352103176-0011*	Parks & Rec Room #9 Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11-Skim Coat *352103176-0011A*	Parks & Rec Room #9 Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
12 *352103176-0012*	Parking Services office Carpet Adhesive	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 04/22/2021 15:05:42

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EMSL Order: 352103176
Customer ID: TWNT42
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
13 352103176-0013 *This is a composite result of wallboard and jt. compound*	Parking Services Hallway Wallboard Textured Wall	Brown/White Fibrous Heterogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
14 352103176-0014	Parking Services N. Entrance Wall board	Brown/White Fibrous Heterogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
15 352103176-0015	Room Across from Parking Services Window 2'x2' P.H. & F C.T.	Gray/White Fibrous Heterogeneous	50% Cellulose 30% Min. Wool	10% Perlite 10% Non-fibrous (Other)	None Detected
16 352103176-0016	Room in Hall Across from Parking Window 2'x2' C.T.	Gray/White Fibrous Heterogeneous	90% Min. Wool	10% Non-fibrous (Other)	None Detected
17-Floor Board 352103176-0017	3rd Floor H.R. Safety Office Floor Board w/ Adhesive	Brown/Tan Fibrous Heterogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
17-Tan Adhesive 352103176-0017A	3rd Floor H.R. Safety Office Floor Board w/ Adhesive	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17-Brown Adhesive 352103176-0017B	3rd Floor H.R. Safety Office Floor Board w/ Adhesive	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
18-Wallboard 352103176-0018	3rd Floor Safety Office N & E Wall Wallboard	Brown/White Fibrous Heterogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
18-White Layer 352103176-0018A	3rd Floor Safety Office N & E Wall Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-Concrete 352103176-0019	3rd Floor N. Side of Hallway W. Wall Concrete	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-Gray Layer 352103176-0019A	3rd Floor N. Side of Hallway W. Wall Concrete	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20 352103176-0020	3rd Floor N. Side of Hallway S. Wall Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21 352103176-0021	3rd Floor Hallway by Safety Office 2'x2' C.T. P.H. & F	Gray/White Fibrous Heterogeneous	50% Cellulose 30% Min. Wool	10% Perlite 10% Non-fibrous (Other)	None Detected
22-Plaster 352103176-0022	3rd Floor E. Side Closet E. Wall Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
22-Skim Coat 352103176-0022A	3rd Floor E. Side Closet E. Wall Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
23 352103176-0023	3rd Floor N.W. Side Confrence Room 2'x4' C.T. P.H. & F.	Gray/White Fibrous Heterogeneous	50% Cellulose 30% Min. Wool	10% Perlite 10% Non-fibrous (Other)	None Detected
24-Floor Board 352103176-0024	3rd Floor H.R. Corner Office Floor Board	Brown/Tan Fibrous Heterogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
24-Adhesive 352103176-0024A	3rd Floor H.R. Corner Office Floor Board	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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EMSL Order: 352103176
Customer ID: TWNT42
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
25 *352103176-0025*	3rd Floor N.W. Side E. Wall Plaster	Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
26 *352103176-0026*	3rd Floor H.R. N.W. Room 2'x2' C.T. Textured	Brown/Gray/Silver Fibrous Heterogeneous	10% Cellulose 75% Min. Wool	15% Non-fibrous (Other)	None Detected
27-Floor Board *352103176-0027*	3rd Floor H.R. Big Office Space Floor Board	Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
27-Mastic *352103176-0027A*	3rd Floor H.R. Big Office Space Floor Board	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
28-Plaster *352103176-0028*	3rd Floor H.R. W. Room #358 1st layer Plaster Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
28-Skim Coat *352103176-0028A*	3rd Floor H.R. W. Room #358 1st layer Plaster Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
29 *352103176-0029*	3rd Floor H.R. W. of Room #358 Wall Base layer	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
30 *352103176-0030*	3rd Floor E. Most Room 2'x4' C.T. P.H.	Gray/White Fibrous Heterogeneous	40% Cellulose 40% Min. Wool	10% Perlite 10% Non-fibrous (Other)	None Detected
31-Floor Board *352103176-0031*	4th Floor Room #430 Floor Board	Brown/Tan Fibrous Heterogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
31-Green Adhesive *352103176-0031A*	4th Floor Room #430 Floor Board	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
31-Brown Mastic *352103176-0031B*	4th Floor Room #430 Floor Board	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
32-Floor Tile *352103176-0032*	4th Floor Mayor Office Break Room 1'x1' F.T. W/ Adhesive	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
32-Adhesive *352103176-0032A*	4th Floor Mayor Office Break Room 1'x1' F.T. W/ Adhesive	Tan/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
33 *352103176-0033*	4th Floor Noah's Office F.T.	Tan/Green Fibrous Heterogeneous	25% Cellulose	75% Non-fibrous (Other)	None Detected
34-Plaster *352103176-0034*	4th Floor Human Rights Office E. Side S. Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
34-Skim Coat *352103176-0034A*	4th Floor Human Rights Office E. Side S. Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
35-Red Layer *352103176-0035*	4th Floor Human Rights Office E. Side S. Clay Wall	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
35-Gray Layer *352103176-0035A*	4th Floor Human Rights Office E. Side S. Clay Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
36-Plaster *352103176-0036*	4th Floor Mayor Office Break Room N. Wall Wallboard	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
36-Skim Coat *352103176-0036A*	4th Floor Mayor Office Break Room N. Wall Wallboard	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
37 *352103176-0037*	4th Floor Mayor Office Break Room W. Wall S.R.	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
38-Sheetrock *352103176-0038*	4th Floor W. Office Area S. Wall S.R. Wall	Brown/White Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
38-Skim Coat *352103176-0038A*	4th Floor W. Office Area S. Wall S.R. Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
39-Plaster *352103176-0039*	4th Floor W. Office Area N. Wall Plaster Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
39-Skim Coat *352103176-0039A*	4th Floor W. Office Area N. Wall Plaster Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
40 *352103176-0040*	4th Floor 2'x4' C.T. Textured	Gray/White Fibrous Heterogeneous	90% Min. Wool	10% Non-fibrous (Other)	None Detected
41 *352103176-0041*	4th Floor 2'x4' W. Office Area 2'x4' C.T. Textured	Gray/White Fibrous Heterogeneous	90% Min. Wool	10% Non-fibrous (Other)	None Detected
42 *352103176-0042*	4th Floor Confrence Room 2'x2' C.T. Textured	Gray/White Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)
Nicholas Asuncion (62)

Rachel Travis, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. New Hope, MN NVLAP Lab Code 200019-0; Colorado AL-24478

Initial report from: 04/22/2021 15:05:42

OrderID: 352103176

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 03176

EMSL Analytical, Inc.
14375 23rd Avenue North
Minneapolis, MN 55447
PHONE: (763) 449-4922
FAX: (763) 449-4924

Company Name: Twin Ports Testing II		**EMSL Customer ID:**	
Street: 1301 North 3rd Street		**City:** Superior	**State/Province:** WI
Zip/Postal Code: 54880	**Country:** US	**Telephone #:** (218) 390-0162	**Fax #:** 7153927163
Report To (Name): Tracy Jacobs		**Please Provide Results:** ☐ Fax ☑ Email	
Email Address: tracy.jacobs@twinportstesting.com		**Purchase Order:**	
Project Name/Number:		**EMSL Project ID** *(Internal Use Only)*:	
U.S. State Samples Taken: MN		**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt	

EMSL-Bill to: ☑ Same ☐ Different - If Bill to is Different note instructions in Comments**
Third Party Billing requires written authorization from third party

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☒ 1 Week ☐ 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air ☐ Check if samples are from NY
☐ NIOSH 7400
☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
☒ PLM EPA 600/R-93/116 (<1%)
☐ PLM EPA NOB (<1%)
Point Count
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
Point Count w/Gravimetric
☐ 400 (<0.25%) ☐ 1000 (<0.1%)
☐ NYS 198.1 (friable in NY)
☐ NYS 198.6 NOB (non-friable-NY)
☐ NYS 198.8 SOF-V
☐ NIOSH 9002 (<1%)

TEM – Air ☐ 4-4.5hr TAT (AHERA only)
☐ AHERA 40 CFR, Part 763
☐ NIOSH 7402
☐ EPA Level II
☐ ISO 10312

TEM - Bulk
☐ TEM EPA NOB
☐ NYS NOB 198.4 (non-friable-NY)
☐ Chatfield SOP
☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
Fibers >10µm ☐ Waste ☐ Drinking
All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
☐ Microvac - ASTM D 5755
☐ Wipe - ASTM D6480
☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
☐ PLM EPA 600/R-93/116 with milling prep (<1%)
☐ PLM EPA 600/R-93/116 with milling prep (<0.25%)
☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
☐ TEM Qualitative via Filtration Prep
☐ TEM Qualitative via Drop Mount Prep
☐ Cincinnati Method EPA 600/R-04/004 – PLM/TEM (BC only)

Other:
☐

☐ Check For Positive Stop – Clearly Identify Homogenous Group

Filter Pore Size (Air Samples): ☐ 0.8µm ☐ 0.45µm

Samplers Name: Ries Trenary **Samplers Signature:** RT

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
1	Lunch Room Carpet Adhesive		
2	Lunch Room Wall Plaster		
3	Lunch Room 1'x1' Ceiling Tile		
4	Training Room Carpet Adhesive		
5	Parks + Rec Hallway 1'x1' C.T. w/ Adhesive		

Client Sample # (s): 1 - 42 **Total # of Samples:** 42

Relinquished (Client): RT **Date:** 4/13/2021 **Time:** 14:30

Received (Lab): Alindahl FE **Date:** ~~4-13~~ 4-15-21 **Time:** 8:52

Comments/Special Instructions:
C.T. = Ceiling Tile

7961003882222

Controlled Document – Asbestos COC – R10 – 05/09/2016

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

EMSL Analytical, Inc.
14375 23rd Avenue North
Minneapolis, MN 55447
PHONE: (763) 449-4922
FAX: (763) 449-4924

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 03176

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
6	Parks + Rec Room #6 Sink under coat		
7	Parks + Rec Room #6 N. Wall Wallboard		
8	Parks + Rec Room #6 2'x4' Textured	C.T.	
9	Parks + Rec Room #9 Wall		
10	Parks + Rec Room #9 2'x4' C.T.		
11	Parks + Rec Room #9 Ceiling		
12	Parking Services office Carpet Adhesive		
13	Parking Services Hallway Wallboard Textured Wall		
14	Parking Services # N. Entrance Wall board		
15	Room Across from Parking Services Window	2'x2' P.H.+F. C.T.	
16	Room in Hall Across from Parking Window	2'x2' C.T.	
17	3rd Floor H.R. Safety office Floor Board W/Adhesive		
18	3rd Floor Safety office N.+E. Wall Wallboard		
19	3rd Floor N. Side of Hallway W. Wall Concrete		
20	3rd Floor N. Side of Hallway S. Wall Plaster		
21	3rd Floor Hallway by Safety office 2'x2'	C.T. P.H.+F.	
22	3rd Floor E. Side Closet E. Wall Plaster		
23	3rd Floor N.W. Side Confrence Room 2'x4'	C.T. P.H.+F.	
24	3rd Floor H.R. Corner office Floor Board		
25	3rd Floor N.W. Side E. Wall Plaster		
26	3rd Floor HR N.W. Room 2'x2' C.T.	Textured	
27	3rd Floor H.R. Big office Space Floor	Board	
28	3rd Floor H.R. W. Room #358 1st layer	Plaster	Wall

***Comments/Special Instructions:**

H.R. = Human Resources
C.T. = Ceiling Tile
P.H.+F. = Pin Hole + Fissured

Controlled Document – Asbestos COC – R10 – 05/09/2016

OrderID: 352103176

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

EMSL Analytical, Inc.
14375 23rd Avenue North

Minneapolis, MN 55447
PHONE: (763) 449-4922
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Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 03176

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
29	3rd Floor H.R. W. of Room #358 Wall	Base layer	
30	3rd Floor E. Most Room 2'x4' C.T.	P.H.	
31	4th Floor Room #430 Floor Board		
32	4th Floor Mayor office Break Room	1'x1' F.T. W/	Adhesive
33	4th Floor Noah's office F.T.		
34	4th Floor Human Rights office E. Side S. Wall		
35	4th Floor Human Rights office E. Side S. Clay		Wall
36	4th Floor Mayor office Break Room	N. Wall	Wall board
37	4th Floor Mayor office Break Room	W. Wall S.	R.
38	4th Floor W. office Area S. Wall S.R.	Wall	
39	4th Floor W. office Area N. Wall	Plaster	Wall
40	4th Floor 2'x4' C.T. Textured		
41	4th Floor 2'x4' W. office Area	2'x4' C.T.	Textured
42	4th Floor Confrence Room 2'x2' C.T.	textured	

***Comments/Special Instructions:**

S.R. = Sheet Rock

Appendix C

Niton XRF Lead Results

Reading No	Time	Units	Compone	Substrate	Side	Color	Floo	Room	Results	Action	PbC	PbC Error
1	4/9/2021 10:14	cps									1.47	0
2	4/9/2021 10:23	mg / cm ^2	cal. check	3.58					Positive	1	3.6	1.9
3	4/9/2021 10:24	mg / cm ^2	cal. check	1.53					Positive	1	1.5	0.3
4	4/9/2021 10:25	mg / cm ^2	cal. check	0.31					Negative	1	0.29	0.16
5	4/9/2021 10:26	mg / cm ^2	Wall	Plaster	South	White	G	Lunch	Negative	1	0.4	0.1
6	**4/9/2021 10:27**	**mg / cm ^2**	**Wall**	**Plaster**	**South**	**Purple**	**G**	**Lunch**	**Positive**	**1**	**1.1**	**0.1**
7	**4/9/2021 10:29**	**mg / cm ^2**	**Radiator**	**Metal**	**East**	**Purple**	**G**	**Lunch**	**Positive**	**1**	**1.2**	**0.2**
8	**4/9/2021 10:31**	**mg / cm ^2**	**Ceiling**	**Plaster**		**White**	**G**	**Hallway**	**Positive**	**1**	**3.1**	**1.7**
9	**4/9/2021 10:34**	**mg / cm ^2**	**Ceiling**	**Plaster**		**Brown**	**G**	**Hallway**	**Positive**	**1**	**4.2**	**2.1**
10	4/9/2021 10:36	mg / cm ^2	Wall	Plaster	North	White	G	Sign	Negative	1	<LOD	0.03
11	**4/9/2021 10:49**	**mg / cm ^2**	**Wall**	**Plaster**	**South**	**White**	**G**	**Parks #9**	**Positive**	**1**	**10.9**	**3.8**
12	**4/9/2021 10:50**	**mg / cm ^2**	**Wall**	**Plaster**	**East**	**White**	**G**	**Parks Hall**	**Positive**	**1**	**10.2**	**3.5**
13	4/9/2021 10:52	mg / cm ^2	Wall	Sheetrock	North	White	G	Parks #6	Negative	1	<LOD	0.03
14	4/9/2021 10:54	mg / cm ^2	Wall	Concrete	North	White	G	Parks by Tunnel	Negative	1	<LOD	0.03
15	**4/9/2021 10:56**	**mg / cm ^2**	**Wall**	**Plaster**	**East**	**White**	**G**	**Park. Tic. Window**	**Positive**	**1**	**10.1**	**3.5**
16	4/9/2021 10:57	mg / cm ^2	Wall	Plaster	West	White	G	E. Entryway	Negative	1	<LOD	0.03
17	4/9/2021 10:58	mg / cm ^2	Wall	Sheetrock	North	White	G	Rm. Across Park. Tic.	Negative	1	<LOD	0.03
18	4/9/2021 10:58	mg / cm ^2	Wall	Sheetrock	West	White	G	Rm. Across Park. Tic.	Negative	1	<LOD	0.03
19	4/9/2021 10:59	mg / cm ^2	Baseboar	Wood	North	Brown	G	Rm. Across Park. Tic.	Negative	1	<LOD	0.03
20	4/9/2021 11:01	mg / cm ^2	Wall	Sheetrock	East	White	G	Off. By Parking	Negative	1	<LOD	0.03
21	4/9/2021 11:01	mg / cm ^2	Cabinet	Wood	East	Brown	G	Off. By Parking	Negative	1	<LOD	0.03
22	4/9/2021 11:06	mg / cm ^2	Wall	Plaster	South	White	3rd	HR Supply	Negative	1	<LOD	0.03
23	4/9/2021 11:07	mg / cm ^2	Wall	Sheetrock	East	White	3rd	HR Hallway	Negative	1	<LOD	0.03
24	4/9/2021 11:07	mg / cm ^2	Wall	Plaster	North	White	3rd	HR Hallway	Negative	1	<LOD	0.03
25	**4/9/2021 11:11**	**mg / cm ^2**	**Wall**	**Plaster**	**West**	**White**	**3rd**	**HR Office #1**	**Positive**	**1**	**8.3**	**2.7**
26	4/9/2021 11:12	mg / cm ^2	Wall	Plaster	South	White	3rd	HR Print Room	Negative	1	<LOD	0.03
27	4/9/2021 11:13	mg / cm ^2	Wall	Plaster	North	White	3rd	HR Paper Room	Negative	1	<LOD	0.03
28	**4/9/2021 11:14**	**mg / cm ^2**	**Wall**	**Plaster**	**East**	**White**	**3rd**	**Room 358**	**Positive**	**1**	**7.9**	**2.5**
29	**4/9/2021 11:16**	**mg / cm ^2**	**Wall**	**Plaster**	**West**	**White**	**3rd**	**Rm. West of 358**	**Positive**	**1**	**7.8**	**2.4**
30	**4/9/2021 11:21**	**mg / cm ^2**	**Wall**	**Plaster**	**South**	**White**	**4th**	**Room 430**	**Positive**	**1**	**8.2**	**2.5**
31	4/9/2021 11:22	mg / cm ^2	Wall	Sheetrock	East	White	4th	Room 430	Negative	1	<LOD	0.03
32	**4/9/2021 11:23**	**mg / cm ^2**	**Wall**	**Plaster**	**South**	**White**	**4th**	**Room 430**	**Positive**	**1**	**8.1**	**2.4**
33	**4/9/2021 11:23**	**mg / cm ^2**	**Wall**	**Plaster**	**West**	**White**	**4th**	**Room 430 Safe Room**	**Positive**	**1**	**8.3**	**2.7**

34	4/9/2021 11:24	mg / cm ^2	Wall	Plaster	East	White	4th	Room 430 Closet	Negative	1	<LOD	0.05
35	4/9/2021 11:26	mg / cm ^2	Wall	Sheetrock	South	White	4th	Room 418	Negative	1	<LOD	0.03
36	4/9/2021 11:27	mg / cm ^2	Wall	Sheetrock	East	White	4th	Room 418	Negative	1	<LOD	0.03
37	4/9/2021 11:27	mg / cm ^2	Wall	Sheetrock	West	White	4th	Room 418 Breakroom	Negative	1	<LOD	0.03
38	**4/9/2021 11:29**	**mg / cm ^2**	**Wall**	**Plaster**	**North**	**White**	**4th**	**Open area west of 418**	**Positive**	**1**	**7.8**	**2.3**
39	4/9/2021 11:29	mg / cm ^2	Wall	Sheetrock	South	White	4th	Open area west of 418	Negative	1	<LOD	0.03
40	4/9/2021 11:30	mg / cm ^2	Wall	Sheetrock	West	White	4th	Open area west of 418	Negative	1	<LOD	0.03
41	4/9/2021 12:45	mg / cm ^2	Ceiling	Plaster		White	3rd	HR Supply	Negative	1	<LOD	0.12
42	4/9/2021 12:45	mg / cm ^2	Ceiling	Plaster		White	3rd	HR Supply	Negative	1	<LOD	0.64
43	4/9/2021 12:46	mg / cm ^2	Wall	Plaster	East	White	3rd	HR Supply	Negative	1	<LOD	0.03
44	4/9/2021 12:46	mg / cm ^2	Wall	Plaster	West	White	3rd	HR Supply	Negative	1	<LOD	0.03
45	4/9/2021 12:47	mg / cm ^2	Ceiling	Plaster		White	3rd	HR Supply	Negative	1	<LOD	0.03
46	4/9/2021 14:41	mg / cm ^2	cal. check	3.58					Positive	1	3.1	1.5
47	4/9/2021 14:41	mg / cm ^2	cal. check	1.53					Positive	1	1.4	0.4
48	4/9/2021 14:42	mg / cm ^2	cal. check	0.31					Negative	1	0.28	0.16

Twin Ports Testing
1301 N 3rd St. • Superior WI 54880 • 715-392-7114 • 1-800-373-2562 • F 715-392-7163 • www.twinportstesting.com

June 24, 2021

TPT #21A0192

Mr. Randy Rosandich
Property & Facilities Management
1532 West Michigan Street
Duluth, MN 55806

Re: XRF Lead Paint Testing
Duluth City Hall
Rooms 314A & 315-Ceilings
Duluth, Minnesota

Dear Mr. Rosandich:

The following is report outlining the lead paint testing conducted at the subject site for renovation purposes. This report contains the following information:

- Introduction
- Results
- Recommendations

INTRODUCTION

Twin Ports Testing II, Inc. (TPT) was contacted by Mr. Randy Rosandich, from the City of Duluth Property & Facilities Management Department, to conduct additional lead paint sampling of ceilings located on the third floor of the City Hall building in Duluth, Minnesota. The ceilings were discovered when the lower ceiling was opened up during renovation activities. On June 23, 2021, Mr. Gary Christner, of TPT, was on-site to perform the lead testing.

RESULTS

Lead

Samples of painted surfaces were tested for lead content using a NITON XLp-303A X-Ray Fluorescence (XRF) Lead Paint Analyzer, Serial Number 22293. Three of the components sampled exceeded the MDH limit of 1.0 mg/cm^2 for painted surfaces and are considered positive for lead content. The following items tested positive for lead.

- White plaster ceiling located in room 314A;
- Brown plaster ceiling located in room 314A; and
- Gray plaster ceiling located in room 314A.

RECOMMENDATIONS

TPT recommends that lead safe work practices be utilized when working with the materials that tested positive for lead content if they to be disturbed during renovation.

If additional materials are discovered during renovation that may contain lead, the material must be tested or assumed to be lead and treated as such.

This inspection was conducted according to federal, state and local regulations. If you have any questions regarding this report, please feel free to contact me at (715) 392-7114 (office). Thank you for the opportunity to conduct this work.

Sincerely,

Twin Ports Testing II, Inc.

Gary J. Christner

Gary Christner
Industrial Hygiene Technician

Date 6/24/2021

Attachments: Appendix A: XRF Lead Paint Results
Appendix B: Inspector Certification

Appendix A

XRF Lead Paint Results

Reading No	Time	Type	Units	Component	Substrate	Color	Floor	Results	Action Level	PbC	PbC Error
1	6/23/2021 12:56	ShutterCal	cps							1.29	0
2	6/23/2021 12:57	Paint	mg / cm ^2	cal. check 3.58				Positive	1	3.5	1.8
3	6/23/2021 12:58	Paint	mg / cm ^2	cal. check 1.53				Positive	1	1.8	0.5
4	6/23/2021 12:58	Paint	mg / cm ^2	cal. check 0.31				Negative	1	0.28	0.16
5	**6/23/2021 13:09**	**Paint**	**mg / cm ^2**	**Ceiling**	**PLASTER**	**White**	**315**	**Positive**	**1**	**8.4**	**3.2**
6	**6/23/2021 13:09**	**Paint**	**mg / cm ^2**	**Ceiling**	**PLASTER**	**Brown**	**315**	**Positive**	**1**	**10.1**	**4.7**
7	**6/23/2021 13:10**	**Paint**	**mg / cm ^2**	**Ceiling**	**PLASTER**	**Gray**	**315**	**Positive**	**1**	**9.4**	**4.1**
8	6/23/2021 13:13	Paint	mg / cm ^2	Ceiling	PLASTER	Brown	314-A	Negative	1	<LOD	0.04
9	6/23/2021 13:14	Paint	mg / cm ^2	Ceiling	PLASTER	White	314-A	Negative	1	<LOD	0.03
10	6/23/2021 13:15	Paint	mg / cm ^2	Ceiling	PLASTER	Brown	314-A	Negative	1	<LOD	0.03
11	6/23/2021 13:28	Paint	mg / cm ^2	Cal. check 3.58	PLASTER			Positive	1	4.1	2.1
12	6/23/2021 13:28	Paint	mg / cm ^2	Cal. check 1.53	PLASTER			Positive	1	1.3	0.4
13	6/23/2021 13:29	Paint	mg / cm ^2	Cal. check 0.31	PLASTER			Negative	1	0.27	0.12

Appendix B

Inspector Certification

Director, Env. Health Div.

DEPARTMENT OF HEALTH **LEAD Risk Assessor**

Licensed by:
State of Minnesota
Department of Health

License No. LR3101
Expires 02/25/2022

Gary J Christner
2337 Pershing Street
Duluth, MN 55811

Submittal

Prepared For:
City of Duluth

Date: May 17, 2022
Job Name:
Duluth City Hall - VRF

Trane U.S. Inc. is pleased to provide the following submittal for your review and approval.

Product Summary

Qty	Product
9	Trane - Mitsubishi VRF Outdoor Unit
13	Trane - Mitsubishi VRF Branch Controller
132	Trane - Mitsubishi VRF Indoor Unit

Notes:

1. Labor warranty **NOT** included.
2. Startup assistance by Trane Ductless Technical Specialist **included.**
3. Disconnect switch **NOT** included.
4. Linesets **NOT** included.

Trane Mitsubishi Products - Standard warranty: The parts are warranted to the original owner a period of one (1) year, and Compressor a period of seven (7) years from the date of installation by a licensed contractor.

Extended warranty: The parts and compressor will be warranted for a period of ten (10) years to the original owner if (1) the System is designed by a Diamond Designer using the MEUS Diamond System Builder™ (2) the installing contractor has successfully completed the CITI MULTI MEUS approved training course, and (3) the contractor has submitted a completed and approved MEUS Extended Warranty Process report.

Joey Beisbier / Richard Youngdahl
Trane U.S. Inc.
775 Vandalia Street
Saint Paul, MN 55114
Office Phone: (651) 468-2700

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

Design View Piping Diagrams

Indoor Units:	22 / 1 to 42		
Capacity:	224 / 84 to 252	(133.3%)	
* Connectable capacity is not actual capacity.			
Total Pipe Length:	0.0 / 2460.0	feet	
Furthest Actual:	0.0 / 541.0	feet	
Furthest Equiv.:	0.0 / 623.0	feet	
Furthest IU from BC Actual:	0.0 / 0.0	feet	
Furthest IU from BC Equiv.:	0.0 / 0.0	feet	
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet	
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet	

Correction Factors

Outdoor Unit Capacity:	1.06	1.04
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.93	1.04

Water Pressure Drop:	6.33	psi/module
Additional Refrigerant:	38.6	lb
Total Refrigerant Amount:	51.8	lb

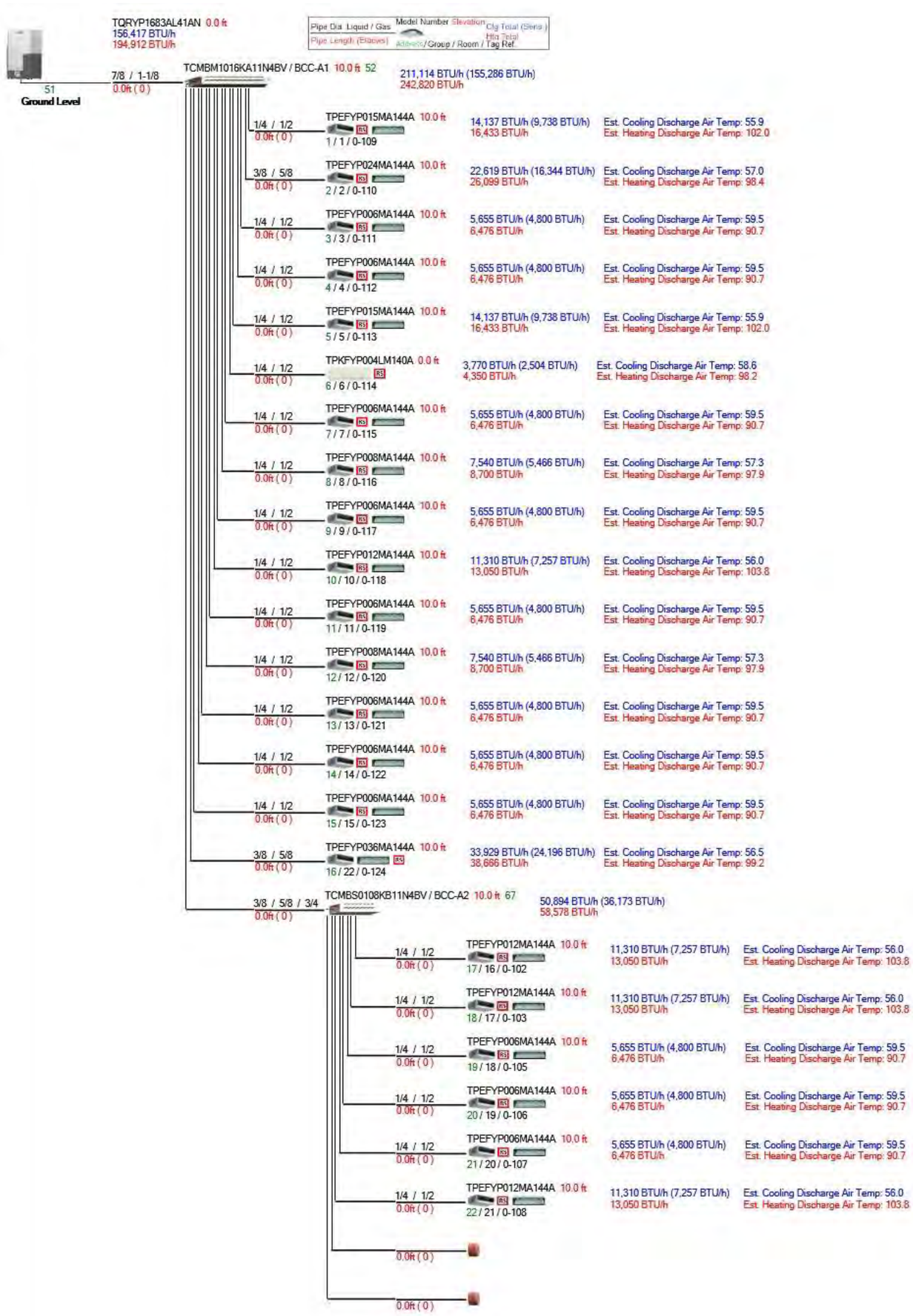
Conditions (°F)

Cooling

Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating

Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



Indoor Units:	12 / 1 to 50	
Capacity:	166 / 72 to 216 (115.3%)	
* Connectable capacity is not actual capacity.		
Total Pipe Length:	0.0 / 2460.0	feet
Furthest Actual:	0.0 / 541.0	feet
Furthest Equiv.:	0.0 / 623.0	feet
Furthest IU from BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Equiv.:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet

Correction Factors

Outdoor Unit Capacity:	1.03	1.02
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.89	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.90	1.00

Water Pressure Drop:	6.59	psi/module
Additional Refrigerant:	29.0	lb
Total Refrigerant Amount:	42.3	lb

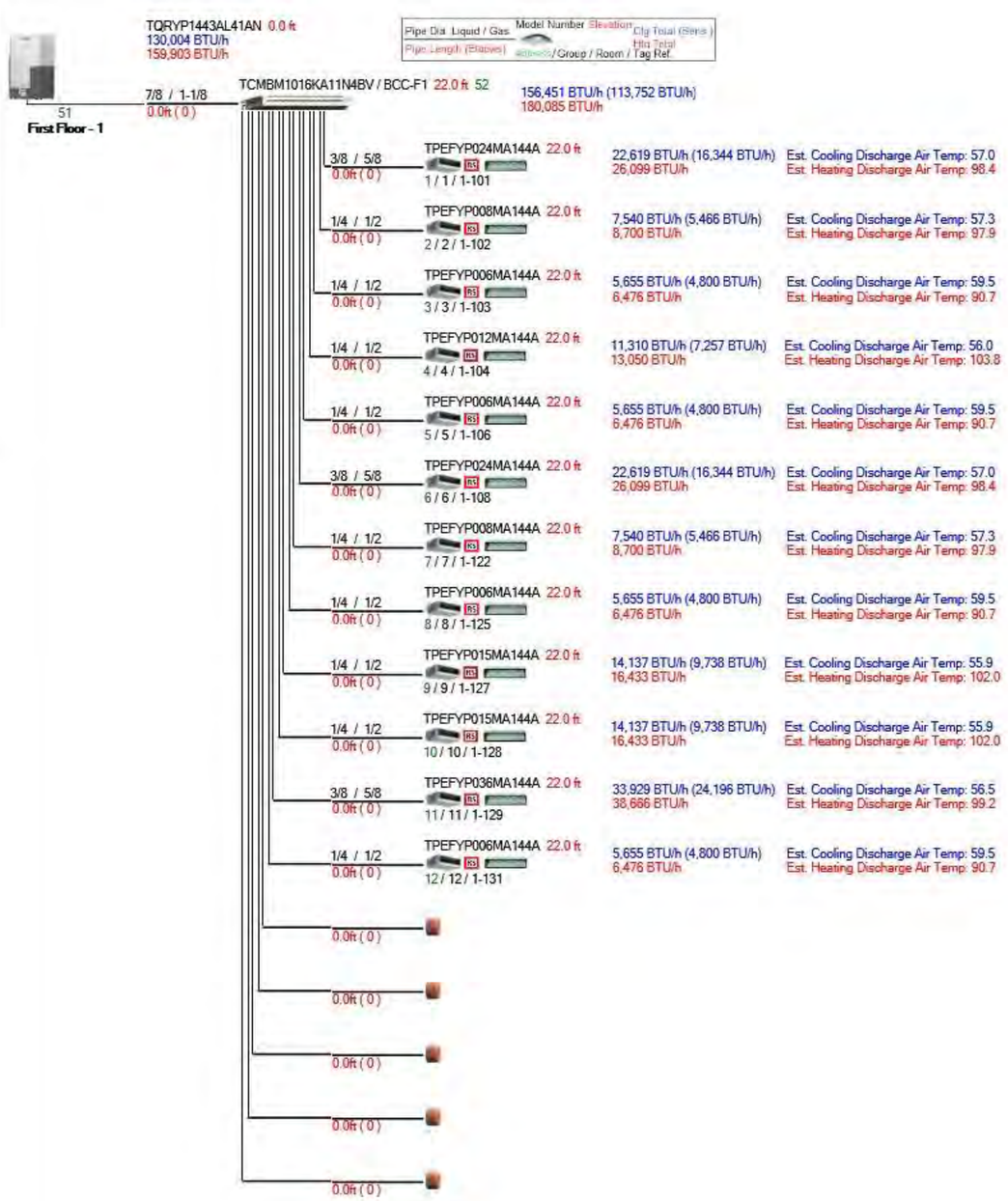
Conditions (°F)

Cooling

Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating

Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



Indoor Units:	15 / 1 to 50	
Capacity:	239 / 96 to 288	(124.5%)
* Connectable capacity is not actual capacity.		
Total Pipe Length:	0.0 / 2460.0	feet
Furthest Actual:	0.0 / 541.0	feet
Furthest Equiv.:	0.0 / 623.0	feet
Furthest IU from BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Equiv.:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet

Correction Factors

Outdoor Unit Capacity:	1.05	1.03
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.92	1.03

Water Pressure Drop:	6.33	psi/module
Additional Refrigerant:	29.9	lb
Total Refrigerant Amount:	43.1	lb

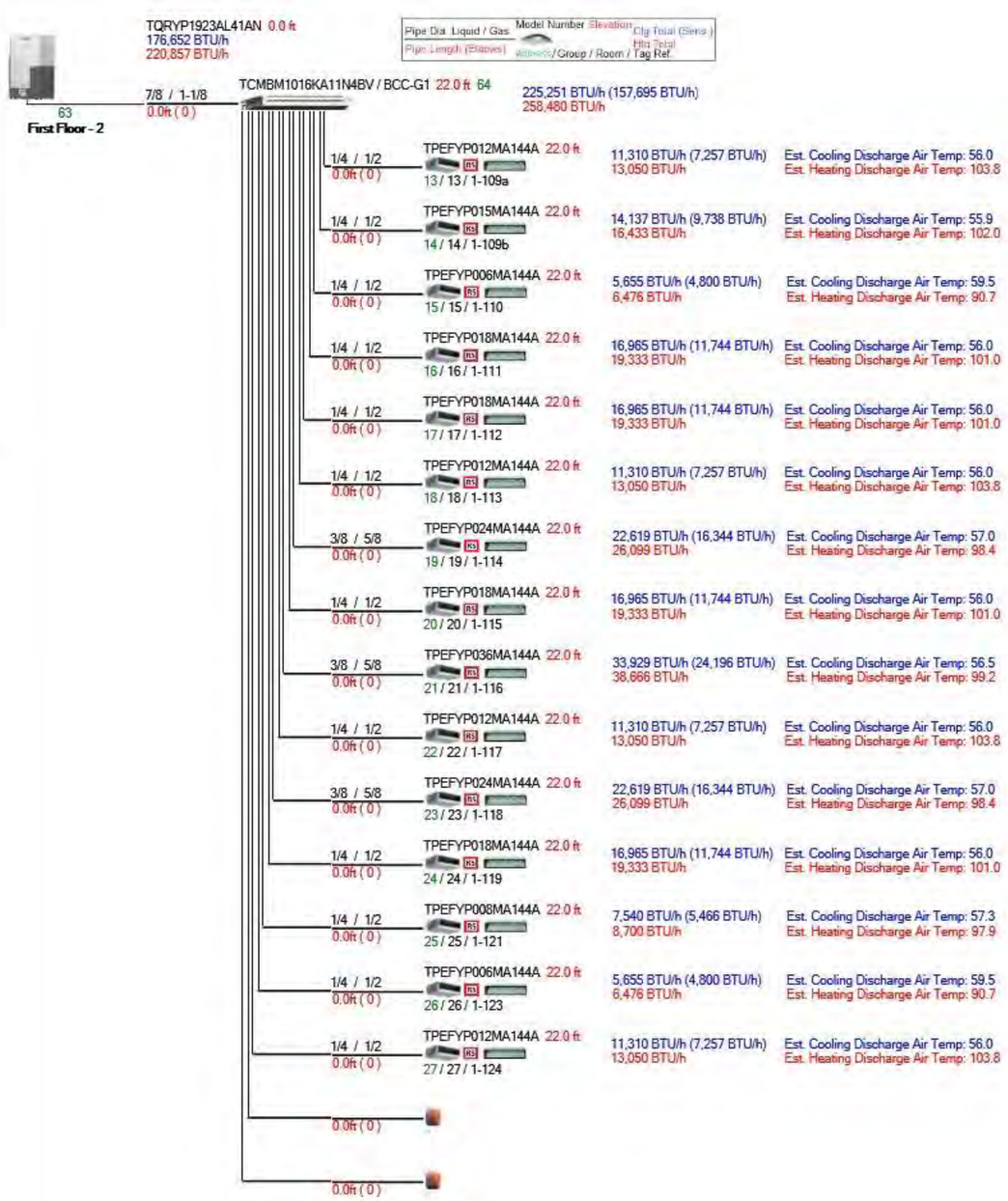
Conditions (°F)

Cooling

Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating

Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



Indoor Units:	19 / 2 to 50		
Capacity:	266 / 108 to 324	(123.1%)	
* Connectable capacity is not actual capacity.			
Total Pipe Length:	0.0 / 2460.0	feet	
Furthest Actual:	0.0 / 541.0	feet	
Furthest Equiv.:	0.0 / 623.0	feet	
Furthest IU from BC Actual:	0.0 / 0.0	feet	
Furthest IU from BC Equiv.:	0.0 / 0.0	feet	
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet	
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet	

Correction Factors

Outdoor Unit Capacity:	1.05	1.02
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.92	1.02

Water Pressure Drop:	6.52	psi/module
Additional Refrigerant:	39.2	lb
Total Refrigerant Amount:	65.0	lb

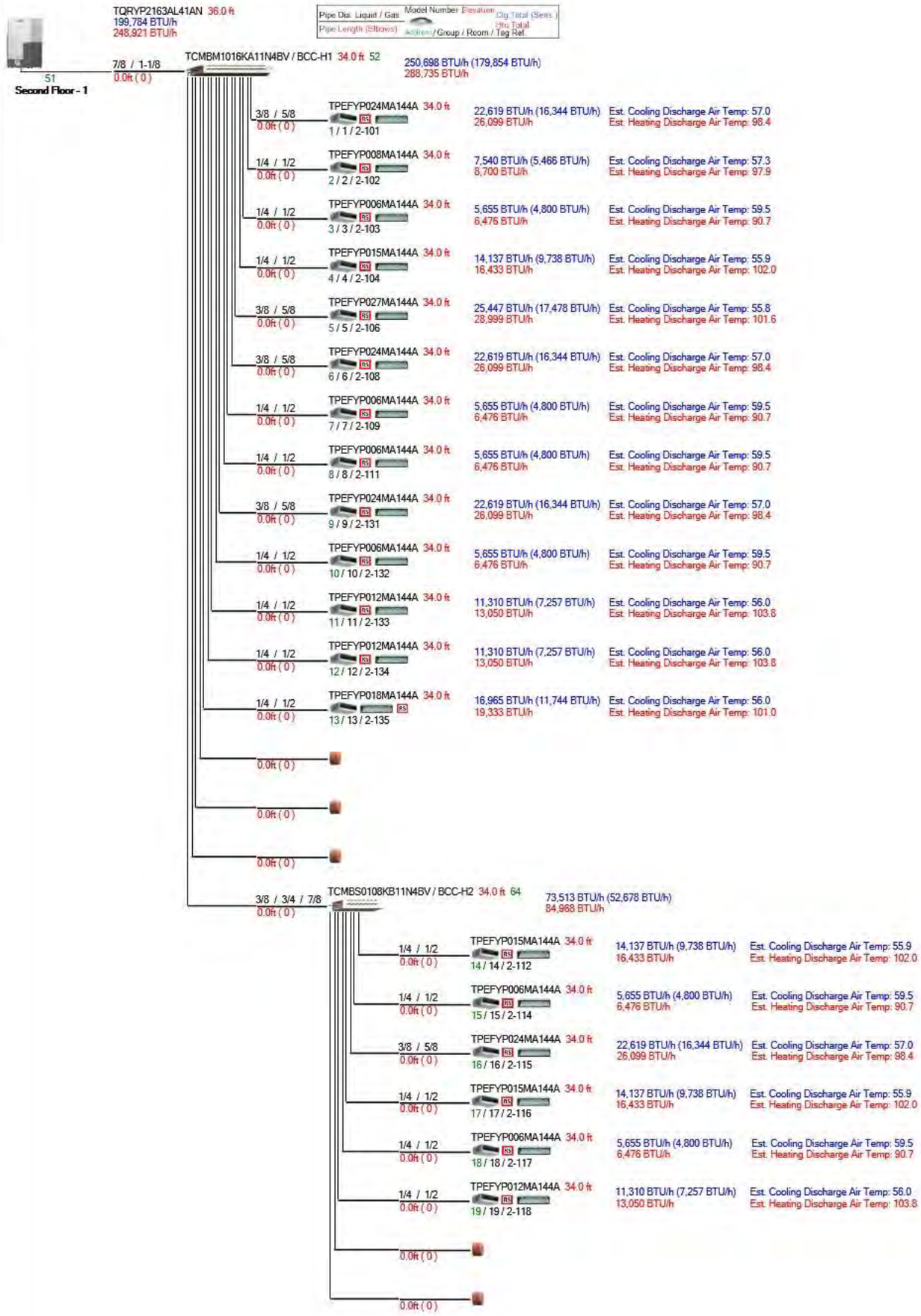
Conditions (°F)

Cooling

Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating

Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



Indoor Units:	14 / 2 to 50		
Capacity:	341 / 120 to 360	(142.1%)	
* Connectable capacity is not actual capacity.			
Total Pipe Length:	0.0 / 2460.0	feet	
Furthest Actual:	0.0 / 541.0	feet	
Furthest Equiv.:	0.0 / 623.0	feet	
Furthest IU from BC Actual:	0.0 / 0.0	feet	
Furthest IU from BC Equiv.:	0.0 / 0.0	feet	
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet	
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet	

Correction Factors

Outdoor Unit Capacity:	1.11	1.04
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.98	1.04

Water Pressure Drop:	6.52	psi/module
Additional Refrigerant:	33.4	lb
Total Refrigerant Amount:	59.2	lb

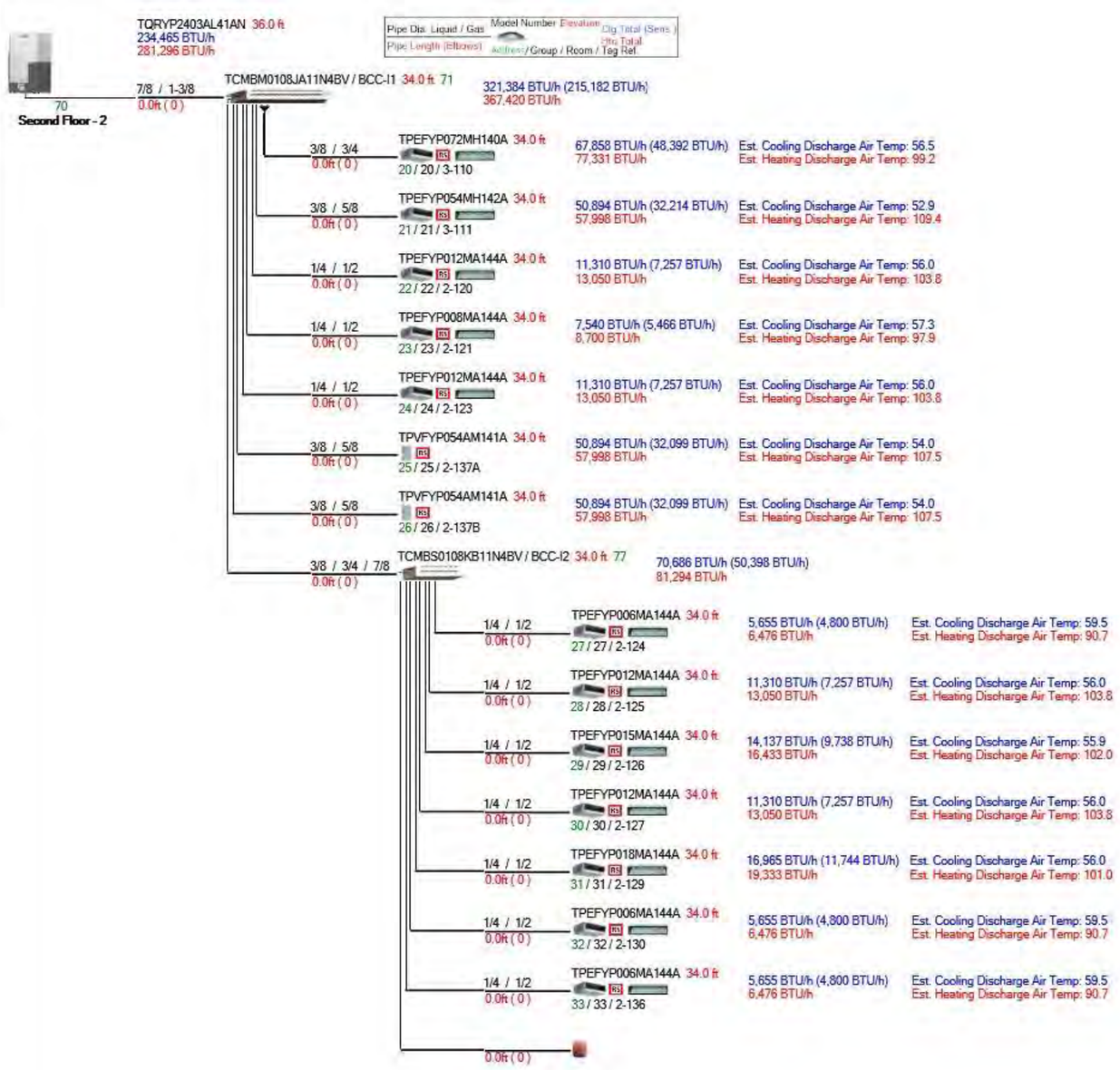
Conditions (°F)

Cooling

Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating

Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



Indoor Units:	9 / 1 to 30	
Capacity:	145 / 60 to 180	(120.8%)
* Connectable capacity is not actual capacity.		
Total Pipe Length:	0.0 / 1804.0	feet
Furthest Actual:	0.0 / 541.0	feet
Furthest Equiv.:	0.0 / 623.0	feet
Furthest IU from BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Equiv.:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet

Correction Factors

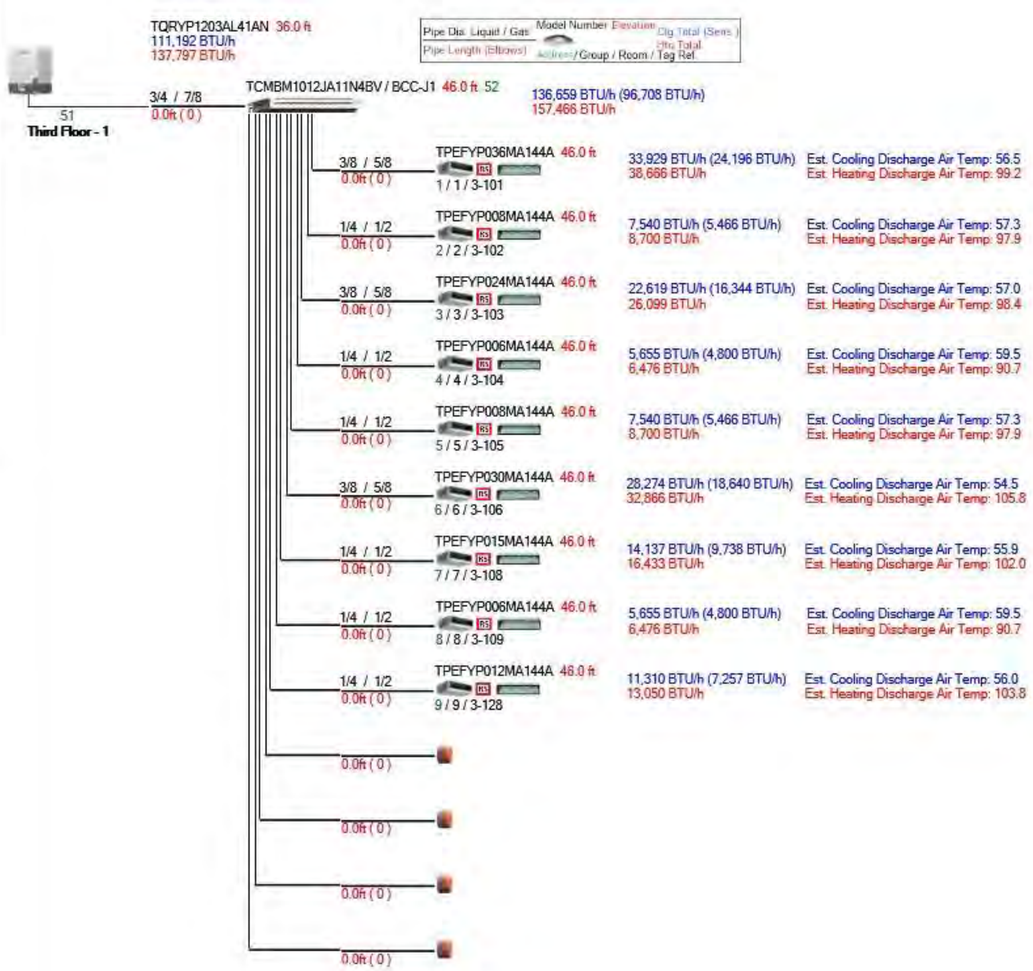
Outdoor Unit Capacity:	1.06	1.02
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.93	1.02

Water Pressure Drop: 3.49 psi/module
Additional Refrigerant: 21.6 lb
Total Refrigerant Amount: 32.6 lb

Conditions (°F)

Cooling
Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating
Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



Indoor Units:	13 / 1 to 50	
Capacity:	181 / 72 to 216 (125.7%)	
* Connectable capacity is not actual capacity.		
Total Pipe Length:	0.0 / 2460.0	feet
Furthest Actual:	0.0 / 541.0	feet
Furthest Equiv.:	0.0 / 623.0	feet
Furthest IU from BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Equiv.:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet

Correction Factors

Outdoor Unit Capacity:	1.04	1.03
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.92	1.03

Water Pressure Drop:	6.33	psi/module
Additional Refrigerant:	26.4	lb
Total Refrigerant Amount:	39.7	lb

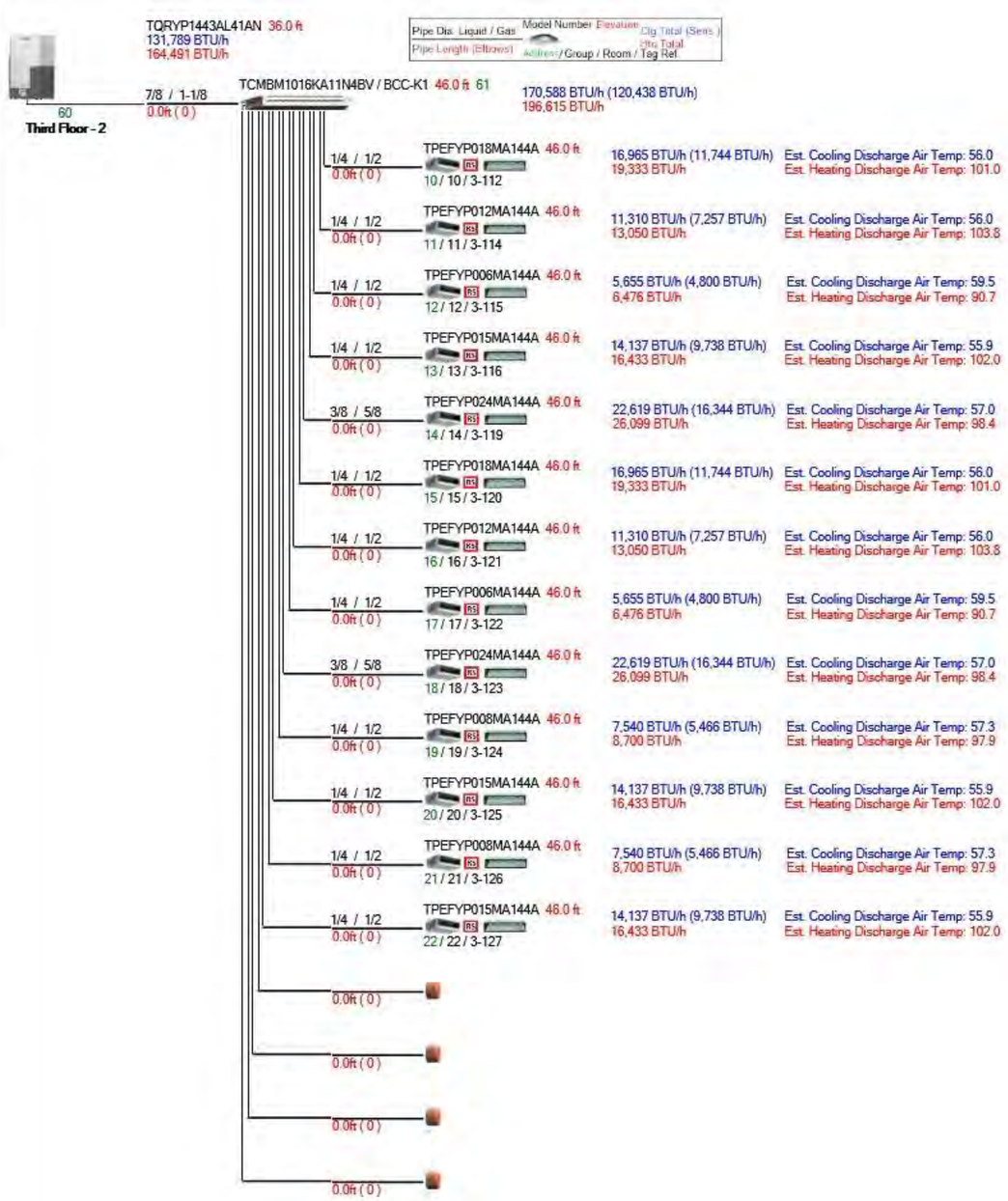
Conditions (°F)

Cooling

Indoor DB	75.0	Humidity	60.0%	Indoor WB	65.2
Outdoor DB	92.0	Water	105.0		

Heating

Indoor DB	70.0	Water	65.0		
Outdoor DB	-16.0	Humidity	72.8%	Outdoor WB	-16.3



Indoor Units:	13 / 1 to 50	
Capacity:	191 / 72 to 216 (132.6%)	
* Connectable capacity is not actual capacity.		
Total Pipe Length:	0.0 / 2460.0	feet
Furthest Actual:	0.0 / 541.0	feet
Furthest Equiv.:	0.0 / 623.0	feet
Furthest IU from BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Equiv.:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet

Correction Factors

Outdoor Unit Capacity:	1.06	1.04
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.93	1.04

Water Pressure Drop:	6.33	psi/module
Additional Refrigerant:	23.9	lb
Total Refrigerant Amount:	37.2	lb

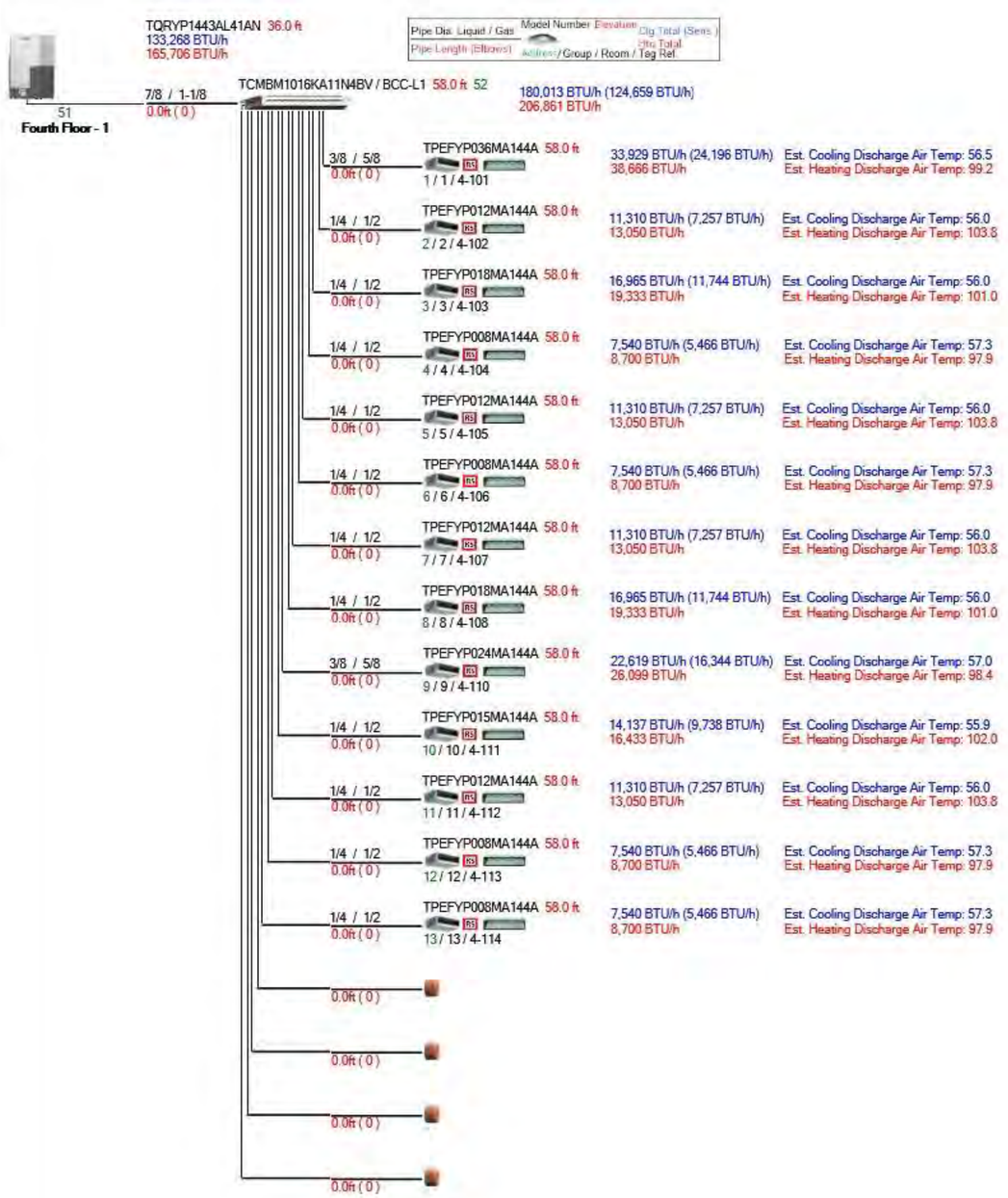
Conditions (°F)

Cooling

Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating

Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



Indoor Units:	15 / 2 to 50	
Capacity:	270 / 108 to 324	(125.0%)
* Connectable capacity is not actual capacity.		
Total Pipe Length:	0.0 / 2460.0	feet
Furthest Actual:	0.0 / 541.0	feet
Furthest Equiv.:	0.0 / 623.0	feet
Furthest IU from BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Equiv.:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Actual:	0.0 / 0.0	feet
Furthest IU from BC Thru Sub BC Equiv.:	0.0 / 0.0	feet

Correction Factors

Outdoor Unit Capacity:	1.06	1.03
Temperature:	1.00	1.00
Piping Length:	1.00	1.00
Water Temperature:	0.88	1.00
Water Volume:	1.00	1.00
User Derate:	1.00	1.00
Total Derate:	0.93	1.03

Water Pressure Drop:	6.52	psi/module
Additional Refrigerant:	30.5	lb
Total Refrigerant Amount:	56.3	lb

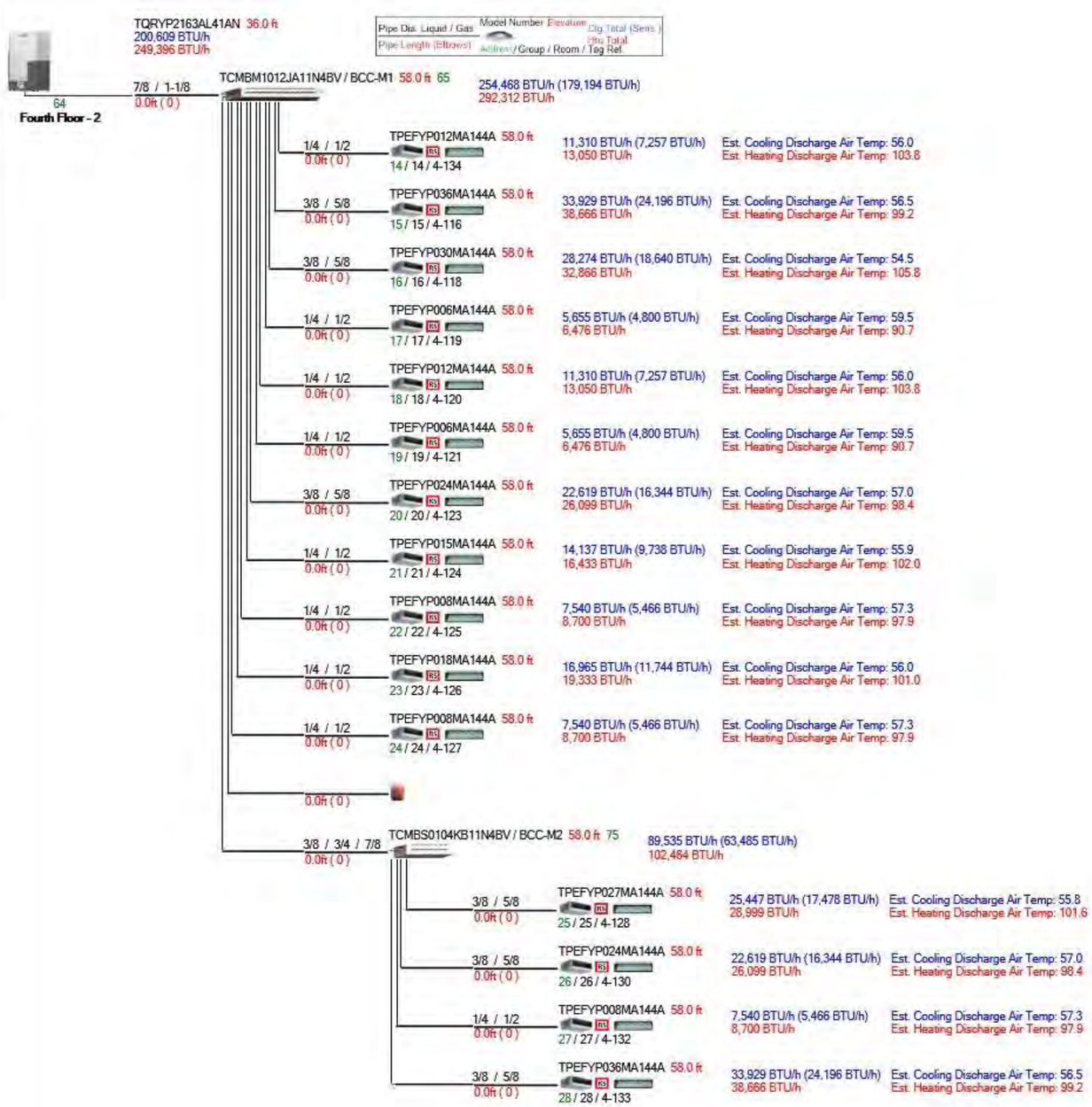
Conditions (°F)

Cooling

Indoor DB 75.0 Humidity 60.0% Indoor WB 65.2
Outdoor DB 92.0 Water 105.0

Heating

Indoor DB 70.0 Water 65.0
Outdoor DB -16.0 Humidity 72.8% Outdoor WB -16.3



AutoCAD Piping & Wiring Diagrams

DIAGRAM SYMBOL LEGEND	
DISPLAY	DESCRIPTION
——//——	POWER WIRE
———	CONTROL WIRE
———	REF. PIPE

CONT.No		PAGE	

CITY MULTI

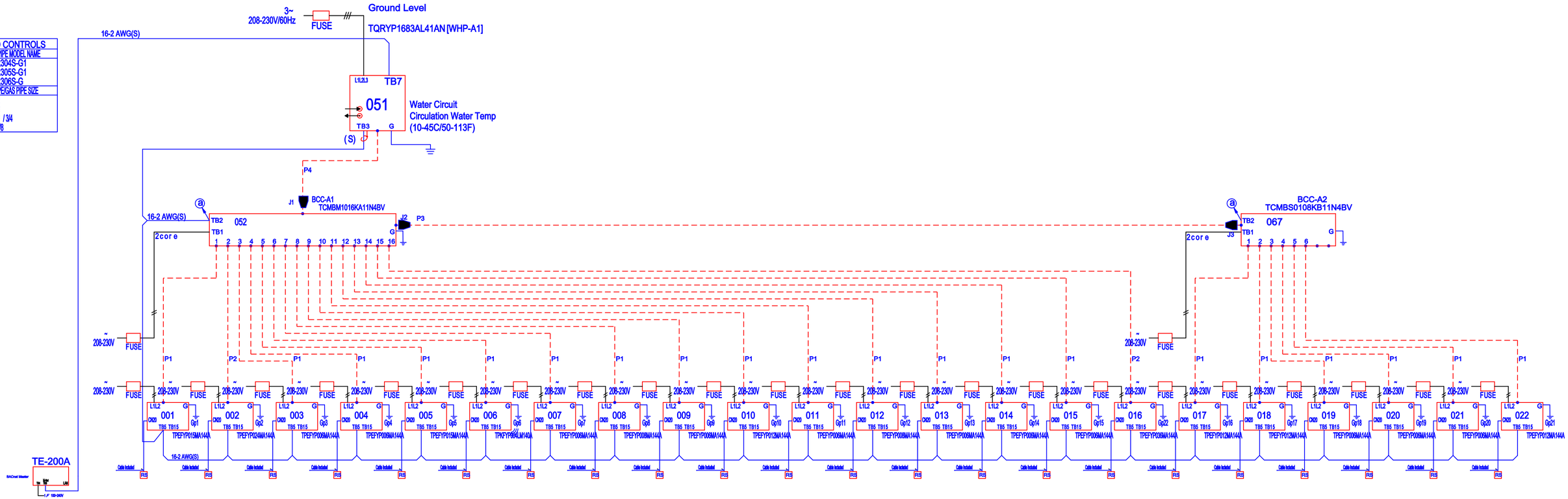
SYSTEM SCHEMATIC DWG.

This drawing is schematic in nature. Final routing of piping & wiring shall be determined by the installing contractor and/or designer of record

Additional refrigerant charge is needed depending on the size and length of extended piping. Please refer the amount of pre-charge and the formula of calculation which is mentioned on the data book.

1.25mm²(16 AWG) : 1.25mm²(16 AWG) or more. 0.75mm²(20 AWG) : between 0.5mm²(24 AWG) and 0.75mm²(20 AWG).

PIPING AND CONTROLS	
SYMBOL	BRANCH PIPE MODEL NAME
J1	CMY-R304S-G1
J2	CMY-R305S-G1
J3	CMY-R306S-G
SYMBOL	LIQUID PIPE/GAS PIPE SIZE
P1	1/4 / 1/2
P2	3/8 / 5/8
P3	3/8 / 5/8 / 3/4
P4	7/8 / 1-1/8



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REMARKS
Comments:

CITY MULTI

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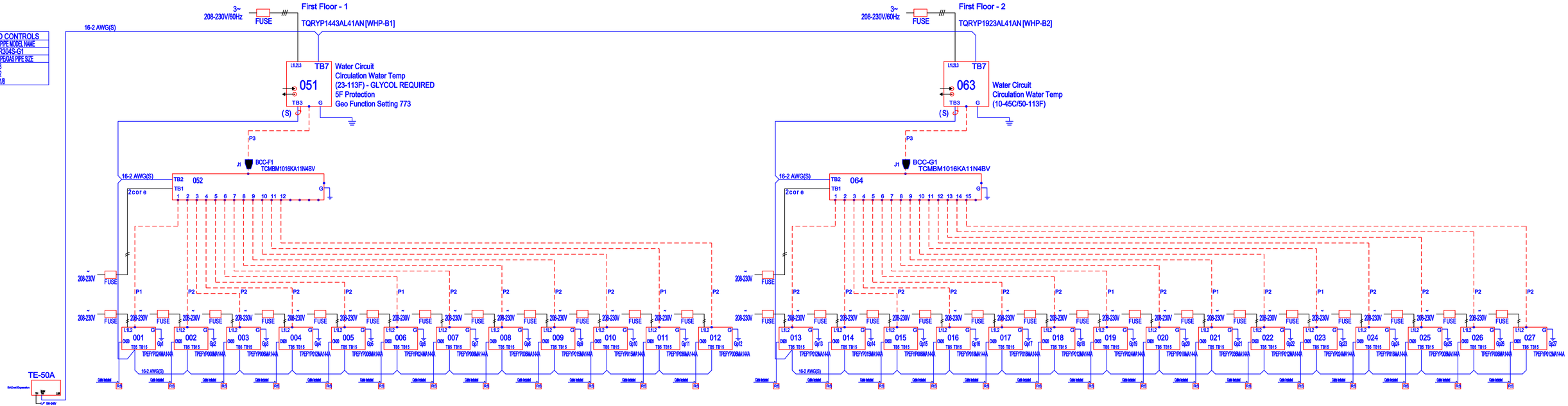
PIPING AND CONTROLS		
SYMBOL	BRANCH PIPE MODEL NAME	
J1	CMY-R304S-G1	
SYMBOL	LIQUID PIPE	GAS PIPE SIZE
P1	3/8	5/8
P2	1/4	1/2
P3	7/8	1 1/8



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CITY MULTI

SYSTEM SCHEMATIC DWG.

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PIPING AND CONTROLS	
SYMBOL	BRANCH PIPE MODEL NAME
J1	CMY-R304S-G1
J2	CMY-R305S-G1
J3	CMY-R306S-G
J4	CMY-R302S-G1
J5	CMY-R160-J1
J6	CMY-R303S-G1
SYMBOL	LIQUID PIPE/GAS PIPE SIZE
P1	3/8 / 5/8
P2	1/4 / 1/2
P3	3/8 / 3/4 / 7/8
P4	7/8 / 1-1/8
P5	3/8 / 3/4
P6	7/8 / 1-3/8

Second Floor - 1

3~ 208-230V/60Hz — FUSE — TQRYP2163AL41AN[WHP-C1]

16-2 AWG(S)

TB7 — 051 Water Circuit Circulation Water Temp (10-45C/50-113F)

BCC-H1 TCMBM1016KA11N4BV — 052

BCC-H2 TCMBS0108KB11N4BV — 064

2 core

208-230V FUSE

001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019

TFEFTP06MAA TFEFTP09MAA TFEFTP12MAA TFEFTP15MAA TFEFTP18MAA

16-2 AWG(S)

TE-50A

Second Floor - 2

3~ 208-230V/60Hz — FUSE — TQRYP2403AL41AN[WHP-C2]

16-2 AWG(S)

TB7 — 070 Water Circuit Circulation Water Temp (10-45C/50-113F)

BCC-I1 TCMBM0108JA11N4BV — 071

BCC-I2 TCMBS0108KB11N4BV — 077

2 core

208-230V FUSE

020 021 022 023 024 025 026 027 028 029 030 031 032 033

TFEFTP06MAA TFEFTP09MAA TFEFTP12MAA TFEFTP15MAA TFEFTP18MAA

16-2 AWG(S)

2-101 2-102 2-103 2-104 2-106 2-108 2-109 2-111 2-131 2-132 2-133 2-134 2-135 2-112 2-114 2-115 2-116 2-117 2-118

3-110 3-111 2-120 2-121 2-123 2-137A 2-137B 2-124 2-125 2-126 2-127 2-129 2-130 2-136

REMARKS
Comments:

Diamond System Builder
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db: 4.4.1.11
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CITY MULTI

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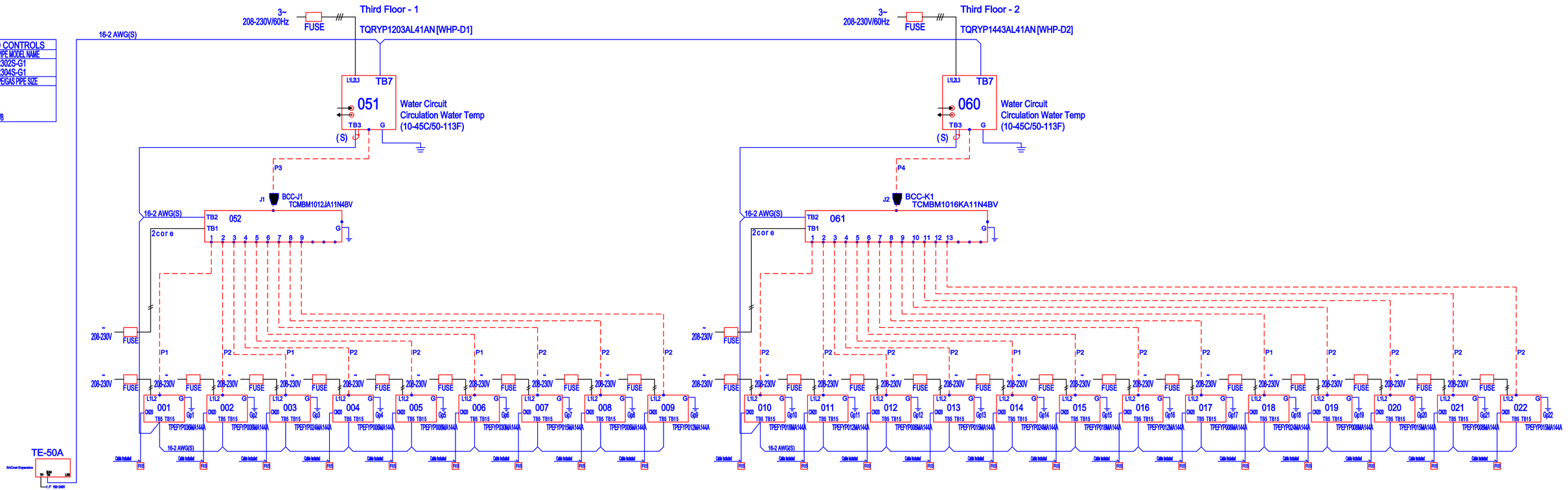
P3	3/4 / 7/8
P4	7/8 / 1-1/8



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3-112 | 3-114 | 3-115 | 3-116 | 3-119 | 3-120 | 3-121 | 3-122 | 3-123 | 3-124 | 3-125 | 3-126 | 3-127

REMARKS
Comments:

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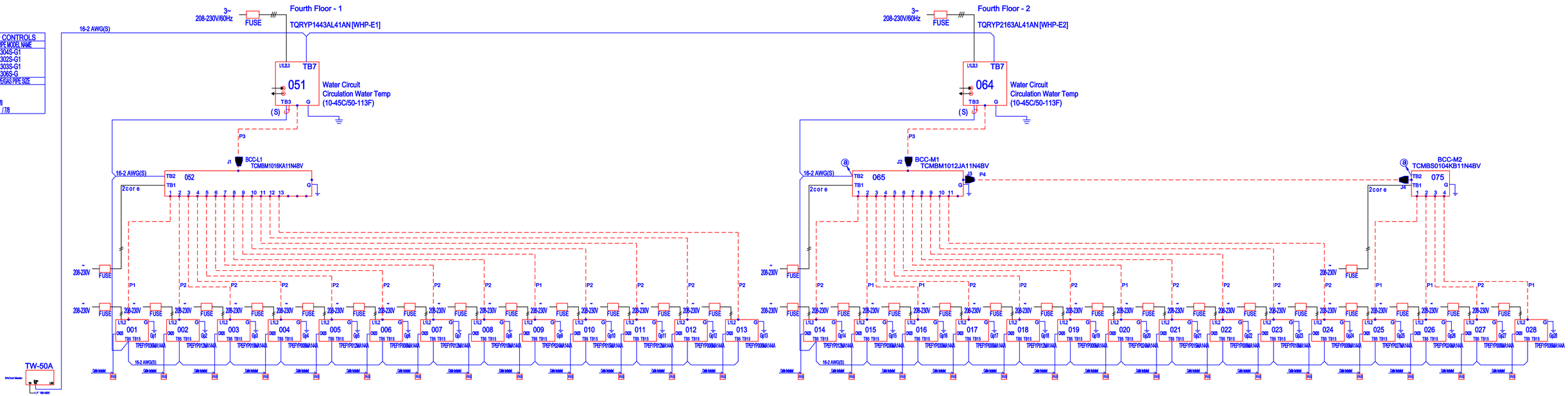
P3	7/8 / 1-1/8
P4	3/8 / 3/4 / 7/8



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4-134 4-116 4-118 4-119 4-120 4-121 4-123 4-124 4-125 4-126 4-127 4-128 4-130 4-132 4-133

REMARKS
Comments:

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Submittal

Prepared For:
City of Duluth

Date: May 17, 2022
Job Name:
Duluth City Hall - VRF

Trane U.S. Inc. is pleased to provide the following submittal for your review and approval.

Product Summary

Qty	Product
9	Trane - Mitsubishi VRF Outdoor Unit
13	Trane - Mitsubishi VRF Branch Controller
132	Trane - Mitsubishi VRF Indoor Unit

Notes:

1. Labor warranty **NOT** included.
2. Startup assistance by Trane Ductless Technical Specialist **included.**
3. Disconnect switch **NOT** included.
4. Linesets **NOT** included.

Trane Mitsubishi Products - Standard warranty: The parts are warranted to the original owner a period of one (1) year, and Compressor a period of seven (7) years from the date of installation by a licensed contractor.

Extended warranty: The parts and compressor will be warranted for a period of ten (10) years to the original owner if (1) the System is designed by a Diamond Designer using the MEUS Diamond System Builder™ (2) the installing contractor has successfully completed the CITI MULTI MEUS approved training course, and (3) the contractor has submitted a completed and approved MEUS Extended Warranty Process report.

Joey Beisbier / Richard Youngdahl
Trane U.S. Inc.
775 Vandalia Street
Saint Paul, MN 55114
Office Phone: (651) 468-2700

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Product performance and submittal data is valid for a period of 6 months from the date of submittal generation. If six months or more has elapsed between submittal generation and equipment release, the product performance and submittal data will need to be verified. It is the customer's responsibility to obtain such verification.

Table of Contents

Water-Source Condensing Units **4**

TQRYP1203AL41AN, WHP-D1 5

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TQRYP1683AL41AN, WHP-A1 9

TQRYP1923AL41AN, WHP-B2 11

TQRYP2163AL41AN, WHP-C1, E2 13

TQRYP2403AL41AN, WHP-C2 15

Branch Controllers **17**

TCMBM1016KA11N4 – 16-Port Main 18

TCMBM1012JA11N4 – 12-Port Main 20

TCMBM0108JA11N4 – 8-Port Main 22

TCMBS0108KB11N4 – 8-Port Sub 24

TCMBS0104KB11N4 – 4-Port Sub 26

Indoor Units **28**

TPEFYP006MA144A, 6-MBh Medium Static 29

TPEFYP008MA144A, 8-MBh Medium Static 32

TPEFYP012MA144A, 1-Ton Medium Static 35

TPEFYP015MA144A, 15-MBh Medium Static 38

TPEFYP018MA144A, 1.5-Ton Medium Static 41

TPEFYP024MA144A, 2-Ton Medium Static 44

TPEFYP027MA144A, 27-MBh Medium Static 47

TPEFYP030MA144A, 2.5-Ton Medium Static 50

TPEFYP036MA144A, 3-Ton Medium Static 53

TPVFYP054AM141A, 4.5-Ton, Multi-Position AHU 56

TPEFYP054MH142A, 4.5-Ton, High-Static 59

TPEFYP072MH140A, 6-Ton, High-Static 61

TPKFYP004LM140A, 4-MBh, Wall Mounted 63

Accessories **66**

High Static Filter Box, MERV 13 67

Medium Static Filter Box, MERV 13 72

Controls **79**

PAC-SE41TSE, Wall Mounted Temperature Sensor 80

TE-200A, Central Controller 82

TE-50A, Expansion Controller 86

TW-50A, Central Controller 90

Bill of Material

Qty	Model	Description
1	TQRYP1683AL41AN	R410A WR2 Series Outdoor Unit
3	TQRYP1443AL41AN	R410A WR2 Series Outdoor Unit
1	TQRYP1923AL41AN	R410A WR2 Series Outdoor Unit
2	TQRYP2163AL41AN	R410A WR2 Series Outdoor Unit
1	TQRYP2403AL41AN	R410A WR2 Series Outdoor Unit
1	TQRYP1203AL41AN	R410A WR2 Series Outdoor Unit
6	TCMBM1016KA11N4BV	BC Controller Main
3	TCMBS0108KB11N4BV	BC Controller Sub
1	TCMBM0108JA11N4BV	BC Controller Main
2	TCMBM1012JA11N4BV	BC Controller Main
1	TCMBS0104KB11N4BV	BC Controller Sub
1	CMY-R160-J1	Joint Pipe
15	TPEFYP015MA144A	Ceiling-Concealed (Ducted) Indoor Unit
15	TPEFYP024MA144A	Ceiling-Concealed (Ducted) Indoor Unit
32	TPEFYP006MA144A	Ceiling-Concealed (Ducted) Indoor Unit
1	TPKFYP004LM140A	Wall -Mounted Indoor Unit
18	TPEFYP008MA144A	Ceiling-Concealed (Ducted) Indoor Unit
25	TPEFYP012MA144A	Ceiling-Concealed (Ducted) Indoor Unit
7	TPEFYP036MA144A	Ceiling-Concealed (Ducted) Indoor Unit
11	TPEFYP018MA144A	Ceiling-Concealed (Ducted) Indoor Unit
2	TPEFYP027MA144A	Ceiling-Concealed (Ducted) Indoor Unit
1	TPEFYP072MH140A	Ceiling-Concealed (Ducted) Indoor Unit
1	TPEFYP054MH142A	Ceiling-Concealed (Ducted) Indoor Unit
2	TPVFYP054AM141A	Muli-Position Air Handler Indoor Unit
2	TPEFYP030MA144A	Ceiling-Concealed (Ducted) Indoor Unit
1	TE-200A	System Remote Controller
3	TE-50A	System Remote Controller
1	TW-50A	System Remote Controller
2	BACNET Master	Software License
3	BACNET Expansion	Software License
6	EV150S396NRXME	1.5" EPIV Valve
9	RIBTE24B	Relay
18	TR50VA015	24VAC Transformer
132	PAC-SE41TS-E	Temperature Sensor
26	FBM2-2-A	Filter Box
19	FBM2-3-A	Filter Box
75	FBM2-1-A	Filter Box
7	FBM2-4-A	Filter Box
6	CMY-R304S-G1	Reducer
2	CMY-R305S-G1	Reducer
4	CMY-R306S-G	Reducer
3	EV200S761ARXME	2" EPIV Valve
1	FBH4-4	Filter Box
1	FBH2-3	Filter Box
3	CMY-R302S-G1	Reducer
2	CMY-R303S-G1	Reducer

MITSUBISHI ELECTRIC TRANE HVAC US

Condensing Units

Job Name: **Duluth City Hall**
System Reference: **WHP-D1** Date: **5-18-22**

208/230V MODULAR WATER-SOURCE VRF HEAT PUMP SYSTEM

ACCESSORIES

Optical Relay for Flow Switch (One Piece) RIBTE24B
1.5” Temp sensor, optional (One Piece) ..... ZM-TW150NPT KIT
☐ Transformer 50VA (One Piece) TR50VA015
☑ 1.5” EPIV Valve (One Piece) EV150S396NRXME
☑ BC Controller (Required) ..... for details see BC Controller Submittals
☐ Joint Kit ..... for details see Pipe Accessories Submittal

NOTE:
Requires two transformers
Requires one optical relay
Requires two temp sensors per one EPIV valve if optional temps sensors are used.

Specifications			System
Unit Type			TQRYP1203AL41AN
Cooling Capacity (Nominal)		BTU/H	120,000
Heating Capacity (Nominal)		BTU/H	135,000
Operating Temperature Range	Cooling (Indoor)	°F WB [°C WB]	59~75 [15.0~24.0]
	Heating (Indoor)	°F DB [°C DB]	59~81 [15.0~27.0]
Operating Water Temperature Range[1]	Cooling/Heating	°F [°C]	50~113 [10~45]
External Dimensions (H x W x D)		In. [mm]	43-5/16 x 34-11/16 x 21-11/16 [1100 x 880 x 550]
Net Weight		Lbs. [kg]	382 [173]
External Finish			Galvanized steel sheets
Electrical Power Requirements	Voltage, Phase, Hertz, Power Tolerance		208/230, 3, 60, ±10%
Minimum Circuit Ampacity		A	29.0/0.0
Maximum Overcurrent Protection		A	50/45
SCCR		kA	5
Flow Rate		G/min (gpm)	25.4
		L/min	96
Pressure Drop		psi	3.48
		Ft.	8.0
Operation Volume Range		G/min (gpm)	13.2~31.7
		m3/h	3.0~7.2
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	3/4 [19.05] Brazed
	Gas (Low Pressure)	In. [mm]	7/8 [22.2] Brazed
Max. Total Refrigerant Line Length		Ft.	2460
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of heatsource unit capacity
	Model/Quantity		P06~P96/1.0~30.0
Sound Pressure Level		dB(A)	54.0/54.0
Compressor Operating Range			14.0% to 100.0%
Compressor	Type x Quantity		Inverter scroll hermetic x 1
Compressor Motor Output		kW	7.7
Refrigerant	Type x Original Charge		R410A x 11 lbs. + 1.0oz. [5.0 kg]
Protection Devices	High Pressure Protection		High pressure sensor, High pressure switch at 4.15 Mpa (601 psi)
	Inverter Circuit		Over-heat protection, Over-current protection
	Compressor		Over-heat protection
Lubricant			MEL32
AHRI Ratings (Ducted/Non-ducted)	EER		13.4/15.6
	IEER		23.2/29.0
	COP		5.51/5.6
	SCHE		19.7/19.7

NOTES:
[1]23°F EWT (Entering water temperature) is possible with glycol.

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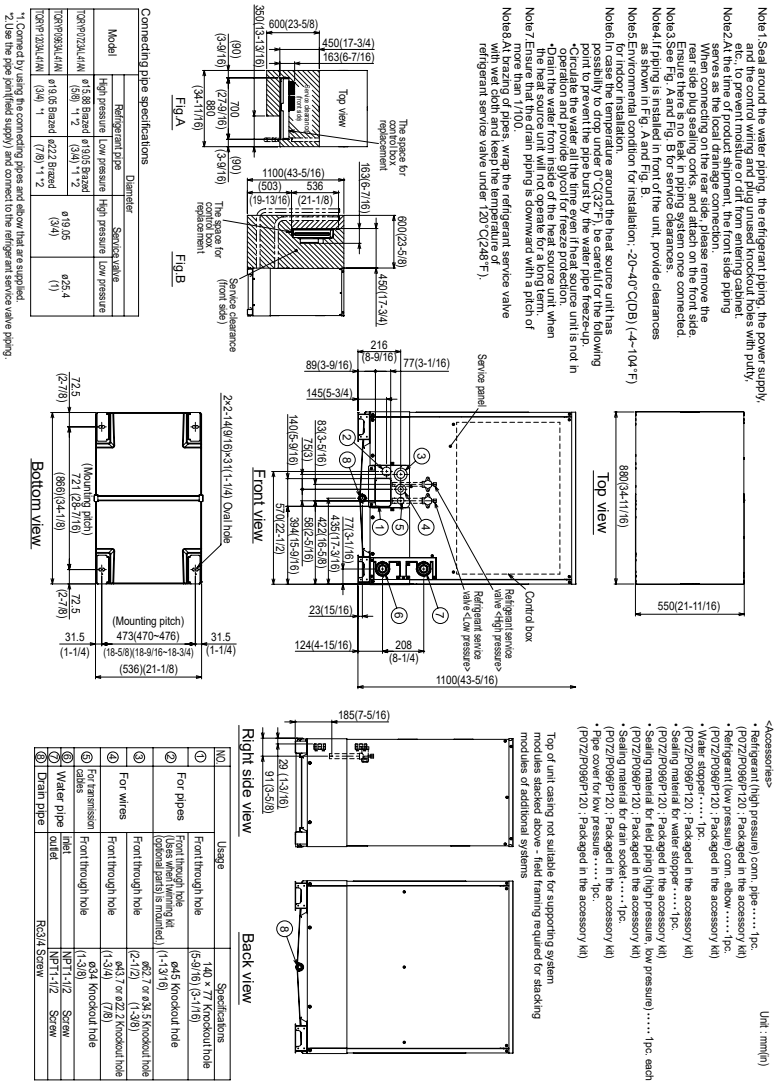
OUTDOOR UNIT: TQRYP1203AL41AN – DIMENSIONS



Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
TQRYP072AL41AN	ø15.88 Brazed (5/8) *1 *2	ø19.05 Brazed (3/4) *1 *2	ø19.05 (3/4)	ø25.4 (1)
TQRYP096AL41AN	ø19.05 Brazed (3/4) *1	ø22 Brazed (7/8) *1 *2		
TQRYP120AL41AN				

*1. Connect by using the connecting pipes and elbow that are supplied.
*2. Use the pipe joint(field supply) and connect to the refrigerant service valve piping.

<Accessories> Unit: mm(in)
• Refrigerant (high pressure) conn. pipe……1pc.
(P072/P096/P120 : Packaged in the accessory kit)
• Refrigerant (low pressure) conn. pipe……1pc.
(P072/P096/P120 : Packaged in the accessory kit)
• Refrigerant pipe joint (for field supply)……1pc.
(P072/P096/P120 : Packaged in the accessory kit)
• Water stopper……1pc.
(P072/P096/P120 : Packaged in the accessory kit)
• Sealing material for water stopper……1pc.
(P072/P096/P120 : Packaged in the accessory kit)
• Sealing material for field piping (high pressure, low pressure)……1pc. each
(P072/P096/P120 : Packaged in the accessory kit)
• Sealing material for drain socket……1pc.
(P072/P096/P120 : Packaged in the accessory kit)
• Pipe cover for low pressure……1pc.
(P072/P096/P120 : Packaged in the accessory kit)

Top of unit casing not suitable for supporting system modules stacked above - field framing required for stacking modules of additional systems

NO	Usage	Specifications
①	Front through hole	140 × 77 Knockout hole (5-9/16) (3-1/16)
②	For pipes	ø45 Knockout hole (1-13/16)
	Front through hole (Uses when wiring kit (optional parts) is mounted)	ø62.7 or ø34.5 Knockout hole (2-1/2) (1-3/8)
③	For wires	
④	Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	For transmission cables	
	Front through hole	ø34 Knockout hole (1-3/8)
⑥	Water pipe inlet	NPT1-1/2 Screw
⑦	Water pipe outlet	NPT1-1/2 Screw
⑧	Drain pipe	Rc3/4 Screw

FORM# TQRYP1203AL41AN - 202106

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Job Name: **Duluth City Hall**

System Reference: **WHP-B1, D2, E1** Date: **5-18-22**

208/230V MODULAR WATER-SOURCE VRF HEAT PUMP SYSTEM

ACCESSORIES

- ☑ BC Controller (Required)..... for details see BC Controller Submittals
- ☐ Joint Kit..... for details see Pipe Accessories Submittal

Specifications			System
Unit Type			TQRYP1443AL41AN
Cooling Capacity (Nominal)		BTU/H	144,000
Heating Capacity (Nominal)		BTU/H	160,000
Operating Temperature Range	Cooling (Indoor)	°F WB [°C WB]	59.0~75.0 [15.0~24.0]
	Heating (Indoor)	°F DB [°C DB]	59.0~81.0 [15.0~27.0]
Operating Water Temperature Range[1]	Cooling/Heating	°F [°C]	50.0~113.0 [10.0~45.0]
External Dimensions (H x W x D)		In. [mm]	57-1/8 x 34-11/16 x 21-11/16 [1450 x 880 x 550]
Net Weight		Lbs. [kg]	481 [218]
External Finish			Galvanized steel sheets
Electrical Power Requirements	Voltage, Phase, Hertz, Power Tolerance		208/230, 3, 60, ±10%
Minimum Circuit Ampacity		A	35.0/32.0
Maximum Overcurrent Protection		A	60/50
SCCR		kA	5
Flow Rate		G/min (gpm)	31.7
		L/min	120
Pressure Drop		psi	6.38
		Ft.	14.7
Operation Volume Range		G/min (gpm)	19.8~50.9
		m3/h	4.5~11.6
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	7/8 [22.2] Brazed
	Gas (Low Pressure)	In. [mm]	1-1/8 [28.58] Brazed
Max. Total Refrigerant Line Length		Ft.	2460
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of heatsource unit capacity
	Model/Quantity		P06~P96/1.0~36.0
Sound Pressure Level		dB(A)	54.0/54.0
Compressor Operating Range			19.0% to 100.0%
Compressor	Type x Quantity		Inverter scroll hermetic x 1
Compressor Motor Output		kW	9.5
Refrigerant	Type x Original Charge		R410A x 13 lbs. + 4oz. [6.0 kg]
Protection Devices	High Pressure Protection		High pressure sensor, High pressure switch at 4.15 Mpa (601 psi)
	Inverter Circuit		Over-heat protection, Over-current protection
	Compressor		Over-heat protection
Lubricant			MEL32
AHRI Ratings (Ducted/Non-ducted)	EER		12.1/15.4
	IEER		19.5/23.1
	COP		4.9/5.5
	SCHE		20.1/20.1

NOTES:
[1]23°F EWT (Entering water temperature) is possible with glycol.

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OUTDOOR UNIT: TQRYP1443AL41AN – DIMENSIONS

Note1.Seal around the water piping, the refrigerant piping, the power supply, and the control wiring and plug unused knockout holes with putty, etc., to prevent moisture or dirt from entering cabinet.
Note2.At the time of product shipment, the front side piping serves as the local drainage connection.
When connecting on the rear side, please remove the rear side plug sealing corks, and attach on the front side.
Ensure there is no leak in piping system once connected.
Note3.See Fig. A and Fig. B for service clearances.
Note4.If piping is installed in front of the unit, provide clearances as shown in Fig. A and Fig. B.
Note5.Environmental condition for installation; -20~40°C(DB) (-4~104°F) for indoor installation.
Note6.In case the temperature around the heat source unit has possibility to drop under 0°C(32°F), be careful for the following point to prevent the pipe burst by the water pipe freeze-up.
•Circulate the water all the time even if heat source unit is not in operation and provide glycol for freeze protection.
•Drain the water from inside of the heat source unit when the heat source unit will not operate for a long term.
Note7.Ensure that the drain piping is downward with a pitch of more than 1/100.
Note8.At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

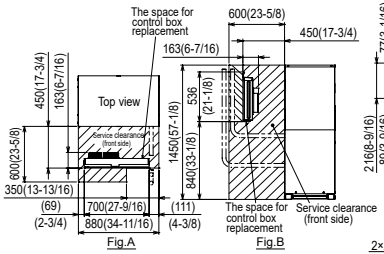
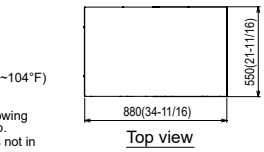
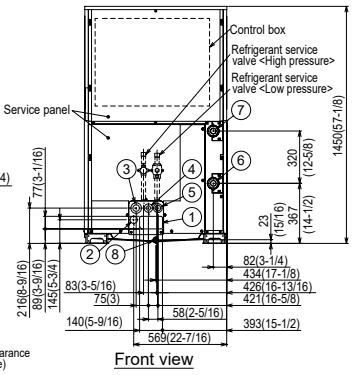


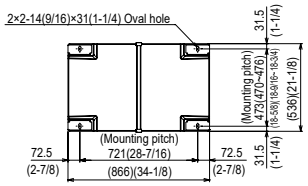
Fig.A Fig.B



Top view



Front view



Bottom view

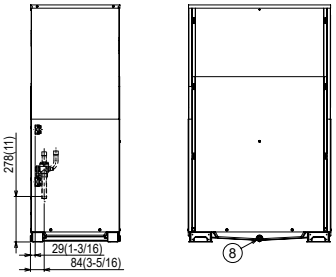
Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
TQRYP1443AL41AN	ø22.2 Brazed (7/8) *1	ø28.58 Brazed (1-1/8) *1	ø25.4 (1)	ø28.58 (1-1/8)
TQRYP1683AL41AN				
TQRYP1923AL41AN				

*1.Connect by using the connecting pipes that are supplied.

<Accessories>
- Refrigerant (high pressure) conn. pipe····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Refrigerant (low pressure) conn. pipe····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Water stopper····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for water stopper····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for field piping (high pressure, low pressure)····· 1pc. each (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for drain socket····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Pipe cover for low pressure····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for base leg (two types)····· 4pc. each (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for panel····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)

Top of unit casing not suitable for supporting system modules stacked above - field framing required for stacking modules of additional systems



Right side view Back view

NO.	Usage		Specifications
①	For pipes	Front through hole	140 × 77 Knockout hole (5-9/16) (3-1/16)
②		Front through hole (Uses when twinning kit (optional parts) is mounted.)	ø45 Knockout hole (1-13/16)
③	For wires	Front through hole	ø62.7 or ø34.5 Knockout hole (2-1/2) (1-3/8)
④		Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	For transmission cables	Front through hole	ø34 Knockout hole (1-3/8)
⑥	Water pipe	inlet	NPT1-1/2 Screw
⑦		outlet	NPT1-1/2 Screw
⑧	Drain pipe	Rc3/4 Screw	

Unit : mm(in)

Specifications are subject to change without notice.

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Submittal Documents

CITYMULTI® 14-TON TQRYP1683AL41AN TRANE MITSUBISHI ELECTRIC

Job Name: **Duluth City Hall**
System Reference: **WHP-A1** Date: **5-18-22**

208/230V MODULAR WATER-SOURCE VRF HEAT PUMP SYSTEM

ACCESSORIES

☑ BC Controller (Required)..... for details see BC Controller Submittals
☐ Joint Kit..... for details see Pipe Accessories Submittal

Specifications			System
Unit Type			TQRYP1683AL41AN
Cooling Capacity (Nominal)		BTU/H	168,000
Heating Capacity (Nominal)		BTU/H	188,000
Operating Temperature Range	Cooling (Indoor)	°F WB [°C WB]	59.0~75.0 [15.0~24.0]
	Heating (Indoor)	°F DB [°C DB]	59.0~81.0 [15.0~27.0]
Operating Water Temperature Range[1]	Cooling/Heating	°F [°C]	50.0~113.0 [10.0~45.0]
External Dimensions (H x W x D)		In. [mm]	57-1/8 x 34-11/16 x 21-11/16 [1450 x 880 x 550]
Net Weight		Lbs. [kg]	481 [218]
External Finish			Galvanized steel sheets
Electrical Power Requirements	Voltage, Phase, Hertz, Power Tolerance		208/230, 3, 60, ±10%
Minimum Circuit Ampacity		A	44.0/39.0
Maximum Overcurrent Protection		A	70/70
SCCR		kA	5
Flow Rate		G/min (gpm)	31.7
		L/min	120
Pressure Drop		psi	6.38
		Ft.	14.7
Operation Volume Range		G/min (gpm)	19.8~50.9
		m3/h	4.5~11.6
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	7/8 [22.2] Brazed
	Gas (Low Pressure)	In. [mm]	1-1/8 [28.58] Brazed
Max. Total Refrigerant Line Length		Ft.	2460
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of heatsource unit capacity
	Model/Quantity		P06~P96/1.0~42.0
Sound Pressure Level		dB(A)	56.0/56.0
Compressor Operating Range			16.0% to 100.0%
Compressor	Type x Quantity		Inverter scroll hermetic x 1
Compressor Motor Output		kW	11.0
Refrigerant	Type x Original Charge		R410A x 13 lbs. + 4oz. [6.0 kg]
Protection Devices	High Pressure Protection		High pressure sensor, High pressure switch at 4.15 Mpa (601 psi)
	Inverter Circuit		Over-heat protection, Over-current protection
	Compressor		Over-heat protection
Lubricant			MEL32
AHRI Ratings (Ducted/Non-ducted)	EER		11.9/13.5
	IEER		18.0/21.8
	COP		4.73/5.39
	SCHE		19.7/19.7

NOTES:
[1]23°F EWT (Entering water temperature) is possible with glycol.

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OUTDOOR UNIT: TQRYP1683AL41AN – DIMENSIONS

Note1.Seal around the water piping, the refrigerant piping, the power supply, and the control wiring and plug unused knockout holes with putty, etc., to prevent moisture or dirt from entering cabinet.
Note2.At the time of product shipment, the front side piping serves as the local drainage connection.
When connecting on the rear side, please remove the rear side plug sealing corks, and attach on the front side.
Ensure there is no leak in piping system once connected.
Note3.See Fig. A and Fig. B for service clearances.
Note4.If piping is installed in front of the unit, provide clearances as shown in Fig. A and Fig. B.
Note5.Environmental condition for installation; -20~40°C(DB) (-4~104°F) for indoor installation.
Note6.In case the temperature around the heat source unit has possibility to drop under 0°C(32°F), be careful for the following point to prevent the pipe burst by the water pipe freeze-up.
•Circulate the water all the time even if heat source unit is not in operation and provide glycol for freeze protection.
•Drain the water from inside of the heat source unit when the heat source unit will not operate for a long term.
Note7.Ensure that the drain piping is downward with a pitch of more than 1/100.
Note8.At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

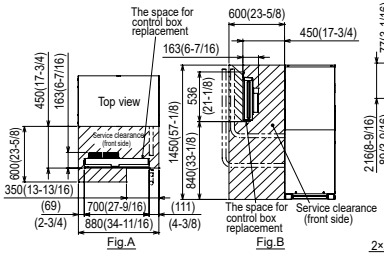
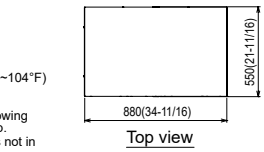
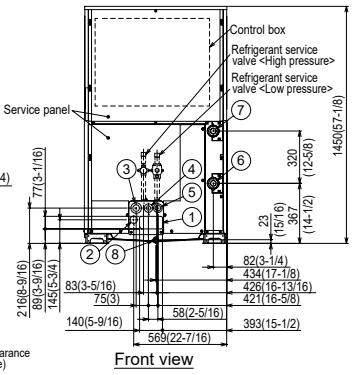


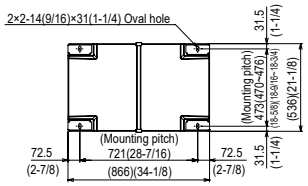
Fig.A Fig.B



Top view



Front view



Bottom view

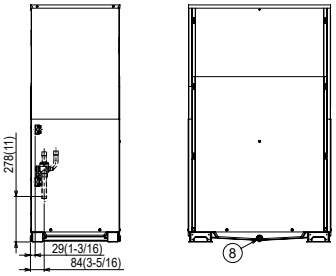
Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
TQRYP1443AL41AN	ø22.2 Brazed (7/8) *1	ø28.58 Brazed (1-1/8) *1	ø25.4 (1)	ø28.58 (1-1/8)
TQRYP1683AL41AN				
TQRYP1923AL41AN				

*1.Connect by using the connecting pipes that are supplied.

<Accessories>
- Refrigerant (high pressure) conn. pipe····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Refrigerant (low pressure) conn. pipe····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Water stopper····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for water stopper····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for field piping (high pressure, low pressure)····· 1pc. each (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for drain socket····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Pipe cover for low pressure····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for base leg (two types)····· 4pc. each (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for panel····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)

Top of unit casing not suitable for supporting system modules stacked above - field framing required for stacking modules of additional systems



Right side view Back view

NO.	Usage		Specifications
①	For pipes	Front through hole	140 × 77 Knockout hole (5-9/16) (3-1/16)
②		Front through hole (Uses when twinning kit (optional parts) is mounted.)	ø45 Knockout hole (1-13/16)
③	For wires	Front through hole	ø62.7 or ø34.5 Knockout hole (2-1/2) (1-3/8)
④		Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	For transmission cables	Front through hole	ø34 Knockout hole (1-3/8)
⑥	Water pipe	inlet	NPT1-1/2 Screw
⑦		outlet	NPT1-1/2 Screw
⑧	Drain pipe	Rc3/4 Screw	

Unit : mm(in)

Specifications are subject to change without notice.

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Job Name: **Duluth City Hall**
System Reference: **WHP-B2** Date: **5-18-22**

208/230V MODULAR WATER-SOURCE VRF HEAT PUMP SYSTEM

ACCESSORIES

- ☑ BC Controller (Required)..... for details see BC Controller Submittals
- ☐ Joint Kit..... for details see Pipe Accessories Submittal

Specifications			System
Unit Type			TQRYP1923AL41AN
Cooling Capacity (Nominal)		BTU/H	192,000
Heating Capacity (Nominal)		BTU/H	215,000
Operating Temperature Range	Cooling (Indoor)	°F WB [°C WB]	59.0~75.0 [15.0~24.0]
	Heating (Indoor)	°F DB [°C DB]	59.0~81.0 [15.0~27.0]
Operating Water Temperature Range[1]	Cooling/Heating	°F [°C]	50.0~113.0 [10.0~45.0]
External Dimensions (H x W x D)		In. [mm]	57-1/8 x 34-11/16 x 21-11/16 [1450 x 880 x 550]
Net Weight		Lbs. [kg]	481 [218]
External Finish			Galvanized steel sheets
Electrical Power Requirements	Voltage, Phase, Hertz, Power Tolerance		208/230, 3, 60, ±10%
Minimum Circuit Ampacity		A	54.0/49.0
Maximum Overcurrent Protection		A	90/80
SCCR		kA	5
Flow Rate		G/min (gpm)	31.7
		L/min	120
Pressure Drop		psi	6.38
		Ft.	14.7
Operation Volume Range		G/min (gpm)	19.8~50.9
		m3/h	4.5~11.6
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	7/8 [22.2] Brazed
	Gas (Low Pressure)	In. [mm]	1-1/8 [28.58] Brazed
Max. Total Refrigerant Line Length		Ft.	2460
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of heatsource unit capacity
	Model/Quantity		P06~P96/1.0~48.0
Sound Pressure Level		dB(A)	58.0/58.0
Compressor Operating Range			14.0% to 100.0%
Compressor	Type x Quantity		Inverter scroll hermetic x 1
Compressor Motor Output		kW	12.4
Refrigerant	Type x Original Charge		R410A x 13 lbs. + 4oz. [6.0 kg]
Protection Devices	High Pressure Protection		High pressure sensor, High pressure switch at 4.15 Mpa (601 psi)
	Inverter Circuit		Over-heat protection, Over-current protection
	Compressor		Over-heat protection
Lubricant			MEL32
AHRI Ratings (Ducted/Non-ducted)	EER		11.5/12.4
	IEER		18.4/21.7
	COP		4.6/5.15
	SCHE		20.3/20.3

NOTES:
[1]23°F EWT (Entering water temperature) is possible with glycol.

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OUTDOOR UNIT: TQRYP1923AL41AN – DIMENSIONS

Note1.Seal around the water piping, the refrigerant piping, the power supply, and the control wiring and plug unused knockout holes with putty, etc., to prevent moisture or dirt from entering cabinet.
Note2.At the time of product shipment, the front side piping serves as the local drainage connection.
When connecting on the rear side, please remove the rear side plug sealing corks, and attach on the front side.
Ensure there is no leak in piping system once connected.
Note3.See Fig. A and Fig. B for service clearances.
Note4.If piping is installed in front of the unit, provide clearances as shown in Fig. A and Fig. B.
Note5.Environmental condition for installation; -20~40°C(DB) (-4~104°F) for indoor installation.
Note6.In case the temperature around the heat source unit has possibility to drop under 0°C(32°F), be careful for the following point to prevent the pipe burst by the water pipe freeze-up.
•Circulate the water all the time even if heat source unit is not in operation and provide glycol for freeze protection.
•Drain the water from inside of the heat source unit when the heat source unit will not operate for a long term.
Note7.Ensure that the drain piping is downward with a pitch of more than 1/100.
Note8.At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

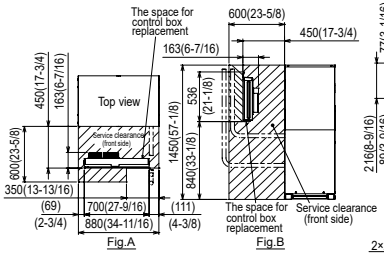
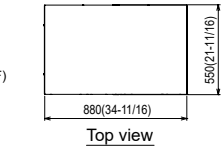
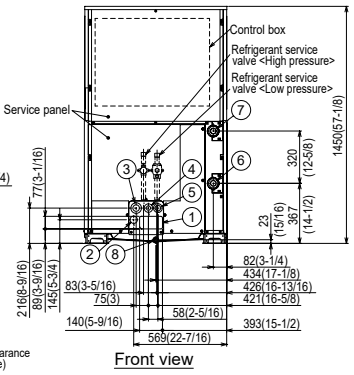


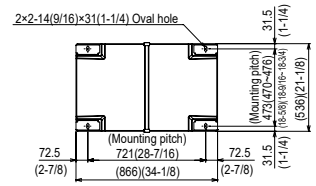
Fig.A Fig.B



Top view



Front view



Bottom view

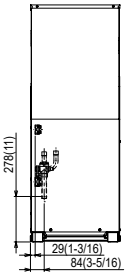
Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
TQRYP1443AL41AN	ø22.2 Brazed (7/8) *1	ø28.58 Brazed (1-1/8) *1	ø25.4 (1)	ø28.58 (1-1/8)
TQRYP1683AL41AN				
TQRYP1923AL41AN				

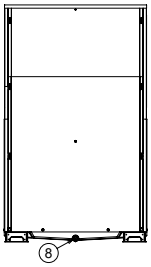
*1.Connect by using the connecting pipes that are supplied.

<Accessories>
- Refrigerant (high pressure) conn. pipe····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Refrigerant (low pressure) conn. pipe····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Water stopper····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for water stopper····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for field piping (high pressure, low pressure)····· 1pc. each (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for drain socket····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Pipe cover for low pressure····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for base leg (two types)····· 4pc. each (P144/P168/P192 ; Packaged in the accessory kit)
- Sealing material for panel····· 1pc. (P144/P168/P192 ; Packaged in the accessory kit)

Top of unit casing not suitable for supporting system modules stacked above - field framing required for stacking modules of additional systems



Right side view



Back view

NO.	Usage		Specifications
①	For pipes	Front through hole	140 × 77 Knockout hole (5-9/16) (3-1/16)
②		Front through hole (Uses when twinning kit (optional parts) is mounted.)	ø45 Knockout hole (1-13/16)
③	For wires	Front through hole	ø62.7 or ø34.5 Knockout hole (2-1/2) (1-3/8)
④		Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	For transmission cables	Front through hole	ø34 Knockout hole (1-3/8)
⑥	Water pipe	inlet	NPT1-1/2 Screw
⑦		outlet	NPT1-1/2 Screw
⑧	Drain pipe	Rc3/4 Screw	

Unit : mm(in)

Specifications are subject to change without notice.

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Job Name: **Duluth City Hall**

System Reference: **WHP-C1, WHP-E2** Date: **5-18-22**

208/230V MODULAR WATER-SOURCE VRF HEAT PUMP SYSTEM

ACCESSORIES

Optical Relay for Flow Switch (One Piece) RIBTE24B

Transformer 50VA (One Piece) TR50VA015

☐ 2" Temp sensor, optional (One Piece) ..... ZM-TW200NPT KIT

☑ 2" EPIV Valve (One Piece) EV200S761ARXME

☑ BC Controller (Required) ..... for details see BC Controller Submittals

☐ Joint Kit ..... for details see Pipe Accessories Submittal

NOTE:
Requires two transformers
Requires one optical relay
Requires two temp sensors per one EPIV valve if optional temps sensors are used.

Specifications			System
Unit Type			TQRYP2163AL41AN
Cooling Capacity (Nominal)		BTU/H	216,000
Heating Capacity (Nominal)		BTU/H	243,000
Operating Temperature Range	Cooling (Indoor)	°F WB [°C WB]	59~75 [15.0~24.0]
	Heating (Indoor)	°F DB [°C DB]	59~81 [15.0~27.0]
Operating Water Temperature Range[1]	Cooling/Heating	°F [°C]	50~113 [10~45]
External Dimensions (H x W x D)		In. [mm]	57-1/8 x 34-11/16 x 21-11/16 [1450 x 880 x 550]
Net Weight		Lbs. [kg]	558 [253]
External Finish			Galvanized steel sheets
Electrical Power Requirements	Voltage, Phase, Hertz, Power Tolerance		208/230, 3, 60, ±10%
Minimum Circuit Ampacity		A	69.0/0.0
Maximum Overcurrent Protection		A	110/110
SCCR		kA	5
Flow Rate		G/min (gpm)	50.7
		L/min	192
Pressure Drop		psi	6.53
		Ft.	15.1
Operation Volume Range		G/min (gpm)	26.4~63.4
		m3/h	6.0~14.4
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	7/8 (1-1/8 for the part that exceeds 65 m) [22.2 (28.58 for the part that exceeds 65 m)] Brazed
	Gas (Low Pressure)	In. [mm]	1-1/8 [28.58] Brazed
Max. Total Refrigerant Line Length		Ft.	2460
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of heatsource unit capacity
	Model/Quantity		P06~P96/2.0~50.0
Sound Pressure Level		dB(A)	58.0/58.0
Compressor Operating Range			13.0% to 100.0%
Compressor	Type x Quantity		Inverter scroll hermetic x 1
Compressor Motor Output		kW	14.5
Refrigerant	Type x Original Charge		R410A x 25 lbs. + 13.0oz. [11.7 kg]
Protection Devices	High Pressure Protection		High pressure sensor, High pressure switch at 4.15 Mpa (601 psi)
	Inverter Circuit		Over-heat protection, Over-current protection
	Compressor		Over-heat protection
Lubricant			MEL32
AHRI Ratings (Ducted/Non-ducted)	EER		11.2/10.9
	IEER		19.0/21.2
	COP		4.75/5.23
	SCHE		19.7/19.7

NOTES:
[1]23°F EWT (Entering water temperature) is possible with glycol.

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OUTDOOR UNIT: TQRYP2163AL41AN – DIMENSIONS

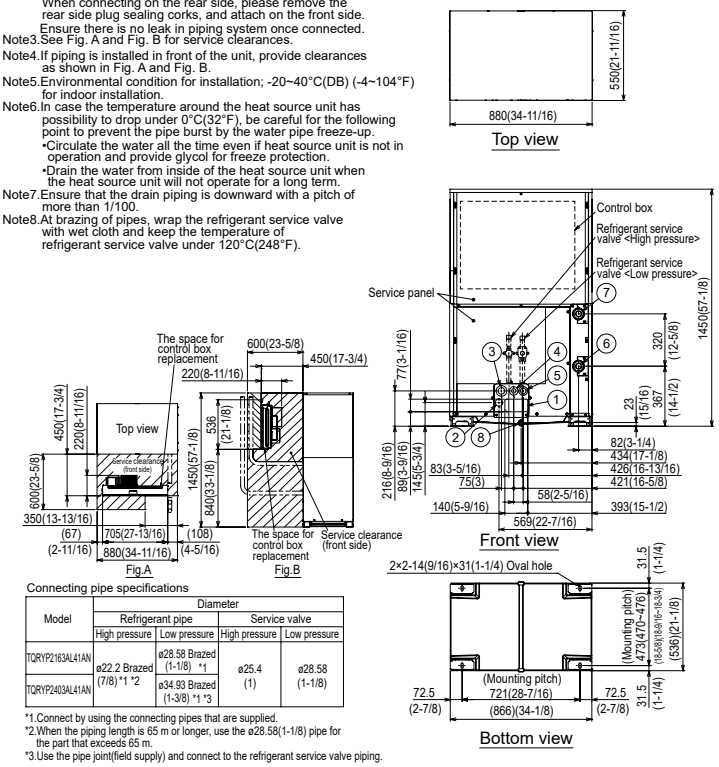
Note1.Seal around the water piping, the refrigerant piping, the power supply, and the control wiring and plug unused knockout holes with putty, etc., to prevent moisture or dirt from entering cabinet.
Note2.At the time of product shipment, the front side piping serves as the local drainage connection.
When connecting on the rear side, please remove the rear side plug sealing corks, and attach on the front side.
Ensure there is no leak in piping system once connected.
Note3.See Fig. A and Fig. B for service clearances.
Note4.If piping is installed in front of the unit, provide clearances as shown in Fig. A and Fig. B.
Note5.Environmental condition for installation; -20~40°C(DB) (-4~104°F) for indoor installation.
Note6.In case the temperature around the heat source unit has possibility to drop under 0°C(32°F), be careful for the following point to prevent the pipe burst by the water pipe freeze-up.
•Circulate the water all the time even if heat source unit is not in operation and provide glycol for freeze protection.
•Drain the water from inside of the heat source unit when the heat source unit will not operate for a long term.
Note7.Ensure that the drain piping is downward with a pitch of more than 1/100.
Note8.At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

Fig.A Fig.B

Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
TQRYP2163AL41AN	ø22.2 Brazed (7/8) *1 *2	ø28.58 Brazed (1-1/8) *1	ø25.4 (1)	ø28.58 (1-1/8)
TQRYP2403AL41AN		ø34.93 Brazed (1-3/8) *1 *3		

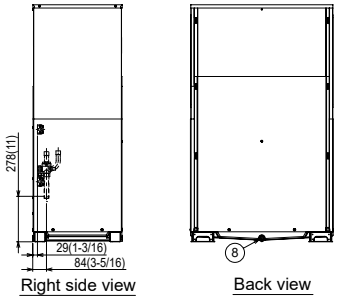
*1.Connect by using the connecting pipes that are supplied.
*2.When the piping length is 65 m or longer, use the ø28.58(1-1/8) pipe for the part that exceeds 65 m.
*3.Use the pipe joint(field supply) and connect to the refrigerant service valve piping.



Unit : mm(in)

<Accessories>
- Refrigerant (high pressure) conn. pipe····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Refrigerant (low pressure) conn. pipe····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Water stopper····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Sealing material for water stopper····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Sealing material for field piping (high pressure, low pressure)····· 1pc. each (P216/P240 ; Packaged in the accessory kit)
- Sealing material for drain socket····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Pipe cover for low pressure····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Sealing material for base leg (two types) ····· 4pc. each (P216/P240 ; Packaged in the accessory kit)
- Sealing material for panel····· 1pc. (P216/P240 ; Packaged in the accessory kit)

Top of unit casing not suitable for supporting system modules stacked above - field framing required for stacking modules of additional systems



NO.	Usage		Specifications
①	For pipes	Front through hole	140 × 77 Knockout hole (5-9/16) (3-1/16)
②		Front through hole (Uses when twinning kit (optional parts) is mounted.)	ø45 Knockout hole (1-13/16)
③	For wires	Front through hole	ø62.7 or ø34.5 Knockout hole (2-1/2) (1-3/8)
④		Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	For transmission cables	Front through hole	ø34 Knockout hole (1-3/8)
⑥	Water pipe	inlet	NPT1-1/2 Screw
⑦		outlet	NPT1-1/2 Screw
⑧	Drain pipe	Rc3/4 Screw	

Specifications are subject to change without notice.

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Job Name: **Duluth City Hall**
System Reference: **WHP-C2** Date: **5-18-22**

208/230V MODULAR WATER-SOURCE VRF HEAT PUMP SYSTEM

ACCESSORIES

- Transformer 50VA (One Piece) TR50VA015
- 2" Temp sensor, optional (One Piece) ..... ZM-TW200NPT KIT
- ☑ 2" EPIV Valve (One Piece) EV200S761ARXME
- ☑ Optical Relay for Flow Switch (One Piece) RIBTE24B
- ☑ BC Controller (Required) ..... for details see BC Controller Submittals
- ☐ Joint Kit ..... for details see Pipe Accessories Submittal

NOTE:
Requires two transformers
Requires one optical relay
Requires two temp sensors per one EPIV valve if optional temps sensors are used.

Specifications			System
Unit Type			TQRYP2403AL41AN
Cooling Capacity (Nominal)		BTU/H	240,000
Heating Capacity (Nominal)		BTU/H	270,000
Operating Temperature Range	Cooling (Indoor)	°F WB [°C WB]	59~75 [15.0~24.0]
	Heating (Indoor)	°F DB [°C DB]	59~81 [15.0~27.0]
Operating Water Temperature Range[1]	Cooling/Heating	°F [°C]	50~113 [10~45]
External Dimensions (H x W x D)		In. [mm]	57-1/8 x 34-11/16 x 21-11/16 [1450 x 880 x 550]
Net Weight		Lbs. [kg]	558 [253]
External Finish			Galvanized steel sheets
Electrical Power Requirements	Voltage, Phase, Hertz, Power Tolerance		208/230, 3, 60, ±10%
Minimum Circuit Ampacity		A	79.0/0.0
Maximum Overcurrent Protection		A	125/125
SCCR		kA	5
Flow Rate		G/min (gpm)	50.7
		L/min	192
Pressure Drop		psi	6.53
		Ft.	15.1
Operation Volume Range		G/min (gpm)	26.4~63.4
		m3/h	6.0~14.4
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	7/8 (1-1/8 for the part that exceeds 65 m) [22.2 (28.58 for the part that exceeds 65 m)] Brazed
	Gas (Low Pressure)	In. [mm]	1-3/8 [34.93] Brazed
Max. Total Refrigerant Line Length		Ft.	2460
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of heatsource unit capacity
	Model/Quantity		P06~P96/2.0~50.0
Sound Pressure Level		dB(A)	58.0/58.0
Compressor Operating Range			12.0% to 100.0%
Compressor	Type x Quantity		Inverter scroll hermetic x 1
Compressor Motor Output		kW	16.1
Refrigerant	Type x Original Charge		R410A x 25 lbs. + 13.0oz. [11.7 kg]
Protection Devices	High Pressure Protection		High pressure sensor, High pressure switch at 4.15 Mpa (601 psi)
	Inverter Circuit		Over-heat protection, Over-current protection
	Compressor		Over-heat protection
Lubricant			MEL32
AHRI Ratings (Ducted/Non-ducted)	EER		10.8/11.0
	IEER		18.8/21.2
	COP		4.52/9.05
	SCHE		19.7/19.7

NOTES:
[1]23°F EWT (Entering water temperature) is possible with glycol.

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OUTDOOR UNIT: TQRYP2403AL41AN – DIMENSIONS

Note1.Seal around the water piping, the refrigerant piping, the power supply, and the control wiring and plug unused knockout holes with putty, etc., to prevent moisture or dirt from entering cabinet.
Note2.At the time of product shipment, the front side piping serves as the local drainage connection.
When connecting on the rear side, please remove the rear side plug sealing corks, and attach on the front side.
Ensure there is no leak in piping system once connected.
Note3.See Fig. A and Fig. B for service clearances.
Note4.If piping is installed in front of the unit, provide clearances as shown in Fig. A and Fig. B.
Note5.Environmental condition for installation; -20~40°C(DB) (-4~104°F) for indoor installation.
Note6.In case the temperature around the heat source unit has possibility to drop under 0°C(32°F), be careful for the following point to prevent the pipe burst by the water pipe freeze-up.
•Circulate the water all the time even if heat source unit is not in operation and provide glycol for freeze protection.
•Drain the water from inside of the heat source unit when the heat source unit will not operate for a long term.
Note7.Ensure that the drain piping is downward with a pitch of more than 1/100.
Note8.At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

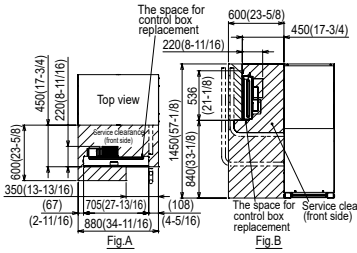
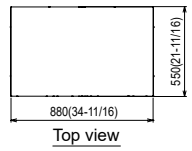
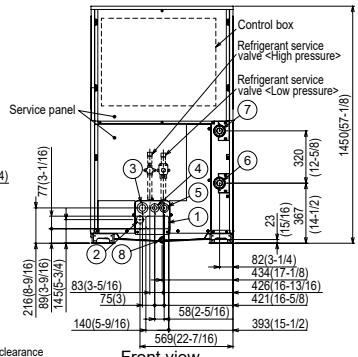


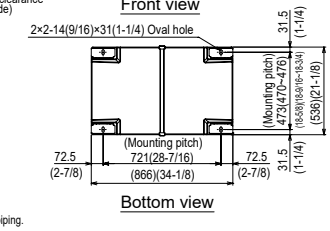
Fig.A Fig.B



Top view



Front view



Bottom view

Connecting pipe specifications

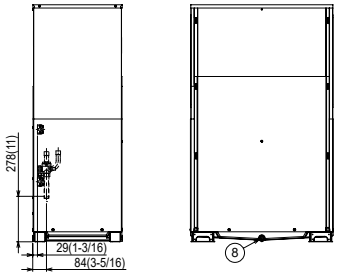
Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
TQRYP2163AL41AN	ø22.2 Brazed (7/8) *1 *2	ø28.58 Brazed (1-1/8) *1	ø25.4 (1)	ø28.58 (1-1/8)
TQRYP2403AL41AN		ø34.93 Brazed (1-3/8) *1 *3		

*1.Connect by using the connecting pipes that are supplied.
*2.When the piping length is 65 m or longer, use the ø28.58(1-1/8) pipe for the part that exceeds 65 m.
*3.Use the pipe joint(field supply) and connect to the refrigerant service valve piping.

Unit : mm(in)

<Accessories>
- Refrigerant (high pressure) conn. pipe····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Refrigerant (low pressure) conn. pipe····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Water stopper····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Sealing material for water stopper····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Sealing material for field piping (high pressure, low pressure)····· 1pc. each (P216/P240 ; Packaged in the accessory kit)
- Sealing material for drain socket····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Pipe cover for low pressure····· 1pc. (P216/P240 ; Packaged in the accessory kit)
- Sealing material for base leg (two types) ····· 4pc. each (P216/P240 ; Packaged in the accessory kit)
- Sealing material for panel····· 1pc. (P216/P240 ; Packaged in the accessory kit)

Top of unit casing not suitable for supporting system modules stacked above - field framing required for stacking modules of additional systems



Right side view Back view

NO.	Usage		Specifications
①	For pipes	Front through hole	140 × 77 Knockout hole (5-9/16) (3-1/16)
②		Front through hole (Uses wheri twinning kit (optional parts) is mounted.)	ø45 Knockout hole (1-13/16)
③	For wires	Front through hole	ø62.7 or ø34.5 Knockout hole (2-1/2) (1-3/8)
④		Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	For transmission cables	Front through hole	ø34 Knockout hole (1-3/8)
⑥	Water pipe	inlet	NPT1-1/2 Screw
⑦		outlet	NPT1-1/2 Screw
⑧	Drain pipe	Rc3/4 Screw	

Specifications are subject to change without notice.

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MITSUBISHI ELECTRIC TRANE HVAC US

Branch Controllers

Job Name: Duluth City Hall
System Reference: 16-Port Main BC
Date: 5-18-22

SPECIFICATIONS

Indoor Unit Capacity Connectable to 1 Branch	Btu/h	54,000w

Number Of Branches	16

Electrical Requirements		
Electrical Power Requirements	208 / 230V, 1 phase, 60Hz	
Minimum Circuit Ampacity (MCA)	A	1.57 / 1.82
Maximum Overcurrent Protection (MOCP)	A	15

Power Input (208 / 230V		
Cooling	kW	0.258 / 0.333
Heating		0.137 / 0.176

Current Input (208 / 230V)		
Cooling	A	1.25 / 1.45
Heating		0.66 / 0.77

External Dimensions	In. (mm)	9-7/8 x 44-11/16 x 21-1/2 (250 x 1,135 x 545)
Net Weight	Lbs. (kg)	153 (69)
External finish	Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)	
Connectable Outdoor / Heat Source Unit Capacity	72,000 to 432,000	

Refrigerant Piping Diameter to Indoor Unit (Brazed)			
		Liquid	Gas
Less than 18,000 Btu/h	In. (mm)	1/4 (6.35)	1/2 (12.7)
Greater than 18,000 Btu/h	In. (mm)	3/8 (9.52)	5/8 (15.88)
	In. (mm)	3/8 (9.52)	3/4 (19.05)
	In. (mm)	3/8 (9.52)	7/8 (22.2)

Field drain pipe size	In. (mm)	3/4 NPT
Refrigerant	R410A	

NOTES:
1. Installation/foundation work, electrical connection work, insulation work, power source switch, and other items shall be referred to the Installation Manual.
2. The equipment is for R410A refrigerant.
3. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors. (For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
4. Sound pressure/power level differs depending on the connected outdoor/heat source unit capacity or operation condition. The sound pressure/power level at the rated operation is the value of the cooling mode.
5. The sound pressure/power level values were obtained in an anechoic room. Actual sound pressure level is usually greater than that measured in anechoic room due to ambient noise and deflection sound.
6. The sound pressure level values were obtained at the location below 1.5m from the unit.
7. The solenoid valve switching sound is 56 dB (sound pressure level) regardless of the unit model.
8. Refrigerant piping diameter for connection of plural indoor units with 1 branch shall be referred to the Installation Manual.
9. This unit is not designed for outside installations.
10. When brazing the pipes, be sure to braze, after covering a wet cloth to the insulation pipes of the units in order to prevent it from burning and shrinking by heat.
11. Indoor unit capacity connectable to 1 branch is changed depending on the indoor unit type and connection method. Please refer to the Installation Manual for more information.
12. For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.

Specifications are subject to change without notice.

ACCESSORIES

Branch Joint (Downstream capacity ≤72,000 Btu/h)	CMY-Y102SS-G2*
Branch Joint (Downstream capacity 73,000-96,000 Btu/h)	CMY-Y102LS-G2*
Branch Joint (Downstream capacity ≤126,000 Btu/h)	CMY-R201S-G*
Branch Joint (Downstream capacity 127,000-216,000 Btu/h)	CMY-R202S-G*
Branch Joint (Downstream capacity 217,000-234,000 Btu/h)	CMY-R203S-G*
Branch Joint (Downstream capacity 235,000-360,000 Btu/h)	CMY-R204S-G*
Branch Joint (Downstream capacity ≥316,000 Btu/h	CMY-R205S-G*
Condensate Pump (Blue Diamond	X87-721
Condensate Pump (Sauermann)	SI3100-230
Ball Valve (3/8" SAE Brazed)	BV38BBSI
Ball Valve (5/8" SAE Brazed)	BV58BBSI
Reducer (Between ODU and BC)	CMY-R302S-G1*
Reducer (Between Main and Sub BC)	CMY-R303S-G1

*See Data Book or Install Manual for more details

Refrigerant Piping Diameter to Outdoor Unit (Brazed)			
		High Pressure	Low Pressure
P72	In. (mm)	5/8 (15.88)	3/4 (19.05)
P96	In. (mm)	3/4 (19.05)	7/8 (22.2)
P120	In. (mm)	3/4 (19.05)	7/8 (22.2) or 1-1/8 (28.58)
P144 to P192	In. (mm)	3/4 (19.05)	1-1/8 (28.58)
P216	In. (mm)	7/8 (22.2) or 1-1/8 (28.58)	1-1/8 (28.58)
P240	In. (mm)	7/8 (22.2) or 1-1/8 (28.58)	1-3/8 (34.93)
P264 to P288	In. (mm)	1-1/8 (28.58)	1-3/8 (34.93)
P312	In. (mm)	1-1/8 (28.58)	1-3/8 (34.93) or 1-5/8 (41.28)
P336	In. (mm)	1-1/8 (28.58)	1-5/8 (41.28)

Refrigerant Piping Diameter to other BC Controller (Brazed)				
		High Pressure	Liquid Pipe	Low Pressure Pipe
P72	In. (mm)	5/8 (15.88)	3/8 (9.52)	3/4 (19.05)
P73 to P108	In. (mm)	3/4 (19.05)	3/8 (9.52)	7/8 (22.2)
P109 to P126	In. (mm)	3/4 (19.05)	1/2 (12.7)	1-1/8 (28.58)
P127 to P144	In. (mm)	7/8 (22.2)	1/2 (12.7)	1-1/8 (28.58)
P145 to P216	In. (mm)	7/8 (22.2)	5/8 (15.88)	1-1/8 (28.58)
P217 to P234	In. (mm)	1-1/8 (28.58)	5/8 (15.88)	1-1/8 (28.58)
P235 to P288	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-3/8 (34.93)
P289 to P360	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-5/8 (41.28)
P361 or above	In. (mm)	1-3/8 (34.93)	3/4 (19.05)	1-5/8 (41.28)

Sound power level (measured in anechoic room)		
Rated operation	dB(A)	66
Defrost		73

Sound pressure level (measured in anechoic room)		
Rated operation	dB(A)	48
Defrost		55

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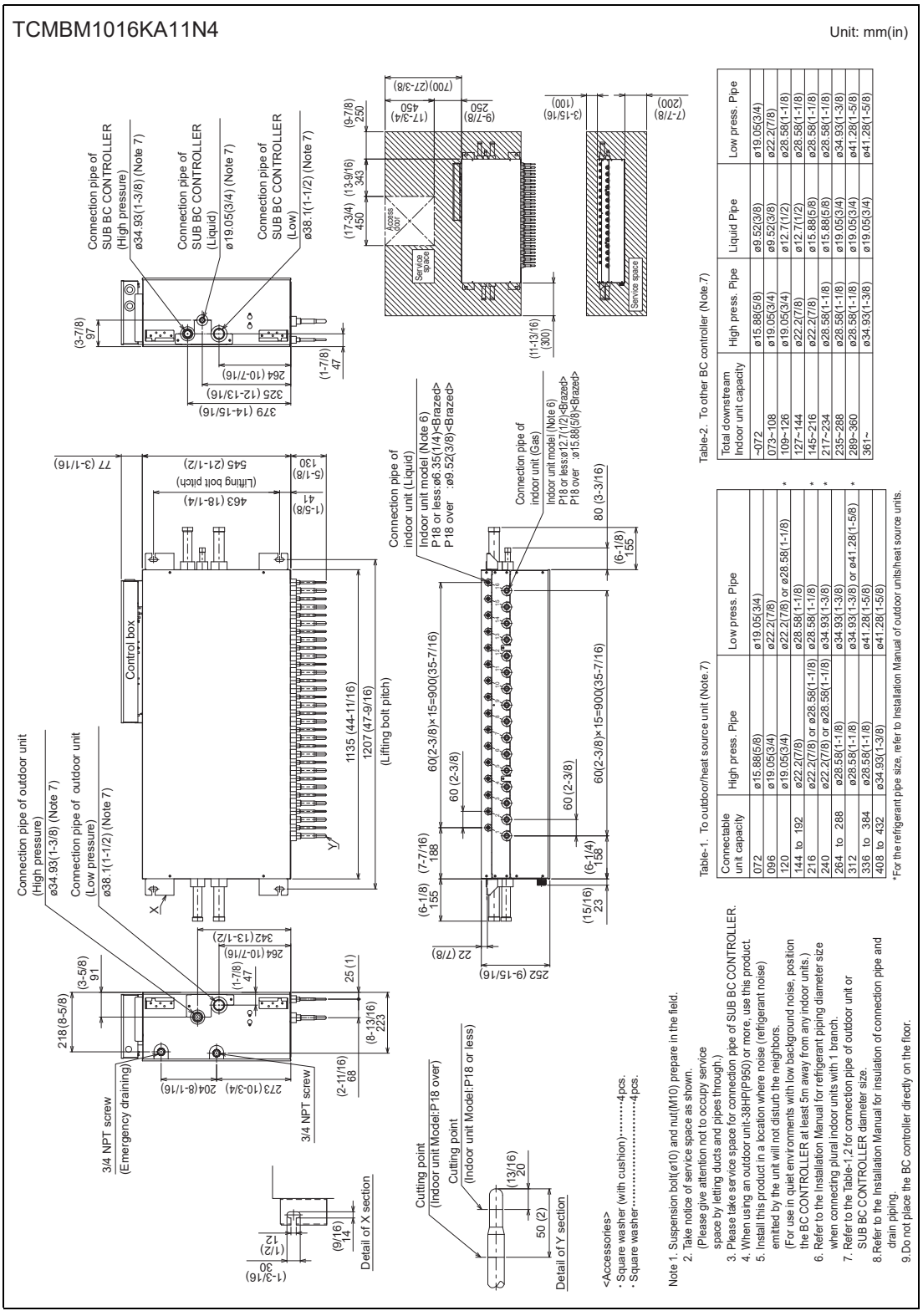
Model: TCMBM1016KA11N4 - DIMENSIONS

TCMBM1016KA11N4

Unit: mm(in)



Note 1. Suspension bolt(ø10) and nut(M10) prepare in the field.
2. Take notice of service space as shown.
(Please give attention not to occupy service space by letting ducts and pipes through.)
3. Please take service space for connection pipe of SUB BC CONTROLLER.
4. When using an outdoor unit-38HP(P950) or more, use this product.
5. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors.
(For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
6. Refer to the Installation Manual for refrigerant piping diameter size when connecting plural indoor units with 1 branch.
7. Refer to the Table-1,2 for connection pipe of outdoor unit or SUB BC CONTROLLER diameter size.
8. Refer to the Installation Manual for insulation of connection pipe and drain piping.
9. Do not place the BC controller directly on the floor.

Table-1. To outdoor/heat source unit (Note.7)

Connectable unit capacity		High press. Pipe	Low press. Pipe	
072		ø15.88(5/8)	ø19.05(3/4)	
096		ø19.05(3/4)	ø22.2(7/8)	
120		ø19.05(3/4)	ø22.2(7/8) or ø28.58(1-1/8)	*
144	to 192	ø22.2(7/8)	ø28.58(1-1/8)	
216		ø22.2(7/8) or ø28.58(1-1/8)	ø28.58(1-1/8)	* *
240		ø22.2(7/8) or ø28.58(1-1/8)	ø34.93(1-3/8)	
264	to 288	ø28.58(1-1/8)	ø34.93(1-3/8)	
312		ø28.58(1-1/8)	ø34.93(1-3/8) or ø41.28(1-5/8)	*
336	to 384	ø28.58(1-1/8)	ø41.28(1-5/8)	
408	to 432	ø34.93(1-3/8)	ø41.28(1-5/8)	

*For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.

Table-2. To other BC controller (Note.7)

Total downstream Indoor unit capacity	High press. Pipe	Liquid Pipe	Low press. Pipe
~072	ø15.88(5/8)	ø9.52(3/8)	ø19.05(3/4)
073~108	ø19.05(3/4)	ø9.52(3/8)	ø22.2(7/8)
109~126	ø19.05(3/4)	ø12.7(1/2)	ø28.58(1-1/8)
127~144	ø22.2(7/8)	ø12.7(1/2)	ø28.58(1-1/8)
145~216	ø22.2(7/8)	ø15.88(5/8)	ø28.58(1-1/8)
217~234	ø28.58(1-1/8)	ø15.88(5/8)	ø28.58(1-1/8)
235~288	ø28.58(1-1/8)	ø19.05(3/4)	ø34.93(1-3/8)
289~360	ø28.58(1-1/8)	ø19.05(3/4)	ø41.28(1-5/8)
361~	ø34.93(1-3/8)	ø19.05(3/4)	ø41.28(1-5/8)

Specifications are subject to change without notice.

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Job Name: **Duluth City Hall**
System Reference: **12-Port Main BC** Date: **5-18-22**

ACCESSORIES

- ☐ Branch Joint (Downstream capacity ≤72,000 Btu/h) CMY-Y102SS-G2*
- ☐ Branch Joint (Downstream capacity 73,000-96,000 Btu/h) CMY-Y102LS-G2*
- ☐ Branch Joint (Downstream capacity ≤126,000 Btu/h) CMY-R201S-G*
- ☐ Branch Joint (Downstream capacity 127,000-216,000 Btu/h) CMY-R202S-G*
- ☐ Branch Joint (Downstream capacity 217,000-234,000 Btu/h) CMY-R203S-G*
- ☐ Branch Joint (Downstream capacity 235,000-360,000 Btu/h) CMY-R204S-G*
- ☐ Branch Joint (Downstream capacity ≥316,000 Btu/h CMY-R205S-G*
- ☐ Condensate Pump (Blue Diamond X87-721
- ☐ Condensate Pump (Sauermann) SI3100-230
- ☐ Ball Valve (3/8" SAE Brazed) BV38BBSI
- ☐ Ball Valve (5/8" SAE Brazed) BV58BBSI
- ☐ Reducer (Between ODU and BC) CMY-R302S-G1*
- ☐ Reducer (Between Main and Sub BC) CMY-R303S-G1

*See Data Book or Install Manual for more details

SPECIFICATIONS

Indoor Unit Capacity Connectable to 1 Branch	Btu/h	54,000

Number Of Branches	12

Electrical Requirements		
Electrical Power Requirements	208 / 230V, 1 phase, 60Hz	
Minimum Circuit Ampacity (MCA)	A	1.57 / 1.82

Power Input (208 / 230V		
Cooling	kW	0.198 / 0.255
Heating		0.106 / 0.137

Current Input (208 / 230V)		
Cooling	A	0.95 / 0.11
Heating		0.52 / 0.60

External Dimensions	In. (mm)	9-7/8 x 44-11/16 x 21-1/2 (250 x 1,135 x 545)

Net Weight	Lbs. (kg)	133 (60)

External finish	Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)

Connectable Outdoor / Heat Source Unit Capacity	72,000 to 336,000

Refrigerant Piping Diameter to Indoor Unit (Brazed)			
		Liquid	Gas
Less than 18,000 Btu/h	In. (mm)	1/4 (6.35)	1/2 (12.7)
Greater than 18,000 Btu/h	In. (mm)	3/8 (9.52)	5/8 (15.88)
	In. (mm)	3/8 (9.52)	3/4 (19.05)
	In. (mm)	3/8 (9.52)	7/8 (22.2)

Field drain pipe size	In. (mm)	3/4 NPT

Refrigerant	R410A

Refrigerant Piping Diameter to Outdoor Unit (Brazed)			
		High Pressure	Low Pressure
072	In. (mm)	5/8 (15.88)	3/4 (19.05)
096	In. (mm)	3/4 (19.05)	7/8 (22.2)
120	In. (mm)	3/4 (19.05)	7/8 (22.2) or 1-1/8 (28.58)
144 to 192	In. (mm)	3/4 (19.05)	1-1/8 (28.58)
216	In. (mm)	7/8 (22.2) or 1-1/8 (28.58)	1-1/8 (28.58)
240	In. (mm)	7/8 (22.2) or 1-1/8 (28.58)	1-3/8 (34.93)
264 to 288	In. (mm)	1-1/8 (28.58)	1-3/8 (34.93)
312	In. (mm)	1-1/8 (28.58)	1-3/8 (34.93) or 1-5/8 (41.28)
336	In. (mm)	1-1/8 (28.58)	1-5/8 (41.28)

Refrigerant Piping Diameter to other BC Controller (Brazed)				
		High Pressure	Liquid Pipe	Low Pressure Pipe
072	In. (mm)	5/8 (15.88)	3/8 (9.52)	3/4 (19.05)
073 to 108	In. (mm)	3/4 (19.05)	3/8 (9.52)	7/8 (22.2)
109 to 126	In. (mm)	3/4 (19.05)	1/2 (12.7)	1-1/8 (28.58)
127 to 144	In. (mm)	7/8 (22.2)	1/2 (12.7)	1-1/8 (28.58)
145 to 216	In. (mm)	7/8 (22.2)	5/8 (15.88)	1-1/8 (28.58)
217 to 234	In. (mm)	1-1/8 (28.58)	5/8 (15.88)	1-1/8 (28.58)
235 to 288	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-3/8 (34.93)
289 to 360	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-5/8 (41.28)
361 or above	In. (mm)	1-3/8 (34.93)	3/4 (19.05)	1-5/8 (41.28)

Sound power level (measured in anechoic room)		
Rated operation	dB(A)	68
Defrost		74

Sound pressure level (measured in anechoic room)		
Rated operation	dB(A)	50
Defrost		56

NOTES:
1. Installation/foundation work, electrical connection work, insulation work, power source switch, and other items shall be referred to the Installation Manual.
2. The equipment is for R410A refrigerant.
3. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors. (For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
4. Sound pressure/power level differs depending on the connected outdoor/heat source unit capacity or operation condition. The sound pressure/power level at the rated operation is the value of the cooling mode.
5. The sound pressure/power level values were obtained in an anechoic room. Actual sound pressure level is usually greater than that measured in anechoic room due to ambient noise and deflection sound.
6. The sound pressure level values were obtained at the location below 1.5m from the unit.
7. The solenoid valve switching sound is 56 dB (sound pressure level) regardless of the unit model.
8. Refrigerant piping diameter for connection of plural indoor units with 1 branch shall be referred to the Installation Manual.
9. This unit is not designed for outside installations.
10. When brazing the pipes, be sure to braze, after covering a wet cloth to the insulation pipes of the units in order to prevent it from burning and shrinking by heat.
11. Indoor unit capacity connectable to 1 branch is changed depending on the indoor unit type and connection method. Please refer to the Installation Manual for more information.
12. For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.

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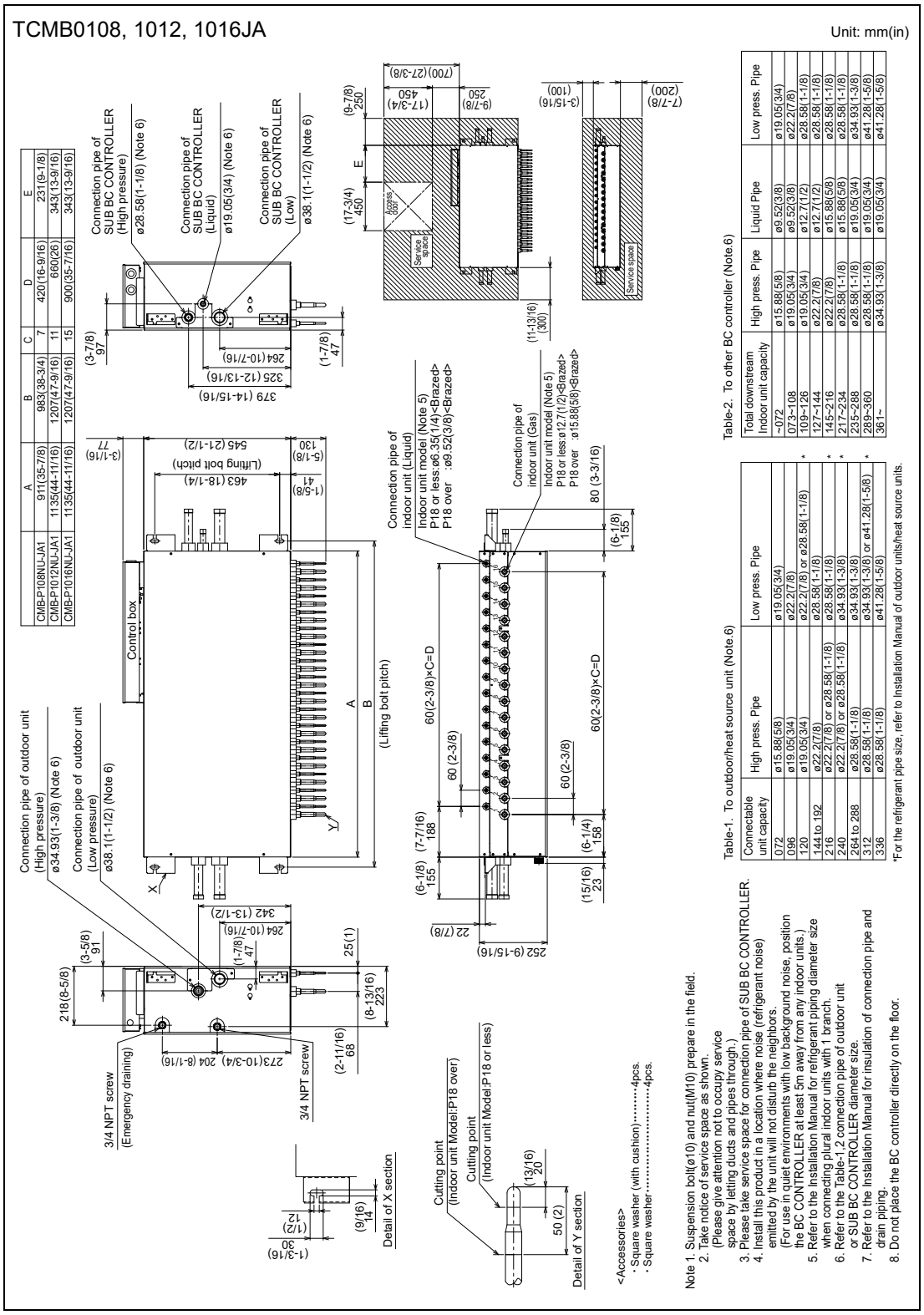
Model: TCMBM1012JA11N4 - DIMENSIONS

TCMB0108, 1012, 1016JA

Unit: mm(in)



	A	B	C	D	E
CMB-P108NU-JA1	911(35-7/8)	983(38-3/4)	7	420(16-9/16)	231(9-1/8)
CMB-P1012NU-JA1	1135(44-11/16)	1207(47-9/16)	11	660(26)	343(13-9/16)
CMB-P1016NU-JA1	1135(44-11/16)	1207(47-9/16)	15	900(35-7/16)	343(13-9/16)

Table-1. To outdoor/heat source unit (Note.6)

Connectable unit capacity	High press. Pipe	Low press. Pipe	
072	ø15.88(5/8)	ø19.05(3/4)	
096	ø19.05(3/4)	ø22.2(7/8)	
120	ø19.05(3/4)	ø22.2(7/8) or ø28.58(1-1/8)	*
144 to 192	ø22.2(7/8)	ø28.58(1-1/8)	
216	ø22.2(7/8) or ø28.58(1-1/8)	ø28.58(1-1/8)	*
240	ø22.2(7/8) or ø28.58(1-1/8)	ø34.93(1-3/8)	*
264 to 288	ø28.58(1-1/8)	ø34.93(1-3/8)	
312	ø28.58(1-1/8)	ø34.93(1-3/8) or ø41.28(1-5/8)	*
336	ø28.58(1-1/8)	ø41.28(1-5/8)	

Table-2. To other BC controller (Note.6)

Total downstream Indoor unit capacity	High press. Pipe	Liquid Pipe	Low press. Pipe
~072	ø15.88(5/8)	ø9.52(3/8)	ø19.05(3/4)
073~108	ø19.05(3/4)	ø9.52(3/8)	ø22.2(7/8)
109~126	ø19.05(3/4)	ø12.7(1/2)	ø28.58(1-1/8)
127~144	ø22.2(7/8)	ø12.7(1/2)	ø28.58(1-1/8)
145~216	ø22.2(7/8)	ø15.88(5/8)	ø28.58(1-1/8)
217~234	ø28.58(1-1/8)	ø15.88(5/8)	ø28.58(1-1/8)
235~288	ø28.58(1-1/8)	ø19.05(3/4)	ø34.93(1-3/8)
289~360	ø28.58(1-1/8)	ø19.05(3/4)	ø41.28(1-5/8)
361~	ø34.93(1-3/8)	ø19.05(3/4)	ø41.28(1-5/8)

*For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.

Note 1. Suspension bolt(ø10) and nut(M10) prepare in the field.
2. Take notice of service space as shown.
(Please give attention not to occupy service space by letting ducts and pipes through.)
3. Please take service space for connection pipe of SUB BC CONTROLLER.
4. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors.
(For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
5. Refer to the Installation Manual for refrigerant piping diameter size when connecting plural indoor units with 1 branch.
6. Refer to the Table-1,2 connection pipe of outdoor unit or SUB BC CONTROLLER diameter size.
7. Refer to the Installation Manual for insulation of connection pipe and drain pipiing.
8. Do not place the BC controller directly on the floor.

<Accessories>
· Square washer (with cushion)·····4pcs.
· Square washer·····4pcs.

Specifications are subject to change without notice.

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Job Name: **Duluth City Hall**
System Reference: **8-Port Main BC** Date: **5-18-22**

ACCESSORIES

- ☐ Branch Joint (Downstream capacity ≤72,000 Btu/h) CMY-Y102SS-G2*
- ☐ Branch Joint (Downstream capacity 73,000-96,000 Btu/h) CMY-Y102LS-G2*
- ☐ Branch Joint (Downstream capacity ≤126,000 Btu/h) CMY-R201S-G*
- ☐ Branch Joint (Downstream capacity 127,000-216,000 Btu/h) CMY-R202S-G*
- ☐ Branch Joint (Downstream capacity 217,000-234,000 Btu/h) CMY-R203S-G*
- ☐ Branch Joint (Downstream capacity 235,000-360,000 Btu/h) CMY-R204S-G*
- ☐ Branch Joint (Downstream capacity ≥316,000 Btu/h CMY-R205S-G*
- ☐ Condensate Pump (Blue Diamond X87-721
- ☐ Condensate Pump (Sauermann) SI3100-230
- ☐ Ball Valve (3/8" SAE Brazed) BV38BBSI
- ☐ Ball Valve (5/8" SAE Brazed) BV58BBSI
- ☐ Reducer (Between ODU and BC) CMY-R302S-G1*
- ☐ Reducer (Between Main and Sub BC) CMY-R303S-G1

*See Data Book or Install Manual for more details

SPECIFICATIONS

Indoor Unit Capacity Connectable to 1 Branch	Btu/h	54,000

Number Of Branches	8

Electrical Requirements		
Electrical Power Requirements	208 / 230V, 1 phase, 60Hz	
Minimum Circuit Ampacity (MCA)	A	0.83 / 0.97
Maximum Overcurrent Protection (MOCP)	A	15

Power Input (208 / 230V		
Cooling	kW	0.137 / 0.176
Heating		0.076 / 0.098

Current Input (208 / 230V)		
Cooling	A	0.66 / 0.77
Heating		0.37 / 0.43

External Dimensions	In. (mm)	9-7/8 x 35-7/8 x 21-1/2 (250 x 911 x 545)
Net Weight	Lbs. (kg)	106 (48)
External finish	Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)	
Connectable Outdoor / Heat Source Unit Capacity	72,000 to 336,000	

Refrigerant Piping Diameter to Indoor Unit (Brazed)			
		Liquid	Gas
Less than 18,000 Btu/h	In. (mm)	1/4 (6.35)	1/2 (12.7)
Greater than 18,000 Btu/h	In. (mm)	3/8 (9.52)	5/8 (15.88)
	In. (mm)	3/8 (9.52)	3/4 (19.05)
	In. (mm)	3/8 (9.52)	7/8 (22.2)

Field drain pipe size	In. (mm)	3/4 NPT
Refrigerant	R410A	

Refrigerant Piping Diameter to Outdoor Unit (Brazed)			
		High Pressure	Low Pressure
072	In. (mm)	5/8 (15.88)	3/4 (19.05)
096	In. (mm)	3/4 (19.05)	7/8 (22.2)
120	In. (mm)	3/4 (19.05)	7/8 (22.2) or 1-1/8 (28.58)
144 to 192	In. (mm)	3/4 (19.05)	1-1/8 (28.58)
216	In. (mm)	7/8 (22.2) or 1-1/8 (28.58)	1-1/8 (28.58)
240	In. (mm)	7/8 (22.2) or 1-1/8 (28.58)	1-3/8 (34.93)
264 to 288	In. (mm)	1-1/8 (28.58)	1-3/8 (34.93)
312	In. (mm)	1-1/8 (28.58)	1-3/8 (34.93) or 1-5/8 (41.28)
336	In. (mm)	1-1/8 (28.58)	1-5/8 (41.28)

Refrigerant Piping Diameter to other BC Controller (Brazed)				
		High Pressure	Liquid Pipe	Low Pressure Pipe
072	In. (mm)	5/8 (15.88)	3/8 (9.52)	3/4 (19.05)
073 to 108	In. (mm)	3/4 (19.05)	3/8 (9.52)	7/8 (22.2)
109 to 126	In. (mm)	3/4 (19.05)	1/2 (12.7)	1-1/8 (28.58)
127 to 144	In. (mm)	7/8 (22.2)	1/2 (12.7)	1-1/8 (28.58)
145 to 216	In. (mm)	7/8 (22.2)	5/8 (15.88)	1-1/8 (28.58)
217 to 234	In. (mm)	1-1/8 (28.58)	5/8 (15.88)	1-1/8 (28.58)
235 to 288	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-3/8 (34.93)
289 to 360	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-5/8 (41.28)
361 or above	In. (mm)	1-3/8 (34.93)	3/4 (19.05)	1-5/8 (41.28)

Sound power level (measured in anechoic room)		
Rated operation	dB(A)	68
Defrost		74

Sound pressure level (measured in anechoic room)		
Rated operation	dB(A)	50
Defrost		56

NOTES:
1. Installation/foundation work, electrical connection work, insulation work, power source switch, and other items shall be referred to the Installation Manual.
2. The equipment is for R410A refrigerant.
3. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors. (For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
4. Sound pressure/power level differs depending on the connected outdoor/heat source unit capacity or operation condition. The sound pressure/power level at the rated operation is the value of the cooling mode.
5. The sound pressure/power level values were obtained in an anechoic room. Actual sound pressure level is usually greater than that measured in anechoic room due to ambient noise and deflection sound.
6. The sound pressure level values were obtained at the location below 1.5m from the unit.
7. The solenoid valve switching sound is 56 dB (sound pressure level) regardless of the unit model.
8. Refrigerant piping diameter for connection of plural indoor units with 1 branch shall be referred to the Installation Manual.
9. This unit is not designed for outside installations.
10. When brazing the pipes, be sure to braze, after covering a wet cloth to the insulation pipes of the units in order to prevent it from burning and shrinking by heat.
11. Indoor unit capacity connectable to 1 branch is changed depending on the indoor unit type and connection method. Please refer to the Installation Manual for more information.
12. For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.

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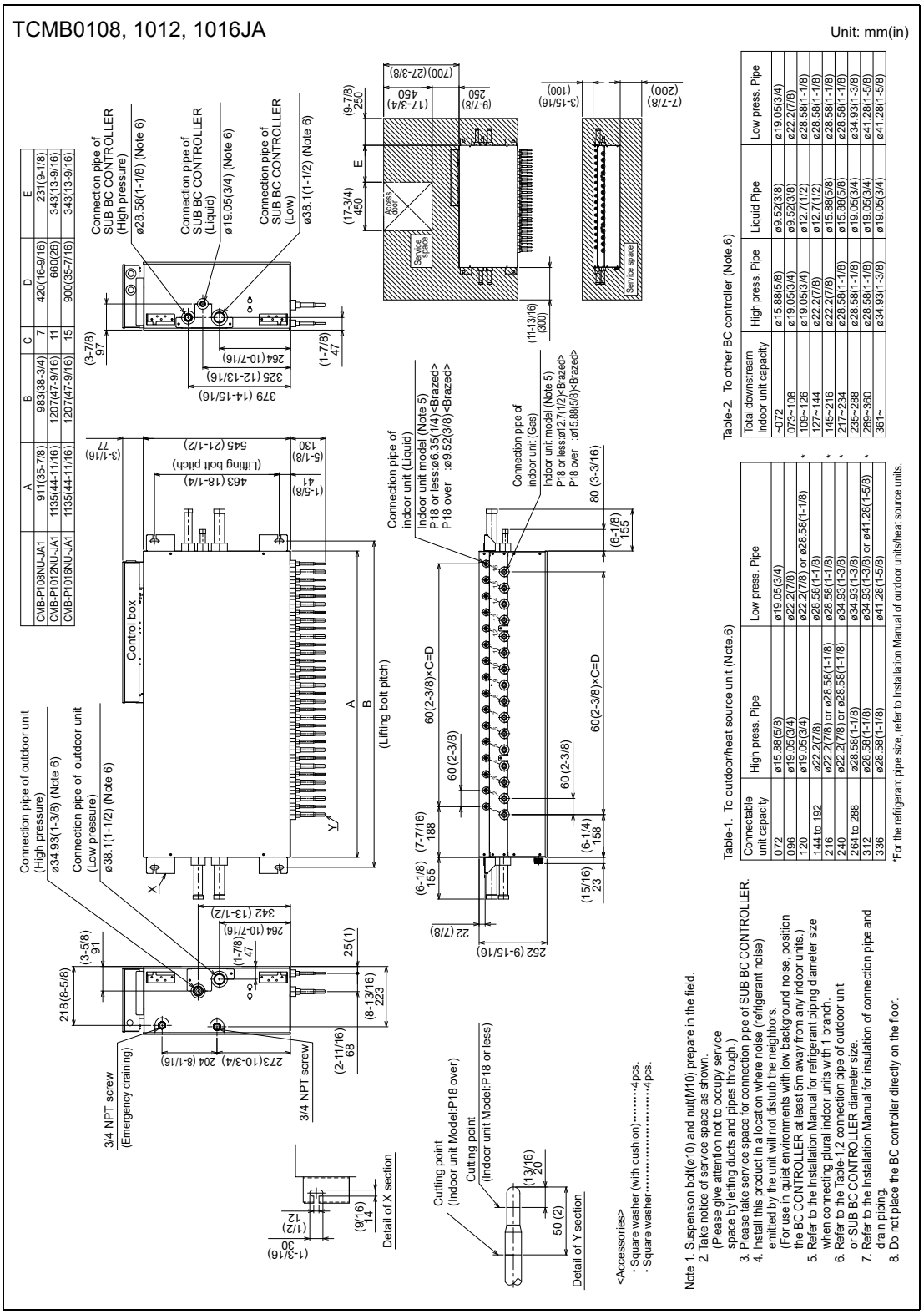
Model: TCMBM0108JA11N4 - DIMENSIONS

TCMB0108, 1012, 1016JA

Unit: mm(in)



	A	B	C	D	E
CMB-P108NU-JA1	911(35-7/8)	983(38-3/4)	7	420(16-9/16)	231(9-1/8)
CMB-P1012NU-JA1	1135(44-11/16)	1207(47-9/16)	11	660(26)	343(13-9/16)
CMB-P1016NU-JA1	1135(44-11/16)	1207(47-9/16)	15	900(35-7/16)	343(13-9/16)

Table-1. To outdoor/heat source unit (Note 6)

Connectable unit capacity	High press. Pipe	Low press. Pipe	
072	ø15.88(5/8)	ø19.05(3/4)	
096	ø19.05(3/4)	ø22.2(7/8)	
120	ø19.05(3/4)	ø22.2(7/8) or ø28.58(1-1/8)	*
144 to 192	ø22.2(7/8)	ø28.58(1-1/8)	*
216	ø22.2(7/8) or ø28.58(1-1/8)	ø28.58(1-1/8)	*
240	ø22.2(7/8) or ø28.58(1-1/8)	ø34.93(1-3/8)	*
264 to 288	ø28.58(1-1/8)	ø34.93(1-3/8)	
312	ø28.58(1-1/8)	ø34.93(1-3/8) or ø41.28(1-5/8)	*
336	ø28.58(1-1/8)	ø41.28(1-5/8)	

Table-2. To other BC controller (Note 6)

Total downstream Indoor unit capacity	High press. Pipe	Liquid Pipe	Low press. Pipe
~072	ø15.88(5/8)	ø9.52(3/8)	ø19.05(3/4)
073~108	ø19.05(3/4)	ø9.52(3/8)	ø22.2(7/8)
109~126	ø19.05(3/4)	ø12.7(1/2)	ø28.58(1-1/8)
127~144	ø22.2(7/8)	ø12.7(1/2)	ø28.58(1-1/8)
145~216	ø22.2(7/8)	ø15.88(5/8)	ø28.58(1-1/8)
217~234	ø28.58(1-1/8)	ø15.88(5/8)	ø28.58(1-1/8)
235~288	ø28.58(1-1/8)	ø19.05(3/4)	ø34.93(1-3/8)
289~360	ø28.58(1-1/8)	ø19.05(3/4)	ø41.28(1-5/8)
361~	ø34.93(1-3/8)	ø19.05(3/4)	ø41.28(1-5/8)

*For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.

Note 1. Suspension bolt(ø10) and nut(M10) prepare in the field.
2. Take notice of service space as shown.
(Please give attention not to occupy service space by letting ducts and pipes through.)
3. Please take service space for connection pipe of SUB BC CONTROLLER.
4. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors.
(For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
5. Refer to the Installation Manual for refrigerant piping diameter size when connecting plural indoor units with 1 branch.
6. Refer to the Table-1,2 connection pipe of outdoor unit or SUB BC CONTROLLER diameter size.
7. Refer to the Installation Manual for insulation of connection pipe and drain piping.
8. Do not place the BC controller directly on the floor.

<Accessories>
· Square washer (with cushion)·····4pcs.
· Square washer·····4pcs.

Specifications are subject to change without notice.

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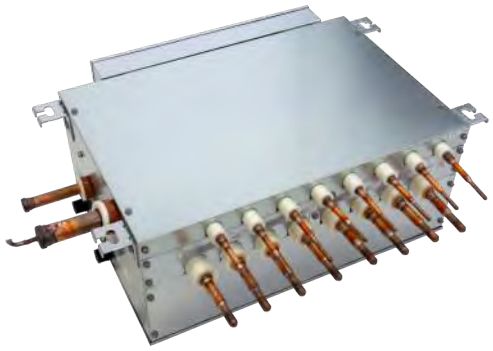
Job Name: **Duluth City Hall**
System Reference: **8-Port Sub BC** Date: **5-18-22**



ACCESSORIES

- ☐ Branch Joint (Downstream capacity ≤72,000 Btu/h) CMY-Y102SS-G2*
- ☐ Branch Joint (Downstream capacity 73,000-96,000 Btu/h) CMY-Y102LS-G2*
- ☐ Condensate Pump (Blue Diamond X87-721
- ☐ Condensate Pump (Sauermann) SI3100-230
- ☐ Ball Valve (3/8" SAE Brazed) BV38BBSI
- ☐ Ball Valve (5/8" SAE Brazed) BV58BBSI
- ☐ Reducer (Between Main and Sub BC) CMY-R306S-G1

*See Data Book or Install Manual for more details

SPECIFICATIONS

Indoor Unit Capacity Connectable to 1 Branch	Btu/h	54,000

Number Of Branches	8

Electrical Requirements		
Electrical Power Requirements	208 / 230V, 1 phase, 60Hz	
Minimum Circuit Ampacity (MCA)	A	0.74 / 0.87
Maximum Overcurrent Protection (MOCP)	A	15

Power Input (208 / 230V		
Cooling	kW	0.122 / 0.157
Heating		0.061 / 0.078

Current Input (208 / 230V)		
Cooling	A	0.59 / 0.69
Heating		0.30 / 0.35

External Dimensions	In. (mm)	9-7/8 x 23-1/2 x 15-11/16 (250 x 596 x 398)

Net Weight	Lbs. (kg)	69 (31)

External finish	Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)

Maximum Connectable Sub BC Controllers	11

Maximum Connectable Capacity of Indoor Units	126,000

Refrigerant Piping Diameter to Indoor Unit (Brazed)			
		Liquid	Gas
Less than 18,000 Btu/h	In. (mm)	1/4 (6.35)	1/2 (12.7)
Greater than 18,000 Btu/h	In. (mm)	3/8 (9.52)	5/8 (15.88)
	In. (mm)	3/8 (9.52)	3/4 (19.05)

Field drain pipe size	In. (mm)	3/4 NPT

Refrigerant	R410A

Refrigerant Piping Diameter to other BC Controller				
		High Pressure	Liquid Pipe	Low Pressure Pipe
072	In. (mm)	5/8 (15.88)	3/8 (9.52)	3/4 (19.05)
073 to 108	In. (mm)	3/4 (19.05)	3/8 (9.52)	7/8 (22.2)
109 to 126	In. (mm)	3/4 (19.05)	1/2 (12.7)	1-1/8 (28.58)
127 to 144	In. (mm)	7/8 (22.2)	1/2 (12.7)	1-1/8 (28.58)
145 to 216	In. (mm)	7/8 (22.2)	5/8 (15.88)	1-1/8 (28.58)
217 to 234	In. (mm)	1-1/8 (28.58)	5/8 (15.88)	1-1/8 (28.58)
235 to 288	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-3/8 (34.93)
289 to 360	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-5/8 (41.28)
361 or above	In. (mm)	1-3/8 (34.93)	3/4 (19.05)	1-5/8 (41.28)

Sound power level (measured in anechoic room)		
Rated operation	dB(A)	59
Defrost		71

Sound pressure level (measured in anechoic room)		
Rated operation	dB(A)	40
Defrost		53

NOTES:
1. Installation/foundation work, electrical connection work, insulation work, power source switch, and other items shall be referred to the Installation Manual.
2. The equipment is for R410A refrigerant.
3. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors. (For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
4. Sound pressure/power level differs depending on the connected outdoor/heat source unit capacity or operation condition. The sound pressure/power level at the rated operation is the value of the cooling mode.
5. The sound pressure/power level values were obtained in an anechoic room. Actual sound pressure level is usually greater than that measured in anechoic room due to ambient noise and deflection sound.
6. The sound pressure level values were obtained at the location below 1.5m from the unit.
7. The solenoid valve switching sound is 56 dB (sound pressure level) regardless of the unit model.
8. Refrigerant piping diameter for connection of plural indoor units with 1 branch shall be referred to the Installation Manual.
9. This unit is not designed for outside installations.
10. When brazing the pipes, be sure to braze, after covering a wet cloth to the insulation pipes of the units in order to prevent it from burning and shrinking by heat.
11. Indoor unit capacity connectable to 1 branch is changed depending on the indoor unit type and connection method. Please refer to the Installation Manual for more information.
12. For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.
13. Sub BC Controllers cannot be used alone or with a Single BC Controller. They must be used in conjunction with a main BC Controller

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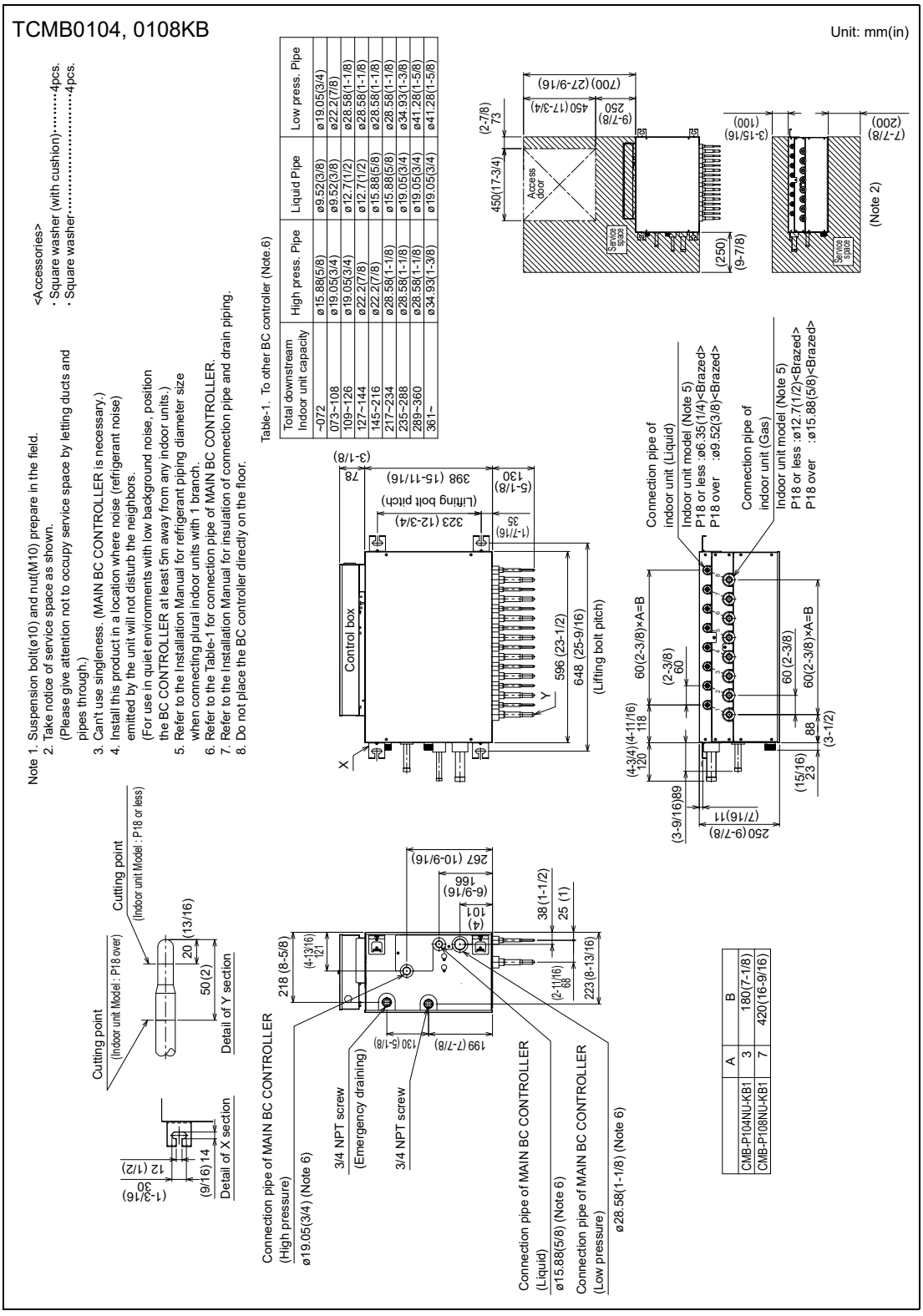
TCMB0104, 0108KB

Unit: mm(in)



Specifications are subject to change without notice.

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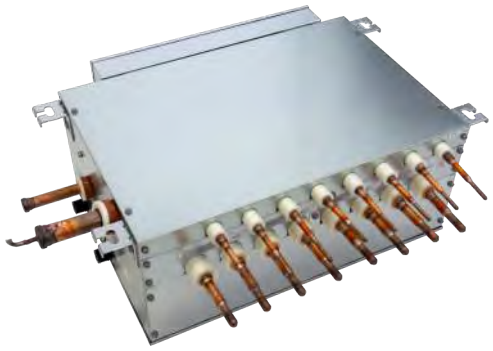
Job Name: **Duluth City Hall**
System Reference: **4-Port Sub BC** Date: **5-18-22**



ACCESSORIES

- ☐ Branch Joint (Downstream capacity ≤72,000 Btu/h) CMY-Y102SS-G2*
- ☐ Branch Joint (Downstream capacity 73,000-96,000 Btu/h) CMY-Y102LS-G2*
- ☐ Condensate Pump (Blue Diamond X87-721
- ☐ Condensate Pump (Sauermann) SI3100-230
- ☐ Ball Valve (3/8" SAE Brazed) BV38BBSI
- ☐ Ball Valve (5/8" SAE Brazed) BV58BBSI
- ☐ Reducer (Between Main and Sub BC) CMY-R306S-G1

*See Data Book or Install Manual for more details

SPECIFICATIONS

Indoor Unit Capacity Connectable to 1 Branch	Btu/h	54,000

Number Of Branches	4

Electrical Requirements		
Electrical Power Requirements	208 / 230V, 1 phase, 60Hz	
Minimum Circuit Ampacity (MCA)	A	0.34 / 0.44
Maximum Overcurrent Protection (MOCP)	A	15

Power Input (208 / 230V		
Cooling	kW	0.061 / 0.078
Heating		0.030 / 0.039

Current Input (208 / 230V)		
Cooling	A	0.30 / 0.35
Heating		0.15 / 0.18

External Dimensions	In. (mm)	9-7/8 x 23-1/2 x 15-11/16 (250 x 596 x 398)
Net Weight	Lbs. (kg)	51 (23)
External finish	Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)	
Maximum Connectable Sub BC Controllers	11	
Maximum Connectable Capacity of Indoor Units	126,000	

Refrigerant Piping Diameter to Indoor Unit (Brazed)			
		Liquid	Gas
Less than 18,000 Btu/h	In. (mm)	1/4 (6.35)	1/2 (12.7)
Greater than 18,000 Btu/h	In. (mm)	3/8 (9.52)	5/8 (15.88)
	In. (mm)	3/8 (9.52)	3/4 (19.05)

Field drain pipe size	In. (mm)	3/4 NPT
Refrigerant	R410A	

Refrigerant Piping Diameter to other BC Controller				
		High Pressure	Liquid Pipe	Low Pressure Pipe
072	In. (mm)	5/8 (15.88)	3/8 (9.52)	3/4 (19.05)
073 to 108	In. (mm)	3/4 (19.05)	3/8 (9.52)	7/8 (22.2)
109 to 126	In. (mm)	3/4 (19.05)	1/2 (12.7)	1-1/8 (28.58)
127 to 144	In. (mm)	7/8 (22.2)	1/2 (12.7)	1-1/8 (28.58)
145 to 216	In. (mm)	7/8 (22.2)	5/8 (15.88)	1-1/8 (28.58)
217 to 234	In. (mm)	1-1/8 (28.58)	5/8 (15.88)	1-1/8 (28.58)
235 to 288	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-3/8 (34.93)
289 to 360	In. (mm)	1-1/8 (28.58)	3/4 (19.05)	1-5/8 (41.28)
361 or above	In. (mm)	1-3/8 (34.93)	3/4 (19.05)	1-5/8 (41.28)

Sound power level (measured in anechoic room)		
Rated operation	dB(A)	59
Defrost		71

Sound pressure level (measured in anechoic room)		
Rated operation	dB(A)	40
Defrost		53

NOTES:
1. Installation/foundation work, electrical connection work, insulation work, power source switch, and other items shall be referred to the Installation Manual.
2. The equipment is for R410A refrigerant.
3. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors. (For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.)
4. Sound pressure/power level differs depending on the connected outdoor/heat source unit capacity or operation condition. The sound pressure/power level at the rated operation is the value of the cooling mode.
5. The sound pressure/power level values were obtained in an anechoic room. Actual sound pressure level is usually greater than that measured in anechoic room due to ambient noise and deflection sound.
6. The sound pressure level values were obtained at the location below 1.5m from the unit.
7. The solenoid valve switching sound is 56 dB (sound pressure level) regardless of the unit model.
8. Refrigerant piping diameter for connection of plural indoor units with 1 branch shall be referred to the Installation Manual.
9. This unit is not designed for outside installations.
10. When brazing the pipes, be sure to braze, after covering a wet cloth to the insulation pipes of the units in order to prevent it from burning and shrinking by heat.
11. Indoor unit capacity connectable to 1 branch is changed depending on the indoor unit type and connection method. Please refer to the Installation Manual for more information.
12. For the refrigerant pipe size, refer to Installation Manual of outdoor units/heat source units.
13. Sub BC Controllers cannot be used alone or with a Single BC Controller. They must be used in conjunction with a main BC Controller

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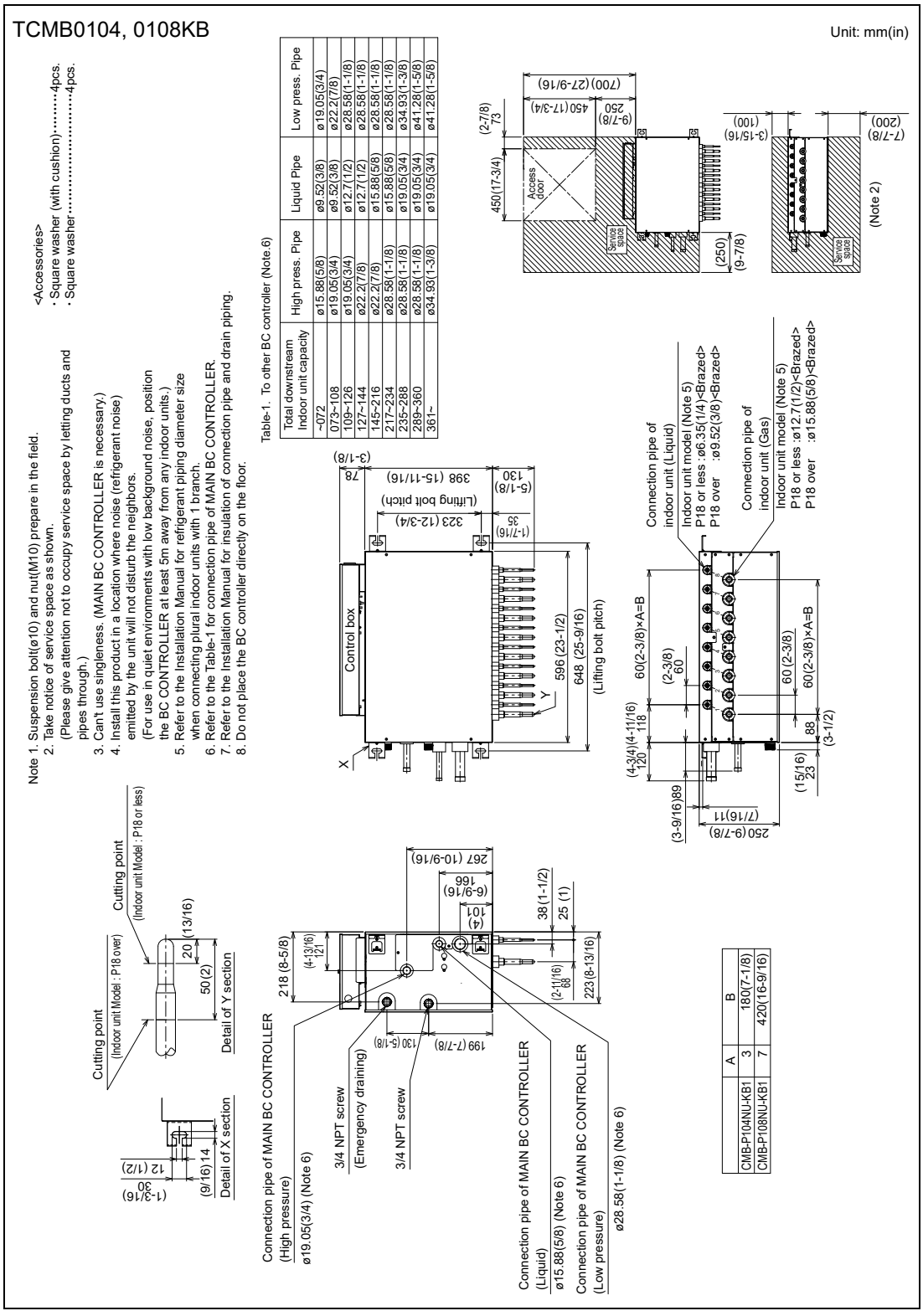
Unit: mm(in)



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MITSUBISHI ELECTRIC TRANE HVAC US

Indoor Units

TPEFYP006MA144A
MEDIUM STATIC CEILING-CONCEALED DUCTED

Job Name: **Duluth City Hall**

System Reference: 0-111, 0-112, 0-115, 0-117, 0-119, 0-121, 0-122, 0-123, 0-105, 0-106, 0-107, 1-103, 1-106, 1-125, 1-131, 1-110, 1-123, 2-103, 2-109, 2-111, 2-132, 2-114, 2-117, 2-124, 2-130, 2-136, 3-104, 3-109, 3-115, 3-122, 4-119, 4-121

Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP006MA144A
Cooling capacity (Nominal)[1]		BTU/H	6,000
Heating capacity (Nominal)[1]		BTU/H	6,700
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.042
	Heating	kW	0.04
Current	Cooling	A	0.42/0.38
	Heating	A	0.42/0.38
MCA		A	1.75
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	27-9/16 x 28-7/8 x 9-7/8 [700 x 732 x 250]
Net weight		Lbs [kg]	47 [21]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 1
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0 In. WG
	Airflow rate	CFM	212–265–300
	Motor type		DC Motor
	Motor Output	kW	0.085
	Motor FLA	A	1.4
Sound pressure level (Measured in anechoic room)³		dB(A)	24–28–30
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	1/4 [6.35] Brazed
	Gas (Low Pressure)	In. [mm]	1/2 [12.7] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP006MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MicroBlue) Mini Condensate Pump (110/208/230V) up to 18,000 BTU/H	☐ X85-003
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2” X 4” utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2” X 4” utility box] - White	☐ TAZ-MS303W
Filter	Filter Box with MERV 13 Filter	☑ FBM2-1-A
Lineset	100’ x 1/4” x 100’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-100
	15’ x 1/4” x 15’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-15
	30’ x 1/4” x 30’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-30
	50’ x 1/4” x 50’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-50
	65’ x 1/4” x 65’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-65

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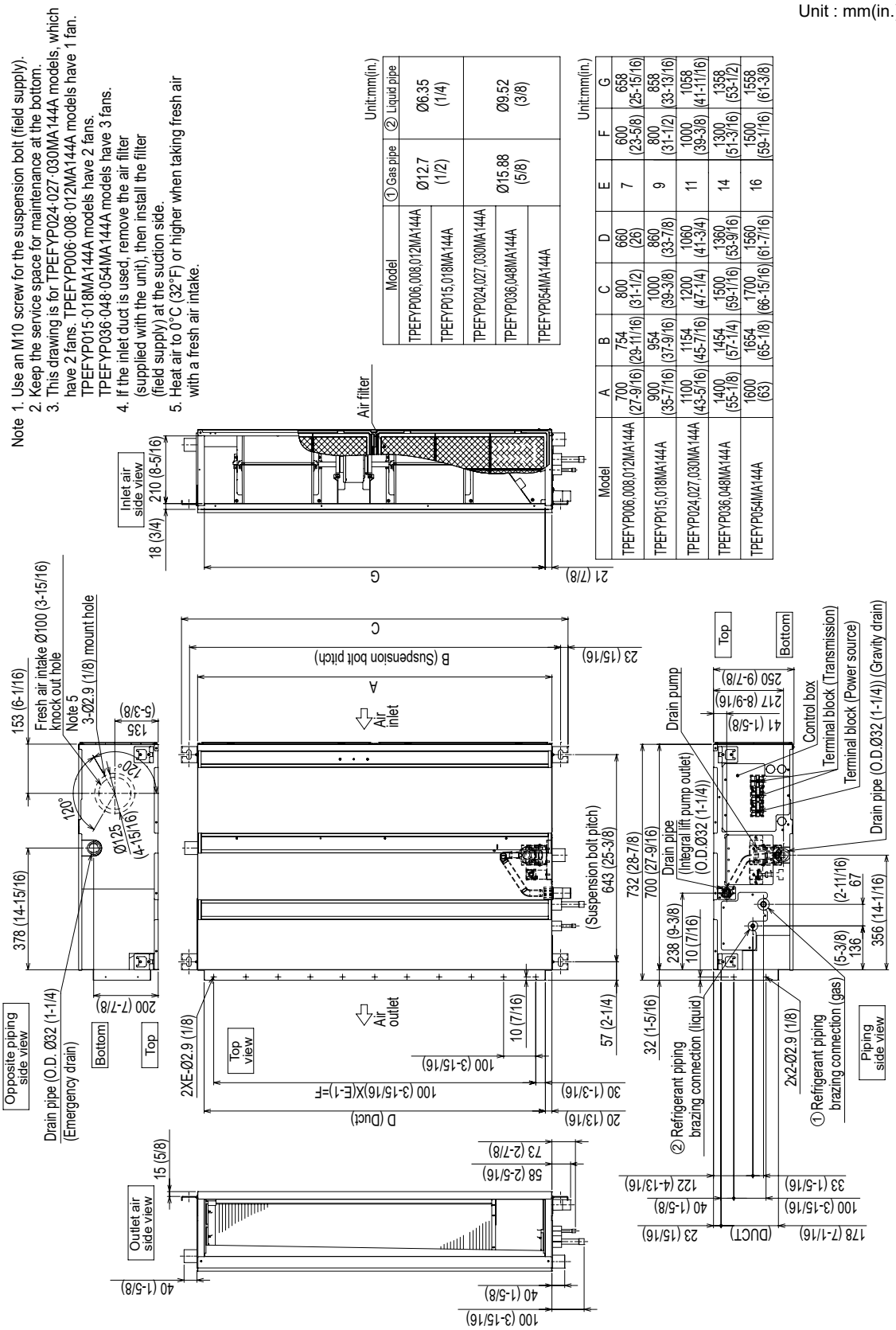
INDOOR UNIT DIMENSIONS: TPEFYP006MA144A

Unit : mm(in.)



FORM# TPEFYP006MA144A - 202107

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TPEFYP008MA144A
8,000 BTU/H MEDIUM STATIC CEILING-CONCEALED DUCTED

Job Name: **Duluth City Hall**
System Reference: 0-116, 0-120, 1-102, 1-122, 1-121, 2-102, 2-121, 3-102, 3-105, 3-124, 3-126, 4-104, 4-106, 4-113, 4-114, 4-125, 4-127, 4-132
Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP008MA144A
Cooling capacity (Nominal)[1]		BTU/H	8,000
Heating capacity (Nominal)[1]		BTU/H	9,000
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.042
	Heating	kW	0.04
Current	Cooling	A	0.42/0.38
	Heating	A	0.42/0.38
MCA		A	1.75
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	27-9/16 x 28-7/8 x 9-7/8 [700 x 732 x 250]
Net weight		Lbs [kg]	47 [21]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 1
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0.2 In. WG
	Airflow rate	CFM	212–265–300
	Motor type		DC Motor
	Motor Output	kW	0.085
	Motor FLA	A	1.4
Sound pressure level (Measured in anechoic room)[3]		dB(A)	24–28–30
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	1/4 [6.35] Brazed
	Gas (Low Pressure)	In. [mm]	1/2 [12.7] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP008MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus® Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MicroBlue) Mini Condensate Pump (110/208/230V) up to 18,000 BTU/H	☐ X85-003
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2” X 4” utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2” X 4” utility box] - White	☐ TAZ-MS303W
Filter	Filter Box with MERV 13 Filter	☑ FBM2-1-A
Lineset	100’ x 1/4” x 100’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-100
	15’ x 1/4” x 15’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-15
	30’ x 1/4” x 30’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-30
	50’ x 1/4” x 50’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-50
	65’ x 1/4” x 65’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-65

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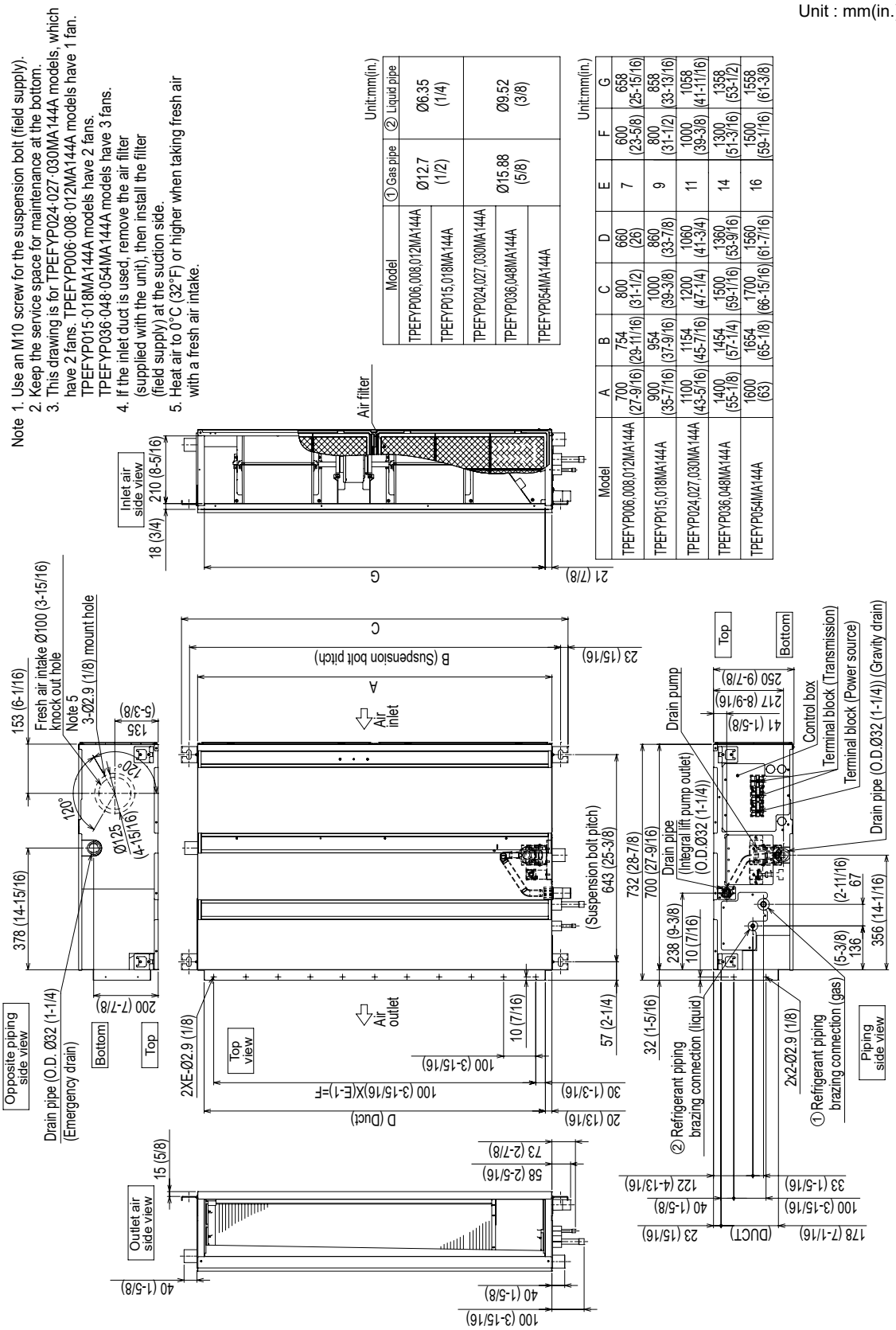
INDOOR UNIT DIMENSIONS: TPEFYP008MA144A

Unit : mm(in.)



FORM# TPEFYP008MA144A - 202110

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Job Name: **Duluth City Hall**
System Reference: 0-118, 0-102, 0-103, 0-108, 1-104, 1-109a, 1-113, 1-117, 1-124, 2-133, 2-134, 2-118, 2-120, 2-123, 2-125, 2-127, 3-128, 3-114, 3-121, 4-102, 4-105, 4-107, 4-112, 4-134, 4-120
Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP012MA144A
Cooling capacity (Nominal)[1]		BTU/H	12,000
Heating capacity (Nominal)[1]		BTU/H	13,500
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.052
	Heating	kW	0.05
Current	Cooling	A	0.56/0.51
	Heating	A	0.56/0.51
MCA		A	2.13
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	27-9/16 x 28-7/8 x 9-7/8 [700 x 732 x 250]
Net weight		Lbs [kg]	47 [21]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 1
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0 In. WG
	Airflow rate	CFM	265–318–371
	Motor type		DC Motor
	Motor Output	kW	0.085
	Motor FLA	A	1.7
Sound pressure level (Measured in anechoic room)³		dB(A)	26–30–34
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	1/4 [6.35] Brazed
	Gas (Low Pressure)	In. [mm]	1/2 [12.7] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP012MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MicroBlue) Mini Condensate Pump (110/208/230V) up to 18,000 BTU/H	☐ X85-003
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2” X 4” utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2” X 4” utility box] - White	☐ TAZ-MS303W
Filter	Filter Box with MERV 13 Filter	☑ FBM2-1-A
Lineset	100’ x 1/4” x 100’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-100
	15’ x 1/4” x 15’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-15
	30’ x 1/4” x 30’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-30
	50’ x 1/4” x 50’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-50
	65’ x 1/4” x 65’ / 1/2” Lineset (Twin-Tube Insulation)	☐ MLS141212T-65

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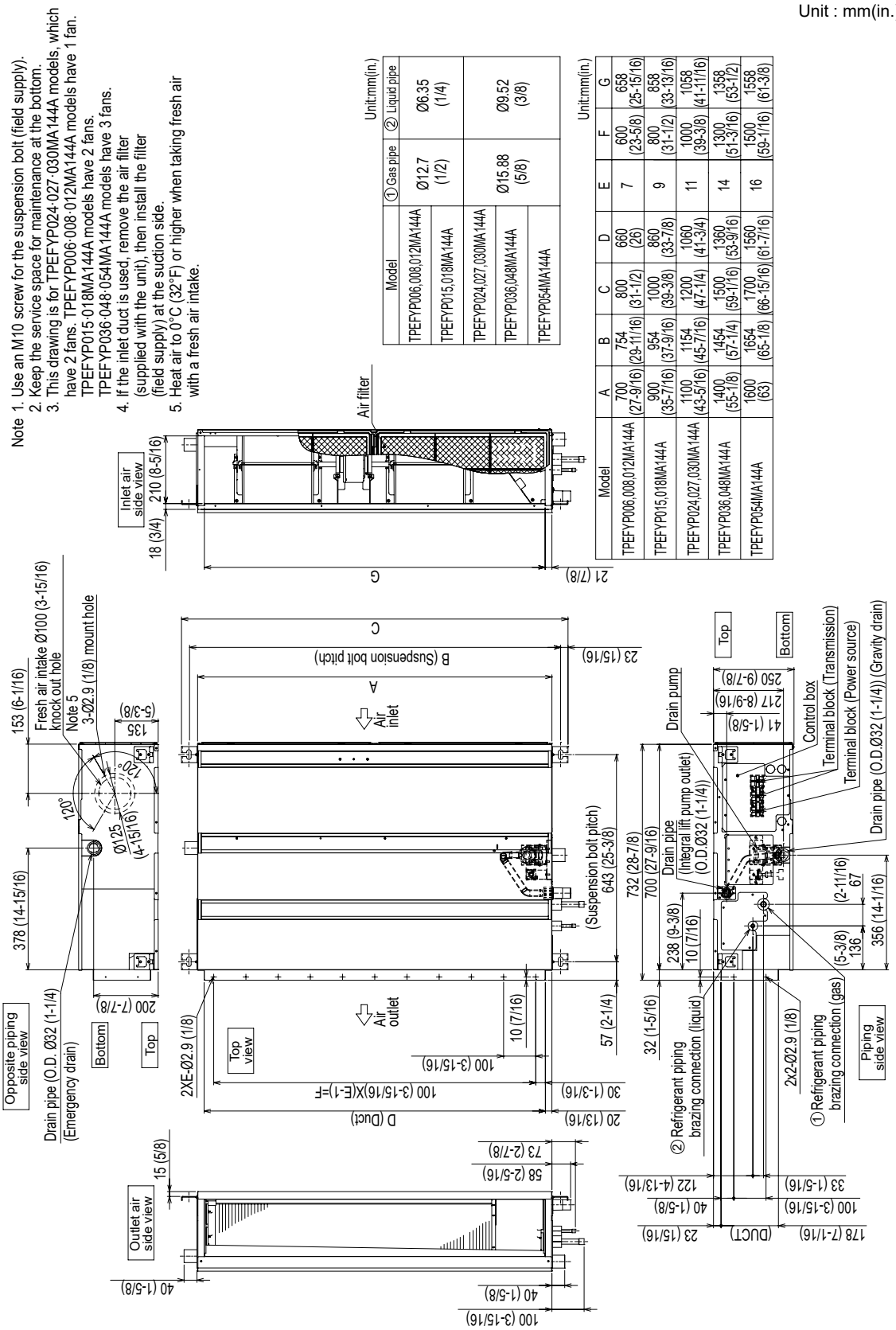
INDOOR UNIT DIMENSIONS: TPEFYP012MA144A

Unit : mm(in.)



FORM# TPEFYP012MA144A - 202107

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Job Name: **Duluth City Hall**
System Reference: 0-109, 0-113, 1-127, 1-128, 1-109b, 2-104, 2-112, 2-116, 2-126, 3-108, 3-116, 3-125, 3-127, 4-111, 4-124
Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP015MA144A
Cooling capacity (Nominal)[1]		BTU/H	15,000
Heating capacity (Nominal)[1]		BTU/H	17,000
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.062
	Heating	kW	0.06
Current	Cooling	A	0.64/0.58
	Heating	A	0.64/0.58
MCA		A	2.88
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	35-7/16 x 28-7/8 x 9-7/8 [900 x 732 x 250]
Net weight		Lbs [kg]	58 [26]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 2
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0.2 In. WG
	Airflow rate	CFM	353–424–494
	Motor type		DC Motor
	Motor Output	kW	0.121
	Motor FLA	A	2.3
Sound pressure level (Measured in anechoic room)[3]		dB(A)	27–31–34
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	1/4 [6.35] Brazed
	Gas (Low Pressure)	In. [mm]	1/2 [12.7] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP015MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus® Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Smart ME Remote Controller - Backlit touchscreen	☐ TAR-U01MEDU-K
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Controller Receiver	☐ PAR-SR32MA-E
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MicroBlue) Mini Condensate Pump (110/208/230V) up to 18,000 BTU/H	☐ X86-003
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Filter Box	Filter Box with MERV 13 Filter	☑ FBM2-2-A

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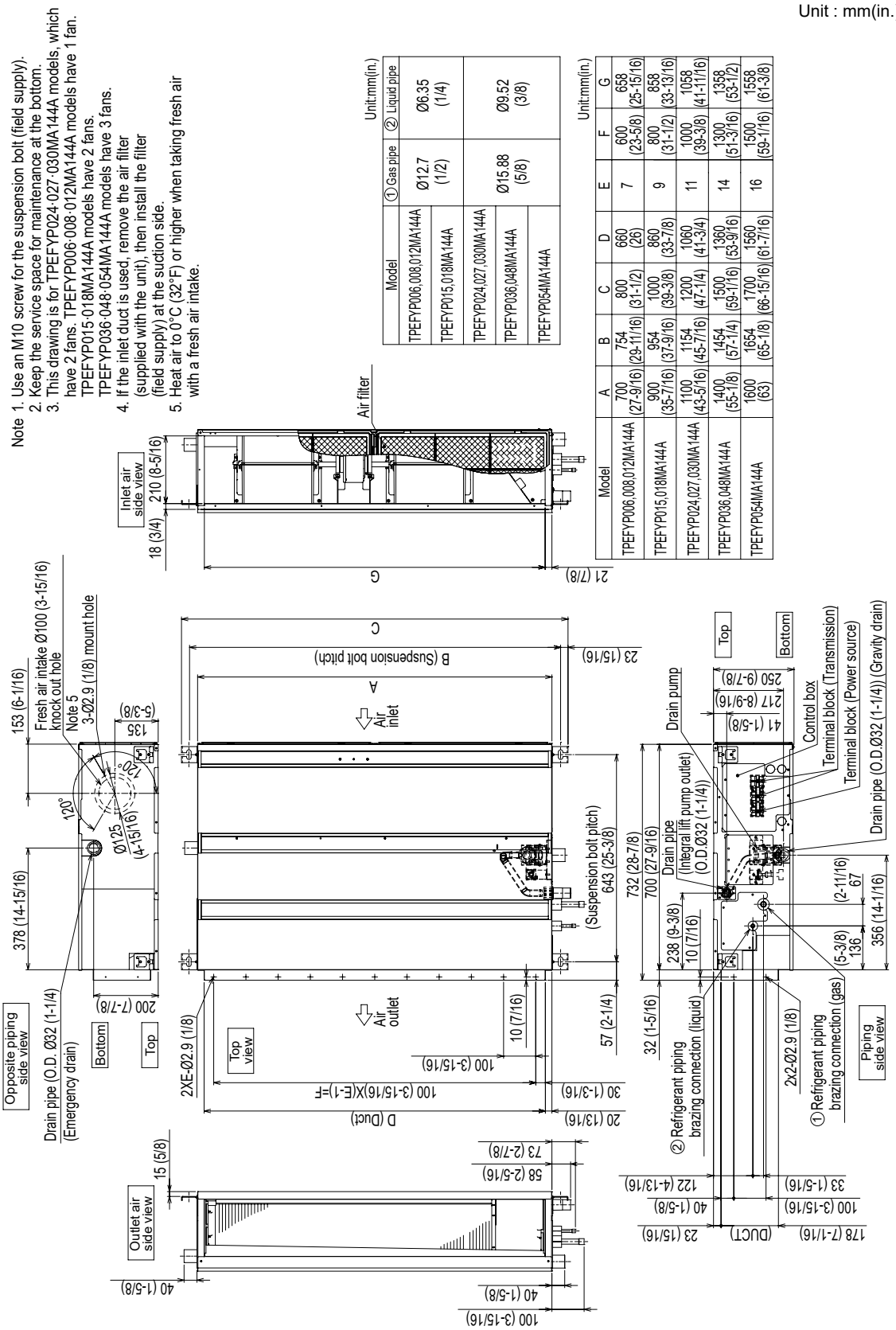
INDOOR UNIT DIMENSIONS: TPEFYP015MA144A

Unit : mm(in.)



FORM# TPEFYP015MA144A - 202201

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Job Name: **Duluth City Hall**

System Reference: 1-111, 1-112, 1-115, 1-119, 2-135, 2-129, 3-112, 3-120, 4-103, 4-108, 4-126 Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP018MA144A
Cooling capacity (Nominal)[1]		BTU/H	18,000
Heating capacity (Nominal)[1]		BTU/H	20,000
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.082
	Heating	kW	0.08
Current	Cooling	A	0.82/0.74
	Heating	A	0.82/0.74
MCA		A	2.94
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	35-7/16 x 28-7/8 x 9-7/8 [900 x 732 x 250]
Net weight		Lbs [kg]	58 [26]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 2
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0.2 In. WG
	Airflow rate	CFM	424–512–600
	Motor type		DC Motor
	Motor Output	kW	0.121
	Motor FLA	A	2.35
Sound pressure level (Measured in anechoic room)[3]		dB(A)	29–33–37
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	1/4 [6.35] Brazed
	Gas (Low Pressure)	In. [mm]	1/2 [12.7] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP018MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus® Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Smart ME Remote Controller - Backlit touchscreen	☐ TAR-U01MEDU-K
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Controller Receiver	☐ PAR-SR32MA-E
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MicroBlue) Mini Condensate Pump (110/208/230V) up to 18,000 BTU/H	☐ X86-003
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Filter Box	Filter Box with MERV 13 Filter	☑ FBM2-2-A

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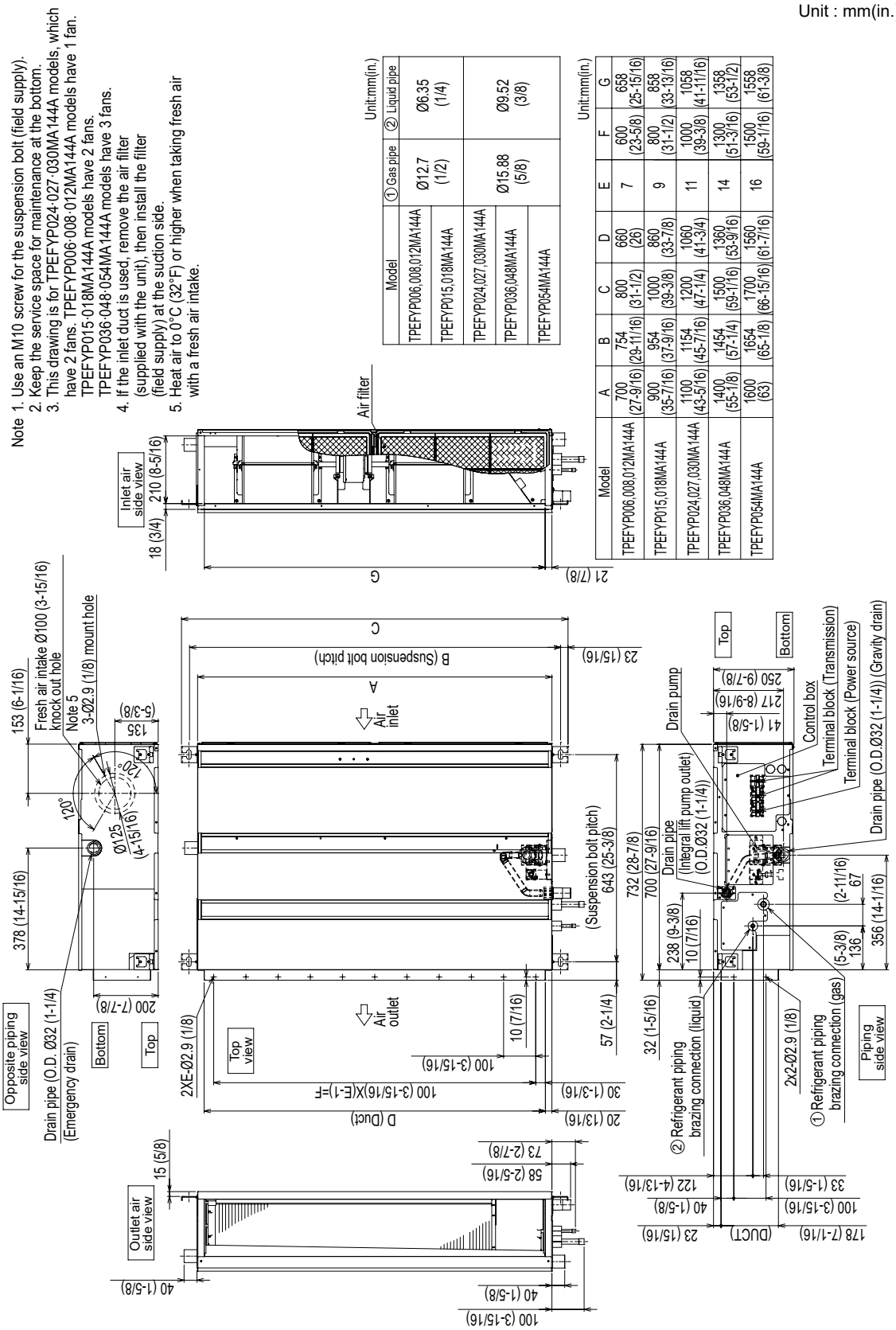
INDOOR UNIT DIMENSIONS: TPEFYP018MA144A

Unit : mm(in.)



FORM# TPEFYP018MA144A - 202201

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Job Name: **Duluth City Hall**
System Reference: 0-110, 1-101, 1-108, 1-114, 1-118, 2-101, 2-108, 2-131, 2-115, 3-103, 3-119, 3-123, 4-110, 4-123, 4-130
Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP024MA144A
Cooling capacity (Nominal)[1]		BTU/H	24,000
Heating capacity (Nominal)[1]		BTU/H	27,000
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.142
	Heating	kW	0.14
Current	Cooling	A	1.24/1.12
	Heating	A	1.24/1.12
MCA		A	2.88
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	43-5/16 x 28-7/8 x 9-7/8 [1100 x 732 x 250]
Net weight		Lbs [kg]	67 [30]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 2
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0 In. WG
	Airflow rate	CFM	618–742–883
	Motor type		DC Motor
	Motor Output	kW	0.121
	Motor FLA	A	2.3
Sound pressure level (Measured in anechoic room)³		dB(A)	31–35–39
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	3/8 [9.52] Brazed
	Gas (Low Pressure)	In. [mm]	5/8 [15.88] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP024MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MegaBlue Advanced) Condensate Pump w/ Reservoir & Sensor	☐ X87-835
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2” X 4” utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2” X 4” utility box] - White	☐ TAZ-MS303W
Filter Box	Filter Box with MERV 13 Filter	☑ FBM2-3-A
Lineset	10’ x 3/8” x 10’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-10
	100’ x 3/8” x 100’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-100
	15’ x 3/8” x 15’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-15
	30’ x 3/8” x 30’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-30
	50’ x 3/8” x 50’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-50
	65’ x 3/8” x 65’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-65

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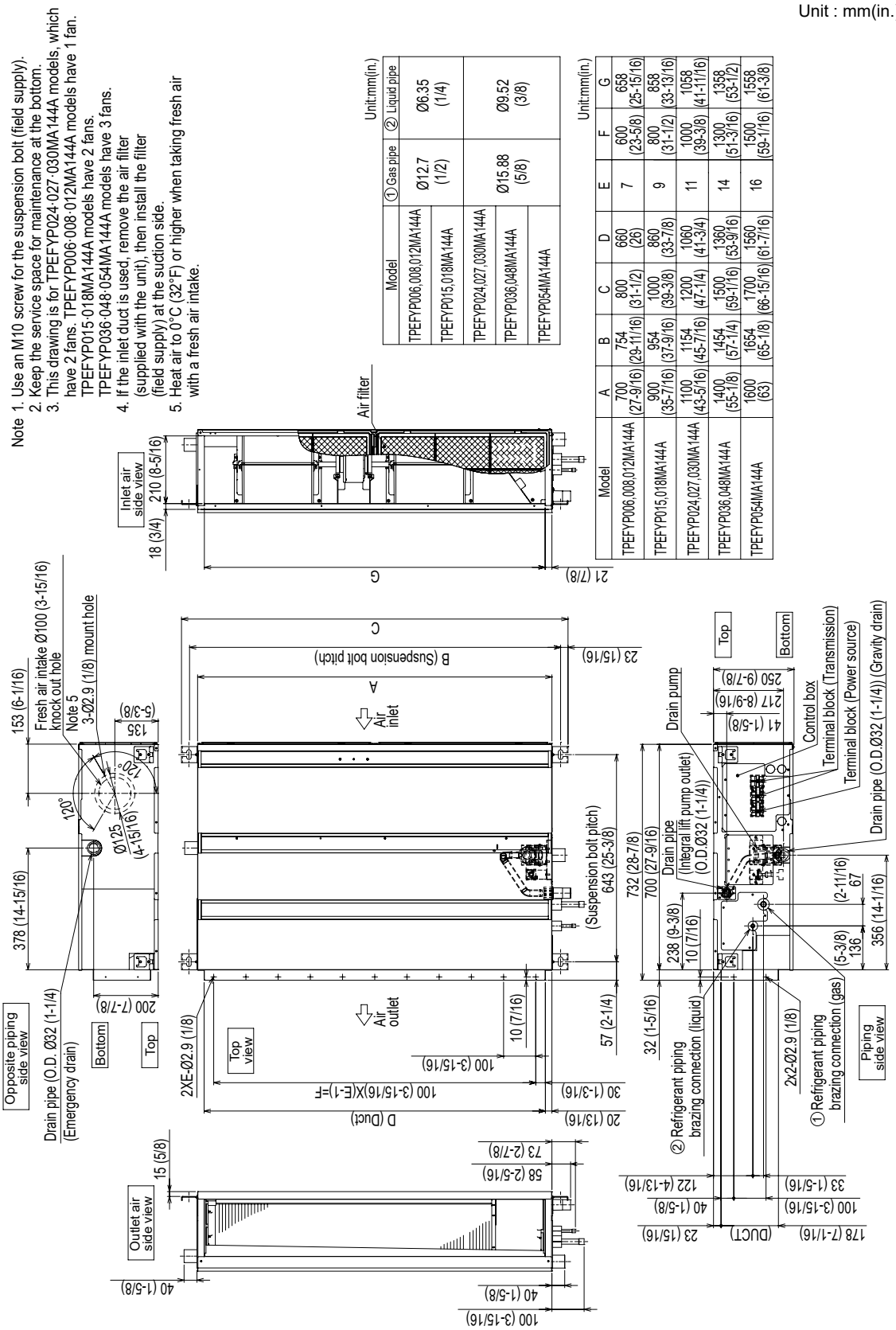
INDOOR UNIT DIMENSIONS: TPEFYP024MA144A

Unit : mm(in.)



FORM# TPEFYP024MA144A - 202107

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TPEFYP027MA144A
MEDIUM STATIC CEILING-CONCEALED DUCTED

Job Name: **Duluth City Hall**

System Reference: **2-106, 4-128**

Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP027MA144A
Cooling capacity (Nominal)[1]		BTU/H	27,000
Heating capacity (Nominal)[1]		BTU/H	30,000
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.142
	Heating	kW	0.14
Current	Cooling	A	1.24/1.12
	Heating	A	1.24/1.12
MCA		A	2.88
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	43-5/16 x 28-7/8 x 9-7/8 [1100 x 732 x 250]
Net weight		Lbs [kg]	67 [30]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 2
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0 In. WG
	Airflow rate	CFM	618–742–883
	Motor type		DC Motor
	Motor Output	kW	0.121
	Motor FLA	A	2.3
Sound pressure level (Measured in anechoic room)³		dB(A)	31–35–39
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	3/8 [9.52] Brazed
	Gas (Low Pressure)	In. [mm]	5/8 [15.88] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP027MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MegaBlue Advanced) Condensate Pump w/ Reservoir & Sensor	☐ X87-835
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2” X 4” utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2” X 4” utility box] - White	☐ TAZ-MS303W
Filter Box	Filter Box with MERV 13 Filter	☑ FBM2-3-A
Lineset	10’ x 3/8” x 10’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-10
	100’ x 3/8” x 100’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-100
	15’ x 3/8” x 15’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-15
	30’ x 3/8” x 30’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-30
	50’ x 3/8” x 50’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-50
	65’ x 3/8” x 65’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-65

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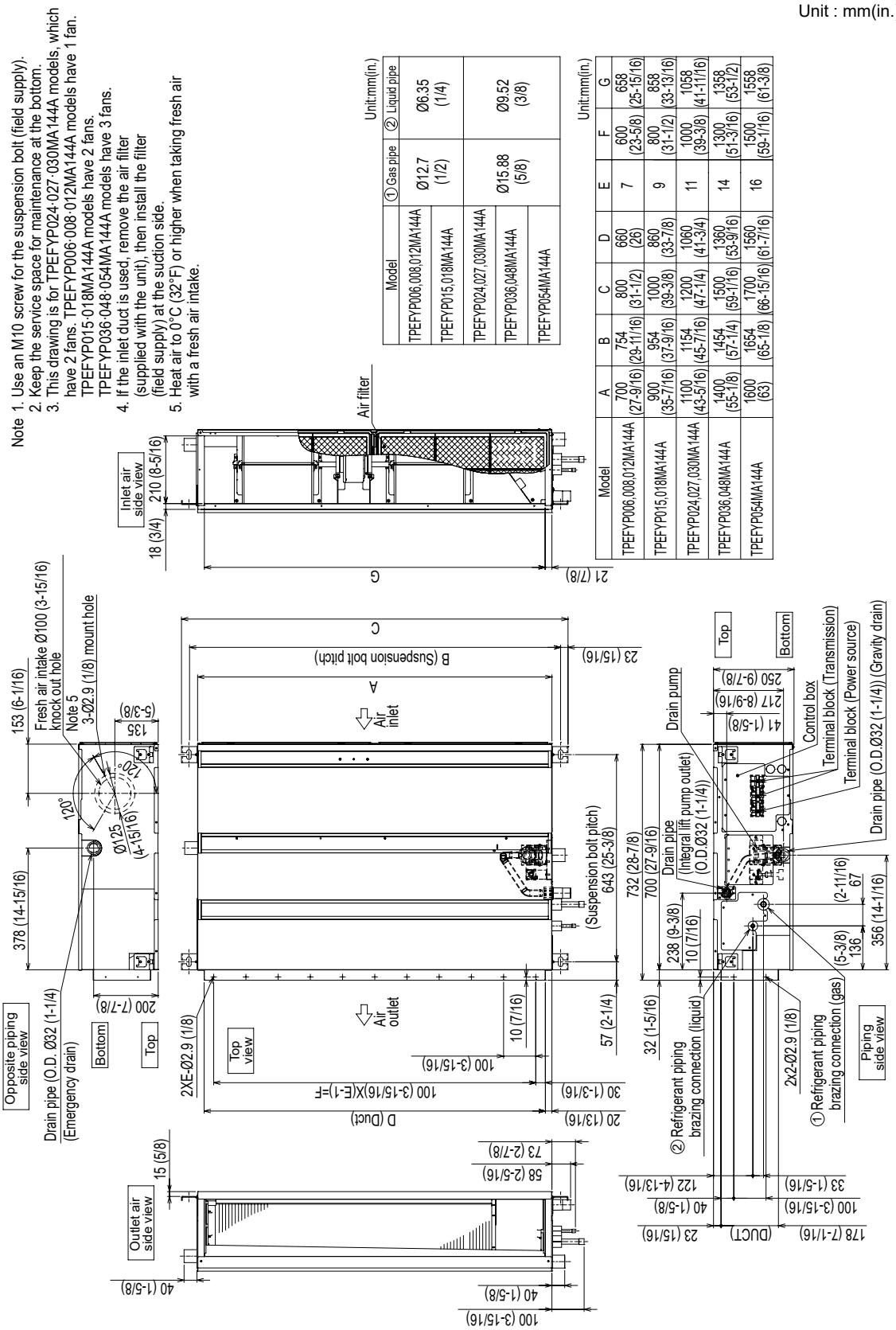
INDOOR UNIT DIMENSIONS: TPEFYP027MA144A

Unit : mm(in.)



FORM# TPEFYP027MA144A - 202107

Specifications are subject to change without notice.

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CITYMULTI®

TPEFYP030MA144A
MEDIUM STATIC CEILING-CONCEALED DUCTED

TRANE

MITSUBISHI ELECTRIC

Job Name: **Duluth City Hall**

System Reference: **3-106, 4-118**

Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP030MA144A
Cooling capacity (Nominal)[1]		BTU/H	30,000
Heating capacity (Nominal)[1]		BTU/H	34,000
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.142
	Heating	kW	0.14
Current	Cooling	A	1.24/1.12
	Heating	A	1.24/1.12
MCA		A	2.88
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	43-5/16 x 28-7/8 x 9-7/8 [1100 x 732 x 250]
Net weight		Lbs [kg]	67 [30]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 2
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0.2 In. WG
	Airflow rate	CFM	618–742–883
	Motor type		DC Motor
	Motor Output	kW	0.121
	Motor FLA	A	2.3
Sound pressure level (Measured in anechoic room)[3]		dB(A)	31–35–39
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	3/8 [9.52] Brazed
	Gas (Low Pressure)	In. [mm]	5/8 [15.88] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP030MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus® Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MegaBlue Advanced) Condensate Pump w/ Reservoir & Sensor	☐ X87-835
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2” X 4” utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2” X 4” utility box] - White	☐ TAZ-MS303W
Filter Box	Filter Box with MERV 13 Filter	☑ FBM2-3-A
Lineset	10’ x 3/8” x 10’ x 5/8” Lineset (Twin-Tube Insulation)††	☐ MPLS385812T-10
	100’ x 3/8” x 100’ x 5/8” Lineset (Twin-Tube Insulation)††	☐ MPLS385812T-100
	15’ x 3/8” x 15’ x 5/8” Lineset (Twin-Tube Insulation)††	☐ MPLS385812T-15
	30’ x 3/8” x 30’ x 5/8” Lineset (Twin-Tube Insulation)††	☐ MPLS385812T-30
	50’ x 3/8” x 50’ x 5/8” Lineset (Twin-Tube Insulation)††	☐ MPLS385812T-50
	65’ x 3/8” x 65’ x 5/8” Lineset (Twin-Tube Insulation)††	☐ MPLS385812T-65

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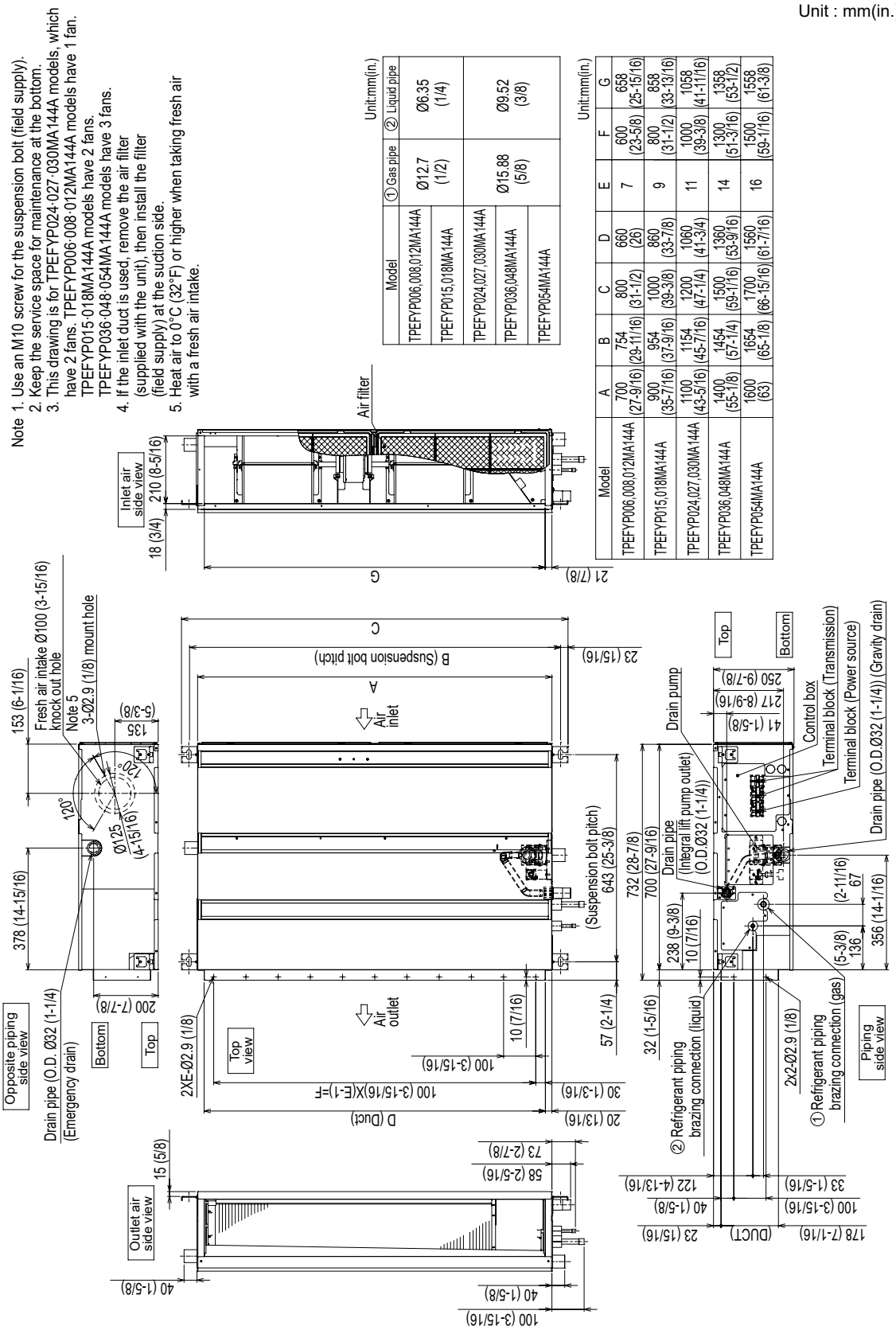
INDOOR UNIT DIMENSIONS: TPEFYP030MA144A

Unit : mm(in.)



FORM# TPEFYP030MA144A - 202110

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Job Name: **Duluth City Hall**

System Reference: **0-124, 1-129, 1-116, 3-101, 4-101, 4-116, 4-133** Date: **5-18-22**

GENERAL FEATURES

- Dual set point functionality
- Multiple fan speed settings
- Auto fan mode
- 9-7/8” (250mm) high for low ceiling heights
- Built-in condensate lift; lifts to 27-9/16” (700 mm)
- Ducted fan coil supporting multiple configurations for flexible installation

Specifications			System
Unit Type			TPEFYP036MA144A
Cooling capacity (Nominal)[1]		BTU/H	36,000
Heating capacity (Nominal)[1]		BTU/H	40,000
Power source	Voltage, Phase, Hertz		208/230V, 1-phase, 60 Hz
Power Consumption	Cooling	kW	0.222
	Heating	kW	0.22
Current	Cooling	A	2.01/1.82
	Heating	A	2.01/1.82
MCA		A	4.25
Maximum Overcurrent Protection (MOCP)		A	15
External finish			Galvanized steel sheet
External Dimensions		In. [mm]	55-1/8 x 28-7/8 x 9-7/8 [1400 x 732 x 250]
Net weight		Lbs [kg]	84 [38]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 3
	External Static pressure	in.WG	0.14, 0.2, 0.28, 0.4, 0.6 factory set to 0 In. WG
	Airflow rate	CFM	883–1077–1271
	Motor type		DC Motor
	Motor Output	kW	0.3
	Motor FLA	A	3.4
Sound pressure level (Measured in anechoic room)³		dB(A)	35–39–43
Air filter			PP Honeycomb fabric
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	3/8 [9.52] Brazed
	Gas (Low Pressure)	In. [mm]	5/8 [15.88] Brazed
Diameter of drain pipe		In. [mm]	O.D. 1-1/4 [32]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPEFYP036MA144A

Control Interface	3-Pin Connector	☐ PAC-715AD
	BACnet® and Modbus Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	Connector and wire for Operation status/error using CN51	☐ PAC-725AD
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
	Wireless Interface for kumo cloud®	☐ PAC-USWHS002-WF-2
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	☑ PAC-SE41TS-E
	Wireless temperature and humitity sensor for kumo cloud®	☐ PAC-USWHS003-TH-1
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MegaBlue Advanced) Condensate Pump w/ Reservoir & Sensor	☐ X87-835
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Disconnect Switch	(30A/600V/UL) [fits 2” X 4” utility box] - Black	☐ TAZ-MS303
	(30A/600V/UL) [fits 2” X 4” utility box] - White	☐ TAZ-MS303W
Filter Box	Filter Box with MERV 13 Filter	☑ FBM2-4-A
Lineset	10’ x 3/8” x 10’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-10
	100’ x 3/8” x 100’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-100
	15’ x 3/8” x 15’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-15
	30’ x 3/8” x 30’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-30
	50’ x 3/8” x 50’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-50
	65’ x 3/8” x 65’ x 5/8” Lineset (Twin-Tube Insulation)	☐ MPLS385812T-65

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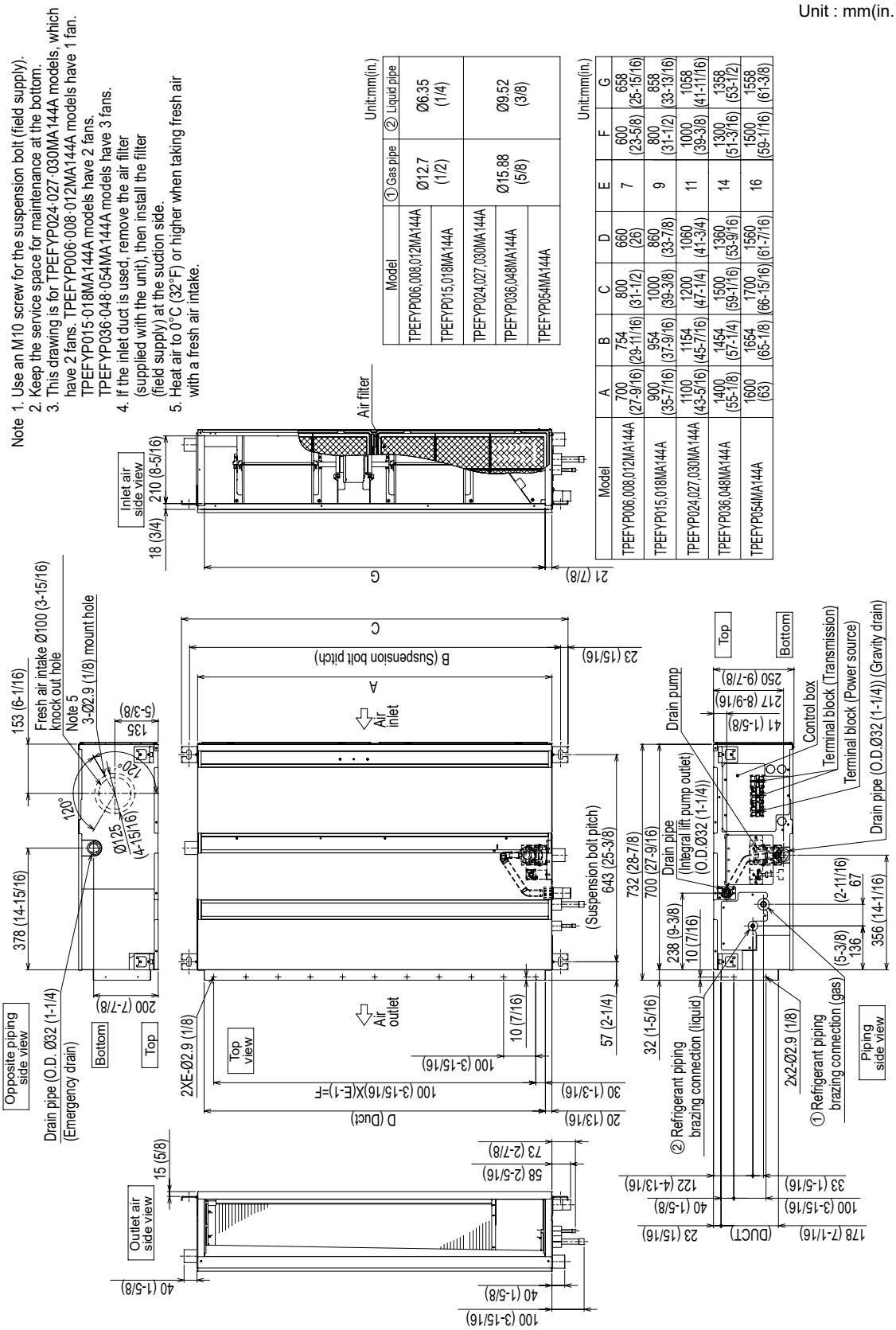
INDOOR UNIT DIMENSIONS: TPEFYP036MA144A

Unit : mm(in.)



FORM# TPEFYP036MA144A - 202107

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CITYMULTI®

TPVFYP054AM141A
54 KBTU/H MULTI-POSITION AIR HANDLER

TRANE

MITSUBISHI ELECTRIC

Job Name: **Duluth City Hall**

System Reference: **2-137A, 2-137B**

Date: **5-18-22**

GENERAL FEATURES

- Multi-position design is suitable for any application requires no additional kits, even for downflow configuration
- Highly efficient DC motor and a forward curved blower ensures quiet, consistent fan operation
- Selectable external static pressure: 0.30, 0.50 and 0.80 in.WG with 3 fan speeds at each static setting
- 1 inch R4.2 fiberglass free insulation reduces condensation and boosts efficiency
- Positive pressure cabinet with air leakage of less than 2.0% at 1.0 In.WG (Tested per ASHRAE Standard 193)
- Unique blow through design allows simple coil cleaning when the blower is removed
- Optional electric heat kit for additional heat capacity
- Optional humidifier control and ERV control

Specifications			System
Unit Type			TPVFYP054AM141A
Cooling capacity (Nominal)[1]		BTU/H	54,000
Heating capacity (Nominal)[1]		BTU/H	60,000
Power source		Voltage, Phase, Hertz	208/230V, 1-phase, 60 Hz
MCA		A	5.6
Maximum Overcurrent Protection (MOCP)		A	15
External finish			High-gloss polyester powder coated
External Dimensions		In. [mm]	25 x 21-5/8 x 59-1/2 [635 x 548 x 1511]
Net weight		Lbs [kg]	172 [78]
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Sirocco fan x 1
	External Static pressure	in.WG	0.30, 0.5, 0.8
	Airflow rate	CFM	1040–1262–1485
	Motor type		DC motor
Sound pressure level (Measured in anechoic room)		dB(A)	36–40–44
Air filter			Polypropylene Honeycomb
Diameter of refrigerant pipe (O.D.)	Liquid (High Pressure)	In. [mm]	3/8 [9.52] Brazed
	Gas (Low Pressure)	In. [mm]	5/8 [15.88] Brazed
Diameter of drain pipe		In. [mm]	FPT 3/4 [19.05]

NOTES:
[1]Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling | Indoor: 80° F (26.7° C) DB / 67° F (19.4° C) WB; Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21.1° C) DB; Outdoor 47° F (8.3° C) DB / 43° F (6.1° C) WB

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INDOOR UNIT ACCESSORIES: TPVFYP054AM141A

Control Interface	BACnet® and Modbus® Interface	☐ PAC-UKPRC001-CN-1
	CN24 Relay Kit	☐ CN24RELAY-KIT-CM3
	IT Extender	☐ PAC-WHS01IE-E
	kumo station® for kumo cloud®	☐ TAC-WHS01HC-E
	Thermostat Interface	☐ PAC-US444CN-1
Remote Sensor	Flush Mount Temperature Sensor	☐ PAC-USSEN001-FM-1
	Remote Temperature Sensor	✔ PAC-SE41TS-E
Terminal Signal Adapter	Terminal Signal Adapter	☐ PAC-IT51AD-E
	Terminal Signal Adapter	☐ PAC-IT52AD-E
Wired Remote Controller	Deluxe Wired MA Remote Controller†	☐ TAR-40MAAU
	Simple MA Remote Controller†	☐ TAC-YT53CRAU-J
	Smart ME Remote Controller - Backlit touchscreen	☐ TAR-U01MEDU-K
	Touch MA Controller†	☐ TAR-CT01MAU-SB
Wireless Remote Controller	kumo touch™ RedLINK™ Wireless Controller	☐ MHK2
	Wireless MA Controller Receiver	☐ PAR-SR32MA-E
	Wireless MA Remote Controller	☐ TAR-FL32MA-E
Condensate	Blue Diamond (Advanced) Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	☐ X87-721
	Blue Diamond (MegaBlue Advanced) Condensate Pump w/ Reservoir & Sensor	☐ X87-835
	Blue Diamond MultiTank — collection tank for use with multiple pumps	☐ C21-014
	Blue Diamond Sensor Extension Cable — 15 Ft.	☐ C13-103
	Sauermann Condensate Pump	☐ SI30-230
Electric Heat Lockout	Electric Heat Lockout	☐ ETC-211000-MIT

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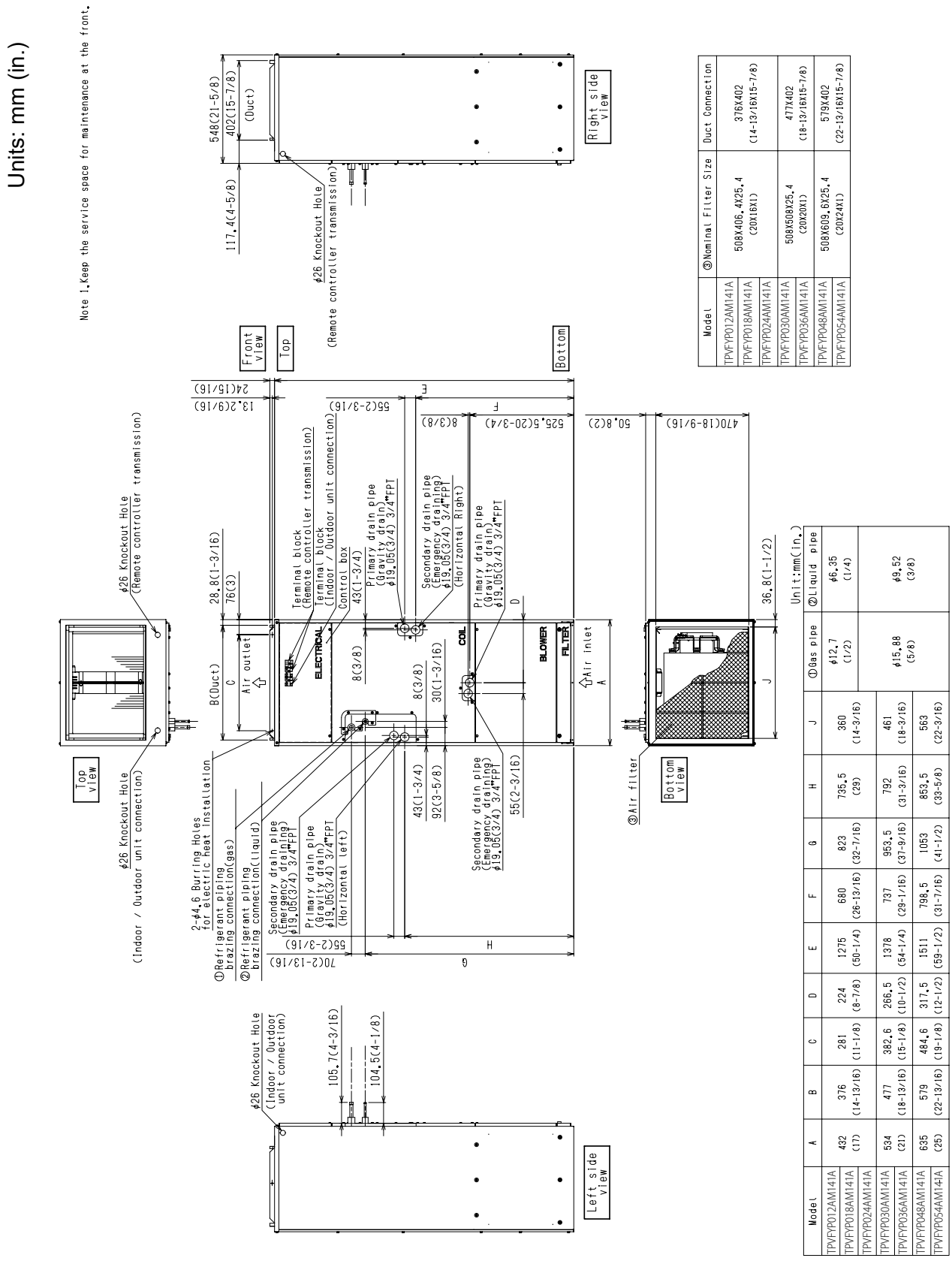
INDOOR UNIT DIMENSIONS: TPVFYP054AM141A



Model	③Nominal Filter Size	Duct Connection
TPVFYP012AM141A	508X406.4X25.4 (20X16X1)	376X402 (14-13/16X15-7/8)
TPVFYP018AM141A		
TPVFYP024AM141A		
TPVFYP030AM141A	508X508X25.4 (20X20X1)	477X402 (18-13/16X15-7/8)
TPVFYP036AM141A		
TPVFYP048AM141A	508X609.6X25.4 (20X24X1)	579X402 (22-13/16X15-7/8)
TPVFYP054AM141A		

Model	A	B	C	D	E	F	G	H	J	①Gas pipe	②Liquid pipe
TPVFYP012AM141A	432 (17)	376 (14-13/16)	281 (11-1/8)	224 (8-7/8)	1275 (50-1/4)	680 (26-13/16)	823 (32-7/16)	735.5 (29)	360 (14-3/16)	ø12.7 (1/2)	ø6.35 (1/4)
TPVFYP018AM141A											
TPVFYP024AM141A											
TPVFYP030AM141A	534 (21)	477 (18-13/16)	382.6 (15-1/8)	266.5 (10-1/2)	1378 (54-1/4)	737 (29-1/16)	953.5 (37-9/16)	792 (31-3/16)	461 (18-3/16)	ø15.88 (5/8)	ø9.52 (3/8)
TPVFYP036AM141A											
TPVFYP048AM141A	635 (25)	579 (22-13/16)	484.6 (19-1/8)	317.5 (12-1/2)	1511 (59-1/2)	798.5 (31-7/16)	1053 (41-1/2)	853.5 (33-5/8)	563 (22-3/16)		
TPVFYP054AM141A											

FORM# TPVFYP054AM141A - 202203

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Job Name: Duluth City Hall	
System Reference: 3-111	Date: 5-18-22

General Features

- Dual set point functionality
- High external static pressure capabilities
- Ducted fan coil supports multiple configurations for flexible installation
- Built-in condensate pump; lifts to 27-9/16 inches
- Suitable for use in air handling spaces in accordance with Section 18.2 of UL 1995 4th Edition

OPTIONS

- □ Condensate Pump……BlueDiamond X87-711/721; 115/230V
- □ Condensate Pump……Sauermann SI30-115/230; 115/230V
- □ Filter Box (Includes 2" MERV 13 filter)……FBH2-3
- □ CN24 Relay Kit……CN24RELAY-KIT-CM3

SPECIFICATIONS

capacity*
Cooling……54,000 Btu/h
Heating……60,000 Btu/h

Power
Power Source……208 / 230V, 1-phase, 60Hz
Power consumption*
Cooling……0.63 / 0.62 kW
Heating……0.61 / 0.60 kW
current*
Cooling……3.11 / 2.78 A
Heating……3.00 / 2.67 A
Minimum circuit ampacity (Mca)
@ 208V……4.18 A
@ 230V……3.69 A

Fuse Size……15 A

external Finish……Galvanized-steel Sheet

external Dimensions
Inches……15 H x 47-1/16 W x 35-7/16 D
mm……380 H x 1,195 W x 900 D

Net Weight……157 lbs. / 71 kg

coil Type……Cross Fin
(Aluminum Plate Fin and Copper Tube)

Fan
Type x Quantity……Sirocco Fan x 2
Airflow Rate (Low - High)……989 - 1,412 CFM
External Static Pressure
@ 208V……0.40 - 1.00"WG
@ 230V……0.60 - 1.00"WG
Motor Type……1-phase induction motor

refrigerant Piping Dimensions
Liquid (High Pressure)……3/8" / 9.52 mm (Brazed)
Gas (Low Pressure)……5/8" / 15.88 mm (Brazed)

Drainpipe Dimension……O.D. 1-1/4" / 32 mm

Sound Pressure levels
Low - High……41 - 47 dB(A)

* Cooling / Heating capacity indicated at operation under the following conditions:
Cooling | Indoor: 80° F (27° C) DB / 67° F (19° C) WB,
Cooling | Outdoor 95° F (35° C) DB
Heating | Indoor: 70° F (21° C) DB,
Heating | Outdoor 47° F (8° C) DB / 43° F (6° C) WB

Notes:

R410A

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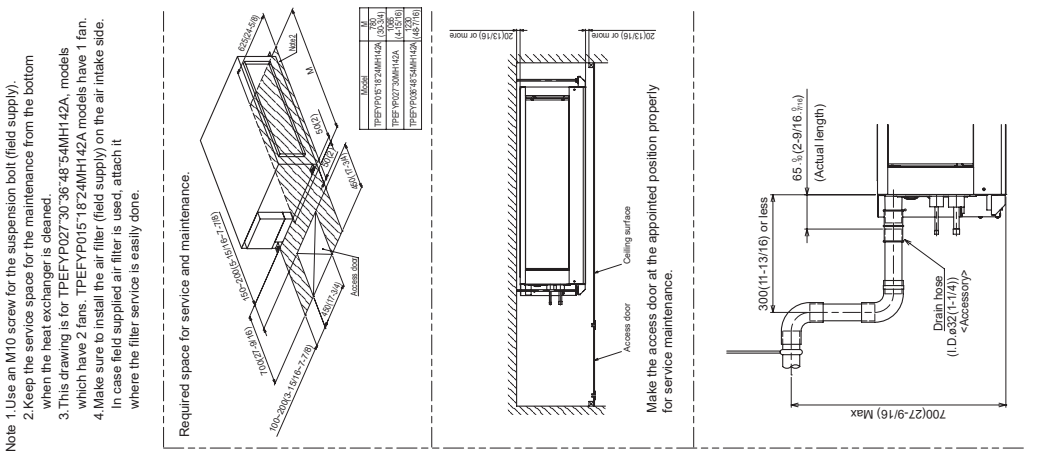
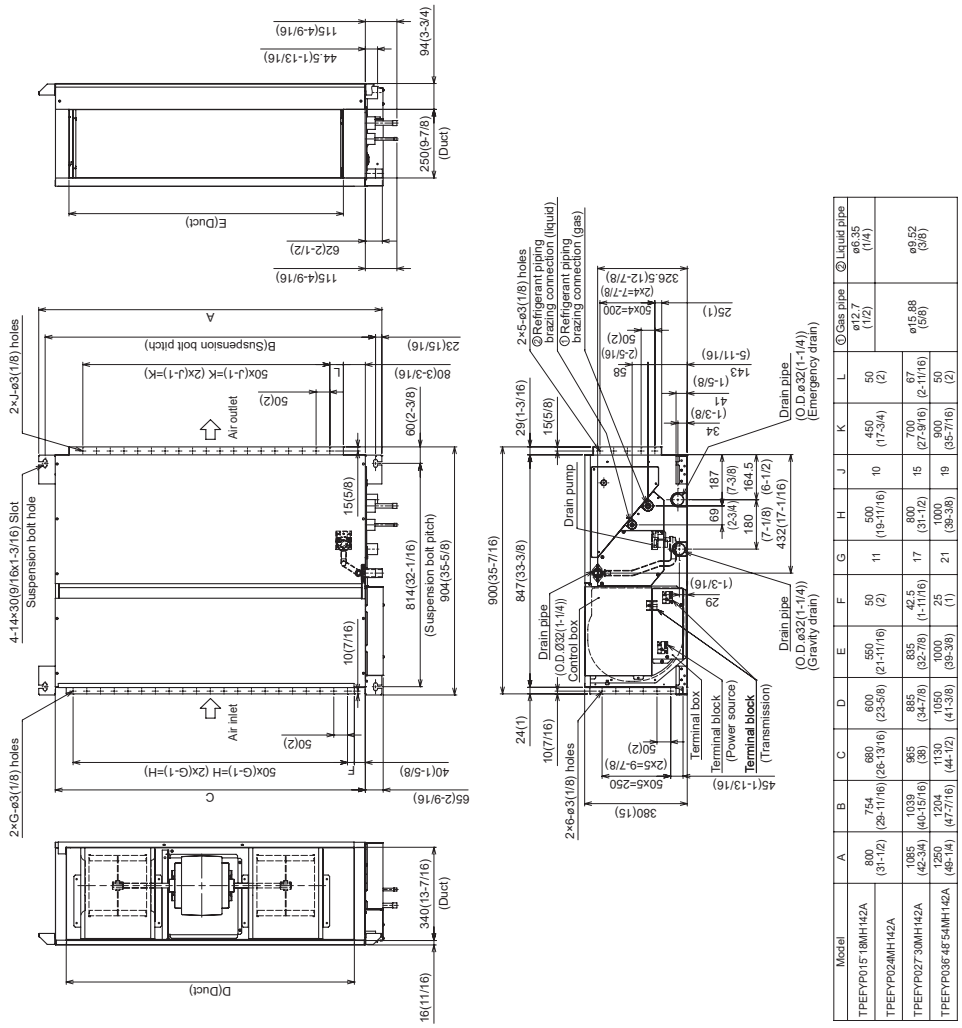
Model: TPEFYP054MH142A – DIMENSIONS

Unit :mm(in.)





Model	A	B	C	D	E	F	G	H	J	K	L	⑥Gas pipe	⑦Liquid pipe
TPEFYP015*18MH142A	800 (31-1/2)	754 (29-11/16)	880 (34-13/16)	600 (23-5/8)	550 (21-11/16)	50 (2)	11	500 (19-11/16)	10	450 (17-3/4)	50 (2)	ø12.7 (1/2)	ø6.35 (1/4)
TPEFYP024MH142A	1085 (42-3/4)	1039 (40-15/16)	965 (38)	885 (34-7/8)	835 (32-7/8)	42.5 (1-11/16)	17	800 (31-1/2)	15	700 (27-9/16)	67 (2-11/16)	ø15.88 (5/8)	ø9.52 (3/8)
TPEFYP027*30MH142A	1250 (49-1/4)	1204 (47-7/16)	1130 (44-1/2)	1050 (41-3/8)	1000 (39-3/8)	25 (1)	21	1000 (39-3/8)	19	900 (35-7/16)	50 (2)		
TPEFYP036*48*54MH142A													

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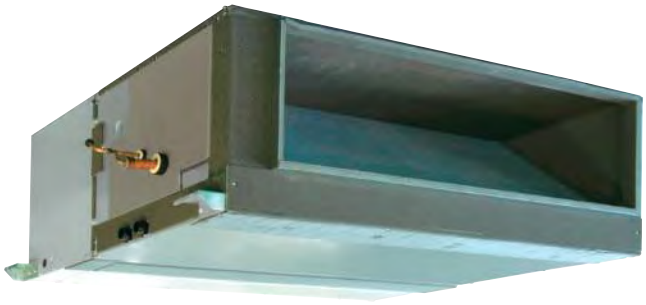
Job Name: Duluth City Hall	
System Reference: 3-110	Date: 5-18-22



General Features

- Single phase
- Dual set point functionality
- DC Motor
- Static Pressure Features
  - Adjustable up to 1”
  - No change in static pressure with voltage change
- Side access control panel
- Flexibility in duct configuration
- Choice of fan speed

Options

- ☐ Joint Adapter (Port Connector)……CMY-R160C-J
- ☐ Drain pump……PAC-KE05DM-F
- ☐ External Heater Adapter……CN24RELAY-KIT-CM3
- ☐ Filter Box (With 4” MERV 13 filter)…….....FBH4-4

Specifications

capacity*

Cooling……72,000 Btu/h
Heating……80,000 Btu/h

power

Power Source……208 / 230V, 1-phase, 60 Hz

power consumption

Cooling……0.63 kW
Heating……0.63 kW

current

Cooling……3.67/3.32A
Heating……3.67/3.32A

Minimum Circuit Ampacity (MCA)……..... 7.7 A
Maximum Overcurrent Protection (MOCP) Fuse..…..... 15 A

external Finish……..……...Galvanized-steel Sheet

external Dimensions

Inches……18-9/16 H x 49-1/4 W x 44-1/8 D
mm……470 H x 1,250 W x 1,120D

net Weight

Unit……214 lbs / 97 kg

coil Type……Cross Fin
(Aluminum Plate Fin and Copper Tube)

Fan

Type x Quantity……..……..……..Sirocco Fan x2
Airflow Rate (Low-Mid-High)……..…..1,766 - 2,154 - 2,542 CFM
External Static Pressure…… 0.20-0.40-0.60-0.80-1.00 "WG
(External static pressure is factory set to 0.60”WG)

Motor

Type……..……..……..……..DC Brushless Motor

Refrigerant Piping Dimensions

Liquid (High Pressure)……..…….....3/8" / 9.52 mm (Brazed)
Gas (Low Pressure)……..…….....3/4" / 19.05 mm (Brazed)

Drainpipe Dimension……..……..……O.D. 1-1/4" / 32 mm

Sound pressure levels (low-Mid-High)

Low-Mid-High……..……..……..……..36-39-43dB(A)

* Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
Cooling: Indoor 80°F (27°C) DB / 67°F (19°C) WB, Outdoor 95°F (35°C) DB
Heating: Indoor 70°F (21°C) DB, Outdoor 47°F (8°C) DB / 43°F (6°C) WB

Notes:

R410A

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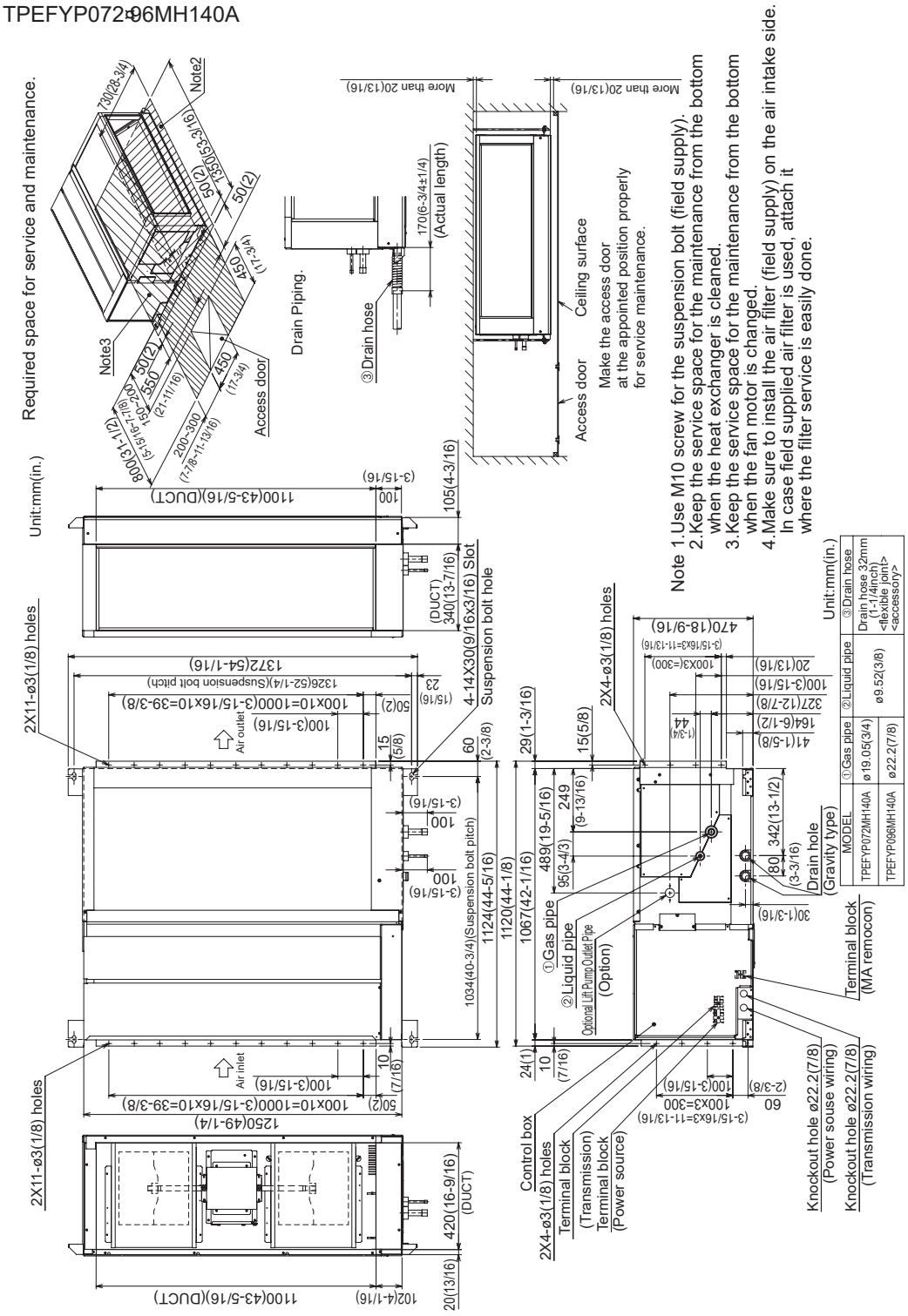
Model: TPEFYP072MH140A – DIMENSIONS

TPEFYP072•96MH140A



Specifications are subject to change without notice.

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CITYMULTI®

MODEL: TPKFYP004LM140A

Job Name: Duluth City Hall	
System Reference: 0-114	Date: 5-18-22

GENERAL FEATURES

- Dual set point functionality
- Compact, lightweight, flat-white, flat-panel, modern design
- Quiet operation
- Multiple fan speed settings
- Intake grille filter is easily removed for cleaning
- Back and right-side wiring take-out
- Wireless receiver on board

SPECIFICATIONS

Power source			1-phase, 208/230V, 60Hz
Cooling Capacity[1] (Nominal)		BTU/H	4,000
Heating Capacity[2] (Nominal)		BTU/H	4,500
Power Consumption	Cooling	kW	0.02
	Heating	kW	0.01
Current	Cooling	A	0.20
	Heating	A	0.15
Minimum Circuit Ampacity (MCA)		A	0.24
Maximum Overcurrent Protection (MOCP)		A	15
Recommended Fuse Size		A	15
External finish			Plastic, MUNSELL (0.7PB 9.2/0.4)
External Dimensions (H x W x D)		In.	11-25/32 x 30-7/16 x 9-11/32
		mm	299 x 733 x 237
Net weight		Lbs (kg)	23.6 (10.7)
Heat exchanger			Cross fin (Aluminum fin and copper tube)
Fan	Type x quantity		Line flow fan x 1
	External Static pressure	in.WG	0
	Airflow rate	CFM	117-124-134-148
	Motor type		DC Motor
	Motor Output	kW	0.030
	Motor FLA	A	0.19
Sound pressure level (Measured in anechoic room)[3]		dB(A)	22-24-26-28
Air filter			PP honeycomb
Diameter of refrigerant pipe (O.D.)	Liquid (R410A)	in. (mm)	1/4 (6.35) Flare
	Gas (R410A)	in. (mm)	1/2 (12.70) Flare
Diameter of drain pipe		in. (mm)	I.D. 5/8 (16)

Notes

Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:

[1]Cooling | Indoor: 81° F (27° C) DB / 66° F (19°C) WB; Outdoor 95° F (35° C) DB

[2]Heating | Indoor: 68° F (20° C) DB; Outdoor 45° F (7° C) DB / 43° F (6° C) WB

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ACCESSORIES: TPKFYP004LM140A

Wireless Signal Receiver	□ PAR-SR32MA-W
Wireless Signal Receiver	□ PAR-FA32MA-E
Wireless Remote Controller	□ TAR-FL32MA-E
kumo touch™ RedLINK™ Wireless Controller	□ MHK2
Deluxe MA Remote Controller	□ TAR-40MAAU
Simple MA Controller	□ TAC-YT53CRAU-J
Touch MA Controller	□ TAR-CT01MAU-SB
Wired Remote Sensor	■ PAC-SE41TS-E
Terminal Signal Adapter	□ PAC-IT52AD-E
Terminal Signal Adapter	□ PAC-IT51AD-E
Wireless Temperature and Humidity Sensor	□ PAC-USWHS003-TH-1
Flush Mount Remote Temperature Sensor	□ PAC-USSEN001-FM-1
System Control Interface	□ MAC-334IF-E
Wireless Interface 2	□ PAC-USWHS002-WF-2
Thermostat Interface	□ PAC-US444CN-1
kumo station®	□ TAC-WHS01HC-E
USNAP Interface	□ PAC-WHS01UP-E
IT Extender	□ PAC-WHS01IE-E
BACnet® and MODBUS® Interface	□ PAC-UKPRC001-CN-1
External Fan / Heater Control Relay Adapter	□ CN24RELAY-KIT-CM3
Wire for Remote on/off with CN32 connector	□ PAC-715AD
Connector and wire for Operation status/error using CN51	□ PAC-725AD
Connector cable for remote display	□ PAC-SA88HA-EP
Wire for Remote on/off with CN32 connector	□ PAC-715AD
Remote Operation Adapter[1]	□ PAC-SF40RM-E
3D i-see Sensor® Corner Panel	□ PAC-SF1ME-E
Grille with 3D i-see Sensor®	□ SLP-18FAEU
Installation/Trim Panels	□ PLFY-ITP2
Space Panel	□ PAC-SJ38AS-E
Bottom Return Plate (Converts low-profile ducted indoor unit from rear return to bottom return)	□ BRP-1
Blue Diamond Sensor Extension Cable — 15 Ft.	□ C13-103
Blue Diamond MultiTank — collection tank for use with multiple pumps	□ C21-014
Mini Condensate Pump — 230 volt application	□ SI30-230
Advanced Blue Diamond Mini Condensate Pump w/ Reservoir & Sensor (208/230V) [recommended]	□ X87-721 - 208/230V
(30A/600V/UL) [fits 2" X 4" utility box] - Black	□ TAZ-MS303
(30A/600V/UL) [fits 2" X 4" utility box] - White	□ TAZ-MS303W

[1] Unable to use with wireless remote controller

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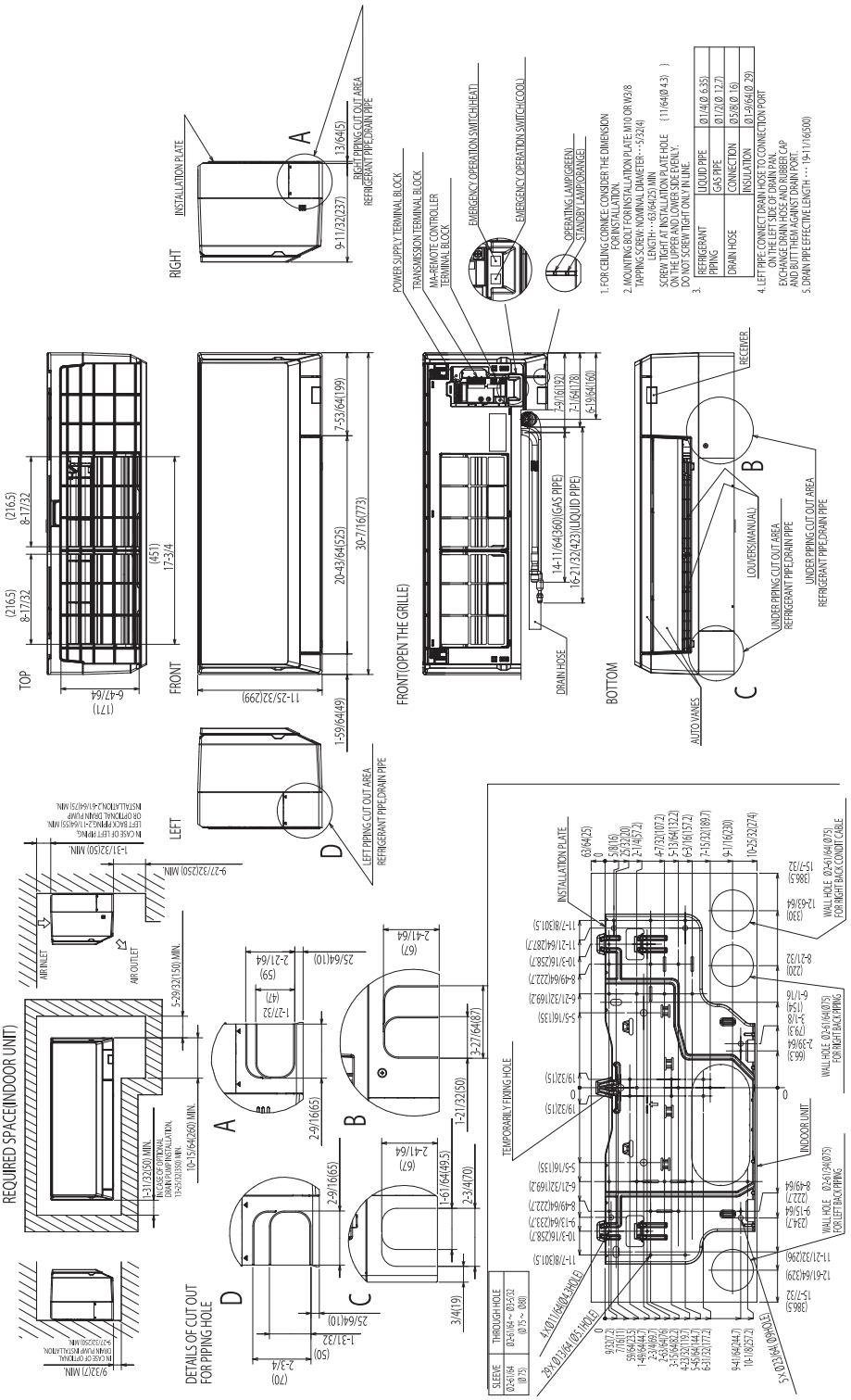
DIMENSIONS: TPKFYP004LM140A

Unit: in(mm)



FORM# TPKFYP004LM140A - 202003

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MITSUBISHI ELECTRIC TRANE HVAC US

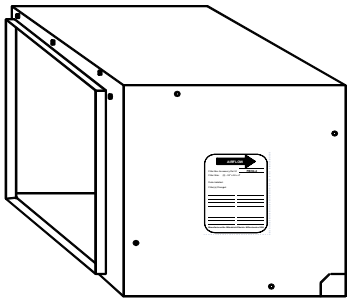
Accessories

Job Name: Duluth City Hall

Schedule Reference: High Static MERV 13 | Date: 5-18-22

GENERAL FEATURES

Meets LEED requirement of MERV 13



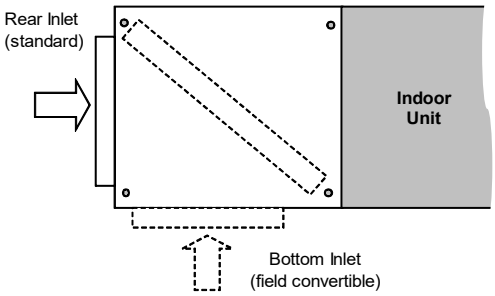
- Filter box includes 4" thick pleated MERV 13 filter(s) installed
  Rated MERV 13 when tested in accordance with ANSI/ASHRAE 52.2 Standard
  Rated Class 2 under U.L. Standard 900
- Cabinet is constructed of non-insulated 20 gauge G-60 galvanized steel
- Knurled thumb screws on access door allows easy filter replacement
- Foam gasket provides air-tight connection to indoor unit and access door
- Gasket material complies with UL 723 requirements
- Screw-through cabinet design for secure attachment to indoor unit
- Return connection in rear easily field converted to bottom
- Filter access door includes area to record maintenance schedule

SPECIFICATIONS

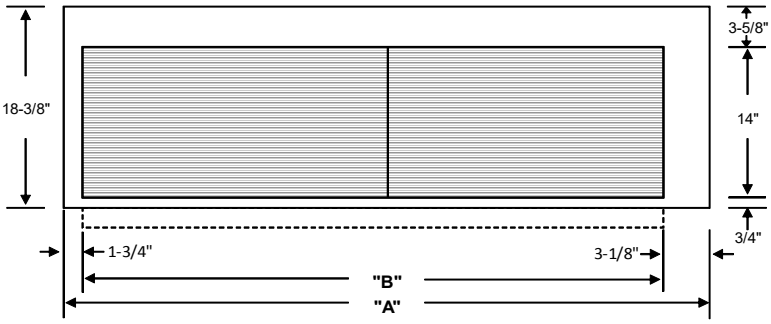
Part Number	Used on CITY MULTI Models	Filters Included	Ship Weight lbs.	Net Weight lbs.
FBH4-4	PEFY-P72, P96NMHSU-E	(2) - 24" x 24" x 4" MERV 13	44	40

EXTERNAL DIMENSIONS

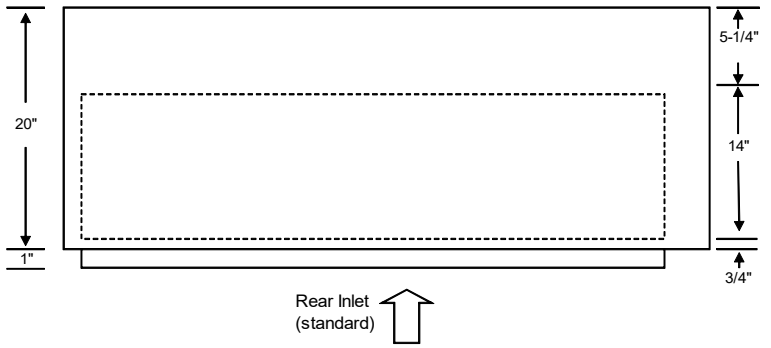
End View



Back View (inlet air)



Top View



Model	"A"	"B"
FBH4-4	49-3/8"	44-1/2"

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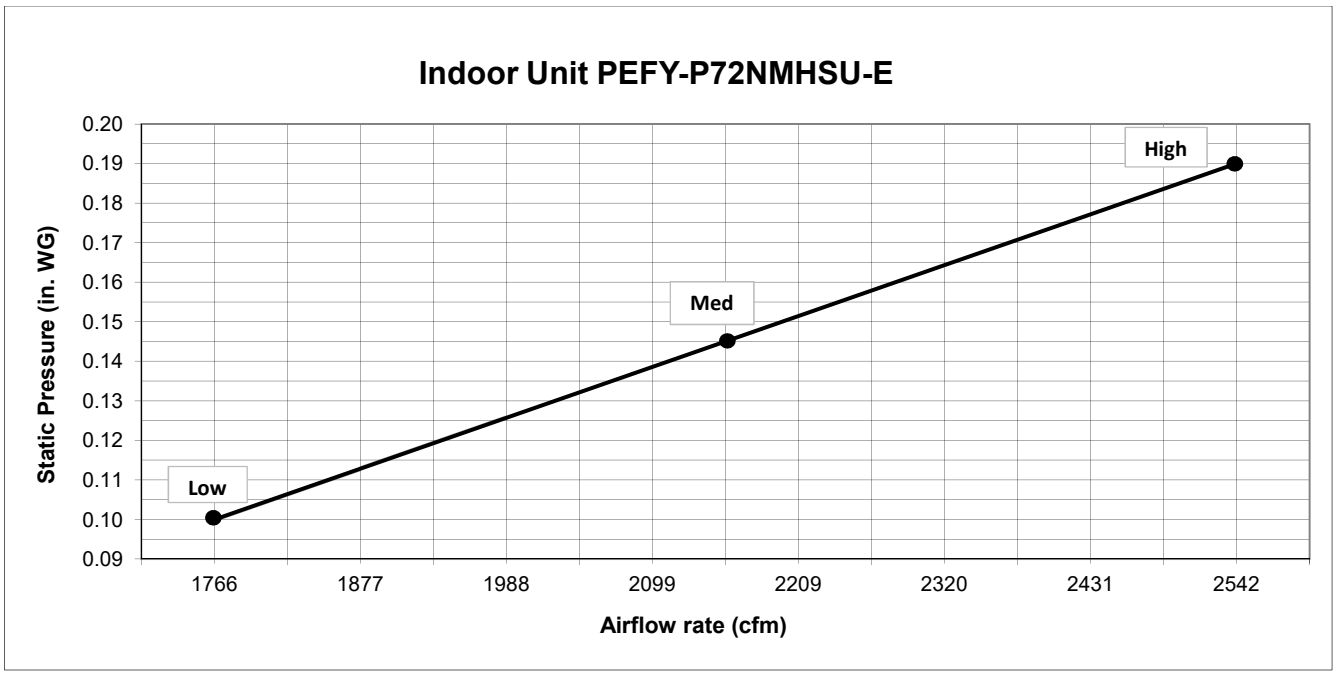
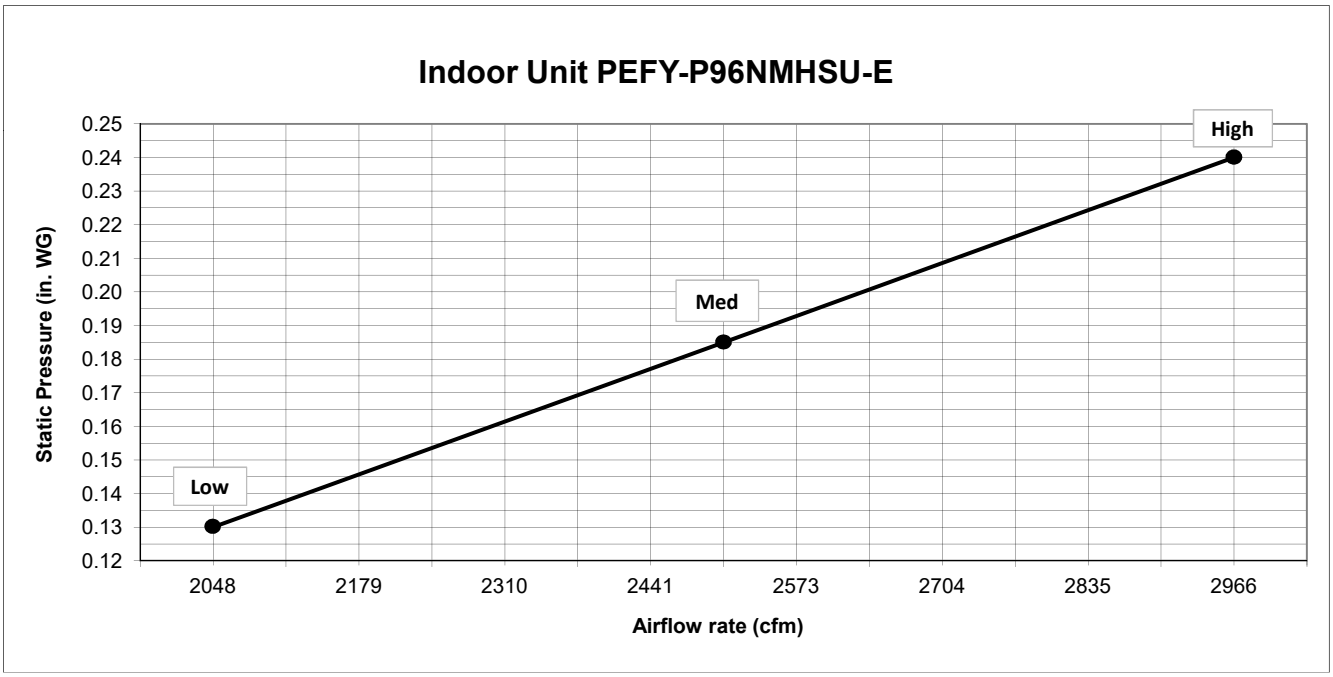
Initial Filter Pressure Drop with 4" MERV 13 Filter(s) Installed





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FORM# FBM Filter Boxes for PEFY-P72,96-NMHSU-E Indoor Units- 201402
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FBH Series Filter Boxes

Manufactured for MITSUBISHI ELECTRIC US, INC.

CITY MULTI® PEFY-P-NMHU-E2 HIGH-STATIC INDOOR UNITS

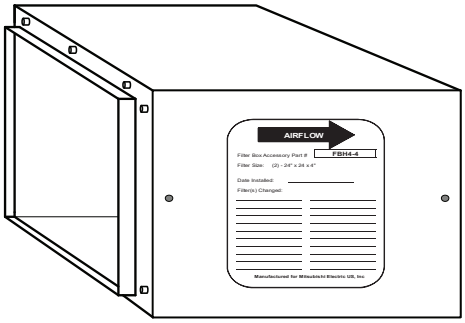
Job Name: Duluth City Hall

Schedule Reference: High Static MERV 13 | Date: 5-18-22

GENERAL FEATURES

- All filter boxes include 2” thick pleated MERV 13 filter(s) installed
  - Rated MERV 13 when tested in accordance with ANSI/ ASHRAE 52.2 Standard
  - Rated Class 2 under U.L. Standard 900
- Cabinet is constructed of non-insulated 20 gauge G-60 galvanized steel
- Knurled thumb screws on access door allow easy filter replacement
- Foam gasket provides air-tight connection to indoor unit and access door
- Gasket material complies with UL 723 requirements
- Screw-through cabinet design for secure attachment to indoor unit
- Return connection in rear easily field converted to bottom
- Filter access door includes area to record maintenance schedule

Meets LEED requirement of MERV 13

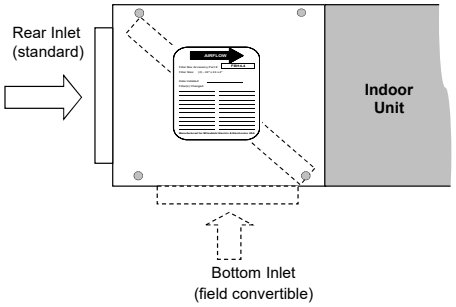


SPECIFICATIONS

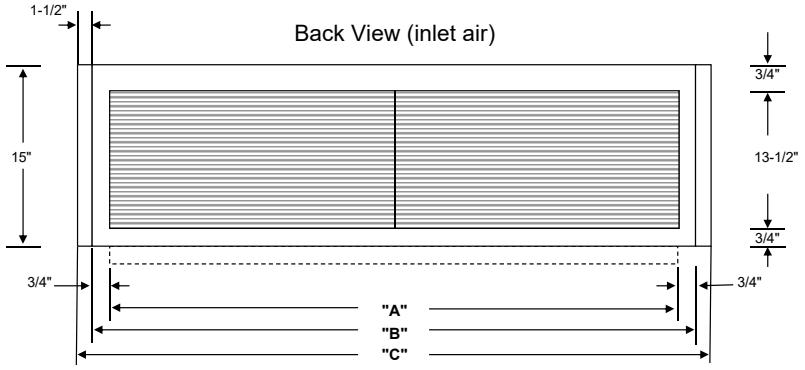
Part Number	Use on CITY MULTI Models	Filters Included	Ship Weight (lbs.)	Net Weight (lbs.)
FBH2-1	PEFY-P15, P18, P24-NMHU-E2	(1) - 20" x 24" x 2"	16	14
FBH2-2	PEFY-P27, P30-NMHU-E2	(1) - 20" x 16" x 2", (1) - 20" x 20" x 2"	26	24
FBH2-3	PEFY-P36, P48 P54-NMHU-E2	(2) - 20" x 20" x 2"	29	27

EXTERNAL DIMENSIONS

End View

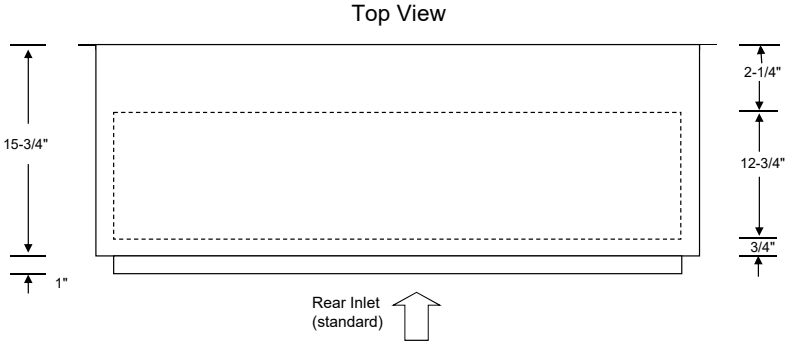


Back View (inlet air)



Model	"A"	"B"	"C"
FBH2-1	22-1/4"	23-3/4"	26-3/4"
FBH2-2	33-1/2"	35"	38"
FBH2-3	40"	41-1/2"	44-1/2"

Top View



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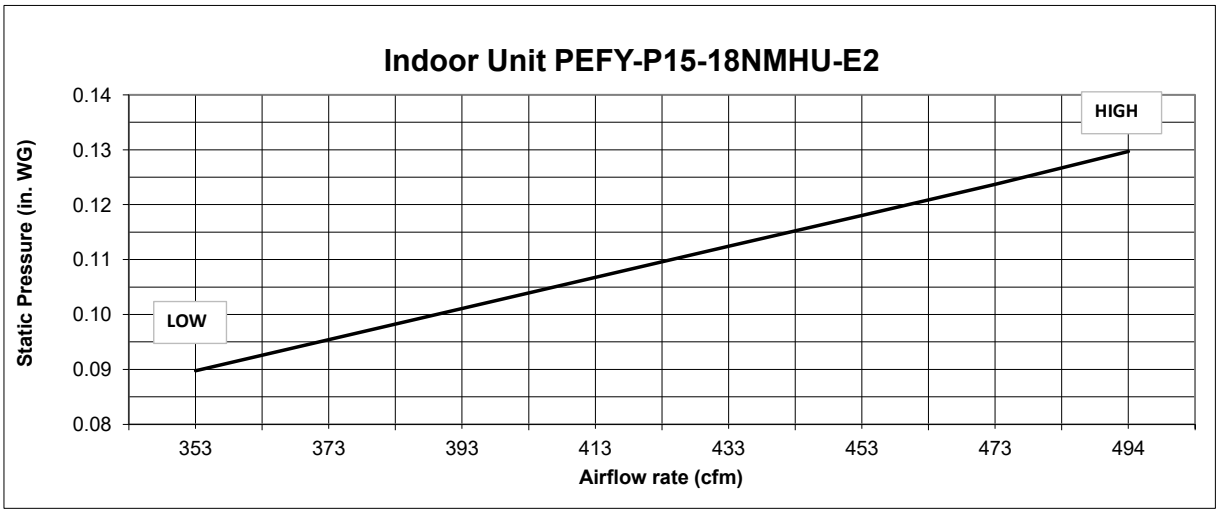
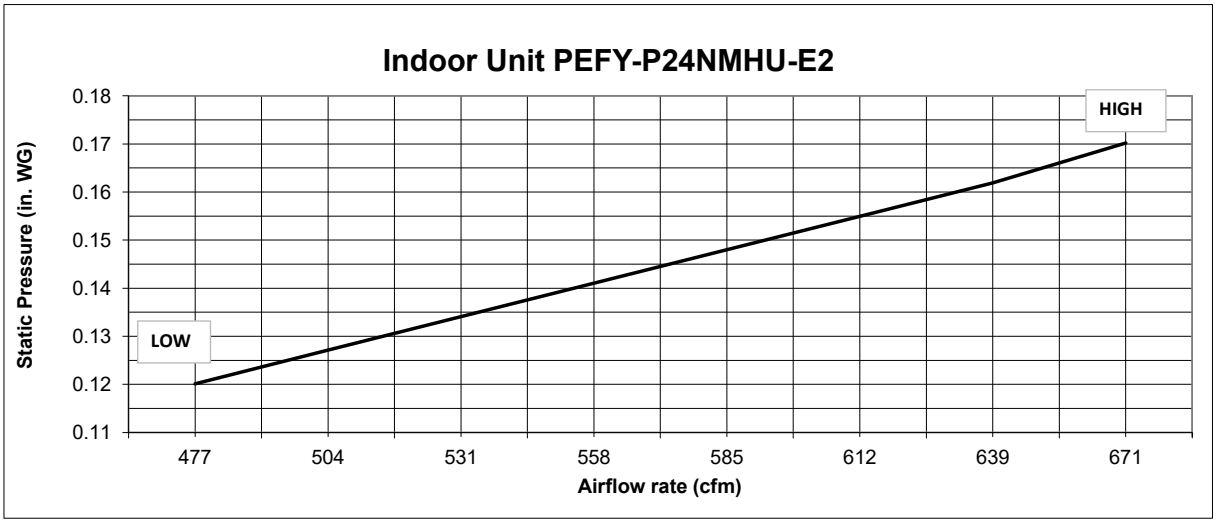
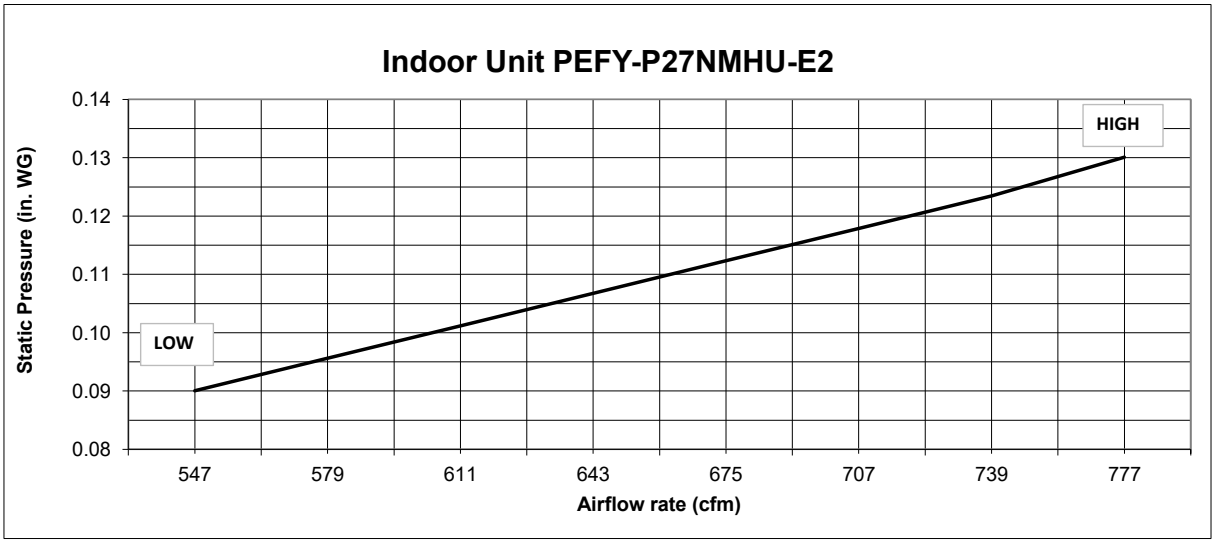
Initial Filter Pressure Drop with 2" MERV 13 Filter(s) Installed







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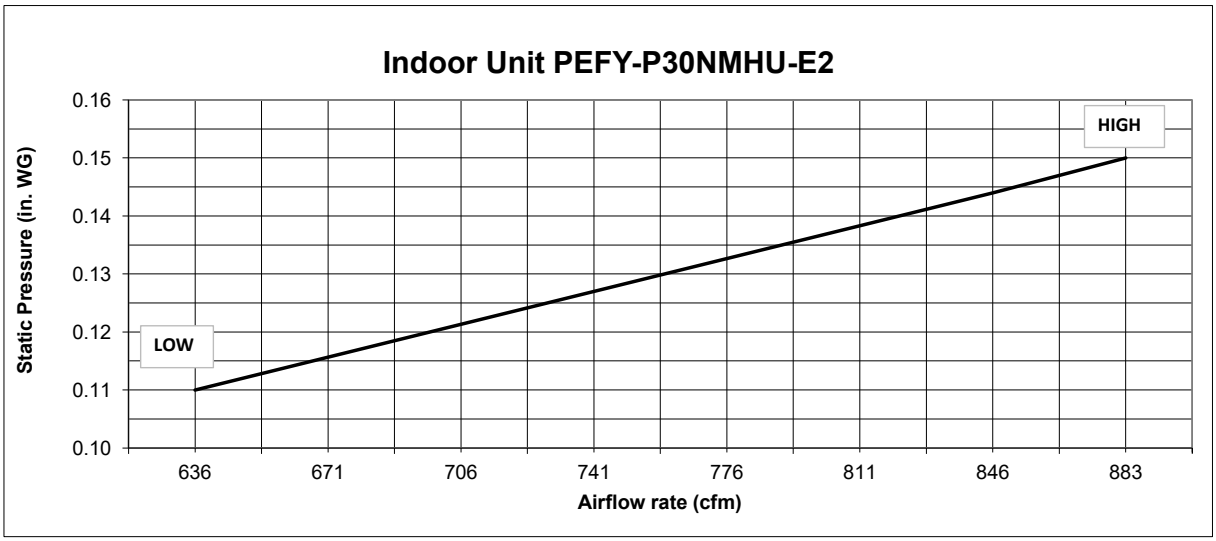
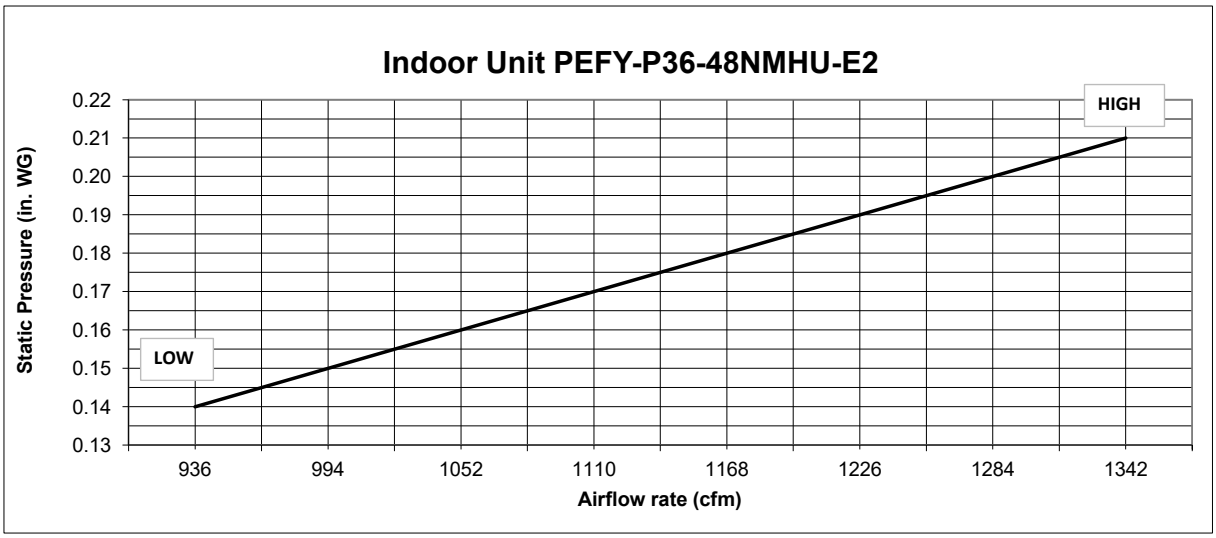
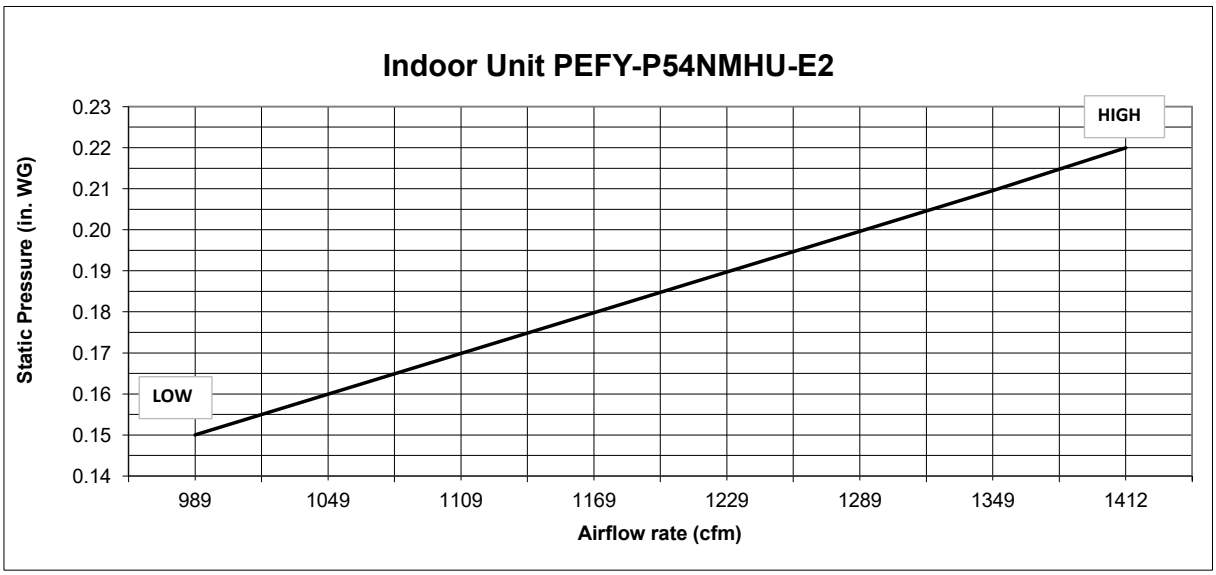
Initial Filter Pressure Drop with 2" MERV 13 Filter(s) Installed







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FBM Series Filter Boxes

Manufactured for MITSUBISHI ELECTRIC US, INC.

CITY MULTI® TPEFYP***MA143A and Nv-P PEAD-A*AA7 Medium-Static Indoor Units

Job Name: **Duluth City Hall**

System Reference: **Medium Static MERV 13** Date: **5-18-22**

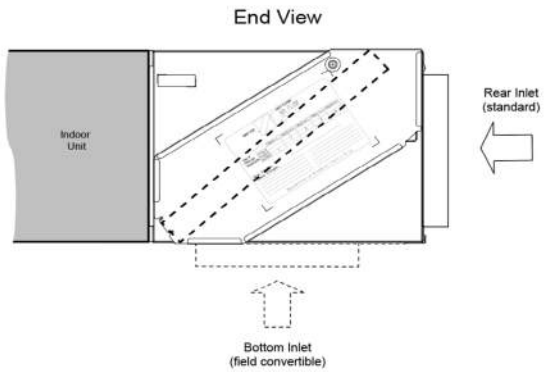
FBM

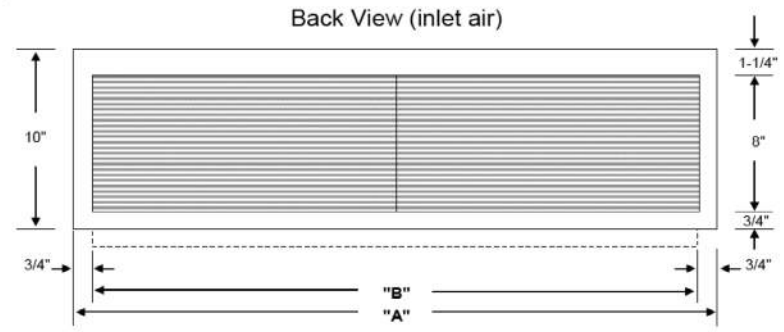
PRODUCT OVERVIEW

- FBM filter boxes include 2" thick pleated MERV 13 filter(s) installed
  - Rated MERV 13 when tested in accordance with ANSI/ASHRAE 52.2 Standard
  - Rated Class 2 under UL Standard 900
- Low static loss design
- Cabinet is constructed of non-insulated G-60 galvanized steel
- Knurled thumb screws on access door allow easy filter replacement
- Cabinet may be inverted to locate access from other side
- Foam gasket provides airtight connection to indoor unit and access door
- Gasket material complies with UL 723 requirements
- Screw-through cabinet design for secure attachment to indoor unit
- Return connection in rear easily field converted to bottom return
- Filter access door includes area to record maintenance schedule

Part Number	Used on CITY MULTI® Models	Used on Nv- and P-Series Ducted Models	Filters Included	Net Weight lbs.
FBM2-1-A	TPEFYP006, 008, 012MA143A	—	(1) - 14" x 25" x 2"	20
FBM2-2-A	TPEFYP015, 018MA143A	PEAD-A09, A12, A15, 18AA7	(1) - 14" x 20" x 2" (1) - 14" x 14" x 2"	24
FBM2-3-A	TPEFYP024, 027, 030MA143A	PEAD-A24, 30AA7	(2) - 14" x 20" x 2"	29
FBM2-4-A	TPEFYP036, 048MA143A	PEAD-A36, 42AA7	(2) - 14" x 20" x 2" (1) - 14" x 14" x 2"	35
FBM2-5-A	TPEFYP054MA143A	—	(3) - 14" x 20" x 2"	37

FBM DIMENSIONS





Part Number	"A"	"B"
FBM2-1-A	27 - 5/8"	26"
FBM2-2-A	35 - 1/2"	34"
FBM2-3-A	43 - 3/8"	42"
FBM2-4-A	55 - 1/8"	53 - 5/8"
FBM2-5-A	63"	61 - 1/2"

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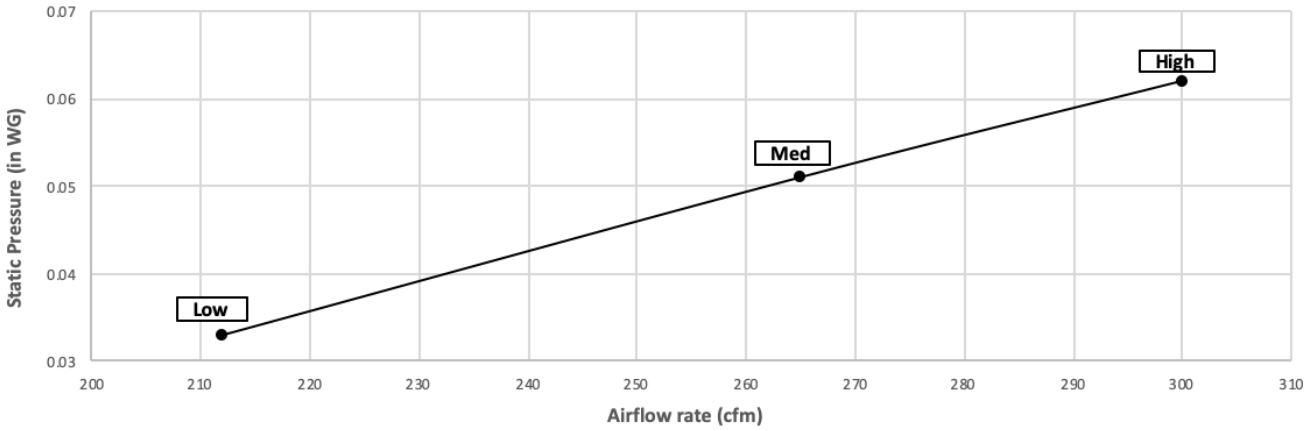
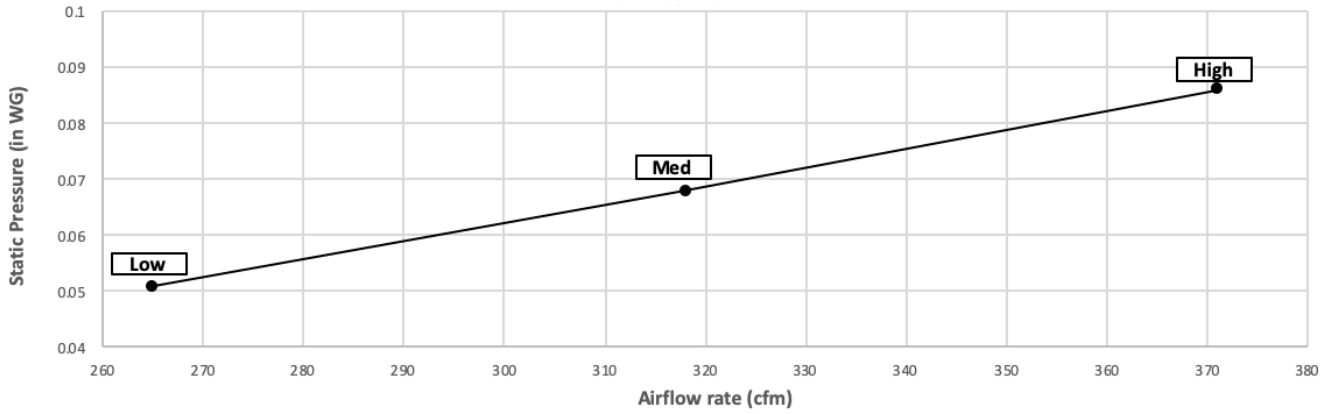
Initial Filter Pressure Drop with 2” MERV 13 Filter(s) Installed

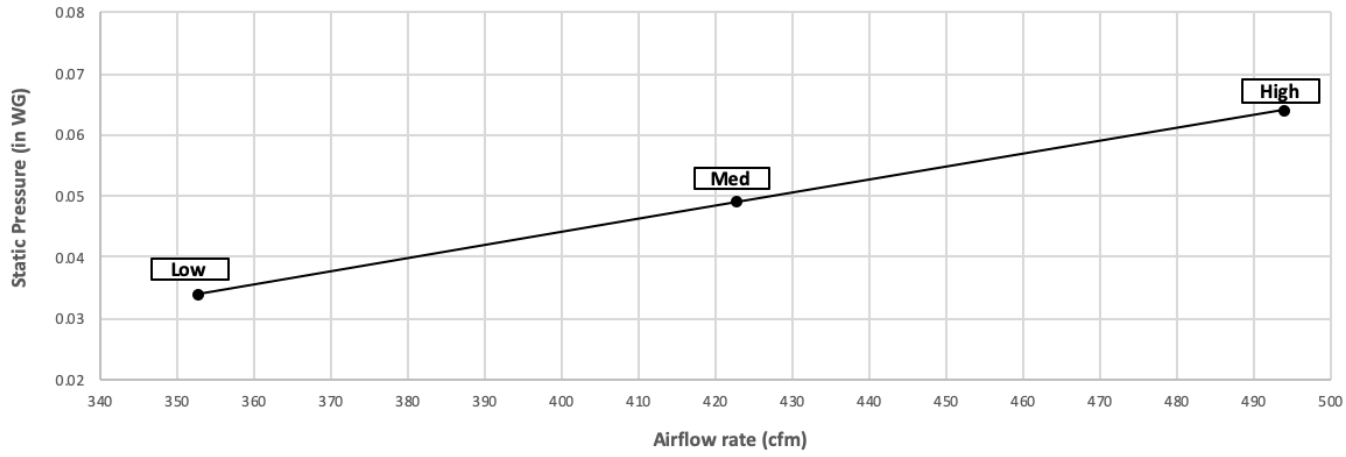
TPEFYP006, 008MA143A
with Filter Box FBM2-1-A



TPEFYP012MA143A
with Filter Box FBM2-1-A



TPEFYP015MA143A
with Filter Box FBM2-2-A



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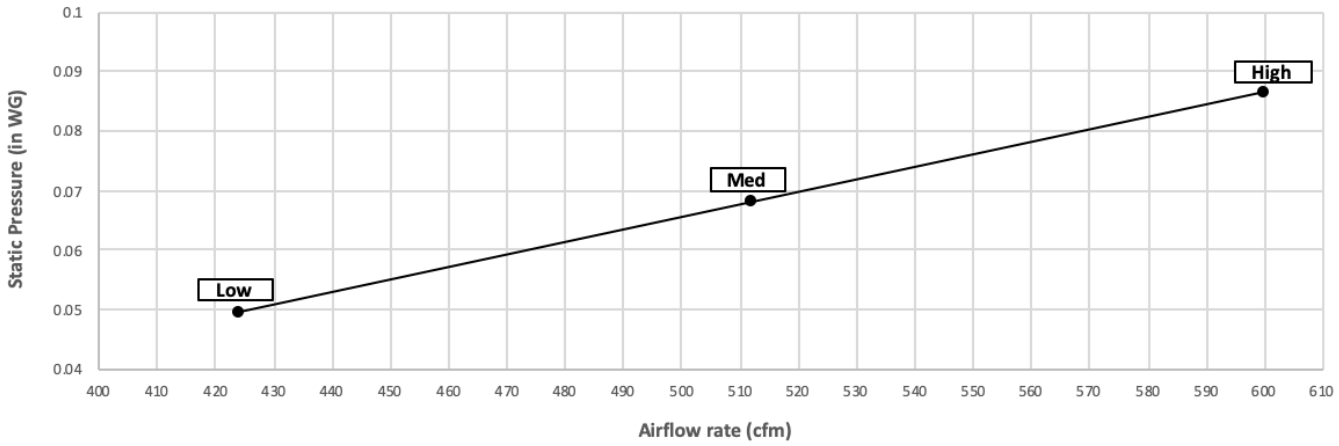
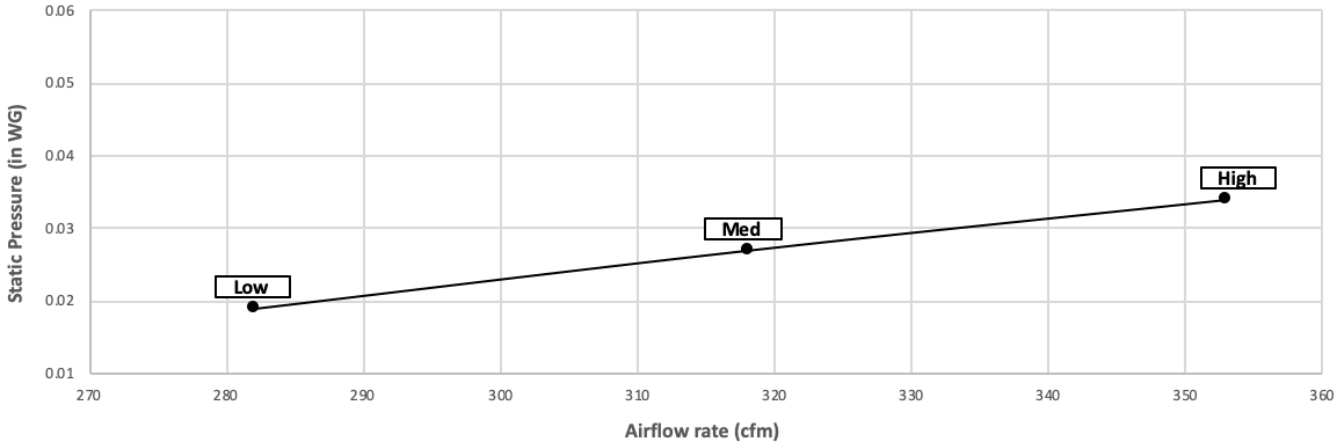
Initial Filter Pressure Drop with 2” MERV 13 Filter(s) Installed, contd.

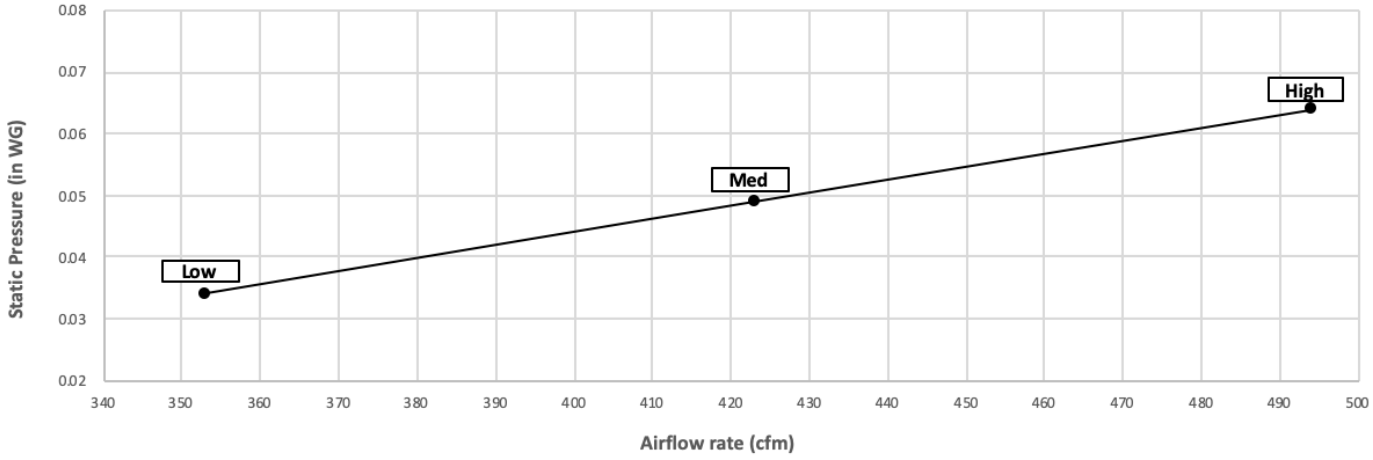
TPEFYP018MA143A
with Filter Box FBM2-2-A



PEAD-A09AA7
with Filter Box FBM2-2-A



PEAD-A12AA7
with Filter Box FBM2-2-A



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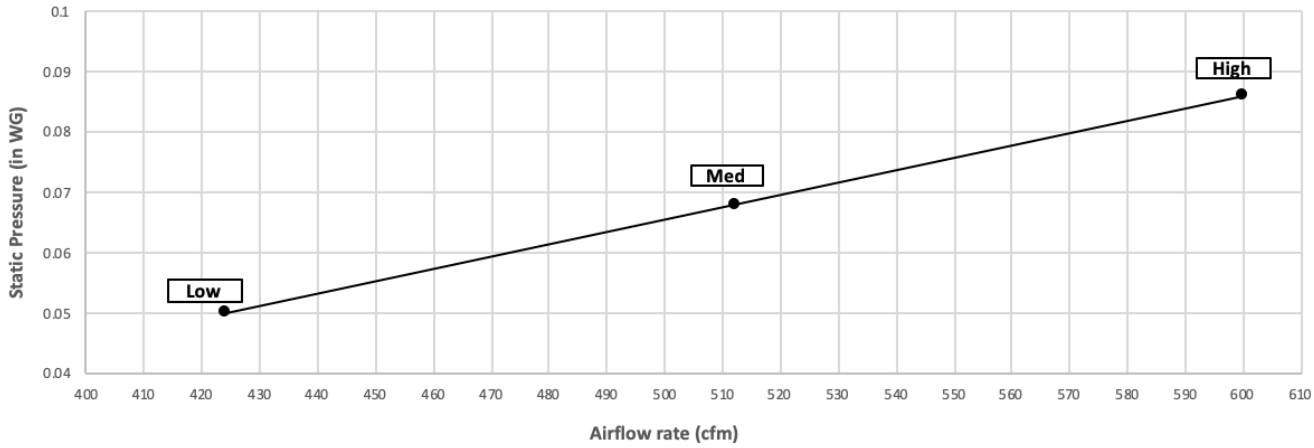
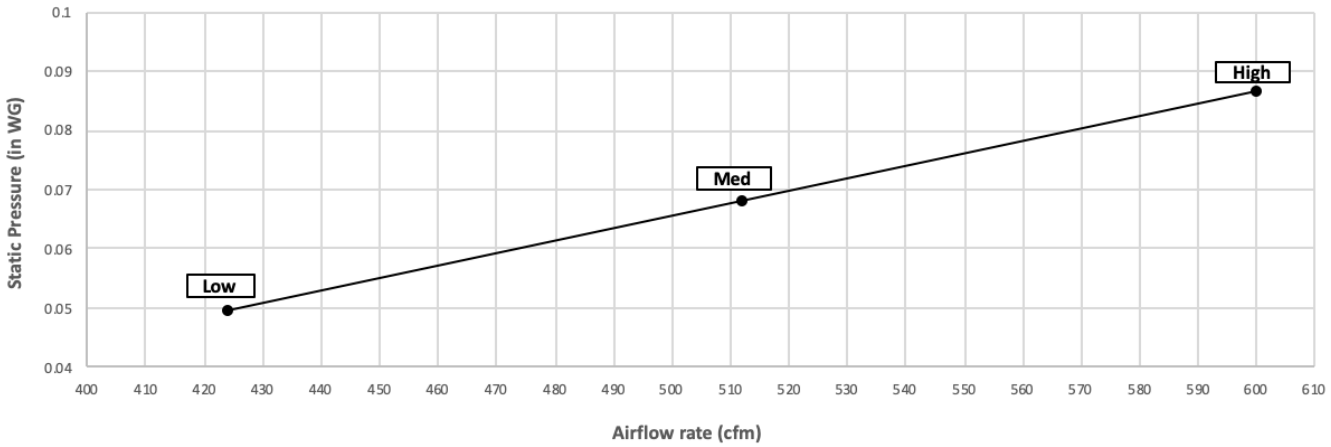
Initial Filter Pressure Drop with 2” MERV 13 Filter(s) Installed, contd.

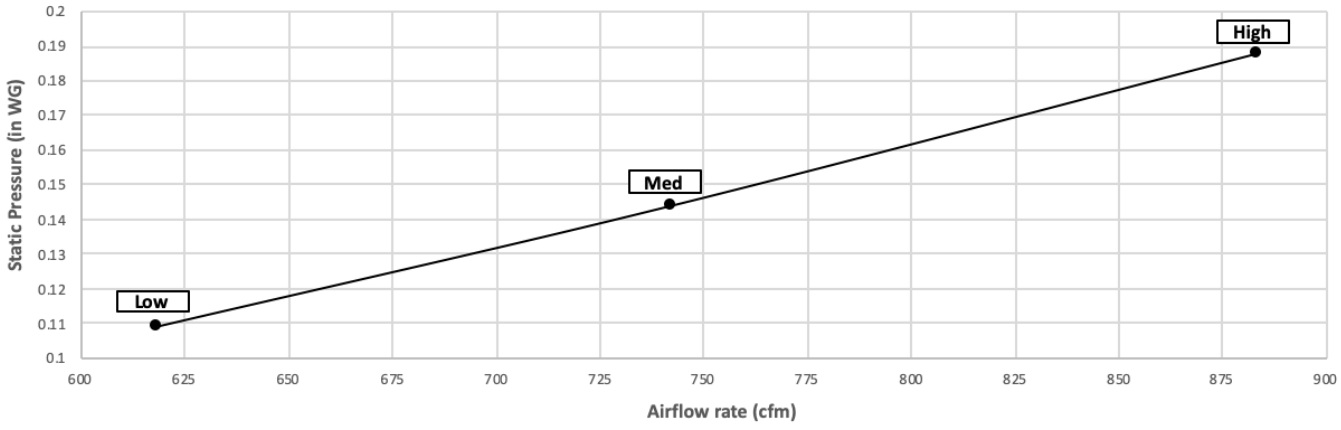
PEAD-A15AA7
with Filter Box FBM2-2-A



PEAD-A18AA7
with Filter Box FBM2-2-A



TPEFYP024, 027, 030MA142A
with Filter Box FBM2-3-A



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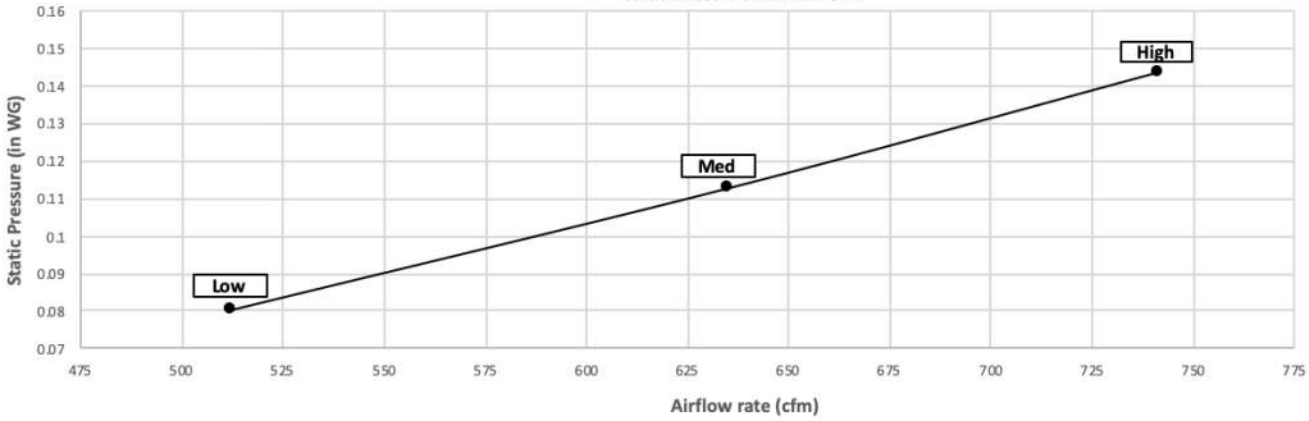
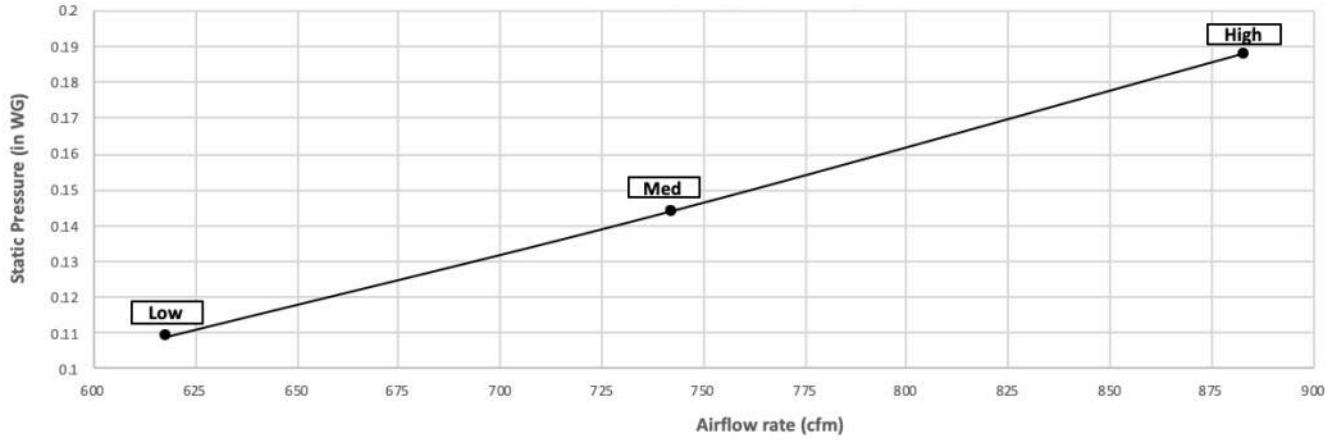
Initial Filter Pressure Drop with 2” MERV 13 Filter(s) Installed, contd.

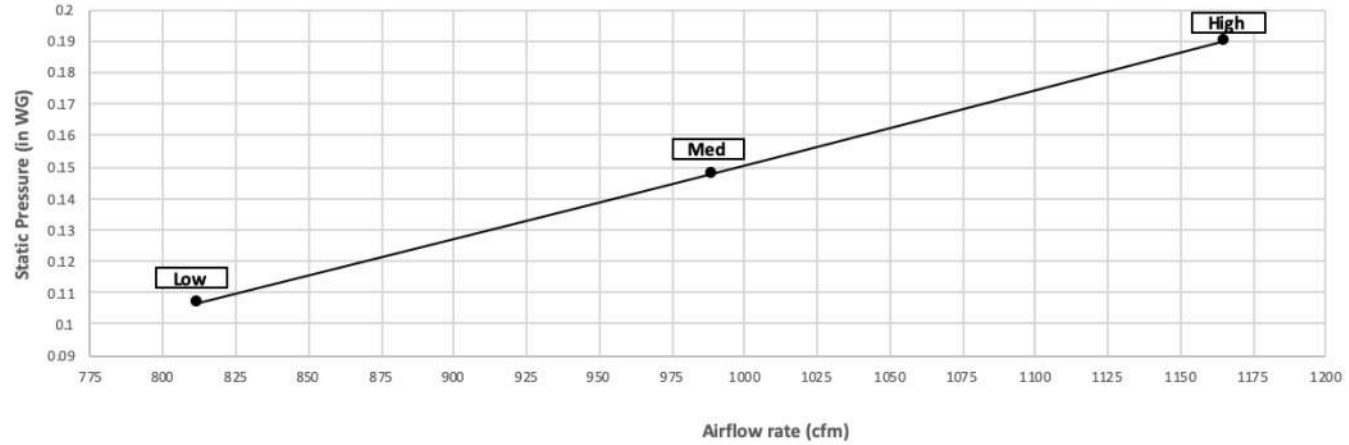
PEAD-A24AA7
with Filter Box FBM2-3-A



PEAD-A30AA7
with Filter Box FBM2-3-A



TPEFYP036MA142A
with Filter Box FBM2-4-A



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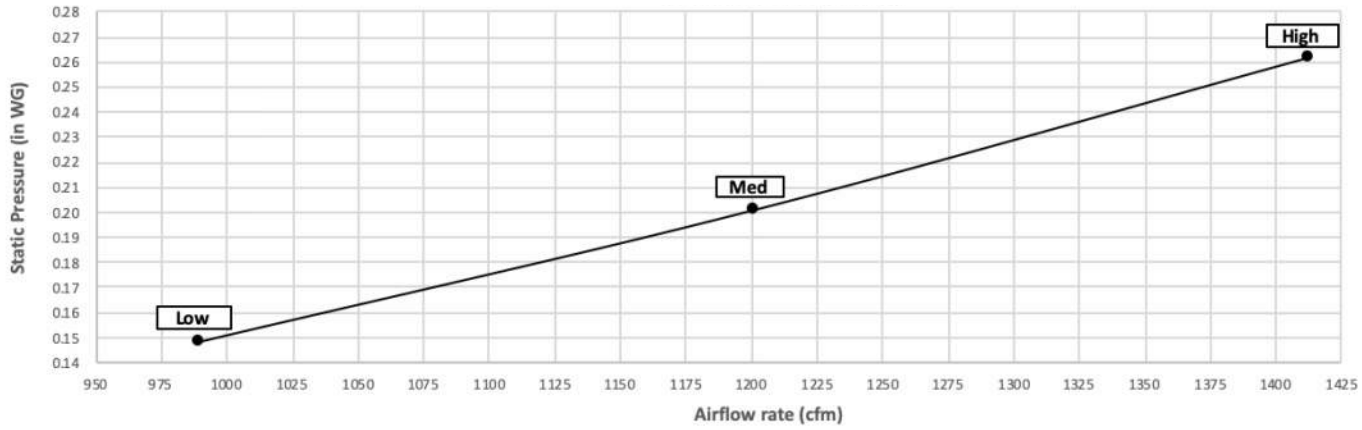
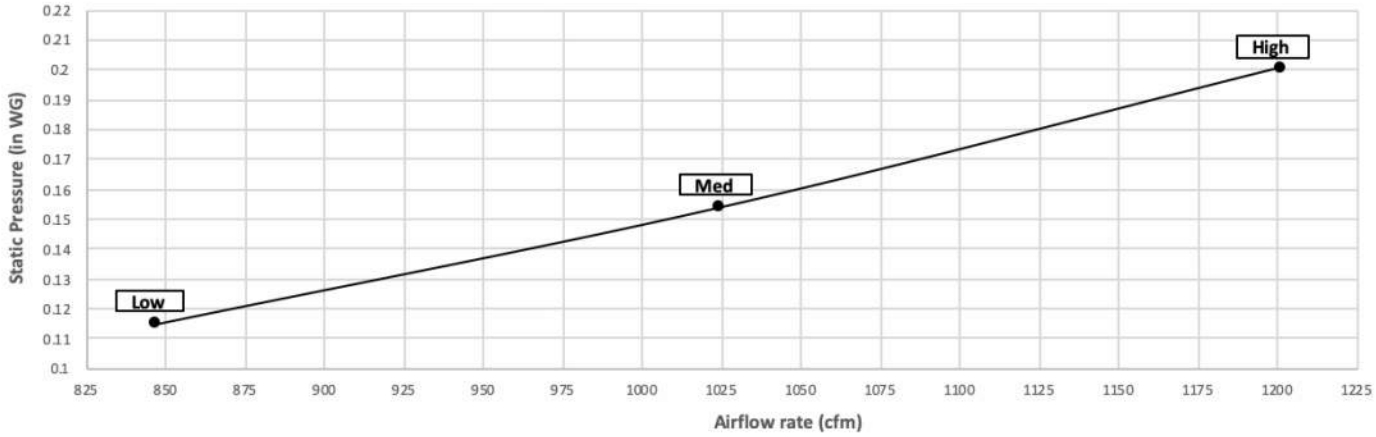
Initial Filter Pressure Drop with 2” MERV 13 Filter(s) Installed, contd.

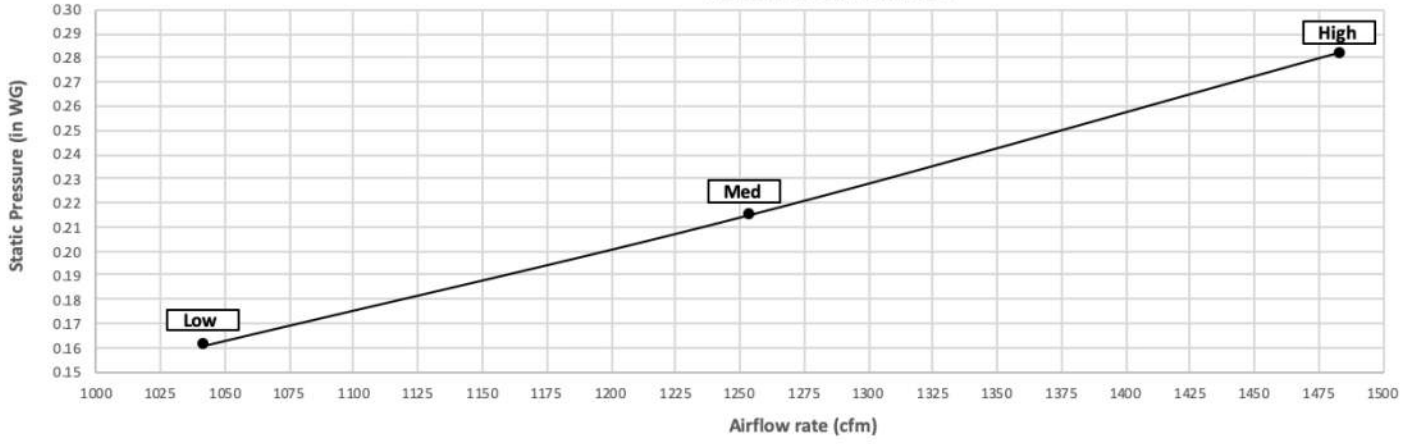
TPEFYP048MA142A
with Filter Box FBM2-4-A



PEAD-A36AA7
with Filter Box FBM2-4-A



PEAD-A42AA7
with Filter Box FBM2-4-A



Specifications are subject to change without notice.

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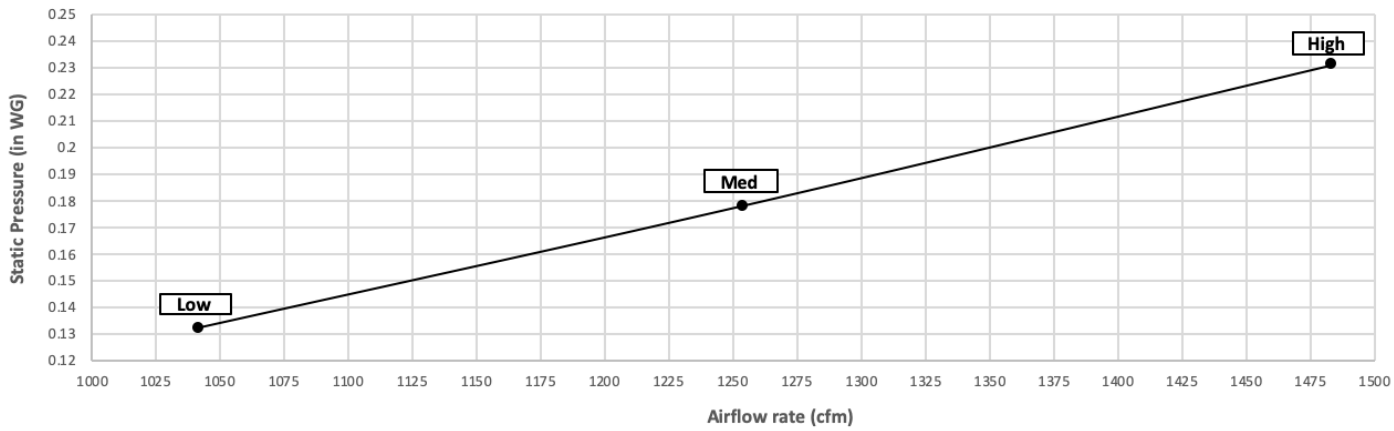
Initial Filter Pressure Drop with 2” MERV 13 Filter(s) Installed, contd.

TPEFYP054MA142A
with Filter Box FBM2-5-A



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MITSUBISHI ELECTRIC TRANE HVAC US

Controls

CITY MULTI®

Model: PAC-SE41TSE
Remote Temperature Sensor

MITSUBISHI ELECTRIC

Job Name: Duluth City Hall

Location:

Drawing Reference:

Schedule No.

System No.:

Date: 5-18-22

OVERVIEW OF CITY MULTI® CONTROLS NETWORK (CMCN)

- Consists of TG-2000 integrated system software, AG-150/ GB-50ADA/GB-24/TC-24 centralized controllers, web browsers, timers, remote controllers, and BMS interfaces.
- TG-2000 integrated system software supports up to 40 AG-150/GB-50ADA centralized controllers (licensed for PC software features) for a maximum of 2,000 indoor units from a single PC.
- AG-150 centralized controller operates up to 50 indoor units with optional control via a field-supplied PC with licensed software.
- GB-50ADA centralized controller operates up to 50 indoor units via a field-supplied PC with licensed software.
- GB-24 central controller operates up to 24 indoor units via a field-supplied PC with licensed software.
- TC-24 standalone centralized controller operates up to 24 indoor units via an integral touch screen interface.
- Remote controllers consist of Deluxe MA, Simple MA Wireless MA, and ME.
- I/O controllers consist of DIDO (PAC-YG66DCA) and AI (PAC-YG63MCA) for third-party equipment control.
- LonWorks® and BACnet® interfaces also available.
- Interlocking of LOSSNAY® ERV units for control via the AG-150/GB-50ADA/GB-24/TC-24 centralized controllers.

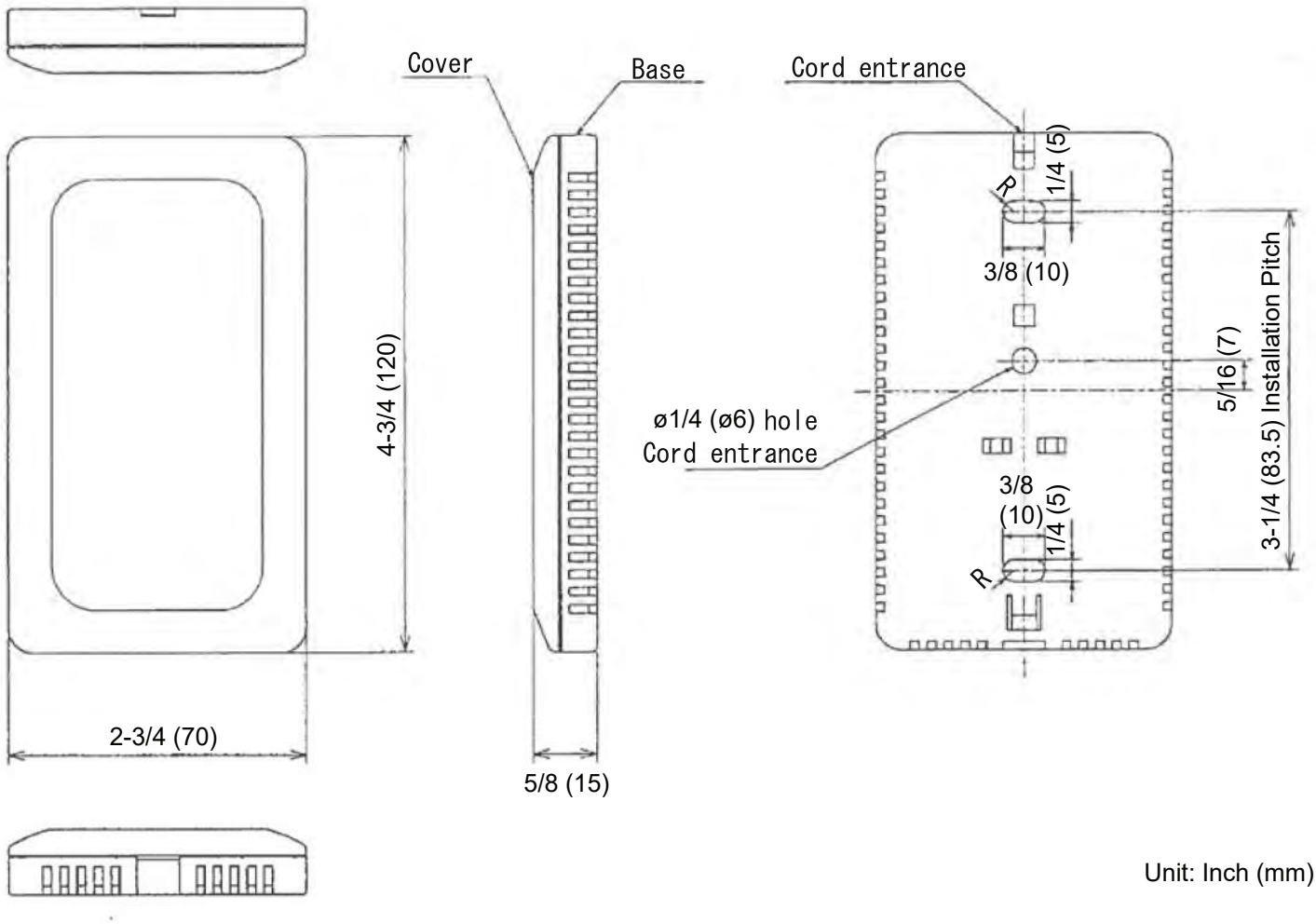
REMOTE SENSOR (PAC-SE41TSE)

Capabilities

- Allows for remote temperature monitoring within an area for the indoor unit.
- Wires back to the indoor unit at CN20 to replace the return air temperature sensor.

General Specifications

- Power supply: Through the indoor unit.
- Dimensions: 2-3/4 W x 4-3/4 H x 5/8" D (70 x 120 x 15 mm).
- Exterior: ABS resin (Munsell No. 4.48Y 7.92 / 0.66)
- Environment Conditions
  - Operating temperature range: -4° to +149° F (-20° to +65° C).
  - Relative humidity: 30 to 90% (no condensation).
  - Install in a single-type switch box or directly on a wall.
- Maximum wiring length: 39' (12 m).
- If combined with environmental measurement controller:
  - Temperature measurement range: -4° to +149° F (-20° to +65° C).
  - Measurement resolution: 0.2° F (0.1° C) for 50° to 95° F (10° to 35° C); 0.9° F (0.5° C) for temperatures outside specified range.



Unit: Inch (mm)

Mitsubishi Electric Air Conditioning & Refrigeration Systems Works acquired ISO 9001 certification under Series 9000 of the International Standard Organization (ISO) based on a review of quality warranties for the production of refrigeration and air conditioning equipment.

ISO Authorization System
The ISO 9000 series is a plant authorization system relating to quality warranties as stipulated by the ISO. ISO 9001 certifies quality warranties based on the "design, development, production, installation and auxiliary services" for products built at an authorized plant.

Certificate Number FM33568

Mitsubishi Electric Air Conditioning & Refrigeration Systems Works acquired environmental management system standard ISO 14001 certification.

The ISO 14000 series is a set of standards applying to environmental protection set by the International Standard Organization (ISO).

Certificate Number EC97J1227

MITSUBISHI ELECTRIC
HVAC Advanced Products Division
Mitsubishi Electric & Electronics USA, Inc.
3400 Lawrenceville Suwanee Rd.
Suwanee, GA 30024
Tele: 678-376-2900 • Fax: 800-889-9904
Toll Free: 800-433-4822 (#4)
www.mehvac.com

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Job Name: **Duluth City Hall**
System Reference: **Central Controller** Date: **5-18-22**

TE-200A

- TE-200A is the Master Controller
- Master Controller can operate and monitor up to 50 indoor units
- Expansion Controllers can expand an TE-200A to operate and monitor up to 50 additional indoor units through the touchscreen or web browser
- Network up to three TE-50A or TW-50A to one TE-200A to allow the TE-200A to manage up to 200 indoor units

OPTIONAL LICENSES

- SW-BACnet Master: BACnet Function
  - Connected air conditioning units can be monitored and operated not only from the existing web browser or the TE-200/TE-50's LCD, but also from the building management system using the BACnet® communication protocol. See SW-BACnet Data Sheet for more information.
- SW-Charge Master: Energy Allocation
  - The apportioned electricity billing function is an electric energy
  - apportionment system that apportions electric energy using input from electricity meters with a pulse generator function. The respective amounts of electric energy can be apportioned based on the operating status and capacity of each tenant. See SW-Charge Data Sheet for more information.
- SW-PWeb Master: Online Personal Browser
  - Allows tenant managers and general users to control their respective zone conditions via a networked PC, tablet, or mobile phone with or without local remote controllers installed in the space. See SW-PWeb Data Sheet for more information.

SPECIFICATIONS

- Supports dual set point functionality (connected equipment dependent)
- Displays:
  - CITY MULTI® compressor speed and hi/low pressure
  - AdvancedHVAC Controller (DC-A2IO) input/output status
  - Indoor unit free contact input/output status
  - Space temperature and humidity (from Smart ME or AI controller)
  - Error code (Can be emailed automatically to specified recipients)
  - Unoccupied setback up temperature range
- Functions
  - Hold function (temporarily disables schedules indoor unit model dependent)
  - Initial setting
  - Operation data back-up
- Permits or prohibits remote controller functions:
  - On/Off
  - Change Operation Mode
  - Change Set Point Temperature
  - Filter Status
  - Change Fan Speed
  - Change Air Direction
- External input/output signals can be used for batch operations such as Start/Stop and Emergency Stop (requires PAC-YG10HA)
- Pulse signal input can obtain watt-hour meter, billing data and energy management data based on the cumulative number of pulse signal pulse signals directly input from a metering device
- Temperature set point range limits can be set for local remote controllers
- User defined indoor unit functions:
  - On/Off
  - Monitoring and Operation
  - Operation mode:
    - Auto* (Dual or Single set point)
    - Heat
    - Fan
    - Drying
    - Setback*

    Note: *R2 Series only (connected equipment dependent)
  - Temperature Setting
  - Fan Speed
  - Airflow Direction
- • Monitoring and Control:
  - CITY MULTI® indoor units
  - Nv- & P-Series units (requires M-Net adapter)
  - Lossnay® units
  - TPWFY hydronic heat pump units
  - DIDO controllers
  - CITY MULTI® DOAS
  - Interlock setting enables integration of general equipment inputs/ outputs and indoor units
- Scheduling
  - Daily
  - Annually
  - Five pattern of weekly seasonal schedule
- Twenty four scheduled events per day, indoor unit model dependent:
  - ON/OFF
  - Mode
  - Temperature Setting
  - Vane Direction
  - Fan
  - Speed
  - Operation Prohibits
- Trend data:
  - Fan operation time
  - Thermo-on time
  - Set temperature
  - Room temperature
  - AI Controller temperature and humidity (requires PAC-YG63-MCA, 2 inputs total for each controller)
- Memory back up via USB (universal serial bus)
- Memory back up via LAN (local area network) port

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TE-200A CENTRALIZED CONTROLLER

Item	Specifications		
Power Supply	**Rated input**		100–240 VAC ± 10%; 0.3–0.2 A 50/60 Hz Single-phase
	Fuse		250 VAC 6.3 A Time-Lag type (IEC 60127-2S.S.5)
M-NET power feeding capability			No specifications**Only an MN converter can be connected.
Ambient conditions	**Temperature**	**Operating Range**	0° C to +40° C (+32° F to +104° F)
		Non-operating Range	-20° C to +60° C (-4° F to +140° F)
	Humidity		30% to 90% RH (no condensation)
Weight			2.3 kg (5-5/64 lbs)
Dimensions (W x H x D)			11-5/32 × 7-55/64 × 2-17/32 in. (284 × 200 × 65 mm)
Installation conditions			Indoor only **To be used in a business office or similar environment

WEB BROWSER REQUIREMENTS

Item		Requirements
CPU		1 GHz or faster
Memory		512 MB or more
Screen Resolution		1024 x 768 or higher recommended
Compatible Browser	Windows®	Microsoft® Internet Explorer 8.0 Microsoft® Internet Explorer 9.0 Microsoft® Internet Explorer 10.0 Microsoft® Internet Explorer 11.0 **Java execution environment is required. (Oracle® Java Plug-in Ver. 1.8.0_60) **Install Oracle® Java Plug-in that is appropriate for your operating system. When using a 64-bit Internet Explorer, install a 64-bit Java Plug-in. **The version of the Oracle® Java Plug-in can be verified by clicking [Java] in the Control Panel.
Onboard LAN Port or LAN Card		100 BASE-TX
100 BASE-TX		e.g., mouse

NOTES:

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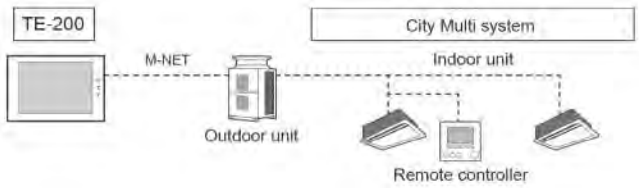
MODEL: TE-200A - SYSTEM CONFIGURATION

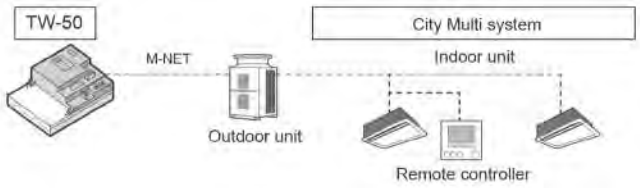
*TE-200A is indicated as TE-200
*TE-50A is indicated as TE-50

CONTROLLING 50 OR FEWER UNITS OF EQUIPMENT

1. TE-200



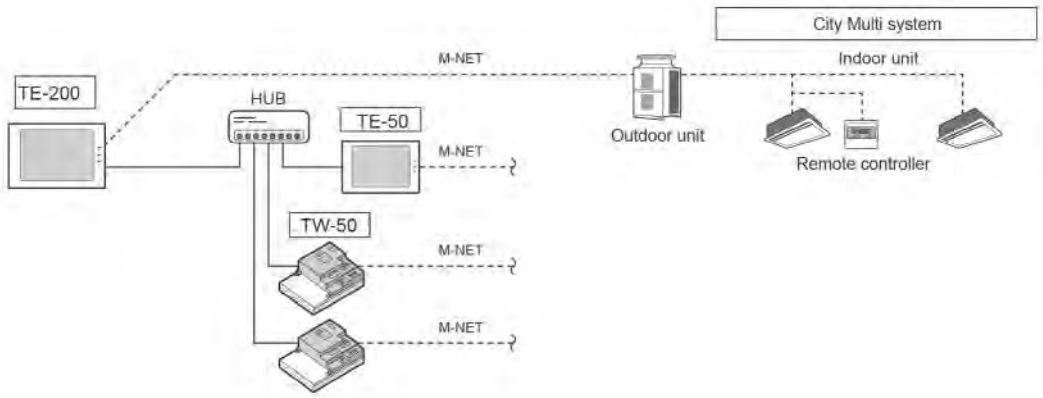
2. TW-50



CONTROLLING MORE THAN 50 UNITS OF EQUIPMENT (WITH CONNECTION TO A TE-200 CONTROLLER)

Note

TE-200 is required when using TE-50



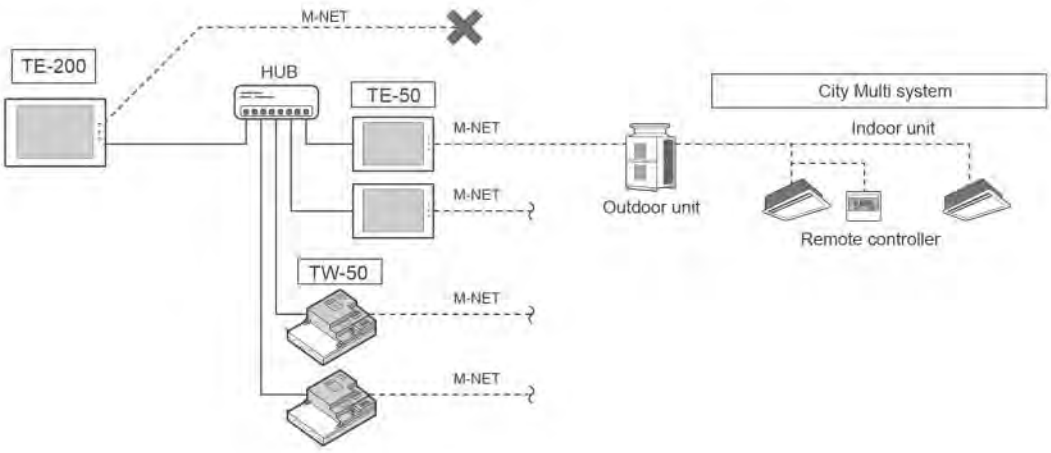
WHEN USING AN APPORTIONED ELECTRICITY BULLING FUNCTION

Notes

TE-200 is required to use a billing function.

TE-200 M-NET cannot be used when a billing function is used

“Charge”license is requited to use a billing function.



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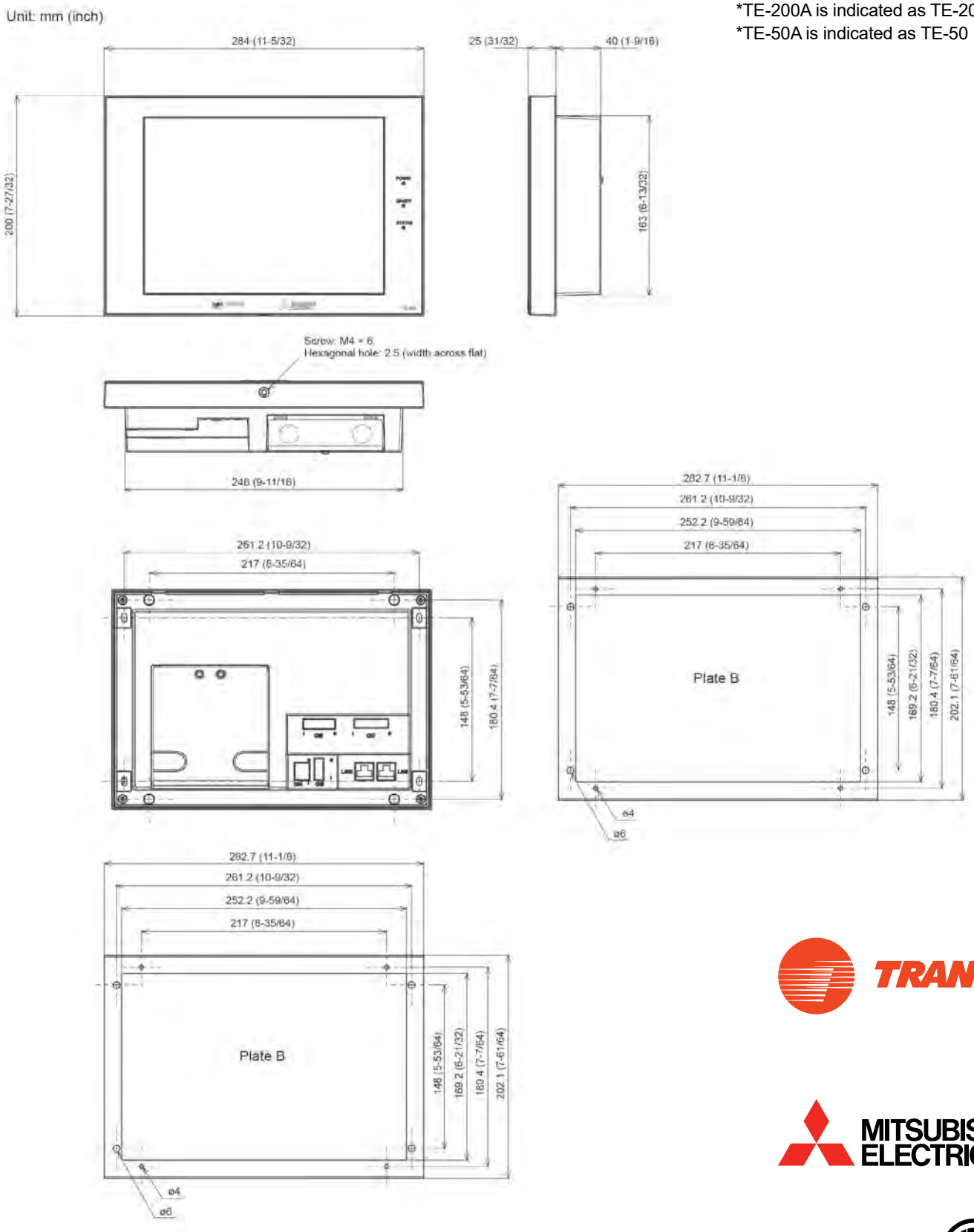
TE-200A - DIMENSIONS

*TE-200A is indicated as TE-200
*TE-50A is indicated as TE-50



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Job Name: **Duluth City Hall**
System Reference: **Expansion Controller** Date: **5-18-22**

TE-50A

- TE-50A is the Expansion Controller
- Expansion Controller can expand TE-200A to operate and monitor up to 50 additional indoor units through the touchscreen or web browser
- Network up to three TE-50A to one TE-200A to allow the TE-200A to manage up to 200 indoor units.

OPTIONAL LICENSES

- SW-BACnet Expansion: BACnet Function
  - Connected air conditioning units can be monitored and operated not only from the existing web browser or the TE-200/TE-50's LCD, but also from the building management system using the BACnet® communication protocol. See SW-BACnet Data Sheet for more information.
- SW-Charge Expansion: Energy Allocation
  - The apportioned electricity billing function is an electric energy apportionment system that apportions electric energy using input from electricity meters with a pulse generator function. The respective amounts of electric energy can be apportioned based on the operating status and capacity of each tenant. See SW-Charge Data Sheet for more information.
- SW-PWeb Expansion: Online Personal Browser
  - Allows tenant managers and general users to control their respective zone conditions via a networked PC, tablet, or mobile phone with or without local remote controllers installed in the space. See SW-PWeb Data Sheet for more information.

SPECIFICATIONS

- Manages up to 50 indoor units individually, in a group or in a collective batch operation
- Networked three TE-50A to one TE-200A to allow the TE-200A to manage up to 200 indoor units.
- Supports dual set point functionality (connected equipment dependent)
- Displays:
  - CITY MULTI® compressor speed and hi/low pressure
  - AdvancedHVAC Controller (DC-A2IO) input/output status
  - Indoor unit free contact input/output status
  - Space temperature and humidity (from Smart ME or AI controller)
  - Error code (Can be emailed automatically to specified recipients)
  - Unoccupied setback up temperature range
- Functions
  - Hold function (temporarily disables schedules indoor unit model dependent)
  - Initial setting
  - Operation data back-up
- Permits or prohibits remote controller functions:
  - On/Off
  - Change Operation Mode
  - Change Set Point Temperature
  - Filter Status
  - Change Fan Speed
  - Change Air Direction
- External input/output signals can be used for batch operations such as Start/Stop and Emergency Stop (requires PAC-YG10HA)
- Pulse signal input can obtain watt-hour meter, billing data and energy management data based on the cumulative number of pulse signal pulse signals directly input from a metering device
- Temperature set point range limits can be set for local remote controllers
- User defined indoor unit functions:
  - On/Off
  - Monitoring and Operation
  - Operation mode:
    - Auto* (Dual or Single set point)
    - Heat
    - Fan
    - Drying
    - Setback*

    Note: *R2 Series only (connected equipment dependent)
  - Temperature Setting
  - Fan Speed
  - Airflow Direction
- Monitoring and Control:
  - CITY MULTI® indoor units
  - Nv & P-Series units (requires M-Net adapter)
  - Lossnay® units
  - TPWFY hydronic heat pump units
  - DIDO controllers
  - CITY MULTI® DOAS
  - Interlock setting enables integration of general equipment inputs/outputs and indoor units
- Scheduling
  - Daily
  - Annually
  - Five pattern of weekly seasonal schedule
- Twenty four scheduled events per day, indoor unit model dependent:
  - ON/OFF
  - Mode
  - Temperature Setting
  - Vane Direction
  - Fan
  - Speed
  - Operation Prohibits
- Trend data:
  - Fan operation time
  - Thermo-on time
  - Set temperature
  - Room temperature
  - AI Controller temperature and humidity (requires PAC-YG63-MCA, 2 inputs total for each controller)
- Memory back up via USB (universal serial bus)
- Memory back up via LAN (local area network) port

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TE-50A EXPANSION CONTROLLER

Item	Specifications		
Power Supply	**Rated input**		100–240 VAC ± 10%; 0.3–0.2 A 50/60 Hz Single-phase
	Fuse		250 VAC 6.3 A Time-Lag type (IEC 60127-2S.S.5)
M-NET power feeding capability			No specifications**Only an MN converter can be connected.
Ambient conditions	**Temperature**	**Operating Range**	0° C to +40° C (+32° F to +104° F)
		Non-operating Range	-20° C to +60° C (-4° F to +140° F)
	Humidity		30% to 90% RH (no condensation)
Weight			2.3 kg (5-5/64 lbs)
Dimensions (W x H x D)			11-5/32 × 7-55/64 × 2-17/32 in. (284 × 200 × 65 mm)
Installation conditions			Indoor only **To be used in a business office or similar environment

WEB BROWSER REQUIREMENTS

Item		*Requirements*
CPU		1 GHz or faster
Memory		512 MB or more
Screen Resolution		1024 x 768 or higher recommended
Compatible Browser	Windows®	Microsoft® Internet Explorer 8.0 Microsoft® Internet Explorer 9.0 Microsoft® Internet Explorer 10.0 Microsoft® Internet Explorer 11.0 **Java execution environment is required. (Oracle® Java Plug-in Ver. 1.8.0_60) **Install Oracle® Java Plug-in that is appropriate for your operating system. When using a 64-bit Internet Explorer, install a 64-bit Java Plug-in. **The version of the Oracle® Java Plug-in can be verified by clicking [Java] in the Control Panel.
Onboard LAN Port or LAN Card		100 BASE-TX
100 BASE-TX		e.g., mouse

NOTES:

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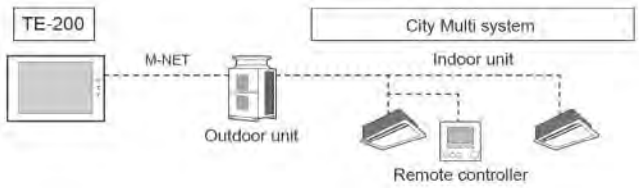
MODEL: TE-50A - SYSTEM CONFIGURATION

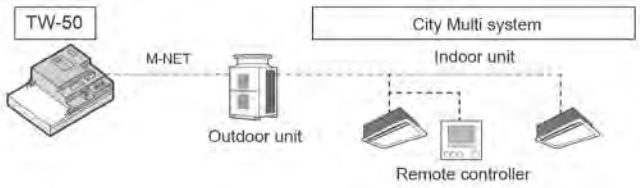
*TE-200A is indicated as TE-200
*TE-50A is indicated as TE-50

CONTROLLING 50 OR FEWER UNITS OF EQUIPMENT

1. TE-200



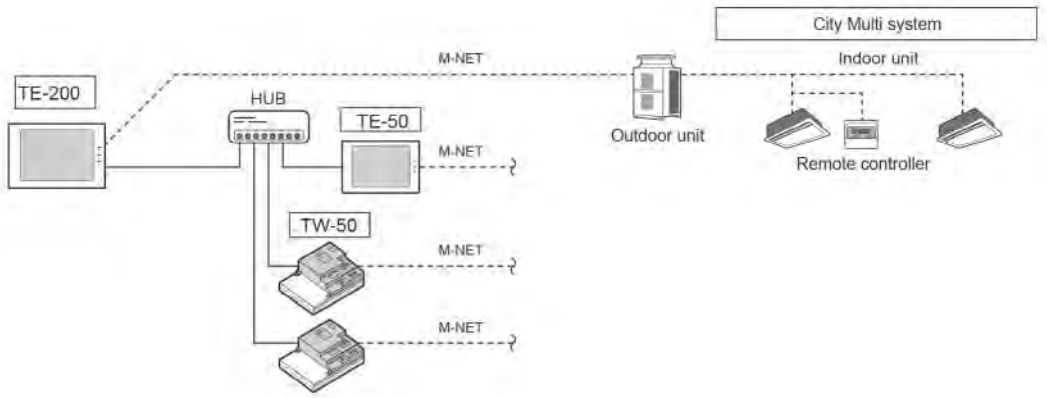
2. TW-50



CONTROLLING MORE THAN 50 UNITS OF EQUIPMENT (WITH CONNECTION TO A TE-200 CONTROLLER)

Note

TE-200 is required when using TE-50



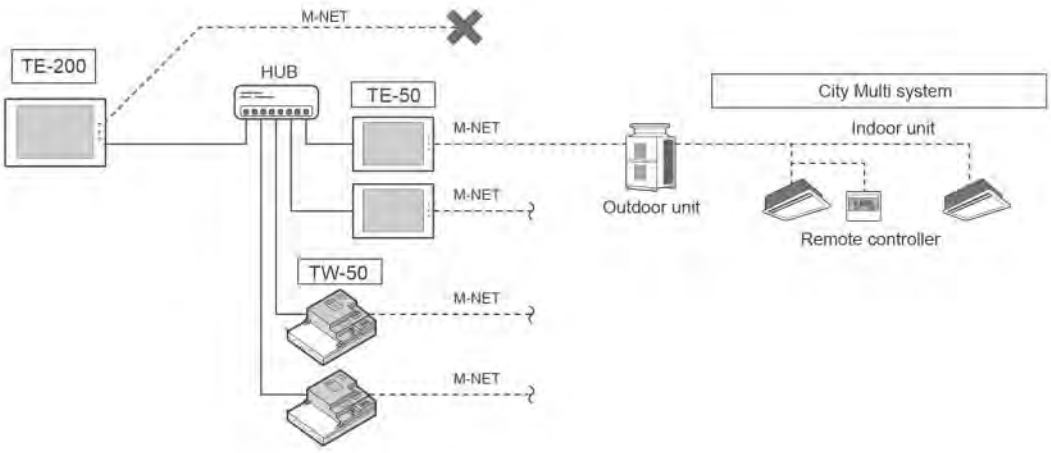
WHEN USING AN APPORTIONED ELECTRICITY BULLING FUNCTION

Notes

TE-200 is required to use a billing function.

TE-200 M-NET cannot be used when a billing function is used

“Charge”license is requited to use a billing function.



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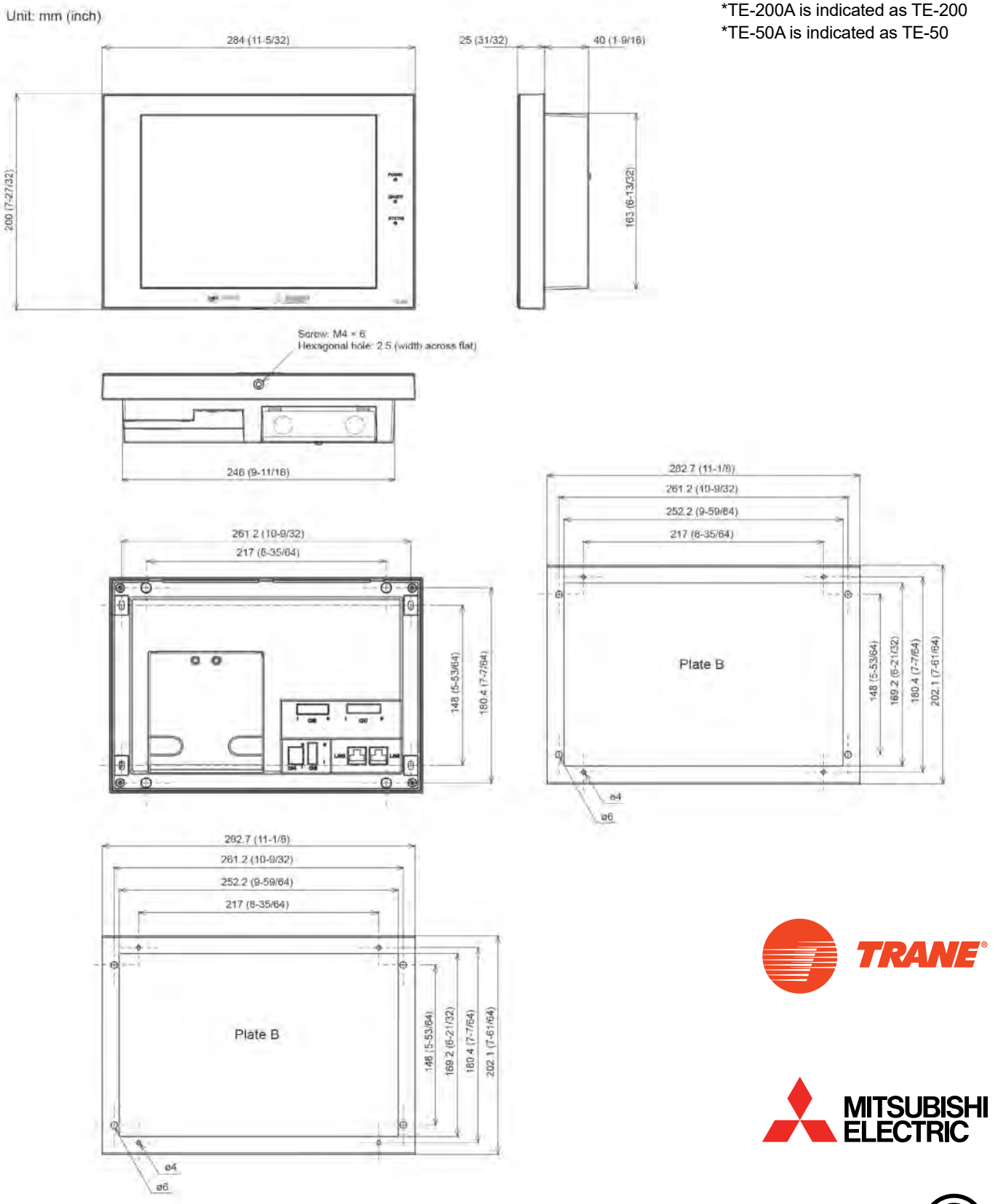
TE-50A - DIMENSIONS

*TE-200A is indicated as TE-200
*TE-50A is indicated as TE-50



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Job Name: **Duluth City Hall**
System Reference: **Central Controller** Date: **5-18-22**

TW-50A

- TW-50A can be a Master Controller or Expansion Controller
- Master Controller can operate and monitor up to 50 indoor
- units
- Expansion Controller can expand an TE-200A to operate and monitor up to 50 additional indoor units through the touch screen or web browser
- Network up to three TW-50A to one TE-200A to allow the TE-200A to manage up to 200 indoor units.

OPTIONAL LICENSES

- SW-BACnet Master or SW-BACnet Expansion: BACnet Function
  - Connected air conditioning units can be monitored and operated not only from the existing web browser or the TE-200/TE-50's LCD, but also from the building management system using the BACnet® communication protocol. See SW-BACnet Data Sheet for more information.
- SW-ChargeExpansion: Energy Allocation
  - The apportioned electricity billing function is an electric energy apportionment system that apportions electric energy using input from electricity meters with a pulse generator function. The respective amounts of electric energy can be apportioned based on the operating status and capacity of each tenant. See SW-Charge Data Sheet for more information.
- SW-PWeb Master or SW-PWeb Expansion: Online Personal Browser
  - Allows tenant managers and general users to control their respective zone conditions via a networked PC, tablet, or mobile phone with or without local remote controllers installed in the space. See SW-PWeb Data Sheet for more information.

SPECIFICATIONS

- Supports dual set point functionality (connected equipment dependent)
- Displays:
  - CITY MULTI® compressor speed and hi/low pressure
  - AdvancedHVAC Controller (DC-A2IO) input/output status
  - Indoor unit free contact input/output status
  - Space temperature and humidity (from Smart ME or AI controller)
  - Error code (Error codes are able to be emailed automatically to specified recipients)
  - Unoccupied setback up temperature range
- Functions
  - Hold function (temporarily disables schedules indoor unit model dependent) - Initial setting
  - Operation data back-up
- Permits or prohibits remote controller functions:
  - On/Off
  - Change Operation Mode
  - Change Set point Temperature
  - Filter Status
  - Change Fan Speed
  - Change Air Direction
- External input/output signals can be used for batch operations such as Start/Stop and Emergency Stop (requires PAC-YG10HA)
- Pulse signal input can obtain watt-hour meter, billing data and energy management data based on the cumulative number of pulse signal pulse signals directly input from a metering device
- Temperature set point range limits can be set for local remote controllers
- User defined indoor unit functions:
  - On/Off
  - Monitoring and Operation
  - Operation mode:
    - Auto* (Dual or Single set point)
    - Heat
    - Fan
    - Drying
    - Setback*

      Note: *R2 Series only (connected equipment dependent)
  - Temperature Setting
  - Fan Speed
  - Airflow Direction
- Monitoring and Control:
  - CITY MULTI® indoor units
  - Nv- and P-Series units (requires M-Net adapter)
  - Lossnay® units
  - PWFY hydronic heat pump units
  - DIDO controllers
  - CITY MULTI® DOAS
  - Interlock setting enables integration of general equipment inputs/ outputs and indoor units
- Scheduling
  - Daily
  - Annually
  - Five pattern of weekly seasonal schedule
- Twenty four scheduled events per day, indoor unit model dependent:
  - ON/OFF
  - Mode
  - Temperature Setting
  - Vane Direction
  - Fan
  - Speed
  - Operation Prohibits
- Trend data:
  - Fan operation time
  - Thermo-on time
  - Set temperature
  - Room temperature
  - AI Controller temperature and humidity (requires PAC-YG63-MCA, 2 inputs total for each controller)
- Memory back up via USB (universal serial bus)
- Memory back up via LAN (Local Area Network) port

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TW-50A - SPECIFICATIONS, CONT.

TW-50A EXPANSION CONTROLLER

Item	Specifications		
Power Supply	**Rated input**		100–240 VAC ± 10%; 0.3–0.2 A 50/60 Hz Single-phase
M-NET power feeding capability			1.5
Ambient conditions	**Temperature**	**Operating Range**	-10°C to +55°C (+14°F to +131°F)
		Non-operating Range	-20°C to +60°C (-4°F to +140°F)
	Humidity		30% to 90% RH (no condensation)
Weight			1.7 kg (4 lbs)
Dimensions (W x H x D)			172 × 209 × 92 mm (6-13/16 × 8-4/16 × 3-10/16 in) **253 × 172 × 92 mm (10 × 6-13/16 × 3-10/16 in) when using L-fittings
Installation conditions			Only in a metal control box indoors

WEB BROWSER REQUIREMENTS

Item		Requirements
CPU		1 GHz or faster
Memory		512 MB or more
Screen Resolution		1024 x 768 or higher recommended
Compatible Browser	Windows®	Microsoft® Internet Explorer 8.0 Microsoft® Internet Explorer 9.0 Microsoft® Internet Explorer 10.0 Microsoft® Internet Explorer 11.0 **Java execution environment is required. (Oracle® Java Plug-in Ver. 1.8.0_60) **Install Oracle® Java Plug-in that is appropriate for your operating system. When using a 64-bit Internet Explorer, install a 64-bit Java Plug-in. **The version of the Oracle® Java Plug-in can be verified by clicking [Java] in the Control Panel.
Onboard LAN Port or LAN Card		100 BASE-TX
100 BASE-TX		e.g., mouse

NOTES:

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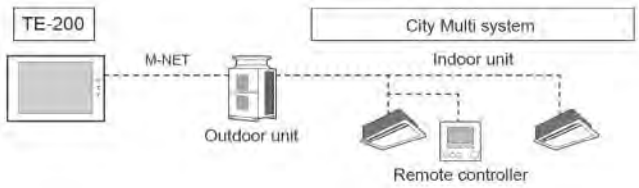
MODEL: TW-50A - SYSTEM CONFIGURATION

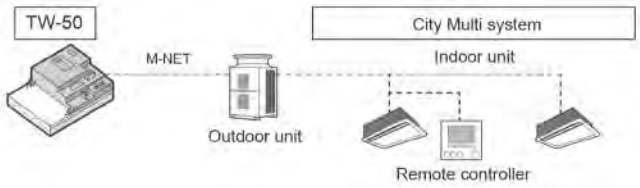
*TE-200A is indicated as TE-200
*TE-50A is indicated as TE-50

CONTROLLING 50 OR FEWER UNITS OF EQUIPMENT

1. TE-200



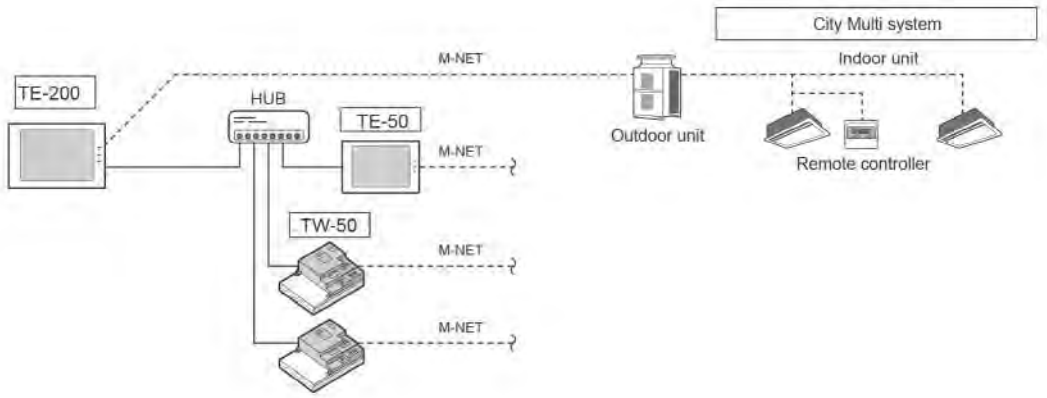
2. TW-50



CONTROLLING MORE THAN 50 UNITS OF EQUIPMENT (WITH CONNECTION TO AN TE-200 CONTROLLER)

Note

TE-200 is required when using TE-50



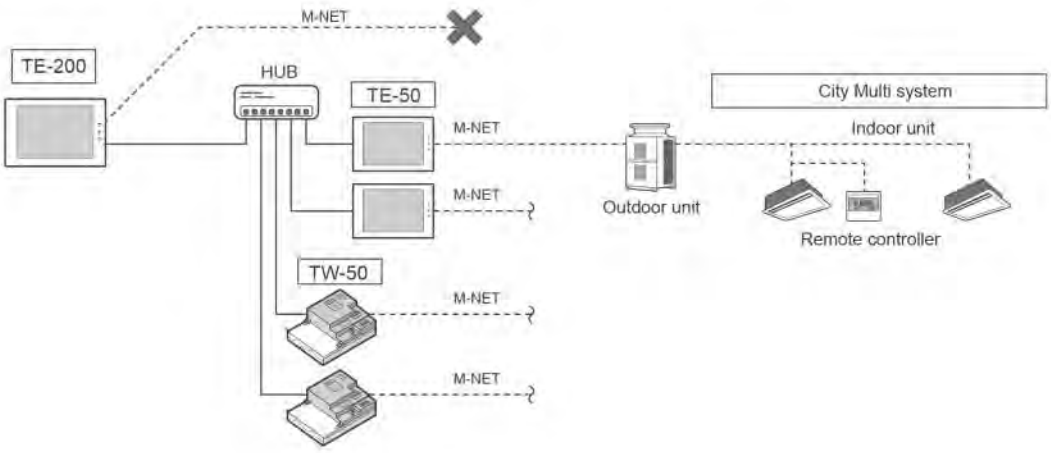
WHEN USING AN APPORTIONED ELECTRICITY BULLING FUNCTION

Notes

TE-200 is required to use a billing function.

TE-200 M-NET cannot be used when a billing function is used

“Charge”license is requited to use a billing function.



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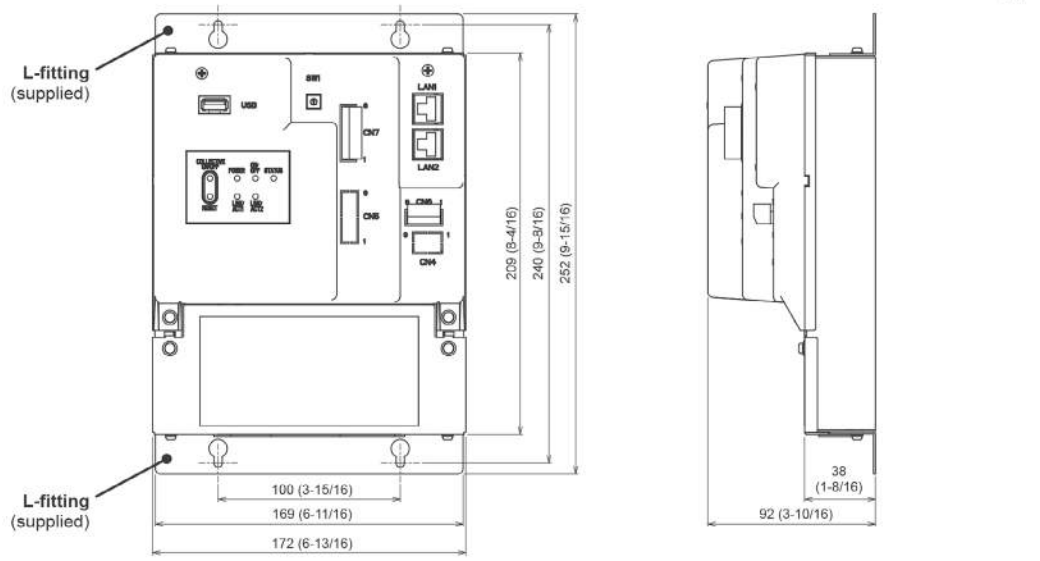
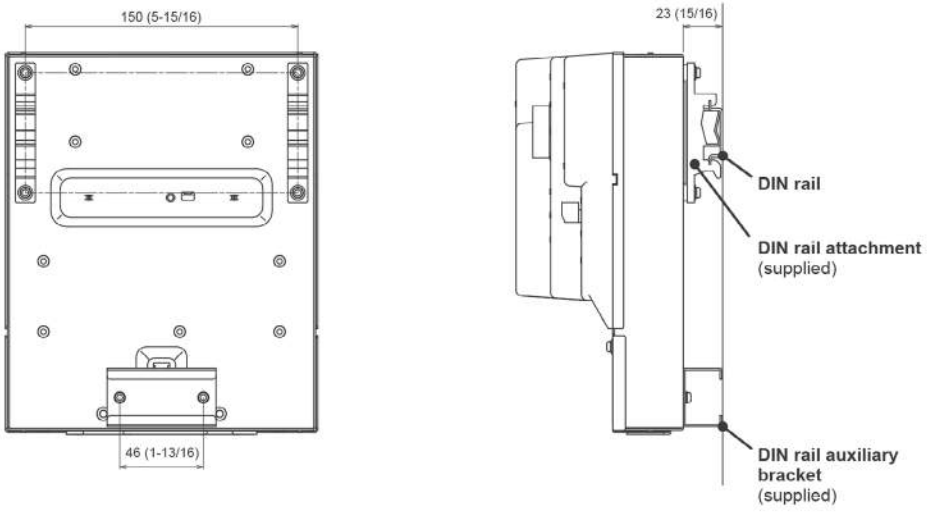
TW-50A - DIMENSIONS

(1) WHEN USING L-FITTINGS

Unit: mm (in)



(2) WHEN USING DIN RAIL



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CITY OF DULUTH LUMINAIRE SCHEDULE - INTERIORS

TYPE	DESCRIPTION	VOLT	MOUNTING	LAMP TYPE	LUMENS	CRI	CCT	WATT	EFFICACY	BALLAST/DRIVER	LENS-LOUVER	MANUFACTURER	CATALOG SERIES	NOTE
A1	2X4 STANDARD TROFFER ACCESS, 22 GAUGE STEEL HOUSEING	120 V	RECESSED, ACT CEILING	LED	4000 lm	80 CRI	3500 K	32 W	125 lm/W	0-10V DIMMING TO 5%	ONE PIECE LOWER REFLECTOR WITH HIGH REFLECTANCE POLYESTER POWDER COATING	CREE LIGHTING	CR24 40LHE 35K CMA	1,2
A2	2X4 STANDARD TROFFER ACCESS, 22 GAUGE STEEL HOUSEING	120 V	RECESSED, GYP CEILING	LED	4000 lm	80 CRI	3500 K	32 W	125 lm/W	0-10V DIMMING TO 5%	ONE PIECE LOWER REFLECTOR WITH HIGH REFLECTANCE POLYESTER POWDER COATING	CREE LIGHTING	CR24 40LHE 35K CMA DGA24-WHT	1,2
A3	2X4 STANDARD TROFFER ACCESS, 22 GAUGE STEEL HOUSEING	120 V	SURFACE	LED	4000 lm	80 CRI	3500 K	32 W	125 lm/W	0-10V DIMMING TO 5%	ONE PIECE LOWER REFLECTOR WITH HIGH REFLECTANCE POLYESTER POWDER COATING	CREE LIGHTING	CR24 40LHE 35K CMA SMK-CR24	1,2
C1	1X4 STANDARD TROFFER ACCESS, 22 GAUGE STEEL HOUSEING	120 V	RECESSED, ACT CEILING	LED	4000 lm	80 CRI	3500 K	32 W	125 lm/W	0-10V DIMMING TO 5%	ONE PIECE LOWER REFLECTOR WITH HIGH REFLECTANCE POLYESTER POWDER COATING	CREE LIGHTING	CR14 40LHE 35K CMA	1,2
C2	1X4 STANDARD TROFFER ACCESS, 22 GAUGE STEEL HOUSEING	120 V	RECESSED, GYP CEILING	LED	4000 lm	80 CRI	3500 K	32 W	125 lm/W	0-10V DIMMING TO 5%	ONE PIECE LOWER REFLECTOR WITH HIGH REFLECTANCE POLYESTER POWDER COATING	CREE LIGHTING	CR14 40LHE 35K CMA DGA14-WHT	1,2
C3	1X4 STANDARD TROFFER ACCESS, 22 GAUGE STEEL HOUSEING	120 V	SURFACE	LED	4000 lm	80 CRI	3500 K	32 W	125 lm/W	0-10V DIMMING TO 5%	ONE PIECE LOWER REFLECTOR WITH HIGH REFLECTANCE POLYESTER POWDER COATING	CREE LIGHTING	CR14 40LHE 35K CMA SMK-CR14	1,2
D1	ROUND RECESSED LED DOWNLIGHT, 4" APERTURE WITH WHEAT COLOR TRIM	120 V	RECESSED, GYP CEILING	LED	2500 lm	80 CRI	2700 K	27.8 W	99 lm/W	0-10V DIMMING TO 1%	AMERICAN MATTE WITH LIGHT WHEAT REFLECTOR COLOR AND TRIM	PRESCOLITE - LITEISTRY	LTR-4RD-H-ML-25L-DM1-LTR-4RD-T-ML-27K-8-MD-MFC-LW	⚠
D2	ROUND SURFACE LED DOWNLIGHT, LOW PROFILE ALUMINUM HOUSING, 6" APERTURE WITH WHITE TRIM	120 V	SURFACE	LED	1100 lm	80 CRI	3500 K	12.9	96 lm/W	0-10V DIMMING	POLYCARBONATE LENS, DIFFUSE	PRESCOLITE - LITEBOX	LBSE-6RD-35K8-WH	
E	SINGLE FACE LED EXIT SIGN, DIE-CAST ALUMINUM HOUSING AND FACEPLATE, IN WHITE HOUSING FINISH	120 V	SURFACE - UNIVERSAL	LED	0 lm	N/A	3500 K	1.78 W	0 lm/W	AC ONLY	WHITE THERMOPLASTIC STENCIL FACE, RED LETTERING	COMPASS - CE	CAR	
EM	EMERGENCY LIGHT - 2 HEADS, SELF-DIAGNOSTIC TEST SWITCH	120 V	WALL MOUNT	LED	640 lm	N/A	3200 K	1 W	97 lm/W	N/A	GLARE-FREE LENS	COMPASS - CU	CU2	
F1	4' WRAP AROUND	120 V	WALL MOUNT	LED	3540 lm	80 CRI	3500 K	30 W	118 lm/W	0-10V DIMMING TO 10%	FROSTED, ACRYLIC LENS	COLUMBIA - CNW	CNW4-LSCS	
S1	4' STRIPLIGHT	120 V	SURFACE/CHAIN HUNG	LED	3300 lm	80 CRI	3500 K	23.6 W	120 lm/W	0-10V DIMMING	CURVE, FROSTED POLYCARBONATE LENS	COLUMBIA MPS	MPS-4-35K-VW-CP-W-ED-U	
S2	8' STRIPLIGHT	120 V	SURFACE/CHAIN HUNG	LED	7900 lm	80 CRI	3500 K	54.6 W	142 lm/W	0-10V DIMMING	CURVE, FROSTED POLYCARBONATE LENS	COLUMBIA MPS	MPS-8-35K-LW-CP-W-ED-U	
S3	8' STRIPLIGHT	120 V	SURFACE/CHAIN HUNG	LED	7900 lm	80 CRI	3500 K	54.6 W	142 lm/W	0-10V DIMMING	CURVE, FROSTED POLYCARBONATE LENS	COLUMBIA MPS	MPS-8-35K-LW-CP-W-ED-U	3

GENERAL NOTES:

1. NO SUBSTITUTIONS ARE ACCEPTABLE FOR A AND C LUMINAIRE TYPES.
2. PROVIDE SMARTCAST TECHNOLOGY CONFIGURATION TOOL AS MANUFACTURED BY CREE, MODEL #CCT-CWC-1 AND CREE SMARTCAST TECHNOLOGY WIRELESS DIMMERS MODEL #CWD-CWC-WH TO ACHIEVE CONTROL AS INDICATED ON LIGHTING CONTROL MATRIX. FIELD VERIFY EXACT QUANTITIES.
3. FOR THIS LIGHT FIXTURE PROVIDE AN INTEGRAL OCCUPANCY SENSOR OR SEPARATE OCCUPANCY SENSOR AS NEEDED FOR AUTOMATIC ON/OFF FUNCTION.

LIGHTING CONTROL MATRIX

SYSTEM INPUTS	SYSTEM INPUTS	CONTROLLED BY LOCAL LV OVERRIDE SWITCH	CONTROLLED BY LOCAL LV SWITCH PROGRAMMED TO DARKEN WHEN DAYLIGHT IS PRESENT	CONTROLLED BY LOCAL SWITCH AND ALSO BY OCCUPANCY SENSOR ⚠
OFFICES WITH EXTERIOR WINDOWS		●	●	●
OFFICES WITHOUT EXTERIOR WINDOWS		●		●
STORAGE ROOMS				●

No:	Date:	By:	Revision:
1	5-17-2022	NNA	ADDENDUM #1

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: LUCIA A. ANDERSON

DATE: 05-03-2022 REG. NO.: 27049

KFI ENGINEERS
670 County Road B West
St. Paul, Minnesota 55113
Tel: (651) 771-0880 Fax: (651) 771-0878
Email: kfi@kfi-eng.com

Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
LUMINAIRE SCHEDULE

Date:	05-03-2022
Drawn By:	GAA
Checked By:	LAA
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

Revision Number: 1

Sheet Number: E500

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City of Duluth, MN
Project Shutdown Plan

In the event that employee illness or a governmental agency requires that the project cease or suspend, prior to suspension the contractor shall provide a written plan to the architect/engineer on the project and to the City for their prior approval and, upon such approval, shall be implemented by the contractor as part of this contract.

The plan shall include the following requirements which shall apply to the status of the work at the time of interruption:

1. Time, if any, between the determination of the necessity of suspension and the actual suspension of work will be allocated in this order of priority; Life Safety Issues, Asset Integrity, Environmental Impacts, & Economic Impacts.
2. Excavations will be completed or temporarily filled.
3. Equipment will be removed from the site or secured by the contractor.
4. Physical barricades shall be installed as necessary to protect the work from damage or destruction and the public from injury in the event of trespass onthe site.
5. Warning signs shall be installed where reasonably necessary to warn thepublic of any hazardous condition on the site.
6. Erosion control necessary to protect the site shall be in place and functioningand vegetation shall be in place and properly protected; all exposed and or erodible soil surfaces shall be fully stabilized per the SWPPP/NPDES permitrequirements.
7. Onsite materials shall be removed from the site to safe storage or protectedon site from damage or theft.

When work is being performed inside a building, the following additional requirements shall apply:

8. Building/Workspace shall be left in a safe and secure manner. Access to the work area will be accessible with a lockable physical barrier.
9. The building shall be left with a weather tight envelope.
10. Electrical infrastructure shall be left in a safe manner compliant with electrical code.
11. Plumbing infrastructure shall be left in a safe and leak-proof manner compliant with plumbing code.
12. Emergency exit routes shall be open and accessible, unless agreed to by the City of Duluth.
13. Fire suppression systems will be left in an operable manner, unless agreed to by the City of Duluth.
14. Alarm systems will be left in an operable manner, unless agreed to by the City of Duluth.
15. The work area will need to be cleaned/sterilized.
16. If the general contractor is unable to meet these requirements; the work related to these items will need to be contracted out by the general contractor.

ADDENDUM

Date: June 2, 2022
Project: City of Duluth City Hall MEP Renewal
KFI Project Number: 21-0486.00
Addendum Number: 3

THIS ADDENDUM IS A CONTRACT DOCUMENT AND MAY APPLY TO ANY OR ALL CONTRACTS AND SUBCONTRACTS UNLESS OTHERWISE SPECIFIED HEREIN OR SHOWN ON THE ATTACHED DRAWINGS (IF ANY). ALL WORK REQUIRED BY THIS ADDENDUM SHALL BE IN COMPLETE ACCORD WITH THE CONTRACT DOCUMENTS AND SUBSEQUENT ADDENDA THERETO. THE ITEMS LISTED IN THIS ADDENDUM ARE NOT IN ANY ORDER IN REGARD TO THE DRAWINGS OR THE SPECIFICATIONS. ALL CONTRACTORS ARE CAUTIONED TO EXAMINE EACH AND EVERY ITEM OF THIS ADDENDUM.

THE FOLLOWING CHANGES OR CLARIFICATIONS TO THE PLANS & SPECIFICATIONS SHALL BE INCLUDED AS PART OF THE CONTRACT DOCUMENT

RESPONSES TO REQUESTS:

1. The City of Duluth is requiring an extended warranty from Trane. In order for Trane to provide an extended warranty (parts and compressor for a period of ten (10) years) the contractor shall provide the following:
    a. Personnel from the installing contractor shall successfully complete the CITY MULTI MEUS approved training course, and
    b. The installing contractor shall submit a completed and approved MEUS Extended Warranty Process report.
2. All VRF equipment (heat pumps and cassettes) is scheduled to be available for delivery before the end of the year. The contractor shall include in their bid:
    a. Coordination with Trane to receive VRF equipment,
    b. Delivery of VRF equipment to a secure storage facility that will protect equipment and minimize component damage,
    c. Secure storage for the duration of VRF system installation, and
    d. Delivery of the VRF equipment to the site as needed to meet the estimated installation schedule.
3. Lighting sheets revisions.
4. Electrical coordination with mechanical submitted shop drawings

BENTZ THOMPSON RIETOW (BTR) CHANGES:

1. See attached BTR narrative, specification sections 017329 and 095100, and revised “A”-drawings.

PLAN SHEET CHANGES:

1. Sheet M213 Plumbing Plan Basement Floor Area C – Additional condensate riser branch connection to the condensate main.
2. Sheet M321 Hydronic Plan Ground Floor Area A – Add hydronic piping for VAV box 0-10.
3. Sheet M324 Hydronic Plan Ground Floor Area D – Modify hydronic pipe sizes on return loop.
4. Sheet M333 Hydronic Plan 1st Floor Area C – Add hydronic piping for VAV box 1-8.
5. Sheet M342 Hydronic Plan 2nd Floor Area B – Add hydronic piping for VAV box 2-9.
6. Sheet M352 Hydronic Plan 3rd Floor Area B – Add hydronic piping for VAV box 3-9.
7. Sheet M352 Hydronic Plan 3rd Floor Area B – Extend hydronic piping through duct chase to ceiling space in office area.
8. Sheet M422 HVAC Plan Ground Floor Area B – Modify ventilation ductwork for locker room.
9. Sheet M452 HVAC Plan 3rd Floor Area B – Modify ventilation ductwork for cassette FC 3-110.

ADDENDUM

10. Sheet M900 Mechanical Schedules – Modify ventilation for VAV box VAV 0-1 to remove heating and increase air flow.
11. Sheet E130 Electrical Demolition Plan 1st Floor – add luminaire demolition in former Judge's Elevator shaft
12. Sheet E140 Electrical Demolition Plan 2nd Floor – add luminaire demolition in Mechanical shaft
13. Sheet E150 Electrical Demolition Plan 3rd Floor – add luminaire demolition in Mechanical shaft
14. Sheet E160 Electrical Demolition Plan 4th Floor – add luminaire demolition in Mechanical shaft
15. Sheet E220 Ground Floor Lighting – revised location of existing power panel
16. Sheet E230 1st Floor Lighting – add new LED luminaire in former Judge's Elevator shaft
17. Sheet E240 2nd Floor Lighting – add new LED luminaire in Mechanical shaft
18. Sheet E250 3rd Floor Lighting – add new LED luminaire in Mechanical shaft and show daylight savings zones
19. Sheet E260 4th Floor Lighting – add new LED luminaire in Mechanical shaft
20. Sheet E270 Penthouse Lighting – relocate light switch
21. Sheet E501 Motor Schedule – coordinated breaker sizes for DC-1 and all WHPs
22. Sheet E505 Panelboard Schedules – updated breakers in panel to match Motor Schedule information
23. Sheet E508 Panelboard Schedules - updated breakers in panel to match Motor Schedule information

END OF ADDENDUM

June 2, 2022

BENTZ / THOMPSON / RIETOW, INC.
Architects
900 Second Avenue S.
Minneapolis, MN 55402
(612) 332-1234

ADDENDUM NO. 3 of the Plans and Specifications for the construction of

CITY HALL MEP RENEWAL CONSTRUCTION

BTR Commission Number: 21075

This Addendum is added to and shall become part of the CD documents, dated May 3, 2022.

A. BTR Addendum NO 1 clarification:
Addendum 01 is added to and shall become part of the CD documents, dated May 3, 2022.

B. Specifications

1.) Section 01 73 29 CUTTING AND PATCHING is added to the Project Manual.
2.) Section 09 51 00 Acoustical Ceilings, 2.01 B and 2.02, A is revised to include specification of ceiling tile and suspension system. Alternate suspension grid manufactures are removed from the specification.

C. Drawings

1.) Sheets A220, A230, A240, A250 AND A260:
a. General Note #4 is revised.
THESE DRAWINS DO NOT DETAIL EVERY INSTANCE WHERE CUTTING AND PATCHING NEEDS TO OCCUR. COORDINAE ALL CUTTING AND PATCHING WORK WITH MECHANICAL CONTRACTOR AND FIELD VERIFY ALL EXISTING CONDITIONS. EXISTING CONSTRUCITON SCHEDULE TO REMAIN THAT IS DAMAGEDD AS A RESUL OF THE WORK SHALL BE REAPRED TO AN EXTENT AND AS REQUIRED TO MATCH ADJACENT EXISTING UNDAMAGED CONSTRUCTION.

b. General Note #8 is added:
THE GENERAL CONTRACTOR IS RESPONSIBLE FOR DISASSEMBLING, MOVING, STORING AND REASSEMBLING THE FURNITURE IN A SEQUENCE THAT MATCHES THE PROJECT SCHEDULE. THE GENERAL CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR ANY DISCONNECTION/RECONNECTION OF POWER TO THE FURNITURE ASSEMBLIES.

2.) Sheet A240: New shaft walls already shown in detail 5/A300 are shown on plan /A240.

3.) Sheet A300: Revised notes in plan 5/A300, see attached.

Attachments: Sheets A220, A230, A240, A250, A260, A300, Specification Sections 017329 and 095100.

END OF ADDENDUM NO. 3

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:
1. Division 01 Section “Temporary Facilities and Controls” for dust and noise control, and protection of adjacent buildings, roofs, structures and finishes.
2. Division 02 Section "Selective Building Demolition" for demolition of selected portions of the building.
3. Divisions 02 through 26 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
4. Division 07 Section "Firestopping" for patching fire-rated construction.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion,

reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
   2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 TRANSITIONS

A. Where new Work abuts or aligns with existing, make a smooth and even transition. Patched work shall match existing adjacent Work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect for final treatment.

3.4 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 73 29

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Acoustical panels
2. Suspended grid system
3. Acoustical insulation

1.02 PROJECT CONDITIONS

A. Do not install acoustical materials until proper temperature and humidity conditions can be maintained before, during and after installation. Interior concrete work, masonry, plastering and other wet operations shall be complete and dry. Windows and doors shall be in place and glazed.

B. Temperature and humidity in area of installation as recommended by acoustical product manufacturer.

1.03 EXTRA MATERIAL

A. Provide additional acoustical ceiling panels for maintenance purposes. Quantity of additional material as noted, furnished in full case lots from the same production runs and shall include proportionate amounts of all types and patterns of ceiling panels.

B. Deliver additional material to the Project and store in the building where directed at completion of the work.

1.04 SUBMITTALS

A. Product Data: For each product indicated.

B. Coordination Drawings: Drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
1. Ceiling suspension assembly members
2. Method of attaching hangers to building structure.
3. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels and special moldings.
4. Minimum drawings scale: 1/4 inch = 1 foot

C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on samples of size indicated below.
1. Acoustical Panel: Set of 6 inch square samples of each type, color, pattern and texture
2. Exposed Suspension System Members, Moldings and Trim: Set of 12 inch long samples of each type, finish and color.

PART 2 PRODUCTS

2.01 SUSPENSION SYSTEM FOR ACOUSTIC PANELS

A. Flame spread rating: Acoustical materials shall have a flame spread index of Class 25 or less according to Fed. Spec. SS-S-118B.

~~B.~~ Acceptable Manufacturers: USG Interiors, Inc. Donn DX. ~~Armstrong World Industries, Prelude 15/16"; and Chicago Metallic, Inc. 200 Snap-Grid.~~

~~C. Exposed Grid Suspension System (SUSP-1): An exposed T-grid, double web Heavy Duty, electrogalvanized cold-rolled steel with 9/16" wide, capped bottom flange with a white baked enamel finish conforming to ASTM C635, unless indicated otherwise.~~

~~D. Extruded Aluminum Edge Trim: 4 inch by 9/16 inch, cold-rolled 14-gauge steel, factory finished in flat white, USG Compasso System or Armstrong World Industries AXIOM Classic Trim.~~

E. Hanger wire: Galvanized, soft temper steel wire conforming to ASTM A641, Class 1.

2.02 ACOUSTICAL CEILING PANEL SYSTEMS

A. ACT
   a. USG, Eclipse, #78775.

C. Extra Materials: No less than 5% of SF.

PART 3 INSTALLATION

3.01 GENERAL

A. Install suspension system and acoustical materials according to ASTM C636 and the manufacturer's instructions.

B. Cooperate with mechanical and electrical contractors in locating and spacing fixtures, diffusers and similar items located in ceiling.

C. Lay out pattern in accordance with reflected ceiling plans. Where not otherwise indicated, lay out in such manner that margins on opposite sides of rooms are equal and greater than 1/2 tile in width.

3.02 SUSPENSION SYSTEM

A. Suspend main runners of mechanical suspension systems with not less than 12 gauge wire. Securely attach hanger wires to structure above. Hang wires vertically with no kinks or bends.

B. Space hangers along main runners according to manufacturer's recommendations and reinforce suspension system as necessary to adequately support the suspension system, acoustical material, light fixtures, grilles, registers and other mechanical equipment to be supported by the system with a maximum allowable deflection of 1/360 of the span. Maximum hanger spacing shall be 4 feet on center.

C. Mechanical suspension systems shall not be supported from metal deck, electrical conduit or mechanical ducts, pipes or equipment. Where spans exceed the recommended or specified spans, furnish larger main runner channels or additional reinforcing members, hangers, stiffening or bracing as necessary to support the loads without exceeding the specified allowable deflection. No swing hangers will be permitted.

D. Install edge moldings at walls and vertical projections through ceiling.

E. Suspension system shall be installed level, true to plane, at the required elevation and pattern with finished surfaces undamaged.

3.03 ACOUSTICAL PANELS

A. Install acoustical ceiling panels in suspension system strictly according to the manufacturer's recommendations. All four edges of each board shall be in firm contact with, and supported by the flanges of the steel runner sections. Check level of system during installation, and maintain a level of true plane.

B. Comply with manufacturer’s instructions and recommendations for installation of ceiling panels and industry standards.

C. Coordinate the exact size, location and sequencing of penetrations of ceiling panels by all building components.

D. Where ceilings of different heights abut, install acoustical material matching ceiling at vertical surface of ceiling break.

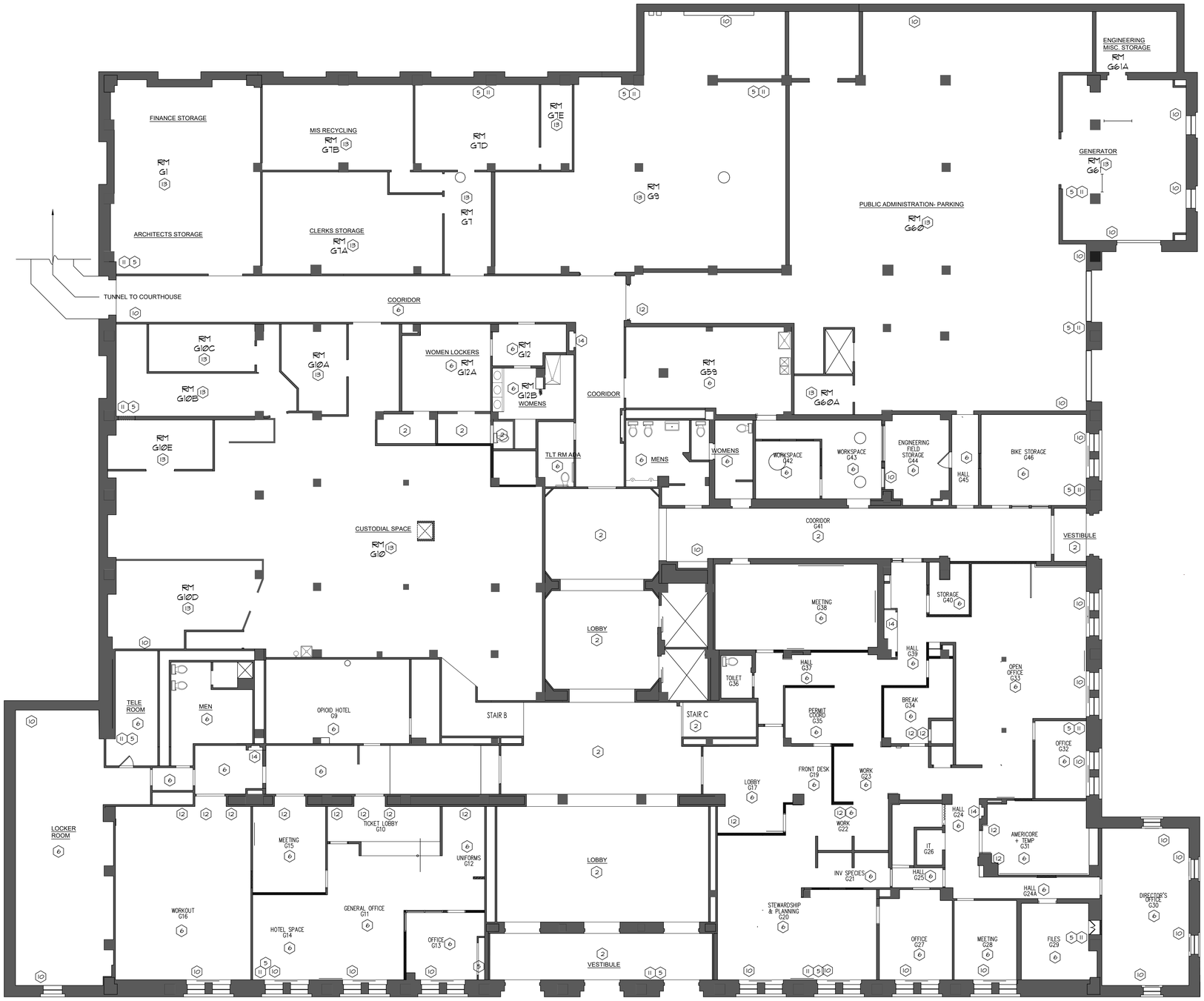
E. Adjust panels after installation so that surfaces are aligned, flush and level with gaps between units consistent in width and straight.

3.04 CLEANING

A. Following installation, clean dirt, finger marks and other discolored spots from the surfaces in a manner and with the materials recommended by the manufacturer.

B. Remove or replace dirty, discolored, damaged and improperly applied units that cannot be properly cleaned.

END OF SECTION



1 A220 REFLECTED CEILING PLAN–GROUND FLOOR

1/4" = 1'-0"

DRAWING LEGEND

- EXSITING TO REMAIN
- DEMOLITION
- NEW PLASTER CEILING
- NEW GYPSUM BOARD SOFFIT

REFLECTED CEILING PLAN KEYNOTES

(ALL KEYNOTES DO NOT APPEAR ON EVERY PLAN)

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2. EXIST PLASTER CEILING TO REMAIN.
3. REMOVE EXIST GYP BD SOFFIT.
4. EXIST PLASTER OR GYP BD SOFFIT TO REMAIN.
5. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR CONSTRUCTION WHERE WORK OCCURS TO INSTALL NEW CONDENSATE PIPE.
6. REMOVE AND SALVAGE ACOUSTICAL CEILING TILE, GRID, HANGER WIRES, ETC. ONLY AS REQUIRED FOR MECHANICAL AND ELECTRICAL WORK. REINSTALL IN SAME LOCATION. REPLACE CEILING TILES DAMAGED DURING CONSTRUCTION.
7. REMOVE AND REPLACE SUSPENDED ACOUSTICAL CEILING SYSTEM IN PACTV.
8. EXIST COFFERED CEILING TO REMAIN. DO NOT DISTURB THE EXISTING CEILING FINISHES AND STRUCTURE.
9. NEW GYP BD SOFFIT TO ENCLOSE NEW MECHANICAL DUCTS.
10. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR WHERE WORK OCCURS TO REMOVE A STEAM RADIATOR, CAP ABANDONED STEAM PIPE OR NEW HYDRONIC PIPING IS INSTALLED. SEE MECHANICAL DRAWINGS.
11. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR WHERE TRANSFER FAN IS REMOVED.
12. PATCH & REPAIR PLASTER WALL TO MATCH EXISTING WHERE WALL SUPPLY OR RETURN DIFFUSERS ARE REMOVED AND/OR REINSTALLED.
13. EXPOSED STRUCTURE AT CEILING IS EXISTING TO REMAIN. FIRESTOP ALL NEW PENETRATTIONS IN EXISTING FLOOR STRUCTURE.
14. PROVIDE NEW PLYWOOD BACKING PANEL SECURED TO EXISTING WALL. SEE ELECTRICAL DRAWING DETAIL 1/E7.00, AND ARCHITECTURAL DETAIL ON SHEET E3.00.
15. DEMOLITION, PATCH AND REPAIR OF EXISTING PLASTER CEILING WHERE HYDRONIC PIPING RUNS ABOVE EXISTING PLASTER CEILINGS. DEMO AS LITTLE AS POSSIBLE TO ALLOW FOR INSTALL OF THE NEW PIPING. SEE MECHANICAL DRAWINGS FOR PIPE SIZES AND LOCATIONS.
16. EXISTING SKYLIGHT TO REMAIN.

ARCHITECTURAL GENERAL NOTES

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REFLECTED CEILING PLAN GENERAL NOTES

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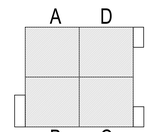
C. SEE MECHANICAL AND ELECTRICAL FOR ADDITIONAL INFORMATION.

D. EXISTING LIGHT FIXTURES TO REMAIN, UNLESS OTHERWISE NOTED. SEE ELECTRICAL DRAWINGS FOR MORE INFORMATION.

E. PROVIDE FIRESTOPPING AT ALL RATED FLOOR AND WALL PENETRATIONS. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS.

F. PROVIDE JOINT SEALANT AT ALL LOCATIONS WHERE DISSIMILIAR MATERIALS ADJOIN.

G. ALL EXISTING CEILING AND WALL CONSTRUCTION AND FINISHES IMPACTED BY THE MECHANICAL AND ELECTRICAL WORK SHALL BE PATCHED AND REPAIRED TO MATCH EXISTING CONDITIONS.



KEYPLAN

No:	Date:	By:	Revision:
2	6/02/22		ADDENDUM 3
1	5/17/22		ADDENDUM 1

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: RANDY MOE

DATE: 06-02-2022 REG. NO.: 20116

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
REFLECTED CEILING PLAN
GROUND FLOOR

Date:	06-02-2022
Drawn By:	BTR
Checked By:	RLM
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

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Sheet Number: A220

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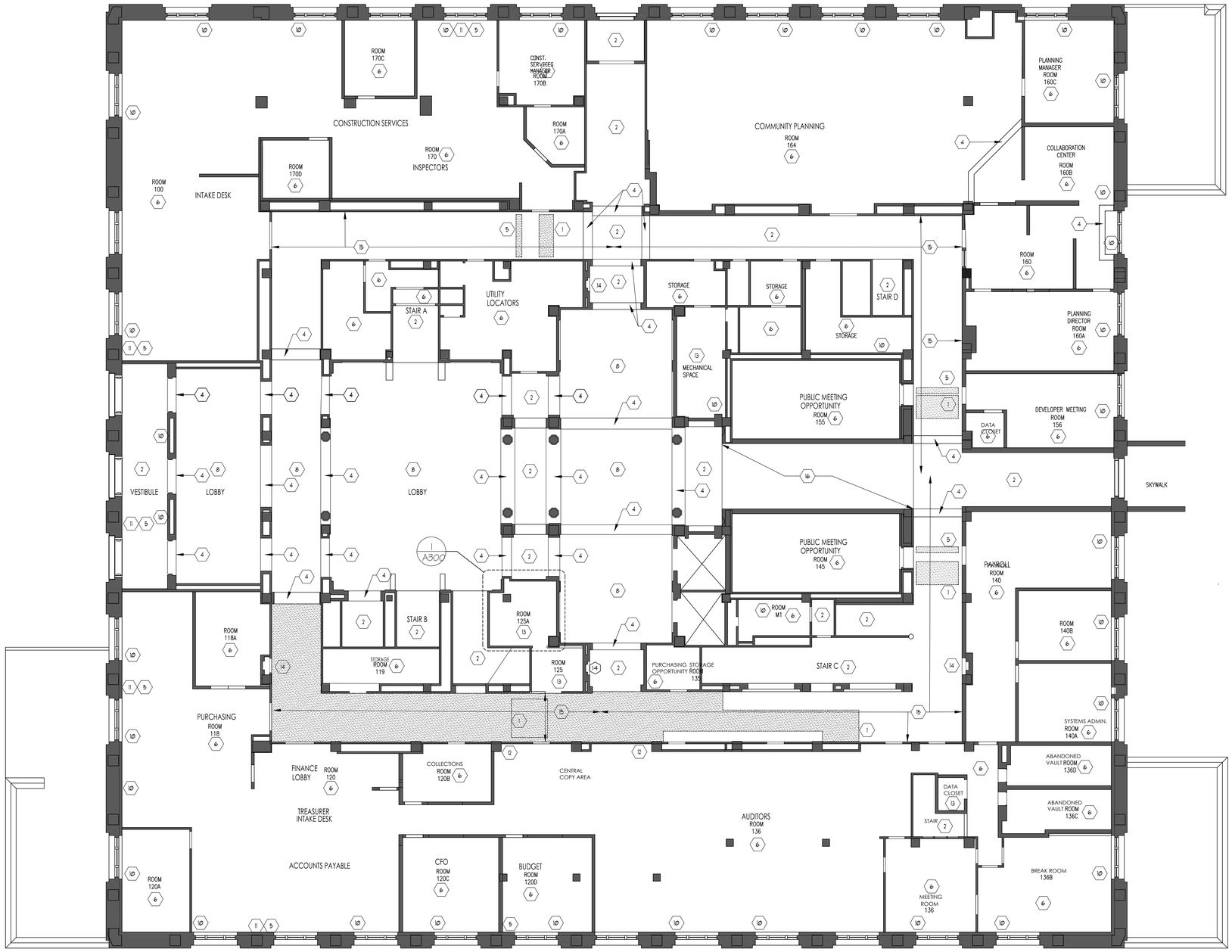

1 A230 REFLECTED CEILING PLAN–FIRST FLOOR

1/4" = 1'-0"

DRAWING LEGEND

- EXISTING TO REMAIN
- DEMOLITION
- NEW PLASTER CEILING
- NEW GYPSUM BOARD SOFFIT

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A D
B C
KEYPLAN

No:	Date:	By:	Revision:
2	6/02/22		ADDENDUM 3
1	5/17/22		ADDENDUM 1

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
REFLECTED CEILING PLAN FIRST FLOOR

Date:	06-02-2022
Drawn By:	BTR
Checked By:	RLM
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

Revision Number: 2

Sheet Number: A230

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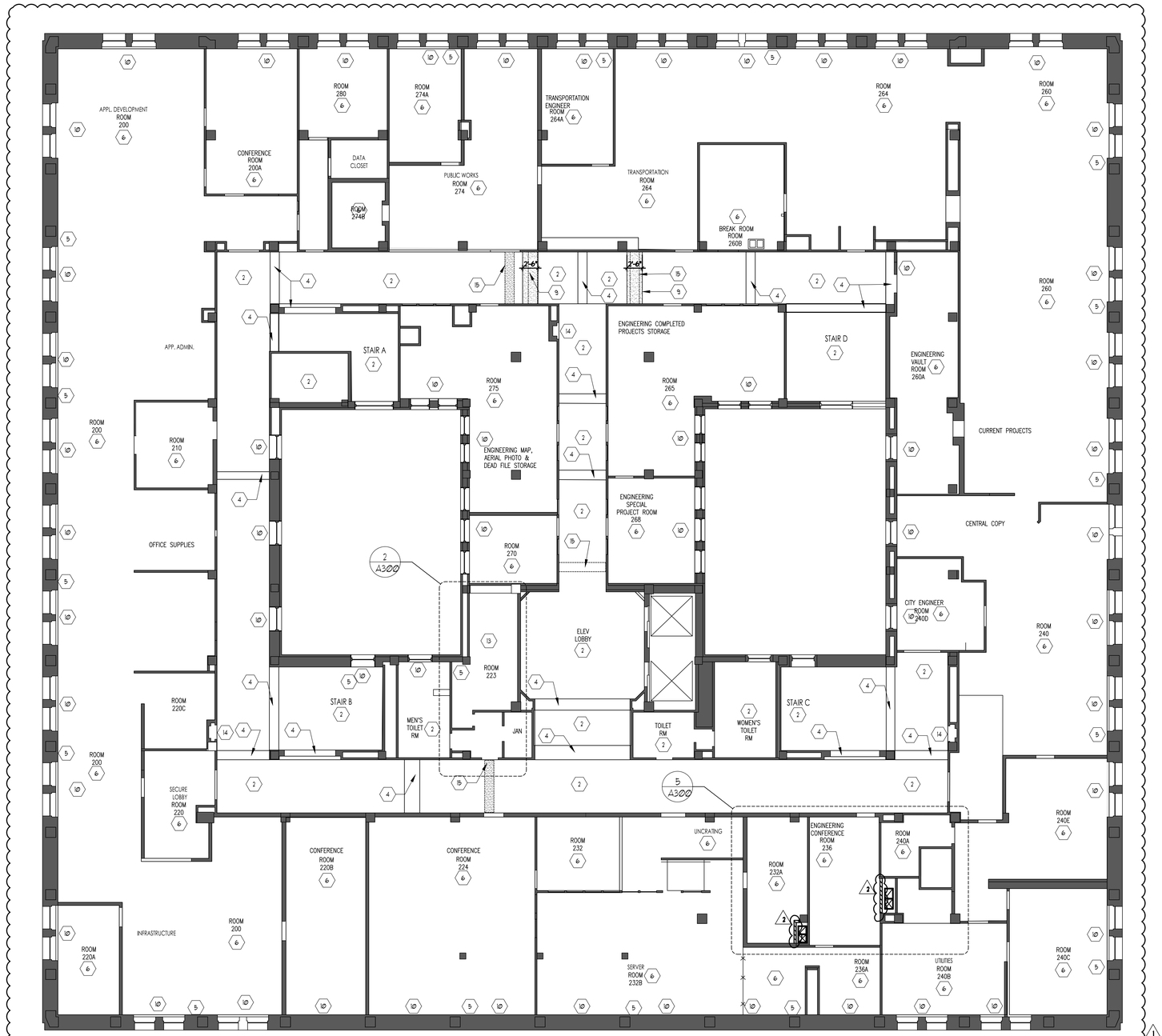

1 A240 REFLECTED CEILING PLAN–SECOND FLOOR

1/4" = 1'-0"

DRAWING LEGEND

- EXSITING TO REMAIN
- DEMOLITION
- NEW PLASTER CEILING
- NEW GYPSUM BOARD SOFFIT

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A D
B C
KEYPLAN

No:	Date:	By:	Revision:
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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
REFLECTED CEILING PLAN
SECOND FLOOR

Date:	06-02-2022
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Checked By:	RLM
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DWG Scale:	AS NOTED
Sheet Size:	30x42

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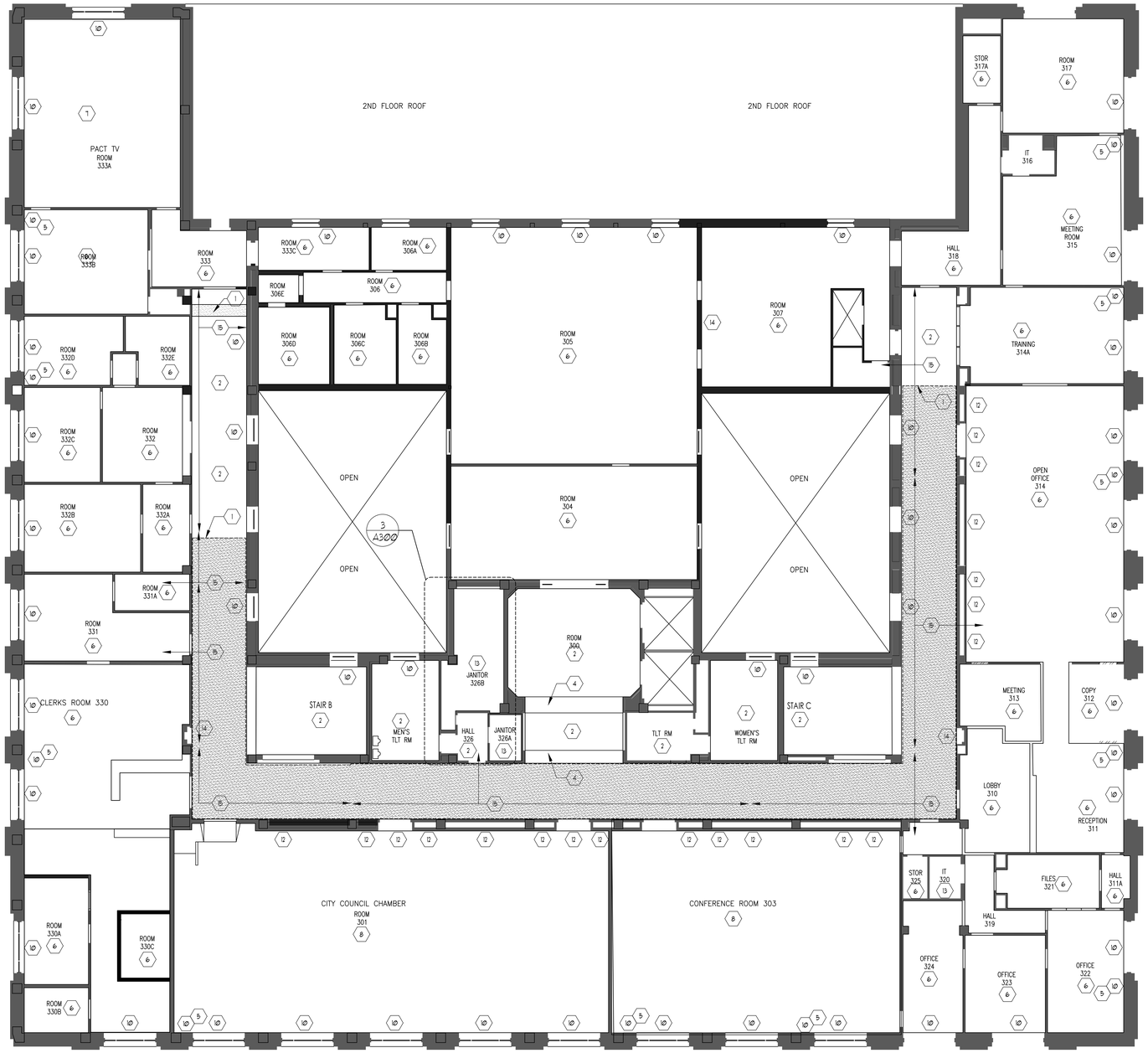

1 A250 REFLECTED CEILING PLAN—THIRD FLOOR

1/4" = 1'-0"

DRAWING LEGEND

- EXISITNG TO REMAIN
- DEMOLITION
- NEW PLASTER CEILING
- NEW GYPSUM BOARD SOFFIT

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4. EXIST PLASTER OR GYP BD SOFFIT TO REMAIN.
5. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR CONSTRUCTION WHERE WORK OCCURS TO INSTALL NEW CONDENSATE PIPE.
6. REMOVE AND SALVAGE ACOUSTICAL CEILING TILE, GRID, HANGER WIRES, ETC. ONLY AS REQUIRED FOR MECHANICAL AND ELECTRICAL WORK. REINSTALL IN SAME LOCATION. REPLACE CEILING TILES DAMAGED DURING CONSTRUCTION.
7. REMOVE AND REPLACE SUSPENDED ACOUSTICAL CEILING SYSTEM IN PACTV.
8. EXIST COFFERED CEILING TO REMAIN. DO NOT DISTURB THE EXISTING CEILING FINISHES AND STRUCTURE.
9. NEW GYP BD SOFFIT TO ENCLOSE NEW MECHANICAL DUCTS.
10. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR WHERE WORK OCCURS TO REMOVE A STEAM RADIATOR, CAP ABANDONED STEAM PIPE OR NEW HYDRONIC PIPING IS INSTALLED. SEE MECHANICAL DRAWINGS.
11. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR WHERE TRANSFER FAN IS REMOVED.
12. PATCH & REPAIR PLASTER WALL TO MATCH EXISTING WHERE WALL SUPPLY OR RETURN DIFFUSERS ARE REMOVED AND/OR REINSTALLED.
13. EXPOSED STRUCTURE AT CEILING IS EXISTING TO REMAIN. FIRESTOP ALL NEW PENETRATIONS IN EXISTING FLOOR STRUCTURE.
14. PROVIDE NEW PLYWOOD BACKING PANEL SEGURED TO EXISTING WALL. SEE ELECTRICAL DRAWING DETAIL 1/E100, AND ARCHITECTURAL DETAIL ON SHEET E300.
15. DEMOLITION, PATCH AND REPAIR OF EXISTING PLASTER CEILING WHERE HYDRONIC PIPING RUNS ABOVE EXISTING PLASTER CEILINGS. DEMO AS LITTLE AS POSSIBLE TO ALLOW FOR INSTALL OF THE NEW PIPING. SEE MECHANICAL DRAWINGS FOR PIPE SIZES AND LOCATIONS.
16. EXISTING SKYLIGHT TO REMAIN.

ARCHITECTURAL GENERAL NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY ARCHITECT OF ANY CONFLICT AND/OR DISCREPANCIES PRIOR TO COMMENCING WORK.
2. CONTRACTOR SHALL VISIT THE SITE AND INVESTIGATE ALL FIELD CONDITIONS PRIOR TO BIDDING AND CONSTRUCTION.
3. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS IN THE DRAWINGS THAT ARE BASED ON FIELD MEASURING/OBSERVATION OF EXISTING CONSTRUCTION.
4. THESE DRAWINGS ARE NOT INTENDED TO SHOW EVERY INSTANCE WHERE CUTTING AND PATCHING NEEDS TO OCCUR. COORDINATE ALL CUTTING AND PATCHING WORK WITH THE MECHANICAL CONTRACTOR AND FIELD VERIFY ALL EXISTING CONDITIONS. EXISTING CONSTRUCTION SCHEDULED TO REMAIN THAT IS DAMAGED AS A RESULT OF THE WORK SHALL BE REPAIRED TO AN EXTENT AND AS REQUIRED TO MATCH ADJACENT EXISTING UNDAMAGED CONSTRUCTION. 2
5. OWNER WILL OCCUPY THE PREMISES DURING ENTIRE CONSTRUCTION PERIOD. COOPERATE WITH OWNER DURING CONSTRUCTION OPERATIONS TO MINIMIZE CONFLICTS AND FACILITATE OWNER USAGE. PERFORM THE WORK SO AS NOT TO INTERFERE WITH OWNER'S OPERATIONS.
6. MAINTAIN ACCESS TO EXISTING EXITS, WALKWAYS, CORRIDORS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. DO NOT CLOSE OR OBSTRUCT WALKWAYS, CORRIDORS, OR OTHER OCCUPIED OR USED FACILITIES WITHOUT WRITTEN PERMISSION FROM OWNER AND AUTHORITIES HAVING JURISDICTION.
7. THE BUILDING AND SITE IS A HISTORIC PROPERTY. FINISHES IN PUBLIC AREAS MUST BE REPLACED TO MATCH EXISTING FINISHES AND CONSTRUCTION.
8. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR DISASSEMBLING, MOVING, STORING AND REASSEMBLING THE FURNITURE IN A SEQUENCE THAT MATCHES THE PROJECT SCHEDULE. THE GENERAL CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR ANY DISCONNECTION/RECONNECTION OF POWER TO THE FURNITURE ASSEMBLIES. 2

REFLECTED CEILING PLAN GENERAL NOTES

A. ALL SUSPENDED ACOUSTICAL CEILING TILE (ACT) SYSTEMS THAT ARE REMOVED MUST EITHER BE PUT BACK IN PLACE OR REPLACED AS REQUIRED BY THE SCOPE OF THE MECHANICAL AND ELECTRICAL WORK.

B. ALL PLASTER CEILINGS THAT ARE REMOVED SHALL BE REPLACED IN THE EXACT SAME LOCATION AND MUST MATCH AND ALIGN WITH ADJACENT PLASTER CEILINGS.

C. SEE MECHANICAL AND ELECTRICAL FOR ADDITIONAL INFORMATION.

D. EXISTING LIGHT FIXTURES TO REMAIN, UNLESS OTHERWISE NOTED. SEE ELECTRICAL DRAWINGS FOR MORE INFORMATION.

E. PROVIDE FIRESTOPPING AT ALL RATED FLOOR AND WALL PENETRATIONS. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS.

F. PROVIDE JOINT SEALANT AT ALL LOCATIONS WHERE DISSIMILIAR MATERIALS ADJOIN.

G. ALL EXISTING CEILING AND WALL CONSTRUCTION AND FINISHES IMPACTED BY THE MECHANICAL AND ELECTRICAL WORK SHALL BE PATCHED AND REPAIRED TO MATCH EXISTING CONDITIONS.

A D
B C
KEYPLAN

No:	Date:	By:	Revision:
2	6/02/22		ADDENDUM 3
1	5/17/22		ADDENDUM 1

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

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DATE: 06-02-2022 REG. NO.: 20116

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
REFLECTED CEILING PLAN THIRD FLOOR

Date:	06-02-2022
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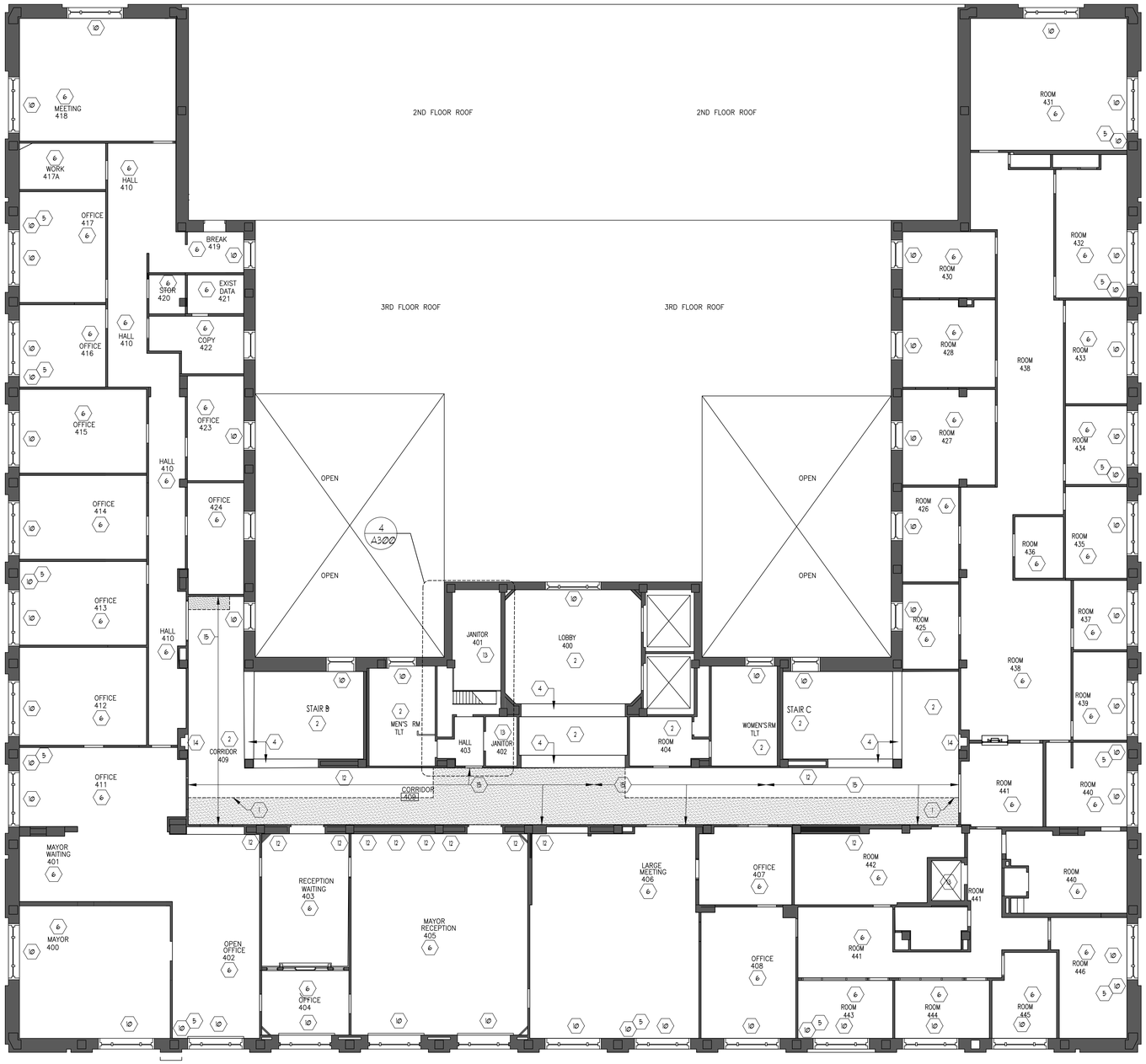

1 A260 REFLECTED CEILING PLAN—FOURTH FLOOR

1/4" = 1'-0"

DRAWING LEGEND

- EXSITING TO REMAIN
- DEMOLITION
- NEW PLASTER CEILING
- NEW GYPSUM BOARD SOFFIT

REFLECTED CEILING PLAN KEYNOTES

(ALL KEYNOTES DO NOT APPEAR ON EVERY PLAN)

1. DEMOLITION, PATCH AND REPAIR OF EXISTING PLASTER CEILING WHERE EXIST MECHANICAL DUCT WORK IS REMOVED AND/OR NEW MECHANICAL DUCT WORK RUNS ABOVE CEILING. DEMO AS LITTLE AS POSSIBLE. SEE MECHANICAL DRAWINGS FOR DUCT SIZES AND LOCATIONS.
2. EXIST PLASTER CEILING TO REMAIN.
3. REMOVE EXIST GYP BD SOFFIT.
4. EXIST PLASTER OR GYP BD SOFFIT TO REMAIN.
5. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR CONSTRUCTION WHERE WORK OCCURS TO INSTALL NEW CONDENSATE PIPE.
6. REMOVE AND SALVAGE ACOUSTICAL CEILING TILE, GRID, HANGER WIRES, ETC., ONLY AS REQUIRED FOR MECHANICAL AND ELECTRICAL WORK. REINSTALL IN SAME LOCATION. REPLACE CEILING TILES DAMAGED DURING CONSTRUCTION.
7. REMOVE AND REPLACE SUSPENDED ACOUSTICAL CEILING SYSTEM IN PAGTV.
8. EXIST COFFERED CEILING TO REMAIN. DO NOT DISTURB THE EXISTING CEILING FINISHES AND STRUCTURE.
9. NEW GYP BD SOFFIT TO ENCLOSE NEW MECHANICAL DUCTS.
10. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR WHERE WORK OCCURS TO REMOVE A STEAM RADIATOR, CAP ABANDONED STEAM PIPE OR NEW HYDRONIC PIPING IS INSTALLED. SEE MECHANICAL DRAWINGS.
11. PATCH & REPAIR PLASTER WALL, CEILING OR FLOOR WHERE TRANSFER FAN IS REMOVED.
12. PATCH & REPAIR PLASTER WALL TO MATCH EXISTING WHERE WALL SUPPLY OR RETURN DIFFUSERS ARE REMOVED AND/OR REINSTALLED.
13. EXPOSED STRUCTURE AT CEILING IS EXISTING TO REMAIN. FIRESTOP ALL NEW PENETRATTIONS IN EXISTING FLOOR STRUCTURE.
14. PROVIDE NEW PLYWOOD BACKING PANEL SECURED TO EXISTING WALL. SEE ELECTRICAL DRAWING DETAIL 1/E1100, AND ARCHITECTURAL DETAIL ON SHEET E300.
15. DEMOLITION, PATCH AND REPAIR OF EXISTING PLASTER CEILING WHERE HYDRONIC PIPING RUNS ABOVE EXISTING PLASTER CEILINGS. DEMO AS LITTLE AS POSSIBLE TO ALLOW FOR INSTALL OF THE NEW PIPING. SEE MECHANICAL DRAWINGS FOR PIPE SIZES AND LOCATIONS.
16. EXISTING SKYLIGHT TO REMAIN.

ARCHITECTURAL GENERAL NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY ARCHITECT OF ANY CONFLICT AND/OR DISCREPANCIES PRIOR TO COMMENCING WORK.
2. CONTRACTOR SHALL VISIT THE SITE AND INVESTIGATE ALL FIELD CONDITIONS PRIOR TO BIDDING AND CONSTRUCTION.
3. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS IN THE DRAWINGS THAT ARE BASED ON FIELD MEASURING/OBSERVATION OF EXISTING CONSTRUCTION.
4. THESE DRAWINGS ARE NOT INTENDED TO SHOW EVERY INSTANCE WHERE CUTTING AND PATCHING NEEDS TO OCCUR. COORDINATE ALL CUTTING AND PATCHING WORK WITH THE MECHANICAL CONTRACTOR AND FIELD VERIFY ALL EXISTING CONDITIONS. EXISTING CONSTRUCTION SCHEDULED TO REMAIN THAT IS DAMAGED AS A RESULT OF THE WORK SHALL BE REPAIRED TO AN EXTENT AND AS REQUIRED TO MATCH ADJACENT EXISTING UNDAMAGED CONSTRUCTION. 2
5. OWNER WILL OCCUPY THE PREMISES DURING ENTIRE CONSTRUCTION PERIOD. COOPERATE WITH OWNER DURING CONSTRUCTION OPERATIONS TO MINIMIZE CONFLICTS AND FACILITATE OWNER USAGE. PERFORM THE WORK SO AS NOT TO INTERFERE WITH OWNER'S OPERATIONS.
6. MAINTAIN ACCESS TO EXISTING EXITS, HALKWAYS, CORRIDORS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. DO NOT CLOSE OR OBSTRUCT HALKWAYS, CORRIDORS, OR OTHER OCCUPIED OR USED FACILITIES WITHOUT WRITTEN PERMISSION FROM OWNER AND AUTHORITIES HAVING JURISDICTION.
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REFLECTED CEILING PLAN GENERAL NOTES

A. ALL SUSPENDED ACOUSTICAL CEILING TILE (ACT) SYSTEMS THAT ARE REMOVED MUST EITHER BE PUT BACK IN PLACE OR REPLACED AS REQUIRED BY THE SCOPE OF THE MECHANICAL AND ELECTRICAL WORK.

B. ALL PLASTER CEILINGS THAT ARE REMOVED SHALL BE REPLACED IN THE EXACT SAME LOCATION AND MUST MATCH AND ALIGN WITH ADJACENT PLASTER CEILINGS.

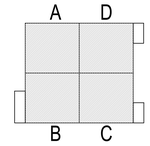
C. SEE MECHANICAL AND ELECTRICAL FOR ADDITIONAL INFORMATION.

D. EXISTING LIGHT FIXTURES TO REMAIN, UNLESS OTHERWISE NOTED. SEE ELECTRICAL DRAWINGS FOR MORE INFORMATION.

E. PROVIDE FIRESTOPPING AT ALL RATED FLOOR AND WALL PENETRATIONS. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS.

F. PROVIDE JOINT SEALANT AT ALL LOCATIONS WHERE DISSIMILIAR MATERIALS ADJOIN.

G. ALL EXISTING CEILING AND WALL CONSTRUCTION AND FINISHES IMPACTED BY THE MECHANICAL AND ELECTRICAL WORK SHALL BE PATCHED AND REPAIRED TO MATCH EXISTING CONDITIONS.



KEYPLAN

No:	Date:	By:	Revision:
2	6/02/22		ADDENDUM 3
1	5/17/22		ADDENDUM 1

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PRINT NAME: RANDY MOE

DATE: 06-02-2022 REG. NO.: 20116

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN

411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
REFLECTED CEILING PLAN FOURTH FLOOR

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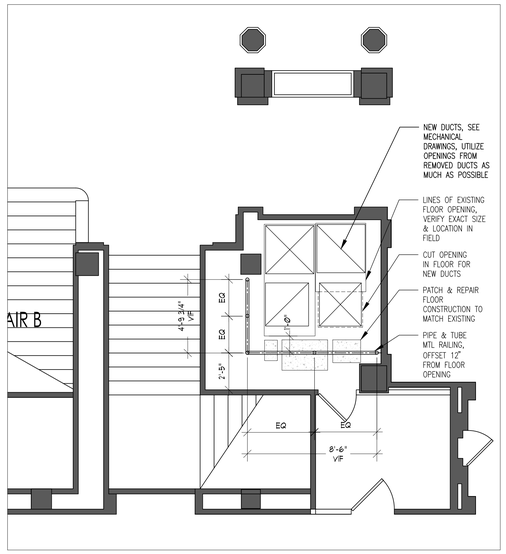
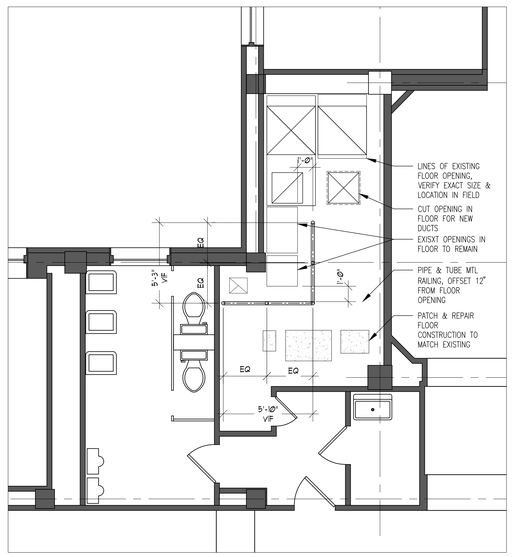


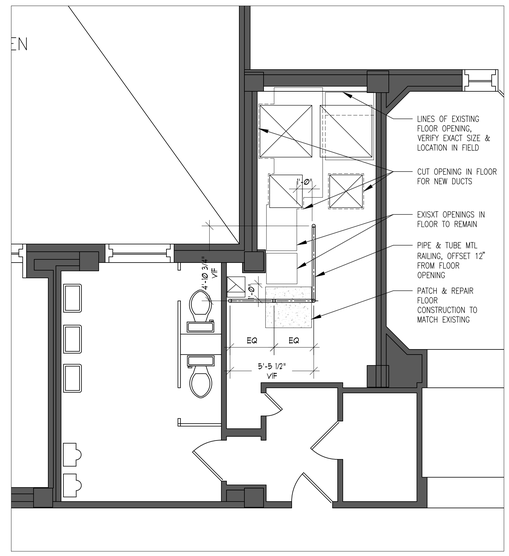
1 A300 ENLARGED FLOOR PLAN–FIRST FLOOR AREA B

1/4" = 1'-0"



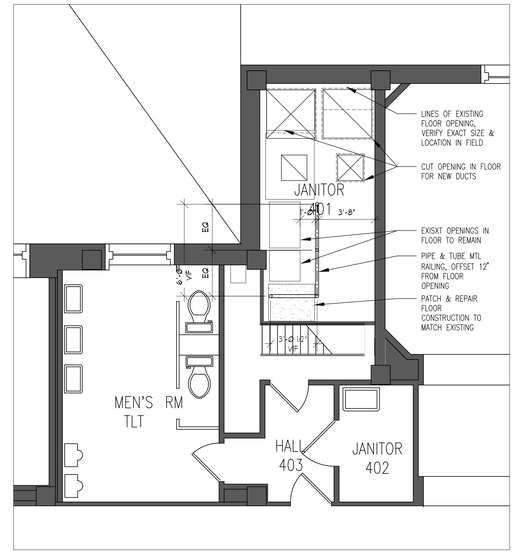
2 A300 ENLARGED FLOOR PLAN–SECOND FLOOR AREA B

1/4" = 1'-0"



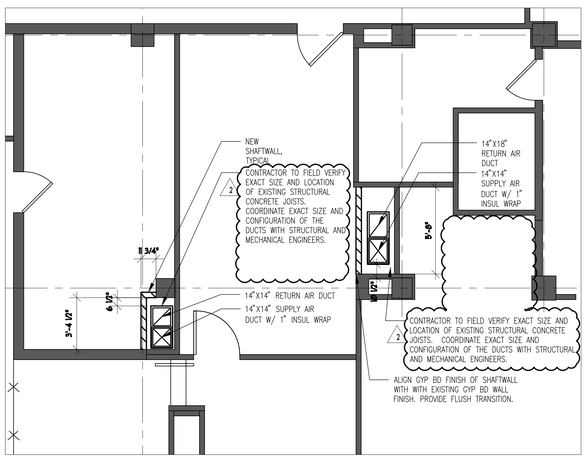
3 A300 ENLARGED FLOOR PLAN–THIRD FLOOR AREA B

1/4" = 1'-0"



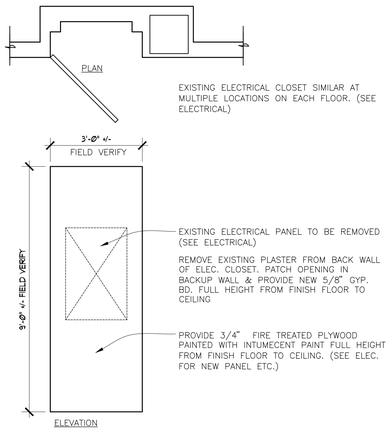
4 A300 ENLARGED FLOOR PLAN–FOURTH FLOOR AREA B

1/4" = 1'-0"



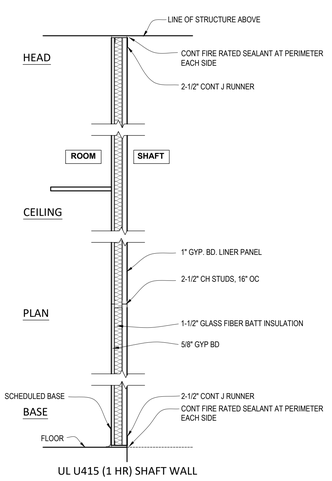
5 A300 ENLARGED FLOOR PLAN–SECOND FLOOR AREA C

1/4" = 1'-0"



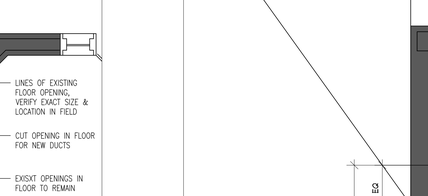
6 A300 TYPICAL ELECTRCIAL CLOSET

1/2" = 1'-0"



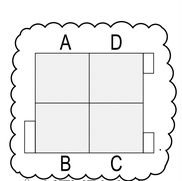
7 A300 TYPICAL NEW SHAFT WALL

1" = 1'-0"



8 A300 TYPICAL RAILING PARTIAL ELEVATION

1/2" = 1'-0"



1 KEYPLAN

No:	Date:	By:	Revision:
2	6/02/22		ADDENDUM 3
1	5/17/22		ADDENDUM 1

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PRINT NAME: RANDY MOE

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
ENLARGED FLOOR PLANS & DETAILS

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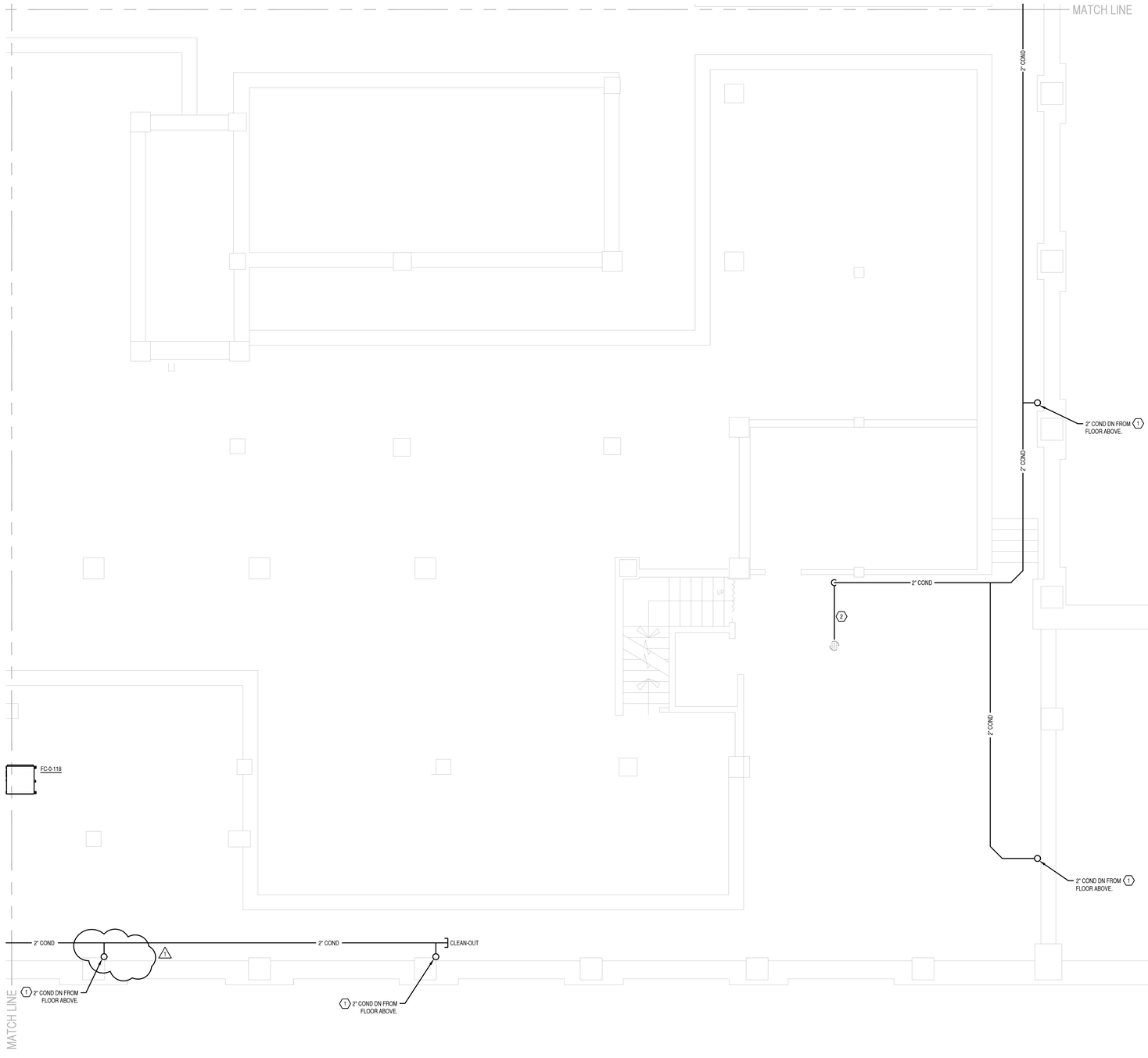
GENERAL NOTES:

1. CONDENSATE PIPING TO BE SLOPED AT 1/8" PER 1'-0".
2. CONTRACTOR SHALL COORDINATE CONSTRUCTION PHASING PRIOR TO START OF NEW WORK.
3. CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL EQUIPMENT ON SITE.
4. CONTRACTOR SHALL VERIFY SIZE, LOCATION, AND ROUTING OF ALL DUCTWORK, PIPING, AND CONTROL COMPONENTS ON SITE.

KEY NOTES:

(NOT ALL NOTES MAY APPLY TO ALL SHEETS)

1. ROUTE NEW CONDENSATE PIPING DOWN THRU EXISTING STEAM PIPING FLOOR PENETRATIONS. VERIFY EXACT LOCATION AND ROUTING ON SITE.
2. ROUTE NEW CONDENSATE PIPING TO EXISTING FLOOR DRAIN, PROVIDE 1" MINIMUM AIR GAP. VERIFY ROUTING AND LOCATION ON SITE.
3. CONNECT NEW 3" WASTE PIPING TO EXISTING WASTE PIPING IN TUNNEL. VERIFY ROUTING AND LOCATION ON SITE.
4. SAW CUT EXISTING SLAB TO INSTALL NEW WASTE PIPING.

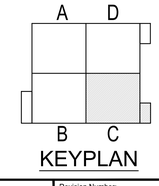


1 M213 PLUMBING PLAN BASEMENT FLOOR AREA C

1/4"=1'-0"

NORTH

0 2' 4' 8'



KEYPLAN

No:	Date:	By:	Revision:
1	6-1-22	JCM	ADDENDUM #3

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: RANDY P. CHRISTENSON

Randy Christenson

DATE: 05-03-2022 REG. NO.: 40493

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Project Title:
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CITY HALL MEP RENEWAL DESIGN

411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
PLUMBING PLAN
BASEMENT FLOOR
AREA C

Date:	05-03-2022
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Project No:	21-0486
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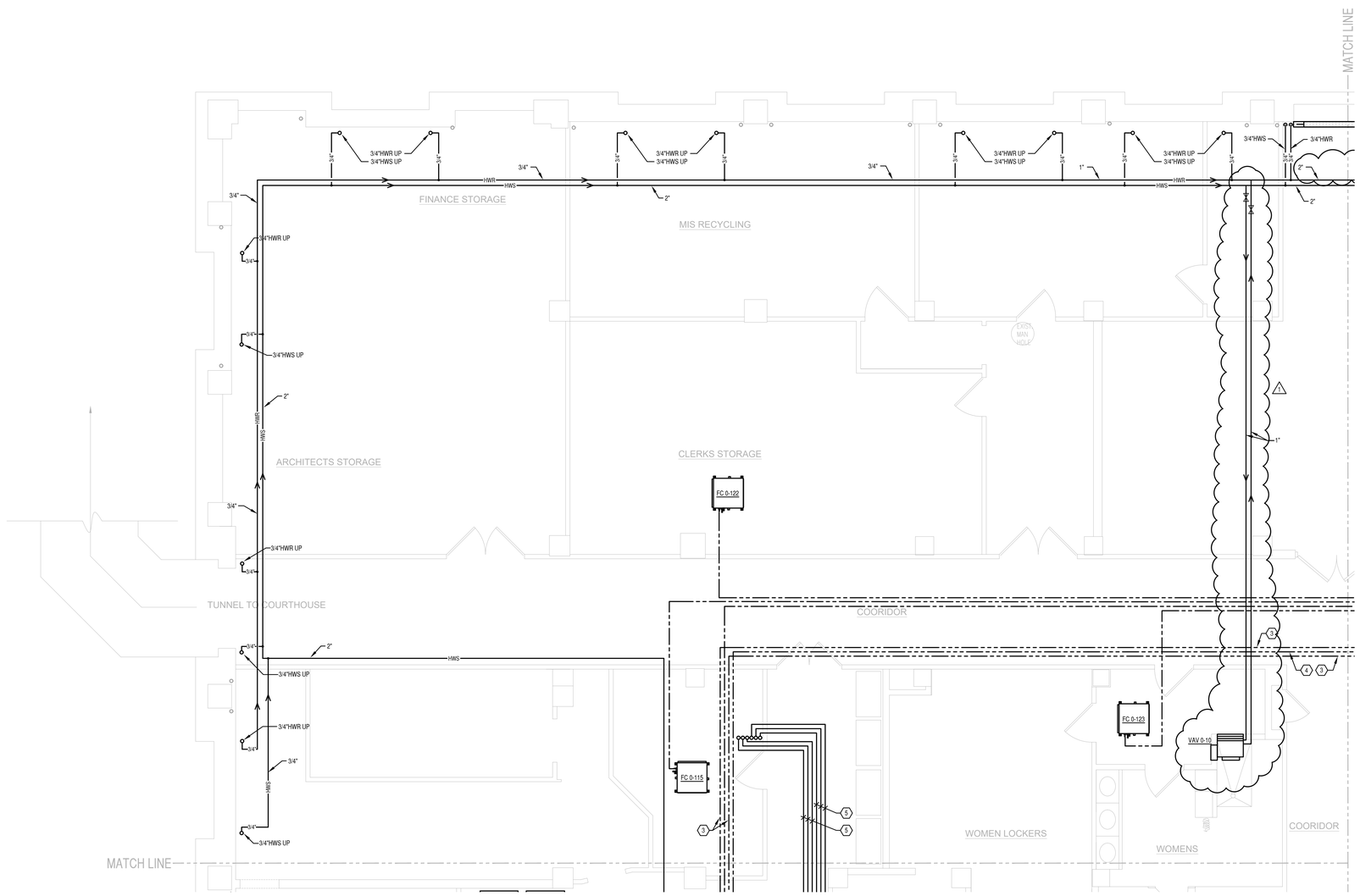

1 M321 HYDRONIC PLAN GROUND FLOOR AREA A
1/4"=1'-0"

NORTH

0 2' 4' 8'

GENERAL NOTES

A. THE NEW HOT WATER SUPPLY AND RETURN LOOP SHALL BE RUN IN THE INTERSTITIAL SPACE BELOW THE FLOOR ABOVE TO SERVE THE FTR ON THE FLOOR ABOVE. BRANCH PIPING TO FTR SHALL PENETRATE THE FLOOR ABOVE THROUGH THE EXISTING FLOOR PENETRATIONS FOR THE LPS AND LCR PIPING REMOVED DURING DEMOLITION.
B. PROVIDE OFFSETS IN THE BRANCH HOT WATER SUPPLY AND RETURN PIPING BELOW THE NEW FTR COVER AS NEEDED.
C. COORDINATE CONSTRUCTION WITH PHASING SCHEDULE.

KEY NOTES:

1. CONNECT NEW 3/4" HWS AND 3/4" HWR FROM CEILING SPACE OF THE FLOOR BELOW TO EXISTING RADIATOR. ROUTE BRANCH PIPING THROUGH EXISTING LPS AND LPC FLOOR OPENINGS.
2. VRF LINE SET (NOTE: ONE SINGLE LINE REPRESENTS BOTH THE SUCTION LINE AND LIQUID LINE) TO THE VRF CASSETTE. REFER TO ONE LINE DIAGRAMS BY MANUFACTURE FOR SIZES.
3. VRF LINES SET (NOTE: ONE SINGLE LINE REPRESENTS THREE (3) REFRIGERANT LINES) FROM THE INDOOR HEAT PUMP TO THE BRANCH CIRCUIT CONTROLLER.
4. VRF LINES SET (NOTE: ONE SINGLE LINE REPRESENTS THREE (3) REFRIGERANT LINES) FROM THE INDOOR HEAT PUMP TO THE BRANCH CIRCUIT CONTROLLER.
5. REFRIGERANT LINE SET FROM THE AIR SOURCE HEATPUMP (AHP) TO THE DEDICATED OUTSIDE AIR SUPPLY (DOAS) UNIT. LINE SIZE PER MANUFACTURERS REQUIREMENTS.

A D
B C
KEYPLAN

No:	Date:	By:	Revision:
1	6-1-22	JCM	ADDENDUM #3

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PRINT NAME: RANDY P. CHRISTENSON
DATE: 05-03-2022 REG. NO.: 40493

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
HYDRONIC PLAN
GROUND FLOOR
AREA A

Date:	05-03-2022
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Sheet Number: M321

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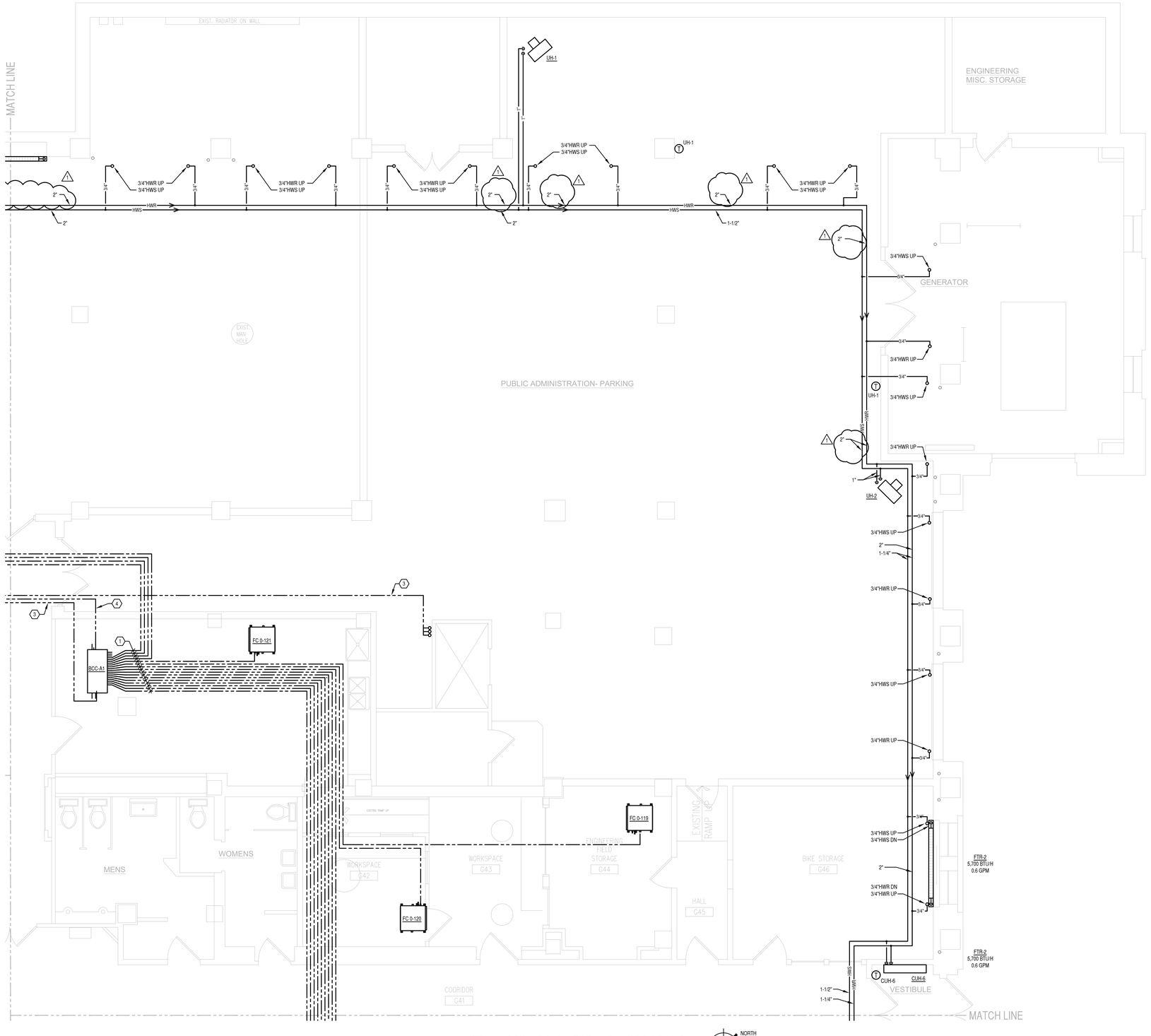


1 M324 HYDRONIC PLAN GROUND FLOOR AREA D
1/4"=1'-0"

NORTH

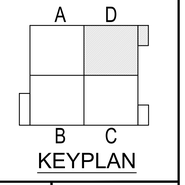
0 2' 4' 8'

GENERAL NOTES

A. THE NEW HOT WATER SUPPLY AND RETURN LOOP SHALL BE RUN IN THE INTERSTITIAL SPACE BELOW THE FLOOR ABOVE TO SERVE THE FTR ON THE FLOOR ABOVE. BRANCH PIPING TO FTR SHALL PENETRATE THE FLOOR ABOVE THROUGH THE EXISTING FLOOR PENETRATIONS FOR THE LPS AND LCR PIPING REMOVED DURING DEMOLITION.
B. PROVIDE OFFSETS IN THE BRANCH HOT WATER SUPPLY AND RETURN PIPING BELOW THE NEW FTR COVER AS NEEDED.
C. COORDINATE CONSTRUCTION WITH PHASING SCHEDULE.

KEY NOTES:

1. CONNECT NEW 3/4" HWS AND 3/4" HWR FROM CEILING SPACE OF THE FLOOR BELOW TO EXISTING RADIATOR. ROUTE BRANCH PIPING THROUGH EXISTING LPS AND LPC FLOOR OPENINGS.
2. VRF LINE SET (NOTE: ONE SINGLE LINE REPRESENTS BOTH THE SUCTION LINE AND LIQUID LINE) TO THE VRF CASSETTE. REFER TO ONE LINE DIAGRAMS BY MANUFACTURE FOR SIZES.
3. VRF LINES SET (NOTE: ONE SINGLE LINE REPRESENTS THREE (3) REFRIGERANT LINES) FROM THE INDOOR HEAT PUMP TO THE BRANCH CIRCUIT CONTROLLER.
4. VRF LINES SET (NOTE: ONE SINGLE LINE REPRESENTS THREE (3) REFRIGERANT LINES) FROM THE INDOOR HEAT PUMP TO THE BRANCH CIRCUIT CONTROLLER.
5. REFRIGERANT LINE SET FROM THE AIR SOURCE HEATPUMP (AHP) TO THE DEDICATED OUTSIDE AIR SUPPLY (DOAS) UNIT. LINE SIZE PER MANUFACTURERS REQUIREMENTS.



KEYPLAN

No:	Date:	By:	Revision:
1	6-1-22	JCM	ADDENDUM #3

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: RANDY P. CHRISTENSON
DATE: 05-03-2022 REG. NO.: 40493

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
HYDRONIC PLAN
GROUND FLOOR
AREA D

Date:	05-03-2022
Drawn By:	CRE
Checked By:	MDP
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

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Sheet Number: M324

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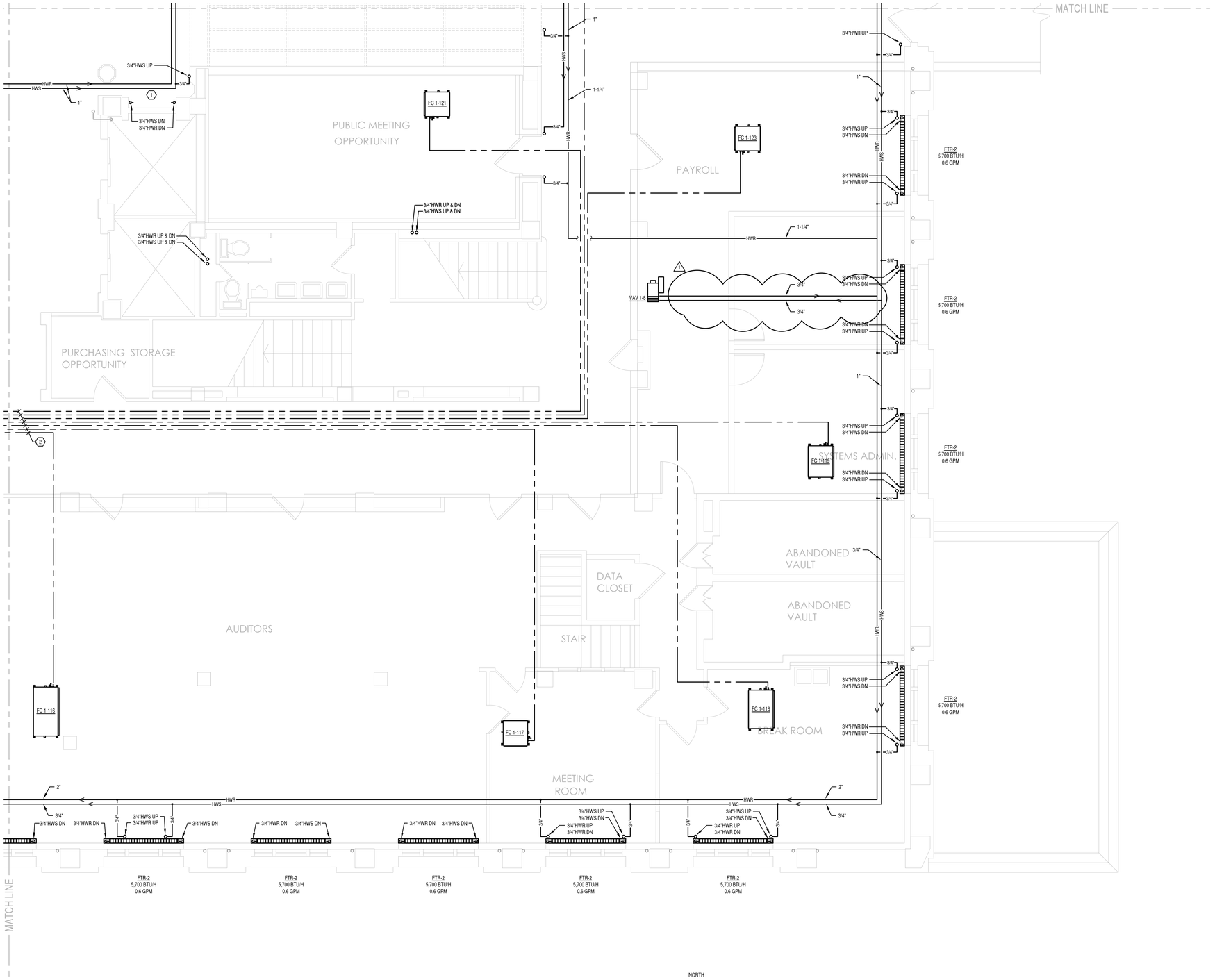


GENERAL NOTES

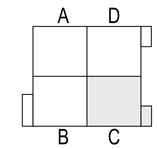
A. THE NEW HOT WATER SUPPLY AND RETURN LOOP SHALL BE RUN IN THE INTERSTITIAL SPACE BELOW THE FLOOR ABOVE TO SERVE THE FTR ON THE FLOOR ABOVE. BRANCH PIPING TO FTR SHALL PENETRATE THE FLOOR ABOVE THROUGH THE EXISTING FLOOR PENETRATIONS FOR THE LPS AND LCR PIPING REMOVED DURING DEMOLITION.
B. PROVIDE OFFSETS IN THE BRANCH HOT WATER SUPPLY AND RETURN PIPING BELOW THE NEW FTR COVER AS NEEDED.

KEY NOTES:

1. CONNECT NEW 3/4" HWS AND 3/4" HWR FROM CEILING SPACE OF THE FLOOR BELOW TO EXISTING RADIATOR. ROUTE BRANCH PIPING THROUGH EXISTING LPS AND LPC FLOOR OPENINGS.
2. VRF LINE SET (NOTE: ONE SINGLE LINE REPRESENTS BOTH THE SUCTION LINE AND LIQUID LINE) TO THE VRF CASSETTE. REFER TO ONE LINE DIAGRAMS BY MANUFACTURE FOR SIZES.
3. VRF LINES SET (NOTE: ONE SINGLE LINE THREE (3) REFRIGERANT LINES) FROM THE INDOOR HEAT PUMP TO THE BRANCH CIRCUIT CONTROLLER.
4. REFRIGERANT LINE SETS UP AND DOWN FROM THE AIR SOURCE HEATPUMP (AHP) TO THE DEDICATED OUTSIDE AIR SUPPLY UNIT (DOAS) UNIT. LINE SIZE PER MANUFACTURERS REQUIREMENTS.

1 M323 HYDRONIC PLAN 1ST FLOOR AREA C
1/4"=1'-0"
0 2' 4' 8'

NORTH



KEYPLAN

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1	6-1-22	JCM	ADDENDUM #3

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
HYDRONIC PLAN
1ST FLOOR
AREA C

Date:	05-03-2022
Drawn By:	CRE
Checked By:	MDP
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

Revision Number: 3

Sheet Number: M333

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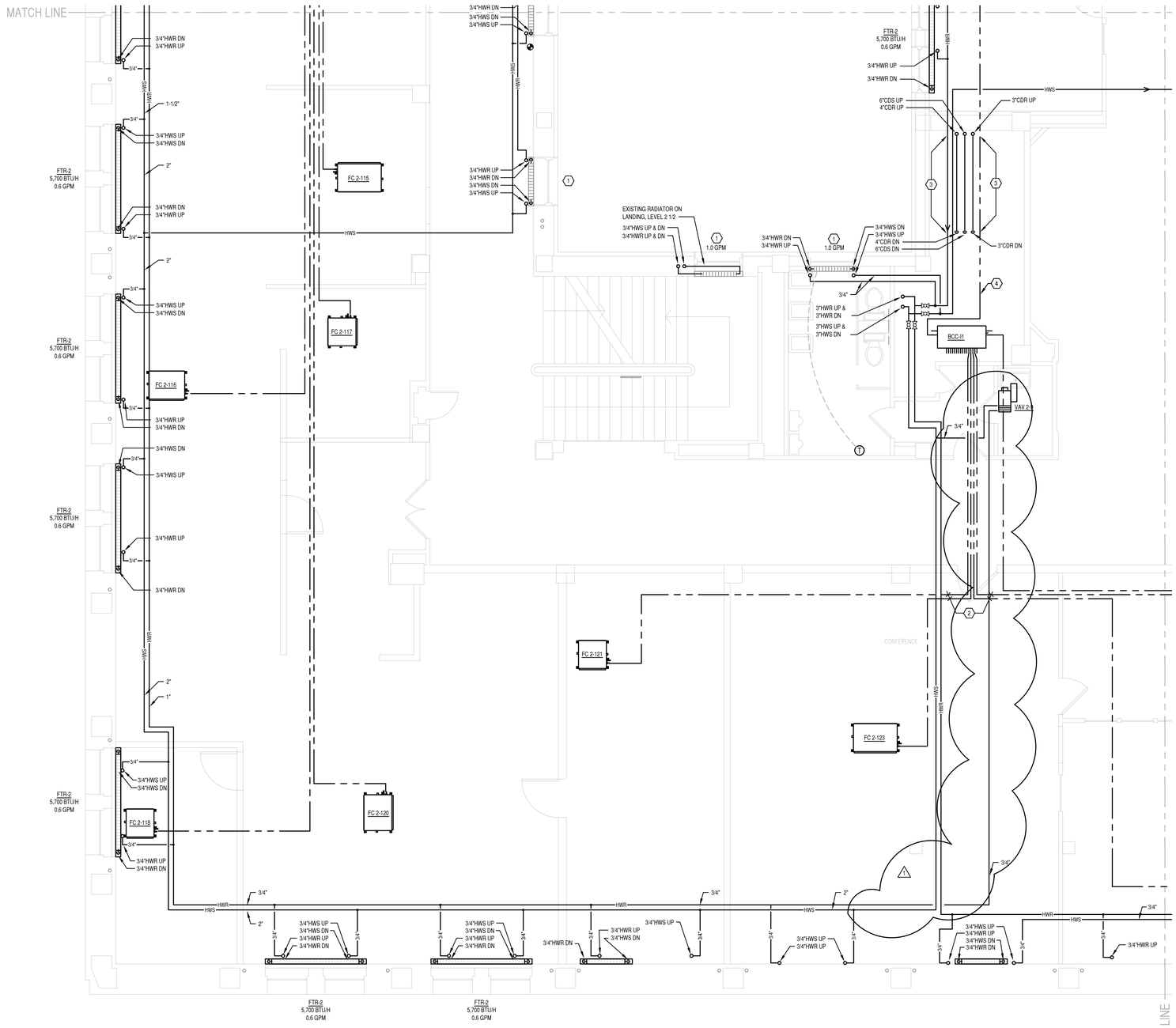
GENERAL NOTES

A. THE NEW HOT WATER SUPPLY AND RETURN LOOP SHALL BE RUN IN THE INTERSTIAL SPACE BELOW THE FLOOR ABOVE TO SERVE THE FTR ON THE FLOOR ABOVE. BRANCH PIPING TO FTR SHALL PENETRATE THE FLOOR ABOVE THROUGH THE EXISTING FLOOR PENETRATIONS FOR THE LPS AND LCR PIPING REMOVED DURING DEMOLITION.
B. PROVIDE OFFSETS IN THE BRANCH HOT WATER SUPPLY AND RETURN PIPING BELOW THE NEW FTR COVER AS NEEDED.

KEY NOTES:

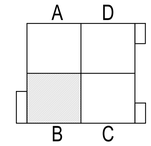
1. CONNECT NEW 3/4" HWS AND 3/4" HWR FROM CEILING SPACE OF THE FLOOR BELOW TO EXISTING RADIATOR. ROUTE BRANCH PIPING THROUGH EXISTING LPS AND LPC FLOOR OPENINGS.
2. VRF LINE SET (NOTE: ONE SINGLE LINE REPRESENTS BOTH THE SUCTION LINE AND LIQUID LINE) TO THE VRF CASSETTE. REFER TO ONE LINE DIAGRAMS BY MANUFACTURE FOR SIZES.
3. COORDINATE ROUTING OF HYDRONIC HEATING AND REFRIGERANT LINES ACROSS THE DUCT CHASE WITH THE DUCTWORK PLANS.
4. VRF LINE SET (NOTE: ONE SINGLE LINE THREE (3) REFRIGERANT LINES) FROM THE INDOOR HEAT PUMP TO THE BRANCH CIRCUIT CONTROLLER.
5. VRF LINE SET (NOTE: ONE SINGLE LINE THREE (3) REFRIGERANT LINES) FROM THE BRANCH CIRCUIT CONTROLLER TO THE SUB-BRANCH CIRCUIT CONTROLLER.



1 HYDRONIC PLAN 2ND FLOOR AREA B
M342 1/4"=1'-0"

NORTH

0 2' 4' 8'



KEYPLAN

No:	Date:	By:	Revision:
1	6-1-22	JCM	ADDENDUM #3

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PRINT NAME: RANDY P. CHRISTENSON

Randy Christenson

DATE: 05-03-2022 REG. NO.: 40493

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CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
HYDRONIC PLAN
2ND FLOOR
AREA B

Date:	05-03-2022
Drawn By:	JCM
Checked By:	MDP
Project No:	21-0486
DWG Scale:	AS NOTED
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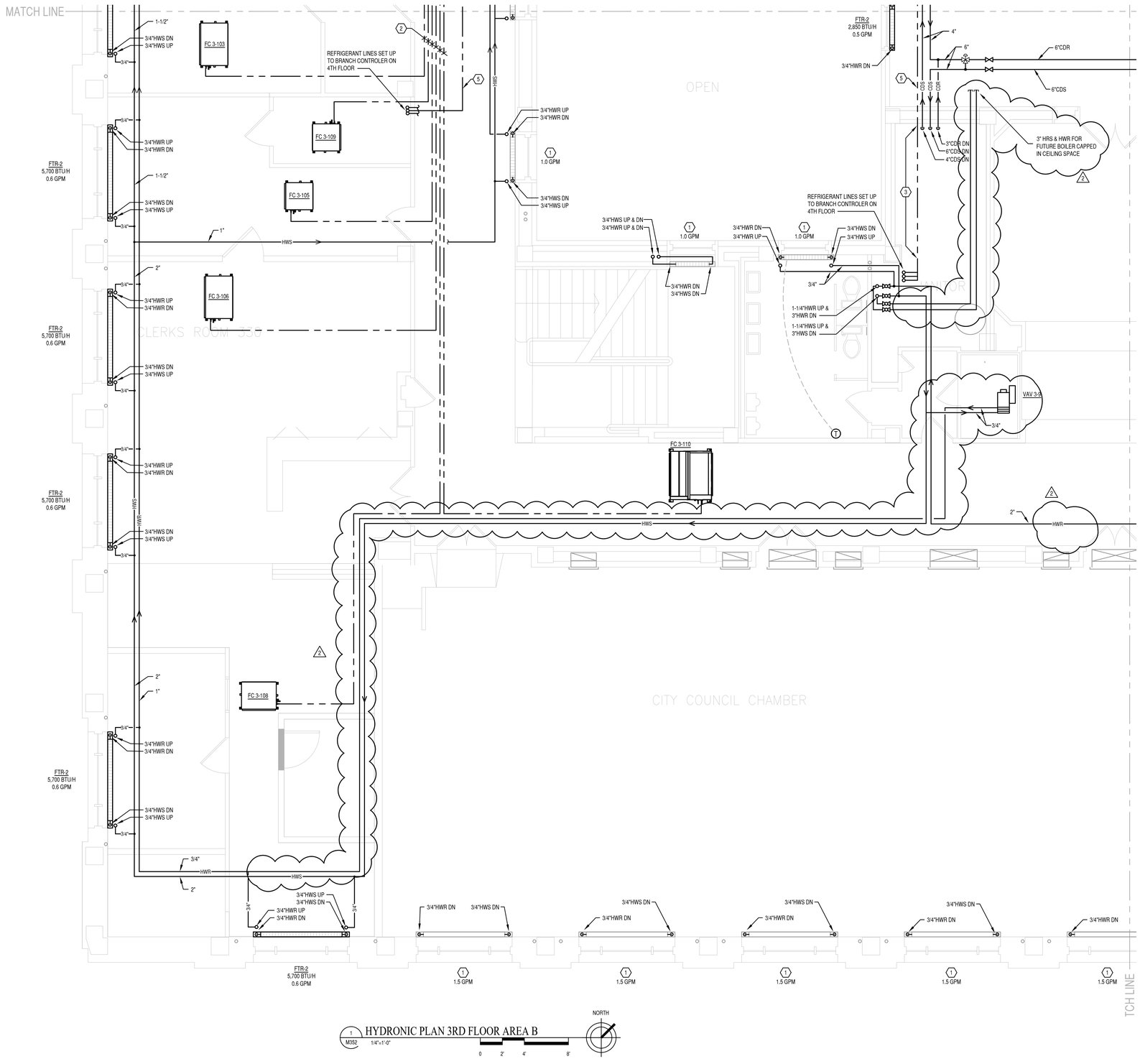

GENERAL NOTES

A. THE NEW HOT WATER SUPPLY AND RETURN LOOP SHALL BE RUN IN THE INTERSTIAL SPACE BELOW THE FLOOR ABOVE TO SERVE THE FTR ON THE FLOOR ABOVE. BRANCH PIPING TO FTR SHALL PENETRATE THE FLOOR ABOVE THROUGH THE EXISTING FLOOR PENETRATIONS FOR THE LPS AND LCR PIPING REMOVED DURING DEMOLITION.
B. PROVIDE OFFSETS IN THE BRANCH HOT WATER SUPPLY AND RETURN PIPING BELOW THE NEW FTR COVER AS NEEDED.

KEY NOTES:

1. CONNECT NEW 3/4" HWS AND 3/4" HWR FROM CEILING SPACE OF THE FLOOR BELOW TO EXISTING RADIATOR. ROUTE BRANCH PIPING THROUGH EXISTING LPS AND LPC FLOOR OPENINGS.
2. VRF LINE SET (NOTE: ONE SINGLE LINE REPRESENTS BOTH THE SUCTION LINE AND LIQUID LINE) TO THE VRF CASSETTE. REFER TO ONE LINE DIAGRAMS BY MANUFACTURE FOR SIZES.
3. COORDINATE ROUTING OF HYDRONIC HEATING AND REFRIGERANT LINES ACROSS THE DUCT CHASE WITH THE DUCTWORK PLANS.
4. INSTALL WET/WET DIFFERENTIAL PRESSURE SENSOR. COORDINATE EXACT LOCATION ON SITE.
5. VRF LINE SET (NOTE: ONE SINGLE LINE THREE (3) REFRIGERANT LINES) FROM THE INDOOR HEAT PUMP TO THE BRANCH CIRCUIT CONTROLLER.

1 M352 HYDRONIC PLAN 3RD FLOOR AREA B
1/4"=1'-0"

NORTH

0 2' 4' 8'

A D
B C
KEYPLAN

No:	Date:	By:	Revision:
2	6-1-22	JCM	ADDENDUM #3
1	5-17-22	CRE	ADDENDUM #1

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
HYDRONIC PLAN
3RD FLOOR
AREA B

Date:	05-03-2022
Drawn By:	CRE
Checked By:	MDP
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

Revision Number: 3

Sheet Number: M352

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GENERAL NOTES:

1. CONTRACTOR SHALL COORDINATE CONSTRUCTION PHASING PRIOR TO START OF NEW WORK.
2. CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL EQUIPMENT ON SITE.
3. CONTRACTOR SHALL VERIFY SIZE, LOCATION, AND ROUTING OF ALL DUCTWORK, PIPING, AND CONTROL COMPONENTS ON SITE.

KEY NOTES:

(NOT ALL NOTES MAY APPLY TO ALL SHEETS)

1. VENTILATION RETURN UP EXISTING SHAFT. SIZE FOR REFERENCE ONLY.
2. OUTDOOR AIR UP EXISTING SHAFT. SIZE FOR REFERENCE ONLY.
3. EXHAUST AIR UP EXISTING SHAFT. SIZE FOR REFERENCE ONLY.
4. VENTILATION AIR UP EXISTING SHAFT. SIZE FOR REFERENCE ONLY.
5. NEW DOAS UNIT.
6. PATCH EXISTING WALL AS REQUIRED TO FOR NEW GRILLE.
7. ROUTE VENTILATION RETURN DUCTWORK AS HIGH AS POSSIBLE, COORDINATE HEIGHT WITH HYDRONIC PIPING.
8. CAP EXISTING 22X10 RETURN DUCT UP TO FLOOR ABOVE. VERIFY LOCATION ON SITE.
9. REPLACE EXISTING STEAM RADIATORS WITH NEW HEATING WATER RADIATOR TO BE INSTALLED IN SAME LOCATIONS. PROVIDE HWS AND HWR PIPING LOOP AS REQUIRED. (TYP)
10. BLANK OFF BACK SIDE OF EXISTING RETURN GRILLE.
11. EXISTING SUPPLY & RETURN GRILL TO REMAIN, SEE SHEETS M412 & M413 TO CONTINUATION.
12. EXTEND EXISTING DUCTWORK TO NEW RA DUCT.
13. CAP EXISTING 54X8 SUPPLY DUCT UP TO FLOOR ABOVE AND CONNECT 10X6 SUPPLY AIR DUCTWORK TO NEW CAP, BALANCE TO 215 CFM. VERIFY LOCATION ON SITE.
14. CAP EXISTING 22X10 RETURN DUCT UP TO FLOOR ABOVE AND CONNECT 10X6 RETURN AIR DUCTWORK TO NEW CAP, BALANCE TO 170 CFM. VERIFY LOCATION ON SITE.
15. CONNECT NEW 18X8 EA DUCT TO EXISTING GRILLE NEAR FLOOR.
16. MOTORIZED DAMPER TO BE INSTALLED IN EA DUCTWORK FOR DOAS UNIT.
17. MOTORIZED DAMPER TO BE INSTALLED IN VS DUCTWORK FOR DOAS UNIT.

MECHANICAL PLAN
GROUND FLOOR AREA B
M422 1/4"=1'-0"

NORTH

KEYPLAN

No:	Date:	By:	Revision:
1	6-1-22	JCM	ADDENDUM #3

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
HVAC PLAN
GROUND FLOOR
AREA B

Date:	05-03-2022
Drawn By:	CKRE
Checked By:	MDP
Project No:	21-0486
DWG Scale:	AS NOTED
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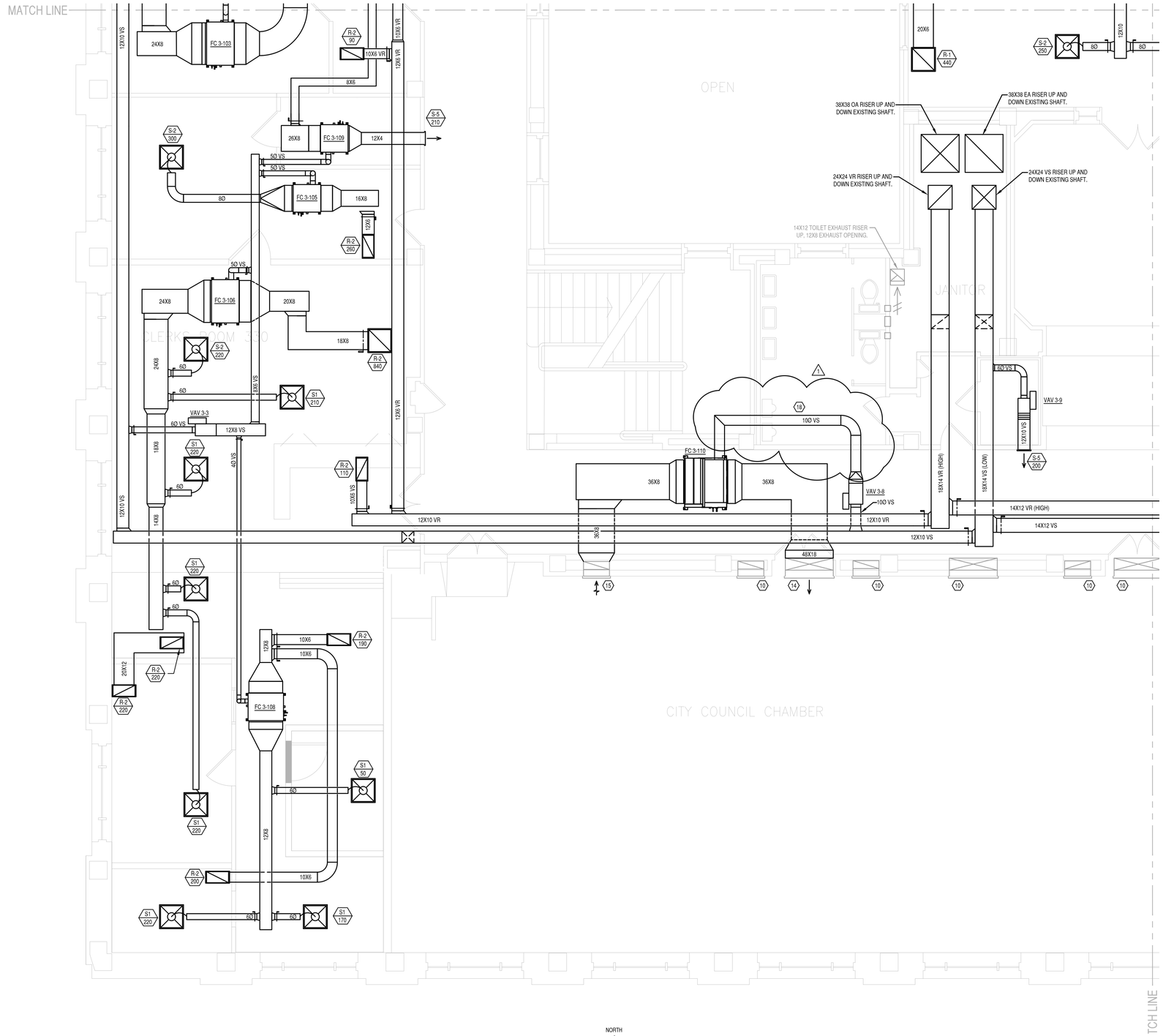

1 M452 MECHANICAL PLAN-3RD FLOOR AREA B

1/4"=1'-0"

0 2' 4' 8'

NORTH

GENERAL NOTES:

1. CONTRACTOR SHALL COORDINATE CONSTRUCTION PHASING PRIOR TO START OF NEW WORK.
2. CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL EQUIPMENT ON SITE.
3. CONTRACTOR SHALL VERIFY SIZE, LOCATION, AND ROUTING OF ALL DUCTWORK, PIPING, AND CONTROL COMPONENTS ON SITE.

KEY NOTES:

(NOT ALL NOTES MAY APPLY TO ALL SHEETS)

1. VENTILATION RETURN UP EXISTING SHAFT. COORDINATE FIRE RATING WITH ARCHITECTURAL SHEETS. SIZE FOR REFERENCE ONLY.
2. OUTDOOR AIR UP EXISTING SHAFT, COORDINATE FIRE RATING WITH ARCHITECTURAL SHEETS. SIZE FOR REFERENCE ONLY.
3. EXHAUST AIR UP EXISTING SHAFT, COORDINATE FIRE RATING WITH ARCHITECTURAL SHEETS. SIZE FOR REFERENCE ONLY.
4. VENTILATION AIR UP EXISTING SHAFT, COORDINATE FIRE RATING WITH ARCHITECTURAL SHEETS. SIZE FOR REFERENCE ONLY.
5. NEW AIR SOURCE HEAT PUMP ON ROOF FOR DOAS SYSTEM.
6. NEW WATER SOURCE HEAT PUMP TO SERVE FLOOR 2.
7. NEW WATER SOURCE HEAT PUMP TO SERVE FLOOR 3.
8. NEW WATER SOURCE HEAT PUMP TO SERVE FLOOR 4.
9. REUSE EXISTING 32X18 RETURN GRILLE NEAR FLOOR AND EXISTING DUCTWORK IN WALL. CONNECT NEW 12X8 VR DUCT TO NEW RV MAIN DUCT, BALANCE TO 440 CFM. VERIFY ROUTING AND LOCATION ON SITE.
10. BLANK OFF BACK SIDE OF EXISTING SUPPLY OR RETURN GRILLE.
11. REUSE EXISTING 32X18 SUPPLY GRILLE NEAR CEILING AND EXISTING DUCTWORK IN WALL, LEAVE TOP 4" OF GRILLE OPEN AND BLANK-OFF BOTTOM 14". EXTENT NEW DUCTWORK TO MAKE CONNECTION TO SUPPLY DUCTWORK, BALANCE TO 600 CFM. VERIFY ROUTING AND LOCATION ON SITE.
12. REUSE EXISTING 24X18 RETURN GRILLE NEAR FLOOR AND EXISTING DUCTWORK IN WALL, BALANCE TO 760 CFM. VERIFY ROUTING AND LOCATION ON SITE.
13. REUSE EXISTING 24X18 RETURN GRILLE NEAR FLOOR AND EXISTING DUCTWORK IN WALL, CONNECT NEW 18X8 VR DUCT TO NEW VR MAIN DUCT, BALANCE TO 660 CFM. VERIFY ROUTING AND LOCATION ON SITE.
14. REUSE EXISTING 48X18 SUPPLY GRILLE NEAR CEILING AND EXISTING DUCTWORK IN WALL , , LEAVE TOP 8" OF GRILLE OPEN AND BLANK-OFF BOTTOM 10". EXTENT NEW DUCTWORK TO MAKE CONNECTION TO SUPPLY DUCTWORK. VERIFY ROUTING AND LOCATION ON SITE.
15. REUSE EXISTING 24X18 RETURN GRILLE NEAR FLOOR AND EXISTING DUCTWORK IN WALL, BALANCE TO 1490 CFM. VERIFY ROUTING AND LOCATION ON SITE.
16. REUSE EXISTING DUCTWORK, CLEAN AND BRING TO LIKE NEW CONDITION.
17. NEW CEILING MOUNTED EXHAUST FAN EF-1. ROUTE 6" Ø DUCT THRU WALL AND TERMINATE IN VENT CAP.
18. DUCTWORK ROUTED IN INTERSTITIAL SPACE.

A D B C

KEYPLAN

No:	Date:	By:	Revision:
1	6-1-22	JCM	ADDENDUM #3

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Sheet Title:
HVAC PLAN
3RD FLOOR
AREA B

Date:	05-03-2022
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Project No:	21-0486
DWG Scale:	AS NOTED
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Sheet Number: M452

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VARIABLE AIR VOLUME BOX SCHEDULE

GENERAL				MECHANICAL															
EQUIP NO.	SERVES CASSETTES	MANUFACTURER	MODEL NO.	TYPE	INLET SIZE (IN)	MIN STATIC PRES.(IN WC) INLET	COOLING DESIGN CFM	COOLING MIN. CFM	HEATING DESIGN CFM	HEATING COIL OUTPUT MBH	HEATING COIL EAT (F)	HEATING COIL LAT (F)	HEATING COIL GPM	HEATING COIL EWT (F)	HEATING COIL LWT (F)	HEATING COIL FLUID TYPE	HEATING COIL COIL ROWS	CONTROL VALVE	NOTES
VAV 0-1	0-102	TITUS	DESV	SERIES	6	1	330	210	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-2	0-103, 0-105, 0-107	TITUS	DESV	SERIES	6	1	150	0	-	-	-	-	-	-	-	-	-		ALL
VAV 0-3	0-118	TITUS	DESV	SERIES	6	1	230	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-4	0-106	TITUS	DESV	SERIES	4	1	50	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-5	0-108, 0-109, 0-110, 0-111	TITUS	DESV	SERIES	6	1	210	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-6	0-112, 0-113	TITUS	DESV	SERIES	6	1	120	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-7	0-114, 0-116, 0-117	TITUS	DESV	SERIES	6	1	260	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-8	0-119, 0-120, 0-121	TITUS	DESV	SERIES	6	1	170	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-9	0-115, 0-123, 0-115	TITUS	DESV	SERIES	6	1	160	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 0-10	GARAGE	TITUS	DESV	SERIES	16	1	2480	0	2480	53.6	55	75	5.36	140	120	35% PG	1	24V	ALL
VAV 1-1	1-101, 1-102, 1-103, 1-104, 1-106, 1-108	TITUS	DESV	SERIES	8	1	610	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 1-2	1-110, 1-113, 1-114	TITUS	DESV	SERIES	6	1	160	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 1-3	1-112, 1-115, 1-116	TITUS	DESV	SERIES	6	1	290	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 1-4	1-117, 1-118	TITUS	DESV	SERIES	6	1	190	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 1-5	1-119, 1-120, 1-121, 1-123	TITUS	DESV	SERIES	6	1	250	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 1-6	1-122, 1-124, 1-125, 1-127, 1-128,1-129, 1-131	TITUS	DESV	SERIES	10	1	630	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 1-7	1-109A	TITUS	DESV	SERIES	6	1	240	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 1-8	CORRIDOR	TITUS	DESV	SERIES	6	1	200	0	200	4.3	55	75	0.43	140	120	35% PG	1	24V	ALL
VAV 2-1	2-101, 2-112, 2-114, 2-115, 2-116, 2-117	TITUS	DESV	SERIES	6	1	280	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-2	2-102, 2-103, 2-104, 2-111, 2-135	TITUS	DESV	SERIES	6	1	320	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-3	2-118, 2-120	TITUS	DESV	SERIES	4	1	80	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-4	2-121, 2-122, 2-123	TITUS	DESV	SERIES	8	1	400	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-5	2-136	TITUS	DESV	SERIES	4	1	40	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-6	2-124, 2-125, 2-126, 2-127	TITUS	DESV	SERIES	6	1	180	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-7	2-108, 2-131, 2-132, 2-130, 2-129	TITUS	DESV	SERIES	6	1	300	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-8	2-106, 2-110, 2-133, 2-134	TITUS	DESV	SERIES	6	1	320	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 2-9	CORRIDOR	TITUS	DESV	SERIES	6	1	280	0	280	6.0	55	75	0.6	140	120	35% PG	1	24V	ALL
VAV 3-1	3-101, 3-102, 3-103, 3-104	TITUS	DESV	SERIES	6	1	220	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-2	3-129, 3-128, 3-127, 3-126, 3-125, 3-124	TITUS	DESV	SERIES	6	1	290	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-3	3-109, 3-103, 3-106, 3-107, 3-108	TITUS	DESV	SERIES	6	1	220	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-4	3-112, 3-114	TITUS	DESV	SERIES	6	1	60	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-5	3-115, 3-116, 3-119, 3-122	TITUS	DESV	SERIES	6	1	330	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-6	3-120, 3-121, 3-123	TITUS	DESV	SERIES	6	1	350	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-7	3-111	TITUS	DESV	SERIES	10	1	440	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-8	3-110	TITUS	DESV	SERIES	10	1	660	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 3-9	CORRIDOR	TITUS	DESV	SERIES	6	1	200	0	200	4.3	55	75	0.43	140	120	35% PG	1	24V	ALL
VAV 4-1	4-101,4-102,4-103,4-104,4-105,4-106,4-107,4-111	TITUS	DESV	SERIES	6	1	320	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 4-2	4-108,4-110,4-112,4-113,4-114	TITUS	DESV	SERIES	6	1	150	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 4-3	4-115,4-116,4-118,4-119,-120	TITUS	DESV	SERIES	8	1	570	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 4-4	4-121,4-123,4-124,4-125	TITUS	DESV	SERIES	6	1	280	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 4-5	4-126,4-127,4-128,4-129,4-130,4-131,4-132,4-133	TITUS	DESV	SERIES	6	1	330	0	-	-	-	-	-	-	-	-	-	-	ALL
VAV 4-6	CORRIDOR	TITUS	DESV	SERIES	6	1	200	0	200	4.3	55	75	0.43	140	120	35% PG	1	24V	ALL

NOTES:
1. W/ BOTTOM ACCESS PANEL
2. FIBER FREE LINING
3. BOX ACTUATOR 24V SPRING RETURN OPEN. INCLUDE DISCONNECT SWITCH

GRILLES, REGISTERS, AND DIFFUSERS SCHEDULE

EQUIP NO.	SERVICE	MANUFACTURER	MODEL NO.	TYPE	FACE SIZE (IN)	NECK SIZE (IN)	MAX CFM	MAX NC	MATERIAL	THROW/ PATTERN	REMARKS/NOTES
S-1	SUPPLY	TITUS	TMS	LAY-IN	24X24	6	220	25	ALUMINUM	4-WAY	LAY-IN CEILING DIFFUSER, FRAME TYPE 3, NOTE 3
S-2	SUPPLY	TITUS	TMS	LAY-IN	24X24	8	320	25	ALUMINUM	4-WAY	LAY-IN CEILING DIFFUSER, FRAME TYPE 3, NOTE 3
S-3	SUPPLY	TITUS	TMS	LAY-IN	24X24	10	500	25	ALUMINUM	4-WAY	LAY-IN CEILING DIFFUSER, FRAME TYPE 3, NOTE 3
S-4	SUPPLY	TITUS	300RL	SURFACE	12X10	12X10	430	25	ALUMINUM	ADJUSTABLE	3/4" SPACING, 35° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION, 1,3
S-5	SUPPLY	TITUS	300RL	SURFACE	12X8	12X8	350	25	ALUMINUM	ADJUSTABLE	3/4" SPACING, 35° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION, 1,3
S-6	SUPPLY	TITUS	300RL	SURFACE	14X10	14X10	620	32	ALUMINUM	ADJUSTABLE	3/4" SPACING, 35° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION, 1,3
R-1	RETURN	TITUS	PAR	LAY-IN	24X24	22X22	900	25	ALUMINUM	ADJUSTABLE	PERFORATED CEILING RETURN, FRAME TYPE 3
R-2	RETURN	TITUS	PAR	LAY-IN	24X12	22X10	500	25	ALUMINUM	ADJUSTABLE	PERFORATED CEILING RETURN, FRAME TYPE 3
R-3	RETURN	TITUS	350RL	SURFACE	12X8	12X8	400	25	ALUMINUM	ADJUSTABLE	3/4" SPACING, 35° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION, 1,3
E-1	EXHAUST	TITUS	350RL	SURFACE	14X10	14X10	620	25	ALUMINUM	ADJUSTABLE	3/4" SPACING, 35° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION, 1,3
E-2	EXHAUST	TITUS	350RL	SURFACE	24X12	22X10	950	20	ALUMINUM	ADJUSTABLE	3/4" SPACING, 35° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION, 1,3
T-1	TRANSFER	TITUS	350RL	SURFACE	12X8	12X8	400	25	ALUMINUM	ADJUSTABLE	3/4" SPACING, 35° DEFLECTION, BLADES PARALLEL TO LONG DIMENSION, 1,3

NOTES:
1. DOUBLE DEFLECTION
2. WITH FILTER
3. WITH OPPOSED BLADE, VOLUME DAMPER
4. COORDINATE ALL FRAMES AND BORDER TYPES FOR DUCT CONNECTION AND CEILING/WALL INSTALLATION PROVIDE TRANSITIONS AS NECESSARY TO ACCOMPLISH CONNECTION

PUMP SCHEDULE

GENERAL					MECHANICAL										ELECTRICAL		NOTES
EQUIP NO.	LOCATION	APPLICATION	MANUFACTURER	MODEL NO.	TYPE	FLUID	GPM	TOTAL DISCHARGE HEAD (FT)	NPSHR (FT)	BHP	MOTOR RPM	IMPELLER SIZE (IN)	SUCTION SIZE (IN)	DISCHARGE SIZE (IN	HP OR LOAD	VOLTAGE & PHASE	
P-1	GROUND FLOOR MECH ROOM	HEATING WATER	BELL & GOSSET	1510E	END-SUCTION	35% PG	274	85	10.7	8.1	1800	10.625	3"	2"	10	208/3	ALL
P-2	GROUND FLOOR MECH ROOM	HEATING WATER	BELL & GOSSET	1510E	END-SUCTION	35% PG	274	85	10.7	8.1	1800	10.625	3"	2"	10	208/3	ALL
P-3	GROUND FLOOR MECH ROOM	CONDENSER WATER	BELL & GOSSET	1510E	END-SUCTION	35% PG	320	55	7.4	5.2	1800	8.75	3"	2.5"	7.5	208/3	ALL
P-4	GROUND FLOOR MECH ROOM	CONDENSER WATER	BELL & GOSSET	1510E	END-SUCTION	35% PG	320	55	7.4	5.2	1800	8.75	3"	2.5"	7.5	208/3	ALL

NOTES:
1. PROVIDE SUCTION DIFFUSER AND TRIPLE DUTY VALVE
2. VFD BY DIV 23, INSTALLED BY DIV 26. CONTROLS BY DIV 25
3. MECHANICAL SEALS RATED FOR GLYCOL

No:	Date:	By:	Revision:
2	6-1-22	JCM	ADDENDUM #3
1	5-17-22	CRE	ADDENDUM #1

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: RANDY P. CHRISTENSON
DATE: 05-03-2022 REG. NO.: 40493

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Project Title: CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title: MECHANICAL SCHEDULES

Date: 05-03-2022
Drawn By: JCM
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Project No: 21-0486
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Sheet Number: M900

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GENERAL NOTES:

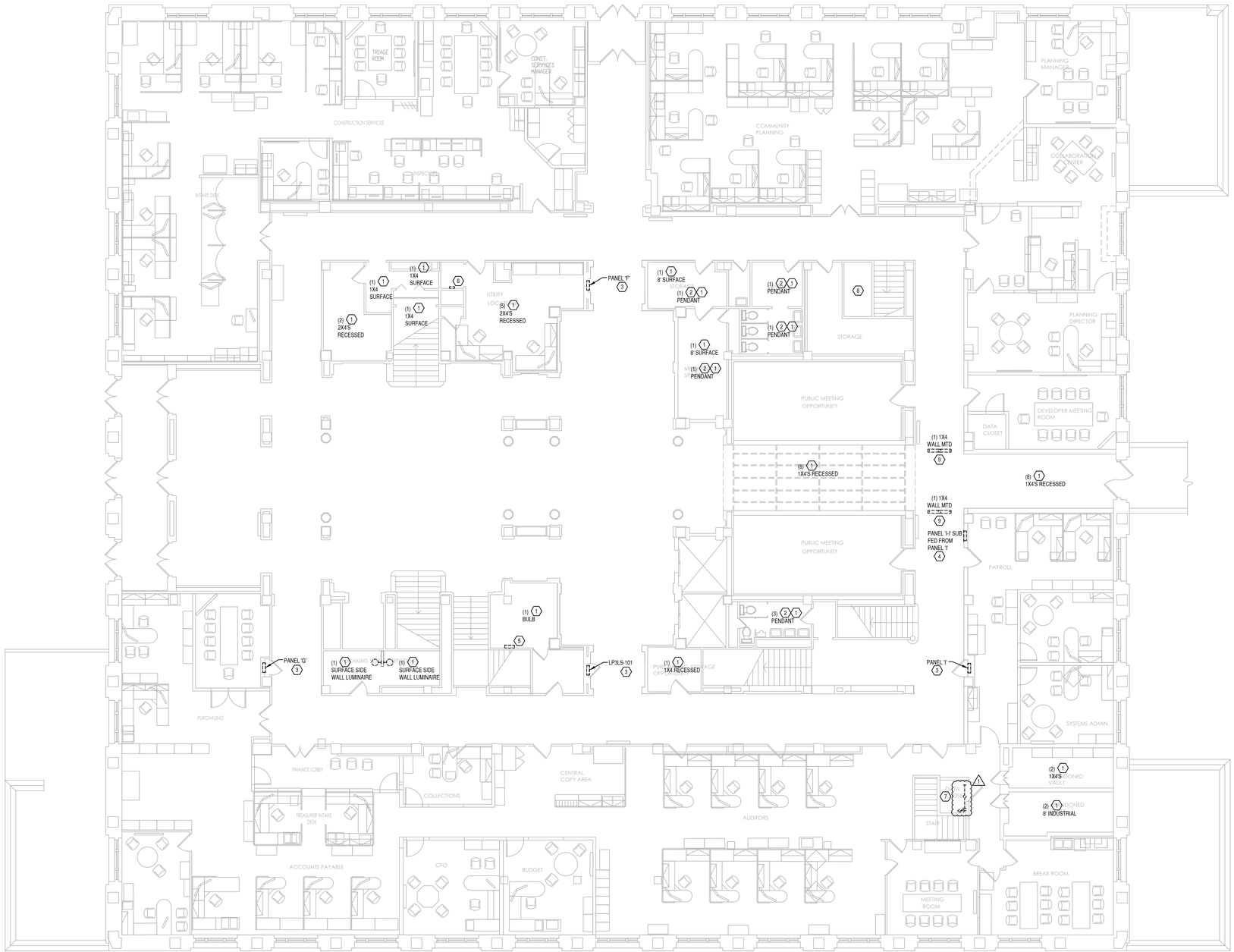
A. INFORMATION ON THE DEMOLITION SHEETS HAS BEEN PUT TOGETHER BASED ON CASUAL SITE VISITS AND OBSERVATIONS. MOST OF THE EXISTING DOCUMENTATION IS OLD AND DOES NOT REFLECT ALL OF THE ELECTRICAL CONDITIONS FOUND IN THE FIELD. CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND BRING TO THE ATTENTION OF THE ENGINEER ALL DISCREPANCIES.

B. THERE ARE ABANDONED IN PLACE CONDUITS, FEEDERS, ELECTRICAL DEVICES LEFT OVER FROM PREVIOUS PROJECTS. CONTRACTOR MUST FAMILIARIZE WITH EXISTING CONDITIONS. THE INTENT IS FOR ALL ABANDONED IN PLACE ITEMS TO BE REMOVED BACK INTO SOURCE.

C. ELECTRICAL WORK ON THIS LEVEL IS TO DISCONNECT AND DEMO ALL THE WAY INTO THE PANEL OF ORIGIN FEEDERS FOR THE MECHANICAL EQUIPMENT MARKED FOR DEMOLITION.

KEY NOTES:

1. DEMO ALL EXISTING FLUORESCENT LUMINAIRES SHOWN HERE AS QUANTITY IN THE SPACE. SAVE THE LIGHTING CIRCUIT FOR THE LED LUMINAIRES REPLACING THE FLUORESCENT LUMINAIRES. SEE LIGHTING SHEETS E200 SERIES FOR NEW LIGHTING.
2. SAVE PENDANT LUMINAIRE AND RETURN TO OWNER FOR STOCK.
3. EXISTING PANEL TO BE REPLACED IN PLACE WITH NEW SURFACE MOUNTED PANEL. SEE MOUNTING DETAIL ON SHEET E700. CONTRACTOR TO RECONNECT EXISTING TO REMAIN LOADS ON SAME CIRCUIT NUMBERS AS IN THE ORIGINAL PANELS. CONTRACTOR TO DEMO ANY ABANDONED ELECTRICAL DEVICES, CONDUITS, WIRING AND EQUIPMENT LEFT IN PLACE FROM PREVIOUS WORK. CONTRACTOR TO PROVIDE UPDATED, TYPED PANEL DIRECTORIES. SEE SHEET E330 FOR COORDINATION.
4. MOVE ALL EXISTING TO REMAIN LOADS FROM THIS PANEL TO THE NEW LP3N-103 WHICH REPLACES IN PLACE PANEL 'I'. AFTER ALL LOADS ARE MOVED, DEMO ENTIRELY EXISTING PANEL 'I' INCLUDING ALL UNUSED CONDUITS AND FEEDERS. SEE SHEET E330 FOR COORDINATION.
5. THIS IS AN EXISTING NORMAL POWER PANEL FED FROM THE BOILER ROOM PANEL, CIRCUIT #28, 30. BACK FEED THE EXISTING TO REMAIN WATER HEATER FROM THE NEW PANEL LP3N-101. PROVIDE 40A/2P BREAKER IN LP3N-101 FOR THIS LOAD. SEE SHEET E330 FOR COORDINATION.
6. DEMO ENTIRELY SMALL LOAD CENTER WITH (5) 20A/1P AND (1) 20A/2P BREAKERS AFTER ALL EXISTING TO REMAIN LOADS HAVE BEEN MOVED ON THE NEW LP3N-102 WHICH REPLACES IN PLACE PANEL 'F'. SEE SHEET E330 FOR COORDINATION.
7. THIS IS A SHAFT THAT GOES ALL THE WAY UP TO THE FOURTH FLOOR LEVEL. ORIGINALLY, THIS WAS THE JUDGE'S ELEVATOR, WHICH HAS BEEN DEMOLISHED DECADES AGO. CONTRACTOR CAN USE THIS SHAFT FOR ANY FEEDER RISERS IF CONVENIENT.
8. THIS IS A SHAFT THAT GOES ALL THE WAY UP TO THE THIRD LEVEL. ORIGINALLY, THIS WAS THE PRISONER'S ELEVATOR AND HAS BEEN DEMOLISHED DECADES AGO. CONTRACTOR CAN USE THIS SHAFT FOR ANY FEEDER RISERS IF CONVENIENT.
9. DEMO EXISTING WALL MOUNTED CANTILEVER LUMINAIRE. REMOVE ALL ASSOCIATED ITEMS (CONDUIT, WIRE, HANGARS, ETC.) BACK TO SOURCE OR CLOSEST JUNCTION BOX.

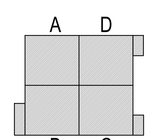


1 E130 ELECTRICAL DEMOLITION PLAN - 1ST FLOOR

1/8"=1'-0"

NORTH

0 4' 8' 16'



KEYPLAN

No:	Date:	By:	Revision:
1	06-02-2022	NNA	ADDENDUM #3

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: LUCIA A. ANDERSON

DATE: 05-03-2022 REG. NO.: 27049

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN

411 WEST 1ST STREET
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Sheet Title:
ELECTRICAL DEMOLITION PLAN - 1ST FLOOR

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GENERAL NOTES:

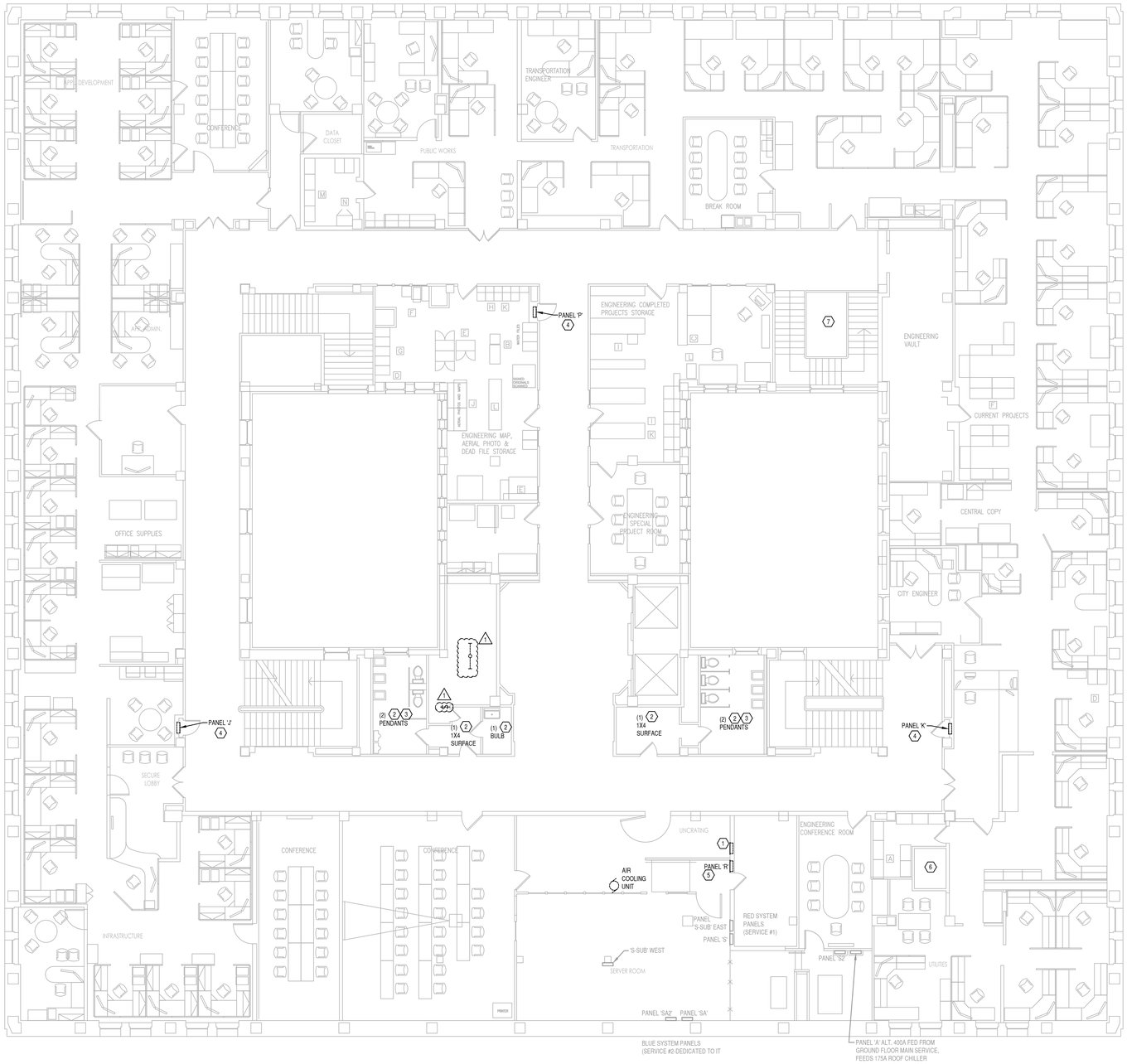
A. INFORMATION ON THE DEMOLITION SHEETS HAS BEEN PUT TOGETHER BASED ON CASUAL SITE VISITS AND OBSERVATIONS. MOST OF THE EXISTING DOCUMENTATION IS OLD AND DOES NOT REFLECT ALL OF THE ELECTRICAL CONDITIONS FOUND IN THE FIELD. CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND BRING TO THE ATTENTION OF THE ENGINEER ALL DISCREPANCIES.

B. THERE ARE ABANDONED IN PLACE CONDUITS, FEEDERS, ELECTRICAL DEVICES LEFT OVER FROM PREVIOUS PROJECTS. CONTRACTOR MUST FAMILIARIZE WITH EXISTING CONDITIONS. THE INTENT IS FOR ALL ABANDONED IN PLACE ITEMS TO BE REMOVED BACK INTO SOURCE.

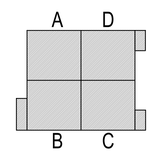
C. ELECTRICAL WORK ON THIS LEVEL IS TO DISCONNECT AND DEMO ALL THE WAY INTO THE PANEL OF ORIGIN FEEDERS FOR THE MECHANICAL EQUIPMENT MARKED FOR DEMOLITION.

KEY NOTES:

1. REMOVE EMPTY BOX, COORDINATE WITH GENERAL CONTRACTOR FOR REPAIRING WALL.
2. DEMO ALL EXISTING FLUORESCENT LUMINAIRES SHOWN HERE AS QUANTITY IN THE SPACE. SAVE THE LIGHTING CIRCUIT FOR THE LED LUMINAIRES REPLACING THE FLUORESCENT LUMINAIRES. SEE LIGHTING SHEETS E200 SERIES FOR NEW LIGHTING.
3. SAVE PENDANT LUMINAIRE AND RETURN TO OWNER FOR STOCK.
4. EXISTING PANEL TO BE REPLACED IN PLACE WITH NEW SURFACE MOUNTED PANEL. SEE MOUNTING DETAIL ON SHEET E700. CONTRACTOR TO RECONNECT EXISTING TO REMAIN LOADS ON SAME CIRCUIT NUMBERS AS IN THE ORIGINAL PANELS. CONTRACTOR TO DEMO ANY ABANDONED ELECTRICAL DEVICES, CONDUITS, WIRING AND EQUIPMENT LEFT IN PLACE FROM PREVIOUS WORK. CONTRACTOR TO PROVIDE UPDATED, TYPED PANEL DIRECTORIES.
5. DEMO ENTIRELY AND ALL THE WAY INTO THE POWER SOURCE EXISTING PANEL AFTER THE MECHANICAL LOADS HAVE BEEN DEMOLISHED AND THE EXISTING TO REMAIN LOADS HAVE BEEN TRANSFERRED ON THE NEW PANEL LP3N-201 WHICH REPLACES IN PLACE PANEL 'K'.
6. THIS IS A SHAFT THAT GOES ALL THE WAY UP TO THE FOURTH FLOOR LEVEL. ORIGINALLY, THIS WAS THE JUDGE'S ELEVATOR, WHICH HAS BEEN DEMOLISHED DECADES AGO. CONTRACTOR CAN USE THIS SHAFT FOR ANY FEEDER RISERS IF CONVENIENT.
7. THIS IS A SHAFT THAT GOES ALL THE WAY UP TO THE THIRD LEVEL. ORIGINALLY, THIS WAS THE PRISONER'S ELEVATOR AND HAS BEEN DEMOLISHED DECADES AGO. CONTRACTOR CAN USE THIS SHAFT FOR ANY FEEDER RISERS IF CONVENIENT.



1 E140 ELECTRICAL DEMOLITION PLAN - 2ND FLOOR
1/8"=1'-0"
0 4' 8' 16'
NORTH



KEYPLAN

No:	Date:	By:	Revision:
1	06-02-2022	NNA	ADDENDUM #3

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: LUCIA A. ANDERSON
DATE: 05-03-2022 REG. NO.: 27049

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
ELECTRICAL DEMOLITION PLAN - 2ND FLOOR

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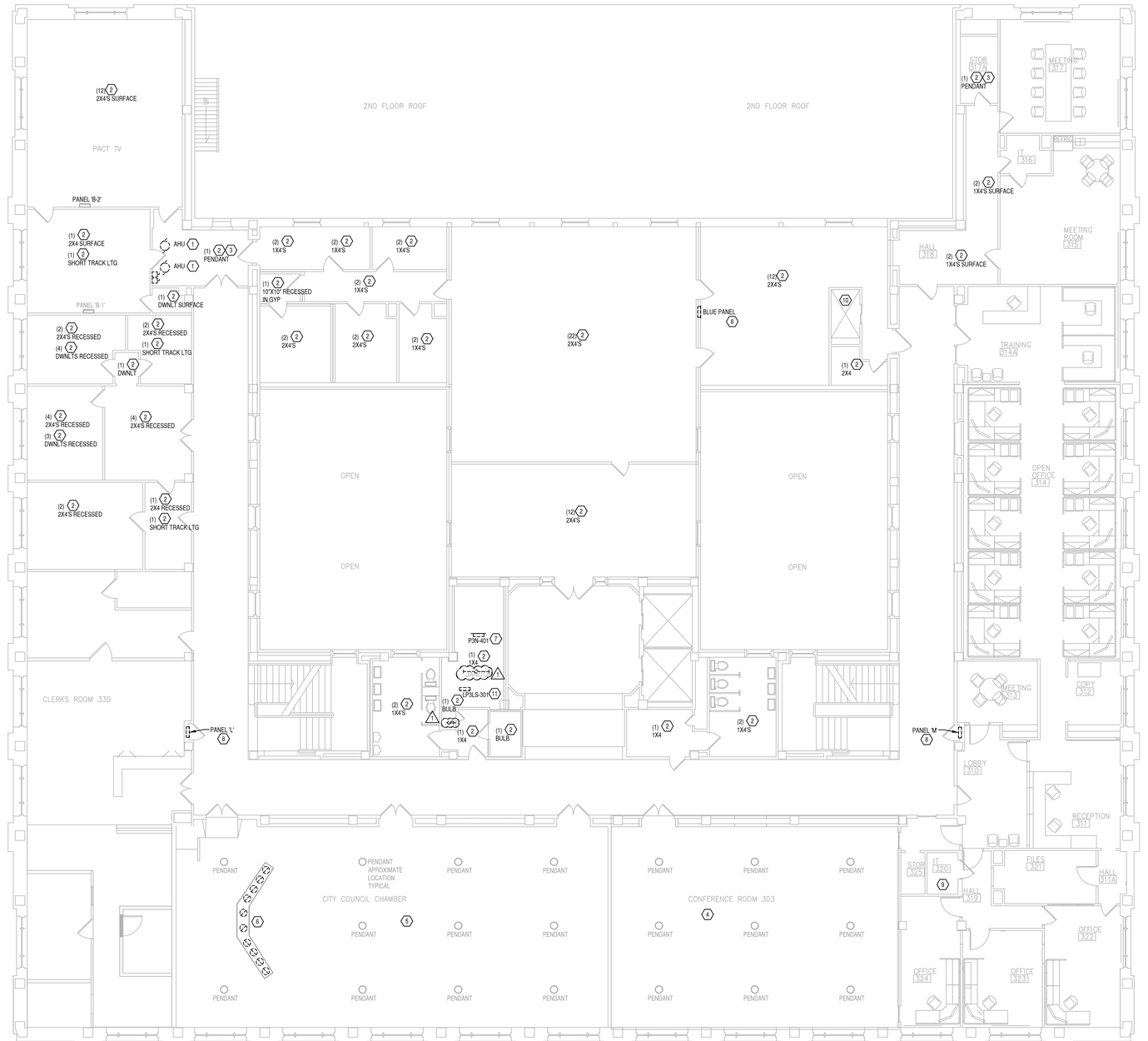


1 E150 ELECTRICAL DEMOLITION PLAN - 3RD FLOOR

1/8"=1'-0"

0 4' 8' 16'

GENERAL NOTES:

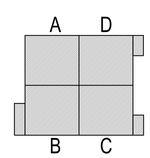
A. INFORMATION ON THE DEMOLITION SHEETS HAS BEEN PUT TOGETHER BASED ON CASUAL SITE VISITS AND OBSERVATIONS. MOST OF THE EXISTING DOCUMENTATION IS OLD AND DOES NOT REFLECT ALL OF THE ELECTRICAL CONDITIONS FOUND IN THE FIELD. CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND BRING TO THE ATTENTION OF THE ENGINEER ALL DISCREPANCIES.

B. THERE ARE ABANDONED IN PLACE CONDUITS, FEEDERS, ELECTRICAL DEVICES LEFT OVER FROM PREVIOUS PROJECTS. CONTRACTOR MUST FAMILIARIZE WITH EXISTING CONDITIONS. THE INTENT IS FOR ALL ABANDONED IN PLACE ITEMS TO BE REMOVED BACK INTO SOURCE.

C. ELECTRICAL WORK ON THIS LEVEL IS TO DISCONNECT AND DEMO ALL THE WAY INTO THE PANEL OF ORIGIN FEEDERS FOR THE MECHANICAL EQUIPMENT MARKED FOR DEMOLITION.

KEY NOTES:

1. DEMO THE TWO EXISTING AIR HANDLING UNITS SERVING PACT AREA. UNITS ARE INSTALLED AT CEILING VIA TWO DISCONNECTS.
2. DEMO ALL EXISTING FLUORESCENT LUMINAIRES SHOWN HERE AS QUANTITY IN THE SPACE. SAVE THE LIGHTING CIRCUIT FOR THE LED LUMINAIRES REPLACING THE FLUORESCENT LUMINAIRES. SEE LIGHTING SHEETS E200 SERIES FOR NEW LIGHTING.
3. SAVE PENDANT LUMINAIRE AND RETURN TO OWNER FOR STOCK.
4. NINE SPECIAL PENDANT CHANDELIERS EACH WITH FIVE LIGHT BULBS AND ONE LARGE LIGHT BULB IN THE MIDDLE ARE LOCATED IN THIS ROOM. REPLACE ALL FLUORESCENT BULBS WITH LED BULBS, FIELD VERIFY.
5. ELEVEN SPECIAL PENDANT CHANDELIERS EACH WITH FIVE LIGHT BULBS AND ONE LARGE LIGHT BULB IN THE MIDDLE ARE LOCATED IN THIS ROOM. REPLACE ALL FLUORESCENT BULBS WITH LED BULBS, FIELD VERIFY.
6. DEMO (10) DOWNLIGHTS RECESSED IN STRUCTURE OVER THE COUNCIL MEMBERS SEATING, ALL DOWNLIGHTS TO BE REPLACED ONE-FOR-ONE. DEMO EXISTING UPLIGHTING IN STRUCTURE. MAINTAIN LIGHTING BNG BRANCH CIRCUIT FOR CONNECTION TO NEW LUMINAIRES. SEE SHEET E250 FOR ADDITIONAL INFORMATION.
7. DEMO ALL MECHANICAL LOADS ON THIS PANEL, ANY EXISTING TO REMAIN LOADS MUST BE MOVED ON NEW PANEL LP3N-301 WHICH REPLACES IN PLACE PANEL 'L'. DEMO ENTIRELY THE PANEL. SEE SHEET E350 FOR COORDINATION.
8. EXISTING PANEL TO BE REPLACED IN PLACE WITH NEW SURFACE MOUNTED PANEL, SEE MOUNTING DETAIL ON SHEET E700. CONTRACTOR TO RECONNECT EXISTING TO REMAIN LOADS ON SAME CIRCUIT NUMBERS AS IN THE ORIGINAL PANELS. CONTRACTOR TO DEMO ANY ABANDONED ELECTRICAL DEVICES, CONDUITS, WIRING AND EQUIPMENT LEFT IN PLACE FROM PREVIOUS WORK. CONTRACTOR TO PROVIDE UPDATED, TYPED PANEL DIRECTORIES.
9. THIS IS A SHAFT THAT GOES ALL THE WAY UP TO THE FOURTH FLOOR LEVEL. ORIGINALLY, THIS WAS THE JUDGE'S ELEVATOR, WHICH HAS BEEN DEMOLISHED DECADES AGO. CONTRACTOR CAN USE THIS SHAFT FOR ANY FEEDER RISERS IF CONVENIENT.
10. THIS IS A SHAFT THAT GOES ALL THE WAY UP TO THE THIRD LEVEL. ORIGINALLY, THIS WAS THE PRISONER'S ELEVATOR AND HAS BEEN DEMOLISHED DECADES AGO. CONTRACTOR CAN USE THIS SHAFT FOR ANY FEEDER RISERS IF CONVENIENT.
11. DEMO ALL LOADS ON THIS PANEL AND DEMO PANEL IN ITS ENTIRETY BACK INTO D3LS-G02. MOVE EXISTING TO REMAIN LOAD LABELED "CAR 1 ELEVATOR LOADS/CAR 2 ELEVATOR LOADS" (20A/2P BREAKER) ON EXISTING PANEL LABELED LP3LS-101, WHICH WILL BE REPLACED IN PLACE WITH NEW PANEL TO BE LABELED LP3E-101 LOCATED ON FIRST FLOOR.



KEYPLAN

No:	Date:	By:	Revision:
1	06-02-2022	NNA	ADDENDUM #3

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PRINT NAME: LUCIA A. ANDERSON

DATE: 05-03-2022 REG. NO.: 27049

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
ELECTRICAL DEMOLITION PLAN - 3RD FLOOR

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GENERAL NOTES:

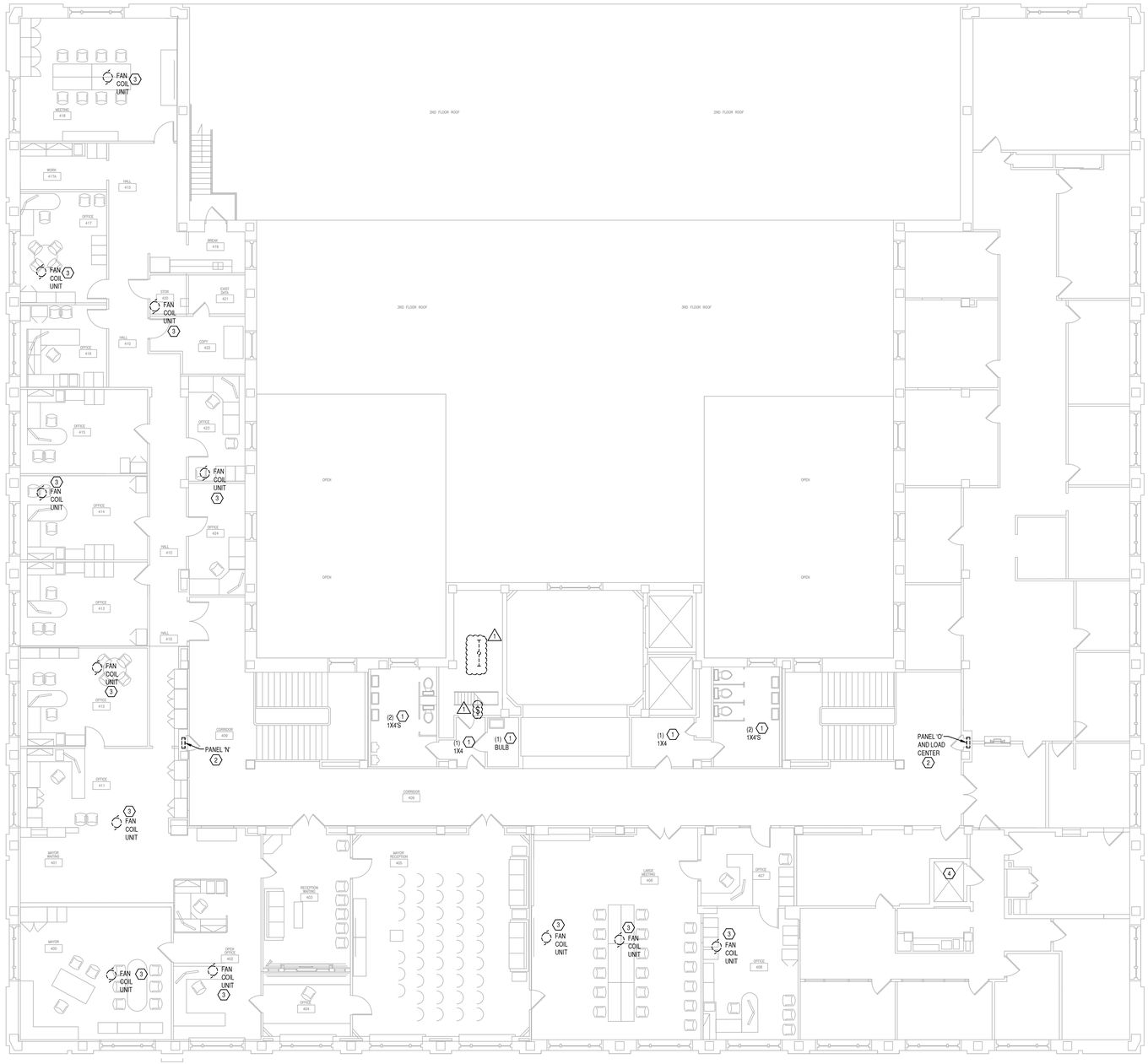
A. INFORMATION ON THE DEMOLITION SHEETS HAS BEEN PUT TOGETHER BASED ON CASUAL SITE VISITS AND OBSERVATIONS. MOST OF THE EXISTING DOCUMENTATION IS OLD AND DOES NOT REFLECT ALL OF THE ELECTRICAL CONDITIONS FOUND IN THE FIELD. CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND BRING TO THE ATTENTION OF THE ENGINEER ALL DISCREPANCIES.

B. THERE ARE ABANDONED IN PLACE CONDUITS, FEEDERS, ELECTRICAL DEVICES LEFT OVER FROM PREVIOUS PROJECTS. CONTRACTOR MUST FAMILIARIZE WITH EXISTING CONDITIONS. THE INTENT IS FOR ALL ABANDONED IN PLACE ITEMS TO BE REMOVED BACK INTO SOURCE.

C. ELECTRICAL WORK ON THIS LEVEL IS TO DISCONNECT AND DEMO ALL THE WAY INTO THE PANEL OF ORIGIN FEEDERS FOR THE MECHANICAL EQUIPMENT MARKED FOR DEMOLITION.

KEY NOTES:

1. DEMO ALL EXISTING FLUORESCENT LUMINAIRES SHOWN HERE AS QUANTITY IN THE SPACE. SAVE THE LIGHTING CIRCUIT FOR THE LED LUMINAIRES REPLACING THE FLUORESCENT LUMINAIRES. SEE LIGHTING SHEETS E200 SERIES FOR NEW LIGHTING.
2. EXISTING PANEL TO BE REPLACED IN PLACE WITH NEW SURFACE MOUNTED PANEL, SEE MOUNTING DETAIL ON SHEET E700. CONTRACTOR TO RECONNECT EXISTING TO REMAIN LOADS ON SAME CIRCUIT NUMBERS AS IN THE ORIGINAL PANELS. CONTRACTOR TO DEMO ANY ABANDONED ELECTRICAL DEVICES, CONDUITS, WIRING AND EQUIPMENT LEFT IN PLACE FROM PREVIOUS WORK. CONTRACTOR TO PROVIDE UPDATED, TYPED PANEL DIRECTORIES.
3. DISCONNECT MECHANICAL EQUIPMENT TO BE DEMOLISHED. DEMO CONDUITS, FEEDERS AND ALL OTHER ELECTRICAL EQUIPMENT AND DEVICES BACK TO SOURCE PANEL.
4. THIS IS A SHAFT THAT GOES ALL THE WAY UP TO THE FOURTH FLOOR LEVEL. ORIGINALLY, THIS WAS THE JUDGE'S ELEVATOR, WHICH HAS BEEN DEMOLISHED DECADES AGO. CONTRACTOR CAN USE THIS SHAFT FOR ANY FEE DER RISERS IF CONVENIENT.

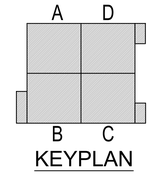


1 E160 ELECTRICAL DEMOLITION PLAN - 4TH FLOOR

1:8"=1'-0"

NORTH

0 4' 8' 16'



KEYPLAN

No:	Date:	By:	Revision:
1	06-02-2022	NNA	ADDENDUM #3

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN

411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
ELECTRICAL DEMOLITION PLAN - 4TH FLOOR

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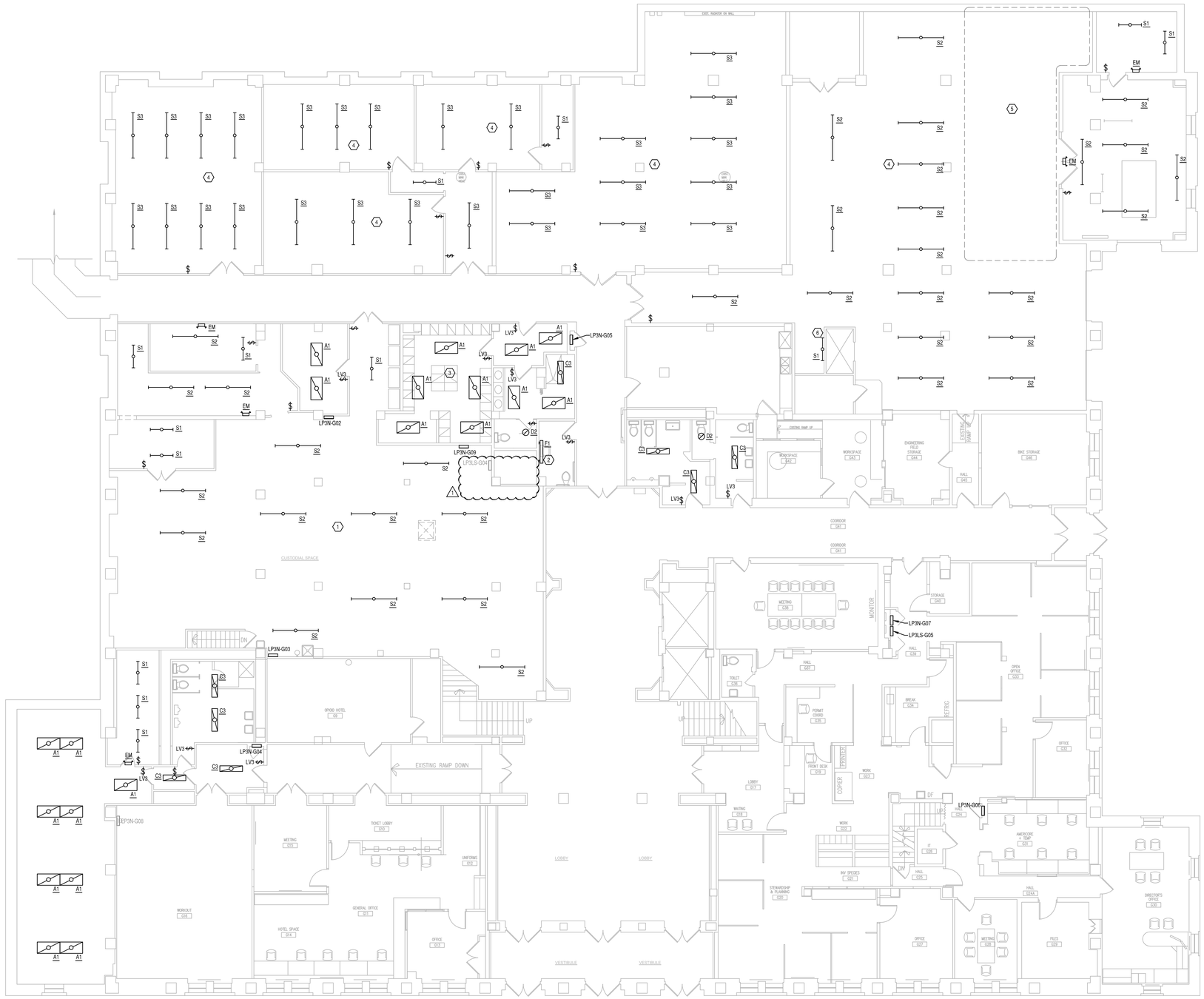


1 ELECTRICAL LIGHTING PLAN - GROUND FLOOR
E220 1/8"=1'-0"

NORTH

0 4' 8' 16'

GENERAL NOTES:

A. ALL NEW LED LUMINAIRES SHOWN ON ALL E200 SERIES SHEETS IN EACH SPACE, ARE SHOWN FOR QUANTITY ONLY. THE INTENT IS THAT THE CONTRACTOR REPLACES IN PLACE AND USES EXISTING LUMINAIRE CIRCUIT FOR ALL NEW LED LUMINAIRES.

B. WHERE THERE ARE MORE LUMINAIRES SHOWN IN A SPACE THAN THE NUMBER OF EXISTING LUMINAIRES THAT WERE DEMOED, THE INTENT IS THAT THE CONTRACTOR INSTALLS NEW LUMINAIRES USING EXISTING LUMINAIRE CIRCUIT FOR LIGHTING BUT PLACES LUMINAIRES SUCH THAT LIGHT IS AROUND AND NOT ON TOP OF EXISTING TO REMAIN EQUIPMENT.

C. WHERE NEW LIGHT SWITCHES ARE SHOWN, THE INTENT IS FOR THESE NEW SWITCHES TO BE INSTALLED IN EXISTING LIGHT SWITCH LOCATION.

D. OCCUPANCY SENSORS ARE NOT SHOWN BUT MUST BE PROVIDED TO ENSURE "LIGHTS OFF" IF NO OCCUPANCY. OCCUPANCY SENSORS CAN BE INTEGRAL TO LUMINAIRE, CEILING MOUNTED, WALL MOUNTED OR PART OF THE LIGHT SWITCH. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. PROVIDE 2X4 TILES FOR INFILL EXISTING LUMINAIRES OPENINGS IN CEILING TILES WHERE NECESSARY.

F. PATCH PLASTER AS NECESSARY WHERE NEW LUMINAIRES DO NOT COVER EXISTING CEILING OPENING.

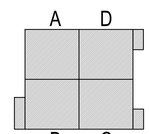
G. IN AREAS WHERE NO NEW LED LIGHTING IS SHOWN ASSUME THAT PRIOR REMODELINGS HAVE UPDATED EXISTING LIGHTING TO LED TECHNOLOGY. IF THERE ARE DESCREPANCIES, BRING IT TO THE ATTENTION OF THE ENGINEER.

H. COORDINATE WITH MECHANICAL CONTRACTOR AND BECOME FAMILIAR WITH ALL MECHANICAL DRAWINGS TO UNDERSTAND THE EXTENT OF NEW MECHANICAL WORK, PARTICULARLY ABOVE ACT OR HARD CEILING IN AREAS WHERE LUMINAIRES ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

I. IN CORRIDORS, LOBBIES, ROTUNDA AND OTHER PUBLIC SPACES THERE ARE HISTORICAL PENDANTS WHICH ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN PENDANT LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

KEY NOTES:

1. INSTALL LED LUMINAIRES IN THIS SPACE COORDINATED WITH THE NEW MECHANICAL EQUIPMENT. DO NOT INSTALL ANY LUMINAIRE ABOVE MECHANICAL EQUIPMENT, DUCTS, PIPES OR ANY OTHER OBSTRUCTIONS TO LIGHT OUTPUT. THE INTENT IS TO LIGHT WALKWAYS, PASSAGE AND LINE OF SIGHT, NOT THE TOP OF EQUIPMENT. LUMINAIRES IN THIS SPACE ARE SHOWN FOR QUANTITY ONLY.
2. INSTALL LED LUMINAIRE ON WALL ABOVE EXISTING MIRROR IN THE SAME LOCATION OF THE EXISTING FLUORESCENT LUMINAIRE THAT IT REPLACES.
3. INSTALL THE NEW LED LUMINAIRES IN THE SAME LOCATION OF THE EXISTING FLUORESCENT LUMINAIRES.
4. IN THIS SPACE THE NEW LED LUMINAIRES ARE SHOWN FOR QUANTITY ONLY. CONTROL NEW LUMINAIRES WITH THE NEW ON/OFF LIGHT SWITCH, REPLACING IN PLACE EXISTING LIGHT SWITCH.
5. EXISTING LIGHTING IN THIS AREA IS LED TECHNOLOGY, NO REPLACEMENT IS NECESSARY.
6. WALL MOUNT LUMINAIRE AT 9'-0" ABOVE FINISHED FLOOR.



KEYPLAN

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CITY HALL MEP RENEWAL DESIGN
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DULUTH, MN 55802

Sheet Title:
ELECTRICAL LIGHTING PLAN - GROUND FLOOR

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Project No:	21-0486
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Sheet Number: E220

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GENERAL NOTES:

A. ALL NEW LED LUMINAIRES SHOWN ON ALL E200 SERIES SHEETS IN EACH SPACE, ARE SHOWN FOR QUANTITY ONLY. THE INTENT IS THAT THE CONTRACTOR REPLACES IN PLACE AND USES EXISTING LUMINAIRE CIRCUIT FOR ALL NEW LED LUMINAIRES. PROVIDE UL924 FOR ALL NEW LUMINAIRE CONNECTED TO EXISTING EMERGENCY CIRCUIT.

B. WHERE THERE ARE MORE LUMINAIRES SHOWN IN A SPACE THAN THE NUMBER OF EXISTING LUMINAIRES THAT WERE DEMOED, THE INTENT IS THAT THE CONTRACTOR INSTALLS NEW LUMINAIRES USING EXISTING LUMINAIRE CIRCUIT FOR LIGHTING BUT PLACES LUMINAIRES SUCH THAT LIGHT IS AROUND AND NOT ON TOP OF EXISTING TO REMAIN EQUIPMENT.

C. WHERE NEW LIGHT SWITCHES ARE SHOWN, THE INTENT IS FOR THESE NEW SWITCHES TO BE INSTALLED IN EXISTING LIGHT SWITCH LOCATION.

D. OCCUPANCY SENSORS ARE NOT SHOWN BUT MUST BE PROVIDED TO ENSURE "LIGHTS OFF" IF NO OCCUPANCY. OCCUPANCY SENSORS CAN BE INTEGRAL TO LUMINAIRE, CEILING MOUNTED, WALL MOUNTED OR PART OF THE LIGHT SWITCH. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. PROVIDE 2X4 TILES FOR INFILL EXISTING LUMINAIRES OPENINGS IN CEILING TILES WHERE NECESSARY.

F. PATCH PLASTER AS NECESSARY WHERE NEW LUMINAIRES DO NOT COVER EXISTING CEILING OPENING.

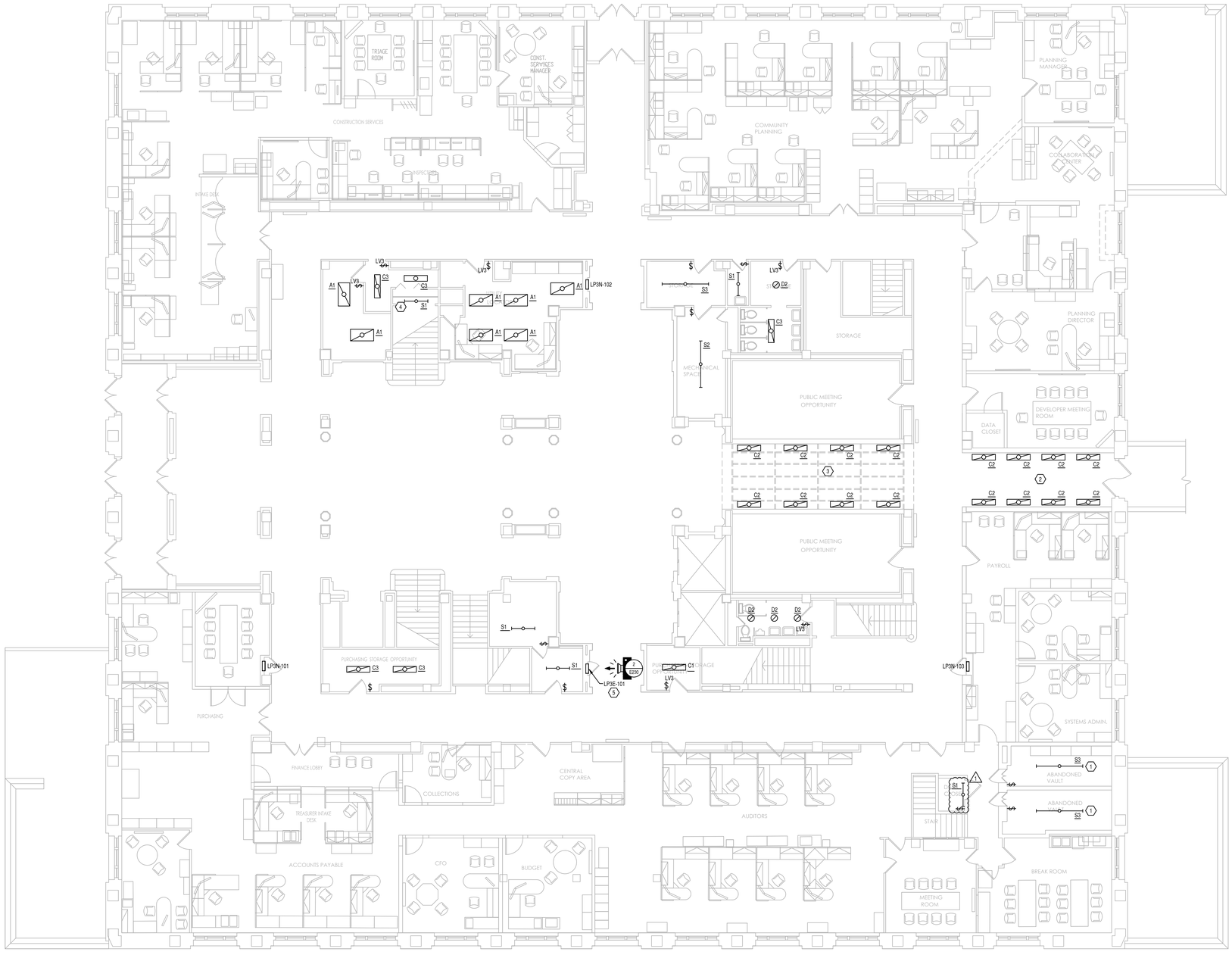
G. IN AREAS WHERE NO NEW LED LIGHTING IS SHOWN ASSUME THAT PRIOR REMODELINGS HAVE UPDATED EXISTING LIGHTING TO LED TECHNOLOGY. IF THERE ARE DESCREPANCIES, BRING IT TO THE ATTENTION OF THE ENGINEER.

H. COORDINATE WITH MECHANICAL CONTRACTOR AND BECOME FAMILIAR WITH ALL MECHANICAL DRAWINGS TO UNDERSTAND THE EXTENT OF NEW MECHANICAL WORK, PARTICULARLY ABOVE ACT OR HARD CEILING IN AREAS WHERE LUMINAIRES ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

I. IN CORRIDORS, LOBBIES, ROTUNDA AND OTHER PUBLIC SPACES THERE ARE HISTORICAL PENDANTS WHICH ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN PENDANT LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

KEY NOTES:

1. INSTALL LUMINAIRE WITH BOTTOM AT 12' ABOVE FINISHED FLOOR.
2. INSTALL LUMINAIRES RECESSED IN EXISTING GYPSUM CEILING IN THE SAME LOCATION OF THE EXISTING FLUORESCENT LUMINAIRES REPLACED ONE TO ONE. USE THE SAME CIRCUIT TO FEED NEW LED LUMINAIRES AND MAINTAIN EXISTING CONTROLS. PROVIDE EXTRA LARGE TRIM FLANGE TO COVER ANY GAP IN CEILING.
3. INSTALL LUMINAIRES RECESSED IN THE EXISTING LOCATION OF THE DEMOLISHED FLUORESCENT LUMINAIRES AND USE THE SAME CIRCUIT TO FEED THE NEW LED LUMINAIRES AND MAINTAIN EXISTING CONTROLS.
4. INSTALL LUMINAIRE IN EXACT LOCATION OF THE FLUORESCENT STRIP IT IS REPLACING AT THE UNDERSIDE OF THE STAIRS, USE EXISTING CIRCUIT AND MAINTAIN EXISTING CONTROLS.
5. THIS LIGHTING CONTROL PANEL REPLACES IN PLACE EXISTING PANEL LP3LS-101. THIS NEW PANEL SHALL BE A CRESTRON, CATALOG NUMBER GLEP-MLO-120-24-GLXP-SW16-LP-DIN-AP4. FURNISH PANEL WITH BACNET / IP INTEGRATION CAPABILITY. EACH INDEPENDENT LIGHTING CIRCUIT TO BE CONTROLLED BY BAS VIA BACNET / IP INTEGRATION TO BE COMPLETED BY DIVISION 25. EXISTING CORRIDOR, ROTUNDA AND COMMON AREA LIGHTING BREAKERS IN PANEL LP3N-101 ARE IDENTIFIED WITH A RED DOT. THESE BREAKERS ARE CURRENTLY USED TO TURN ON / OFF THESE LUMINAIRES. THE PANEL SHALL CONTROL THESE LOADS VIA THE SWITCHING MODULES CONTROLLED BY A SIGNAL FROM THE BAS. PROVIDE A SINGLE SWITCH ADJACENT TO THE PANEL TO OVERRIDE LIGHTING CONTROL AND TURN ALL THESE CIRCUITS ON. EXISTING 20A/2P LABELED CAR 1 ELEVATOR LIGHTS, CAR 2 ELEVATOR LIGHTS IN EXISTING PANEL LP3LS-301 SHALL BE MOVED TO PANEL LP3E-101. THIS NEW CIRCUIT SHALL NOT BE CONTROLLED.

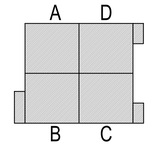


1 E230 ELECTRICAL LIGHTING PLAN - 1ST FLOOR
1/8"=1'-0"

NORTH

0 4' 8' 16'

2 E230 REFERENCE PHOTO
1/8"=1'-0"



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DULUTH, MN 55802

Sheet Title:
ELECTRICAL LIGHTING PLAN - 1ST FLOOR

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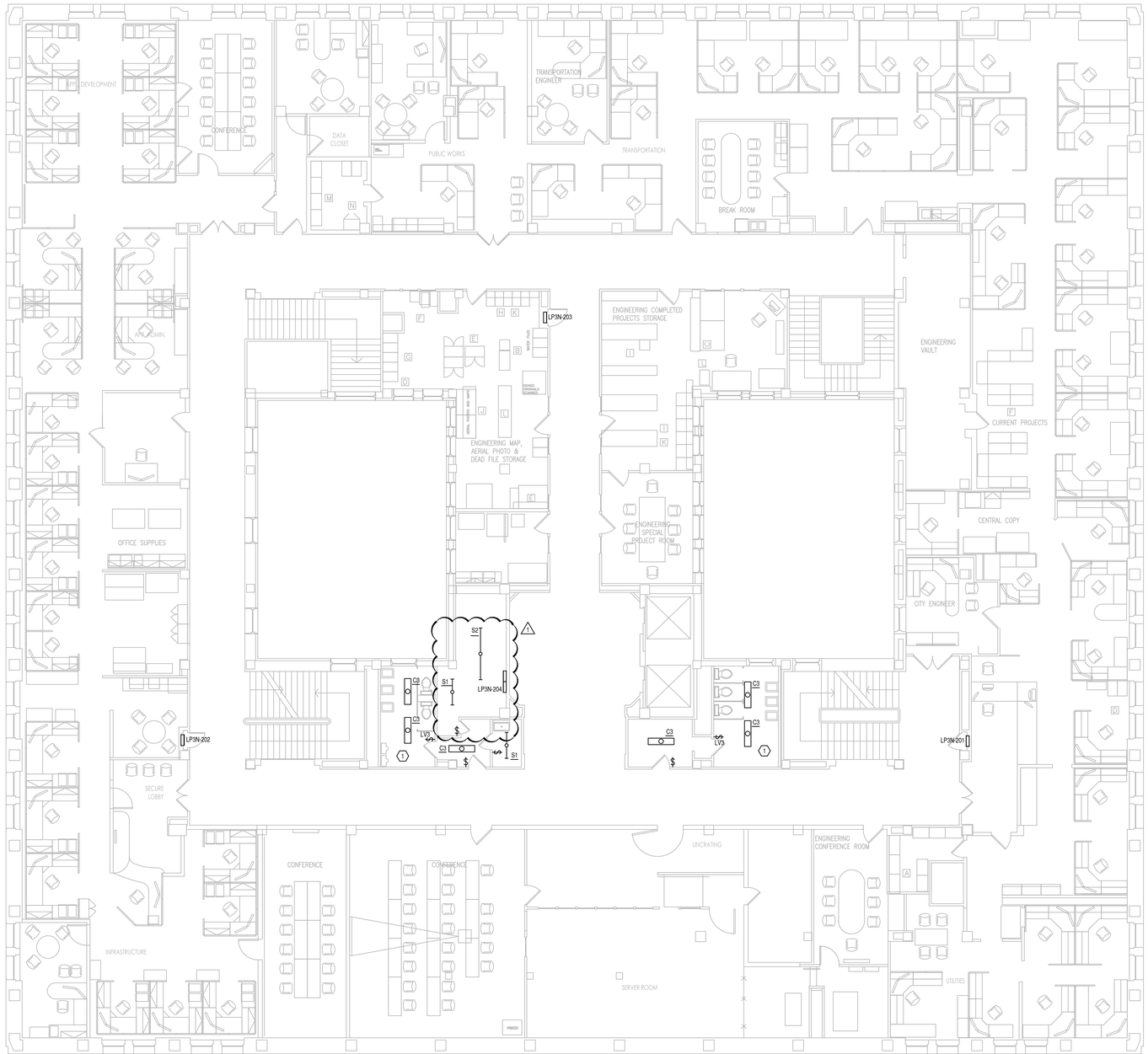


1 E240 ELECTRICAL LIGHTING PLAN - 2ND FLOOR

1/8"=1'-0"

NORTH

0 4' 8' 16'

GENERAL NOTES:

A. ALL NEW LED LUMINAIRES SHOWN ON ALL E200 SERIES SHEETS IN EACH SPACE, ARE SHOWN FOR QUANTITY ONLY. THE INTENT IS THAT THE CONTRACTOR REPLACES IN PLACE AND USES EXISTING LUMINAIRE CIRCUIT FOR ALL NEW LED LUMINAIRES. PROVIDE UL924 FOR ALL NEW LUMINAIRE CONNECTED TO EXISTING EMERGENCY CIRCUIT.

B. WHERE THERE ARE MORE LUMINAIRES SHOWN IN A SPACE THAN THE NUMBER OF EXISTING LUMINAIRES THAT WERE DEMOED, THE INTENT IS THAT THE CONTRACTOR INSTALLS NEW LUMINAIRES USING EXISTING LUMINAIRE CIRCUIT FOR LIGHTING BUT PLACES LUMINAIRES SUCH THAT LIGHT IS AROUND AND NOT ON TOP OF EXISTING TO REMAIN EQUIPMENT.

C. WHERE NEW LIGHT SWITCHES ARE SHOWN, THE INTENT IS FOR THESE NEW SWITCHES TO BE INSTALLED IN EXISTING LIGHT SWITCH LOCATION.

D. OCCUPANCY SENSORS ARE NOT SHOWN BUT MUST BE PROVIDED TO ENSURE "LIGHTS OFF" IF NO OCCUPANCY. OCCUPANCY SENSORS CAN BE INTEGRAL TO LUMINAIRE, CEILING MOUNTED, WALL MOUNTED OR PART OF THE LIGHT SWITCH. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. PROVIDE 2X4 TILES FOR INFILL EXISTING LUMINAIRES OPENINGS IN CEILING TILES WHERE NECESSARY.

F. PATCH PLASTER AS NECESSARY WHERE NEW LUMINAIRES DO NOT COVER EXISTING CEILING OPENING.

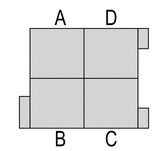
G. IN AREAS WHERE NO NEW LED LIGHTING IS SHOWN ASSUME THAT PRIOR REMODELINGS HAVE UPDATED EXISTING LIGHTING TO LED TECHNOLOGY. IF THERE ARE DESCREPANCIES, BRING IT TO THE ATTENTION OF THE ENGINEER.

H. COORDINATE WITH MECHANICAL CONTRACTOR AND BECOME FAMILIAR WITH ALL MECHANICAL DRAWINGS TO UNDERSTAND THE EXTENT OF NEW MECHANICAL WORK, PARTICULARLY ABOVE ACT OR HARD CEILING IN AREAS WHERE LUMINAIRES ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

I. IN CORRIDORS, LOBBIES, ROTUNDA AND OTHER PUBLIC SPACES THERE ARE HISTORICAL PENDANTS WHICH ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN PENDANT LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

KEY NOTES:

1 INSTALL THE NEW LED LUMINAIRES IN THE SAME LOCATION OF THE EXISTING FLUORESCENT LUMINAIRE. IN THIS SPACE THE NEW LED LUMINAIRES ARE SHOWN FOR QUANTITY ONLY.



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Project Title:
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DULUTH, MN 55802

Sheet Title:
ELECTRICAL LIGHTING PLAN - 2ND FLOOR

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Project No:	21-0486
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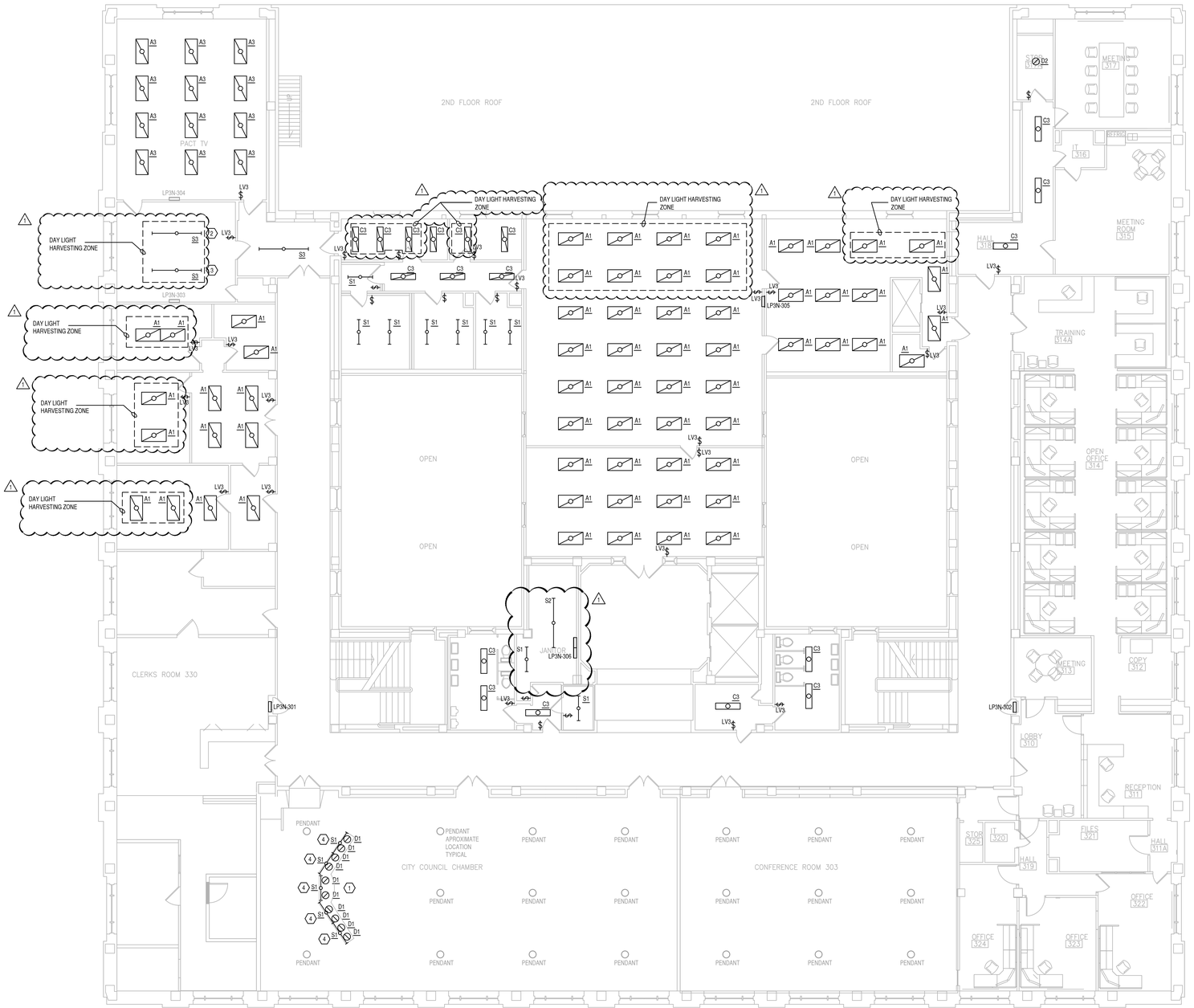


1 E250 ELECTRICAL LIGHTING PLAN - 3RD FLOOR

1/8"=1'-0"

NORTH

0 4' 8' 16'

1 GENERAL NOTES:

A. ALL NEW LED LUMINAIRES SHOWN ON ALL E200 SERIES SHEETS IN EACH SPACE, ARE SHOWN FOR QUANTITY ONLY. THE INTENT IS THAT THE CONTRACTOR REPLACES IN PLACE AND USES EXISTING LUMINAIRE CIRCUIT FOR ALL NEW LED LUMINAIRES. PROVIDE UL924 FOR ALL NEW LUMINAIRE CONNECTED TO EXISTING EMERGENCY CIRCUIT.

B. WHERE THERE ARE MORE LUMINAIRES SHOWN IN A SPACE THAN THE NUMBER OF EXISTING LUMINAIRES THAT WERE DEMOED, THE INTENT IS THAT THE CONTRACTOR INSTALLS NEW LUMINAIRES USING EXISTING LUMINAIRE CIRCUIT FOR LIGHTING BUT PLACES LUMINAIRES SUCH THAT LIGHT IS AROUND AND NOT ON TOP OF EXISTING TO REMAIN EQUIPMENT.

C. WHERE NEW LIGHT SWITCHES ARE SHOWN, THE INTENT IS FOR THESE NEW SWITCHES TO BE INSTALLED IN EXISTING LIGHT SWITCH LOCATION.

D. OCCUPANCY SENSORS ARE NOT SHOWN BUT MUST BE PROVIDED TO ENSURE "LIGHTS OFF" IF NO OCCUPANCY. OCCUPANCY SENSORS CAN BE INTEGRAL TO LUMINAIRE, CEILING MOUNTED, WALL MOUNTED OR PART OF THE LIGHT SWITCH. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. PROVIDE 2X4 TILES FOR INFILL EXISTING LUMINAIRES OPENINGS IN CEILING TILES WHERE NECESSARY.

F. PATCH PLASTER AS NECESSARY WHERE NEW LUMINAIRES DO NOT COVER EXISTING CEILING OPENING.

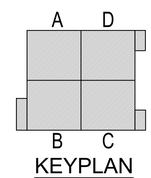
G. IN AREAS WHERE NO NEW LED LIGHTING IS SHOWN ASSUME THAT PRIOR REMODELINGS HAVE UPDATED EXISTING LIGHTING TO LED TECHNOLOGY. IF THERE ARE DESCREPANCIES, BRING IT TO THE ATTENTION OF THE ENGINEER.

H. COORDINATE WITH MECHANICAL CONTRACTOR AND BECOME FAMILIAR WITH ALL MECHANICAL DRAWINGS TO UNDERSTAND THE EXTENT OF NEW MECHANICAL WORK, PARTICULARLY ABOVE ACT OR HARD CEILING IN AREAS WHERE LUMINAIRES ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

I. IN CORRIDORS, LOBBIES, ROTUNDA AND OTHER PUBLIC SPACES THERE ARE HISTORICAL PENDANTS WHICH ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN PENDANT LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

KEY NOTES:

1. REPLACE EXISTING DOWNLIGHTS ONE TO ONE WITH THE NEW LED DOWNLIGHTS. CONNECT TO EXISTING LIGHTING CIRCUIT PREVIOUSLY SERVING DOWNLIGHT.
2. INSTALL LUMINAIRE BELOW DUCT USING UNISTRUT FOR SUPPORT.
3. INSTALL LUMINAIRE CHAIN HUNG AT 12' ABOVE FINISHED FLOOR.
4. PROVIDE LUMINAIRE TYPE 'S1' FOR UPLIGHTING FOR LIGHTING BOX SUSPENDED FROM CEILING. CONNECT TO EXISTING LIGHTING CIRCUIT PREVIOUSLY SERVING UPLIGHTS.



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ELECTRICAL LIGHTING PLAN - 3RD FLOOR

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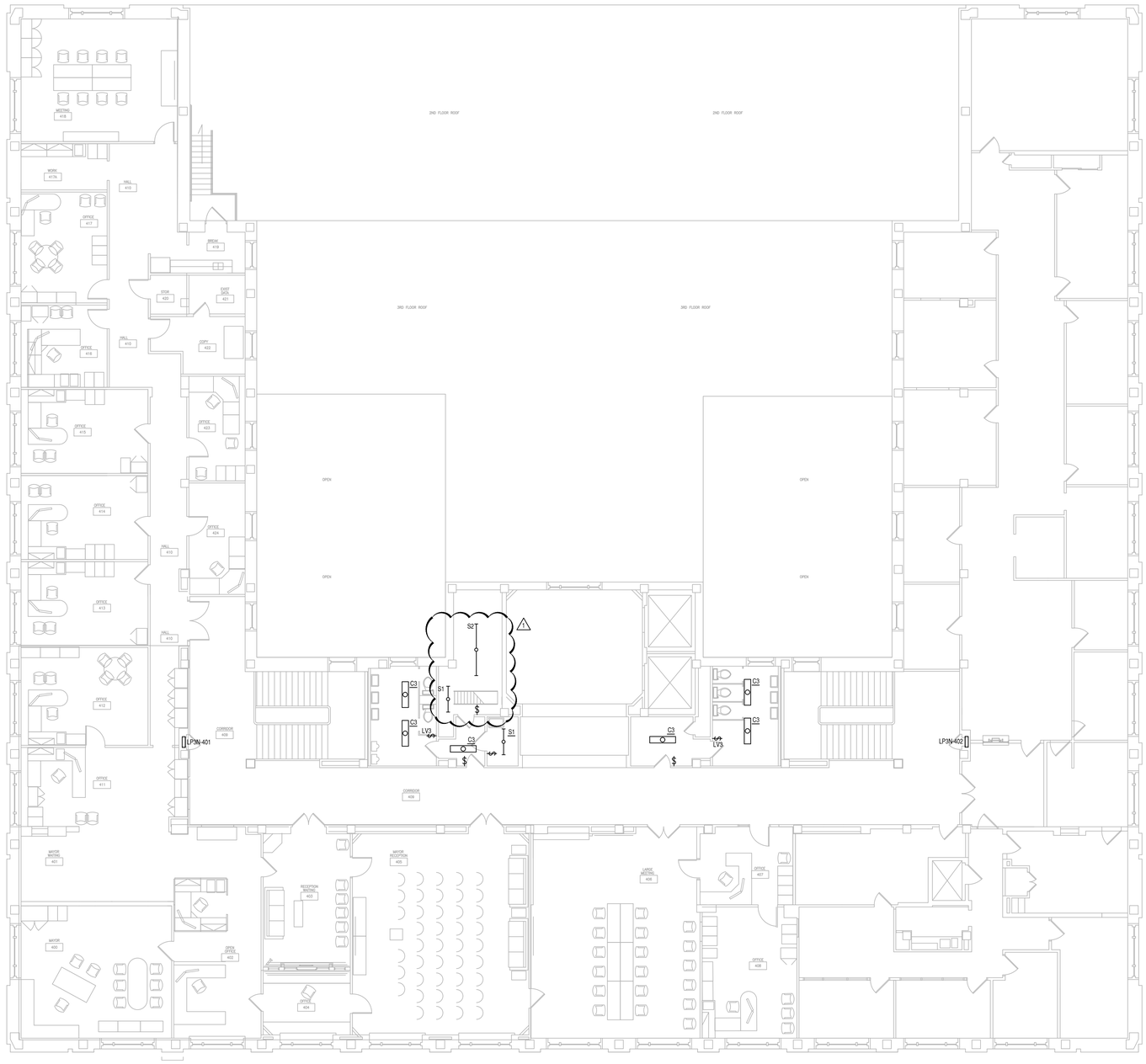

1 E260 ELECTRICAL LIGHTING PLAN - 4TH FLOOR

1/8"=1'-0"

0 4' 8' 16'

NORTH

⚠ GENERAL NOTES:

A. ALL NEW LED LUMINAIRES SHOWN ON ALL E200 SERIES SHEETS IN EACH SPACE, ARE SHOWN FOR QUANTITY ONLY. THE INTENT IS THAT THE CONTRACTOR REPLACES IN PLACE AND USES EXISTING LUMINAIRE CIRCUIT FOR ALL NEW LED LUMINAIRES. PROVIDE UL924 FOR ALL NEW LUMINAIRE CONNECTED TO EXISTING EMERGENCY CIRCUIT.

B. WHERE THERE ARE MORE LUMINAIRES SHOWN IN A SPACE THAN THE NUMBER OF EXISTING LUMINAIRES THAT WERE DEMOLISHED, THE INTENT IS THAT THE CONTRACTOR INSTALLS NEW LUMINAIRES USING EXISTING LUMINAIRE CIRCUIT FOR LIGHTING BUT PLACES LUMINAIRES SUCH THAT LIGHT IS AROUND AND NOT ON TOP OF EXISTING TO REMAIN EQUIPMENT.

C. WHERE NEW LIGHT SWITCHES ARE SHOWN, THE INTENT IS FOR THESE NEW SWITCHES TO BE INSTALLED IN EXISTING LIGHT SWITCH LOCATION.

D. OCCUPANCY SENSORS ARE NOT SHOWN BUT MUST BE PROVIDED TO ENSURE "LIGHTS OFF" IF NO OCCUPANCY. OCCUPANCY SENSORS CAN BE INTEGRAL TO LUMINAIRE, CEILING MOUNTED, WALL MOUNTED OR PART OF THE LIGHT SWITCH. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. PROVIDE 2X4 TILES FOR INFILL EXISTING LUMINAIRES OPENINGS IN CEILING TILES WHERE NECESSARY.

F. PATCH PLASTER AS NECESSARY WHERE NEW LUMINAIRES DO NOT COVER EXISTING CEILING OPENING.

G. IN AREAS WHERE NO NEW LED LIGHTING IS SHOWN ASSUME THAT PRIOR REMODELINGS HAVE UPDATED EXISTING LIGHTING TO LED TECHNOLOGY. IF THERE ARE DISCREPANCIES, BRING IT TO THE ATTENTION OF THE ENGINEER.

H. COORDINATE WITH MECHANICAL CONTRACTOR AND BECOME FAMILIAR WITH ALL MECHANICAL DRAWINGS TO UNDERSTAND THE EXTENT OF NEW MECHANICAL WORK, PARTICULARLY ABOVE ACT OR HARD CEILING IN AREAS WHERE LUMINAIRES ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

I. IN CORRIDORS, LOBBIES, ROTUNDA AND OTHER PUBLIC SPACES THERE ARE HISTORICAL PENDANTS WHICH ARE EXISTING TO REMAIN. CONTRACTOR MUST PROTECT, SUPPORT AND/OR REWIRE ANY EXISTING TO REMAIN PENDANT LUMINAIRE FOUND TO BE IN THE WAY OF NEW MECHANICAL PIPES, DUCTS OR OTHER NEW EQUIPMENT.

A D
B C
KEYPLAN

No:	Date:	By:	Revision:
1	06-02-2022	NNA	ADDENDUM #3

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: LUCIA A. ANDERSON
DATE: 05-03-2022 REG. NO.: 27049

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
ELECTRICAL LIGHTING PLAN - 4TH FLOOR

Date:	05-03-2022
Drawn By:	GAA
Checked By:	LAA
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

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GENERAL NOTES:

A. ALL NEW LED LUMINAIRES SHOWN ON ALL E200 SERIES SHEETS IN EACH SPACE, ARE SHOWN FOR QUANTITY ONLY. THE INTENT IS THAT THE CONTRACTOR REPLACES IN PLACE AND USES EXISTING LUMINAIRE CIRCUIT FOR ALL NEW LED LUMINAIRES. PROVIDE UL924 FOR ALL NEW LUMINAIRE CONNECTED TO EXISTING EMERGENCY CIRCUIT.

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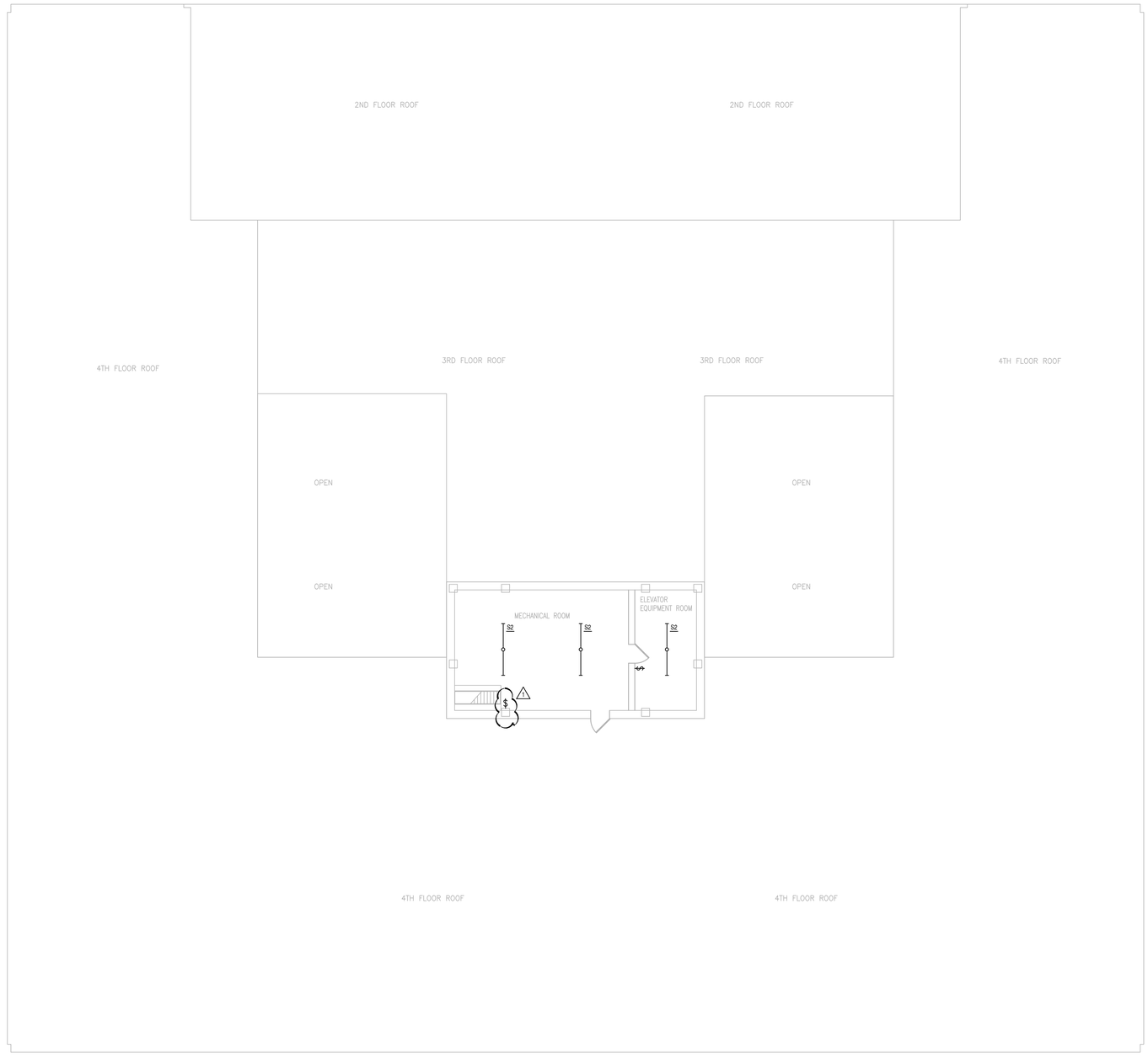
C. WHERE NEW LIGHT SWITCHES ARE SHOWN, THE INTENT IS FOR THESE NEW SWITCHES TO BE INSTALLED IN EXISTING LIGHT SWITCH LOCATION.

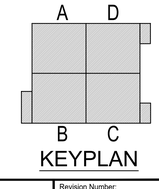


1 E270 ELECTRICAL LIGHTING PLAN - PENTHOUSE & ROOF

1/8"=1'-0"

NORTH

0 4' 8' 16'



KEYPLAN

No:	Date:	By:	Revision:
1	06-02-2022	NNA	ADDENDUM #3

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411 WEST 1ST STREET
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MOTOR AND EQUIPMENT WIRING SCHEDULE

UNIT NO./ TAG	DESCRIPTION		HP	KW	V/PH/HZ	MCA	MOCP	MIN SCCR	CONTROLLER/STARTER			DISCONNECT AT MOTOR				CONTROL BY	DUCT SMOKE DETECTORS	CONDUIT/CONDUCTOR SIZE & QUANTITY	PANEL NAME	CIRCUIT NUMBER(S)	OVERCURRENT PROTECTION AMP/POLE	NOTES
									TYPE	SIZE	FURN. BY	NEMA	SIZE	FURN. BY	FUSE SIZE							
AHP-1	CHILLER UNIT	2ND FLOOR ROOF			208/3/60	110	150	32000	N/A	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	2"C, 3#3/0, 1#3 GND	D3LS-G02	8	150A/3P	2,3,4
⚠1 AHP-2	CHILLER UNIT	2ND FLOOR ROOF			208/3/60	110	150	32000	N/A	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	2"C, 3#3/0, 1#3 GND	D3LS-G02	9	150A/3P	2,3,4
DC-1	DRY COOLER	3RD FLOOR ROOF		25.0	208/3/60		100	10000	N/A	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	1 1/2"C, 3#2, 1#6 GND	LP3N-306	14,16,18	100A/3P	2,3
EF-1	EXHAUST FAN	3RD FLOOR			120/1/60	0	20	5000	N/A	N/A	MECH	1	MSS	ELEC	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-305	2	20A/1P	
DOAS-1 (RETURN)	DED. OUTDOOR AIR SYS.	GROUND FLOOR	7. 5		208/3/60	23.3	30	10000	VFD	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#10, 1#10 GND	LP3N-G09	1,3,5	30A/3P	1,3
DOAS-1 (SUPPLY)	DED. OUTDOOR AIR SYS.	GROUND FLOOR	10		208/3/60	29.5	45	10000	VFD	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#6, 1#10 GND	LP3N-G09	7,9,11	45A/3P	1,3
DOAS-2 (RETURN)	DED. OUTDOOR AIR SYS.	GROUND FLOOR	7. 5		208/3/60	23.3	30	10000	VFD	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#10, 1#10 GND	LP3N-G09	13.15.17	30A/3P	1,3
⚠1 DOAS-2 (SUPPLY)	DED. OUTDOOR AIR SYS.	GROUND FLOOR	10		208/3/60	29.5	45	10000	VFD	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#6, 1#10 GND	LP3N-G09	19,21,23	45A/3P	1,3
WHP-A1	WATER HEAT PUMP	GROUND FLOOR			208/3/60	44	70	10000	N/A	N/A	N/A	1	60A	ELEC	50A	BAS	N/A	1 1/4"C, 3#4, 1#8 GND	LP3N-G09	25,27,29	70A/3P	3
WHP-F1	WATER HEAT PUMP	GROUND FLOOR			208/3/60	35	60	10000	N/A	N/A	N/A	1	60A	ELEC	50A	BAS	N/A	1 1/4"C, 3#4, 1#10 GND	LP3N-G09	31,33,35	60A/3P	3
WHP-G1	WATER HEAT PUMP	GROUND FLOOR			208/3/60	54	90	10000	N/A	N/A	N/A	1	100A	ELEC	80A	BAS	N/A	1 1/4"C, 3#2, 1#8 GND	LP3N-G09	37,39,41	90A/3P	3
WHP-H1	WATER HEAT PUMP	3RD FLOOR			208/3/60	69	110	10000	N/A	N/A	N/A	1	200A	ELEC	110A	BAS	N/A	1 1/4"C, 3#2, 1#6 GND	LP3N-204	7,9,11	110A/3P	3
WHP-I1	WATER HEAT PUMP	3RD FLOOR			208/3/60	79	125	10000	N/A	N/A	N/A	1	200A	ELEC	125A	BAS	N/A	1 1/2"C, 3#1, 1#6 GND	LP3N-204	11,13,15	125A/3P	3
WHP-K1	WATER HEAT PUMP	3RD FLOOR			208/3/60	35	60	10000	N/A	N/A	N/A	1	60A	ELEC	50A	BAS	N/A	1 1/4"C, 3#4, 1#10 GND	LP3N-306	2,4,6	60A/3P	3
WHP-J1	WATER HEAT PUMP	3RD FLOOR			208/3/60	29	50	10000	N/A	N/A	N/A	1	60A	ELEC	45A	BAS	N/A	1 1/4"C, 3#6, 1#10 GND	LP3N-306	8,10,12	50A/3P	3
WHP-L1	WATER HEAT PUMP	3RD FLOOR			208/3/60	35	60	10000	N/A	N/A	N/A	1	60A	ELEC	50A	BAS	N/A	1 1/4"C, 3#4, 1#10 GND	LP3N-204	1,3,5	60A/3P	3
WHP-M1	WATER HEAT PUMP	3RD FLOOR			208/3/60	69	110	10000	N/A	N/A	N/A	1	200A	ELEC	110A	BAS	N/A	1 1/4"C, 3#2, 1#6 GND	LP3N-204	59,61,63	110A/3P	3
P-1	HEATING WATER PUMP	GROUND FLOOR	10		208/3/60	29.5	45	32000	VFD	N/A	MECH	1	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#6, 1#10 GND	D3LS-G02	3	45A/3P	3,4
P-2	HEATING WATER PUMP	GROUND FLOOR	10		208/3/60	29.5	45	32000	VFD	N/A	MECH	1	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#6, 1#10 GND	D3LS-G02	7	45A/3P	3,4
P-3	CONDENSER WATER PUMP	GROUND FLOOR	7. 5		208/3/60	23.3	30	10000	VFD	N/A	MECH	1	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#10, 1#10 GND	LP3N-G09	8,10,12	30A/3P	3
P-4	CONDENSER WATER PUMP	GROUND FLOOR	7. 5		208/3/60	23.3	30	10000	VFD	N/A	MECH	1	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#10, 1#10 GND	LP3N-G09	14,16,18	30A/3P	3
ERU-1A	ENERGY RECOVERY UNIT	PENTHOUSE			208/3/60	17.53	25	10000	N/A	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 3#10, 1#10 GND	LP3N-306	48,50,52	25A/3P	3
ERU-1B	ENERGY RECOVERY UNIT	PENTHOUSE			208/3/60	58.38	80	10000	N/A	N/A	MECH	N/A	N/A	MECH	N/A	BAS	N/A	1 1/4"C, 3#3, 1#6 GND	LP3N-306	54,56,58	80A/3P	3
FC 0-102	VFR CASSETTE	GROUND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	8,10	15A/2P	
FC 0-103	VFR CASSETTE	GROUND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	8,10	15A/2P	
FC 0-105	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	12,14	15A/2P	
FC 0-106	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	12,14	15A/2P	
FC 0-107	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	16,18	15A/2P	
FC 0-108	VFR CASSETTE	GROUND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	16,18	15A/2P	
FC 0-109	VFR CASSETTE	GROUND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	16,18	15A/2P	
FC 0-110	VFR CASSETTE	GROUND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	20,22	15A/2P	
FC 0-111	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	20,22	15A/2P	
FC 0-112	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	20,22	15A/2P	
FC 0-113	VFR CASSETTE	GROUND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	24,26	15A/2P	
FC 0-114	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	24,26	15A/2P	
FC 0-115	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	36,38	15A/2P	
FC 0-116	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	24,26	15A/2P	
FC 0-117	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	28,30	15A/2P	
FC 0-118	VFR CASSETTE	BASEMENT			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	28,30	15A/2P	
FC 0-119	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	32,34	15A/2P	
FC 0-120	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	32,34	15A/2P	
FC 0-121	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	32,34	15A/2P	
FC 0-122	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	36,38	15A/2P	
FC 0-123	VFR CASSETTE	GROUND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G09	36,38	15A/2P	
FC 0-124	VFR CASSETTE	GROUND FLOOR			208/1/60	4.25	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-G04	31,33	15A/2P	
FC 1-101	VFR CASSETTE	1ST FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	19,21	15A/2P	
FC 1-102	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	19,21	15A/2P	
FC 1-103	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	19,21	15A/2P	
FC 1-104	VFR CASSETTE	1ST FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	23,25	15A/2P	
FC 1-106	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	23,25	15A/2P	
FC 1-108	VFR CASSETTE	1ST FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	27,29	15A/2P	
FC 1-109A	VFR CASSETTE	1ST FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	27,29	15A/2P	
FC 1-109B	VFR CASSETTE	1ST FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	27,29	15A/2P	
FC 1-110	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	31,33	15A/2P	
FC 1-111	VFR CASSETTE	1ST FLOOR			208/1/60	2.94	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	31,33	15A/2P	
FC 1-112	VFR CASSETTE	1ST FLOOR			208/1/60	2.94	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	31,33	15A/2P	
FC 1-113	VFR CASSETTE	1ST FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	35,37	15A/2P	
FC 1-114	VFR CASSETTE	1ST FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	35,37	15A/2P	
FC 1-115	VFR CASSETTE	1ST FLOOR			208/1/60	2.94	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	35,37	15A/2P	
FC 1-116	VFR CASSETTE	1ST FLOOR			208/1/60	4.25	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	39,41	15A/2P	
FC 1-117	VFR CASSETTE	1ST FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	39,41	15A/2P	
FC 1-118	VFR CASSETTE	1ST FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	39,41	15A/2P	
FC 1-119	VFR CASSETTE	1ST FLOOR			208/1/60	2.94	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	43,45	15A/2P	
FC 1-121	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	43,45	15A/2P	
FC 1-122	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	47,49	15A/2P	
FC 1-123	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	47,49	15A/2P	
FC 1-124	VFR CASSETTE	1ST FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	47,49	15A/2P	
FC 1-125	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	51,53	15A/2P	
FC 1-127	VFR CASSETTE	1ST FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	51,53	15A/2P	
FC 1-128	VFR CASSETTE	1ST FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	55,57	15A/2P	
FC 1-129	VFR CASSETTE	1ST FLOOR			208/1/60	4.25	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	55,57	15A/2P	
FC 1-131	VFR CASSETTE	1ST FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	2,4	15A/2P	
FC 2-101	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	6,8	15A/2P	
FC 2-102	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	6,8	15A/2P	
FC 2-103	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	6,8	15A/2P	
FC 2-104	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	10,12	15A/2P	
FC 2-106	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	10,12	15A/2P	
FC 2-108	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	14,16	15A/2P	
FC 2-109	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	14,16	15A/2P	
FC 2-111	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	18,20	15A/2P	
FC 2-112	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	18,20	15A/2P	
FC 2-114	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	22,24	15A/2P	
FC 2-115	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	22,24	15A/2P	
FC 2-116	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	26,28	15A/2P	
FC 2-117	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	26,28	15A/2P	
FC 2-118	VFR CASSETTE	2ND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	26,28	15A/2P	
FC 2-120	VFR CASSETTE	2ND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	30,32	15A/2P	
FC 2-121	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	30,32	15A/2P	
FC 2-123	VFR CASSETTE	2ND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	34,36	15A/2P	
FC 2-124	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	34,36	15A/2P	
FC 2-125	VFR CASSETTE	2ND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	38,40	15A/2P	
FC 2-126	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	38,40	15A/2P	
FC 2-127	VFR CASSETTE	2ND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	38,40	15A/2P	
FC 2-129	VFR CASSETTE	2ND FLOOR			208/1/60	2.94	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	42,44	15A/2P	
FC 2-130	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	42,44	15A/2P	
FC 2-131	VFR CASSETTE	2ND FLOOR			208/1/60	2.88	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	46,48	15A/2P	
FC 2-132	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	46,48	15A/2P	
FC 2-133	VFR CASSETTE	2ND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	46,48	15A/2P	
FC 2-134	VFR CASSETTE	2ND FLOOR			208/1/60	2.13	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	50,52	15A/2P	
FC 2-135	VFR CASSETTE	2ND FLOOR			208/1/60	2.94	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	50,52	15A/2P	
FC 2-136	VFR CASSETTE	2ND FLOOR			208/1/60	1.75	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	50,52	15A/2P	
FC 2-137A	VFR CASSETTE	2ND FLOOR			208/1/60	4.38	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	54,56	15A/2P	
FC 2-137B	VFR CASSETTE	2ND FLOOR			208/1/60	4.38	15	10000	N/A	N/A	N/A	N/A	N/A	MECH	N/A	BAS	N/A	3/4"C, 2#12, 1#12 GND	LP3N-204	58,60	15A/2P	

GENERAL MOTOR AND EQUIPMENT SCHEDULE NOTES:

A. DIVISION 26 CONTRACTOR TO VERIFY EQUIPMENT SPECIFICATION INFORMATION WITH CORRESPONDING MECHANICAL SCHEDULES AND SHOP DRAWINGS PRIOR TO INSTALLATION.
B. DIVISION 26 CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING REQUIRED ELECTRICAL INTERCONNECTING POWER WIRING BETWEEN STARTER/VFD'S, DISCONNECTS AND CONNECTIONS TO MECHANICAL EQUIPMENT LISTED UNLESS NOTED OTHERWISE.
C. DUCT SMOKE DETECTORS SHALL BE PROVIDED ON BOTH THE SUPPLY AND RETURN DUCT WHEN INDICATED ON SCHEDULE.
D. DUCT SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY DIVISION 26 CONTRACTOR, INSTALLED BY DIVISION 23 CONTRACTOR.
E. ALL EQUIPMENT SIZES, LOADS, HP RATINGS, CIRCUIT BREAKER SIZES, STARTER SIZES, CONNECTION TYPE, AND CONDUIT/WIRE SIZES ARE AS PER THE SIZES AND BASIS OF DESIGN EQUIPMENT COORDINATED DURING DESIGN WITH THE VARIOUS DISCIPLINES. ALL REVISIONS AFTER BID (PER EQUIPMENT SUBMITTALS AND ACTUAL SUPPLIED EQUIPMENT) SHALL BE CONSOLIDATED INTO A SINGLE CONFIRMING RFI SUBMITTED BY THE ELECTRICAL CONTRACTOR SHOWING REDLINED PROPOSED REVISIONS TO BE REVIEWED BY KFI.

SPECIFIC MOTOR AND EQUIPMENT SCHEDULE NOTES:

1. PROVIDE (2) DEDICATED 120 VOLT, 20 AMP CIRCUIT TO UNIT. ONE FOR GENERAL PURPOSE GFCI OUTLETS AND GENERAL LIGHTING AND THE SECOND CIRCUIT FOR THE 120V HEAT WHEEL 3/4HP MOTOR.
2. PROVIDE DEDICATED 120 VOLT, 20 AMP CIRCUIT TO UNIT FOR GENERAL PURPOSE GFCI WEATHERPROOF OUTLET.
3. COORDINATE LOCATION OF ANY STARTERS/VFD'S AND DISCONNECTS PROVIDED BY MECHANICAL WITH EQUIPMENT, ALSO COORDINATE POINT OF CONNECTION TO EQUIPMENT FOR ELECTRICAL FEEDER WITH MECHANICAL CONTRACTOR.
4. CIRCUIT BREAKER NUMBER FOR THIS EQUIPMENT TO BE COORDINATED ON SITE. THIS NEW BREAKER IS REPLACING IN PLACE AN EXISTING BREAKER IN D3LS-G02. SEE SCHEDULE D3LS-G02.

No:	Date:	By:	Revision:
1	06-02-2022	LAA	ADDENDUM #3

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: LUCIA A. ANDERSON
DATE: 05-03-2022 REG. NO.: 27049

KFI ENGINEERS
670 County Road B West
St. Paul, Minnesota 55113
Tel: (651) 771-0880 Fax: (651) 771-0878
Email: kfi@kfi-eng.com

Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
M

(NEW PANEL)

PANEL: LP3N-G09 VOLTAGE: 120/208V, 3PH, 4W SD QMF 08-1002: 1

NO.	AMP/P	NOTE	DESCRIPTION	PH	CODE L VA	CODE C VA	CODE R VA	CODE M VA	CODE E VA	CODE K VA	CODE D VA
1				- A -				2795			
3	30/3		DOAS-1 (RETURN FAN)	- B -				2795			
5				- C -				2795			
7				- A -				3539			
9	45/3		DOAS-1 (SUPPLY FAN)	- B -				3539			
11				- C -				3539			
13				- A -				2795			
15	30/3		DOAS-2 (RETURN FAN)	- B -				2795			
17				- C -				2795			
19				- A -				3539			
21	45/3		DOAS-2 (SUPPLY FAN)	- B -				3539			
23		4		- C -				3539			
25				- A -				5280			
27	70/3		WHP-A1 (WATER HEAT PUMP)	- B -				5280			
29				- C -				5280			
31				- A -				4198			
33	60/3		WHP-F1 (WATER HEAT PUMP)	- B -				4198			
35				- C -				4198			
37				- A -				6477			
39	90/3		WHP-G1 (WATER HEAT PUMP)	- B -				6477			
41				- C -				6477			
43				- A -							
45	15/3		SPARE	- B -							
47				- C -							
49				- A -							
51	20/3		SPARE	- B -							
53				- C -							
55				- A -				2904			
57	30/3		P-3 (HOT WATER PUMP)	- B -				2904			
59				- C -				2904			
2				- A -				2904			
4	30/3		P-4 (HOT WATER PUMP)	- B -				2904			
6				- C -				2904			
8	15/2		FC 0-102, FC 0-103	- A -					443		
10				- B -					443		
12	15/2		FC 0-105, FC 0-106	- C -					364		
14				- A -					364		
16	15/2		FC 0-107, FC 0-108, FC 0-109	- B -					703		
18				- C -					703		
20	15/2		FC 0-110, FC 0-111, FC 0-112	- A -					664		
22				- B -					664		
24	15/2		FC 0-113, FC 0-114, FC 0-116	- C -					664		
26				- A -					664		
28	15/2		FC 0-117, FC 0-118	- B -					404		
30				- C -					404		
32	15/2		FC 0-119, FC 0-120, FC 0-121	- A -					546		
34				- B -					546		
36	15/2		FC 0-115, FC 0-122, FC 0-123	- C -					546		
38				- A -					546		
40				- B -							
42	20/3		SPARE	- C -							
44				- A -							
46				- B -							
48	20/3		SPARE	- C -							
50				- A -							
52				- B -							
54	20/3		SPARE	- C -							
56				- A -							
58	15/2		SPARE	- B -							
60				- C -							
THROUGH FEED LUG CONNECTION				- A -							
				- B -							
				- C -							
MAIN BREAKER			400/3	- A -	0	0	0	34431	3227	0	0
			----	- B -	0	0	0	34431	2760	0	0
			----	- C -	0	0	0	34431	2681	0	0
								Total	- A -	- B -	- C -
								112.0	37.7	37.2	37.1

OVERCURRENT DEVICE NOTES:	
1 -	PROVIDE LOCK-ON DEVICE
2 -	CONNECT VIA TIMECLOCK
3 -	
4 -	
5 -	

CONN KVA PHASE LOADS

DMD	CONN	BUS KVA LOADS
0.0	0.0	CODE L - LIGHTING
0.0	0.0	CODE C - CONVENIENCE RECEPTACLES (180 W)
0.0	0.0	CODE R - RECEPTACLES (NON CONVENIENCE)
103.3	103.3	CODE M - MOTORS LARGEST MTR VA = 0
8.7	8.7	CODE E - ELECTRIC HEAT
0.0	0.0	CODE K - KITCHEN EQUIP DMD = 100%
0.0	0.0	CODE D - DWELLING UNITS (HOTEL/MOTEL ROOMS)
112	112	TOTAL KVA
0		SPARE KVA SPARE = 0%
112		ADJUSTED KVA (DEMAND + SPARE KVA)
311		ADJUSTED AMPS (DEMAND + SPARE KVA) 6/2/2022

Panelboard Notes:	
1 -	PROVIDE DUTY TYPE SWITCHES
2 -	E.C SHALL BALANCE EACH PHASE WITHIN 10%
3 -	
4 -	
5 -	

SURFACE	: MOUNTING
22KA	: SCCR RATING
400	: AMP RATING OF BUS
400	: PANEL AMP RATING (MIN MAIN)
208	: PHASE TO PHASE VOLTAGE

FILE NAME:	PROJECT NUMBER :	PROJECT NAME :
120/208V	21-0486	Duluth City Hall

(NEW PANEL, RELABELED)

PANEL: LP3N-G10 VOLTAGE: 120/208V, 3PH, 4W SD QMF 08-1002: 1

NO.	AMP/P	NOTE	DESCRIPTION	PH	CODE L VA	CODE C VA	CODE R VA	CODE M VA	CODE E VA	CODE K VA	CODE D VA
1				- A -							
3	60/3		EXISTING LOAD	- B -							
5				- C -							
7				- A -							
9	60/3		EXISTING LOAD	- B -							
11				- C -							
13	20/1		EXISTING LOAD	- A -							
15	20/1		EXISTING LOAD	- B -							
17	20/1		EXISTING LOAD	- C -							
19	20/1		EXISTING LOAD	- A -							
21	20/1		EXISTING LOAD	- B -							
23	20/1		SPARE	- C -							
25	20/1		SPARE	- A -							
27	20/1		SPARE	- B -							
29	20/1		SPARE	- C -							
31	20/1		SPARE	- A -							
33	20/1		SPACE	- B -							
35	20/1		SPACE	- C -							
37	20/1		SPACE	- A -							
39	20/1		SPACE	- B -							
41	20/1		SPACE	- C -							
2				- A -							
4	60/3		EXISTING LOAD	- B -							
6				- C -							
8	30/2		EXISTING LOAD	- A -							
10				- B -							
12	20/1			- C -							
14	20/1			- A -							
16	20/2		EXISTING LOAD	- B -							
18				- C -							
20	20/1		EXISTING LOAD	- A -							
22	20/1		EXISTING LOAD	- B -							
24	20/1		SPARE	- C -							
26	20/1		SPARE	- A -							
28	20/1		SPARE	- B -							
30	20/1		SPARE	- C -							
32	20/1		SPACE	- A -							
34	20/1		SPACE	- B -							
36	20/1		SPACE	- C -							
38	20/1		SPACE	- A -							
40	20/1		SPACE	- B -							
42	20/1		SPACE	- C -							
THROUGH FEED LUG CONNECTION			----	- A -							
			----	- B -							
			----	- C -							
MAIN BREAKER			150/3	- A -	0	0	0	0	0	0	0
			----	- B -	0	0	0	0	0	0	0
			----	- C -	0	0	0	0	0	0	0
								Total	- A -	- B -	- C -
								0.0	0.0	0.0	0.0

OVERCURRENT DEVICE NOTES:	
1 -	PROVIDE LOCK-ON DEVICE
2 -	CONNECT VIA TIMECLOCK
3 -	
4 -	
5 -	

CONN KVA PHASE LOADS

DMD	CONN	BUS KVA LOADS
0.0	0.0	CODE L - LIGHTING
0.0	0.0	CODE C - CONVENIENCE RECEPTACLES (180 W)
0.0	0.0	CODE R - RECEPTACLES (NON CONVENIENCE)
0.0	0.0	CODE M - MOTORS LARGEST MTR VA = 0
0.0	0.0	CODE E - ELECTRIC HEAT
0.0	0.0	CODE K - KITCHEN EQUIP DMD = 100%
0.0	0.0	CODE D - DWELLING UNITS (HOTEL/MOTEL ROOMS)
0	0	TOTAL KVA
0		SPARE KVA SPARE = 0%
0		ADJUSTED KVA (DEMAND + SPARE KVA)
0		ADJUSTED AMPS (DEMAND + SPARE KVA) 6/2/2022

Panelboard Notes:	
1 -	PROVIDE DUTY TYPE SWITCHES
2 -	E.C SHALL BALANCE EACH PHASE WITHIN 10%
3 -	
4 -	
5 -	

SURFACE	: MOUNTING
22KA	: SCCR RATING
200	: AMP RATING OF BUS
150	: PANEL AMP RATING (MIN MAIN)
208	: PHASE TO PHASE VOLTAGE

FILE NAME:	PROJECT NUMBER :	PROJECT NAME :
120/208V	21-0486	Duluth City Hall

(NEW PANEL, RELABELED)

PANEL: LP3N-102 VOLTAGE: 120/208V, 3PH, 4W SD QMF 08-1002: 1

NO.	AMP/P	NOTE	DESCRIPTION	PH	CODE L VA	CODE C VA	CODE R VA	CODE M VA	CODE E VA	CODE K VA	CODE D VA
1	20/1		EXISTING LOAD	- A -							
3	20/1		EXISTING LOAD	- B -							
5	20/1		EXISTING LOAD	- C -							
7	20/1		EXISTING LOAD	- A -							
9	20/1		EXISTING LOAD	- B -							
11	20/1		EXISTING LOAD	- C -							
13	20/1		EXISTING LOAD	- A -							
15	20/1		SPARE	- B -							
17				- C -							
19	30/3		EXISTING LOAD	- A -							
21				- B -							
23	20/1		EXISTING LOAD	- C -							
25	20/1		SPARE	- A -							
27	20/1		SPARE	- B -							
29	20/1		SPARE	- C -							
31	20/1		SPARE	- A -							
33	20/1		SPARE	- B -							
35	20/1		EXISTING LOAD	- C -							
37	20/1		EXISTING LOAD	- A -							
39	20/1		EXISTING LOAD	- B -							
41	20/1		EXISTING LOAD FROM LOAD CENTER	- C -							
43	20/1		EXISTING LOAD FROM LOAD CENTER	- A -							
45	20/1		EXISTING LOAD FROM LOAD CENTER	- B -							
47	20/1		EXISTING LOAD FROM LOAD CENTER	- C -							
49	20/1		EXISTING LOAD FROM LOAD CENTER	- A -							
51	20/2		EXISTING LOAD FROM LOAD CENTER	- B -							
53				- C -							
55	20/1		SPARE	- A -							
57	20/1		SPARE	- B -							
59	20/1		SPARE	- C -							
2	20/1		EXISTING LOAD	- A -							
4	20/1		EXISTING LOAD	- B -							
6	20/1		EXISTING LOAD	- C -							
8	20/1		EXISTING LOAD	- A -							
10	20/1		EXISTING LOAD	- B -							
12	20/1		EXISTING LOAD	- C -							
14	20/1		EXISTING LOAD	- A -							
16	20/1		EXISTING LOAD	- B -							
18	20/1		EXISTING LOAD	- C -							
20	20/1		EXISTING LOAD	- A -							
22	20/1		EXISTING LOAD	- B -							
24	20/1		EXISTING LOAD	- C -							
26	20/1		SPARE	- A -							
28	20/1		SPARE	- B -							
30	20/1		EXISTING LOAD	- C -							
32	20/1		EXISTING LOAD	- A -							
34	20/1		EXISTING LOAD	- B -							
36	20/1		EXISTING LOAD	- C -							
38	20/1		SPARE	- A -							
40	20/1		SPARE	- B -							
42	20/1		EXISTING LOAD	- C -							
44	15/2		BCC-F1	- A -							
46				- B -							
48	20/1		SPARE	- C -							
50	20/1		SPARE	- A -							
52	20/1		SPARE	- B -							
54	20/1		SPARE	- C -							
56	20/1		SPARE	- A -							
58	20/1		SPARE	- B -							
60	20/1		SPARE	- C -							
THROUGH FEED LUG CONNECTION				- A -							
				- B -							
				- C -							
MAIN BREAKER			100/3	- A -	0	0	0	0	0	0	0
			----	- B -	0	0	0	0	0	0	0
			----	- C -	0	0	0	0	0	0	0
								Total	- A -	- B -	- C -
								0.0	0.0	0.0	0.0

OVERCURRENT DEVICE NOTES:	
1 -	PROVIDE LOCK-ON DEVICE
2 -	CONNECT VIA TIMECLOCK
3 -	
4 -	
5 -	

CONN KVA PHASE LOADS

DMD	CONN	BUS KVA LOADS
0.0	0.0	CODE L - LIGHTING
0.0	0.0	CODE C - CONVENIENCE RECEPTACLES (180 W)
0.0	0.0	CODE R - RECEPTACLES (NON CONVENIENCE)
0.0	0.0	CODE M - MOTORS LARGEST MTR VA = 0
0.0	0.0	CODE E - ELECTRIC HEAT
0.0	0.0	CODE K - KITCHEN EQUIP DMD = 100%
0.0	0.0	CODE D - DWELLING UNITS (HOTEL/MOTEL ROOMS)
0	0	TOTAL KVA
0		SPARE KVA SPARE = 0%
0		ADJUSTED KVA (DEMAND + SPARE KVA)
0		ADJUSTED AMPS (DEMAND + SPARE KVA) 5/23/2022

Panelboard Notes:	
1 -	PROVIDE DUTY TYPE SWITCHES
2 -	E.C SHALL BALANCE EACH PHASE WITHIN 10%
3 -	
4 -	
5 -	

SURFACE	: MOUNTING
10KA	: SCCR RATING
100	: AMP RATING OF BUS
100	: PANEL AMP RATING (MIN MAIN)
208	: PHASE TO PHASE VOLTAGE

FILE NAME:	PROJECT NUMBER :	PROJECT NAME :
120/208V	21-0486	Duluth City Hall

No:	Date:	By:	Revision:
2	06-02-2022	LAA	ADDENDUM #3
1	05-25-2022	LAA	ADDENDUM #2

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
PRINT NAME: LUCIA A. ANDERSON
DATE: 05-03-2022 REG. NO.: 27049

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Project Title:
CITY OF DULUTH
CITY HALL MEP RENEWAL DESIGN
411 WEST 1ST STREET
DULUTH, MN 55802

Sheet Title:
PANELBOARD SCHEDULES

Date:	05-03-2022
Drawn By:	GAA
Checked By:	LAA
Project No:	21-0486
DWG Scale:	AS NOTED
Sheet Size:	30x42

Revision Number: 2

Sheet Number: E505

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(NEW PANEL, RELABELED)

PANEL: LP3N-302 VOLTAGE: 120/208V, 3PH, 4W SD QMF 06-1002: 1

NO.	AMP/P	NOTE	DESCRIPTION	PH	CODE L VA	CODE C VA	CODE R VA	CODE M VA	CODE E VA	CODE K VA	CODE D VA
1	20/1		EXISTING LOAD	- A -							
3	20/1		SPARE	- B -							
5	20/1		EXISTING LOAD	- C -							
7	20/1		EXISTING LOAD	- A -							
9	20/1		EXISTING LOAD	- B -							
11	20/1		EXISTING LOAD	- C -							
13	20/1		EXISTING LOAD	- A -							
15	20/1		EXISTING LOAD	- B -							
17	20/1		EXISTING LOAD	- C -							
19	20/1		EXISTING LOAD	- A -							
21	20/1		EXISTING LOAD	- B -							
23	20/1		EXISTING LOAD	- C -							
25	20/1		EXISTING LOAD	- A -							
27	20/1		EXISTING LOAD	- B -							
29	20/1		SPARE	- C -							
31	20/1		EXISTING LOAD	- A -							
33	20/1		EXISTING LOAD	- B -							
35	20/1		EXISTING LOAD	- C -							
37	20/1		EXISTING LOAD	- A -							
39	20/2		EXISTING LOAD	- B -							
41				- C -							
43	20/1		SPARE	- A -							
45	20/1		SPARE	- B -							
47	20/1		SPARE	- C -							
49	20/1		SPARE	- A -							
51	20/1		SPARE	- B -							
53	20/1		SPARE	- C -							
55	20/1		SPARE	- A -							
57	20/1		SPARE	- B -							
59	20/1		SPARE	- C -							
2	20/1		EXISTING LOAD	- A -							
4	20/1		EXISTING LOAD	- B -							
6	20/1		EXISTING LOAD	- C -							
8	20/1		EXISTING LOAD	- A -							
10	20/1		EXISTING LOAD	- B -							
12	20/1		EXISTING LOAD	- C -							
14	20/1		EXISTING LOAD	- A -							
16	20/1		EXISTING LOAD	- B -							
18	20/1		EXISTING LOAD	- C -							
20	20/1		EXISTING LOAD	- A -							
22	20/1		EXISTING LOAD	- B -							
24	20/1		EXISTING LOAD	- C -							
26	20/1		EXISTING LOAD	- A -							
28	20/1		EXISTING LOAD	- B -							
30	20/1		EXISTING LOAD	- C -							
32	20/1		EXISTING LOAD	- A -							
34	20/1		EXISTING LOAD	- B -							
36	20/1		EXISTING LOAD	- C -							
38	20/1		EXISTING LOAD	- A -							
40	20/1		EXISTING LOAD	- B -							
42	20/1		EXISTING LOAD	- C -							
44	20/1		SPARE	- A -							
46	20/1		SPARE	- B -							
48	20/1		SPARE	- C -							
50	20/1		SPARE	- A -							
52	20/1		SPARE	- B -							
54	20/1		SPARE	- C -							
56	20/1		SPARE	- A -							
58	20/1		SPARE	- B -							
60	20/1		SPARE	- C -							
THROUGH FEED LUG CONNECTION				- A -							
				- B -							
				- C -							
MAIN BREAKER			150/3	- A -	0	0	0	0	0	0	0
			----	- B -	0	0	0	0	0	0	0
			----	- C -	0	0	0	0	0	0	0

OVERCURRENT DEVICE NOTES:						
1 -	PROVIDE LOCK-ON DEVICE	CONN KVA PHASE LOADS			0.0	0.0	0.0	0.0
2 -	CONNECT VIA TIMECLOCK	DMD	CONN	BUS KVA LOADS				
3 -		0.0	0.0	CODE L - LIGHTING				
4 -		0.0	0.0	CODE C - CONVENIENCE RECEPTACLES (180 W)				
5 -		0.0	0.0	CODE R - RECEPTACLES (NON CONVENIENCE)				
Panelboard Notes:		0.0	0.0	CODE M - MOTORS LARGEST MTR VA =	0			
1 -	PROVIDE DUTY TYPE SWITCHES	0.0	0.0	CODE E - ELECTRIC HEAT				
2 -	E.C SHALL BALANCE EACH PHASE WITHIN 10%	0.0	0.0	CODE K - KITCHEN EQUIP DMD =	100%			
3 -		0.0	0.0	CODE D - DWELLING UNITS (HOTEL/MOTEL ROOMS)				
4 -		0	0	TOTAL KVA				
5 -		0	SPARE KVA	SPARE =	0%			
SURFACE	: MOUNTING	0	ADJUSTED KVA (DEMAND + SPARE KVA)					
10KA	: SCCR RATING	0	ADJUSTED AMPS (DEMAND + SPARE KVA)					
200	: AMP RATING OF BUS				6/1/2022			
150	: PANEL AMP RATING (MIN MAIN)	FILE NAME:	PROJECT NUMBER :	PROJECT NAME :				
208	: PHASE TO PHASE VOLTAGE	120/208V	21-0486	Duluth City Hall				

(NEW PANEL, RELABELED)

PANEL: LP3N-305 VOLTAGE: 120/208V, 3PH, 4W SD QMF 06-1002: 1

NO.	AMP/P	NOTE	DESCRIPTION	PH	CODE L VA	CODE C VA	CODE R VA	CODE M VA	CODE E VA	CODE K VA	CODE D VA
1	30/2		EXISTING LOAD	- A -							
3				- B -							
5			EXISTING LOAD	- C -							
7	70/2			- A -							
9	15/2		EXISTING LOAD	- B -							
11				- C -							
13	15/2		EXISTING LOAD	- A -							
15				- B -							
17	15/2		EXISTING LOAD	- C -							
19				- A -							
21	20/2		EXISTING LOAD	- B -							
23				- C -							
25	20/1		EXISTING LOAD	- A -							
27	20/1		EXISTING LOAD	- B -							
29	20/1		EXISTING LOAD	- C -							
31	20/1		EXISTING LOAD	- A -							
33	20/1		EXISTING LOAD	- B -							
35	20/1		EXISTING LOAD	- C -							
37	20/1		EXISTING LOAD	- A -							
39	20/1		EXISTING LOAD	- B -							
41	20/1		EXISTING LOAD	- C -							
2	20/1		EXHAUST FAN EF-1	- A -				200			
4	20/1		EXISTING LOAD	- B -							
6	20/1		EXISTING LOAD	- C -							
8	20/1		EXISTING LOAD	- A -							
10	20/1		EXISTING LOAD	- B -							
12	20/1		EXISTING LOAD	- C -							
14	20/1		EXISTING LOAD	- A -							
16	20/1		EXISTING LOAD	- B -							
18	20/1		EXISTING LOAD	- C -							
20	20/1		EXISTING LOAD	- A -							
22	20/1		EXISTING LOAD	- B -							
24	20/1		EXISTING LOAD	- C -							
26	20/1		EXISTING LOAD	- A -							
28	20/1		EXISTING LOAD	- B -							
30	20/1		EXISTING LOAD	- C -							
32	20/1		RECEPT ON 2ND FL ROOF BY AWP-1,2	- A -							
34	20/1		SPARE	- B -							
36	20/1		SPARE	- C -							
38	20/1		SPARE	- A -							
40	20/1		SPARE	- B -							
42	20/1		SPARE	- C -							
THROUGH FEED LUG CONNECTION			----	- A -							
			----	- B -							
			----	- C -							
MAIN BREAKER			100/3	- A -	0	0	0	200	0	0	0
			----	- B -	0	0	0	0	0	0	0
			----	- C -	0	0	0	0	0	0	0

OVERCURRENT DEVICE NOTES:						
1 -	PROVIDE LOCK-ON DEVICE	CONN KVA PHASE LOADS			0.2	0.2	0.0	0.0
2 -	CONNECT VIA TIMECLOCK	DMD	CONN	BUS KVA LOADS				
3 -		0.0	0.0	CODE L - LIGHTING				
4 -		0.0	0.0	CODE C - CONVENIENCE RECEPTACLES (180 W)				
5 -		0.0	0.0	CODE R - RECEPTACLES (NON CONVENIENCE)				
Panelboard Notes:		0.2	0.2	CODE M - MOTORS LARGEST MTR VA =	0			
1 -	PROVIDE DUTY TYPE SWITCHES	0.0	0.0	CODE E - ELECTRIC HEAT				
2 -	E.C SHALL BALANCE EACH PHASE WITHIN 10%	0.0	0.0	CODE K - KITCHEN EQUIP DMD =	100%			
3 -		0.0	0.0	CODE D - DWELLING UNITS (HOTEL/MOTEL ROOMS)				
4 -		0	0	TOTAL KVA				
5 -		0	SPARE KVA	SPARE =	0%			
SURFACE	: MOUNTING	0	ADJUSTED KVA (DEMAND + SPARE KVA)					
10KA	: SCCR RATING	1	ADJUSTED AMPS (DEMAND + SPARE KVA)					
100	: AMP RATING OF BUS				6/2/2022			
100	: PANEL AMP RATING (MIN MAIN)	FILE NAME:	PROJECT NUMBER :	PROJECT NAME :				
208	: PHASE TO PHASE VOLTAGE	120/208V	21-0486	Duluth City Hall				

(NEW PANEL)

PANEL: LP3N-306 VOLTAGE: 120/208V, 3PH, 4W SD QMF 06-1002: 1

NO.	AMP/P	NOTE	DESCRIPTION	PH	CODE L VA	CODE C VA	CODE R VA	CODE M VA	CODE E VA	CODE K VA	CODE D VA
1	15/2		FC 3-101	- A -					442		
3				- B -					442		
5	15/2		FC 3-102, FC 3-103, FC 3-104	- C -					664		
7				- A -					664		
9	15/2		FC 3-105, FC 3-106, FC 3-109	- B -					664		
11				- C -					664		
13	15/2		FC 3-108, FC 3-1010	- A -					1100		
15				- B -					1100		
17	15/2		FC 3-111, FC 3-112	- C -					761		
19				- A -					761		
21	15/2		FC 3-114, FC 3-115, FC 3-116	- B -					703		
23				- C -					703		
25	15/2		FC 3-119	- A -					300		
27				- B -					300		
29	15/2		FC 3-120, FC 3-121, FC 3-123	- C -					827		
31				- A -					827		
33	15/2		FC 3-122, FC 3-124, FC 3-125	- B -					664		
35				- C -					664		
37	15/2		FC 3-126, FC 3-127, FC 3-128	- A -					703		
39				- B -					703		
41	15/2		FC 4-101, FC 4-102, FC 4-103	- C -					970		
43				- A -					970		
45	15/2		FC 4-104, FC 4-105, FC 4-111	- B -					703		
47				- C -					703		
49	15/2		FC 4-106, FC 4-107, FC 4-108	- A -					709		
51				- B -					709		
53	15/2		FC 4-110, FC 4-112	- C -					521		
55				- A -					521		
57	15/2	1	FC 4-113, FC 4-114, FC 4-116	- B -					806		
59				- C -					806		
61	60/3		WHP-L1 (WATER HEAT PUMP)	- A -					4198		
63				- B -					4198		
65				- C -					4198		
67	15/2		SPARE	- A -							
69				- B -							
71	15/2		SPARE	- C -							
73				- A -							
75	15/2		SPARE	- B -							
77				- C -							
79	20/1		RECEPT. ON 3RD FLOOR ROOF BY DC-1	- A -							
81	20/1	1	SPARE	- B -							
83	20/1	1	SPARE	- C -							
2	60/3		WHP-K1 (WATER HEAT PUMP)	- A -					4198		
4				- B -					4198		
6				- C -					4198		
8	50/3		WHP-J1 (WATER HEAT PUMP)	- A -					4198		
10				- B -					4198		
12				- C -					4198		
14	100/3		DC-1 (DRY COOLER)	- A -					8333		
16				- B -					8333		
18				- C -					8333		
20	15/2		FC 4-134	- A -					222		
22				- B -					222		
24	15/2		FC 4-118, FC 4-119, FC 4-120	- C -					703		
26				- A -					703		
28	15/2		FC 4-123, FC 4-124	- B -					599		
30				- C -					599		
32	15/2		FC 4-121, FC 4-125, FC 4-126	- A -					670		
34				- B -					670		
36	15/2		FC 4-127, FC 4-130	- C -					482		
38				- A -					482		
40	15/2		FC 4-128, FC 4-132	- B -					482		
42				- C -					482		
44	15/2		FC 4-133	- A -					442		
46				- B -					442		
48	25/3		ERU-1A	- C -					2103		
50				- A -					2103		
52				- B -					2103		
54	80/3		ERU-1B	- C -					2103		
56				- A -					2103		
58				- B -					2103		
60	15/2		BCC-J1	- C -							
62				- A -							
64	15/2		BCC-K1	- B -							
66				- C -							
68	15/2		BCC-L1	- A -							
70				- B -							
72	15/2		BCC-M1	- C -							
74				- A -							
76	15/2		BCC-M2	- B -							
78				- C -							
80	15/2		SPARE	- A -							
82				- B -							
84	20/1		SPARE	- C -							
THROUGH FEED LUG CONNECTION											
MAIN BREAKER			400/3	- A -	0	0	0	25133	9516	0	0
			----	- B -	0	0	0	25133	9209	0	0
			----	- C -	0	0	0	25133	9549	0	0

OVERCURRENT DEVICE NOTES:						
1 -	PROVIDE LOCK-ON DEVICE	CONN KVA PHASE LOADS			103.7	34.6	34.3	34.7
2 -	CONNECT VIA TIMECLOCK	DMD	CONN	BUS KVA LOADS				
3 -		0.0	0.0	CODE L - LIGHTING				
4 -		0.0	0.0	CODE C - CONVENIENCE RECEPTACLES (180 W)				
5 -		0.0	0.0	CODE R - RECEPTACLES (NON CONVENIENCE)				
Panelboard Notes:		75.4	75.4	CODE M - MOTORS LARGEST MTR VA =	0			
1 -	PROVIDE DUTY TYPE SWITCHES	28.3	28.3	CODE E - ELECTRIC HEAT				
2 -	E.C SHALL BALANCE EACH PHASE WITHIN 10%	0.0	0.0	CODE K - KITCHEN EQUIP DMD =	100%			
3 -		0.0	0.0	CODE D - DWELLING UNITS (HOTEL/MOTEL ROOMS)				
4 -		104	104	TOTAL KVA				
5 -		0	SPARE KVA	SPARE =	0%			
SURFACE	: MOUNTING	104	ADJUSTED KVA (DEMAND + SPARE KVA)					
22KA	: SCCR RATING	288	ADJUSTED AMPS (DEMAND + SPARE KVA)					
400	: AMP RATING OF BUS				6/1/2022			
400	: PANEL AMP RATING (MIN MAIN)	FILE NAME:	PROJECT NUMBER :	PROJECT NAME :				
208	: PHASE TO PHASE VOLTAGE	120/208V	21-0486	Duluth City Hall				

No:	Date:	By:	Revision:
1	06-02-2022	LAA	ADDENDUM #3

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: LUCIA A. ANDERSON

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