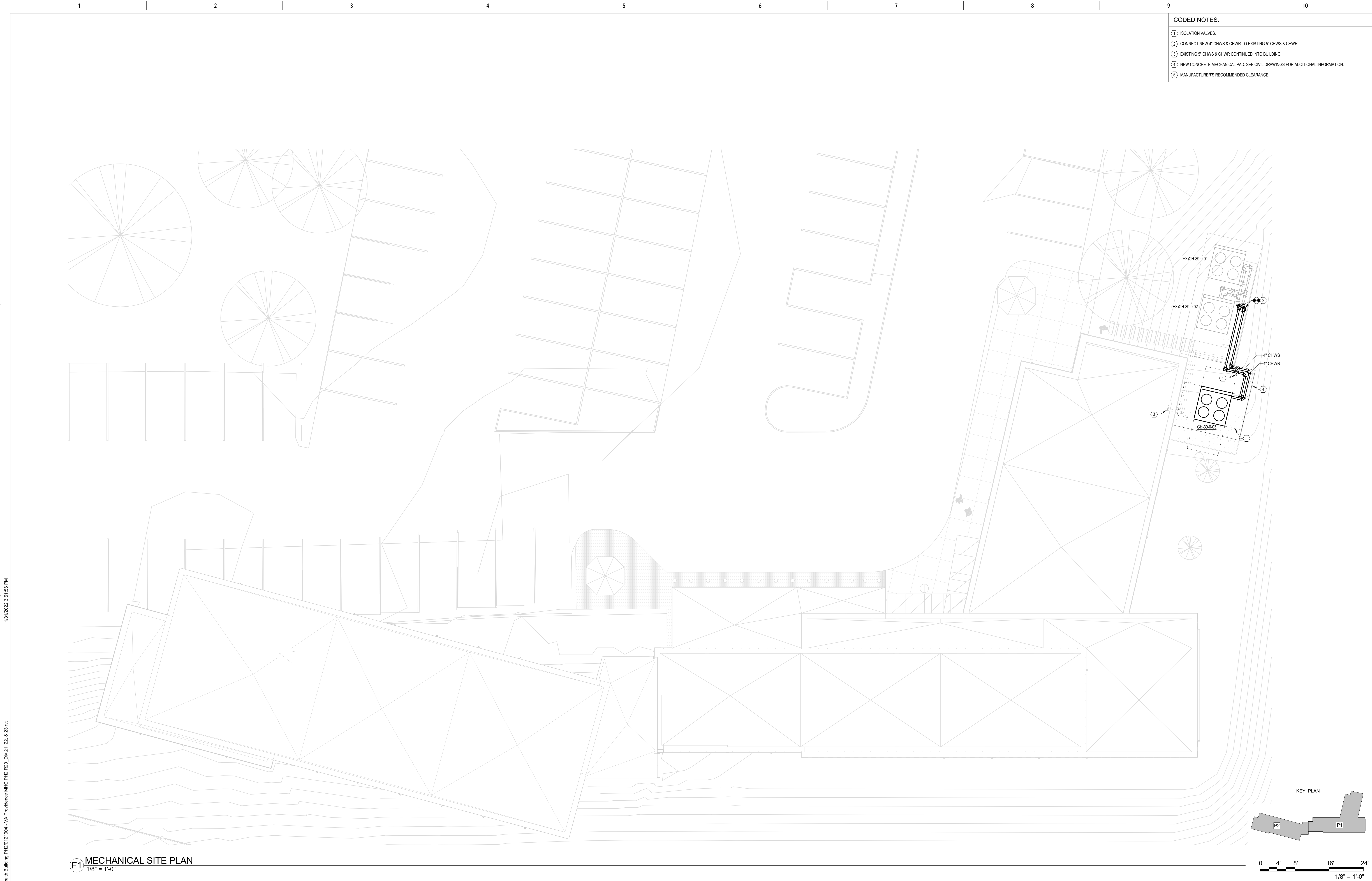


NOTE: SOME SYMBOLS SHOWN ON THIS LEGEND MAY NOT PERTAIN TO THIS PROJECT

Project Number
650-347

Building Number
39

Drawing Number
M-001



- CODED NOTES:**
- ① ISOLATION VALVES.
 - ② CONNECT NEW 4" CHWS & CHWR TO EXISTING 5" CHWS & CHWR.
 - ③ EXISTING 5" CHWS & CHWR CONTINUED INTO BUILDING.
 - ④ NEW CONCRETE MECHANICAL PAD. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
 - ⑤ MANUFACTURER'S RECOMMENDED CLEARANCE.

F1 MECHANICAL SITE PLAN
1/8" = 1'-0"

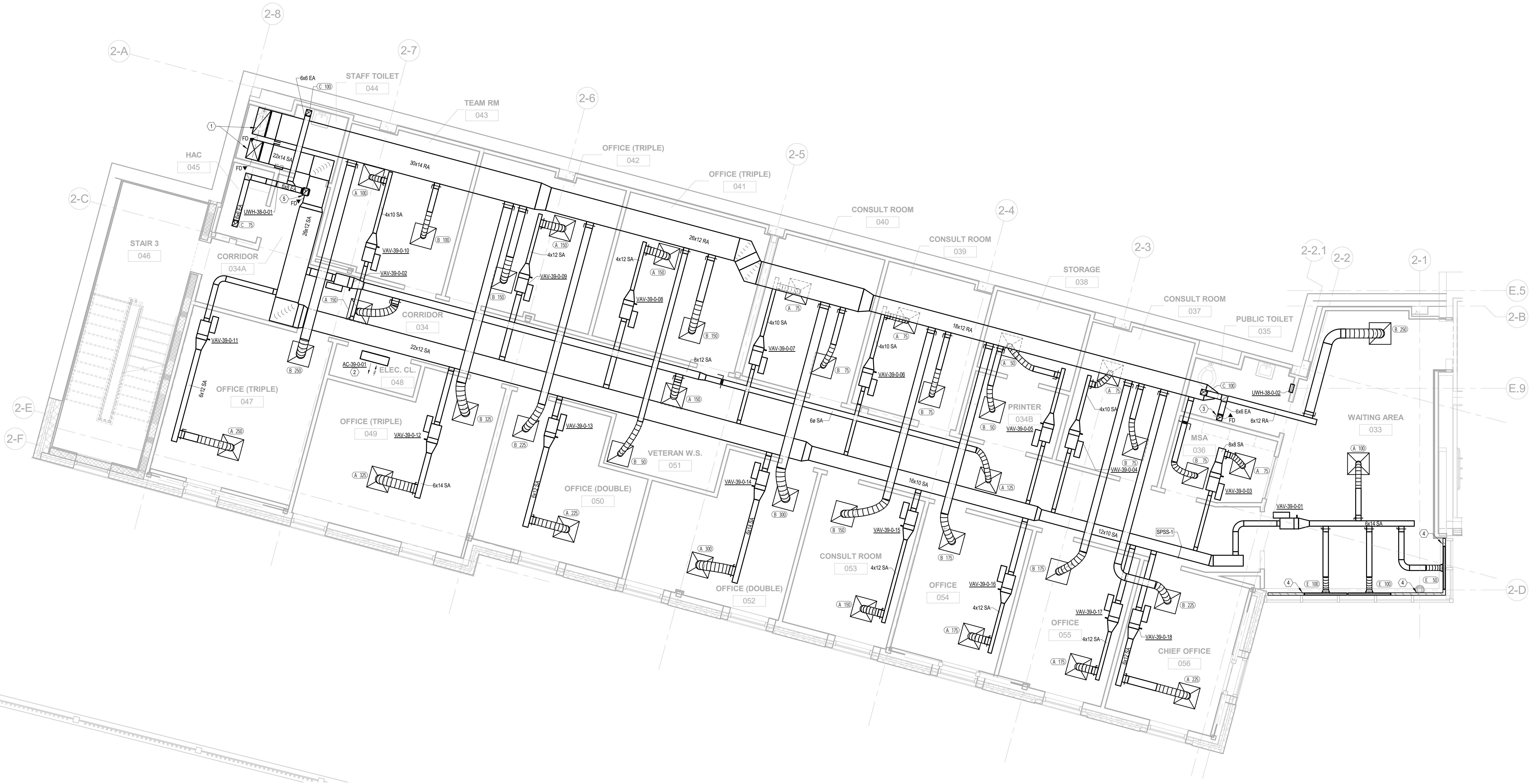


KEY PLAN

P2 P1

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	Revisions:	Revision Description	Date:								

- DRAWING NOTES:
1. ALL VAV CONTROL PANELS SHALL HAVE SUFFICIENT CLEARANCE IN FRONT OF THE PANEL FOR MAINTENANCE.
 2. DUCT RUNOUTS TO DIFFUSERS SHALL MATCH THE SIZE OF THE DIFFUSER NECK.
- CODED NOTES:
- ① 22x14 SA & 30x14 RA ROUTED DOWN FROM FLOOR ABOVE. REFER TO SHEET MH121 FOR CONTINUATION. PROVIDE FIRE DAMPER AT FLOOR PENETRATION. REFER TO DETAIL D7 SHEET M-501 FOR MORE INFORMATION.
 - ② MOUNT BOTTOM OF UNIT AC-39-0-01 TO BE 90" AFF.
 - ③ 6x6 EA DUCTWORK ROUTED UP TO LEVEL ABOVE. REFER TO SHEET MH121 FOR MORE INFORMATION. PROVIDE FIRE DAMPER AT LEVEL 1 FLOOR PENETRATION. REFER TO DETAIL D7 SHEET M-501 FOR MORE INFORMATION.
 - ④ BLANK OFF PORTION OF SLOT DIFFUSER.
 - ⑤ 6x6 EA DUCTWORK ROUTED UP TO LEVEL ABOVE. REFER TO SHEET MH121 FOR MORE INFORMATION. PROVIDE FIRE DAMPER AT LEVEL 1 FLOOR PENETRATION. REFER TO DETAIL D7 SHEET M-501 FOR MORE INFORMATION.



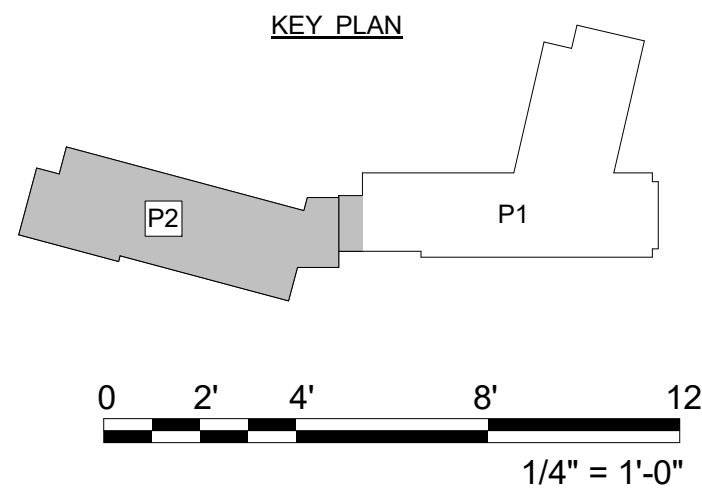
F1 MECHANICAL HVAC PLAN - LEVEL B
1/4" = 1'-0"

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DRAWING NOTES:
PRESSURIZATION OF ROOMS WILL BE DISPLAYED AS FOLLOWS:
S = SUPPLY CFM
T = TRANSFER CFM (*SHOWN WHERE APPLICABLE)
R = RETURN CFM
E = EXHAUST CFM
P = PRESSURIZATION CFM (SUM OF SUPPLY, RETURN, EXHAUST)

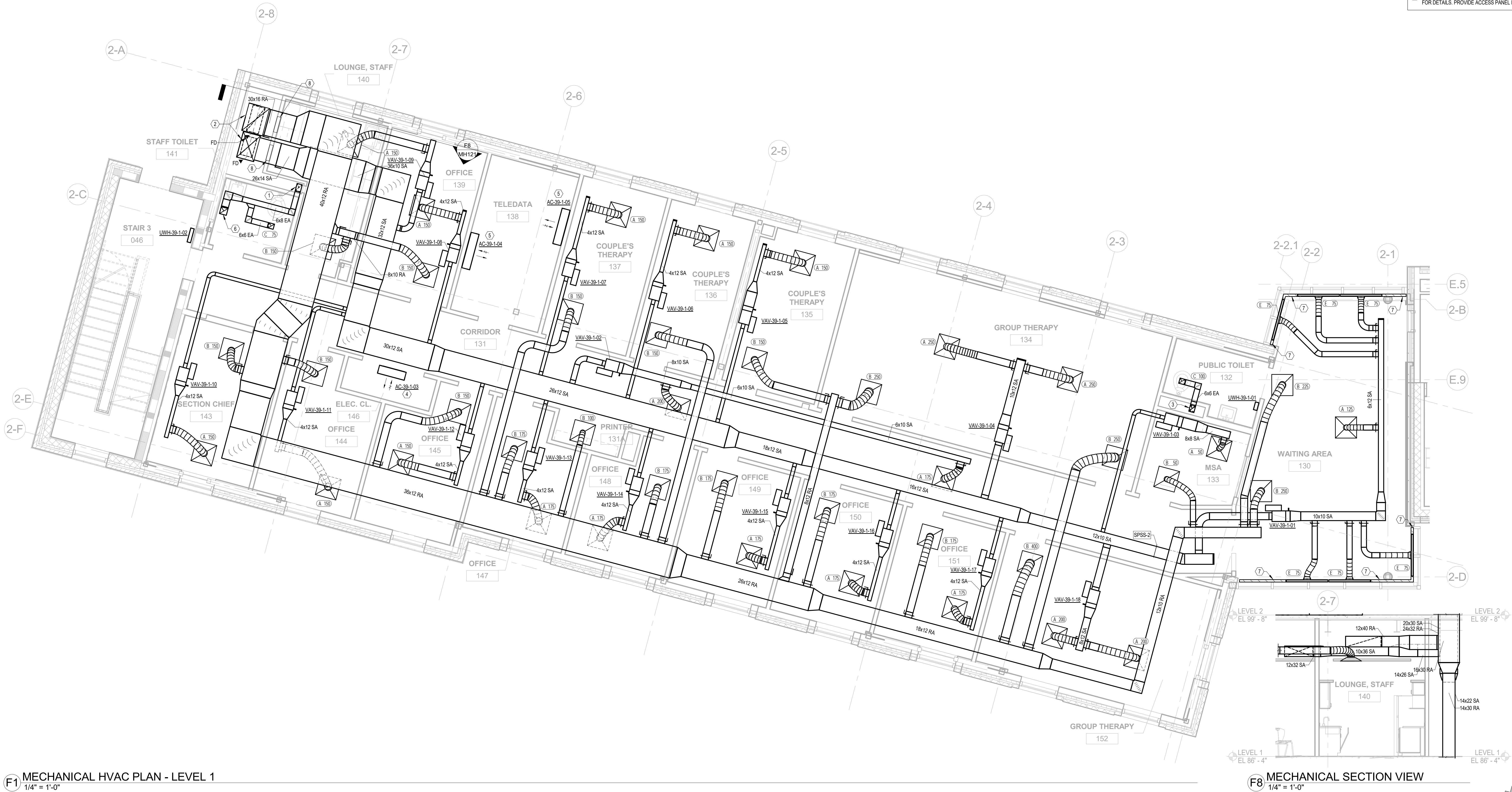


F1 MECHANICAL PRESSURIZATION PLAN - LEVEL B
1/4" = 1'-0"



	<table><tr><td>Revisions:</td><td>Revision Description</td><td>Date:</td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></table>	Revisions:	Revision Description	Date:																ENGINEER ENGINEERING DESIGN CONSULTING www.abovegroupinc.com COA/CA Lic. No. 31120 305 East Dr., Suite H, Melbourne, Florida 32904 PH: 321.345.9026	ARCHITECT/ENGINEER OF RECORD ARCHITECTS • ENGINEERS www.wbrcae.com BANGOR, MAINE 207-947-4511 PORTLAND, MAINE 207-838-4511 SARASOTA, FLORIDA 941-556-0757	STAMP Allen D. Lantz, P.E. MD License #41513	Office of Construction and Facilities Management U.S. Department of Veterans Affairs	Drawing Title MECHANICAL PRESSURIZATION PLAN - LEVEL B Approved: _____	Phase CONSTRUCTION DOCUMENTS FULLY SPRINKLERED	Project Title PROVIDENCE VAMC MENTAL HEALTH PHASE 2 Location PROVIDENCE, RI Issue Date FEB 04 2022	Checked ADL Drawn JJA	Project Number 650-347 Building Number 39 Drawing Number MH112
		Revisions:	Revision Description	Date:																								
VA FORM 08 - 6231																												

- DRAWING NOTES:
1. ALL VAV CONTROL PANELS SHALL HAVE SUFFICIENT CLEARANCE IN FRONT OF THE PANEL FOR MAINTENANCE.
 2. DUCT RUNOUTS TO DIFFUSERS SHALL MATCH THE SIZE OF THE DIFFUSER NECK.
- CODED NOTES:
- ① 6X8 EA DUCTWORK ROUTED UP FROM FLOOR BELOW. REFER TO SHEET MH111 FOR MORE INFORMATION.
 - ② 30X20 SA & 32X24 RA ROUTED DOWN FROM FLOOR ABOVE. AFTER 1ST FLOOR BRANCH, 22"X14" SA & 30X14 ROUTED DOWN TO FLOOR BELOW. REFER TO SHEET M-401 & MH111 FOR CONTINUATION.
 - ③ 6X8 EA DUCTWORK ROUTED UP FROM FLOOR BELOW. AFTER BRANCH CONNECTION, 6X8 EA DUCTWORK ROUTED UP TO FLOOR ABOVE. REFER TO SHEET MH111 & MH131 FOR MORE INFORMATION.
 - ④ MOUNT BOTTOM OF UNIT AC-38-1-03 TO BE 90" AFF.
 - ⑤ MOUNT BOTTOM OF UNITS AC-38-1-04 & AC-38-1-05 TO BE 120" AFF.
 - ⑥ 6X8 EA DUCTWORK ROUTED UP TO FLOOR ABOVE. REFER TO SHEET M-401 FOR MORE INFORMATION.
 - ⑦ BLANK OFF PORTION OF SLOT DIFFUSER.
 - ⑧ ACCESS PANEL IN RATED WALL FOR FIRE DAMPER ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. PROVIDE ACCESS PANEL IN DUCTWORK FOR DAMPER ACCESS.



F1 MECHANICAL HVAC PLAN - LEVEL 1
1/4" = 1'-0"

F8 MECHANICAL SECTION VIEW
1/4" = 1'-0"

KEY PLAN

0 2' 4' 8' 12'
1/4" = 1'-0"

	<table><tr><th>Revisions:</th><th>Revision Description</th><th>Date:</th></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></table>	Revisions:	Revision Description	Date:																ENGINEER ENGINEERING DESIGN CONSULTING www.abovegroupinc.com COA/CA Lic. No. 31120 305 East Dr., Suite H, Melbourne, Florida 32904 PH: 321.345.9026	ARCHITECT/ENGINEER OF RECORD ARCHITECTS • ENGINEERS www.wbrcae.com BANGOR, MAINE 207-947-4511 PORTLAND, MAINE 207-638-4511 SARASOTA, FLORIDA 941-556-0757	STAMP Allen D. Lantz, P.E. MD License #41513	Office of Construction and Facilities Management U.S. Department of Veterans Affairs	Drawing Title MECHANICAL HVAC PLAN - LEVEL 1 Approved:	Phase CONSTRUCTION DOCUMENTS FULLY SPRINKLERED	Project Title PROVIDENCE VAMC MENTAL HEALTH PHASE 2 Location PROVIDENCE, RI Issue Date FEB 04 2022	Checked ADL Drawn JJA	Project Number 650-347 Building Number 39 Drawing Number MH121
		Revisions:	Revision Description	Date:																								
VA FORM 08 - 6231																												

DRAWING NOTES:
PRESSURIZATION OF ROOMS WILL BE DISPLAYED AS FOLLOWS:
S = SUPPLY CFM
T = TRANSFER CFM (*SHOWN WHERE APPLICABLE)
R = RETURN CFM
E = EXHAUST CFM
P = PRESSURIZATION CFM (SUM OF SUPPLY, RETURN, EXHAUST)



F1 MECHANICAL PRESSURIZATION PLAN - LEVEL 1
1/4" = 1'-0"

Revisions:	Revision Description	Date:

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Office of Construction and Facilities Management
U.S. Department of Veterans Affairs

Drawing Title
MECHANICAL PRESSURIZATION PLAN - LEVEL 1
Approved:

Phase
CONSTRUCTION DOCUMENTS

FULLY SPRINKLERED

Project Title
PROVIDENCE VAMC MENTAL HEALTH PHASE 2

Location
PROVIDENCE, RI

Issue Date
FEB 04 2022

Checked
ADL

Drawn
JJA

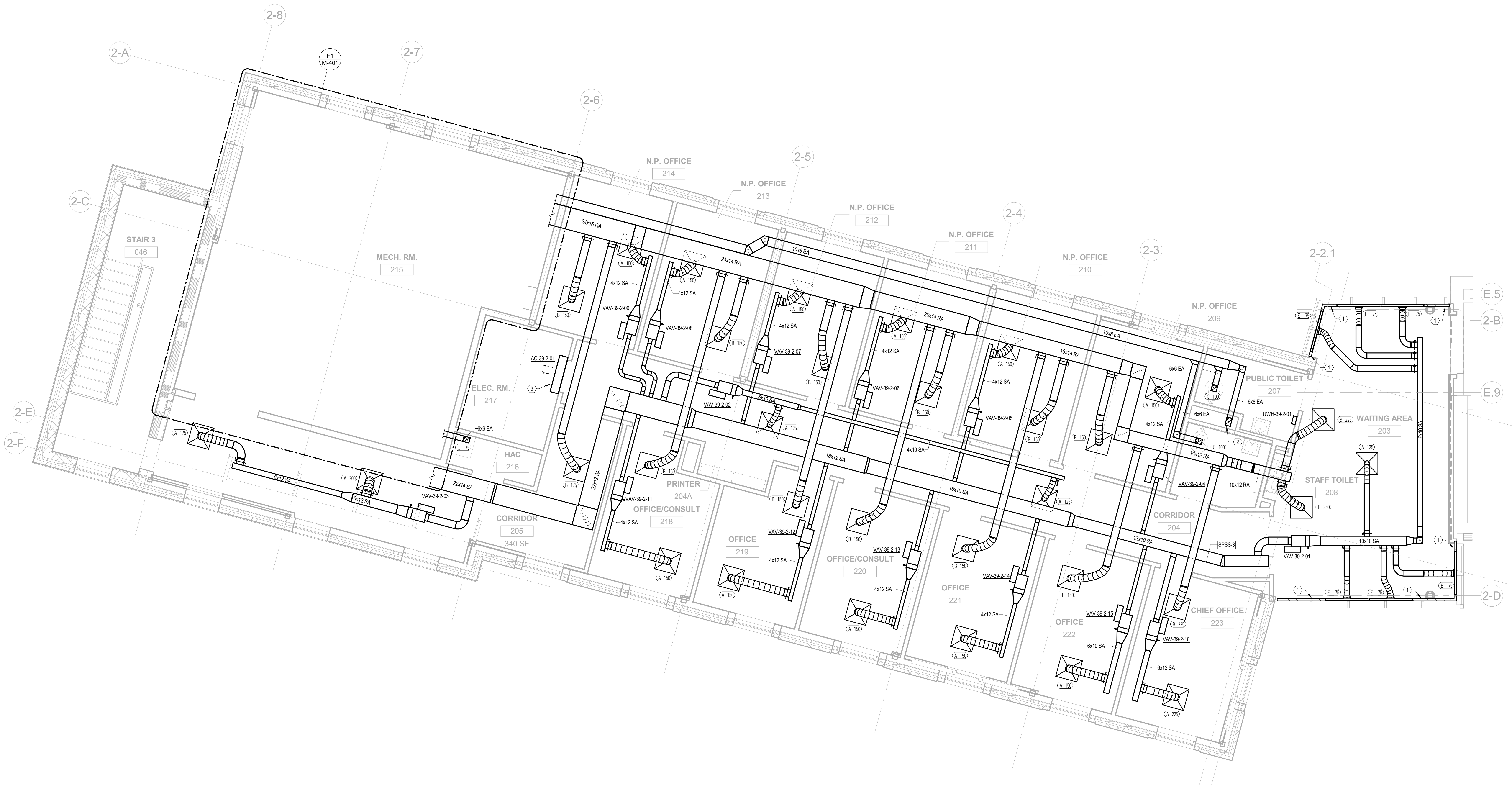
Project Number
650-347

Building Number
39

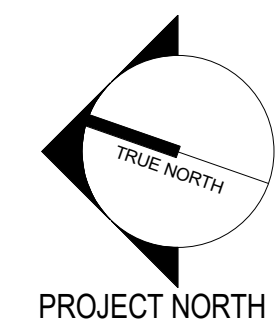
Drawing Number
MH122

BM 36010121004 - VA Providence Mental Health Building (PH2)0121004 - VA Providence MHC Ph2 Pkg 120, Dwg 21, 22, & 23.rvt
1/31/2022 3:53:03 PM
F1

- DRAWING NOTES:
- ALL VAV CONTROL PANELS SHALL HAVE SUFFICIENT CLEARANCE IN FRONT OF THE PANEL FOR MAINTENANCE.
 - DUCT RUNOUTS TO DIFFUSERS SHALL MATCH THE SIZE OF THE DIFFUSER NECK.
- CODED NOTES:
- BLANK OFF PORTION OF SLOT DIFFUSER.
 - 6X8 EA DUCTWORK ROUTED UP FROM FLOOR BELOW. REFER TO SHEET MH121 FOR MORE INFORMATION.
 - MOUNT BOTTOM OF UNIT AC-39-2-01 TO BE 90" AFF.



F1 MECHANICAL HVAC PLAN - LEVEL 2
1/4" = 1'-0"



Revisions:	Revision Description	Date:

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**Office of
Construction
and Facilities
Management**

VA U.S. Department
of Veterans Affairs

Drawing Title
MECHANICAL HVAC PLAN - LEVEL 2

Approved: _____

Phase
**CONSTRUCTION
DOCUMENTS**

FULLY SPRINKLERED

Project Title
**PROVIDENCE VAMC MENTAL
HEALTH PHASE 2**

Location
PROVIDENCE, RI

Issue Date
FEB 04 2022

Checked
ADL

Drawn
JJA

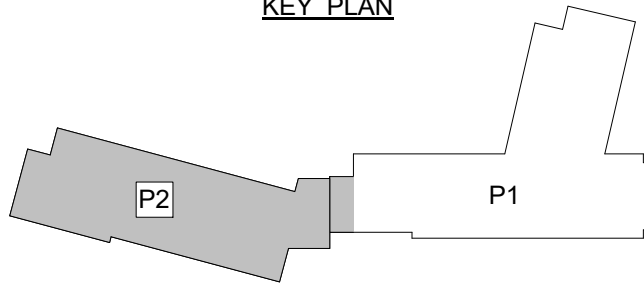
Project Number
650-347

Building Number
39

Drawing Number
MH131



KEY PLAN




DRAWING NOTES:
PRESSURIZATION OF ROOMS WILL BE DISPLAYED AS FOLLOWS:
S = SUPPLY CFM
R = RETURN CFM (*SHOWN WHERE APPLICABLE)
E = EXHAUST CFM
P = PRESSURIZATION CFM (SUM OF SUPPLY, RETURN, EXHAUST)



F1 MECHANICAL PRESSURIZATION PLAN - LEVEL 2
1/4" = 1'-0"

<div>PROJECT NORTH</div>		
Revisions:	Revision Description	Date:

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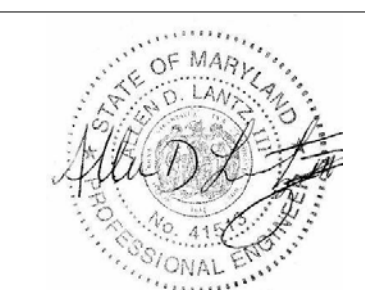
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Office of
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and Facilities
Management

 U.S. Department
of Veterans Affairs

Drawing Title

MECHANICAL PRESSURIZATION
PLAN - LEVEL 2

Approved:

Phase

CONSTRUCTION
DOCUMENTS

FULLY SPRINKLERED

Project Title

PROVIDENCE VAMC MENTAL
HEALTH PHASE 2

Location
PROVIDENCE, RI

Issue Date
FEB 04 2022

Checked
ADL

Drawn
JJA

Project Number
650-347

Building Number
39

Drawing Number
MH132

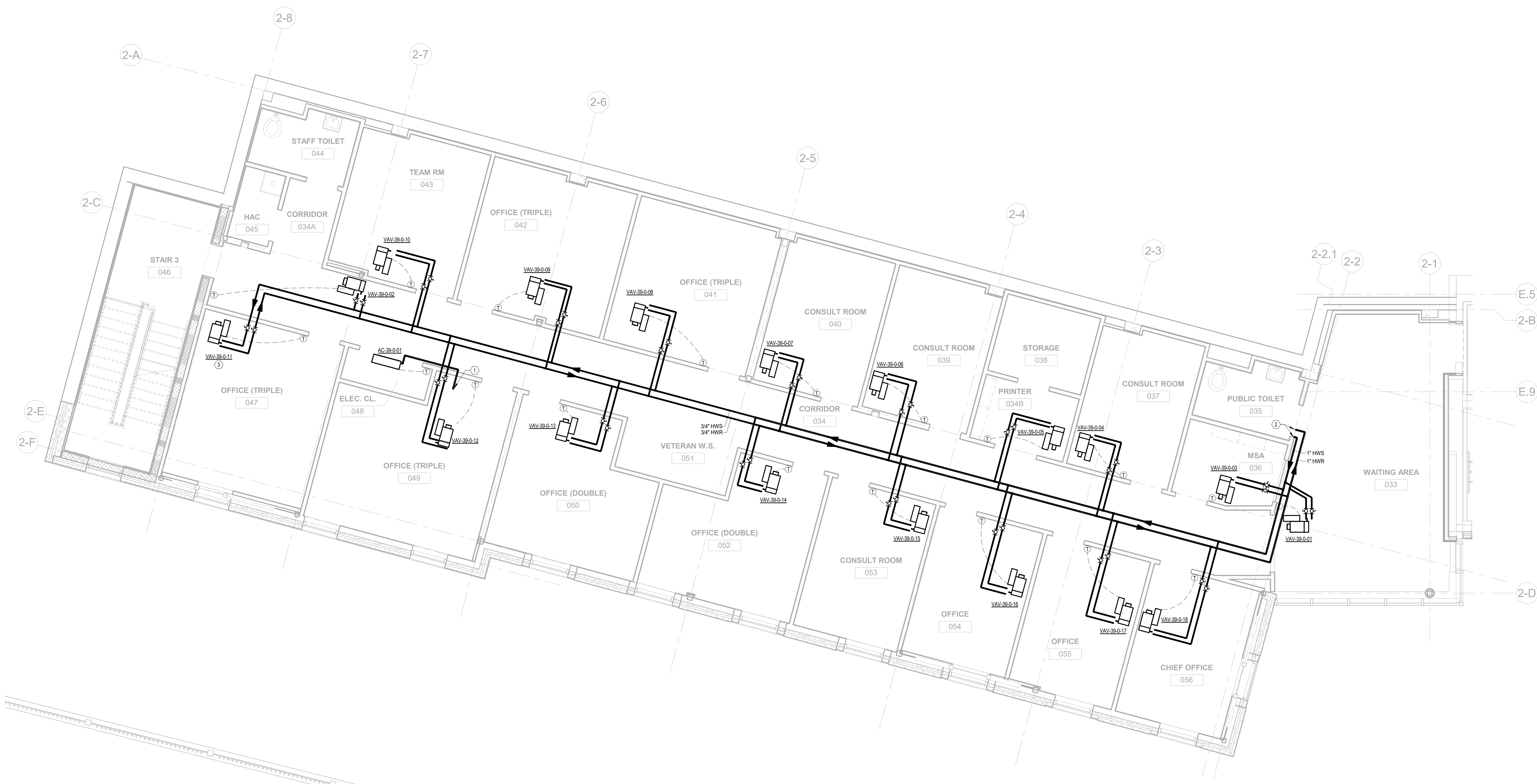
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1/31/2022 3:53:19 PM

DRAWING NOTES:

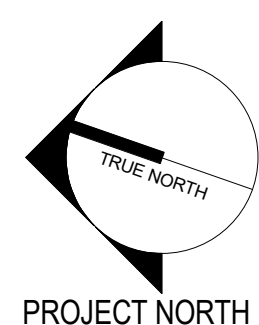
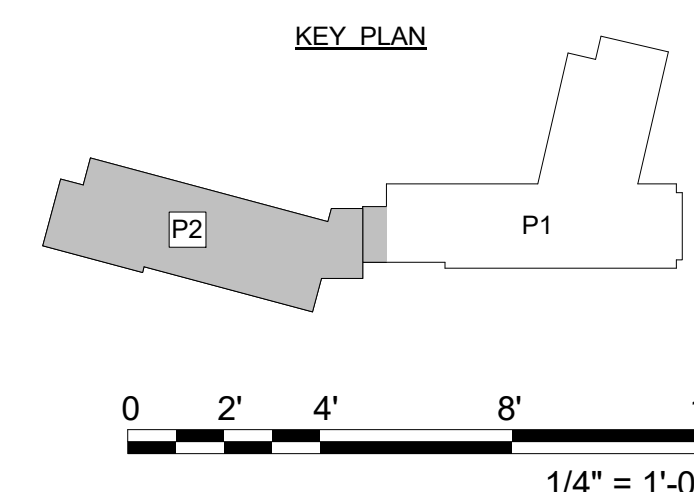
1. REFRIGERANT PIPING SHOWN AS SCHEMATIC. REFRIGERANT PIPING SHALL BE ROUTED, SIZED, AND PROVIDED WITH PIPING ACCESSORIES AS REQUIRED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
2. ALL VAV CONTROL PANELS SHALL HAVE SUFFICIENT CLEARANCE IN FRONT OF THE PANEL FOR MAINTENANCE.

CODED NOTES:

- ① REFRIGERANT PIPING ROUTED FROM FLOOR ABOVE. REFER TO SHEET MP121 FOR CONTINUATION.
- ② 1" HWS & R PIPING UP. REFER TO SHEET MP121 FOR CONTINUATION.
- ③ PROVIDE 3-WAY VALVE.



F1 MECHANICAL PIPING PLAN - LEVEL B
1/4" = 1'-0"



Revisions:	Revision Description	Date:

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U.S. Department
of Veterans Affairs

Drawing Title

MECHANICAL PIPING PLAN - LEVEL
B

Approved:

Phase

CONSTRUCTION
DOCUMENTS

FULLY SPRINKLERED

Project Title

PROVIDENCE VAMC MENTAL
HEALTH PHASE 2

Location	PROVIDENCE, RI
----------	----------------

Checked	ADL
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	Draw JJA
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Project Number

650-347
Building Number
39

Drawing Number

MP111

- DRAWING NOTES:
1.

REFRIGERANT PIPING SHOWN AS SCHEMATIC. REFRIGERANT PIPING SHALL BE ROUTED, SIZED, AND PROVIDED WITH PIPING ACCESSORIES AS REQUIRED ACCORDING TO MANUFACTURERS INSTRUCTIONS.
2.
- ALL VAV CONTROL PANELS SHALL HAVE SUFFICIENT CLEARANCE IN FRONT OF THE PANEL FOR MAINTENANCE.

CODED NOTES:

①

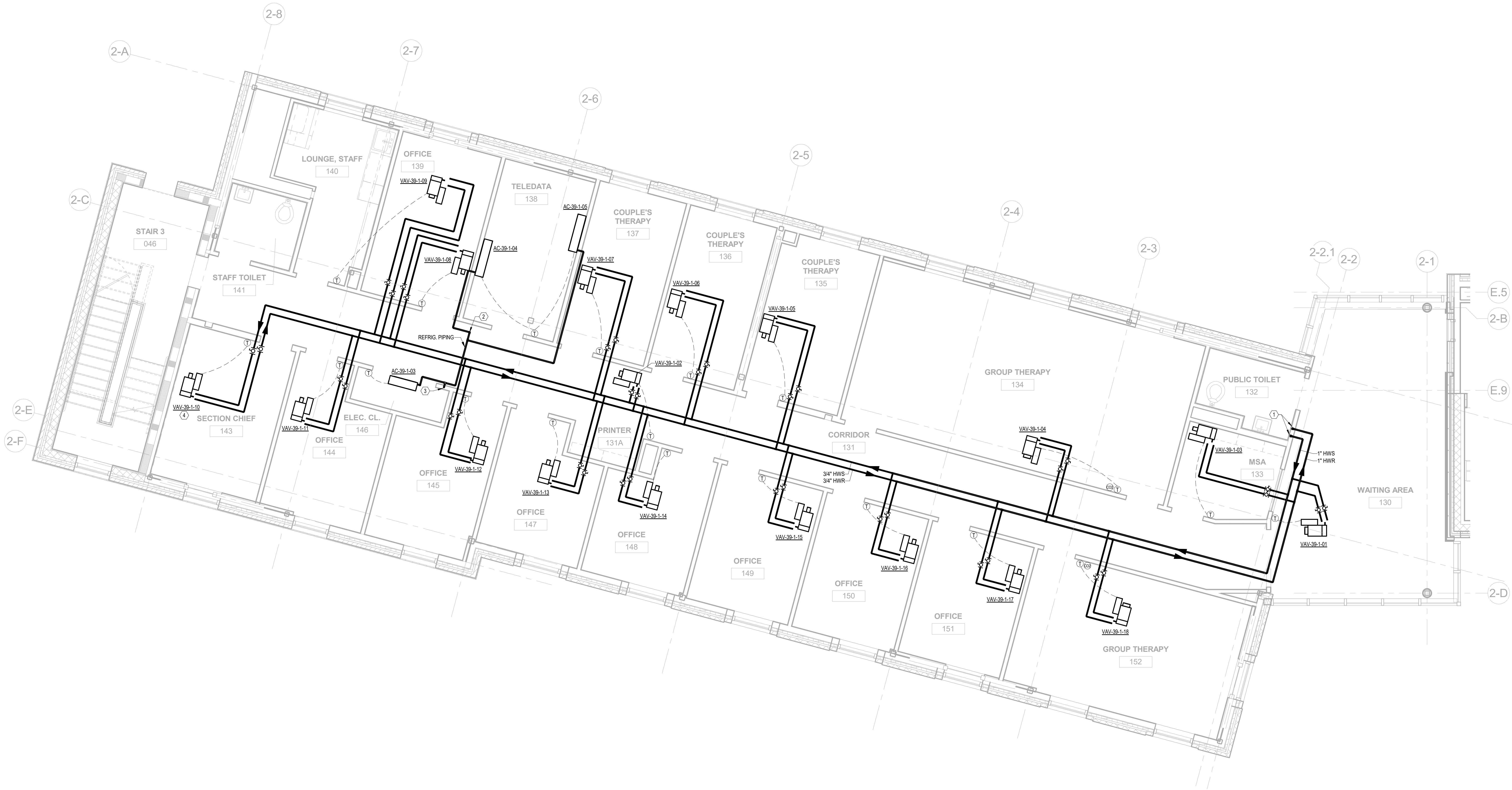
1-1/2" HWS & R PIPING UP/DOWN, AFTER 2ND FLOOR HWS & R PIPING CONNECTIONS, REDUCE TO 1" HWS & R AND CONTINUE DOWN TO FLOOR BELOW. REFER TO SHEET MP1111 & MP131 FOR CONTINUATION.

②

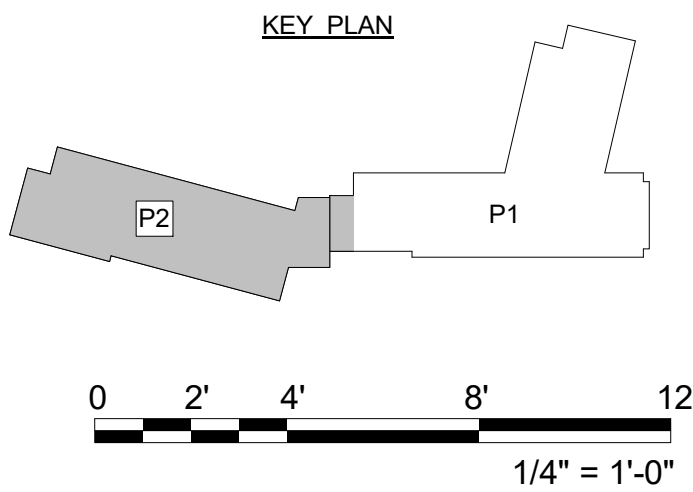
REFRIGERANT PIPING ROUTED DOWN FROM FLOOR ABOVE. REFER TO SHEET MP131 FOR CONTINUATION.




③

④



F1 MECHANICAL PIPING PLAN - LEVEL 1
1/4" = 1'-0"



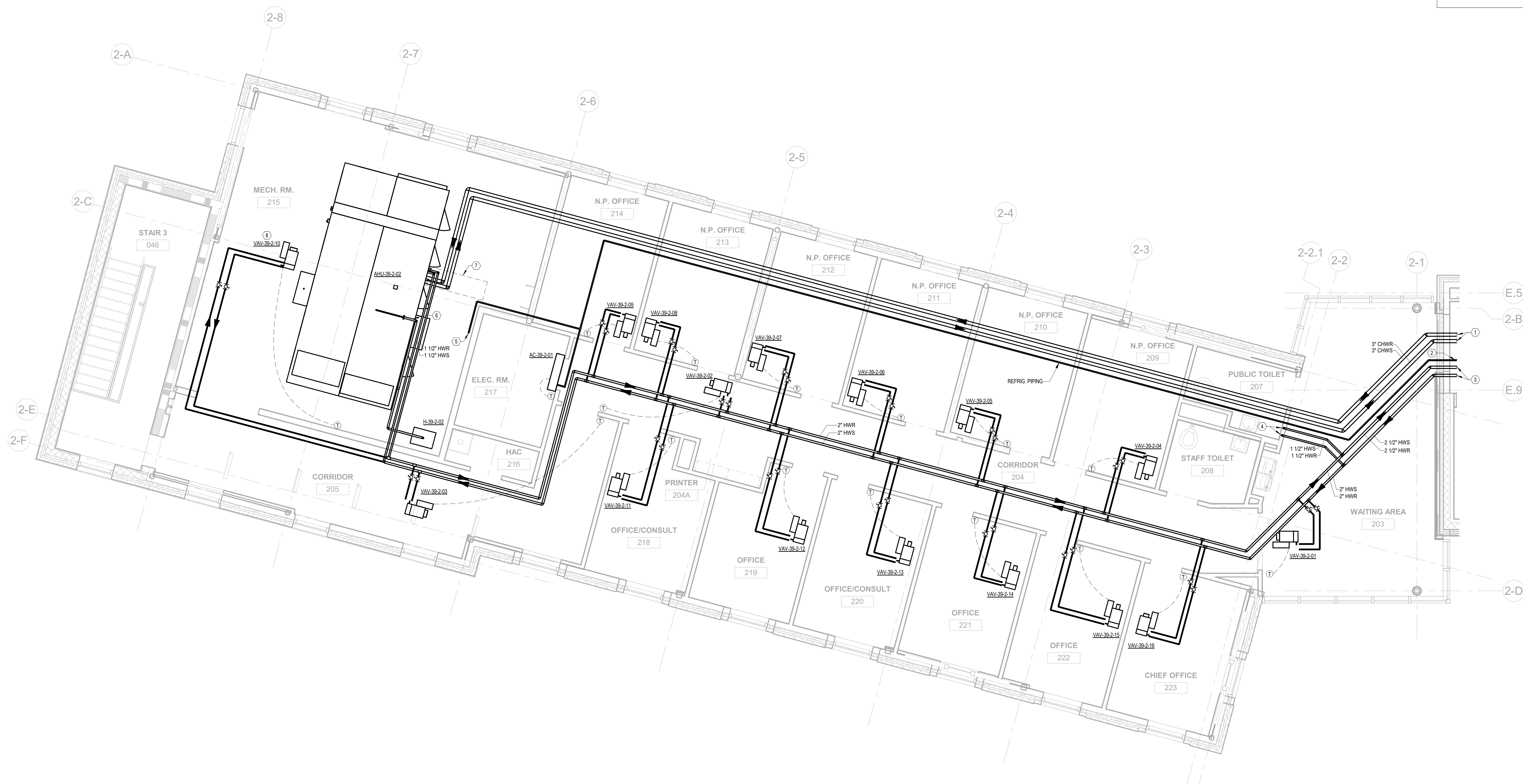
<div><div>PROJECT NORTH</div><div></div></div>				<div>ENGINEER</div> <div><div><div></div><div>bove Group</div><div>ENGINEERING DESIGN CONSULTING</div></div><div><div>www.abovegroupinc.com</div><div>COA/CA Lic. No. 31120</div></div><div><div>305 East Dr., Suite H,</div><div>Melbourne, Florida 32904</div><div>PH: 321.345.9026</div></div></div>	<div>ARCHITECT/ENGINEER OF RECORD</div> <div><div><div>WBRC</div><div>ARCHITECTS • ENGINEERS</div></div><div><div>www.wbrcae.com</div><div>BANGOR, MAINE 207-947-4511</div><div>PORTLAND, MAINE 207-838-4511</div><div>SARASOTA, FLORIDA 941-556-0757</div></div></div>	<div>STAMP</div> <div><div></div><div>Allen D. Lantz, P.E.</div><div>MD License #41513</div></div>	<div>Office of Construction and Facilities Management</div> <div><div>VA</div><div>U.S. Department of Veterans Affairs</div></div>	<div>Drawing Title</div> <div>MECHANICAL PIPING PLAN - LEVEL 1</div>	<div>Phase</div> <div>CONSTRUCTION DOCUMENTS</div>	<div>Project Title</div> <div>PROVIDENCE VAMC MENTAL HEALTH PHASE 2</div>	<div>Project Number</div> <div>650-347</div>
	<div>Revisions:</div> <div>Revision Description</div> <div>Date:</div>	<div>Approved:</div>	<div>FULLY SPRINKLERED</div>	<div>Location</div> <div>PROVIDENCE, RI</div>	<div>Building Number</div> <div>39</div>						
				<div>Issue Date</div> <div>FEB 04 2022</div>	<div>Checked</div> <div>ADL</div>	<div>Drawn</div> <div>JJA</div>	<div>Drawing Number</div> <div>MP121</div>				

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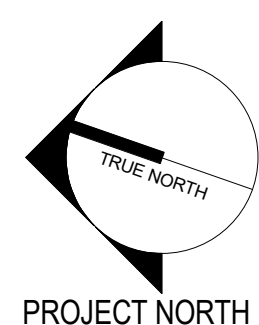
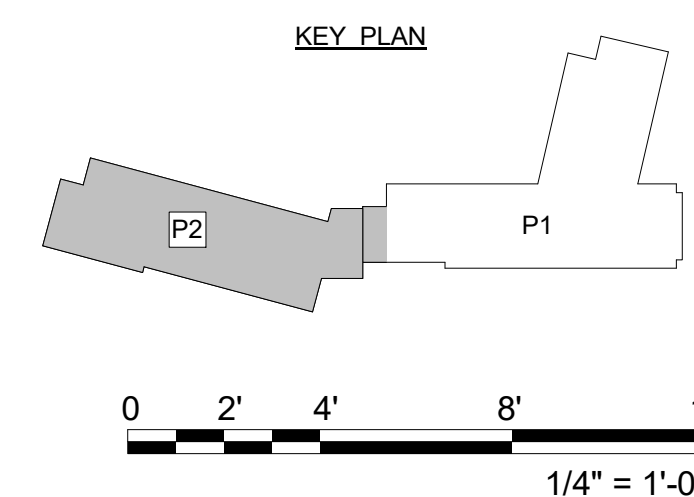
1. REFRIGERANT PIPING SHOWN AS SCHEMATIC. REFRIGERANT PIPING SHALL BE ROUTED, SIZED, AND PROVIDED WITH PIPING ACCESSORIES AS REQUIRED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
2. ALL VAV CONTROL PANELS SHALL HAVE SUFFICIENT CLEARANCE IN FRONT OF THE PANEL FOR MAINTENANCE.

CODED NOTES:

- ① 3" CHWS & CHWR PIPING ROUTED FROM PH1 MECHANICAL ROOM. REFER TO SHEET MH132 FOR CONTINUATION.
- ② REFRIGERANT PIPING ROUTED FROM PH1 MECHANICAL ROOM. REFER TO SHEET MH132 FOR CONTINUATION.
- ③ 1-1/2" HWS & HWR PIPING ROUTED FROM PH1 MECHANICAL ROOM. REFER TO SHEET MH132 FOR CONTINUATION.
- ④ 1-1/2" HWS & HWR PIPING DOWN. REFER TO SHEET MH121 FOR CONTINUATION.
- ⑤ REFRIGERANT PIPING ROUTED DOWN TO FLOOR BELOW. REFER TO SHEET MH121 FOR CONTINUATION.
- ⑥ 1-1/2" LPS SERVING DUCT MOUNTED HUMIDIFIER. INSTALL PER MANUFACTURER'S INSTRUCTION.
- ⑦ COOLING/HEATING COILS MAINTENANCE CLEARANCE.
- ⑧ PROVIDE 3-WAY VALVE.



F1 MECHANICAL PIPING PLAN - LEVEL 2
1/4" = 1'-0"



Revisions:	Revision Description	Date:

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MD License #41513

Office of
Construction
and Facilities
Management



U.S. Department
of Veterans Affairs

	Drawing Title
--	---------------

MECHANICAL PIPING PLAN - LEVEL
2

Approved:

Phase

CONSTRUCTION
DOCUMENTS

FULLY SPRINKLERED

Project Title

PROVIDENCE VAMC MENTAL
HEALTH PHASE 2

Location	PROVIDENCE, RI
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Checked
ADL

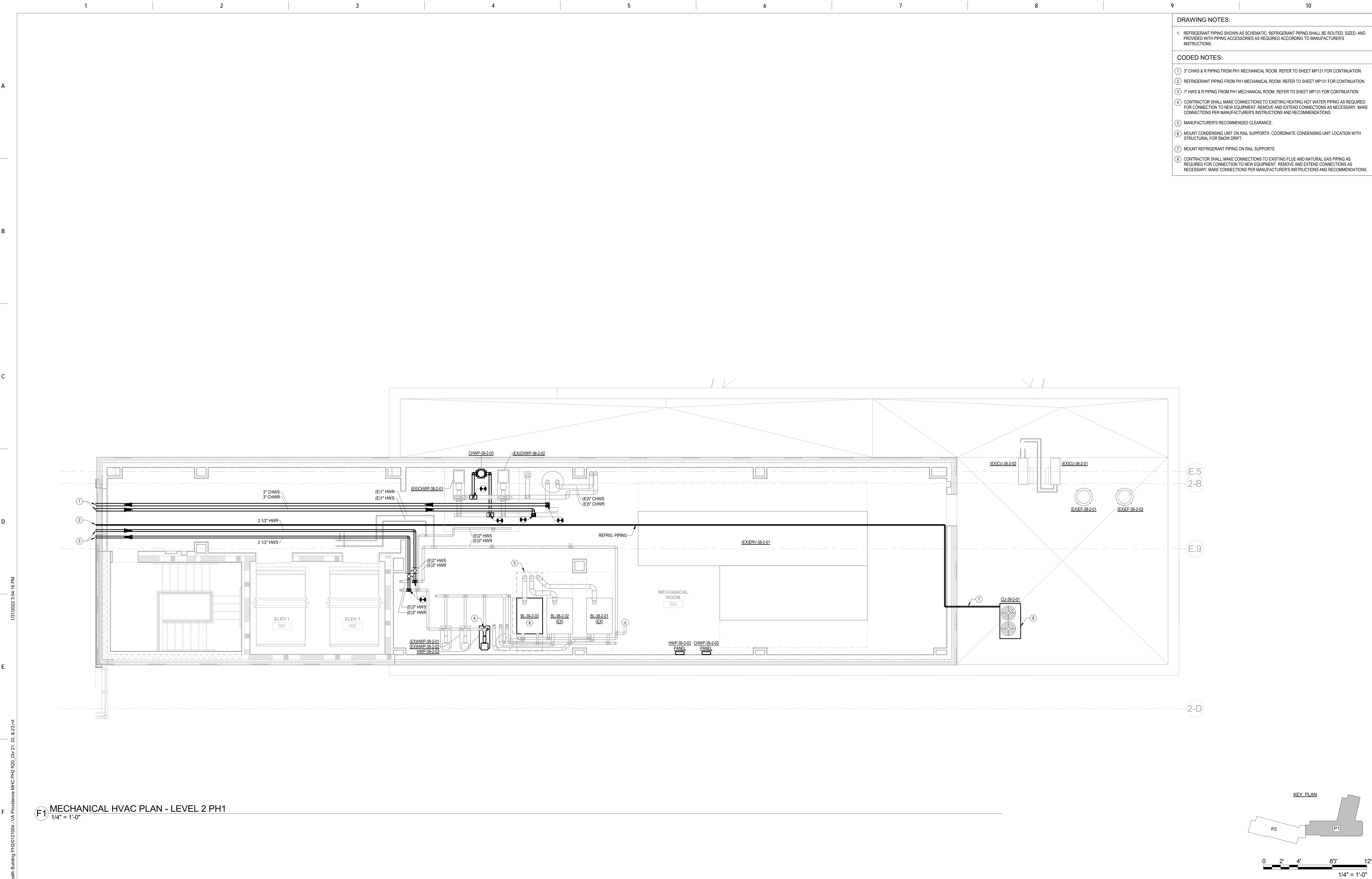
	Draw
	JJA

Project Number	
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650-347
Building Number
39

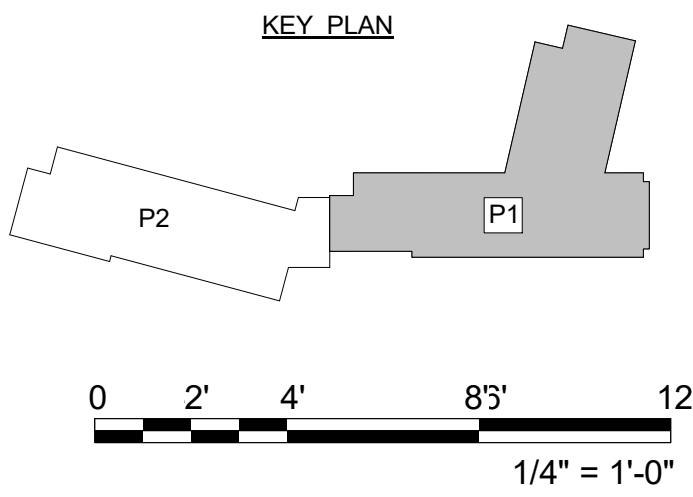
Drawing Number

MP131



- DRAWING NOTES:**
- REFRIGERANT PIPING SHOWN AS SCHEMATIC. REFRIGERANT PIPING SHALL BE ROUTED, SIZED, AND PROVIDED WITH PIPING ACCESSORIES AS REQUIRED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
- CODED NOTES:**
- 3" CHWS & R PIPING FROM PH1 MECHANICAL ROOM. REFER TO SHEET MP131 FOR CONTINUATION.
 - REFRIGERANT PIPING FROM PH1 MECHANICAL ROOM. REFER TO SHEET MP131 FOR CONTINUATION.
 - 1" HWS & R PIPING FROM PH1 MECHANICAL ROOM. REFER TO SHEET MP131 FOR CONTINUATION.
 - CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING HEATING HOT WATER PIPING AS REQUIRED FOR CONNECTION TO NEW EQUIPMENT. REMOVE AND EXTEND CONNECTIONS AS NECESSARY. MAKE CONNECTIONS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
 - MANUFACTURER'S RECOMMENDED CLEARANCE.
 - MOUNT CONDENSING UNIT ON RAIL SUPPORTS. COORDINATE CONDENSING UNIT LOCATION WITH STRUCTURAL FOR SNOW DRIFT.
 - MOUNT REFRIGERANT PIPING ON RAIL SUPPORTS.
 - CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING FLUE AND NATURAL GAS PIPING AS REQUIRED FOR CONNECTION TO NEW EQUIPMENT. REMOVE AND EXTEND CONNECTIONS AS NECESSARY. MAKE CONNECTIONS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

F1 MECHANICAL HVAC PLAN - LEVEL 2 PH1
1/4" = 1'-0"



	<table><tr><td>Revisions:</td><td>Revision Description</td><td>Date:</td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></table>	Revisions:	Revision Description	Date:																						ENGINEER ENGINEERING DESIGN CONSULTING www.abovegroupinc.com COA/CA Lic. No. 31120 305 East Dr., Suite H, Melbourne, Florida 32904 PH: 321.345.9026	ARCHITECT/ENGINEER OF RECORD ARCHITECTS • ENGINEERS www.wbrcae.com BANGOR, MAINE 207-947-4511 PORTLAND, MAINE 207-838-4511 SARASOTA, FLORIDA 941-556-0757	STAMP Allen D. Lantz, P.E. MD License #41513	Office of Construction and Facilities Management U.S. Department of Veterans Affairs	Drawing Title MECHANICAL PIPING PLAN - LEVEL 2 PH1 Approved:	Phase CONSTRUCTION DOCUMENTS FULLY SPRINKLERED	Project Title PROVIDENCE VAMC MENTAL HEALTH PHASE 2 Location PROVIDENCE, RI Issue Date FEB 04 2022 Checked ADL Drawn JJA	Project Number 650-347 Building Number 39 Drawing Number MP132
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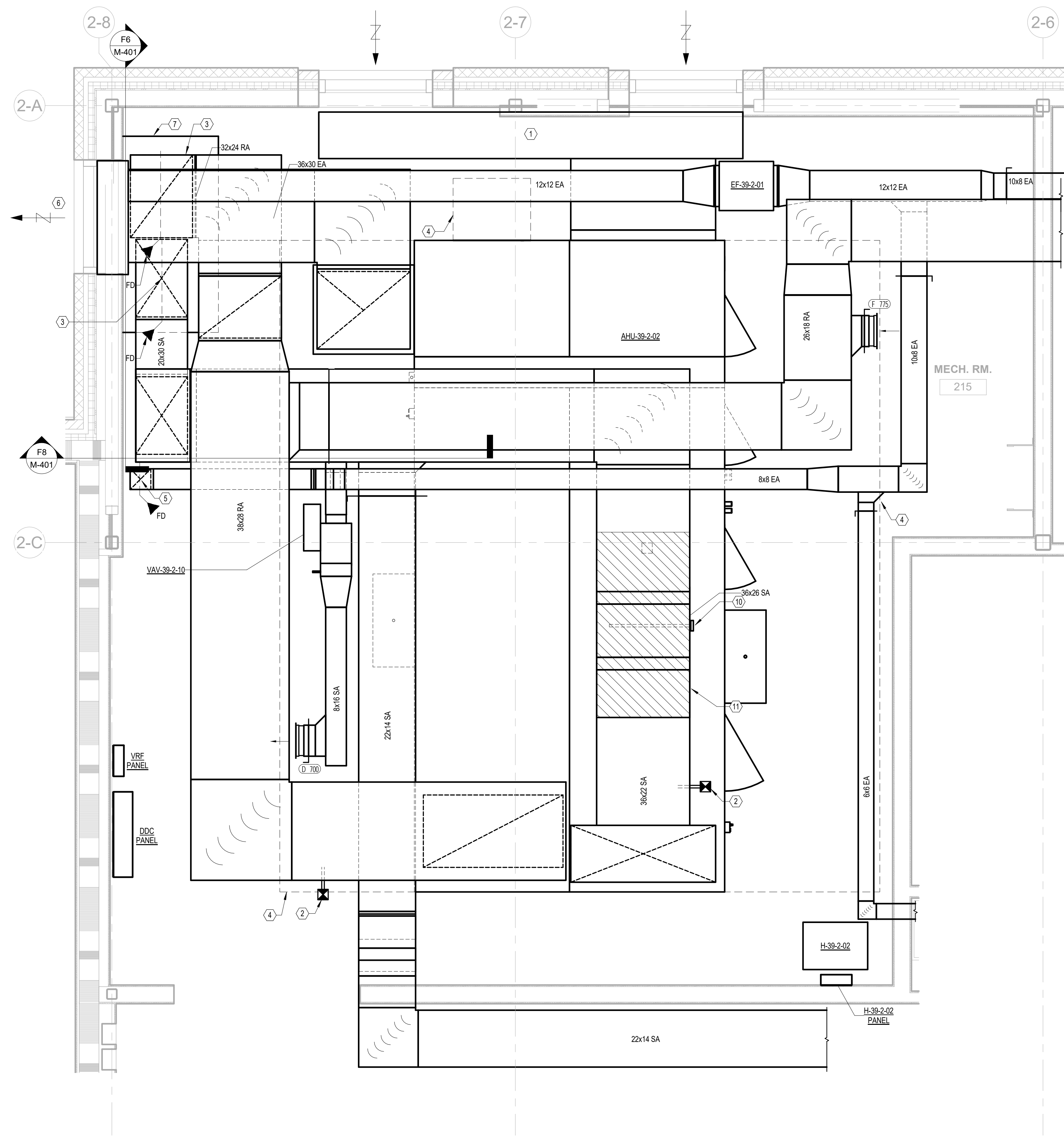
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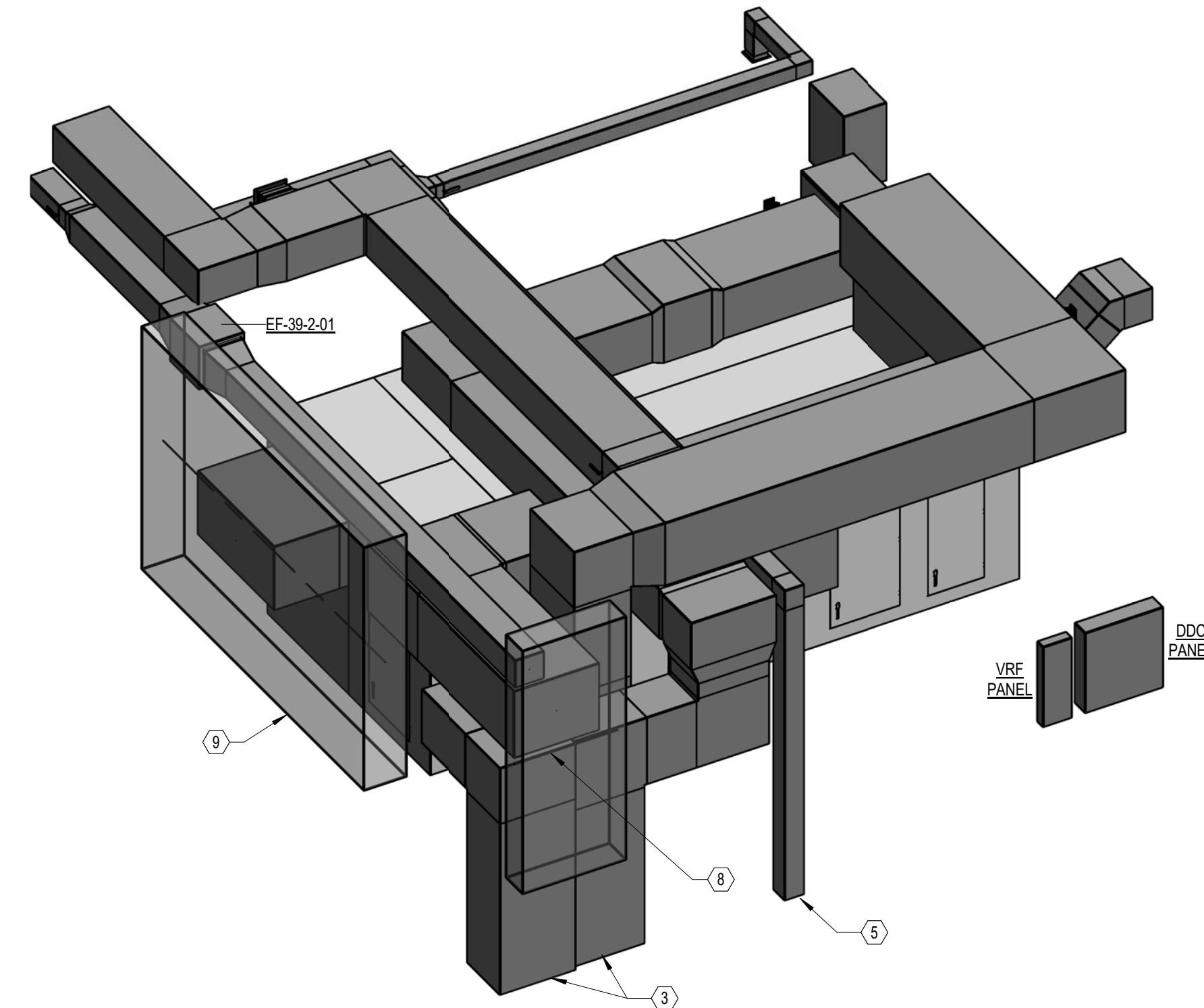
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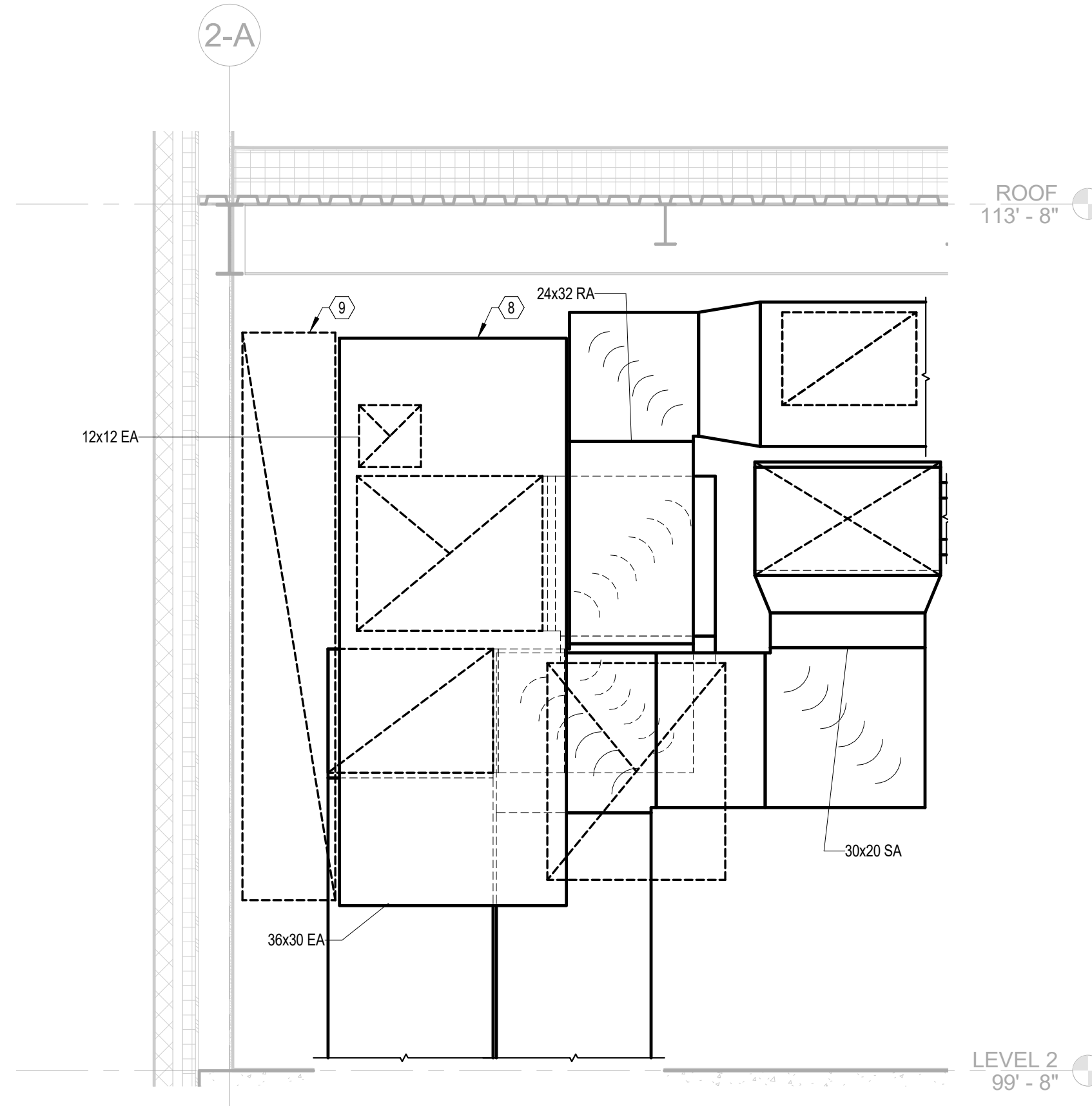
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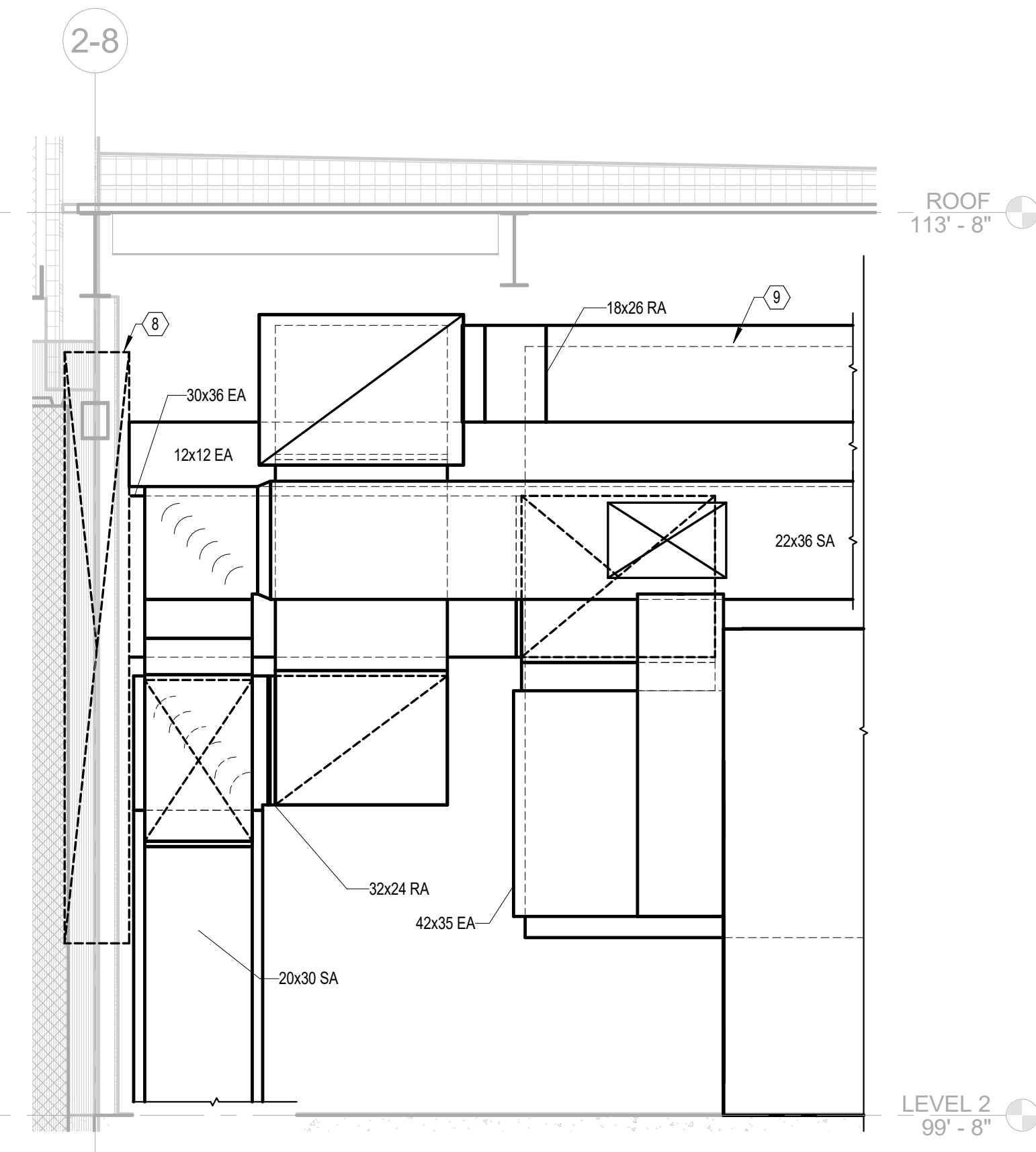
F1 MECHANICAL ROOM 215 ENLARGED PLAN
1/2" = 1'-0"



C7 MECHANICAL ROOM 215 - HVAC 3D



F6 MECHANICAL - MECH ROOM 215 SECTION 1
1/2" = 1'-0"



F8 MECHANICAL - MECH ROOM 215 SECTION 2
1/2" = 1'-0"

DRAWING NOTES:

1. ALL VAV CONTROL PANELS SHALL HAVE SUFFICIENT CLEARANCE IN FRONT OF THE PANEL FOR MAINTENANCE.

CODED NOTES:

- ① PROVIDE 18" DEEP PLENUM EQUAL TO HEIGHT OF LOUVERS. PLENUM SHALL EXTEND ACROSS BOTH LOUVERS. LOUVERS PROVIDED UNDER ANOTHER DIVISION. EACH LOUVER SHALL HAVE A MINIMUM FREE AREA OF 1800 SQ IN. (111 SQ. FT.).
- ② DUCT MOUNTED SMOKE DETECTOR. ELECTRICAL CONTRACTOR TO FURNISH & WIRE. MECHANICAL CONTRACTOR TO MOUNT IN DUCTWORK.
- ③ 30x20 SA & 32x24 RA ROUTED DOWN TO FLOOR BELOW. REFER TO SHEET MH121 FOR CONTINUATION. PROVIDE FIRE DAMPER AT FLOOR PENETRATION. REFER TO DETAIL D7 SHEET M-501 FOR MORE INFORMATION.
- ④ MANUFACTURER'S RECOMMENDED CLEARANCE.
- ⑤ 8x8 EA DUCTWORK ROUTED UP FROM FLOOR BELOW. REFER TO SHEET MH121 FOR MORE INFORMATION.
- ⑥ PROVIDE 12" DEEP PLENUM EQUAL TO HEIGHT OF LOUVER. LOUVER PROVIDED UNDER ANOTHER DIVISION. LOUVER SHALL HAVE A MINIMUM FREE AREA OF 2088 SQ IN. (145 SQ. FT.). PROVIDE BLANK-OFF AROUND STRUCTURAL BRACING.
- ⑦ PROVIDE 4" DUCTWORK CONCRETE PAD. PAD SHALL EXTEND MINIMUM 6" BEYOND PERIMETER OF DUCTWORK PENETRATIONS.
- ⑧ EXHAUST LOUVER PLENUM.
- ⑨ OUTSIDE AIR LOUVER PLENUM.
- ⑩ DUCT MOUNTED HUMIDIFIER. REFER TO DETAIL B1 SHEET M-502 FOR MORE INFORMATION.
- ⑪ HATCHED AREA TO BE WELDED STAINLESS STEEL 3" UPSTREAM OF HUMIDIFIER AND 3" DOWNSTREAM OF HUMIDIFIER. REFER TO DETAIL B1 SHEET M-502.

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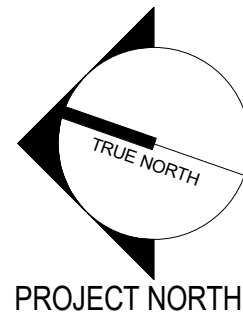
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VA FORM 08 - 6231



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Office of
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Drawing Title
MECHANICAL ENLARGED PLANS

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PROVIDENCE VAMC MENTAL
HEALTH PHASE 2

Location
PROVIDENCE, RI

Issue Date
FEB 04 2022

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Drawn
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Project Number
650-347

Building Number
39

Drawing Number
M-401

0 1' 2' 4' 6'
1/2" = 1'-0"

STRUCTURE ABOVE

DUCT WITH INSULATION

ROD

ANGLE

PROTECT DUCT INSULATION FROM BEING CRUSHED BY DUCT SUPPORTS

ATTACH PER SMACNA

MAINTAIN VAPOR BARRIER AT PENETRATION

DUCT WITH INSULATION

DUCT STRAP

ATTACH DUCT STRAP PER SMACNA

NOTES:

1. REFER TO SMACNA FOR ADDITIONAL HANGERS AND SUPPORTS

B1

DUCT INSULATION DETAIL

N.T.S.

AIR FLOW

MAIN EXHAUST OR RETURN

AIR FLOW

BRANCH DUCT

VD

14"W OR 4" [100mm] MIN.

PROVIDE VOLUME DAMPER AT EACH BRANCH DUCT

PLAN VIEW

D1

EXHAUST OR RETURN BRANCH DUCTWORK

N.T.S.

TURNING VANES

SEE FLOOR PLAN FOR SPLIT DIMENSION

AIR FLOW

MAIN SUPPLY DUCT

AIR FLOW

VOLUME EXTRACTOR: ADJUSTABLE FROM FULLY CLOSED POSITION TO CFM NOTED ON FLOOR PLANS

AIR FLOW

ADJUSTABLE METAL ROD OR LINKAGE

AIR FLOW

MAIN SUPPLY DUCT

TOP REGISTER

SUPPLY REGISTER TAKE-OFF PLAN VIEW

AIR SPLIT DUCT TAKE-OFF PLAN VIEW

PROVIDE VOLUME DAMPER

14" W OR 4" [100mm] MIN.

BRANCH DUCT TAKE-OFF PLAN VIEW

DESIGNER'S NOTES:

1. THE SUPPLY REGISTER TAKE-OFF MAY BE USED FOR UP TO 25% OF THE MAIN DUCT CFM. THE BRANCH DUCT TAKE-OFF MAY BE USED FOR UP TO 15% OF THE MAIN DUCT CFM ANYTIME AND UP TO 40% WHEN THE MAIN DUCT VELOCITY IS 1000 FPM (5.1 M/S) OR LESS. THE AIR SPLIT DUCT TAKE-OFF SHALL BE USED IN ALL OTHER CASES AND MAY BE USED AT ANYTIME.

2. SHOW ALL VOLUME DAMPERS ON FLOOR PLANS.

F1

SUPPLY DUCTWORK TAKE-OFFS

N.T.S.

LOAD RATED FASTENERS

BAND OF SAME SIZE AS HANGER STRAP

50" [1250mm] Ø & UNDER

HANGER RODS

BAND

OVER 50" [1250mm] Ø

HANGER STRAPS OR RODS			
MAX. DUCT Ø IN. [mm]	QUANTITY/SIZE IN. [mm]	MAX. LOAD LBS. [kg]	MAX. SPACING IN. [mm]
26 [650]	ONE 1 [25] x 22 GA STRAP	260 [119]	144 [3600]
36 [900]	ONE 1 [25] x 18 GA STRAP	420 [190]	144 [3600]
50 [1250]	ONE 1 [25] x 16 GA STRAP	700 [317]	144 [3600]
60 [1500]	TWO 3/8 [10] Ø RODS	1320 [596]	144 [3600]
84 [2100]	TWO 1/2 [13] Ø RODS	2500 [1133]	144 [3600]

NOTE:

TABULATED DATA FROM SMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

B4

ROUND DUCT HANGERS

N.T.S.

R SHALL EQUAL OR BE GREATER THAN W.

R SHALL EQUAL OR BE GREATER THAN 10"W.

R SHALL EQUAL OR BE GREATER THAN 10"W.

R SHALL EQUAL OR BE GREATER THAN 16"W.

NOTES:

1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.

2. ALL STANDARD RADIUS ELBOWS CAN BE SUBSTITUTED WITH SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

D4

DUCTWORK RADIUS ELBOWS

N.T.S.

NOTES:

1. ALL VANE ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.

2. WHEN W1 DOES NOT EQUAL W2, VANE SHALL BE SINGLE THICKNESS VANE TYPE REGARDLESS OF W DIMENSION.

3. ALL SINGLE THICKNESS VANES SHALL HAVE A 2" [50mm] RADIUS, 1 1/2" [40mm] MAXIMUM SPACE BETWEEN VANES AND A 3/4" [20mm] TRAILING EDGE.

4. WHEN W EQUALS W2 AND W1 IS GREATER THAN 20" [500mm] VANES SHALL BE DOUBLE VANE TYPE.

F4

DUCTWORK SQUARE VANE ELBOWS

N.T.S.

SEE SPECIFICATIONS FOR CLAMPS AND SEALANT (TYP.)

SUPPORT SADDLE FROM STRUCTURE

FLEXIBLE DUCT SIZE SAME AS DIFFUSER INLET. 5'-0" MAX LENGTH

USE RIGID ELBOWS FOR CHANGE OF DIRECTION GREATER THAN 45°

12"

300mm

CEILING

TYPICAL DIFFUSER OR REGISTER IN LAY-IN CLG.

THERMAL INSULATION SEE SPECIFICATIONS

CONICAL OUTLET

BRANCH DUCT

SHEET METAL SADDLE

VOLUME DAMPER W/ LOCKING QUAD

NOTE:

THE USE OF FLEXIBLE AIR DUCT CONNECTORS ARE NOT PERMITTED FOR THE DEDICATED AHU SERVING THE SURGICAL SUITE.

B7

FLEXIBLE AIR DUCT CONNECTOR

N.T.S.

DUCT INSULATION

FIRE DAMPER FRAME

CONCRETE FLOOR

ACCESS DOOR

1-1/2"x1-1/2"x12 GA. ANGLE SECURE TO SLEEVE

14 GA. STEEL SLEEVE SECURE TO FIRE DAMPER FRAME

FUSIBLE LINK

DUCT

D7

VERTICAL FIRE DAMPER DETAIL

N.T.S.

ALTERNATE POSITION OF BOLT

1" [25mm] FLANGE & HEM

BOLT ON 4" [100mm] CENTERS

1"x1/8" [25x3mm] BAND IRON

FLEXIBLE MATERIAL AS SPECIFIED

WASHER

FLANGED CONNECTION ON FAN SIDE

SHEET METAL AS SPECIFIED FOR DUCTWORK.

1 1/2" [40mm] POCKET SLIP

DUCT

1 1/2" [40mm] MIN. TO 3" [75mm] MAX. INSTALLED 6" [150mm] NOMINAL WITH MATERIAL TAUT

RECTANGULAR FLEXIBLE CONNECTION

5/16" [8mm] FLANGE

BOLT ON 4" [100mm] CENTERS

1"x1/8" [25x3mm] BAND IRON

1"x1/8" [25x3mm] DRAW BAND

SHEET METAL AS SPECIFIED

SHEET METAL SCREWS ON 12" [300mm] CENTERS

RIVET ON 4" [100mm] CENTERS

DUCT

1 1/2" [40mm] MIN. TO 3" [75mm] MAX. INSTALLED 6" [150mm] NOMINAL WITH MATERIAL TAUT

ROUND FLEXIBLE CONNECTION

F7

FLEXIBLE DUCT CONNECTIONS

N.T.S.

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Office of Construction and Facilities Management

VA

U.S. Department of Veterans Affairs

Drawing Title

MECHANICAL DETAILS

Approved:

Phase

CONSTRUCTION DOCUMENTS

FULLY SPRINKLERED

Project Title

PROVIDENCE VAMC MENTAL HEALTH PHASE 2

Location

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Issue Date

FEB 04 2022

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Project Number

650-347

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39

Drawing Number

M-501

SEQUENCE OF OPERATION

SYSTEM DESCRIPTION: THE AIR HANDLING UNIT (AHU) IS A VAV SYSTEM COMPRISED OF AN OUTSIDE AIR (OA) PATH WITH AN OUTSIDE AIR DAMPER AND AN AIRFLOW MONITORING STATION, A RETURN AIR (RA) PATH, AN ENERGY RECOVERY WHEEL WITH BYPASS DAMPERS (D-4 AND D-5), AN EXHAUST FAN WITH A VARIABLE FREQUENCY DRIVE (VFD), AN EXHAUST AIR PATH WITH AN EXHAUST AIR DAMPER, AN ECONOMIZER, A COOLING COIL, AIR FILTERS, AND A SUPPLY AIR PATH, A SUPPLY AIR FAN WITH A VFD, AND ALL ASSOCIATED APPURTENANCES AND DEVICES DEPICTED ON THE CONTROL SYSTEM DIAGRAM.

GENERAL: THE AIR HANDLING SYSTEM SHALL BE STARTED AND STOPPED THROUGH A SYSTEM HAND-OFF-AUTOMATIC (HOA) SWITCH, WHEN INDEXED TO "HAND", THE SYSTEM SHALL BE ENERGIZED TO OPERATE UNDER THE CONTROL SEQUENCE. WHEN INDEXED TO "OFF", THE SYSTEM SHALL BE DE-ENERGIZED. WHEN INDEXED TO "AUTOMATIC", THE SYSTEM SHALL BE STARTED AND STOPPED THROUGH THE BUILDING AUTOMATION SYSTEM (BAS). THE H-O-A SWITCH POSITION SHALL BE MONITORED THROUGH THE BAS.

ALL SAFETIES AND ASSOCIATED CONTROL INTERLOCKS SHALL BE HARDWIRED AND REMAIN ACTIVE IN ALL H-O-A SWITCH POSITIONS.

ALL CONTROLS SHALL BE AUTOMATIC AND ALL SETPOINTS SHALL BE ADJUSTABLE.

REMOTE EMERGENCY SHUTDOWN FOR SYSTEM SHUTDOWN SHALL BE PROVIDED THROUGH THE FIRE ALARM SYSTEM UNDER ANOTHER DIVISION.

ELECTRIC FREEZE/STAT F-1 SHALL STOP SA AND RA FANS AT 35 DEGREES F AND SEND AN ALARM TO THE BAS.

SYSTEM START/STOP: WHEN THE UNIT SUPPLY AIR FANS ARE ENERGIZED TO OPERATE, THE RETURN AIR FANS SHALL BE INTERLOCKED TO OPERATE. UNLESS OTHERWISE NOTED, AIR HANDLING UNIT SUPPLY AND RETURN AIR FANS SHALL BE SOFT STARTED THROUGH THEIR VFD.

STATIC PRESSURE SENSOR SP5-1 STOPS SA FAN SHOULD MIXING PLENUM PRESSURE FALL BELOW MINUS 2" WG AND SENDS AN ALARM TO THE ECC. STATIC PRESSURE SENSOR SP5-2 STOPS SA FAN SHOULD DISCHARGE PLENUM PRESSURE RISE ABOVE 6" WG AND SENDS AN ALARM TO THE ECC. STATIC PRESSURE SENSOR SP5-3 STOPS RA FAN SHOULD RELIEF DUCT PRESSURE RISE ABOVE 3" WG AND SENDS AN ALARM TO THE ECC.

WHENEVER FANS ARE STOPPED, THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE. THE BYPASS DAMPER SHALL OPEN.

OCCUPIED MODE: THE SYSTEM FANS SHALL ENERGIZE CONTINUOUSLY. THE EA AND OA DAMPERS SHALL OPEN TO MINIMUM POSITION. AND THE EA, BYPASS AIR, AND OA DAMPERS SHALL OPEN PER THE DAMPER CONTROL SEQUENCES. THE CONTROL VALVES SHALL MODULATE PER THE "SUPPLY AIR TEMPERATURE CONTROL AND RESET". THE OA DAMPER SHALL MODULATE PER THE "OUTSIDE AIR DAMPER CONTROL".

WHEN OA AT TS-1 IS BELOW 60 DEGREES F (ADJUSTABLE), SA TEMPERATURE AT TS-6 SHALL MODULATE THE EA, OA, AND BYPASS DAMPERS AND THEN TS-6 SHALL MODULATE THE CHILLED WATER VALVE AT V-2. ALL IN SEQUENCE ON TEMPERATURE RISE, TO MAINTAIN 55 DEGREES F (ADJUSTABLE).

WHEN AHU IS AT MINIMUM AIRFLOW FOR 30 MINUTES (ADJUSTABLE), SA TEMPERATURE AT TS-6 SHALL RESET UP IN 1 DEGREE F INCREMENTS EVERY 30 MINUTES (ADJUSTABLE) UNTIL THE RA RELATIVE HUMIDITY AT H-3 RISES ABOVE 60 PERCENT. THE SA TEMPERATURE AT TS-6 SHALL THEN BE RESET DOWN TO 55 DEGREES F IN 1 DEGREE F INCREMENTS EVERY 10 MINUTES (ADJUSTABLE).

UNOCCUPIED MODE: THE ECC SHALL MAINTAIN SETBACK TEMPERATURE SET POINTS DURING UNOCCUPIED PERIODS. THE UNOCCUPIED SPACE TEMPERATURE RANGE SHALL BE 60°F (ADJUSTABLE) TO 80°F (ADJUSTABLE). THE EA AND OA DAMPERS SHALL CLOSE AND THE BYPASS DAMPER SHALL OPEN. THE UNIT SHALL BE OFF.

UPON ANY SPACE TEMPERATURE FALLING BELOW THE UNOCCUPIED SET POINT, THE UNIT SHALL BE ENERGIZED AND THE BYPASS DAMPER SHALL OPEN AND HEATING SEQUENCES ENGAGED TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT. ONCE SPACE TEMPERATURE SENSOR IS SATISFIED, UNIT SHALL BE DE-ENERGIZED. UNOCCUPIED HEATING DISCHARGE AIR TEMPERATURE SET POINT SHALL BE 70°F (ADJUSTABLE). THE FMS SHALL OPERATE ZONE RE-HEAT IN ON-OFF FASHION AS REQUIRED IN EACH SPACE.

UPON ANY SPACE TEMPERATURE RISING ABOVE THE UNOCCUPIED SET POINT, THE UNIT SHALL BE ENERGIZED AND COOLING SEQUENCES ENGAGED TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT. ONCE SPACE TEMPERATURE SENSOR IS SATISFIED, UNIT SHALL BE DE-ENERGIZED. UNOCCUPIED COOLING DISCHARGE AIR TEMPERATURE SET POINT SHALL BE 55°F (ADJUSTABLE).

DURING THE MORNING WARM-UP PERIOD, THE SPACE TEMPERATURE SET POINTS SHALL REVERT TO THE OCCUPIED PERIOD SETTINGS. MORNING WARM-UP HEATING DISCHARGE AIR TEMPERATURE SET POINT SHALL BE 80°F (ADJUSTABLE). THE ECC SHALL OPERATE SPACE HEATING SEQUENCES AS DURING OCCUPIED PERIODS. ONCE ANY SPACE TEMPERATURE SENSOR IS SATISFIED, THE ECC SHALL REVERT TO NORMAL, OCCUPIED CONTROL.

F1 AHU-39-2-02 CONTROLS N.T.S.

Revisions:	Revision Description	Date:

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**Office of
Construction
and Facilities
Management**

VA U.S. Department
of Veterans Affairs

Drawing Title MECHANICAL CONTROLS	Phase CONSTRUCTION DOCUMENTS
Approved:	Location PROVIDENCE, RI
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	Checked ADL
	Drawn JJA

F8 BACNET SYSTEM ARCHITECTURE N.T.S.

Project Title PROVIDENCE VAMC MENTAL HEALTH PHASE 2	Project Number 650-347
Location PROVIDENCE, RI	Building Number 39
Issue Date FEB 04 2022	Drawing Number M-701
Checked ADL	Drawn JJA

DRAWING NOTES:

- CONTRACTOR SHALL PROVIDE COMPLETE DDC AUTOMATIC TEMPERATURE CONTROL SYSTEM COMPATIBLE WITH THE EXISTING METASYS BUILDING MANAGEMENT SYSTEM BY JOHNSON CONTROLS, INC. ALL HVAC SYSTEM AND ANCILLARY COMPONENTS SHALL BE CONTROLLED BY THE EXISTING METASYS BUILDING MANAGEMENT SYSTEM. FINAL CONNECTION OF NEW EQUIPMENT TO THE EXISTING METASYS BUILDING MANAGEMENT SYSTEM SHALL BE MADE BY A COMPANY AND TECHNICIANS FULLY QUALIFIED AND CERTIFIED BY JOHNSON CONTROLS, INC. TO PROGRAM, INSTALL, ADJUST, REPAIR, MAINTAIN, MODIFY, OR OTHERWISE MANIPULATE THE METASYS BUILDING MANAGEMENT SYSTEM BY JOHNSON CONTROLS, INC. CURRENT COMPANY AND TECHNICIAN QUALIFICATIONS AND CERTIFICATIONS TO PROGRAM, INSTALL, ADJUST, REPAIR, MAINTAIN, MODIFY, OR OTHERWISE MANIPULATE THE JOHNSON CONTROLS METASYS SYSTEM MUST BE MAINTAINED THROUGHOUT THE CONSTRUCTION OF THE PROJECT INCLUDING ANY EXTENSIONS OF THE CONSTRUCTION PERFORMANCE PERIOD. IF THE CONTRACTOR UTILIZES THE SERVICES OF A SUBCONTRACTOR OTHER THAN JOHNSON CONTROLS TO PERFORM THIS WORK, THE CONTRACTOR SHALL PROVIDE THE VA, VA SUBMITTAL, COPIES OF FACTORY TRAINING CERTIFICATES FOR EACH TECHNICIAN WORKING ON THE PROVIDENCE VAMC METASYS SYSTEM PRIOR TO COMMENCEMENT OF ANY CONTROLS WORK. THE PROVIDENCE VAMC WILL REVIEW THE CERTIFICATIONS AS PART OF THE SUBMITTAL PROCESS. CONTRACTOR SHALL CARRY THE COST OF THIS WORK IN THEIR BID.
- ALL DDC CONTROLS SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE BACNET METASYS CONTROLS BY JOHNSON CONTROLS FOR AHUS, CHILLERS, FANS, FCUS, WAYS, CIRCULATING PUMPS, CONTROL VALVES, MOTORIZED DAMPERS, AND ANY OTHER EQUIPMENT OR ACCESSORIES AS NOTED IN THE DRAWINGS AND SPECIFICATIONS.
- ALL CONTROLS SHALL HAVE OCCUPIED AND UNOCCUPIED FUNCTIONS.
- ALL SET POINTS SHALL BE FULLY ADJUSTABLE.
- ALL MONITORED POINTS, INCLUDING STATUS (ON, OFF, FAILED) AND ANY ALARMS SHALL DISPLAY AT THE DDC WORKSTATIONS.
- "COOLING MODE" SHALL BE DEFINED AS ANY TIME THE OUTSIDE AIR TEMPERATURE IS ABOVE 50°F (ADJUSTABLE) AND A CALL FOR COOLING EXISTS FROM ANY ASSOCIATED PIECE OF EQUIPMENT. "COOLING MODE" SHALL EXTEND TO 1 HOUR BEYOND THE CALL FOR COOLING IS SATISFIED TO PREVENT SHORT CYCLING.
- "HEATING MODE" SHALL BE DEFINED AS ANY TIME THE OUTSIDE AIR TEMPERATURE IS BELOW 68°F (ADJUSTABLE) AND A CALL FOR HEATING EXISTS FROM ANY ASSOCIATED PIECE OF EQUIPMENT.
- WHERE 100% REDUNDANT MOTORIZED EQUIPMENT IS INSTALLED, THE TWO (OR MORE) PIECES OF EQUIPMENT SHALL ALTERNATE OPERATION ON AN ADJUSTABLE, EQUAL RUN-TIME BASIS. THE DDC SYSTEM SHALL DISPLAY CUMULATIVE RUN-TIME OF EACH UNIT. IF ONE UNIT FAILS, THE OTHER UNIT SHALL START AUTOMATICALLY AND THE DDC SYSTEM SHALL GENERATE AN ALARM SIGNAL.
- HVAC SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF THE VA HVAC DESIGN MANUAL AND THE LATEST VERSIONS OF THOSE STANDARDS REFERENCED WITHIN THAT MANUAL. THE DESIGNER IS RESPONSIBLE FOR VERIFICATION OF THE LATEST VERSION.
- ALL INDIVIDUAL ROOM ENVIRONMENTAL PARAMETERS SHALL BE DESIGNED AND SET IN ACCORDANCE WITH THE LATEST VERSION OF THE VA HVAC DESIGN MANUAL.
- ALL EQUIPMENT SHALL BE ENERGY STAR CERTIFIED AND MAXIMUM EFFICIENCY.

AIR FLOW CONTROL: THE UNIT CONTROLLER SHALL MODULATE THE VFD FREQUENCY ECCED ON A SIGNAL FROM THE STATIC PRESSURE SENSOR LOCATED IN THE SUPPLY DUCT TO MAINTAIN THE STATIC PRESSURE SET POINT AS DETERMINED BY THE TEST AND BALANCE CONTRACTOR.

OUTSIDE AIR DAMPER CONTROL: THE OUTSIDE AIR DAMPER SHALL BE MODULATED TO MAINTAIN THE OUTSIDE AIR VOLUME SETPOINT AS SCHEDULED. THE BYPASS AND EXHAUST AIR DAMPERS SHALL BE OPENED TO 100% IF THE OUTSIDE AIR DAMPER IS OPEN 100% AND THE OUTSIDE AIR VOLUME IS BELOW SETPOINT. THE BYPASS AIR AND EXHAUST AIR DAMPERS SHALL BE MODULATED TO MAINTAIN THE OUTSIDE AIR VOLUME SETPOINT. AN ALARM SHALL BE GENERATED AT THE ECC IF THE OUTDOOR AIRFLOW VARIES BY MORE THAN 10% FROM SETPOINT FOR MORE THAN 10 MINUTES (ADJ.).

SUPPLY AIR TEMPERATURE CONTROL AND RESET: WHEN THE SUPPLY FAN IS ON, THE CHILLED WATER VALVE SHALL MODULATE TO MAINTAIN THE LEAVING AIR TEMPERATURE SETPOINT. INITIALLY SET AT 55°F (ADJUSTABLE). DURING WINTER CONDITIONS, HEATING HOT WATER COIL VALVE SHALL MODULATE TO BRING MIXED AIR TEMPERATURE TO 60°F AND THE AHU SHALL RAMP DOWN TO MINIMUM AIRFLOW AND THE VAV BOXES HEATING HOT WATER VALVE SHALL MODULATE TO MAINTAIN ROOM TEMPERATURE SETPOINT (SEE VAV TERMINAL UNIT SEQUENCE OF OPERATION FOR MORE INFORMATION). THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET TO THE OPTIMAL SETPOINT COMMUNICATED BY THE ECC. THE ECC SHALL RESET THE DISCHARGE AIR TEMPERATURE SETPOINT ECCED ON THE CURRENT OUTSIDE AIR TEMPERATURE, BUT SHALL OVERRIDE THIS RESET FUNCTION AND RETURN THE DISCHARGE AIR TEMPERATURE SETPOINT TO 55°F (ADJ.) IF MORE THAN TWO (ADJ.) ZONES BEGIN TO OVERHEAT. ALSO, THE ECC SHALL OVERRIDE THIS RESET FUNCTION WHENEVER OUTDOOR DEW POINT IS HIGHER THAN 60.0 DEG. F (ADJ.) OR INDOOR HUMIDITY IS HIGHER THAN 60% RH (ADJ.). IF THE DISCHARGE AIR TEMPERATURE DROPS BELOW THE MINIMUM LIMIT, A LOW TEMPERATURE ALARM SHALL ANNUNCIATE AND THE UNIT SHALL SHUT DOWN. IF THE DISCHARGE AIR TEMPERATURE RISES ABOVE THE MAXIMUM LIMIT, A HIGH TEMPERATURE ALARM SHALL ANNUNCIATE.

ENERGY RECOVERY OPERATION:

COOLING RECOVERY MODE: THE WHEEL SHALL BE ENERGIZED WHEN THE OUTSIDE AIR ENTHALPY IS HIGHER THAN THE RETURN AIR ENTHALPY AND THE OUTSIDE AIR TEMPERATURE IS ABOVE ECONOMIZER ENABLE SETPOINT. HEATING RECOVERY MODE: THE WHEEL SHALL BE ENERGIZED WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW THE ECONOMIZER ENABLE SETPOINT. THE COOLING COIL VALVE IS CLOSED, AND THE OUTSIDE AIR DAMPER IS SET TO MINIMUM POSITION. IF THE OUTSIDE AIR FLOW VARIES BELOW THE FROST THRESHOLD SETPOINT OF 33°F (ADJ.), THE WHEEL VFD SHALL ENERGIZE TO VARY THE WHEEL SPEED.

ECONOMIZER: WHEN OUTSIDE AIR ENTHALPY IS LOWER THAN RETURN AIR ENTHALPY AND THE OUTSIDE AIR IS 75°F DB OR LESS, THE HEATING AND COOLING COIL VALVES SHALL CLOSE, ENERGY WHEEL SHALL DE-ENERGIZE, AND THE OUTSIDE AIR DAMPER AND BYPASS DAMPER SHALL MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE. THE ECONOMIZER SHALL DISABLE WHEN OA ENTHALPY IS GREATER THAN RA ENTHALPY OR THE OUTSIDE AIR IS GREATER THAN 75°F DB. DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE DETERMINED VIA DEMAND-ECCED RESET.

- INITIAL MAXIMUM DISCHARGE AIR TEMPERATURE SET POINT SHALL BE 65°F (ADJUSTABLE).
- ECC SHALL POLE THE POSITION OF ALL VAV TERMINAL DAMPERS (D-1 ON VAV SEQUENCE) AND RESET THE STATIC PRESSURE SENSING STATIONS SETPOINT WITH THE GREATEST NEED UNTIL ONE DAMPER IS OPEN TO 75% (ADJUSTABLE) OF FULL AIR FLOW.

VENTILATION CONTROL: WHEN THE SPACE CO2 LEVEL IS GREATER THAN 350 PPM (ADJUSTABLE), THE OUTDOOR AIR DAMPER SHALL OPEN TO THE DESIGN MINIMUM OUTDOOR AIR DAMPER SETPOINT. AS SPACE CO2 LEVELS RISE TO THE MAXIMUM 1,000 PPM (ADJUSTABLE) SETPOINT, THE OUTDOOR AIR DAMPER SHALL OPEN SHALL MODULATE TO 100% OPEN UNTIL DIFFERENTIAL FALLS BELOW 700 PPM OR UNTIL TS-5 CAN NO LONGER MAINTAIN ITS SETPOINT. SPACE TEMPERATURE SENSOR T-1 SHALL MODULATE ITS ASSOCIATED VALVE TO MAINTAIN 18 DEGREE SPACE COOLING TEMPERATURE OR 68 DEGREE SPACE HEATING TEMPERATURE.

HUMIDITY CONTROL: WHENEVER SPACE RELATIVE HUMIDITY IS ABOVE 60% (ADJUSTABLE), THE UNIT SHALL MAINTAIN A CCAT OF 40°F (ADJUSTABLE). IF THE VFD IS AT MINIMUM SPEED AND THE SPACE TEMPERATURE DROPS BELOW HEATING SETPOINT OF 70°F (ADJUSTABLE), THE VAV BOXES HEATING HOT WATER VALVE SHALL MODULATE TO PREVENT OVERCOOLING OF THE SPACE AND MAINTAIN SPACE TEMPERATURE SETPOINT. ONCE THE SPACE RELATIVE HUMIDITY HAS DROPPED BACK TO 50% RH (ADJUSTABLE) FOR MORE THAN 20 MINUTES (ADJUSTABLE), THE COOLING MODE SEQUENCE SHALL BE RESTORED. WHENEVER SPACE RELATIVE HUMIDITY IS BELOW 30% (ADJUSTABLE), STEAM HUMIDIFIER H-39-2-02 SHALL ENERGIZE. ONCE HUMIDITY IS ABOVE 50% (ADJUSTABLE) FOR MORE THAN 20 MINUTES (ADJUSTABLE), STEAM HUMIDIFIER H-39-2-02 SHALL DE-ENERGIZE.

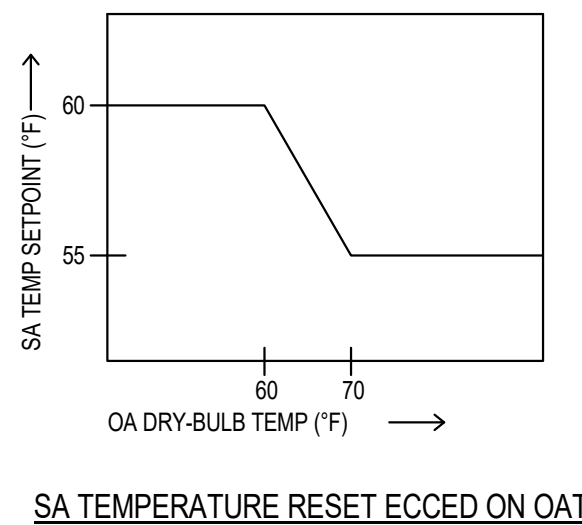
SMOKE DETECTION SHUTDOWN: UPON A SIGNAL FROM THE ASSOCIATED, HARD WIRED, INTERLOCKED, SMOKE DETECTOR (FURNISHED AND WIRED BY DIVISION 28, MOUNTED BY DIVISION 23) THAT SMOKE IS DETECTED IN THE AIR STREAM, THE FIRE ALARM SYSTEM SHALL SHUT DOWN ASSOCIATED UNITS SUPPLY FANS, AND AT THE SAME TIME THE SMOKE DETECTOR SIGNAL SHALL DISPLAY AN ALARM ON THE UNIT GRAPHICAL USER INTERFACE THAT THE AIR HANDLING UNIT WAS SHUTDOWN FOR SMOKE DETECTION.

HOA - LIMIT STATIC SHUTDOWN: UPON HIGH STATIC SUPPLY DUCT PRESSURE SENSOR, THE SUPPLY FAN SHALL DE-ENERGIZE, THE OUTSIDE AIR DAMPER SHALL CLOSE, THE BYPASS DAMPER SHALL BE OPENED AND AN ALARM SHALL DISPLAYED ON THE UNIT GRAPHICAL USER INTERFACE.

FILTER STATUS: A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS FILTER(S) WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSURES DURING NORMAL OPERATION A DIRTY FILTER ALARM SHALL ANNUNCIATE AT THE ECC.

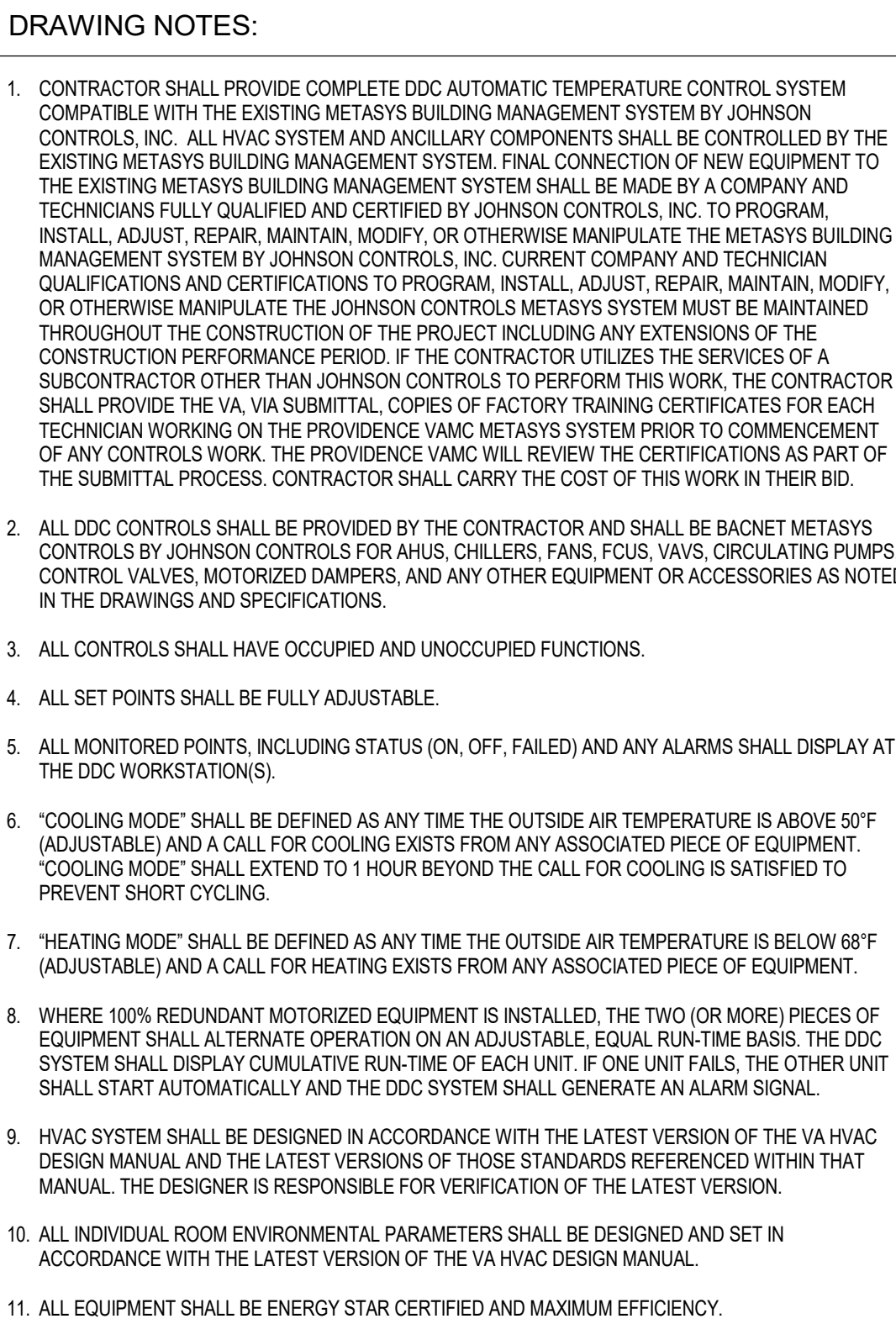
GRAPHICAL USER INTERFACE: PROVIDE A COMPLETE GRAPHIC DISPLAY OF THE SYSTEM AT THE ECC. THE DISPLAY SHALL SHOW ALL POINTS WITH THEIR MEASURED VALUES OR STATUS, WHICH SHALL BE UPDATED CONTINUOUSLY.

INPUT/OUTPUT SUMMARY											
SYSTEM	GRAPHIC	INDICATION					CONTROL				
		STATUS	TEMPERATURE	RELATIVE HUMIDITY	PMI	CHW	STATIC PRESSURE	DIFF. PRESSURE	POSITION	RUN TIME	REMARKS
AHU-39-2-02											
SYSTEM	●										ECC, HOA
SUPPLY AIR FAN	●	●					●				DPS-3, CS-1, AFS-2
EXHAUST AIR FAN	●	●					●				DPS-5, CS-2
OUTDOOR AIR	●		●		●						AFS-1, TS-1, H-1, CO2-1
RETURN AIR	●		●								TS-7, H-3
SUPPLY AIR	●		●				●				TS-4, H-2, AFS-2, SPSS-1, SPSS-2, SPSS-3
MIXED AIR	●		●								TS-3
CC EAT	●		●								TS-4, F-1
CC LAT	●		●								TS-4
VALVE & FLOW	●					●					V-1, WFS-1, V-2, WFS-2, V-3
SMOKE DETECTOR	●										SD-1, SD-2, INTERLOCK W/ FAS
FILTERS	●							●			DPS-1, DPS-2, DPS-4
COMPRESSORS	●										SPSS-1, SPSS-2, SPSS-3
HIGH/LOW STATIC PRESSURE	●										D-1, D-2, D-3, D-4, D-5
DAMPERS	●										TS-2, CO2-2
SPACE	●		●		●						



NOTES:

- REUSE EXISTING COMMUNICATION NETWORK.
- EXISTING CONTROL SYSTEM SOFTWARE TO REMAIN. UPGRADE GRAPHICS ACCORDINGLY.



SYSTEM DESCRIPTION: THE CHILLED WATER PLANT CONSISTS OF (2) EXISTING 60-TON AIR COOLED CHILLERS, (1) NEW 60-TON AIR COOLED CHILLER, (2) EXISTING PUMPS, AND CONTROLS VALVES AS SHOWN ON THE CONTROL DIAGRAM. THE NEW CHILLER SHALL BE PROVIDED WITH A NEW CHILLED WATER PUMP, A NEW 2-WAY MODULATING VALVE SHALL BE PROVIDED. A DIRECT DIGITAL CONTROL (DDC) SYSTEM SHALL BE PROVIDED THAT INTERFACES WITH THE CHILLER FACTORY CONTROLS TO PROVIDE FULL REMOTE CONTROL, AND ALL INFORMATION FOR MONITORING AVAILABLE IN THE CHILLER CONTROLLER. THE PUMPS ARE EACH SERVED BY A SEPARATE VFD.

GENERAL: UNIT SHALL BE NORMALLY STARTED AND STOPPED REMOTELY AT THE ENGINEERING CONTROL CENTER (ECC). H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED FOR MAINTENANCE ONLY. ALL CONTROLS SHALL BE AUTOMATIC AND ALL SETPOINTS SHALL BE ADJUSTABLE.

SYSTEM START/STOP: UPON A REQUEST FOR THE LEAD CHILLER, THE DDC SYSTEM SHALL ENERGIZE THE LEAD CHILLED WATER PUMP. UPON PROOF OF PRIMARY FLOW, THE DDC SYSTEM SHALL THEN ENERGIZE THE LEAD CHILLER THROUGH ITS LOCAL CONTROL PANEL. THE ASSOCIATED ISOLATION CONTROL VALVE SHALL SHUT UPON THE CHILLER SHUTTING DOWN. CHILLER(S) SHALL NOT START UNTIL FLOW IS PROVED BY WATER FLOW SWITCH WIRED TO CHILLER CONTROL PANEL. AFTER ENABLING THE LOCAL CHILLER PANEL, THE DDC SYSTEM SHALL MONITOR THE CHILLER RUN/LOAD AMPS FOR PROOF OF OPERATION.

CHILLER STAGING: CHILLERS WILL OPERATE IN A LEAD / LAG SEQUENCE, SO THAT THE LAST CHILLER ENABLED IS THE FIRST TO BE DISABLED. THE COOLING PLANT SYSTEM SHALL INITIATE THE STAGING OF THE NEXT CHILLER IN THE SEQUENCE WHENEVER THE CHILLED WATER LOAD, AS DETERMINED BY THE SYSTEM SUPPLY WATER TEMPERATURE, IS NOT MET FOR 15 MINUTES (ADJ.). THE DDC SHALL INITIATE THE SHUT DOWN OF THE NEXT CHILLER IN THE SEQUENCE WHENEVER EXCESS CHILLED WATER CAPACITY EXISTS, AS DETERMINED BY PERCENT RUN LOAD AMPS. FOR 60 MINUTES (ADJ.). CHILLER LEAD/LAG SEQUENCE ORDER WILL BE BASED ON A ROUND ROBIN LOGIC. (ROUND ROBIN LOGIC EXAMPLE: 1-2,3, THEN 2-3,1, THEN 3-1,2, THEN 1-2,3, ETC.)

THE CHILLER SEQUENCE ORDER SHALL BE ROTATED ON A SCHEDULE FROM THE ECC. CHILLER ROTATIONS WILL BE PROGRAMMED TO OCCUR AT ONE OF THE FOLLOWING OPERATOR-DEFINED INTERVALS:

NEVER: CHILLERS WILL ALWAYS HAVE THE SAME SEQUENCE NUMBER.

DAY OF WEEK: CHILLERS WILL ROTATE ON AN OPERATOR DEFINED DAY AND TIME ONCE PER WEEK

FIXED NUMBER OF DAYS: CHILLERS WILL ROTATE AFTER THE NUMBER OF DAYS SPECIFIED HAS ELAPSED

RUN HOURS: CHILLERS ROTATE TO ATTEMPT TO EVEN OUT THE AMOUNT OF TIME EACH CHILLER RUNS. WHEN ANY CHILLER REACHES THE OPERATOR DEFINED RUN HOURS SETPOINT (WHICH IS MEASURED ONLY FROM THE LAST ROTATION), THE SYSTEM CONTROLLER CAN RE-SEQUENCE THE CHILLERS, IF NECESSARY, TO PUT THE CHILLER WITH THE LEAST TOTAL RUN HOURS INTO A HIGH USE POSITION IN THE SEQUENCE.

ROTATIONAL INPUT: CHILLERS WILL ROTATE WHEN THE SPECIFIED REFERENCE COMMANDS THEM TO ROTATE. FROM THE ECC INTERFACE, AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE LEAD/LAG SEQUENCE OR REQUEST ANY CHILLER TO BE UNAVAILABLE WHICH WOULD REMOVE IT FROM THE ROTATION SEQUENCE.

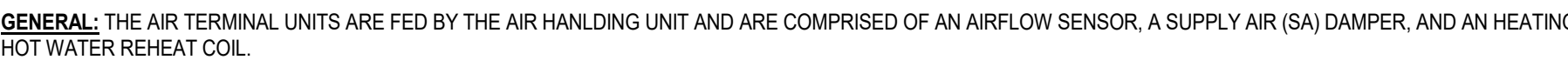
SUPPLY TEMPERATURE SET POINT: SET POINT SHALL BE RESET ON A LINEAR SCHEDULE BASED ON OUTSIDE AIR TEMPERATURE. PROVIDE CONTROL FUNCTIONS AS REQUIRED. SET POINT SHALL 44°F (ADJ.) AT 70°F (ADJ.) OUTDOOR AIR TEMPERATURE, AND 48°F (ADJ.) AT 50°F (ADJ.).

DISTRIBUTION PUMPING OPERATION: THE DCS SHALL START LEAD PUMPS UPON A CALL TO ENERGIZE THE LEAD CHILLERS. EACH LEAD PUMP SHALL BE INTERLOCKED WITH LEAD CHILLER OPERATOR. DIFFERENTIAL PRESSURE SENSOR ACROSS HYDRONIC SUPPLY AND RETURN MAIN SHALL MODULATE CHILLED WATER DISTRIBUTION PUMP SPEED AS REQUIRED, VIA INDIVIDUAL VARIABLE FREQUENCY DRIVES, TO MAINTAIN SET POINT. INITIAL SET POINT SHALL BE 5 PS (ADJ.). SET POINT TO BE DETERMINED IN FIELD BY TAB CONTRACTOR. MINIMUM PUMP FLOW SHALL BE MAINTAINED VIA A DIFFERENTIAL PRESSURE BY-PASS VALVE. REFER TO CHILLER MANUFACTURER'S IOM FOR MINIMUM FLOW SETPOINT. EACH PUMP SHALL BE CAPABLE OF PROVIDING CHILLED WATER TO ANY OF THE CHILLERS.

PUMP STAGING: PUMPS SHALL HAVE AUTOMATED LEAD / LAG SEQUENCE. REFER TO CHILLER STAGING FOR SEQUENCE.

FREEZE PROTECTION: THE CHILLED WATER PUMPS SHALL OPERATE WHEN OUTDOOR AIR TEMPERATURE IS 25°F (ADJ.) OR BELOW TO AVOID EVAPORATOR FREEZE.

GRAPHICAL USER INTERFACE: PROVIDE A COMPLETE GRAPHIC DISPLAY OF THE SYSTEM AT THE ECC TO MATCH THE EXISTING CHILLERS GRAPHICS, SCREENS, AND LOGS. THE DISPLAY SHALL SHOW ALL POINTS WITH THEIR MEASURED VALUES OR STATES, WHICH SHALL BE UPDATED CONTINUOUSLY AND SHOWN AS CURRENT VALUE.



OPERATION: THE VAV TERMINAL UNIT SHALL MAINTAIN ROOM SETPOINT OF 75°F (ADJUSTABLE) BY MODULATING THE NORMALLY CLOSED DAMPER BETWEEN ITS MAXIMUM AND MINIMUM POSITIONS THROUGH A TERMINAL UNIT CONTROLLER (TUC) MOUNTED ON THE TERMINAL UNIT. ONCE THE DAMPER REACHES MINIMUM POSITION, THE SPACE TEMPERATURE SHALL BE ALLOWED TO DROP THROUGH A DEADBAND TO 68°F (ADJUSTABLE). IF THE SPACE TEMPERATURE CONTINUES TO FALL, THE DAMPER SHALL OPEN TO 50% AND THE HEATING HOT WATER CONTROL VALVE SHALL MODULATE TO MAIN SPACE TEMPERATURE.

OCCUPIED/UNOCCUPIED MODES: EACH VATERMINAL UNIT SHALL HAVE THE OPTION FOR OCCUPIED AND UNOCCUPIED MODES WITHIN THE UNIT CONTROLLER. OCCUPIED/UNOCCUPIED MODES SHALL HAVE UPPER AND LOWER SPACE TEMPERATURE SETPOINT LIMITS THAT SHALL BE PROGRAMMABLE THROUGH THE OPERATOR WORKSTATION. VALUES SHALL BE DETERMINED BY THE VA IF UNOCCUPIED MODE IS ENABLED.

[illegible]

F8 VARIABLE AIR VOLUME TERMINAL BOX - HEATING HOT WATER
N.T.S.

A

B

C

D

E

F

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DRAWING NOTES:

- CONTRACTOR SHALL PROVIDE COMPLETE DDC AUTOMATIC TEMPERATURE CONTROL SYSTEM COMPATIBLE WITH THE EXISTING METASYS BUILDING MANAGEMENT SYSTEM BY JOHNSON CONTROLS, INC. ALL HVAC SYSTEM AND ANCILLARY COMPONENTS SHALL BE CONTROLLED BY THE EXISTING METASYS BUILDING MANAGEMENT SYSTEM. FINAL CONNECTION OF NEW EQUIPMENT TO THE EXISTING METASYS BUILDING MANAGEMENT SYSTEM SHALL BE MADE BY A COMPANY AND TECHNICIANS FULLY QUALIFIED AND CERTIFIED BY JOHNSON CONTROLS, INC. TO PROGRAM, INSTALL, ADJUST, REPAIR, MAINTAIN, MODIFY, OR OTHERWISE MANIPULATE THE METASYS BUILDING MANAGEMENT SYSTEM BY JOHNSON CONTROLS, INC. CURRENT COMPANY AND TECHNICIAN QUALIFICATIONS AND CERTIFICATIONS TO PROGRAM, INSTALL, ADJUST, REPAIR, MAINTAIN, MODIFY, OR OTHERWISE MANIPULATE THE JOHNSON CONTROLS METASYS SYSTEM MUST BE MAINTAINED THROUGHOUT THE CONSTRUCTION OF THE PROJECT INCLUDING ANY EXTENSIONS OF THE CONSTRUCTION PERFORMANCE PERIOD. IF THE CONTRACTOR UTILIZES THE SERVICES OF A SUBCONTRACTOR OTHER THAN JOHNSON CONTROLS TO PERFORM THIS WORK, THE CONTRACTOR SHALL PROVIDE THE VA, VIA SUBMITTAL, COPIES OF FACTORY TRAINING CERTIFICATES FOR EACH TECHNICIAN WORKING ON THE PROVIDENCE VAMC METASYS SYSTEM PRIOR TO COMMENCEMENT OF ANY CONTROLS WORK. THE PROVIDENCE VAMC WILL REVIEW THE CERTIFICATIONS AS PART OF THE SUBMITTAL PROCESS. CONTRACTOR SHALL CARRY THE COST OF THIS WORK IN THEIR BID.
- ALL DDC CONTROLS SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE BACKUP METASYS CONTROLS BY JOHNSON CONTROLS FOR AHUS, CHILLERS, FANS, FCUS, VALVS, CIRCULATING PUMPS, CONTROL VALVES, MOTORIZED DAMPERS, AND ANY OTHER EQUIPMENT OR ACCESSORIES AS NOTED IN THE DRAWINGS AND SPECIFICATIONS.
- ALL CONTROLS SHALL HAVE OCCUPIED AND UNOCCUPIED FUNCTIONS.
- ALL SET POINTS SHALL BE FULLY ADJUSTABLE.
- ALL MONITORED POINTS, INCLUDING STATUS (ON, OFF, FAILED) AND ANY ALARMS SHALL DISPLAY AT THE DDC WORKSTATIONS.
- "COOLING MODE" SHALL BE DEFINED AS ANY TIME THE OUTSIDE AIR TEMPERATURE IS ABOVE 50°F (ADJUSTABLE) AND A CALL FOR COOLING EXISTS FROM ANY ASSOCIATED PIECE OF EQUIPMENT. "COOLING MODE" SHALL EXTEND TO 1 HOUR BEYOND THE CALL FOR COOLING IS SATISFIED TO PREVENT SHORT CYCLING.
- "HEATING MODE" SHALL BE DEFINED AS ANY TIME THE OUTSIDE AIR TEMPERATURE IS BELOW 68°F (ADJUSTABLE) AND A CALL FOR HEATING EXISTS FROM ANY ASSOCIATED PIECE OF EQUIPMENT.
- WHERE 100% REDUNDANT MOTORIZED EQUIPMENT IS INSTALLED, THE TWO (OR MORE) PIECES OF EQUIPMENT SHALL ALTERNATE OPERATION ON AN ADJUSTABLE, EQUAL RUN-TIME BASIS. THE DDC SYSTEM SHALL DISPLAY CUMULATIVE RUN-TIME OF EACH UNIT. IF ONE UNIT FAILS, THE OTHER UNIT SHALL START AUTOMATICALLY AND THE DDC SYSTEM SHALL GENERATE AN ALARM SIGNAL.
- HVAC SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF THE VA HVAC DESIGN MANUAL AND THE LATEST VERSIONS OF THOSE STANDARDS REFERENCED WITHIN THAT MANUAL. THE DESIGNER IS RESPONSIBLE FOR VERIFICATION OF THE LATEST VERSION.
- ALL INDIVIDUAL ROOM ENVIRONMENTAL PARAMETERS SHALL BE DESIGNED AND SET IN ACCORDANCE WITH THE LATEST VERSION OF THE VA HVAC DESIGN MANUAL.
- ALL EQUIPMENT SHALL BE ENERGY STAR CERTIFIED AND MAXIMUM EFFICIENCY.

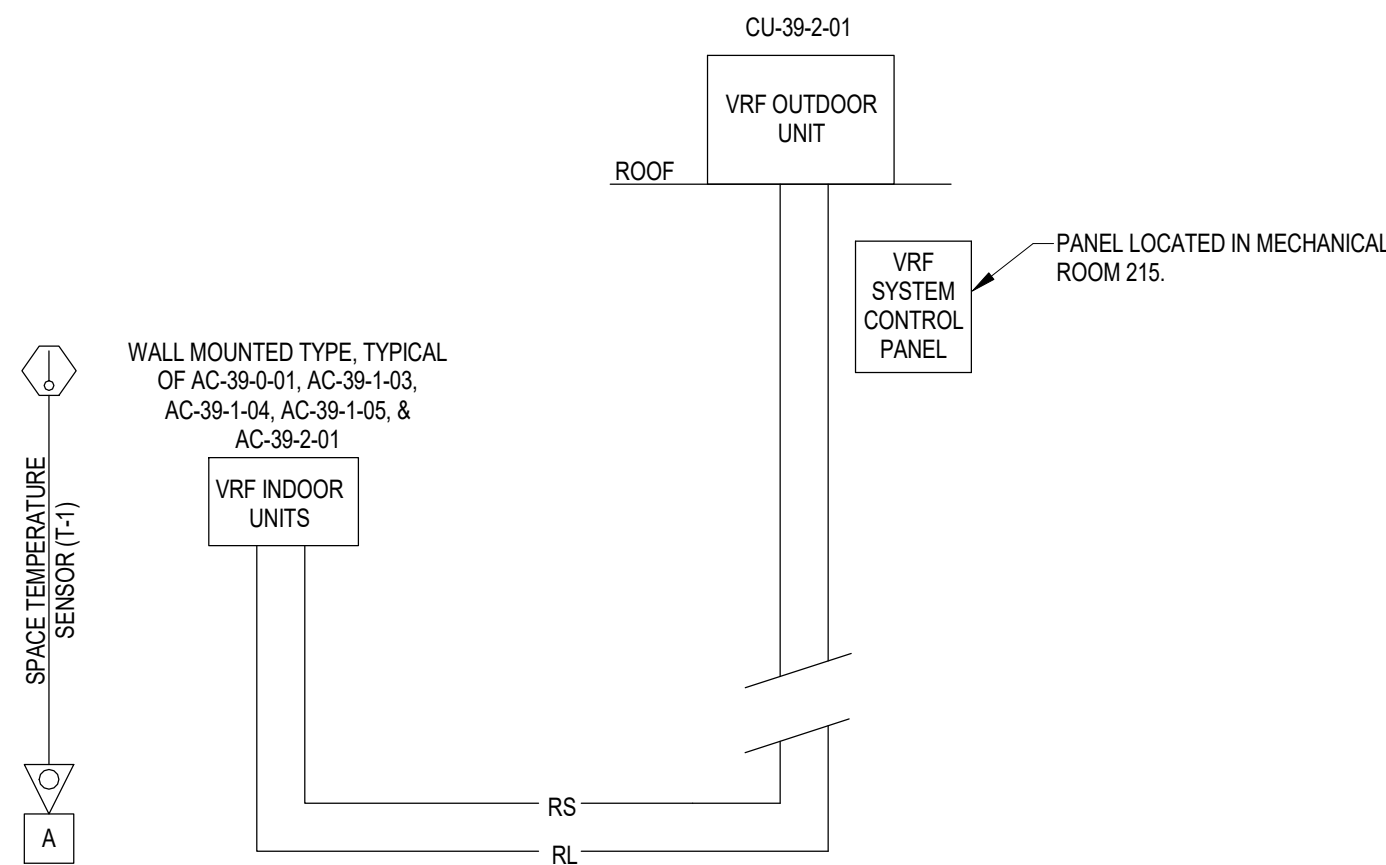
SEQUENCE OF OPERATION

GENERAL: THE BAS SHALL INDEX FAN TO UNOCCUPIED / OCCUPIED CONTROL. FAN SERVES GENERAL EXHAUST FOR LEVEL B, LEVEL 1, AND LEVEL 2.

STARTUP/SHUTDOWN: EXHAUST FAN SHALL BE INTERLOCKED WITH AIR HANDLING UNIT (AHU-39-2-02) DURING OCCUPIED HOURS ONLY FOR OPERATION. EXHAUST FAN SHALL DE-ENERGIZED BASED UPON AIR HANDLING UNIT SHUTDOWN UNOCCUPIED CONTROL. ALARM SHALL BE SENT TO ENGINEERING CONTROL CENTER UPON FAILURE OF FAN.

INPUT/OUTPUT SUMMARY																							
SYSTEM		GRAPHIC	INDICATION									ALARM		CONTROL		REMARKS							
			STATUS	TEMPERATURE	RELATIVE HUMIDITY	PPM	CFM	STATIC PRESSURE	DIFF. PRESSURE	GPM	POSITION	RUN TIME	HERTZ	LOW	HIGH		CRITICAL	MAINTENANCE	PROGRAM START/STOP	HAND-OFF-AUTO	MODULATE	MIN/MAX	OPEN/CLOSED
CONSTANT VOLUME FAN																							
SYSTEM		●																					
EXHAUST FAN		●											●										
																	ASSOCIATED AHU						
																	CS-1						

C6 CONSTANT VOLUME EXHAUST FAN
N.T.S.



SEQUENCE OF OPERATION

SYSTEM DESCRIPTION: THE CONDENSING UNIT (CU) IS A VARIABLE REFRIGERANT FLOW (VRF) SYSTEM COMPRISED OF A FACTORY VRF SYSTEM CONTROL PANEL, SPACE TEMPERATURE SENSORS, AND INDOOR WALL-MOUNTED UNITS.

GENERAL: THE UNIT SHALL BE STARTED AND STOPPED THROUGH A BACKUP SYSTEM CONTROL PANEL PROVIDED BY THE SYSTEM MANUFACTURER. PROVIDE BACKUP INTERFACE FOR CONNECTION TO AN ENGINEERING CONTROL CENTER (ECC). SYSTEM SHALL BE CAPABLE OF BEING MONITORED AND CONTROLLED THROUGH THE ECC. ALL SAFETIES AND ASSOCIATED CONTROL INTERLOCKS SHALL REMAIN ACTIVE IN ALL HOA SWITCH POSITIONS. WHERE 100% REDUNDANT EQUIPMENT IS INSTALLED, THE TWO PIECES OF EQUIPMENT SHALL ALTERNATE OPERATION ON AN ADJUSTABLE, EQUAL RUN-TIME BASIS. THE DDC SYSTEM SHALL DISPLAY CUMULATIVE RUN-TIME OF EACH UNIT. IF ONE UNIT FAILS, THE OTHER UNIT SHALL START AUTOMATICALLY AND THE DDC SYSTEM SHALL GENERATE AN ALARM SIGNAL. SPACE TEMPERATURE SENSOR "T-1" CONTROLS ITS RESPECTIVE INDOOR UNIT THROUGH MANUFACTURER'S SUPPLIED CONTROLS TO MAINTAIN SPACE TEMPERATURE OF 68°F (ADJUSTABLE). AIR-COOLED CONDENSING UNITS REJECT/ABSORB EXCESS HEAT BASED ON THE INDOOR UNIT(S) REQUIREMENTS THROUGH THE MANUFACTURER'S SYSTEM CONTROL PANEL AND SHALL OPERATE 24-HOURS AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SENSOR(S).

START/STOP: WHEN THE SYSTEM IS ENERGIZED TO OPERATE, INDOOR UNITS START AND ASSOCIATED AIR-COOLED CONDENSING UNITS ARE ENERGIZED. SYSTEM OPERATES THROUGH MANUFACTURER'S SUPPLIED SYSTEM CONTROL PANEL. WHEN SYSTEM IS DE-ENERGIZED, INDOOR UNIT(S) STOP AND AIR-COOLED CONDENSING UNIT STOPS.

INPUT/OUTPUT SUMMARY																						
SYSTEM		INDICATION								ALARM			CONTROL			REMARKS						
	GRAPHIC	STATUS	TEMPERATURE	RELATIVE HUMIDITY	PPM	CFM	STATIC PRESSURE	DIFF. PRESSURE	GPM	POSITION	RUN TIME	HERTZ	LOW	HIGH	CRITICAL		MAINTENANCE	PROGRAM STATUS/STOP	HAND-OFF-AUTO	MODULATE	MIN/MAX	OPEN/CLOSED
VRF UNITS																						
SYSTEM	●																●	●				ECC, SYSTEM CONTROL PANEL
VRF INDOOR UNITS		●	●								●					●	●					AC-39-0-01, AC-39-1-03, AC-39-1-04, AC-39-1-05, & AC-39-2-01
AIR-COOLED CONDENSING UNIT		●	●																			CU-39-0-01
SUPPLY AIR FAN											●					●						AC-39-0-01, AC-39-1-03, AC-39-1-04, AC-39-1-05, & AC-39-2-01
SUPPLY AIR						●																AC-39-0-01, AC-39-1-03, AC-39-1-04, AC-39-1-05, & AC-39-2-01
SPACE TEMPERATURE SENSOR		●												●								T-1

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Drawing Number	M-801

