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CONTROLS SYMBOLS	
	ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT
	ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER - WALL MOUNT
	TEMPERATURE TRANSMITTER
	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
	MOISTURE (HUMIDITY) TRANSMITTER
	PRESSURE TRANSMITTER
	STATIC PRESSURE SENSOR
	FLOW TRANSMITTER
	CURRENT TRANSMITTER
	CONDUCTIVITY TRANSMITTER
	SMOKE DETECTOR
	PRESSURE DIFFERENTIAL TRANSMITTER
	PRESSURE DIFFERENTIAL SWITCH
	HAND SWITCH (HAND-OFF-AUTO SWITCH)
	VALVE OR DAMPER POSITION CONTROLLER
	LOCAL RECORDING TIME CLOCK (RUNTIME)
	TEMPERATURE SWITCH, LOW (FREEZE/STAT)
	TEMPERATURE SWITCH, HIGH (FREEZE/STAT)
	LEVEL CONTROLLER
	LEVEL TRANSMITTER
	START/STOP

TERMINAL UNIT SYMBOLS	
	CONNECTOR OR RADIATOR (RECESSED)
	HOT WATER REHEAT COIL
CONTROLS SYMBOLS	
	TEMPERATURE SENSING ELEMENT FOR TRANSMITTING TEMPERATURE TO EMCS (PROVIDE 12 INCHES [200mm] MINIMUM LENGTH IN DUCT WHEN SPACE PERMITS.)
	SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO EMCS
	MOTOR STARTER
	ELECTRIC OPERATED CONTROL DAMPER/OR VALVE

DUCTWORK SYMBOLS	
	COMBINATION FIRE/SMOKE DAMPER
	POINT OF CHANGE IN DUCT CONSTRUCTION BY STATIC PRESSURE CLASS. THE NUMBER ASSIGNS PRESSURE CLASS (IN. OF WATER) WHICH WILL ACCOMMODATE MAXIMUM OPERATING PRESSURE IN THE DUCT SUBSECTION. THE SYMBOL CONTINUES THE ASSIGNMENT UNTIL THE DUCT TERMINATES OR ANOTHER SYMBOL APPEARS. A "N" SUPERScript INDICATES NEGATIVE PRESSURE.
	AUTOMATIC CONTROL DAMPER MODULATING
	AUTOMATIC CONTROL DAMPER TWO POSITION
	MANUAL SPLITTER DAMPER
	STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)
	DUCT MOUNTED COIL (HOT WATER OR STEAM COIL)

DUCTWORK SYMBOLS	
	FLEXIBLE CONNECTION, EQUIPMENT, VIBRATION, OR SEISMIC
	VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING)
	VANED ELBOW (SHORT RADIUS)
	STANDARD RADIUS ELBOW (LONG RADIUS)
	NEW DUCT (INSIDE DIMENSIONS: WIDTH x DEPTH)
	EXISTING DUCT TO REMAIN
	LOUVER (LOUVER SPECIFIED IN ARCHITECTURAL SECTION.)
	FLEXIBLE DUCTWORK (INSULATED)
	DUCT WITH SOUND LINING
	MANUAL VOLUME DAMPER
	FIRE DAMPER
	BACK DRAFT DAMPER

DUCTWORK SYMBOLS	
	SUPPLY DUCT (UP & DOWN)
	EXHAUST DUCT (UP & DOWN)
	RETURN DUCT (UP & DOWN)
	SQUARE 4-WAY CEILING DIFFUSERS
	SQUARE 3-WAY CEILING DIFFUSERS
	SQUARE 2-WAY CEILING DIFFUSERS
	SQUARE 1-WAY CEILING DIFFUSERS
	LINEAR SLOT DIFFUSER
	SUPPLY TOP REGISTER OR GRILLE (WALL TYPE)
	EXHAUST OR RETURN CEILING REGISTER OR GRILLE (WALL TYPE)
	EXHAUST OR RETURN BOTTOM REGISTER OR GRILLE (WALL TYPE)
	EXHAUST OR RETURN REGISTER OR TOP GRILLE (WALL TYPE)
	VANED ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF
	CONNECT NEW DUCT TO EXISTING DUCT
	LIMIT OF DEMOLITION

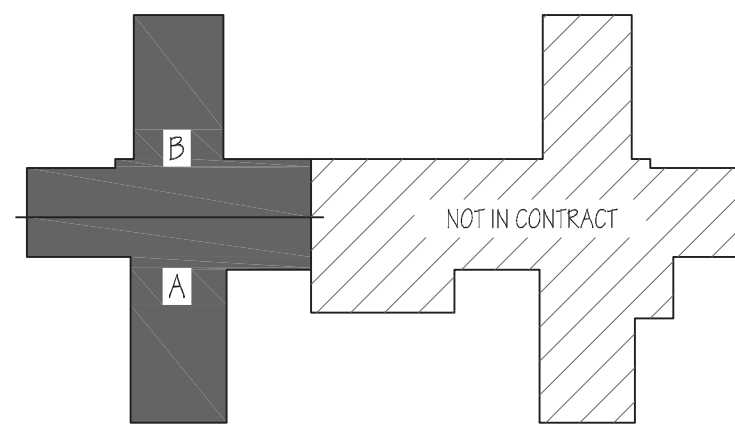
CONTROLS SYMBOLS	
	PRESSURE SWITCH HIGH
	PRESSURE SWITCH LOW
	ELECTRONIC TO PNEUMATIC TRANSDUCER
	CARBON DIOXIDE TRANSMITTER
	CARBON MONOXIDE TRANSMITTER
	OCCUPANCY SENSOR
	LOCAL TEMPERATURE CONTROL PANEL
	HVAC CONTROL PANEL
	VARIABLE SPEED MOTOR CONTROLLER
	INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
	TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
	PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
	SPEED CONTROLLER. SEE SEQUENCE OF OPERATION
	FLOW CONTROLLER. SEE SEQUENCE OF OPERATION
	FLOW SWITCH HIGH
	FLOW SWITCH LOW
	TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE
	DIFFERENTIAL PRESSURE MONITOR
	DIFFERENTIAL PRESSURE SENSING DEVICE

AIR TERMINAL SYMBOLS	
	TERMINAL UNIT WITH REHEAT COIL
	FAN POWERED VARIABLE VOLUME TERMINAL UNIT WITH HEATING COIL
DRAWING SYMBOLS	
	DETAIL NUMBER
	DRAWING NUMBER WHERE DRAWN
	SECTION LETTER
	DRAWING NUMBER WHERE SHOWN
	BUILDING NO. WHERE EQUIPMENT IS LOCATED.
	EQUIPMENT ABBREVIATION (SUPPLY FAN)
	SUPPLY FAN NO. 3 IN BUILDING NO. 26
	TYPICAL UNIT NO.
	BUILDING NO. WHERE EQUIPMENT IS LOCATED
	ITEM (TERMINAL UNIT SHOWN)
	ITEM NUMBER (TERMINAL UNIT NO. 1)
	SERVED BY AIR HANDLER UNIT NO. 1





PIPING SYMBOLS	
	HIGH PRESSURE STEAM (60 PSIG AND ABOVE)
	HIGH PRESSURE STEAM CONDENSATE RETURN
	MEDIUM PRESSURE STEAM (16 PSIG THRU 59 PSIG)
	MEDIUM PRESSURE STEAM CONDENSATE RETURN
	LOW PRESSURE STEAM (15 PSIG AND BELOW)
	LOW PRESSURE STEAM CONDENSATE RETURN
	CONDENSATE PUMP DISCHARGE
	HOT WATER HEATING SUPPLY
	HOT WATER HEATING RETURN
	GLYCOL-WATER HEATING SUPPLY
	GLYCOL-WATER HEATING RETURN
	CONDENSER WATER SUPPLY
	CONDENSER WATER RETURN
	CHILLED WATER SUPPLY
	CHILLED WATER RETURN
	CHILLED GLYCOL-WATER SUPPLY
	CHILLED GLYCOL-WATER RETURN
	MAKE-UP WATER
	EXISTING PIPE TO BE REMOVED
	EXISTING PIPE

GENERAL PIPING SYMBOLS	
	DIRECTION OF PIPE PITCH (DOWN)
	DIRECTION OF FLOW
	ANCHOR
	REDUCER OR INCREASER
	ECCENTRIC REDUCER
	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION, 45° OR 90°
	SIDE CONNECTION
	CAPPED OUTLET
	RISE OR DROP IN PIPE
	UNION
	PIPE UP
	PIPE DOWN
	INVERTED BUCKET TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	THERMOMETER
	PRESSURE GAGE
	FLOW ELEMENT
	REFRIGERANT SIGHT GLASS
	TEST PLUG (PRESSURE/TEMPERATURE)
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	QUICK-COUPLE HOSE CONNECTOR

VALVE SYMBOLS	
	GATE VALVE - THREADED/FLANGED
	GLOBE VALVE - THREADED/FLANGED
	GATE VALVE WITH 3/4" HOSE ADAPTER
	CHECK VALVE
	WYE STRAINER (WITH BALL VALVE & HOSE CONNECTION) AND CAP W/ CHAIN
	WYE STRAINER WITH VALVED DRAIN AND QUICK-COUPLE HOSE CONNECTOR AND CAP W/ CHAIN
	FLEXIBLE CONNECTION
	ANGLE GLOBE VALVE
	BUTTERFLY VALVE
	BALL VALVE
	ISOLATION/SHUTOFF VALVE - SEE SPECS FOR VALVE TYPE
	MODULATING CONTROL VALVE
	MODULATING CONTROL BUTTERFLY VALVE
	TWO POSITION CONTROL VALVE
	THREE-WAY MODULATING CONTROL VALVE
	THREE-WAY TWO POSITION CONTROL VALVE
	PRESSURE REGULATING VALVE
	PRESSURE SAFETY VALVE
	AUTOMATIC BALANCING CONTROL VALVE
	WATER BALANCE DEVICE
	CIRCUIT SETTER VALVE
	GATE VALVE WITH GLOBE-VALVED BYPASS
	PLUG VALVE
	CONTROL VALVE (CV) - FLOAT-OPERATED
	PRESSURE REDUCING VALVE (PRV)
	WATER LEVEL CONTROLLER
	FLOW METER



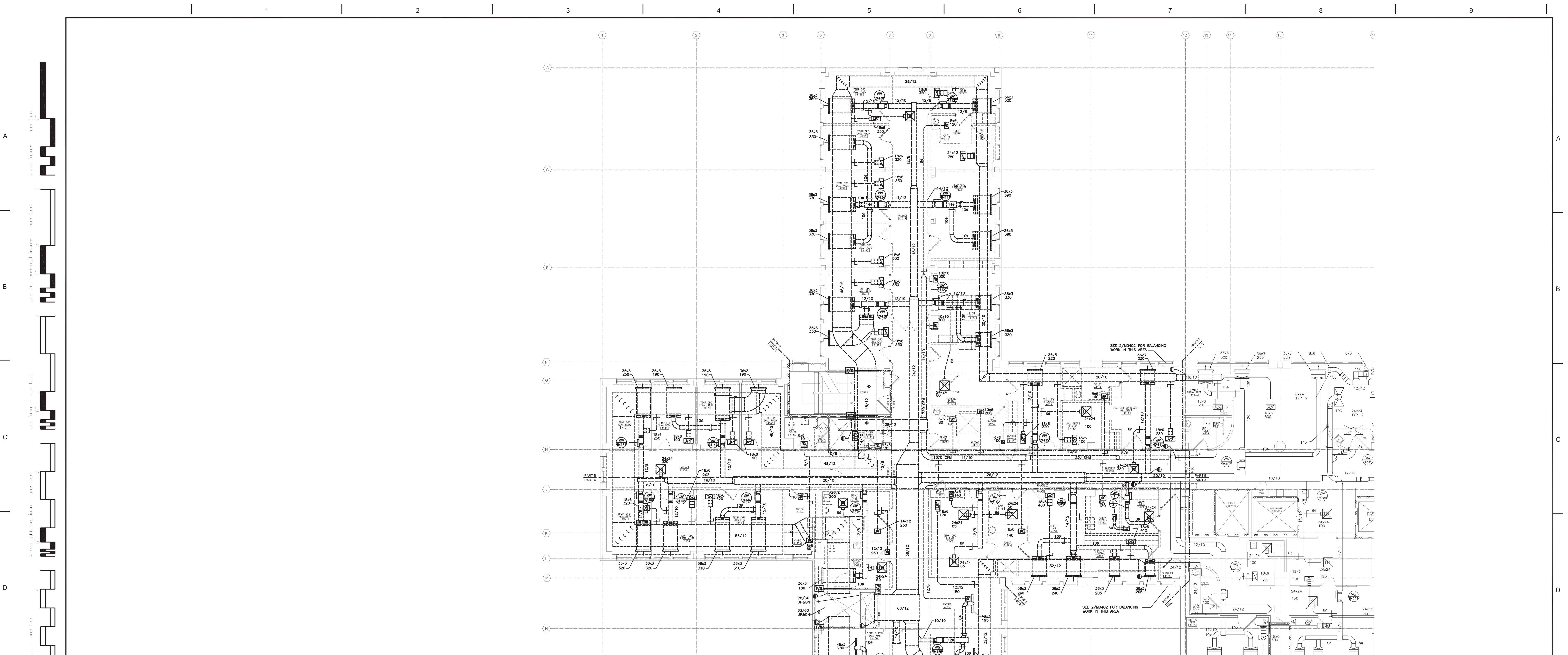
KEY PLAN - FOURTH FLOOR  
NOT TO SCALE

		CONSULTANTS:			ARCHITECT/ENGINEERS:		Drawing Title MECHANICAL LEGENDS AND SYMBOLS		Project Title Renovate Four West		Project Number 585-12-132		Office of Construction and Facilities Management
		 engineers   consultants   commissioning MEP Associates, LLC   2750 Arbor Court   Eau Claire, WI 54701 Phone: 715.832.5589   Fax: 715.832.5668   www.mepassociates.com MEP PROJECT NO.: N06.13.01			 420 RAIL STREET NEGAUNEE, MI 49866 PHONE: 906-475-6616 FAX: 906-475-6954 NDW PROJECT NUMBER: 1214		Approved: Project Director		Location IRON MOUNTAIN, MICHIGAN		Building Number 1		
											Drawing Number MOO1 Dwg. 61 of 100		
100% CONSTRUCTION DOCUMENTS	11/04/2013								Date 11/04/2013		Checked BD	Drawn DLK	
Revisions:	Date												 Department of Veterans Affairs

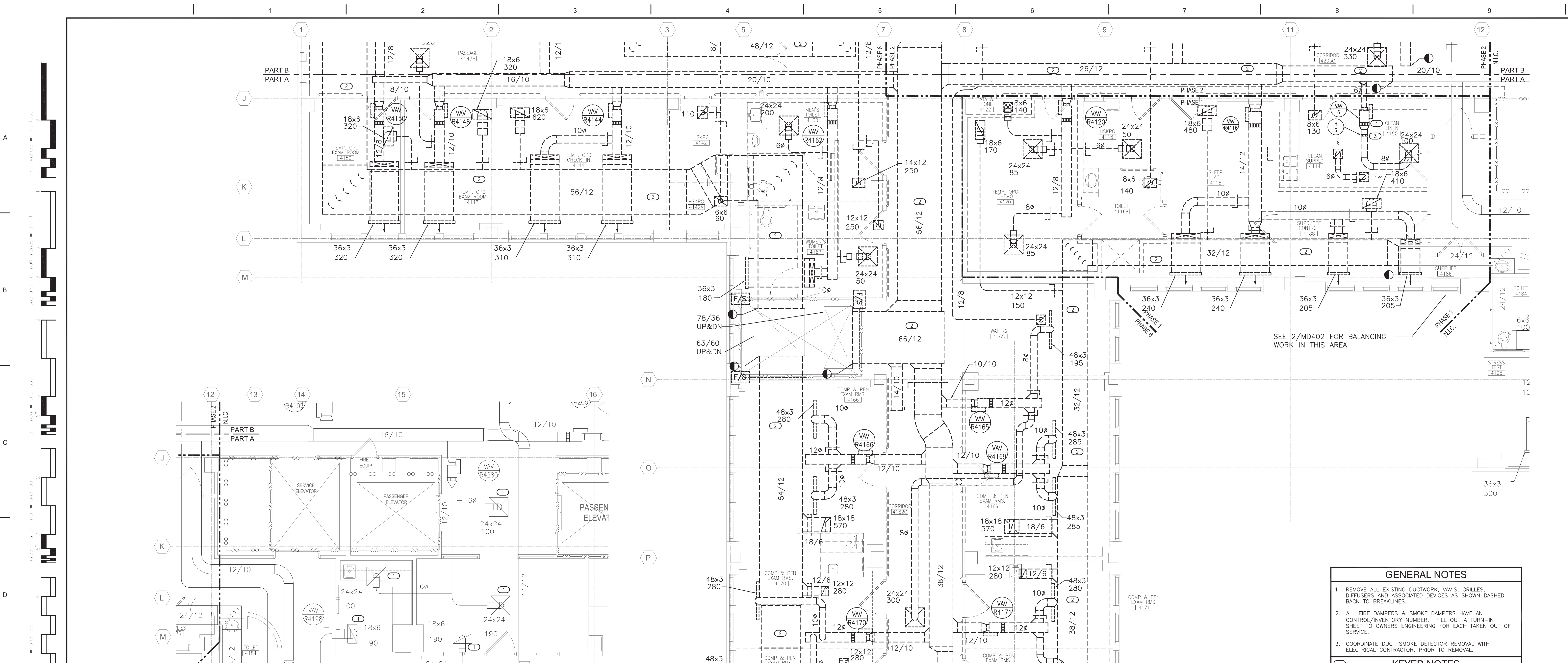






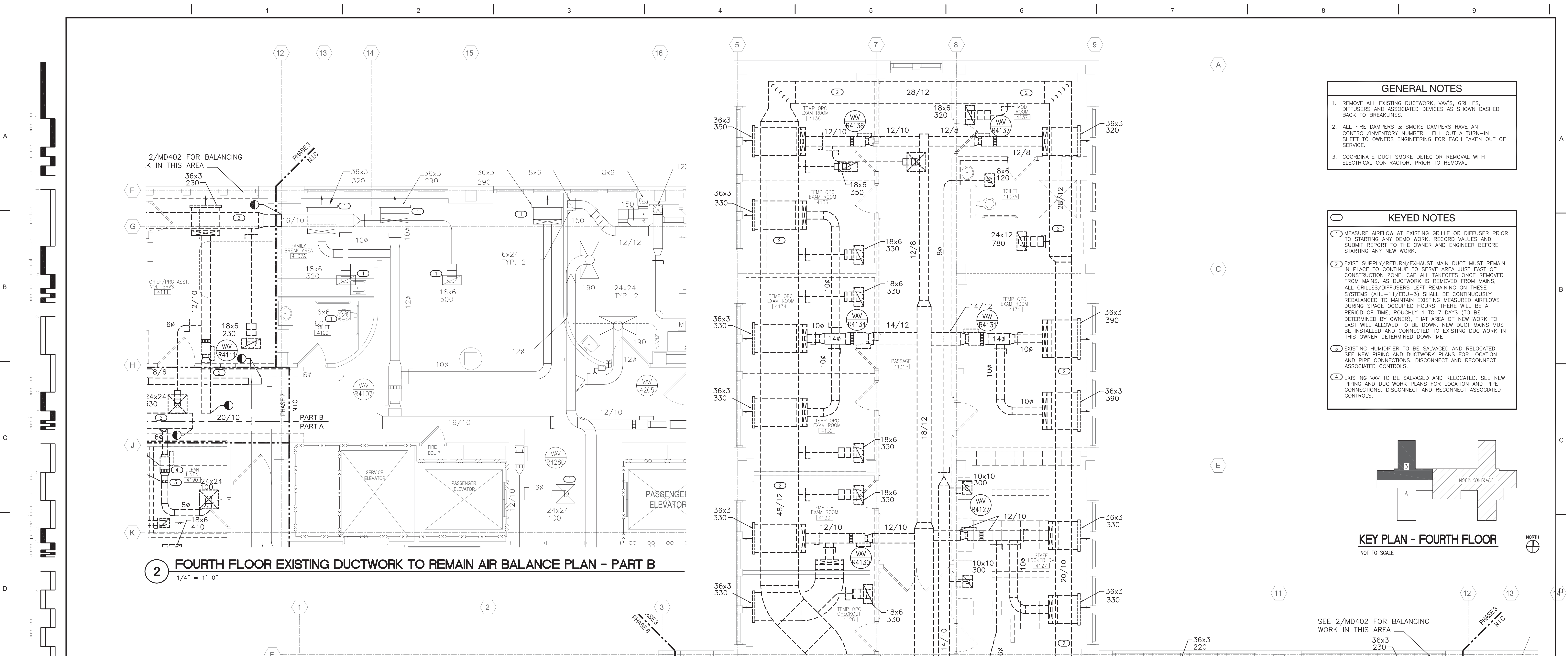






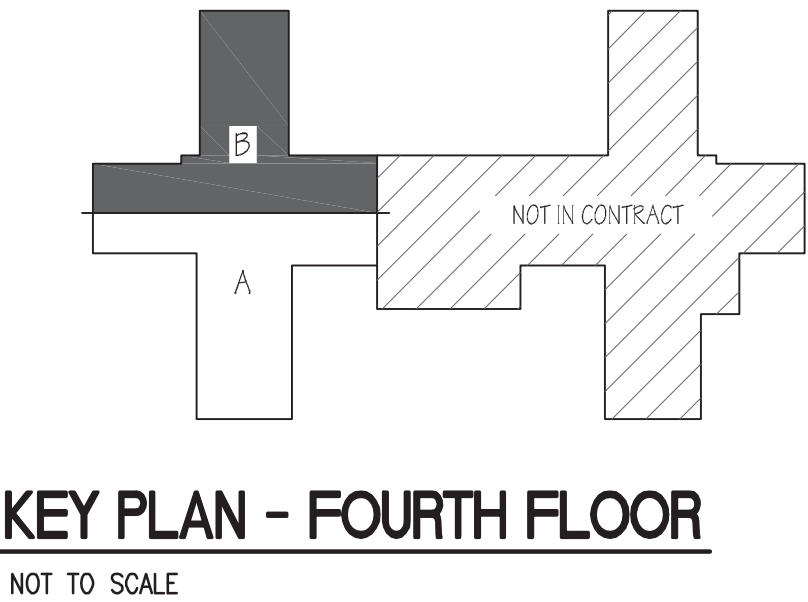
- GENERAL NOTES**
1. REMOVE ALL EXISTING DUCTWORK, VAV'S, GRILLES, DIFFUSERS AND ASSOCIATED DEVICES AS SHOWN DASHED BACK TO BREAKLINES.
  2. ALL FIRE DAMPERS & SMOKE DAMPERS HAVE AN CONTROL/INVENTORY NUMBER. FILL OUT A TURN-IN SHEET TO OWNERS ENGINEERING FOR EACH TAKEN OUT OF SERVICE.
  3. COORDINATE DUCT SMOKE DETECTOR REMOVAL WITH ELECTRICAL CONTRACTOR, PRIOR TO REMOVAL.
- KEYED NOTES**



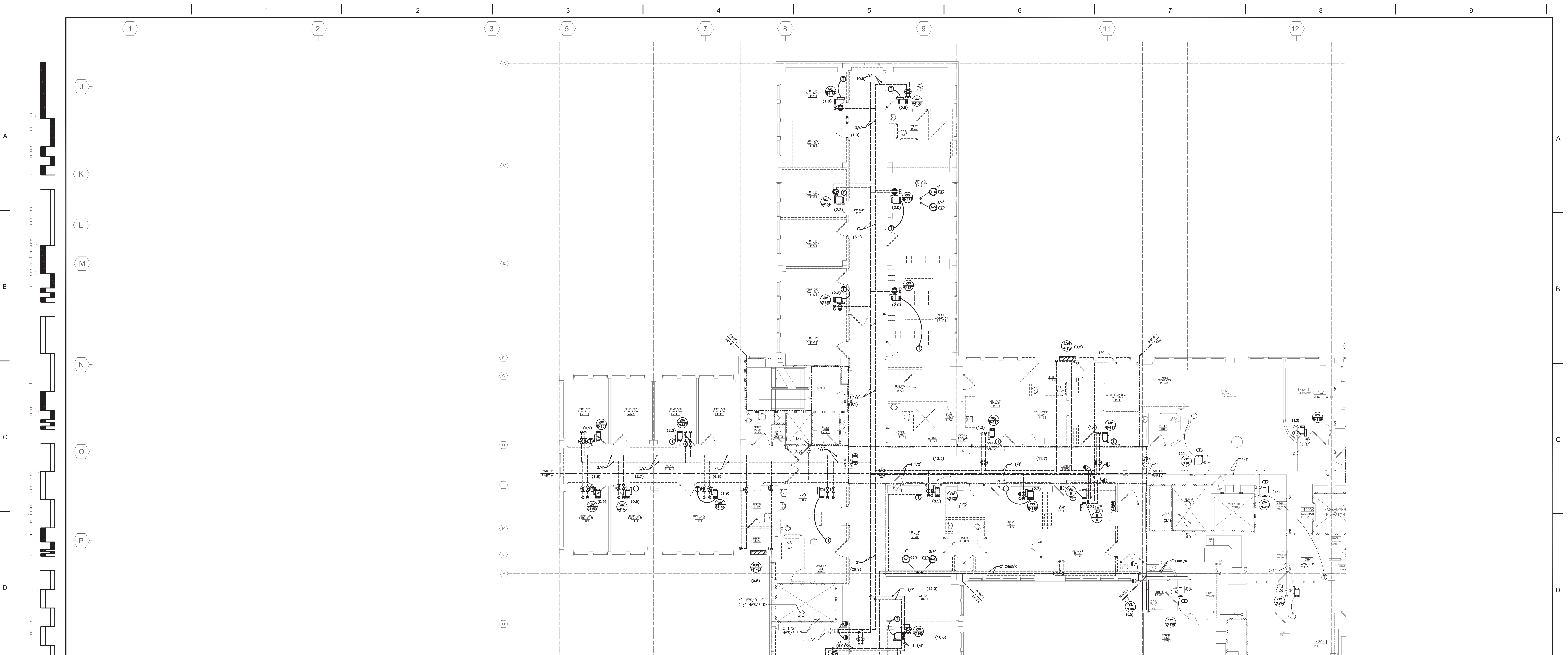


- GENERAL NOTES**
1. REMOVE ALL EXISTING DUCTWORK, VAV'S, GRILLES, DIFFUSERS AND ASSOCIATED DEVICES AS SHOWN DASHED BACK TO BREAKLINES.
  2. ALL FIRE DAMPERS & SMOKE DAMPERS HAVE AN CONTROL/INVENTORY NUMBER. FILL OUT A TURN-IN SHEET TO OWNERS ENGINEERING FOR EACH TAKEN OUT OF SERVICE.
  3. COORDINATE DUCT SMOKE DETECTOR REMOVAL WITH ELECTRICAL CONTRACTOR, PRIOR TO REMOVAL.

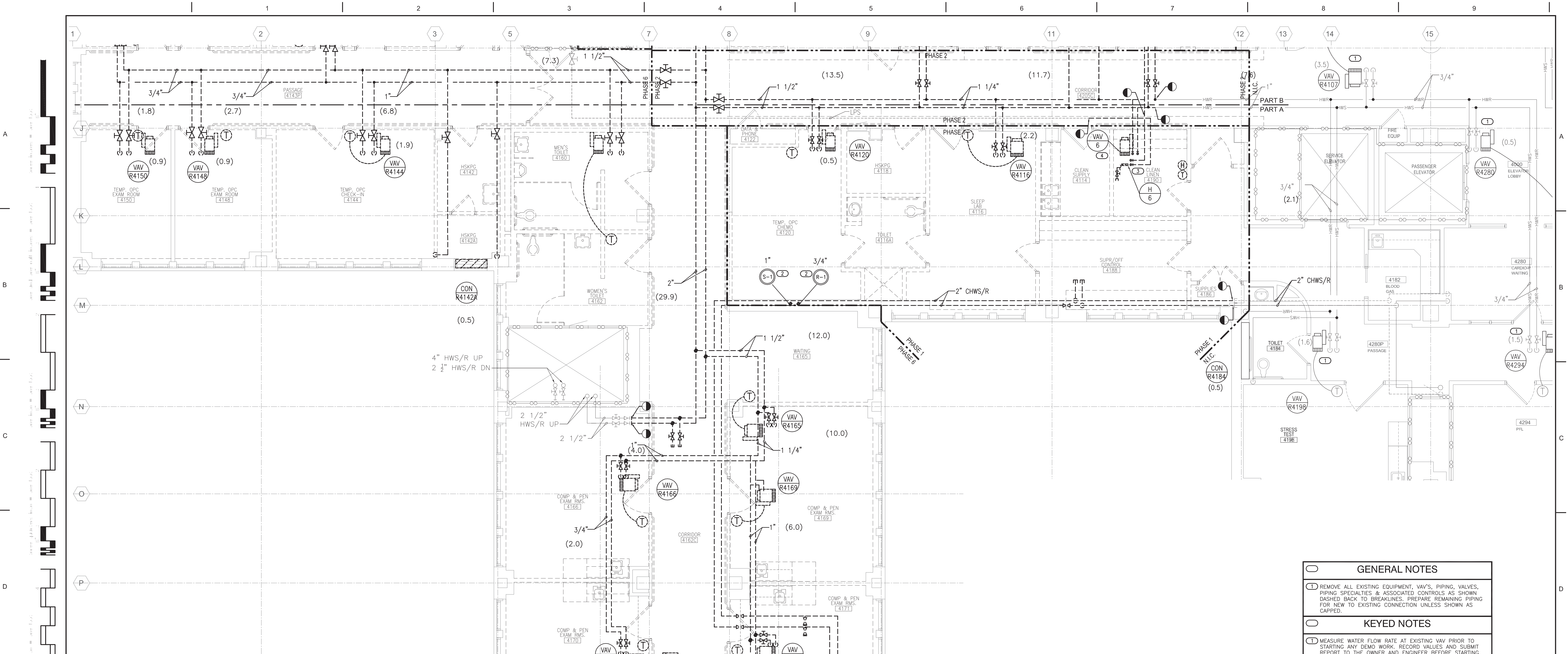
- KEYED NOTES**
1. MEASURE AIRFLOW AT EXISTING GRILLE OR DIFFUSER PRIOR TO STARTING ANY DEMO WORK. RECORD VALUES AND SUBMIT REPORT TO THE OWNER AND ENGINEER BEFORE STARTING ANY NEW WORK.
  2. EXIST SUPPLY/RETURN/EXHAUST MAIN DUCT MUST REMAIN IN PLACE TO CONTINUE TO SERVE AREA JUST EAST OF CONSTRUCTION ZONE. CAP ALL TAKEOFFS ONCE REMOVED FROM MAINS. AS DUCTWORK IS REMOVED FROM MAINS, ALL GRILLES/DIFFUSERS LEFT REMAINING ON THESE SYSTEMS (AHU-11/ERU-3) SHALL BE CONTINUOUSLY REBALANCED TO MAINTAIN EXISTING MEASURED AIRFLOWS DURING SPACE OCCUPIED HOURS. THERE WILL BE A PERIOD OF TIME, ROUGHLY 4 TO 7 DAYS (TO BE DETERMINED BY OWNER), THAT AREA OF NEW WORK TO EAST WILL ALLOWED TO BE DOWN. NEW DUCT MAINS MUST BE INSTALLED AND CONNECTED TO EXISTING DUCTWORK IN THIS OWNER DETERMINED DOWNTIME.
  3. EXISTING HUMIDIFIER TO BE SALVAGED AND RELOCATED. SEE NEW PIPING AND DUCTWORK PLANS FOR LOCATION AND PIPE CONNECTIONS. DISCONNECT AND RECONNECT ASSOCIATED CONTROLS.
  4. EXISTING VAV TO BE SALVAGED AND RELOCATED. SEE NEW PIPING AND DUCTWORK PLANS FOR LOCATION AND PIPE CONNECTIONS. DISCONNECT AND RECONNECT ASSOCIATED CONTROLS.

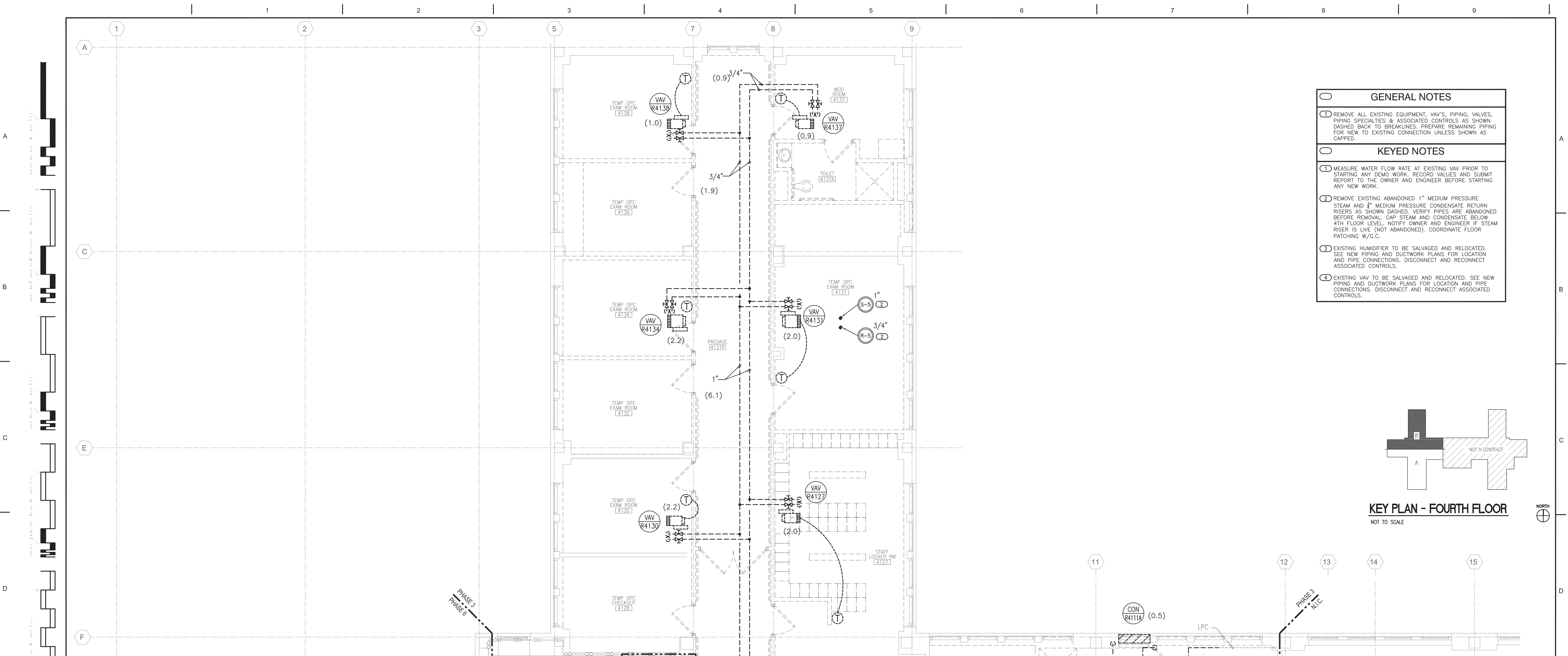


SEE 2/MD402 FOR BALANCING WORK IN THIS AREA

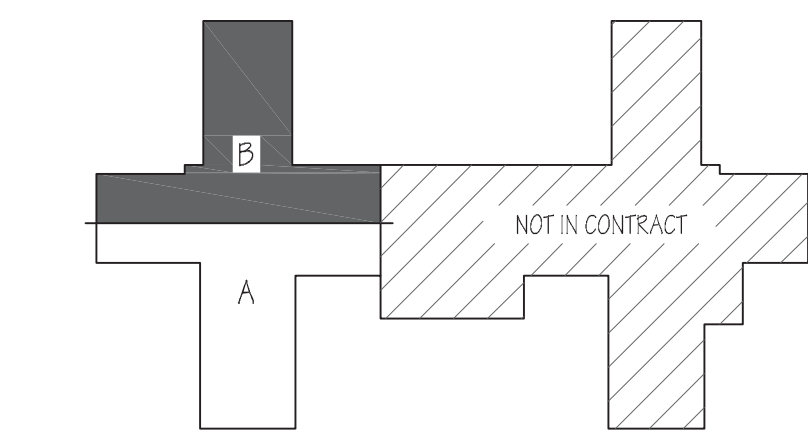








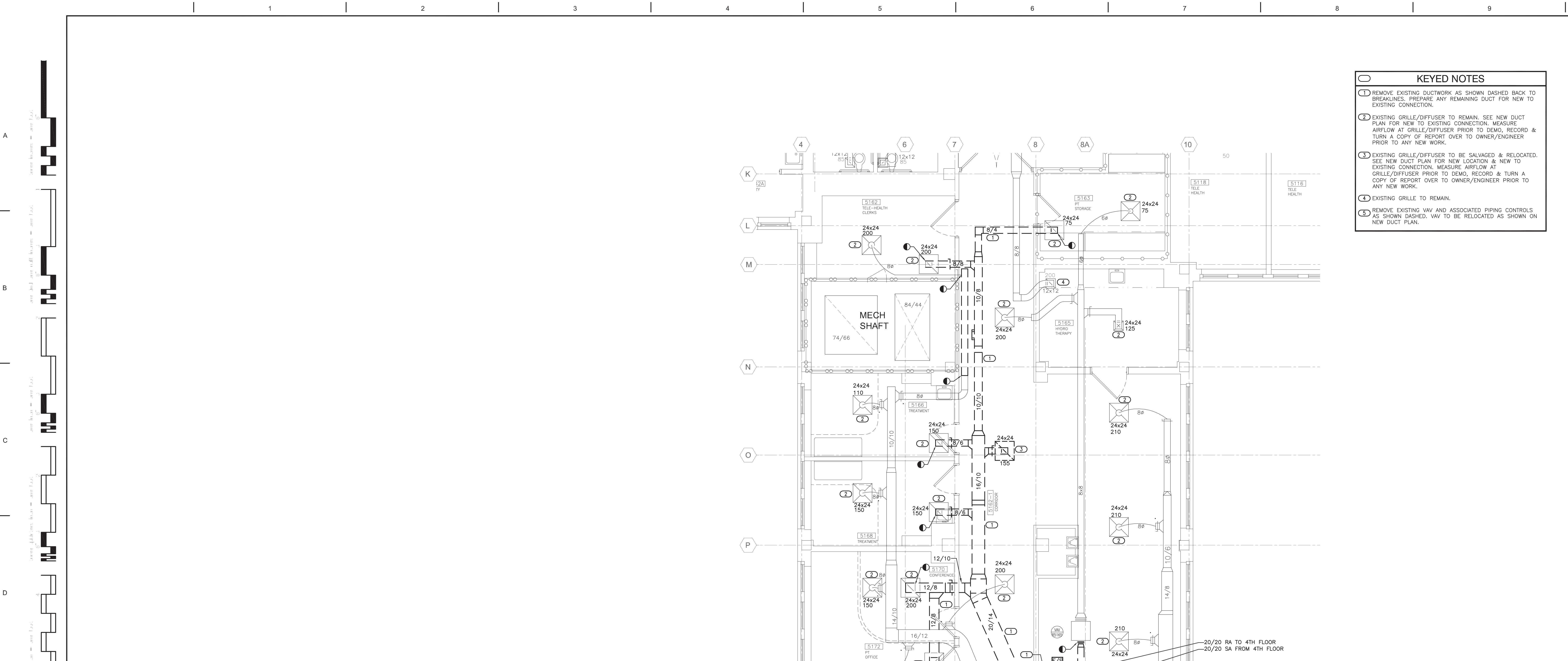
- | GENERAL NOTES |  |
|---------------|--|
| 1             | REMOVE ALL EXISTING EQUIPMENT, VAV'S, PIPING, VALVES, PIPING SPECIALTIES & ASSOCIATED CONTROLS AS SHOWN DASHED BACK TO BREAKLINES. PREPARE REMAINING PIPING FOR NEW TO EXISTING CONNECTION UNLESS SHOWN AS CAPPED. |
- | KEYED NOTES |   |
|-------------|---|
| 1           | MEASURE WATER FLOW RATE AT EXISTING VAV PRIOR TO STARTING ANY DEMO WORK. RECORD VALUES AND SUBMIT REPORT TO THE OWNER AND ENGINEER BEFORE STARTING ANY NEW WORK.  |
| 2           | REMOVE EXISTING ABANDONED 1" MEDIUM PRESSURE STEAM AND 3" MEDIUM PRESSURE CONDENSATE RETURN RISERS AS SHOWN DASHED. VERIFY PIPES ARE ABANDONED BEFORE REMOVAL. CAP STEAM AND CONDENSATE BELOW 4TH FLOOR LEVEL. NOTIFY OWNER AND ENGINEER IF STEAM RISER IS LIVE (NOT ABANDONED). COORDINATE FLOOR PATCHING W/G.C. |
| 3           | EXISTING HUMIDIFIER TO BE SALVAGED AND RELOCATED. SEE NEW PIPING AND DUCTWORK PLANS FOR LOCATION AND PIPE CONNECTIONS. DISCONNECT AND RECONNECT ASSOCIATED CONTROLS.  |
| 4           | EXISTING VAV TO BE SALVAGED AND RELOCATED, SEE NEW PIPING AND DUCTWORK PLANS FOR LOCATION AND PIPE CONNECTIONS. DISCONNECT AND RECONNECT ASSOCIATED CONTROLS.   |



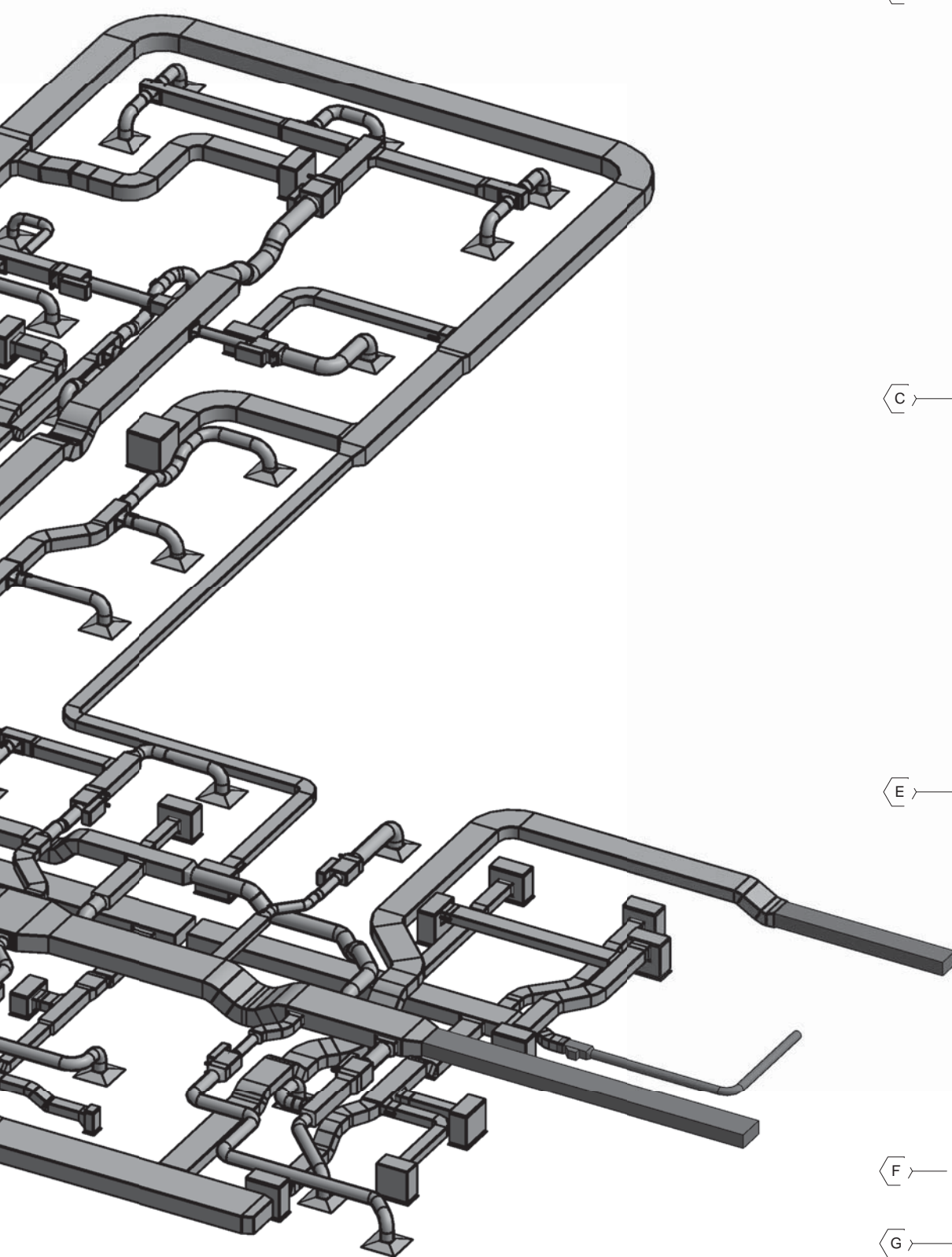
**KEY PLAN - FOURTH FLOOR**  
NOT TO SCALE



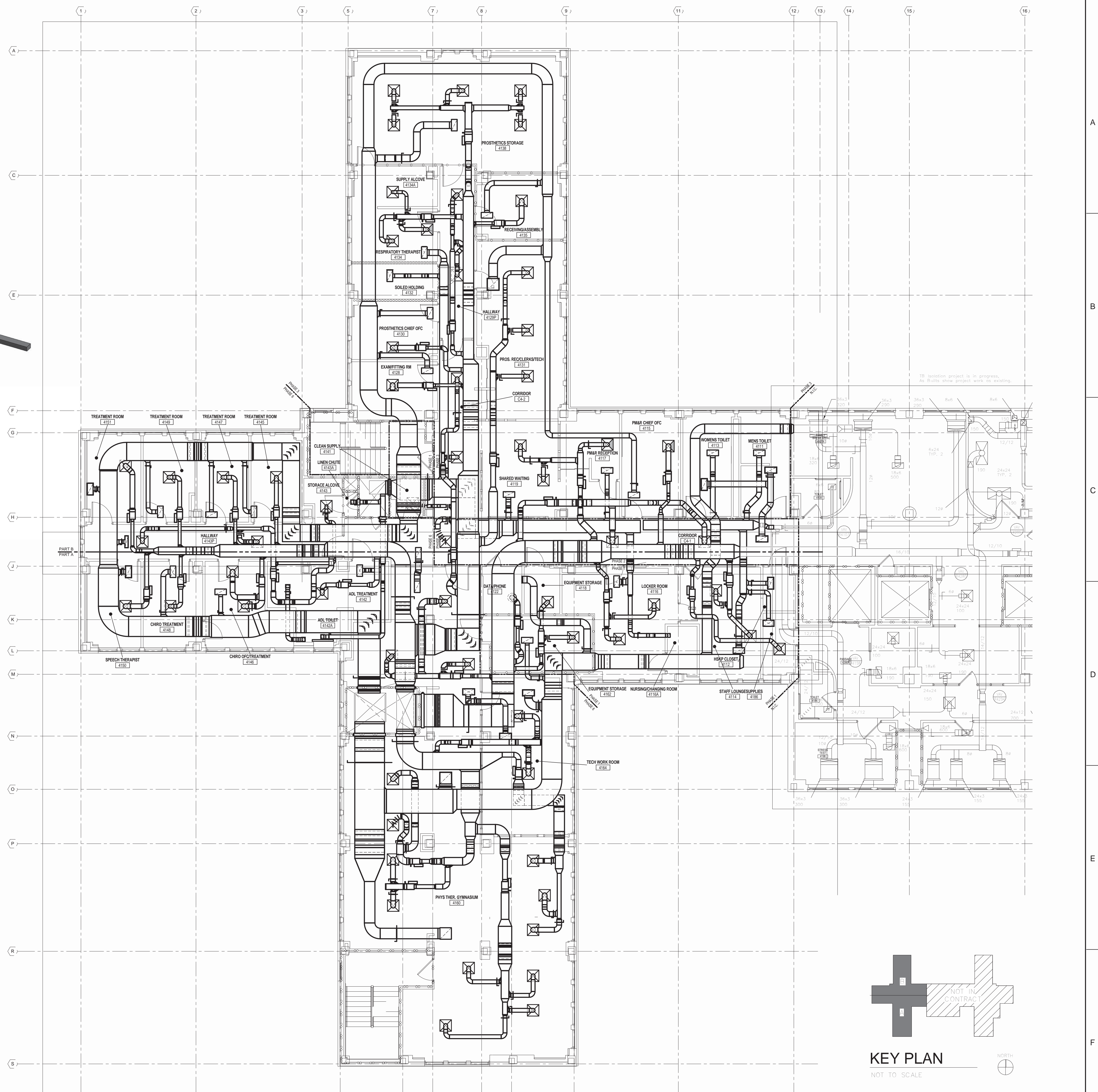








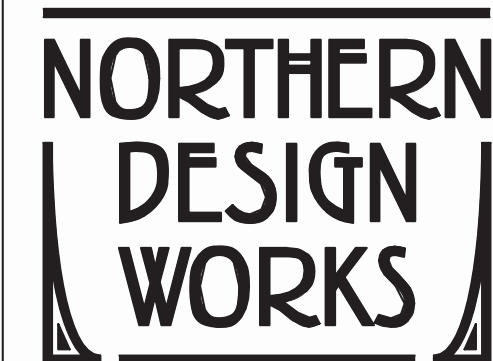
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1 4TH FLOOR DUCTWORK PLAN - OVERALL (FOR REFERENCE ONLY)  
1/8" = 1'-0"



ARCHITECT/ENGINEERS:



420 RAIL STREET  
NEGAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

Drawing Title  
4TH FLOOR DUCWORK PLAN -  
OVERALL (FOR REFERENCE ONLY)

Approved: Project Director

Project Title  
Renovate Four West

Location  
IRON MOUNTAIN, MICHIGAN

Date  
01/22/2014

Checked  
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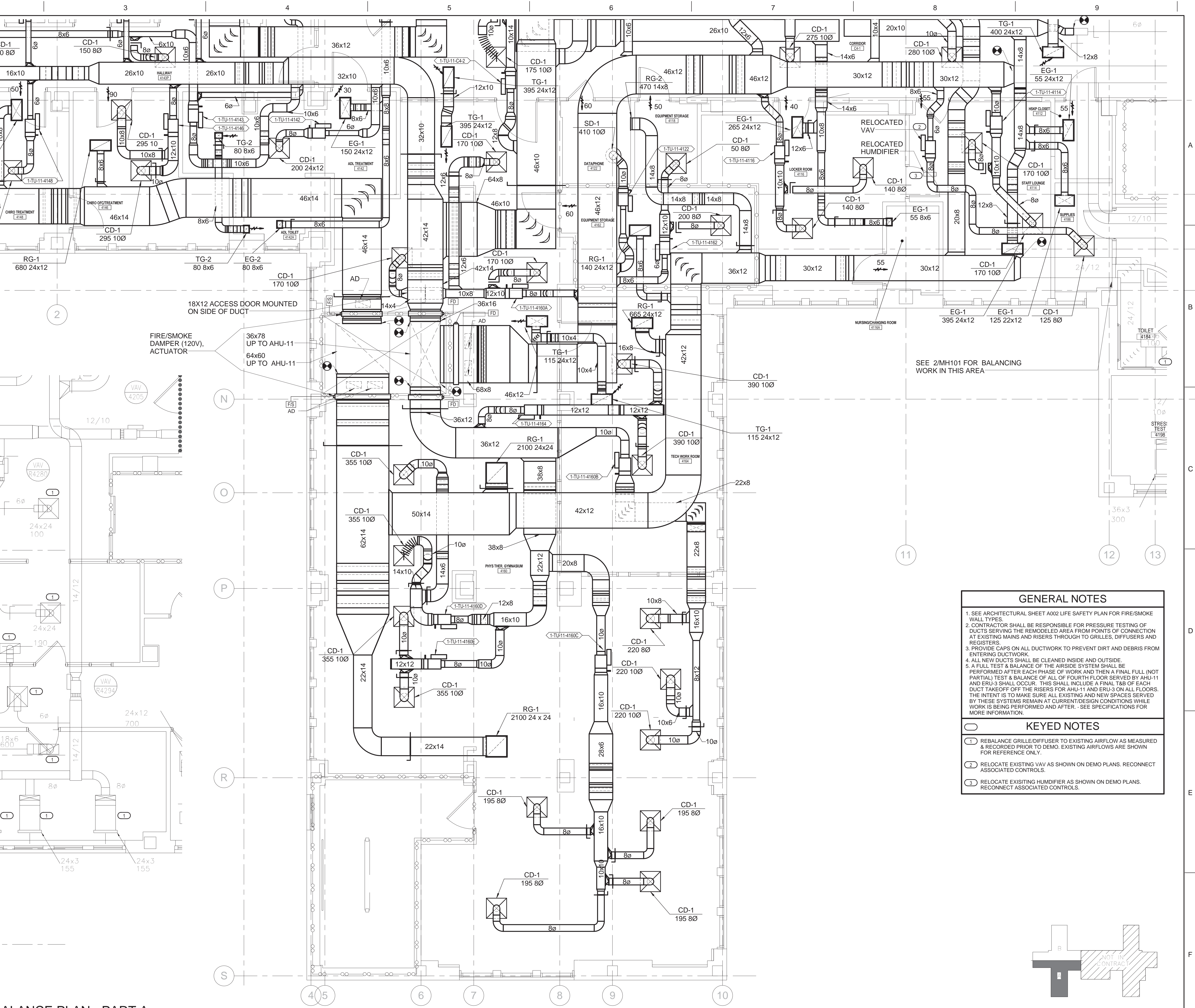
Project Number  
585-12-132  
Building Number  
1

Drawing Number  
MH100  
Dwg. 70 of 100

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and Facilities  
Management







- GENERAL NOTES**
- SEE ARCHITECTURAL SHEET A002 LIFE SAFETY PLAN FOR FIRE/SMOKE WALL TYPES.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR PRESSURE TESTING OF DUCTS SERVING THE REMODELED AREA FROM POINTS OF CONNECTION AT EXISTING MAINS AND RISERS THROUGH TO GRILLES, DIFFUSERS AND REGISTERS.
  - PROVIDE CAPS ON ALL DUCTWORK TO PREVENT DIRT AND DEBRIS FROM ENTERING DUCTWORK.
  - ALL NEW DUCTS SHALL BE CLEANED INSIDE AND OUTSIDE.
  - A FULL TEST & BALANCE OF THE AIRSIDE SYSTEM SHALL BE PERFORMED AFTER EACH PHASE OF WORK AND THEN A FINAL FULL (NOT PARTIAL) TEST & BALANCE OF ALL OF FOURTH FLOOR SERVED BY AHU-11 AND ERU-3 SHALL OCCUR. THIS SHALL INCLUDE A FINAL T&B OF EACH DUCT TAKEOFF OFF THE RISERS FOR AHU-11 AND ERU-3 ON ALL FLOORS. THE INTENT IS TO MAKE SURE ALL EXISTING AND NEW SPACES SERVED BY THESE SYSTEMS REMAIN AT CURRENT/DESIGN CONDITIONS WHILE WORK IS BEING PERFORMED AND AFTER. - SEE SPECIFICATIONS FOR MORE INFORMATION.
- KEYED NOTES**
- REBALANCE GRILLE/DIFFUSER TO EXISTING AIRFLOW AS MEASURED & RECORDED PRIOR TO DEMO. EXISTING AIRFLOWS ARE SHOWN FOR REFERENCE ONLY.
  - RELOCATE EXISTING VAV AS SHOWN ON DEMO PLANS. RECONNECT ASSOCIATED CONTROLS.
  - RELOCATE EXISTING HUMIDIFIER AS SHOWN ON DEMO PLANS. RECONNECT ASSOCIATED CONTROLS.

BALANCE PLAN - PART A

1 4TH FLOOR DUCTWORK PLAN - PART A  
1/4" = 1'-0"



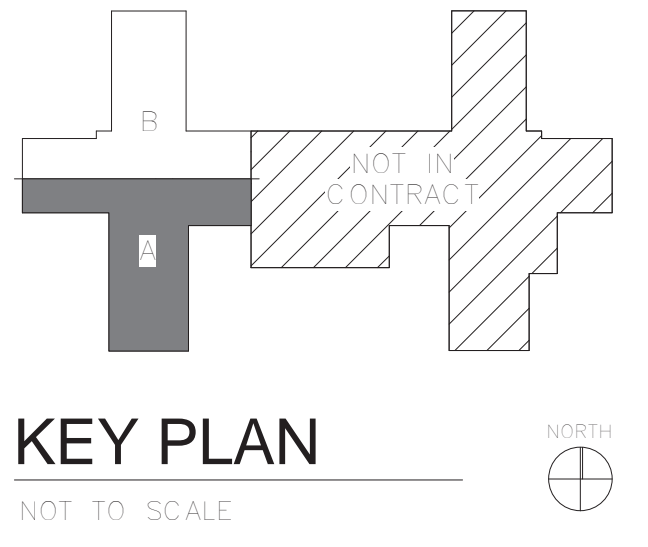
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**NORTHERN DESIGN WORKS**  
420 RAIL STREET  
NEGAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

Drawing Title  
**4TH FLOOR DUCTWORK PLAN - PART A**  
Approved: Project Director

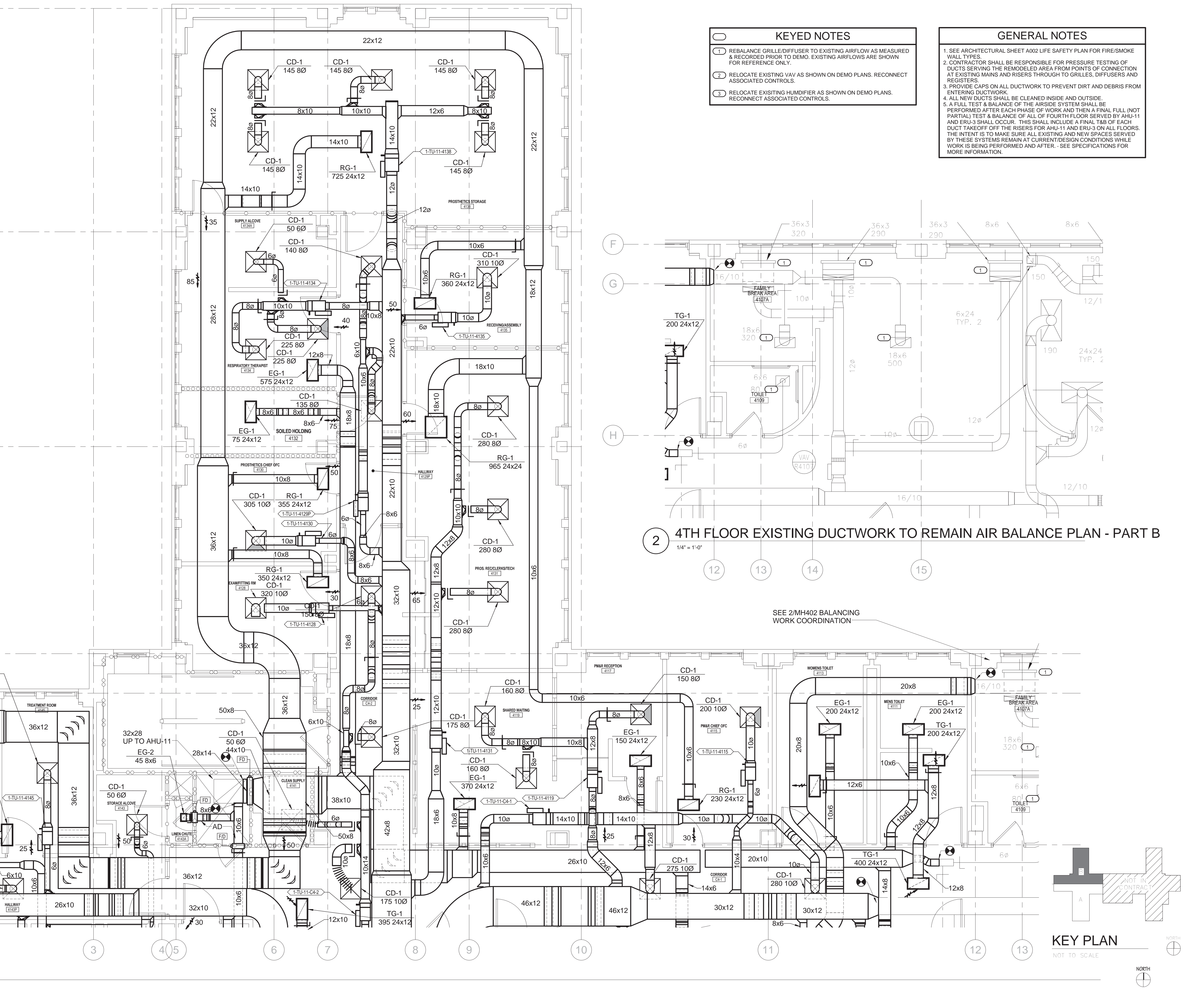
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Location  
IRON MOUNTAIN, MICHIGAN  
Date  
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Project Number  
585-12-132  
Building Number  
1  
Drawing Number  
MH101  
Dwg. 71 of 100

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Department of Veterans Affairs







ARCHITECT/ENGINEERS:



420 RAIL STREET  
NEGAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

Drawing Title  
4TH FLOOR DUCTWORK PLAN -  
PART B

Approved: Project Director

Project Title  
Renovate Four West

Location  
IRON MOUNTAIN, MICHIGAN

Date  
01/22/2014

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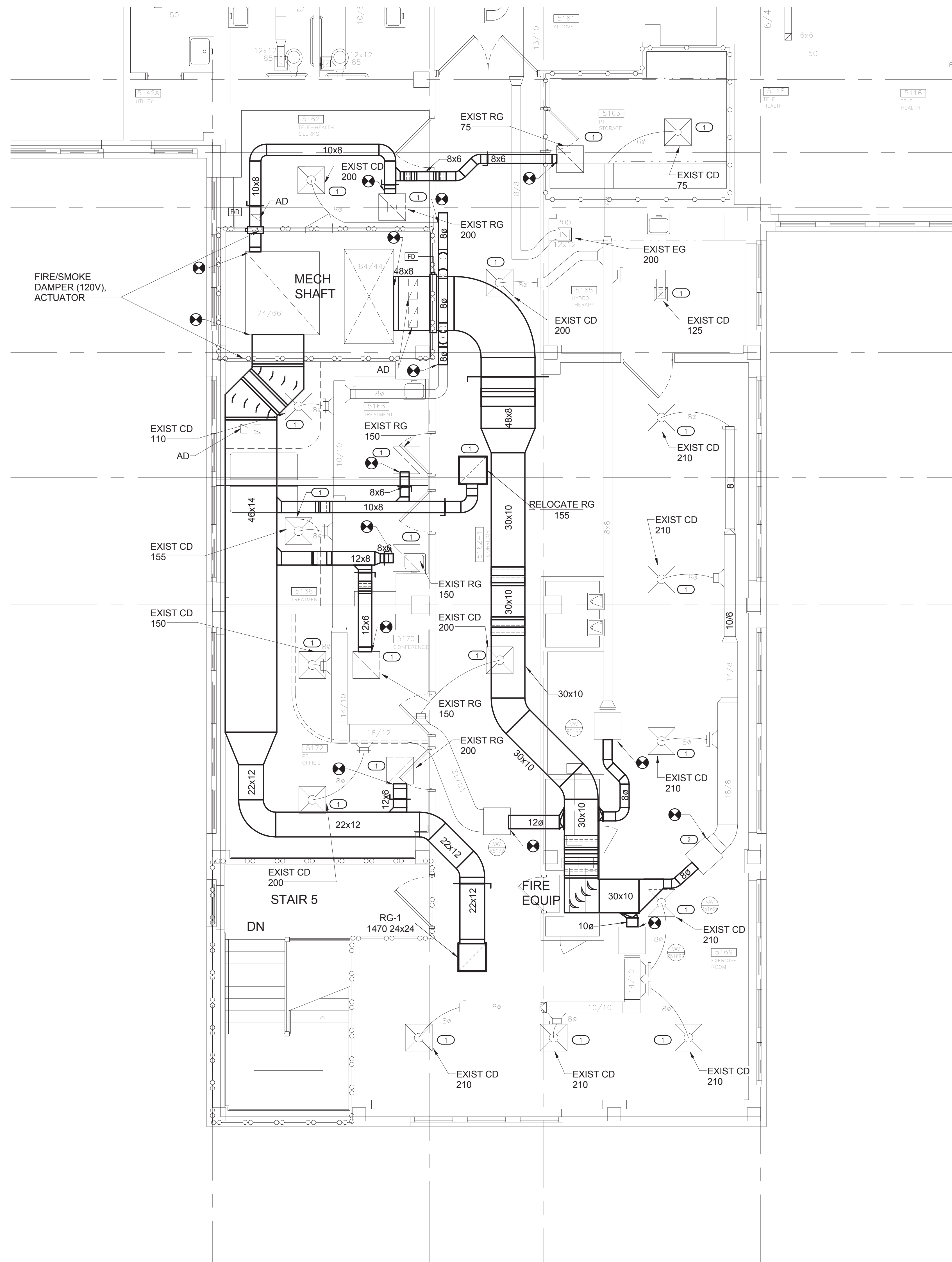
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Building Number  
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Drawing Number  
MH102  
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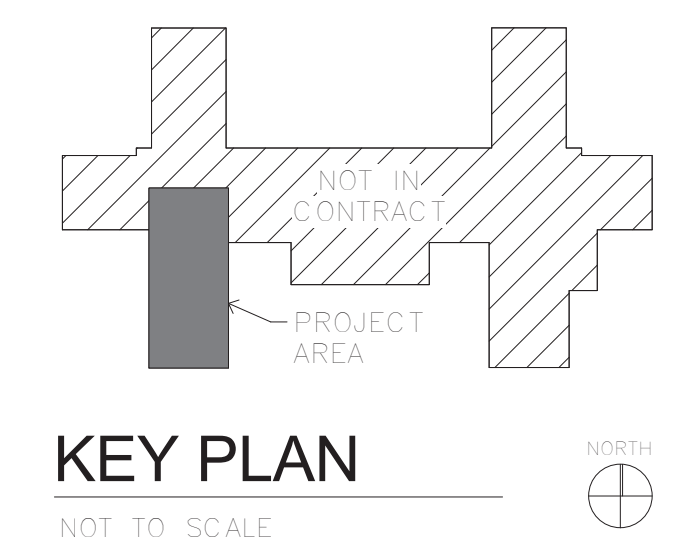
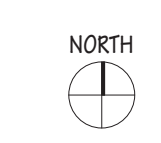






- KEYED NOTES**
- 1 REBALANCE GRILLE/DIFFUSER TO EXISTING AIRFLOW AS MEASURED & RECORDED PRIOR TO DEMO. EXISTING AIRFLOWS ARE SHOWN FOR REFERENCE ONLY.
  - 2 DISCONNECT AND RECONNECT PIPING TO NEW VAV LOCATION

1 5TH FLOOR DUCWORK PLAN  
1/4" = 1'-0"



KEY PLAN  
NOT TO SCALE



ARCHITECT/ENGINEERS:  
**NORTHERN DESIGN WORKS**  
420 RAIL STREET  
NEGAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

Drawing Title  
**5TH FLOOR DUCTWORK PLAN**

Approved: Project Director

Project Title  
**Renovate Four West**

Location  
**IRON MOUNTAIN, MICHIGAN**

Date  
11/04/2013

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BD

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Project Number  
**585-12-132**

Building Number  
**1**

Drawing Number  
**MH200**

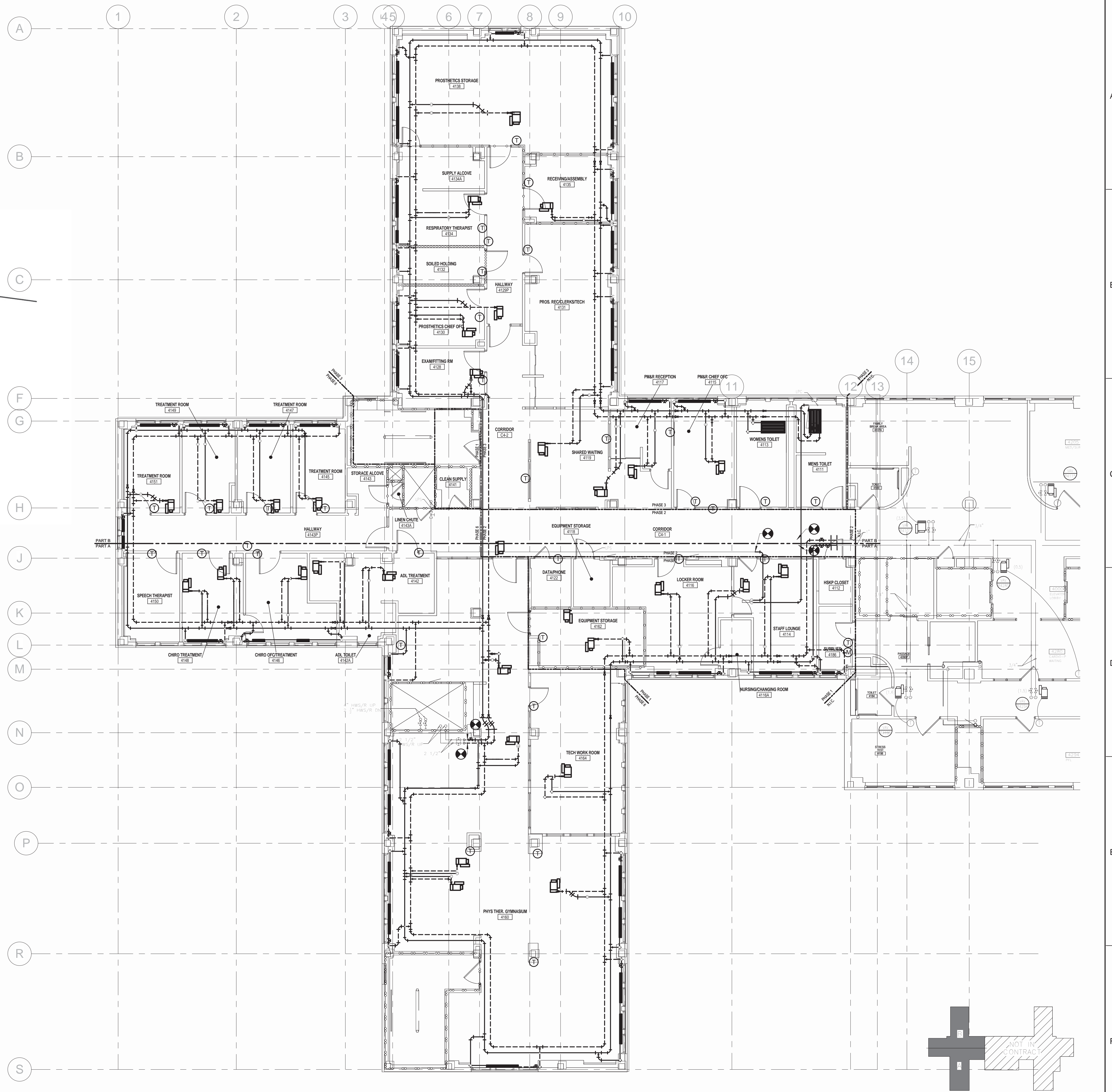
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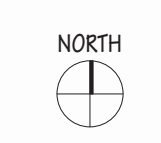
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Veterans Affairs



REFERENCE ONLY)



1 FOURTH FLOOR MECHANICAL PIPING PLAN - OVERALL (FOR REFERENCE ONLY)  
1/8" = 1'-0"



KEY PLAN  
NOT TO SCALE



ARCHITECT/ENGINEERS:  
**NORTHERN DESIGN WORKS**  
420 RAIL STREET  
NEGAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

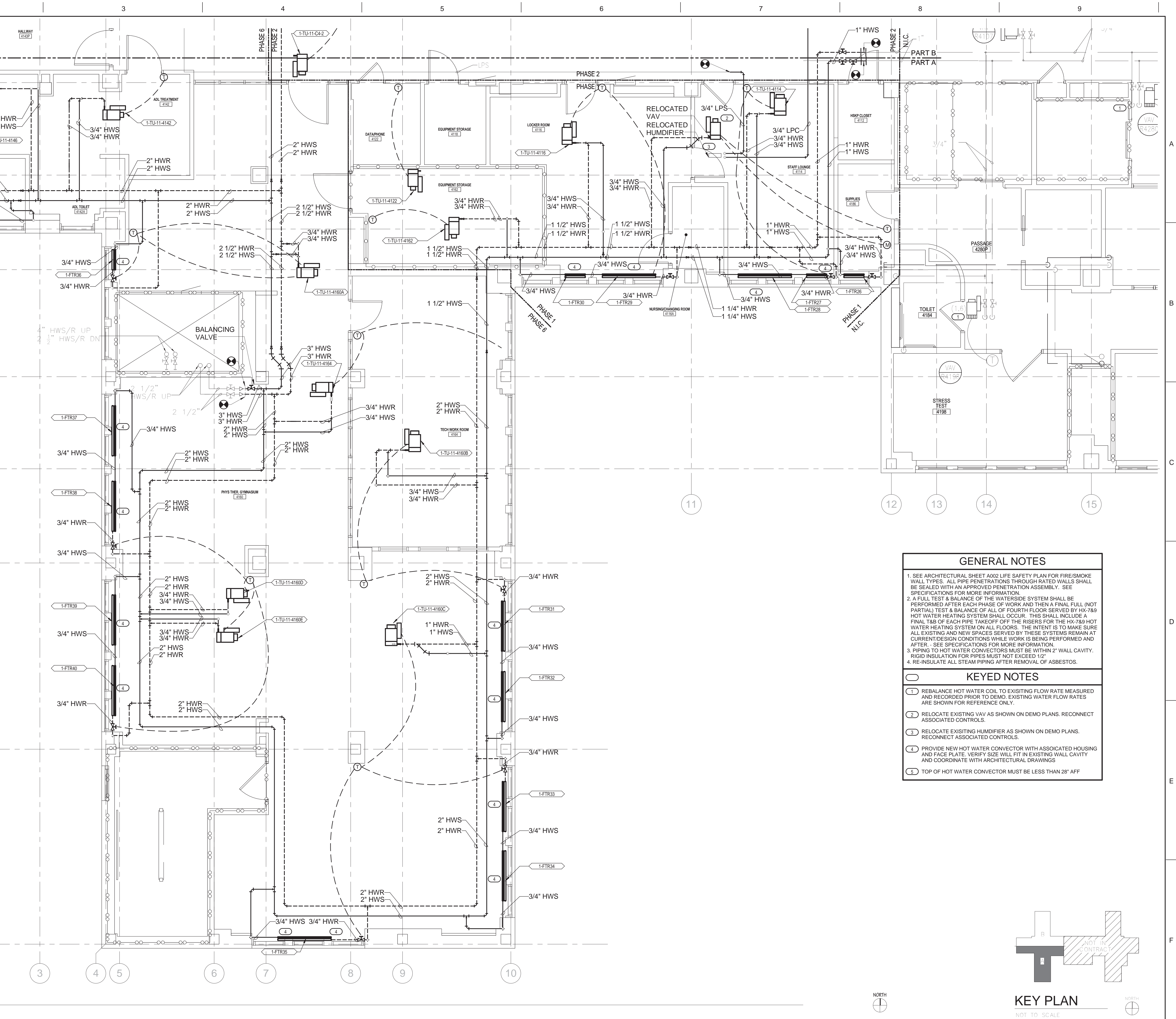
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**4TH FLOOR MECHANICAL PIPING PLAN - OVERALL (FOR REFERENCE ONLY)**  
Approved: Project Director

Project Title  
Renovate Four West  
Location  
IRON MOUNTAIN, MICHIGAN  
Date  
01/22/2014  
Checked  
BD  
Drawn  
DLK

Project Number  
585-12-132  
Building Number  
1  
Drawing Number  
MP100  
Dwg. 74 of 100

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Department of Veterans Affairs





**GENERAL NOTES**

1. SEE ARCHITECTURAL SHEET A002 LIFE SAFETY PLAN FOR FIRE/SMOKE WALL TYPES. ALL PIPE PENETRATIONS THROUGH RATED WALLS SHALL BE SEALED WITH AN APPROVED PENETRATION ASSEMBLY. SEE SPECIFICATIONS FOR MORE INFORMATION.

2. A FULL TEST & BALANCE OF THE WATERSIDE SYSTEM SHALL BE PERFORMED AFTER EACH PHASE OF WORK AND THEN A FINAL FULL (NOT PARTIAL) TEST & BALANCE OF ALL OF FOURTH FLOOR SERVED BY HX-7&9 HOT WATER HEATING SYSTEM SHALL OCCUR. THIS SHALL INCLUDE A FINAL T&B OF EACH PIPE TAKEOFF OFF THE RISERS FOR THE HX-7&9 HOT WATER HEATING SYSTEM ON ALL FLOORS. THE INTENT IS TO MAKE SURE ALL EXISTING AND NEW SPACES SERVED BY THESE SYSTEMS REMAIN AT CURRENT/DESIGN CONDITIONS WHILE WORK IS BEING PERFORMED AND AFTER. SEE SPECIFICATIONS FOR MORE INFORMATION.

3. PIPING TO HOT WATER CONVECTORS MUST BE WITHIN 2" WALL CAVITY. RIGID INSULATION FOR PIPES MUST NOT EXCEED 1/2"

4. RE-INSULATE ALL STEAM PIPING AFTER REMOVAL OF ASBESTOS.

**KEYED NOTES**

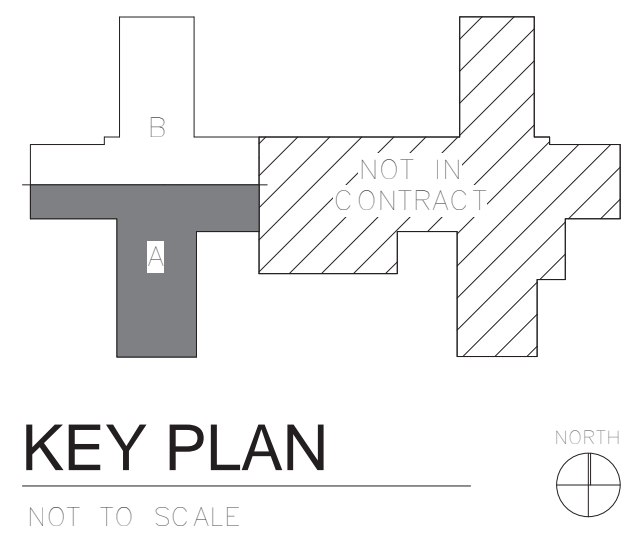
1 REBALANCE HOT WATER COIL TO EXISTING FLOW RATE MEASURED AND RECORDED PRIOR TO DEMO. EXISTING WATER FLOW RATES ARE SHOWN FOR REFERENCE ONLY.

2 RELOCATE EXISTING VAV AS SHOWN ON DEMO PLANS. RECONNECT ASSOCIATED CONTROLS.

3 RELOCATE EXISTING HUMIDIFIER AS SHOWN ON DEMO PLANS. RECONNECT ASSOCIATED CONTROLS.

4 PROVIDE NEW HOT WATER CONVECTOR WITH ASSOCIATED HOUSING AND FACE PLATE. VERIFY SIZE WILL FIT IN EXISTING WALL CAVITY AND COORDINATE WITH ARCHITECTURAL DRAWINGS

5 TOP OF HOT WATER CONVECTOR MUST BE LESS THAN 28" AFF



ARCHITECT/ENGINEERS:



420 RAIL STREET  
NEGAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

Drawing Title  
**4TH FLOOR MECHANICAL PIPING  
PLAN - PART A**

Approved: Project Director

Project Title  
**Renovate Four West**

Location  
**IRON MOUNTAIN, MICHIGAN**

Date  
01/22/2014

Checked  
BD

Drawn  
DLK

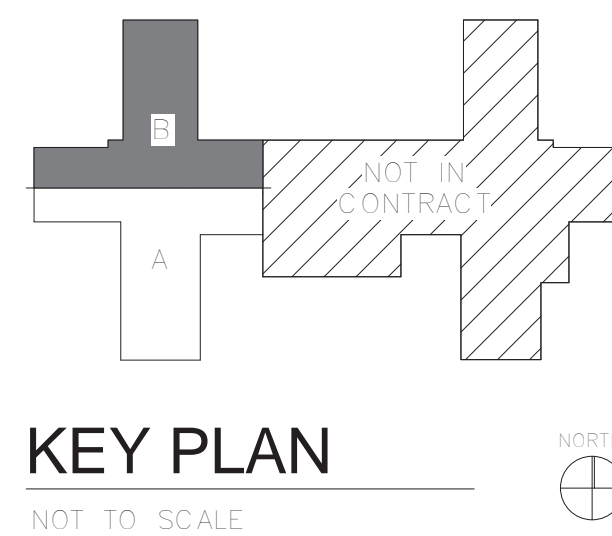
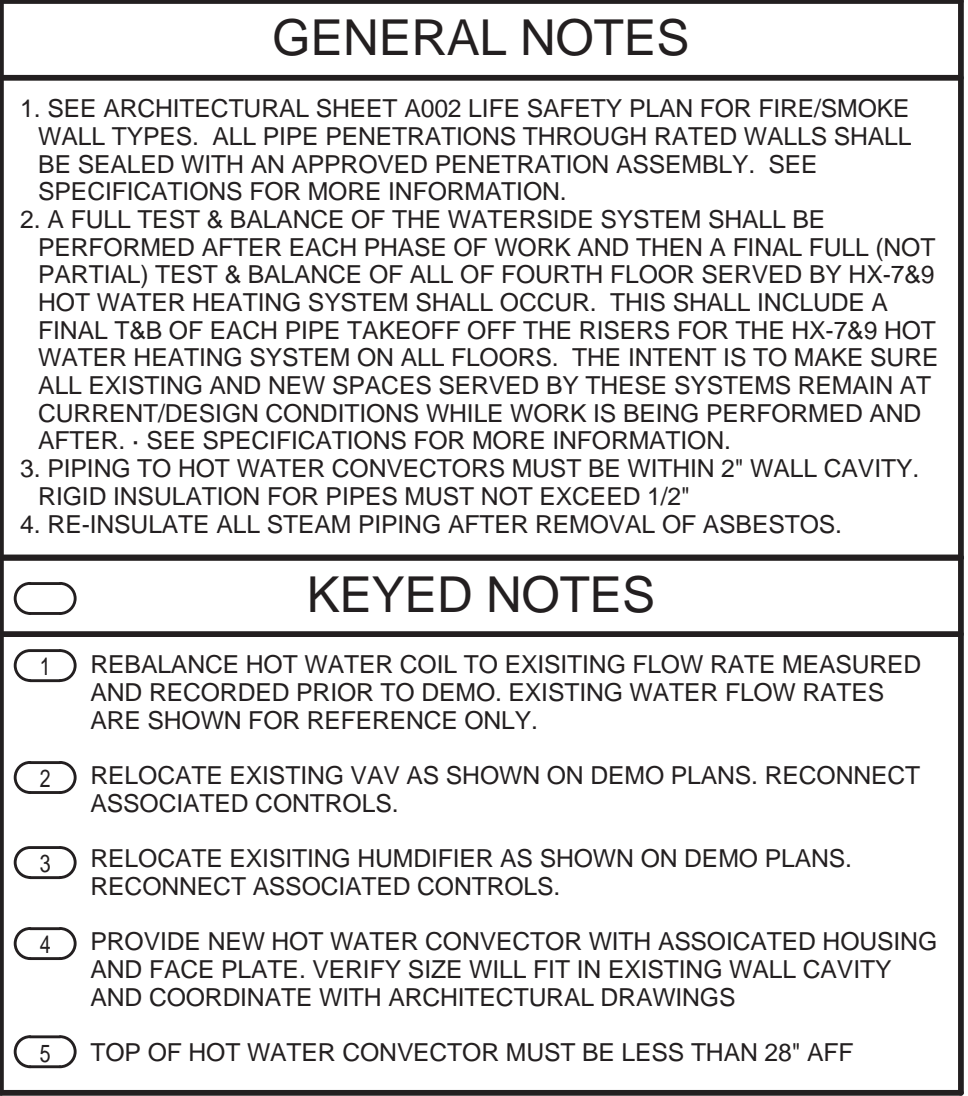
Project Number  
**585-12-132**  
Building Number  
**1**

Drawing Number  
**MP101**  
Dwg. 75 of 100

Office of  
Construction  
and Facilities  
Management











one and one half inches = one foot

one inch = one foot

three quarters inch = one foot

one half inch = one foot

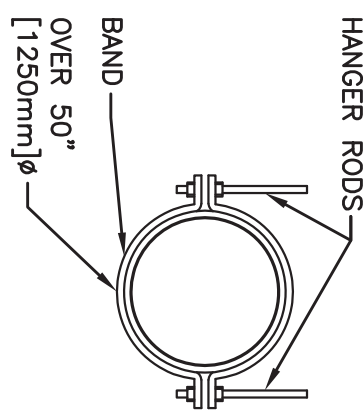
three eighths inch = one foot

one quarter inch = one foot

one eighth inch = one foot

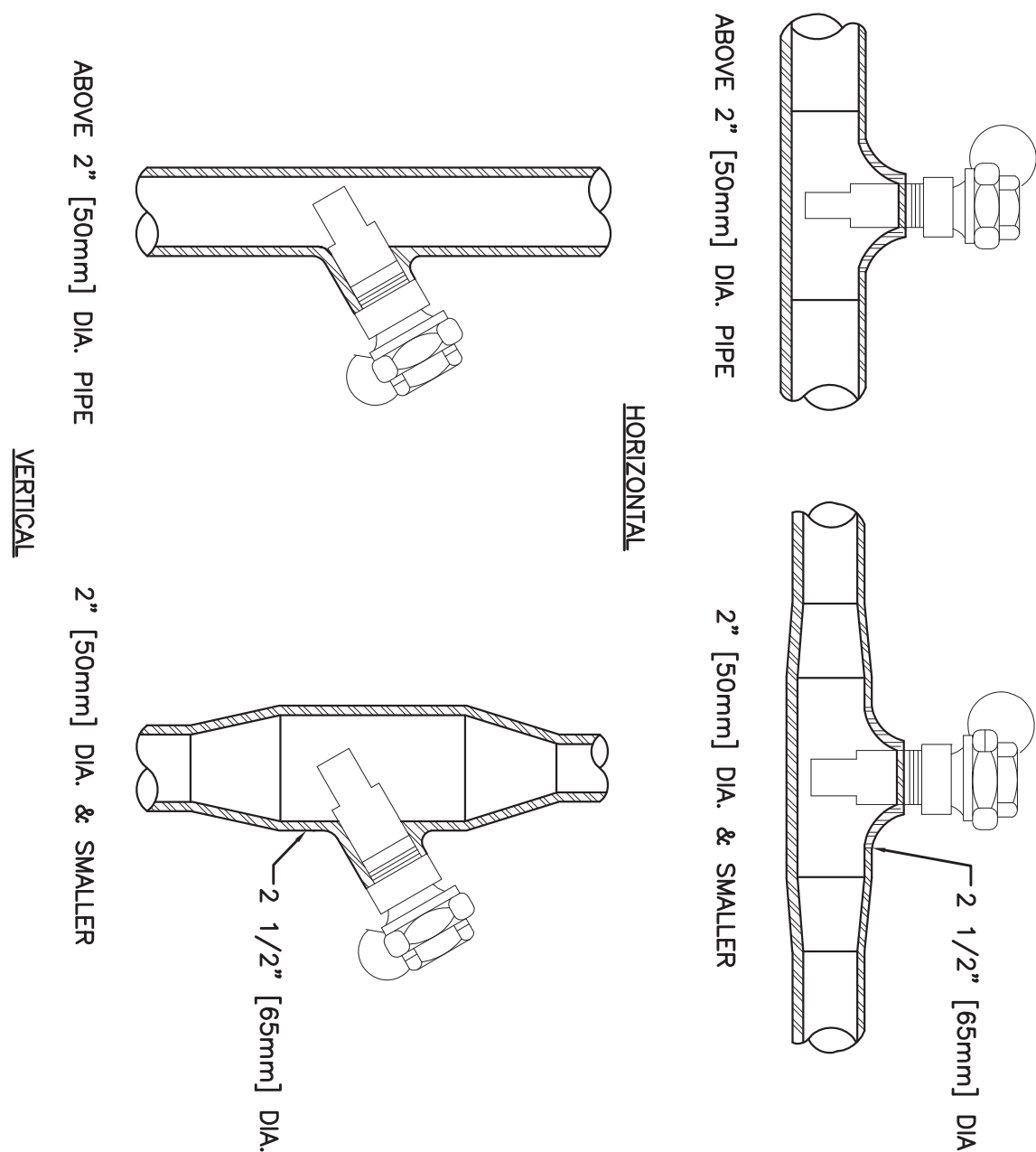
HANGER STRAPS OR RODS				
MAX. DUCT #	QUANTITY/SIZE	MAX. LOAD	MAX. SPACING	
IN. [mm]	N. [mm]	LEBS. [kg]	IN. [mm]	
26 [660]	ONE 1 [25] x 22 GA STRAP	260 [119]	144 [3600]	
36 [900]	ONE 1 [25] x 18 GA STRAP	420 [190]	144 [3600]	
50 [1250]	ONE 1 [25] x 16 GA STRAP	700 [317]	144 [3600]	
60 [1500]	TWO 3/8 [10] # RODS	1320 [598]	144 [3600]	
84 [2100]	TWO 1/2 [13] # RODS	2500 [1133]	144 [3600]	

NOTE:  
RADIATED DUCTS FROM SPACE HEATING SYSTEMS REQUIRE INSULATION, BUT NO EXTERNAL LOAD.

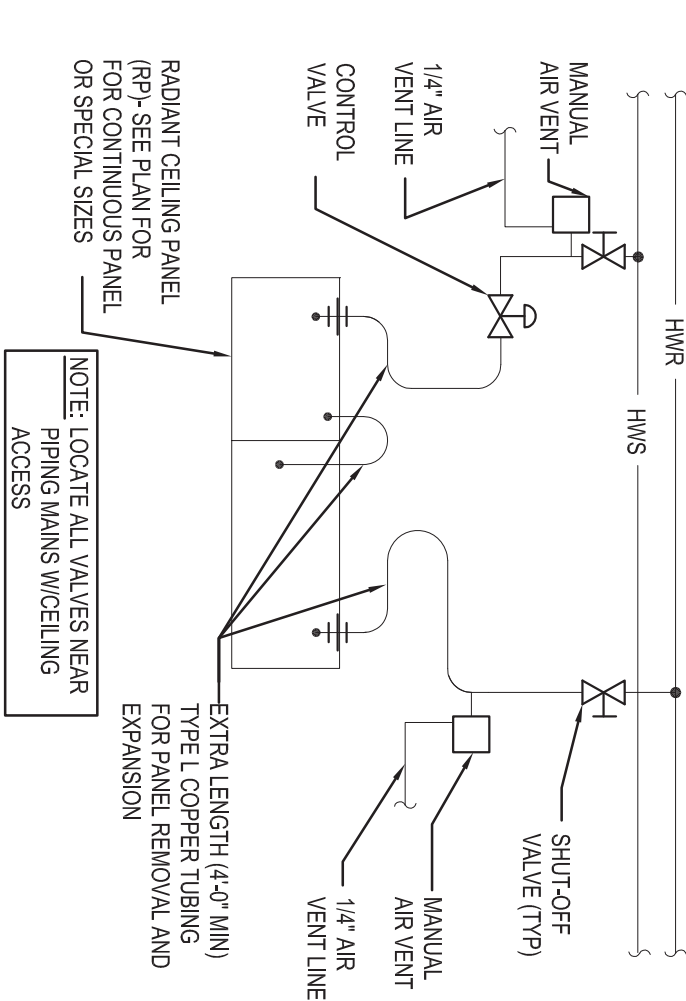


#### 4 ROUND DUCT HANGERS

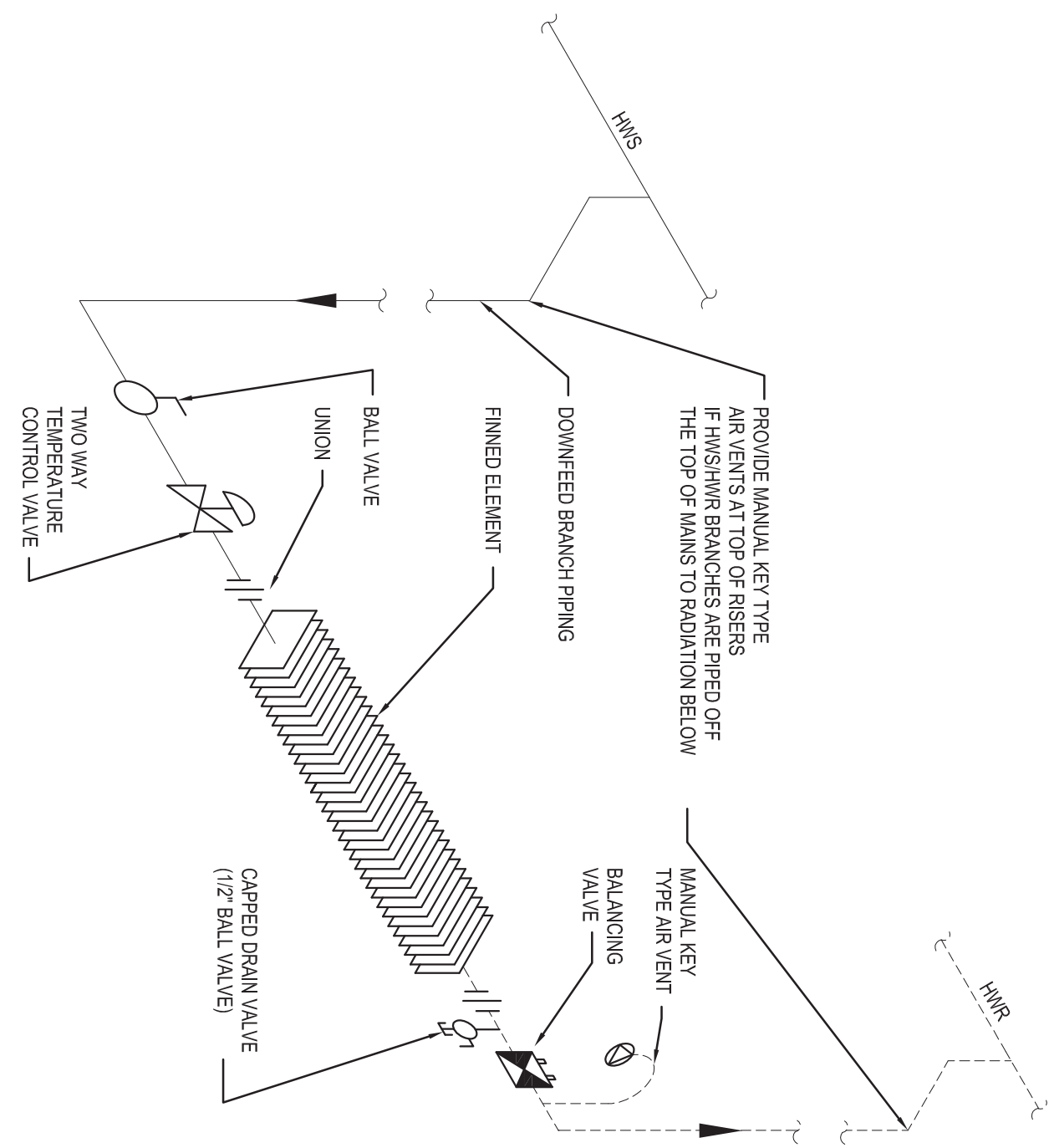
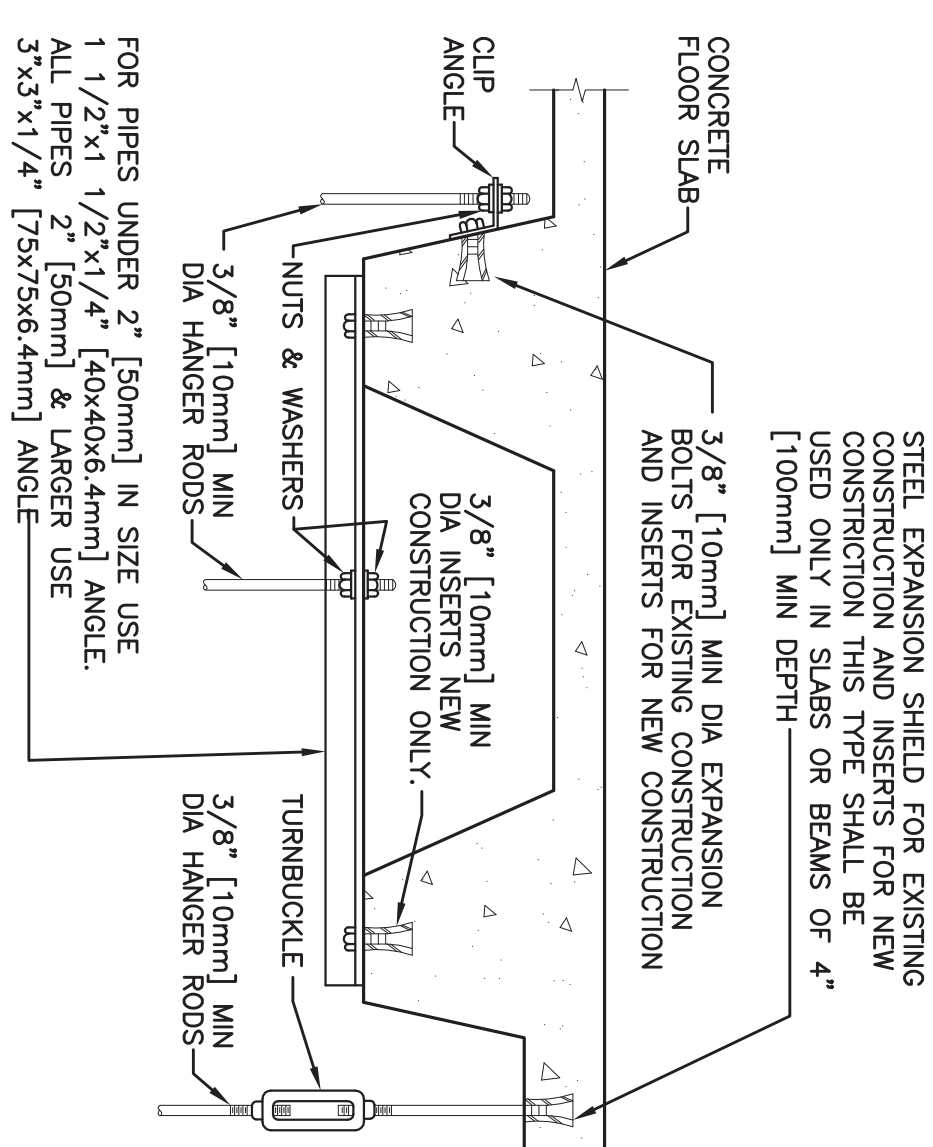
#### 3 INSTALLATION OF THERMOMETER WELLS



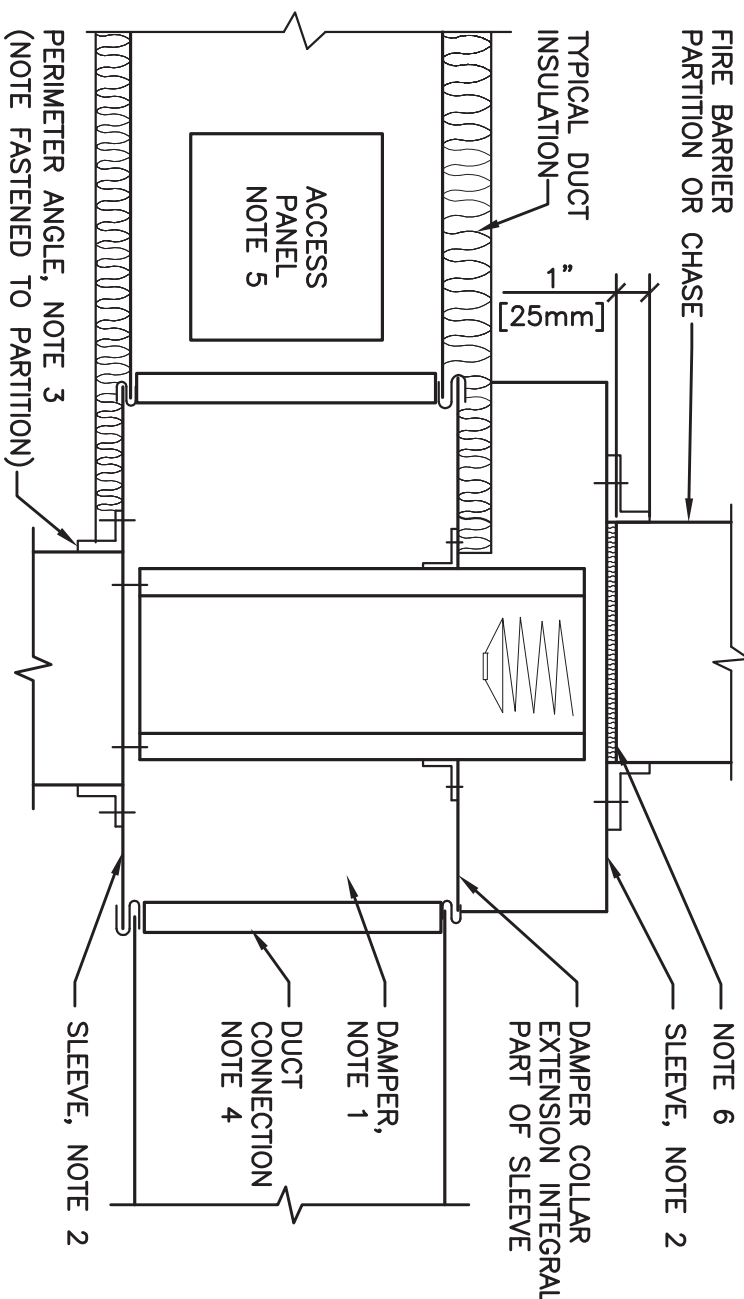
#### 2 RADIANT CEILING PANEL DETAIL



#### 1 SECURING HANGER RODS IN CONCRETE

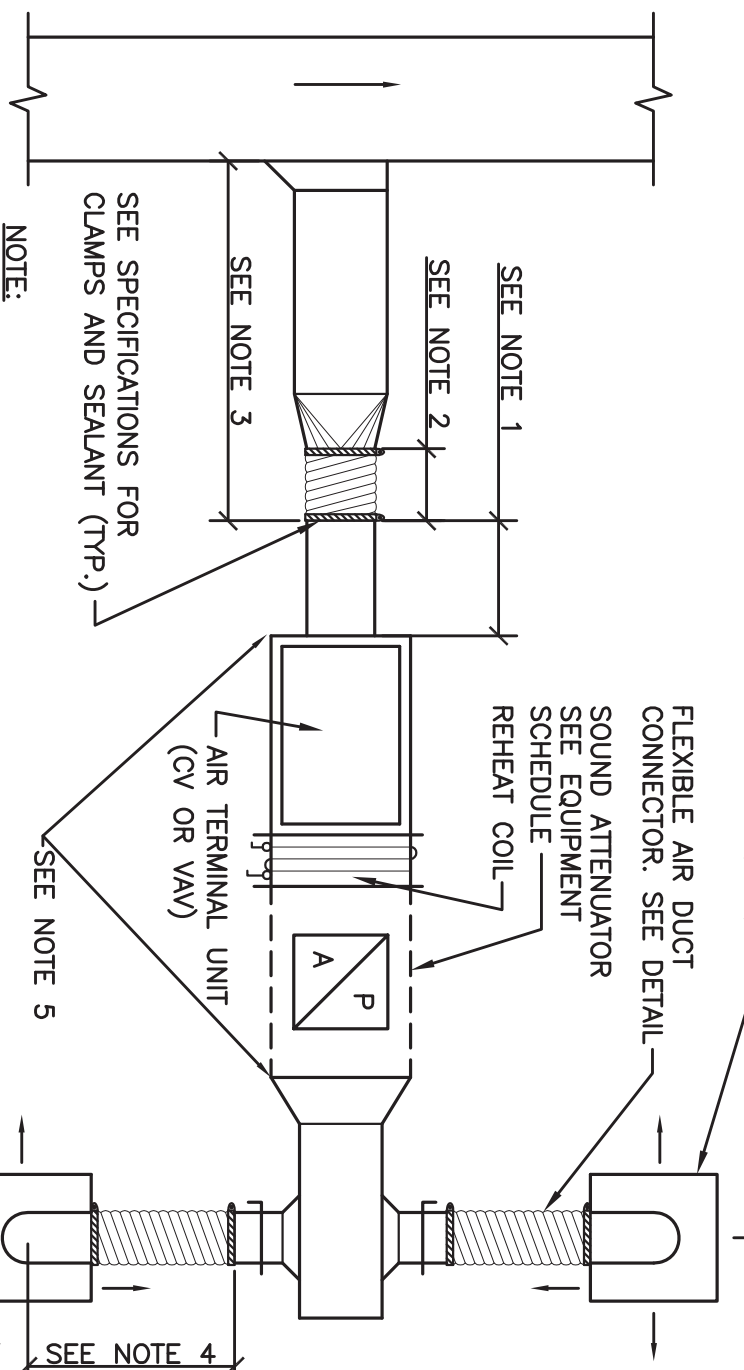


#### 8 DOWNFEED FIN-TUBE RADIATION PIPING DETAIL



1. A VERTICAL DAMPER IS SHOWN. HORIZONTAL DAMPER INSTALLATION IS SIMILAR. FOLLOW DAMPER MANUFACTURER'S INSTRUCTIONS, INCLUDING FASTENER OPTIONS AND THE PARTITION OR FLOOR AND NOT OUTSIDE THE RESTRICTION.
2. GALVANIZED SLEEVE, GAGE NOT LESS THAN CONNECTING DUCT. FASTEN SLEEVE TO 14 GAUGE TO PROVIDE 1" [25mm] MINIMUM OVERLAP OF OPENING ON ALL 4 SIDES.
3. PERIMETER ACCESS, GALVANIZED STEEL, NOT LESS THAN 1 1/2"x1 1/2" [40x40mm], 14 GAUGE TO PROVIDE 1" [25mm] MINIMUM OVERLAP OF OPENING ON ALL 4 SIDES.
4. BREAKAWAY DUCT CONNECTION. CONTRACTOR'S OPTION OF TYPE SHOWN IN SPACE ACCESS PANELS. SIZE AND LOCATION TO PERMIT SERVING THE FUSIBLE LINK OR LINKS.
5. PROVIDE 1/4" TO 1/2" [6 TO 15mm] CLEARANCE ON HEIGHT AND WIDTH. FULL OPEN SPACE WITH ROCK WOOL FIRESTOP FIBER.
6. ALL DUCT WORK ASSES WHICH ARE RUN EXPOSED, SUCH AS THRU ATTIC FLOORS CONCRETE CURB AROUND OPENING FOR DUCT.

#### 7 SECTION THRU FIRE DAMPER INSTALLATION

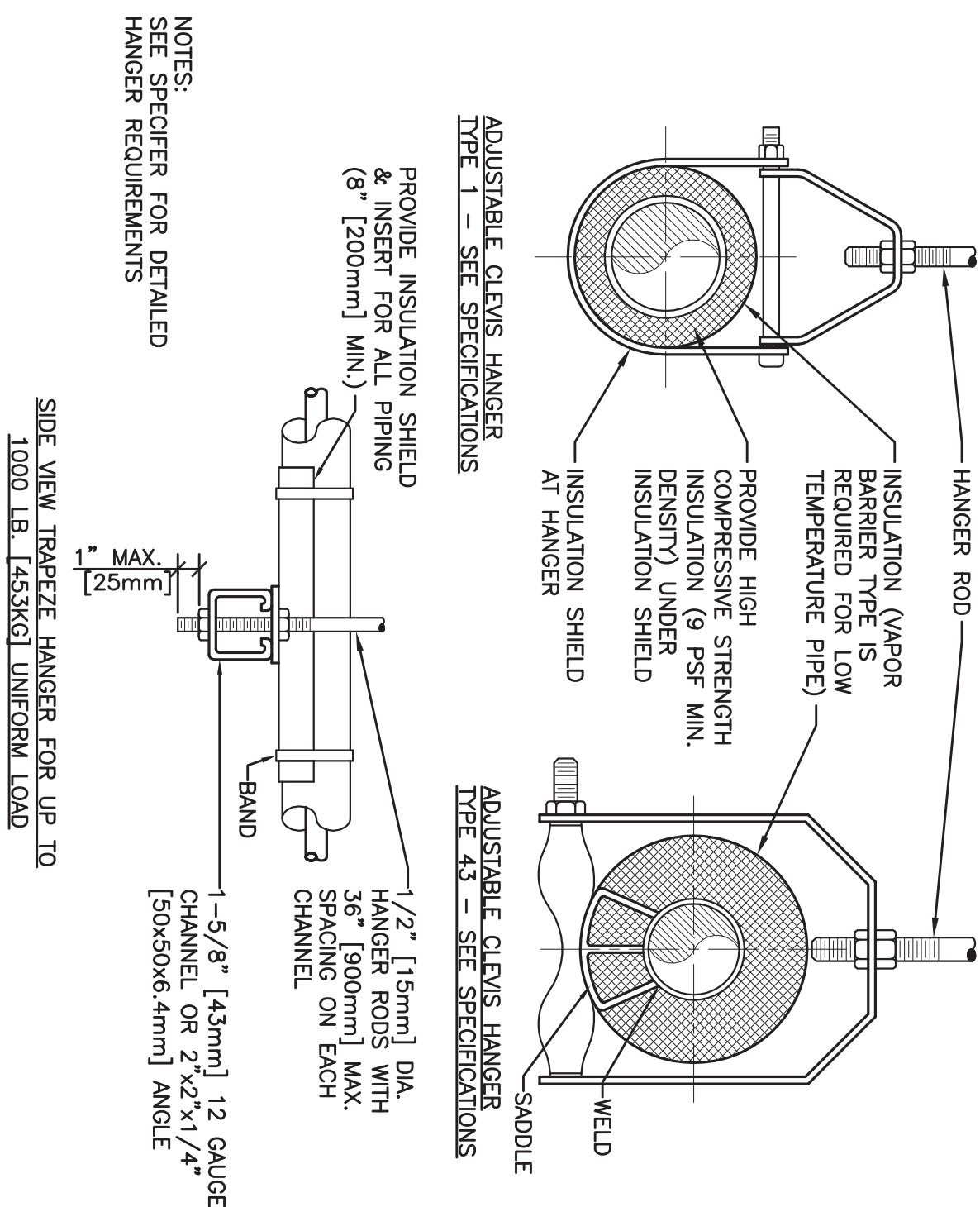


1. RIGID STRAIGHT TERMINAL UNIT INLET LENGTH SHALL BE A MINIMUM OF 3 TIMES THE DIAMETER OF INLET.
2. A FLEXIBLE AIR DUCT CONNECTOR IS NOT MANDATORY FOR INLET TO THIS BOX, BUT ALLOWED TO ACCOMMODATE MINOR OFFSETS. MAXIMUM LENGTH 3'-0" [900mm].
3. A BRANCH DUCT SERVING AN INDIVIDUAL BOX MAY BE THE SAME SIZE FOR LONGER LENGTHS. INCREASE THE DUCT SIZE AND PROVIDE A BRANCH DUCT, AS SHOWN, DOES NOT EXCEED TO FEET (3 METERS) OR BELOW 0.27/100 [1.64m/m].
4. FLEXIBLE AIR DUCT CONNECTORS, WHEN USED FROM TERMINAL UNIT SUPPLY AIR DUCT TO DIFFUSER, SHALL NOT EXCEED 5'-0" [1500mm]. USE RIGID ELBOWS FOR CHANGE OF DIRECTION GREATER THAN 45°.
5. COMPONENT ARRANGEMENT MAY VARY BY MANUFACTURER. PROVIDE INSULATION W/VAPOR BARRIER FOR CONNECTING DUCT SECTIONS.
6. USE OF THE FLEXIBLE AIR DUCT CONNECTORS ARE NOT PERMITTED FOR THE DEDICATED AHU SERVING THE SURGICAL SUITE.
7. TAPE VAPOR BARRIER AT FLEX DUCT CONNECTION

#### 6 DUCT CONNECTIONS - AIR TERMINAL UNITS

NOM. SIZE	THRU	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24
IN. [mm]	3/4 [20]	[25]	[32]	[40]	[50]	[63]	[75]	[90]	[125]	[150]	[190]	[250]	[300]	[360]	[450]	[560]	[680]	
PIPE	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]	[2100]
5 FT. TUBING	[1900]	[1800]	[2100]	[2400]	[2400]	[2700]	[2700]	[3000]	[3000]	[3300]	[3600]	[3900]	[4200]	[4500]	[4800]	[5100]	[5400]	[5700]

NOTE: FOR TRAPEZOIDAL HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZOID.



SIZE: VIEW TRAPEZOIDAL HANGER FOR UP TO 1000 LB. [453KG] UNIFORM LOAD

#### 5 PIPE HANGERS

CONSULTANTS:



engineers | consultants | commissioning  
MEP Associates, LLC | 2225 Lake Court | Lake Charles, Louisiana  
Phone: 337-583-0000 | Fax: 337-583-0001  
WWW.MEP-ASSOCIATES.COM

Revisions: 01/22/2014 Date

ARCHITECT/ENGINEERS:



NORTHERN  
DESIGN  
WORKS

420 RAIL STREET  
MEGAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

MECHANICAL DETAILS

Approved Project Director

Project Title  
Renoate Four West

Project Number  
585-12-132

Building Number  
1

Location  
IRON MOUNTAIN, MICHIGAN

Drawing Number  
M501

Date  
01/22/2014

Drawn  
DLK

Checked  
EP



Office of  
Construction  
and Facilities  
Management







AIR TERMINAL UNIT SIZING SCHEDULE														
SIZE	MIN ALLOWABLE AIR FLOW		MAX ALLOWABLE AIR FLOW		DUCT INLET SIZE		MAX AFD		MAXIMUM SOUND POWER LEVEL (Per 10 <sup>-12</sup> WATTS) FOR BOX DISCHARGE ATTACHMENT INLET DUCT STATIC					
	CFM	[L/s]	CFM	[L/s]	IN	[mm]	IN WG	[Pa]	OCTAVE BANDS					
									2	3	4	5	6	7
A	60	[28]	170	[80]	4	[100]	0.4	[100]	69	65	58	52	51	47
B	90	[42]	260	[120]	5	[130]	0.4	[100]	69	63	59	52	51	47
C	120	[61]	380	[180]	6	[150]	0.4	[100]	69	67	61	55	52	49
D	160	[78]	480	[220]	7	[180]	0.4	[100]	70	68	63	57	53	49
E	220	[110]	680	[320]	8	[200]	0.4	[100]	71	68	59	53	51	47
F	270	[130]	770	[370]	9	[230]	0.4	[100]	71	69	60	54	51	47
G	350	[170]	1050	[500]	10	[250]	0.4	[100]	74	68	61	57	54	52
H	500	[240]	1500	[710]	12	[300]	0.4	[100]	73	69	64	59	57	53
I	750	[350]	2250	[1100]	14	[350]	0.4	[100]	73	68	65	61	61	58
J	1000	[470]	3000	[1400]	16	[400]	0.4	[100]	73	68	66	60	58	55

- NOTES
- INLET STATIC BASED ON ARI 895-98.
  - THIS SCHEDULE IS USED WITH THE TERMINAL UNIT SCHEDULE.
  - CONTROL SEQUENCE SHALL BE AS INDICATED ON THE AIR TERMINAL UNIT SCHEDULE.
  - PROVIDE SOUND ATTENUATION AFTER SECTION AS REQUIRED TO MEET ROOM NC LEVEL.

AIR DEVICE SCHEDULE (SUPPLY)				
MARK	TYPE	MOUNTING	PANEL/FRAME SIZE	REMARKS
			DAMPER	
CD-1	LOWERED FACE	CEILING	24 x 24 [600 x 600]	NONE
CD-2	LOWERED FACE	CEILING	24 x 24 [600 x 600]	NONE
SD-1	ROUND	ATTACHED TO DUCTWORK	100 [2500]	NONE

- NOTES
- SEE FLOOR PLAN FOR THROW PATTERN.
  - SEE DETAIL FOR DAMPER IN BRANCH DUCT SERVING EACH DIFFUSER.

AIR DEVICE SCHEDULE (RETURN/EXHAUST)				
MARK	TYPE	MOUNTING	DAMPER	FINISH
				REMARKS
RG-1	EGG CRATE	CEILING	NONE	WHITE
RG-2	EGG CRATE	CEILING	NONE	WHITE
EG-1	EGG CRATE	CEILING	NONE	WHITE
EG-2	EGG CRATE	CEILING	NONE	WHITE

NOTE  
PROVIDE SQUARE TO ROUND ADAPTER

SINGLE DUCT AIR TERMINAL UNIT SCHEDULE														
MARK	LOCATION	AREA AND/OR ROOMS SERVED	SYSTEM AIR HANDLING	SIZE	AIR FLOW			ADDITIONAL SOUND ATTENUATION REQUIRED	CONTROL TYPE	CONTROL SEQUENCE	REHEAT		PERIMETER SUPPLEMENTAL HEAT LINK	REMARKS
					MAX	MIN					HW	ELEC		
1-TU-11-CA-1	EAST WING	CA-1	AHU 11	G	555 [260]	555 [260]		NONE	CV		X			NONE
1-TU-11-CA-2	EAST WING	CA-2&4&41	AHU 11	E	555 [260]	555 [260]		NONE	CV		X			NONE
1-TU-11-41-4	EAST WING	41-4	AHU 11	G	340 [160]	340 [160]		NONE	CV		X			NONE
1-TU-11-41-5	EAST WING	41-5	AHU 11	C	200 [94]	200 [94]		NONE	WAV		X			NONE
1-TU-11-41-6	EAST WING	41-6	AHU 11	E	280 [130]	280 [130]		NONE	CV		X			NONE
1-TU-11-41-9	EAST WING	41-9&41-17	AHU 11	E	470 [220]	470 [220]		NONE	CV		X			NONE
1-TU-11-41-22	EAST WING	41-22	AHU 11	C	410 [190]	0	[1]	NONE	WAV			X		NONE
1-TU-11-41-28	NORTH WING	41-28	AHU 11	C	320 [150]	160 [78]		NONE	WAV		X			NONE
1-TU-11-41-29P	NORTH WING	41-29P	AHU 11	C	275 [126]	275 [130]		NONE	CV		X			NONE
1-TU-11-41-30	NORTH WING	41-30	AHU 11	C	305 [140]	155 [73]		NONE	WAV		X			NONE
1-TU-11-41-31	NORTH WING	41-31	AHU 11	G	840 [400]	840 [400]		NONE	CV		X			NONE
1-TU-11-41-34	NORTH WING	41-34&41-34A	AHU 11	E	500 [240]	500 [240]		NONE	CV		X			NONE
1-TU-11-41-35	NORTH WING	41-35	AHU 11	C	310 [150]	310 [150]		NONE	WAV		X			NONE
1-TU-11-41-38	NORTH WING	41-38	AHU 11	H	725 [340]	725 [340]		NONE	CV		X			NONE
1-TU-11-41-42	WEST WING	41-42	AHU 11	C	200 [94]	200 [94]		NONE	WAV		X			NONE
1-TU-11-41-43	WEST WING	41-43&41-43P	AHU 11	E	380 [180]	380 [180]		NONE	CV		X			NONE
1-TU-11-41-45	WEST WING	41-45	AHU 11	C	140 [66]	140 [66]		NONE	WAV		X			NONE
1-TU-11-41-46	WEST WING	41-46	AHU 11	E	500 [240]	270 [130]		NONE	WAV		X			NONE
1-TU-11-41-47	WEST WING	41-47	AHU 11	C	160 [78]	160 [78]		NONE	WAV		X			NONE
1-TU-11-41-48	WEST WING	41-48	AHU 11	C	325 [150]	160 [78]		NONE	WAV		X			NONE
1-TU-11-41-49	WEST WING	41-49	AHU 11	C	140 [66]	140 [66]		NONE	WAV		X			NONE
1-TU-11-41-51	WEST WING	41-51	AHU 11	E	335 [160]	330 [140]		NONE	WAV		X			NONE
1-TU-11-41-51P	WEST WING	41-51P	AHU 11	C	250 [120]	250 [120]		NONE	WAV		X			NONE
1-TU-11-41-58A	SOUTH WING	41-58	AHU 11	E	510 [240]	475 [220]		NONE	WAV		X			NONE
1-TU-11-41-58B	SOUTH WING	41-58	AHU 11	G	860 [400]	475 [220]		NONE	WAV		X			NONE
1-TU-11-41-58C	SOUTH WING	41-58	AHU 11	G	780 [370]	530 [250]		NONE	WAV		X			NONE
1-TU-11-41-59D	SOUTH WING	41-59	AHU 11	E	710 [340]	465 [210]		NONE	WAV		X			NONE
1-TU-11-41-59E	SOUTH WING	41-59	AHU 11	E	710 [340]	465 [210]		NONE	WAV		X			NONE
1-TU-11-41-62	SOUTH WING	41-62&41-62	AHU 11	C	250 [120]	250 [120]		NONE	CV		X			NONE
1-TU-11-41-64	SOUTH WING	41-64	AHU 11	E	780 [370]	300 [140]		NONE	WAV		X			NONE

DUCT PRESSURE CLASS, MATERIAL, & LEAKAGE									
							LEAKAGE TESTING		
SYSTEM	SERVICE	PRESSURE CLASS (IN.WG.)	MATERIALS OF CONSTRUCTION	SULQAN SEAL CLASS	PERCENT OF DUCT TO BE TESTED	TEST PRESSURE (IN.WG.)	ALLOWABLE LEAKAGE (L/HR IN.WG-FT)	REMARKS	
AHU-0	SUPPLY AIR FROM EXTERMINALS UNIT TO SUPPLY AIR TERMINALS	3	GAUVANIZED	A	100	2	-	-	
	SUPPLY AIR FROM SUPPLY AIR TERMINALS TO AIR OUTLETS	2	GAUVANIZED	A	100	2	2	-	
	TO AIR HANDLING UNIT	-	GAUVANIZED	A	100	2	2	-	
	OUTDOOR AIR FROM TOWER	-	GAUVANIZED	A	100	2	2	-	
ERV-2	GENERAL EXHAUST	-	GAUVANIZED	A	100	2	2	-	
	AIR ALL INCLUSIVE	-	GAUVANIZED ALUM	A	100	2	2	-	

CONSULTANTS:



MEP Associates, LLC  
2225 Lake Court  
Farmington Hills, MI 48334  
MEP PROJECT NO.: 100-1310

ARCHITECT/ENGINEERS:



NORTHERN DESIGN WORKS  
420 RAIL STREET  
NECAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

Revisions:	Date
BOX CONSTRUCTION DOCUMENTS - REISED	01/22/2014

Drawing Title					Project Title				
MECHANICAL EQUIPMENT SCHEDULES					Remorate Four West				
Approved Project Director					Location IRON MOUNTAIN, MICHIGAN				
Project Number 585-12-132					Building Number 1				
Drawing Number M601					Drawing Number Dwg. 79 of 100				
Date 01/22/2014					Drawn DLK				
Checked BD					Department of Veterans Affairs				







AIR BALANCE SCHEDULE (VARIABLE VOLUME SYSTEMS)																													
Room Number	Room Name	VA Design Manual Page	Room Air Balance	Return/ Exhaust	Constant/ Variable Volume	Room Area (R²)	Ceiling Height (ft)	Number of Occupants	Source (Unit No.)	Code			Design												Exhaust		Transfer		Notes
										Outdoor	Supply	Exhaust	Supply			Outdoor			Return										
										(Air Changes per Hour)	(Air Changes per Hour)	(Air Changes per Hour)	(CFM)	(Air Changes per Hour)	(CFM)	(Air Changes per Hour)	(CFM)	(CFM)	(Air Changes per Hour)	(CFM)	(Air Changes per Hour)	(CFM)	(Air Changes per Hour)	(CFM)	(CFM)	(Air Changes per Hour)	(CFM)	(CFM)	
4128	FITTING ROOM	6.90	O	R	VAV	141	8	2	AHU-11/ERU-3	2	6	-	320	17.0	160	8.5	80	4.3	40	2.1	350	18.6	190	10.1	0	0.0	30	0	-
4129P	PROSTHETICS CORRIDOR	6.95	+	R	CV	220	8	0	AHU-11/ERU-3	2	4	-	275	9.4	275	9.4	69	2.4	69	2.3	0	0.0	0	0.0	0	0.0	0	275	-
4130	PROSTHETICS CHIEF OFFICE	6.98	O	R	VAV	145	8	1	AHU-11/ERU-3	2	4	-	305	15.8	155	8.0	76	3.9	39	2.0	355	18.4	205	10.6	0	0.0	50	0	-
4131	CLERKS	6.98	O	R	CV	417	8	3	AHU-11/ERU-3	2	4	-	840	15.1	840	15.1	210	3.8	210	3.8	965	17.4	241	4.3	0	0.0	125	0	-
4132	SOILED HOLDING	6.105	-	E	CV	85	8	1	AHU-11/ERU-3	-	-	6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	75	6.6	75	0	-
4134	RESPIRATORY THERAPIST	6.94	-	E	CV	133	8	3	AHU-11/ERU-3	2	12	12	450	25.4	450	25.4	113	6.3	113	6.3	0	0.0	0	0.0	575	32.4	125	0	-
4134A	RESPIRATORY STORAGE	6.100	+	R	CV	96	8	0	AHU-11/ERU-3	-	4	-	50	3.9	50	3.9	13	1.0	13	1.0	0	0.0	0	0.0	0	0.0	35	85	-
4135	RECEIVING / ASSEMBLY	6.970	O	R	VAV	157	8	2	AHU-11/ERU-3	2	4	-	310	14.8	310	14.8	78	3.7	78	3.7	360	17.2	360	17.2	0	0.0	50	0	-
4138	PROSTHETICS STORAGE	6.100	+	R	CV	644	8	2	AHU-11/ERU-3	2	4	-	725	8.4	725	8.4	181	2.1	181	2.1	690	8.0	690	8.0	0	0.0	0	35	-
NORTH WING TOTAL													3,275		2,965						2,720		1,686		860				-
4142	ADL APARTMENT	6.61	-	E	VAV	182	8	3	AHU-11/ERU-3	2	6	6	200	8.2	200	8.2	50	2.1	50	2.1	0	0.0	0	0.0	150	6.2	30	80	-
4142A	ADL TOILET	6.61	-	E	CV	60	8	0	AHU-11/ERU-3	-	-	10	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	80	10.0	80	0	-
4143	STORAGE ALCOVE	6.100	+	R	CV	39	8	0	AHU-11/ERU-3	-	4	-	50	9.6	50	9.6	13	2.4	13	2.4	0	0.0	0	0.0	0	0.0	0	50	-
4143P	TREATMENT CORRIDOR	6.95	+	R	CV	267	8	0	AHU-11/ERU-3	2	4	-	300	8.4	300	8.4	75	2.1	75	2.1	95	2.7	95	2.7	0	0.0	50	255	-
4145	TREATMENT ROOM	6.94	O	R	VAV	127	8	2	AHU-11/ERU-3	2	6	-	140	8.3	140	8.3	35	2.1	35	2.1	165	9.7	165	9.7	0	0.0	25	0	-
4146	CHIRO OFFICE TREATMENT	6.94	O	R	VAV	181	8	2	AHU-11/ERU-3	2	6	-	590	24.5	270	11.2	148	6.1	68	2.8	680	28.2	360	14.9	0	0.0	90	0	-
4147	TREATMENT ROOM	6.94	O	R	VAV	127	8	2	AHU-11/ERU-3	2	6	-	160	9.4	160	9.4	40	2.4	40	2.4	185	10.9	185	10.9	0	0.0	25	0	-
4148	CHIRO TREATMENT	6.94	O	R	VAV	145	8	2	AHU-11/ERU-3	2	6	-	325	16.8	160	8.3	81	4.2	40	2.1	375	19.4	210	10.9	0	0.0	50	0	-
4149	TREATMENT ROOM	6.94	-	R	VAV	127	8	2	AHU-11/ERU-3	2	6	-	140	8.3	140	8.3	35	2.1	35	2.1	165	9.7	165	9.7	0	0.0	25	0	-
4150	SPEECH THERAPIST	6.94	O	R	VAV	133	8	3	AHU-11/ERU-3	2	6	-	335	18.9	300	16.9	84	4.7	75	4.2	385	21.7	350	19.7	0	0.0	50	0	-
4151	TREATMENT ROOM	6.94	-	R	VAV	133	8	2	AHU-11/ERU-3	2	6	-	250	14.1	250	14.1	63	3.5	63	3.5	290	16.4	290	16.4	0	0.0	40	0	-
WEST WING TOTAL													2,490		1,970						2,340		1,820		230				-
4160	PT GYM	6.94	-	R	VAV	2,216	8	21	AHU-11/ERU-3	2	6	-	3,590	12.2	2,390	8.1	898	3.0	598	2.0	4,160	14.1	2,860	10.0	0	0.0	570	0	-
4162	EQUIPMENT STORAGE	6.100	+	R	CV	173	8	1	AHU-11/ERU-3	2	4	-	200	8.7	200	8.7	50	2.2	50	2.2	140	6.1	140	6.1	0	0.0	0	60	-
4164	TECH WORK ROOM	6.98	O	R	VAV	280	8	7	AHU-11/ERU-3	2	6	-	780	20.9	300	8.0	195	5.2	75	2.0	665	17.8	415	11.1	0	0.0	0	115	-
SOUTH WING TOTAL													4,570		2,890						4,965		3,100		200				-
4111	MENS TOILET	6.98	-	E	CV	145	8	0	AHU-11/ERU-3	-	-	10	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	200	10.3	200	0	-
4112	HOUSEKEEPING	6.103	-	E	CV	41	8	0	AHU-11/ERU-3	-	-	10	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	55	10.0	55	0	-
4113	WOMEN'S TOILET	6.98	-	E	CV	145	8	0	AHU-11/ERU-3	-	-	10	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	200	10.3	200	0	-
4114	STAFF LOUNGE	6.96	-	E	CV	214	8	8	AHU-11/ERU-3	2	4	4	340	11.9	340	11.9	85	3.0	85	3.0	0	0.0	0	0.0	395	13.8	55	0	-
4115	PM&R CHIEF OFFICE	6.98	O	R	VAV	175	8	2	AHU-11/ERU-3	2	4	-	200	8.6	200	8.6	50	2.1	50	2.1	230	9.9	230	9.9	0	0.0	30	0	-
4116	LOCKER ROOM	6.96	-	E	CV	261	8	10	AHU-11/ERU-3	0	6	6	280	8.0	280	8.0	70	2.0	70	2.0	0	0.0	0	0.0	265	7.6	40	55	-
4116B	NURSING ROOM	6.98	O	R	CV	98	8	1	AHU-11/ERU-3	0	4	4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	55	4.2	55	0	-
4117	PM&R RECEPTION	6.95	-	E	CV	100	8	1	AHU-11/ERU-3	2	6	6	150	11.3	150	11.3	38	2.8	38	2.8	0	0.0	0	0.0	150	11.3	0	0	-
4119	WAITING	6.95	-	E	CV	289	8	14	AHU-11/ERU-3	2	6	6	320	8.3	320	8.3	80	2.1	80	2.1	0	0.0	0	0.0	370	9.6	50	0	-
4120	EQUIPMENT STORAGE	6.100	+	R	CV	50	8	0	AHU-11/ERU-3	-	4	-	50	7.5	50	7.5	13	1.9	13	1.9	0	0.0	0	0.0	0	0.0	0	50	-
4122	DATA / PHONE	6.101	O	R	VAV	57	8	0	AHU-11/ERU-3	-	-	-	410	53.9	0	0.0	103	13.5	0	0.0	470	61.8	118	15.5	0	0.0	60	0	-
4141	CLEAN SUPPLY	6.100	+	R	CV	37	8	0	AHU-11/ERU-3	0	4	-	50	10.1	50	10.1	13	2.5	13	2.5	0	0.0	0	0.0	0	0.0	0	50	-
4143A	LINEN CHUTE	6.100	+	R	CV	13	8	0	AHU-11/ERU-3	-	4	-	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	45	26.0	45	0	-
4186	STERILE SUPPLY	6.750	+	E	CV	57	8	0	AHU-11/ERU-4	4	4	4	125	16.4	125	16.4	31	4.1	31	4.1	0	0.0	0	0.0	125	16.4	0	0	-
C4-1	MAIN CORRIDOR	6.95	+	R	CV	219	8	0	AHU-11/ERU-3	2	4	-	555	19.0	555	19.0	139	4.8	139	4.8	0	0.0	0	0.0	0	0.0	50	605	-
C4-2	MAIN CORRIDOR	6.95	+	R	CV	626	8	0	AHU-11/ERU-3	2	4	-	555	6.6	555	6.6	139	1.7	139	1.7	0	0.0	0	0.0	0	0.0	50	605	-
EAST WING TOTAL													3,035		2,625						700		348		1,860				-
AHU Totals:						7,988	95						13,370		10,450		3,075		1,144		10,725		3,506		2,740				-

[illegible]



CONTROLS SYMBOLS

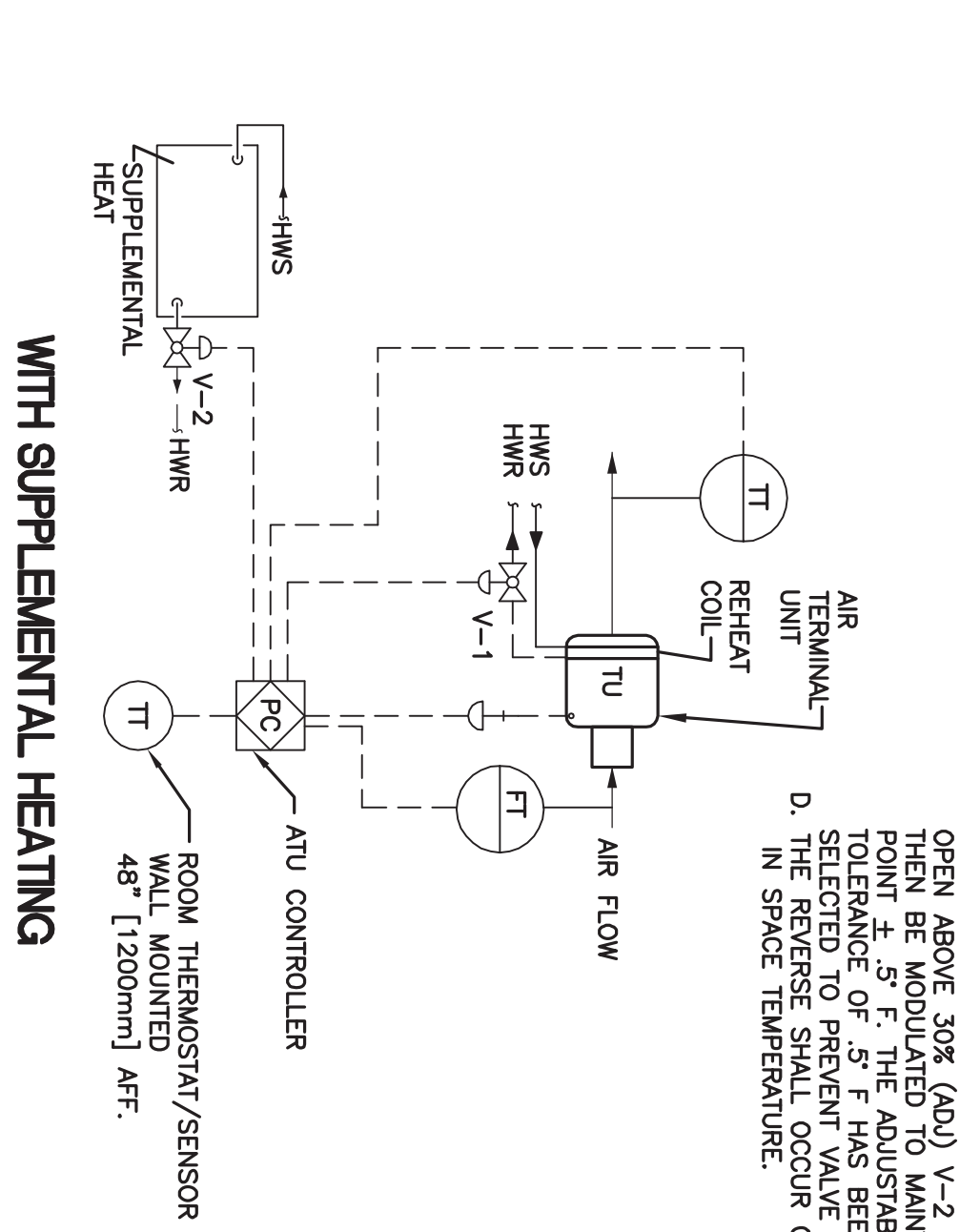
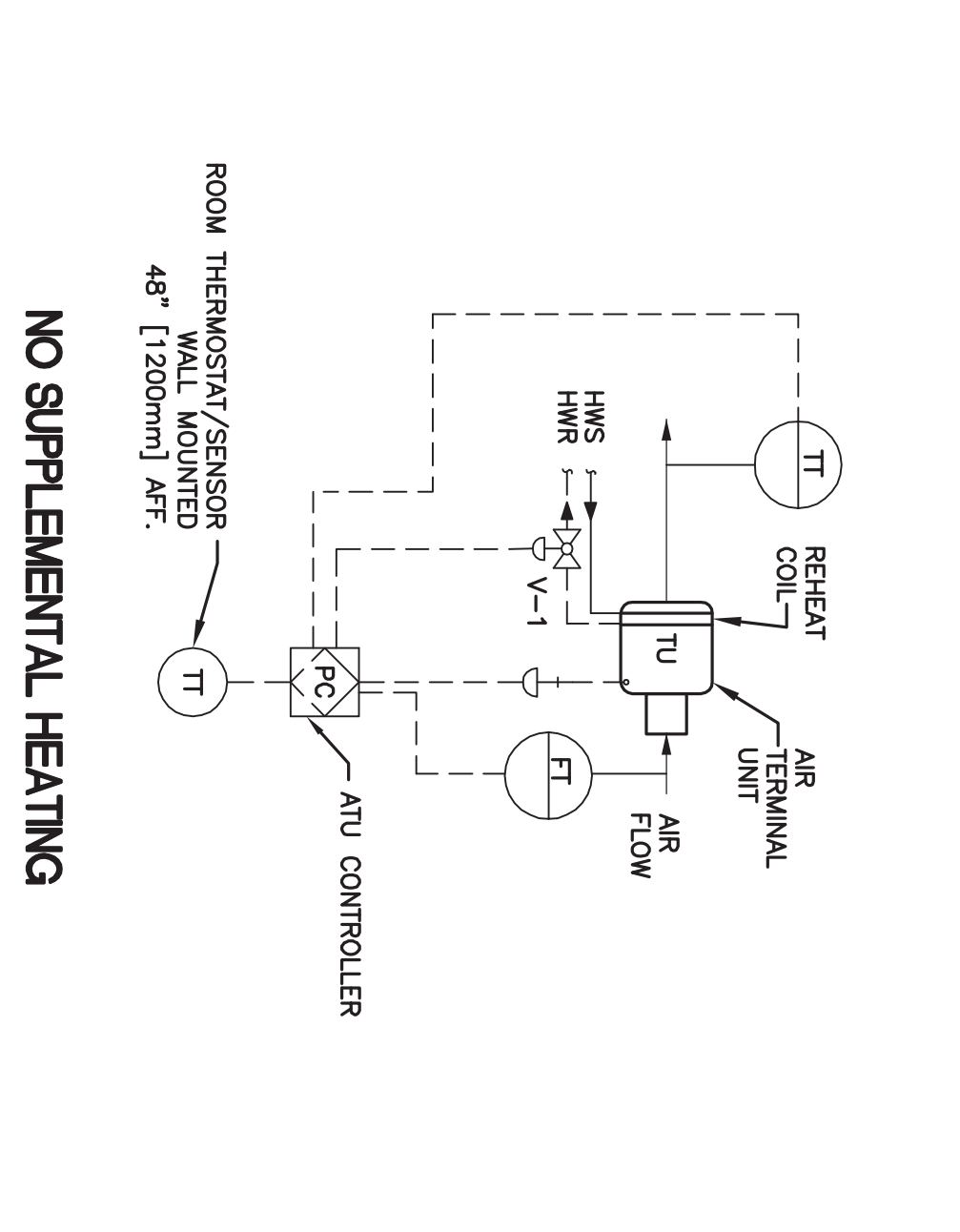
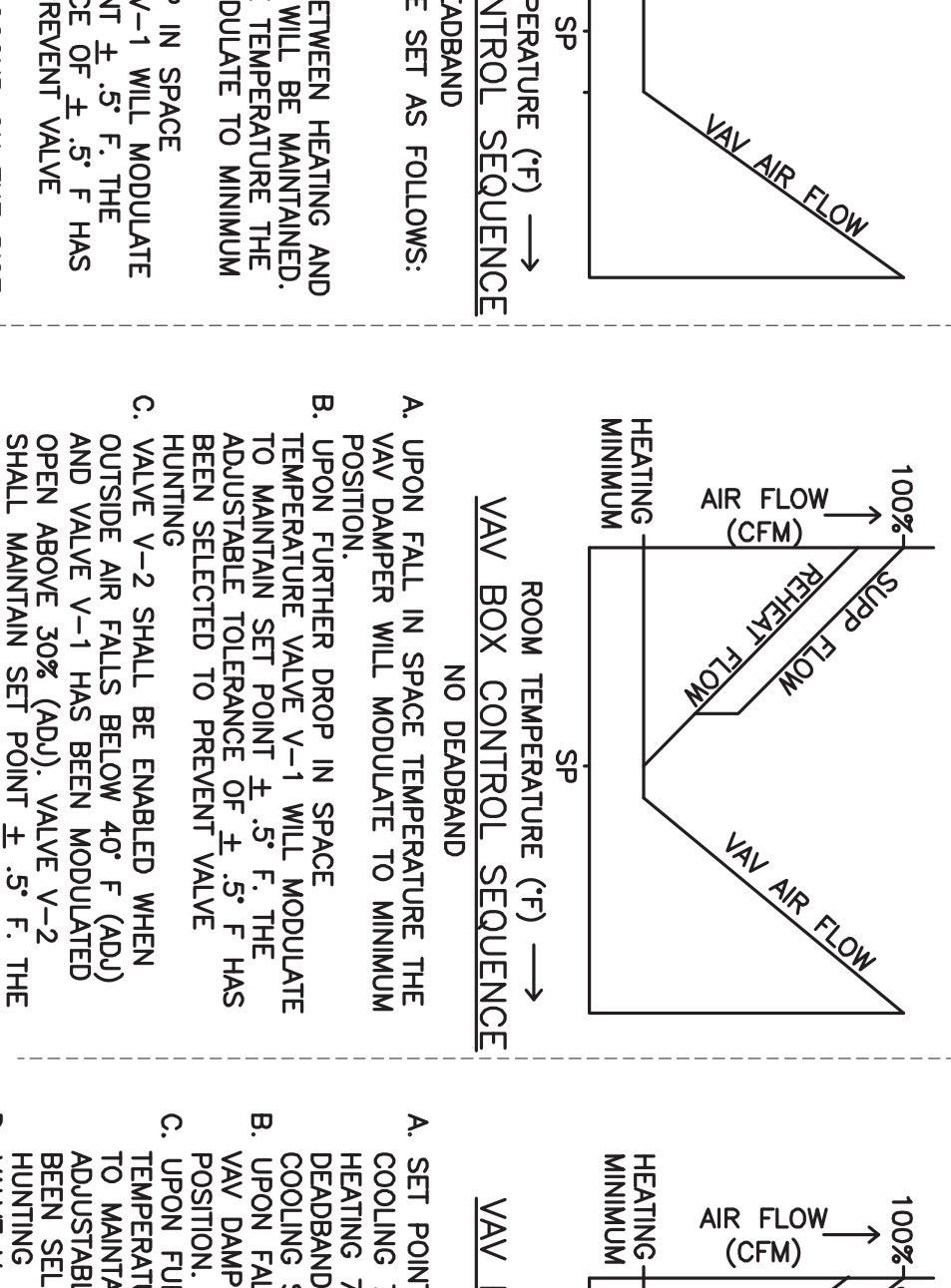
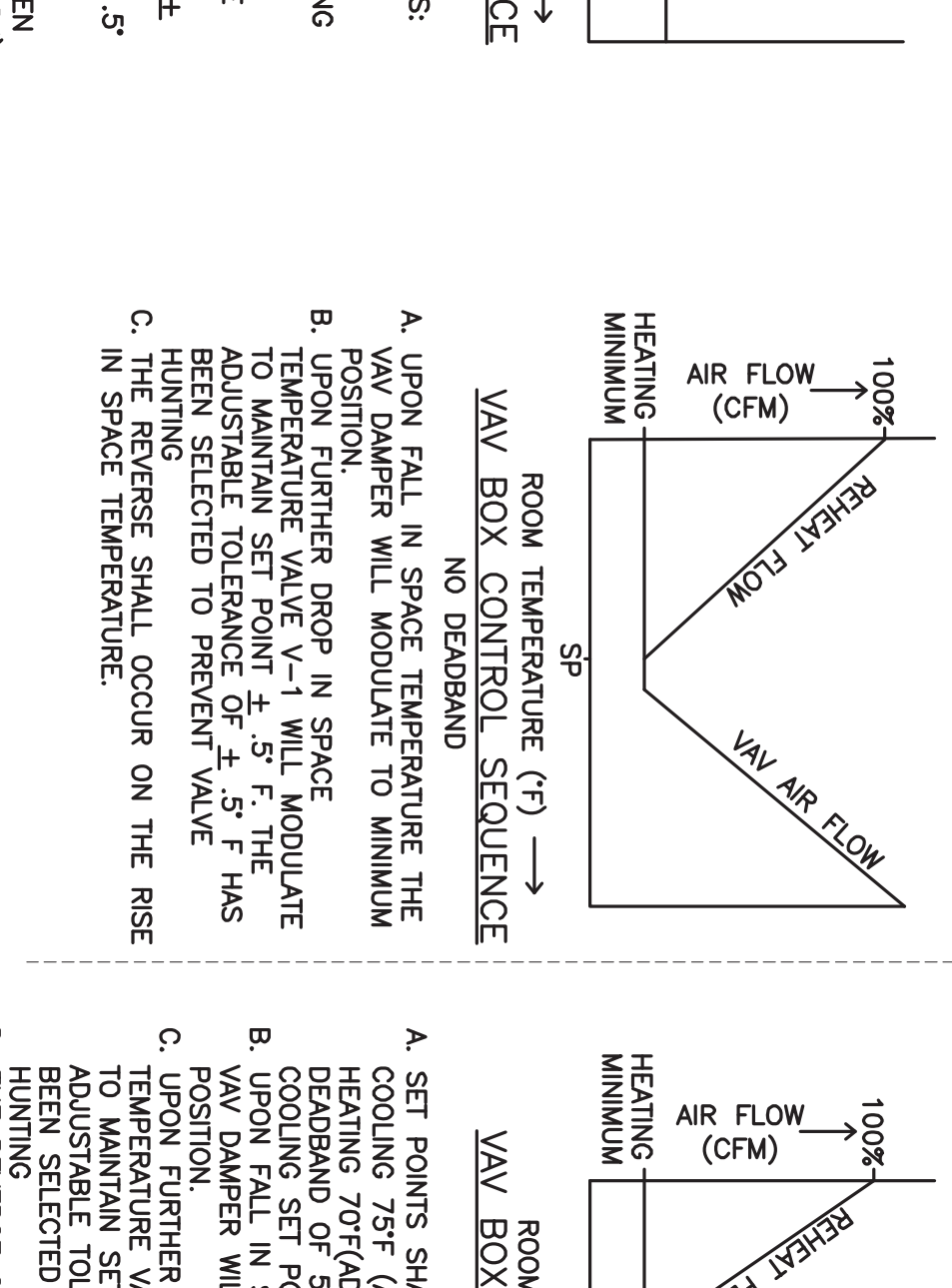
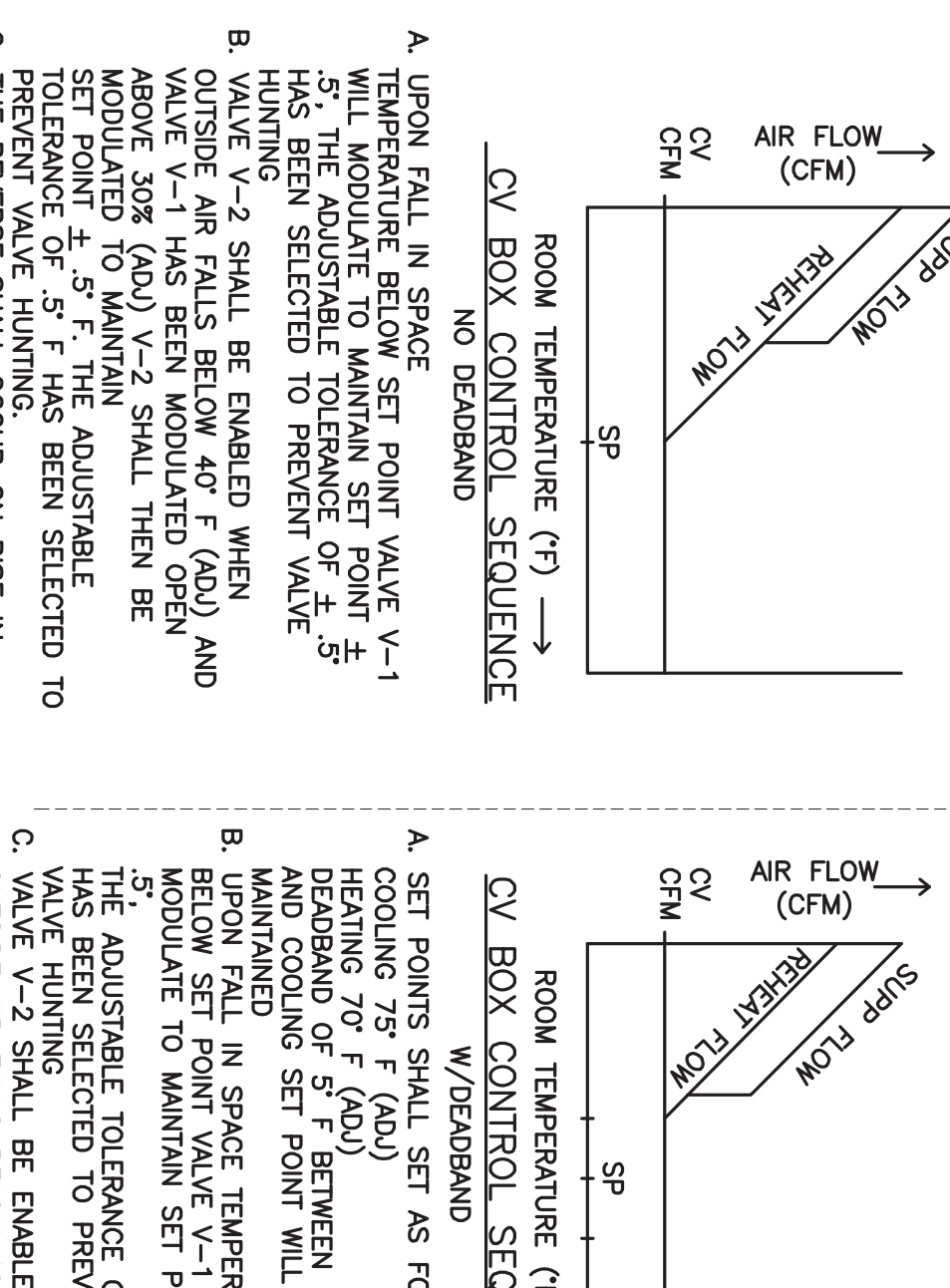
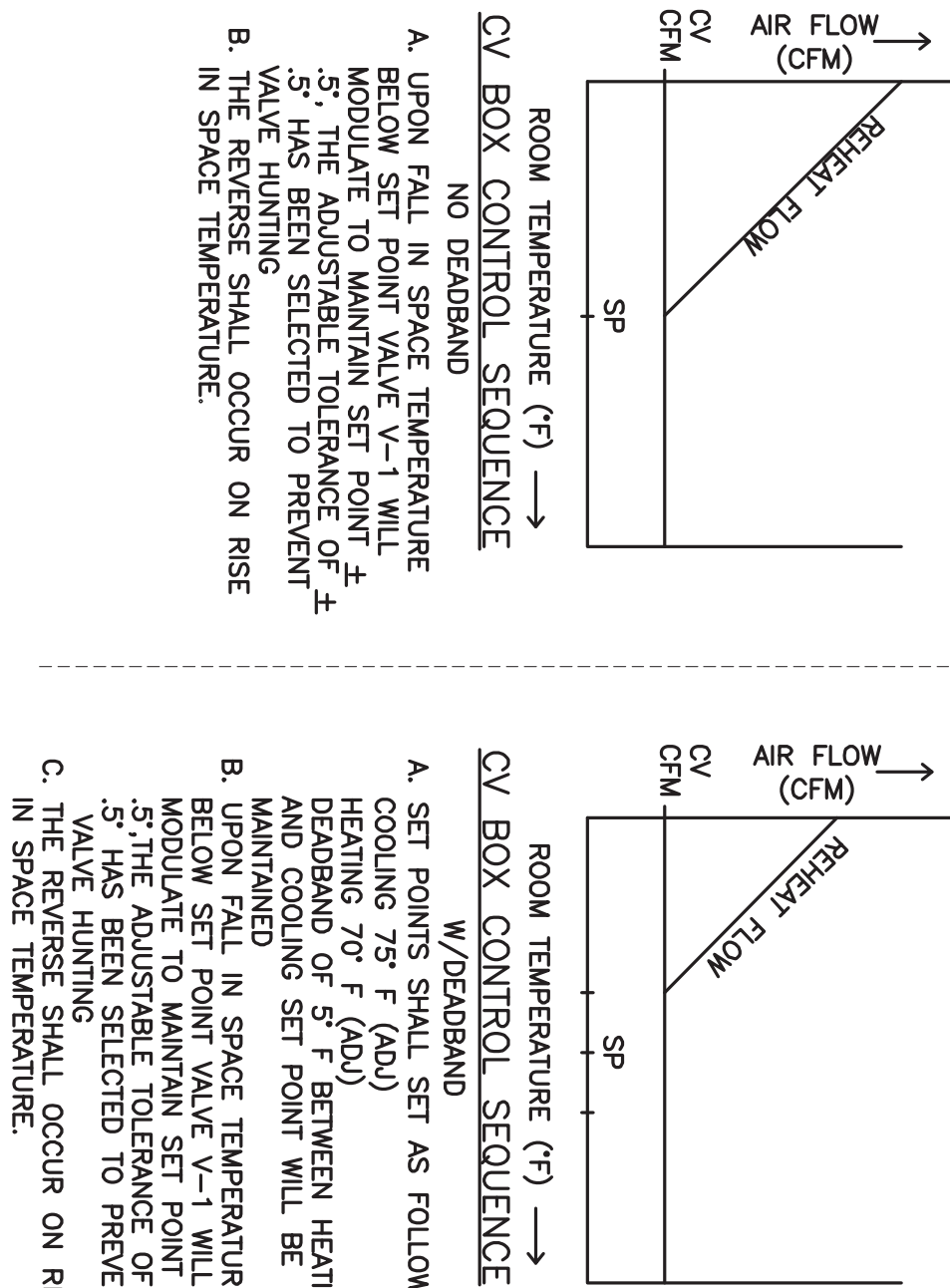
- 1 ROOM THERMOSTAT/TRANSMITTER – WALL MOUNT
- M ROOM HUMIDISTAT (MOISTURE)/TRANSMITTER – WALL MOUNT
- TT TEMPERATURE TRANSMITTER
- TT TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
- MT MOISTURE (HUMIDITY) TRANSMITTER
- PT PRESSURE TRANSMITTER
- SPS STATIC PRESSURE SENSOR
- FT FLOW TRANSMITTER
- IT CURRENT TRANSMITTER
- CT CONDUCTIVITY TRANSMITTER
- SD SMOKE DETECTOR
- POT PRESSURE DIFFERENTIAL TRANSMITTER
- PDS PRESSURE DIFFERENTIAL SWITCH
- HS HAND SWITCH (HAND-OFF-AUTO SWITCH)
- ZC VALVE OR DAMPER POSITION CONTROLLER
- KR LOCAL RECORDING TIME CLOCK (RUNTIME)
- TSL TEMPERATURE SWITCH, LOW (FREEZE/STAY)
- TSR TEMPERATURE SWITCH, HIGH (FREEZE/STAY)
- LC LEVEL CONTROLLER
- LT LEVEL TRANSMITTER

CONTROLS SYMBOLS

- PSH PRESSURE SWITCH HIGH
- PSL PRESSURE SWITCH LOW
- EPT ELECTRONIC TO PNEUMATIC TRANSDUCER
- CD CARBON DIOXIDE TRANSMITTER
- CO CARBON MONOXIDE TRANSMITTER
- OC OCCUPANCY SENSOR
- LTOT LOCAL TEMPERATURE CONTROL PANEL
- HMVC HVAC CONTROL PANEL
- VSMC VARIABLE SPEED MOTOR CONTROLLER
- FACP FIRE ALARM CONTROL PANEL
- ECC INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
- TC TEMPERATURE CONTROLLER, SEE SEQUENCE OF OPERATION
- PC PRESSURE CONTROLLER, SEE SEQUENCE OF OPERATION
- SC SPEED CONTROLLER, SEE SEQUENCE OF OPERATION
- FC FLOW CONTROLLER, SEE SEQUENCE OF OPERATION
- FH FLOW SWITCH HIGH
- FL FLOW SWITCH LOW
- KC TIME CLOCK CONTROLLING EQUIPMENT ON A SCHEDULE

CONTROLS SYMBOLS

- TEMPERATURE SENSING ELEMENT FOR TRANSMITTING TEMPERATURE TO DAMPS (TYPICAL) 1/2" MINIMUM LENGTH IN DUCT WHEN SPACE PERMITS)
- SENSOR WITH AVERAGING ELEMENT TO TRANSMIT TEMPERATURE TO DAMPS
- MOTOR STARTER
- ELECTRIC OPERATED CONTROL DAMPER/OR VALVE



2 CONSTANT VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM

SYSTEM:	SYSTEM IN/OUTS	SYSTEM SOFTWARE/CONTROL
CAY TERMINAL UNITS	LEGEND	ALARM PROCESSING APPLICATION/FUNCTION
SYSTEM COMPONENT:	POINT ID	ABBREVIATION
ROOM TEMPERATURE	AT-1	TT-RM
ROOM HUMIDITY	AT-2	MT-RM
SUPPLY AIR FLOW (CFM)	AT-3	FT-S
WAV DAMPER	AO-1	D-1
REHEAT COIL VALVE	AO-2	V-1
CONNECTOR CONTROL VALVE	AO-3	V-1
REMARKS		

4 POINTS LIST FOR CAY AIR TERMINAL UNITS AND SUPPLEMENTAL HEAT

1 VARIABLE VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM

SYSTEM:	SYSTEM IN/OUTS	SYSTEM SOFTWARE/CONTROL
VAV TERMINAL UNITS	LEGEND	ALARM PROCESSING APPLICATION/FUNCTION
SYSTEM COMPONENT:	POINT ID	ABBREVIATION
ROOM TEMPERATURE	AT-1	TT-RM
ROOM HUMIDITY	AT-2	MT-RM
SUPPLY AIR FLOW (CFM)	AT-3	FT-S
WAV DAMPER	AO-1	D-1
REHEAT COIL VALVE	AO-2	V-1
CONNECTOR CONTROL VALVE	AO-3	V-1
REMARKS		

2 POINTS LIST FOR VAV AIR TERMINAL UNITS AND SUPPLEMENTAL HEAT

CONSULTANTS:



MEP Associates, LLC  
12250 Lake Court  
Suite 100  
Merrillville, IN 46459  
Phone: 317.336.1111  
Fax: 317.336.1112  
www.mep-associates.com

ARCHITECT/ENGINEERS:



NORTHERN DESIGN WORKS  
420 RAIL STREET  
NECAUNEE, MI 49866  
PHONE: 906-475-6616  
FAX: 906-475-6954  
NDW PROJECT NUMBER: 1214

Drawing Title

MECHANICAL CONTROLS DIAGRAMS

Project Title

Renovate Four West

Project Number

585-12-132

Office of Construction and Facilities Management

Approved Project Director	Location	DWG	Drawn	Checked	DKL	Dwg. 82 of 100
	IRON MOUNTAIN, MICHIGAN	01/22/2014	JAU			



A

B

C

D

E

F

A

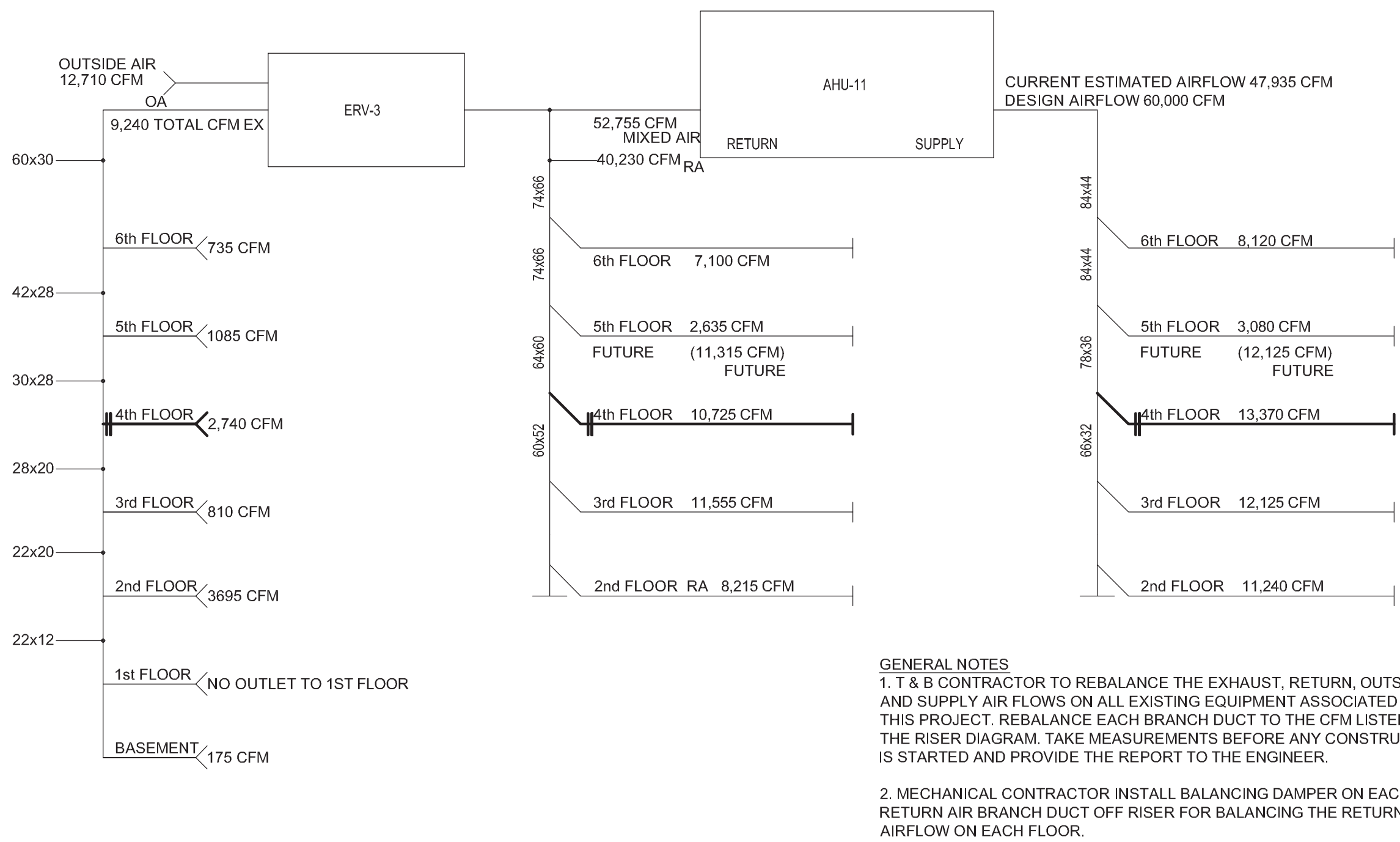
B





C

D

E

F



		CONSULTANTS:			ARCHITECT/ENGINEERS:		Drawing Title AIR SIDE RISER DIAGRAM		Project Title Renovate Four West		Project Number 585-12-132		 Office of Construction and Facilities Management Department of Veterans Affairs		
		 engineers   consultants   commissioning MEP Associates, LLC   2750 Arbor Court   Eau Claire, WI 54701 Phone: 715.832.5580   Fax: 715.832.5568   www.mepassociates.com MEP PROJECT NO.: N0613.01			 420 RAIL STREET NEGAUNEE, MI 49866 PHONE: 906-475-6616 FAX: 906-475-6954 NDW PROJECT NUMBER: 1214		Approved: Project Director		Location IRON MOUNTAIN, MICHIGAN		Building Number 1				
100% CONSTRUCTION DOCUMENTS		11/04/2013							Date 11/04/2013		Checked JAU			Drawn DLK	
Revisions:		Date													