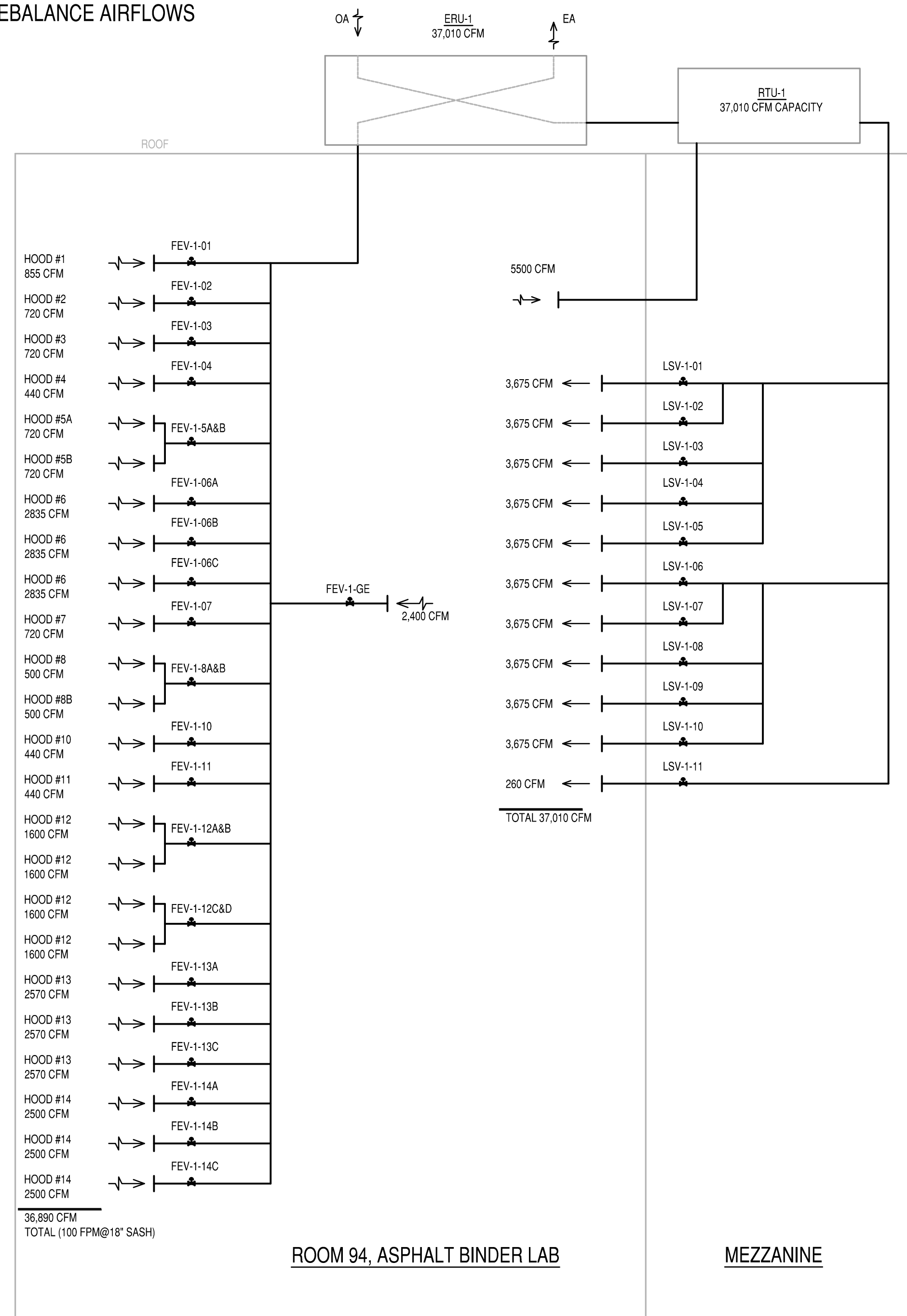


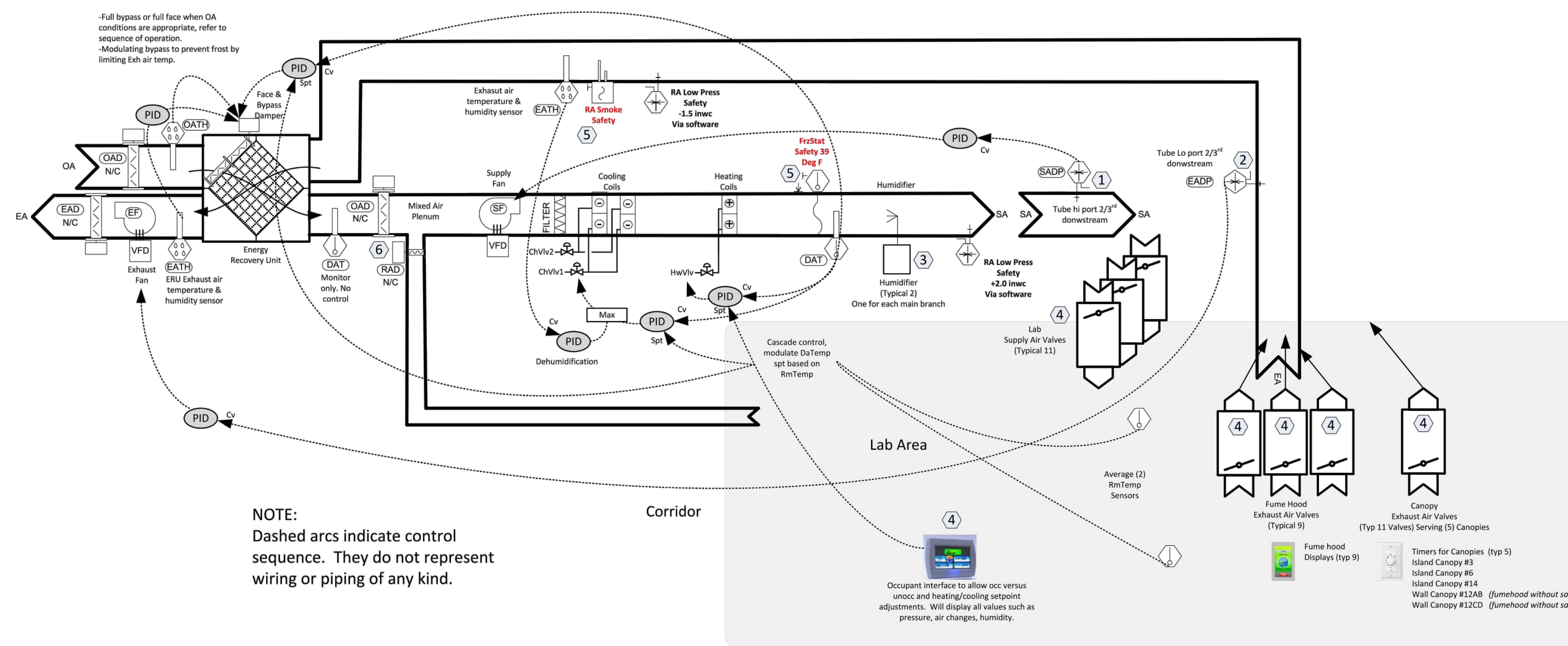
EXISTING

NOTE: REBALANCE AIRFLOWS



PHASE 3

RTU-1 & ERU-1  
Located on Roof Serving Asphalt Binder Lab (Room 94)

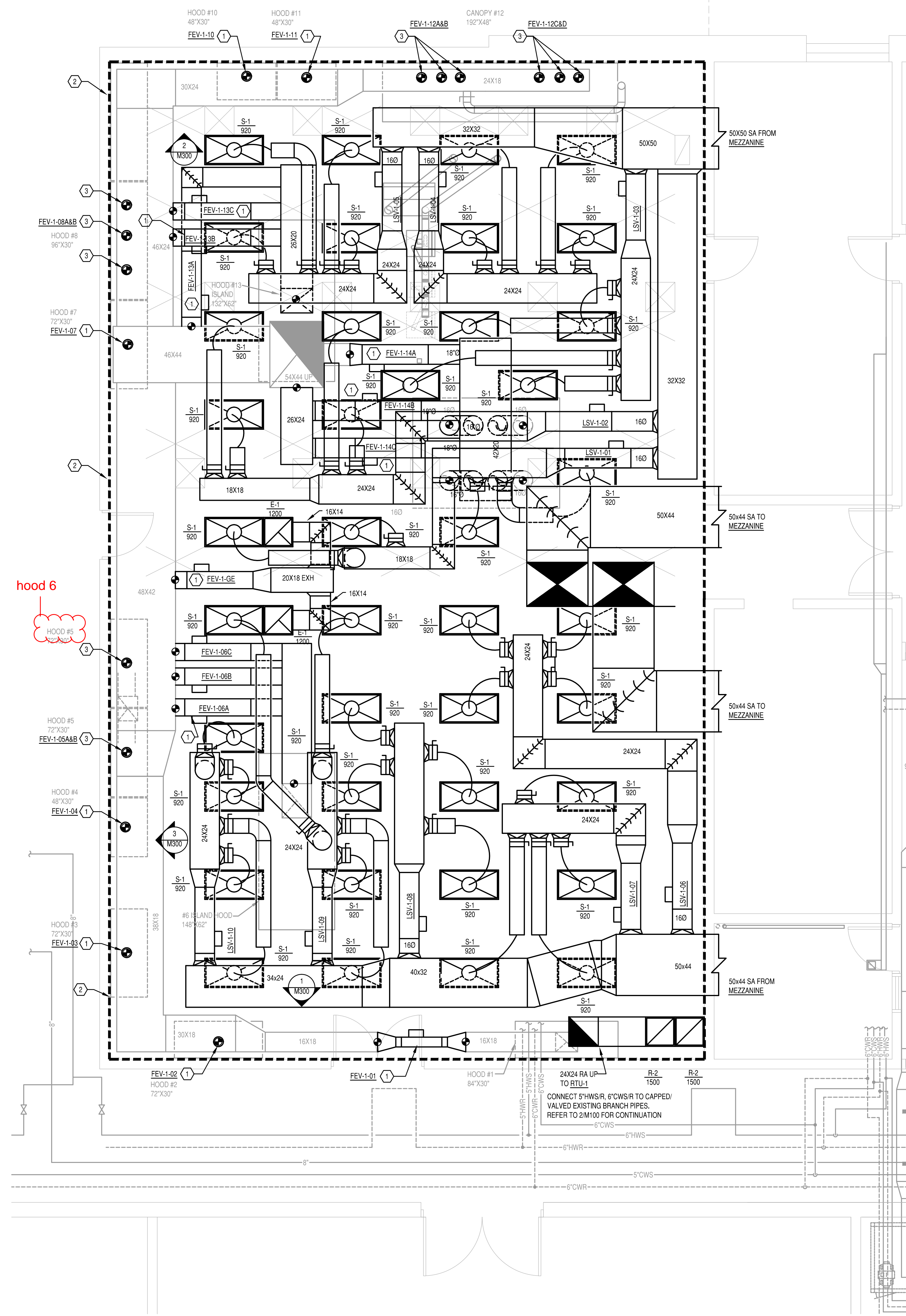


- ① Reference low port to plenum area, no tubing required this port.
- ② Reference hi port to corridor, shortest run from sensor.
- ③ Humidifier and components provided by others. Controls contractor to install and wire components according to mfg. Controls Contractor to integrate to humidifier.
- ④ Complete air valve control system and components provided by others. Controls contractor to install and wire components according to mfg. Controls Contractor to integrate to system.
- ⑤ Safety limit devices to be hardwired such that fans stop and exterior dampers shut on trip independent of any type of DDC software logic. All to be a manual reset type.
- ⑥ Software link such that outside air damper closes as return air damper opens and visa versa.

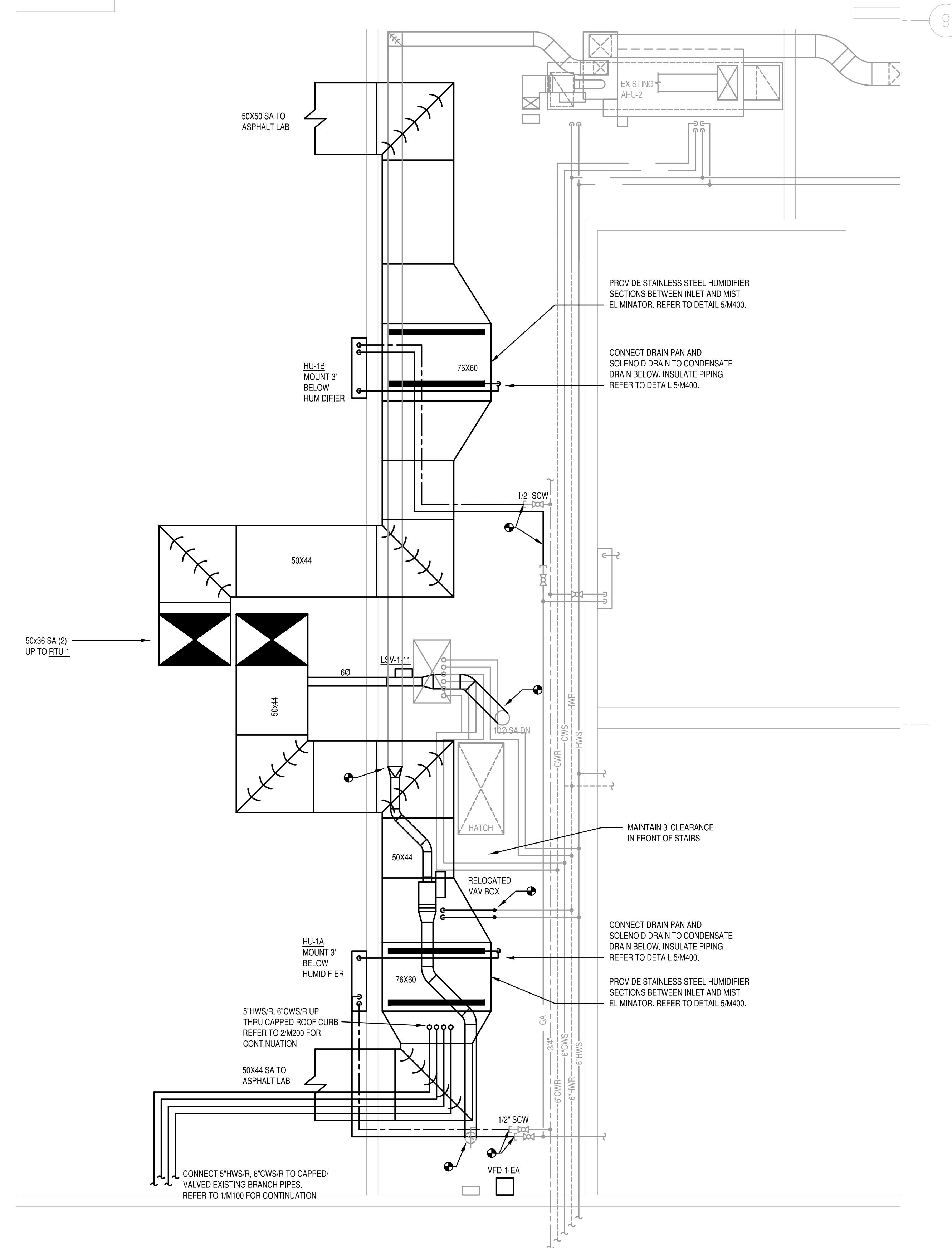
No.	Date	By	Revision
1	9/23/2015	HTK	BID DOCUMENTS

Project Title:	MnDOT ASPHALT LAB 94 RENOVATION PHASE 3 BUILDING NO: 90986 PROJECT NO: 16-6787 MAPLEWOOD, MN	Sheet Title:	ROOM 94 ASPHALT BINDER LAB AIR FLOW DIAGRAM	Date:	9-23-2015	Revision Number:	0
Drawn By:	HTK	Checked By:	RPC	Project No.:	14-289	Sheet Number:	M001
DWG. Scale:	NO SCALE	Sheet Size:	30x42				





1 MECHANICAL PLAN-GROUND LEVEL  
M100 1/4"=1'-0"



2 MECHANICAL PLAN-MEZZANINE  
M100 1/4"=1'-0"

- GENERAL NOTES:**
- ALL NEW EXHAUST AIR DUCTWORK SHALL BE SLOPED DOWNWARD TOWARD THE HOODS AND CANOPIES AT 1/8" PER FOOT OR AS MUCH AS POSSIBLE, WITH FLAT BOTTOM TRANSITION.
  - DRAWINGS ARE DIAGRAMMATIC. NOT ALL DROPS, RISES, OR OFFSETS ARE SHOWN.
  - ALL S-1 DIFFUSERS SHALL HAVE 12" O.D. BRANCH DUCT WITH A BALANCING DAMPER.
  - ALL AIR VALVE INLET DUCTS ARE 16" O.D. UNLESS OTHERWISE NOTED.
- KEYED NOTES:**
- INSTALL OWNER-PROVIDED AIR VALVE IN EXISTING EXHAUST HOOD DUCT.
  - REPLACE EXISTING CEILING GRID.
  - INSTALL OWNER-PROVIDED AIR VALVE IN EXISTING EXHAUST HOOD DUCT. CONNECT TO TWO EXISTING EXHAUST HOOD OPENINGS.

No.	Date	By	Revision
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Project Title:	MnDOT ASPHALT LAB 94 RENOVATION PHASE 3 BUILDING NO: 90986 PROJECT NO: 16-6787 MAPLEWOOD, MN	Sheet Title:	MECHANICAL PLAN	Date:	9-23-2015	Revision Number:	0
Drawn By:	HTK	Checked By:	RPC	Project No.:	14-289	Sheet Number:	M100
DWG. Scale:	1/4"=1'-0"	Sheet Size:	30x42				

ROOFTOP HVAC SCHEDULE (EXISTING, INSTALLED IN PREVIOUS PHASE) SD QMF 08-2034: 1																																								
MECHANICAL																																								
TAG	LOCATION	SUPPLY FAN				DESIGN	COOLING COIL 1										COOLING COIL 2										HEATING COIL										ELECTRICAL			
		CFM	EXT SP (IN)	TOTAL HP	FAN RPM		TOT CAP MBH	SEN CAP MBH	ENTERING AIR		LEAVING AIR		GPM	EWT	LWT	ROWS	TOT CAP MBH	SEN CAP MBH	ENTERING AIR		LEAVING AIR		GPM	EWT	LWT	ROWS	MBH	EAT DB (F)	LAT DB (F)	GPM	MAX WPD FT HD	EWT	LWT	FILTER TYPE	FILTER EFFICIENCY	MANUF.	MODEL NO.	NOTES	MCA	V/HZ/PH
RTU-1	ROOF	37010	4.0	62	2061	37010	1,242.28	697	76.3	68.8	59.28	58.65	255.93	45	55.5	6	843	366	59.28	58.65	50.3	50.2	304	45	51	6	3817	-20	75.1	419.1	18.9	140	120	2.4	MERV 13	TRANE	CSAA 080UB	ALL	93.28	460/603

**NOTES:**

- WITH 24" FACTORY ROOF CURB
- WITH INTERNAL VIBRATION ISOLATION
- ALL DAMPERS TO BE ACTUATED. NO BACK DRAFT DAMPERS
- SIZE AHU AT MEAN DIRTY FILTER PRESSURE DROP.
- DOUBLE WALL CONSTRUCTION W/ COOLING COIL FIRST, THEN ACCESS SPACE, THEN HEATING SECTION.
- CONFIGURE UNIT W/ COOLING COIL FIRST, THEN ACCESS SPACE, THEN HEATING SECTION.
- SS DRAIN PAN
- WITH ECONOMIZER
- TWO SETS OF SPLIT COOLING COILS SIZED FOR 30% P.G.
- VAV PACKAGED UNIT WITH VFD'S, DISCONNECTS AND SINGLE POINT ELECT. CONNECTION.
- TO BE EQUIPPED W/ COMPATIBLE CONTROL PACKAGE TO INTERFACE W/ EMS.
- PROVIDE LIGHTS IN FAN SECTIONS.
- SPLIT 2-ROW HEATING COIL SIZED FOR 30% ETHYLENE GLYCOL
- PROVIDE 120V OUTLET ON UNIT EXTERIOR
- OWNER FURNISHED, CONTRACTOR TO RECEIVE AND INSTALL
- HEATING COIL, RATED FOR 140 F WATER, TO BE BALANCED FOR SAME PERFORMANCE WITH 180 F WATER (286 GPM LAT 93.1F), SIZED FOR 30% E.G.
- RTU-1 EXISTING, INSTALLED IN PREVIOUS PHASE. CONNECT DUCTWORK, CONTROLS, AND PIPING TO EXISTING UNIT.**

**FILTERS**

- FARR 3030, PLEATED PRE-FILTER FACE LOADING
- 6" FILTER 65% CARTRIDGE FACE LOADING
- 2" FRONT LOAD MERV 8
- 4" FRONT LOAD MERV 13
- FACE LOADING FILTER FRAME WITH GASKETS
- NO SIDE ACCESS FILTERS ALLOWED
- 99.5% HEPA FILTER
- MAX AIR VELOCITY = 450 FPM
- SINGLE FRAME SHALL HOLD BOTH FILTERS
- FILTER PRESSURE DROPS ARE FOR CLEAN FILTERS

AIR VALVE SCHEDULE (OWNER PURCHASED, CONTRACTOR TO INSTALL)									
UNIT NO.	SERVES	MFR.	MODEL	TYPE	INLET SIZE	MAXIMUM CFM	MINIMUM CFM	NOTES	
LSV-1-01	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-02	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-03	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-04	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-05	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-06	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-07	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-08	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-09	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-10	ASPHALT 94	CRC	CRC-CLV-SAV-16-AL-GV-DPT	SINGLE DUCT VAV	16	3,675	425	1,2,4,6,7	
LSV-1-11	ASPHALT 94	CRC	CRC-CLV-SAV-8-AL-GV-DPT	SINGLE DUCT VAV	06	260	60	1,2,4,6,7	
FEV-1-01	HOOD #1	CRC	CRC-CLV-HEX8-AL-SS-CT-DPT	SINGLE DUCT VAV	08	855	105	1,2,3,5,6,7	
FEV-1-02	HOOD #2	CRC	CRC-CLV-HEX8-AL-SS-CT-DPT	SINGLE DUCT VAV	08	720	105	1,2,3,5,6,7	
FEV-1-03	HOOD #3	CRC	CRC-CLV-HEX8-AL-SS-CT-DPT	SINGLE DUCT VAV	08	720	105	1,2,3,5,6,7	
FEV-1-04	HOOD #4	CRC	CRC-CLV-HEX8-AL-SS-CT-DPT	SINGLE DUCT VAV	06	440	60	1,2,3,5,6,7	
FEV-1-05A&B	HOOD #5	CRC	CRC-CLV-HEX10-AL-SS-CT-DPT	SINGLE DUCT VAV	10	1,440	240	1,2,3,5,6,7	
FEV-1-06A	CANOPY #6	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,878	325	1,2,3,5,6,7	
FEV-1-06B	CANOPY #6	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,878	325	1,2,3,5,6,7	
FEV-1-06C	CANOPY #6	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,878	325	1,2,3,5,6,7	
FEV-1-07	HOOD #7	CRC	CRC-CLV-HEX8-AL-SS-CT-DPT	SINGLE DUCT VAV	08	720	105	1,2,3,5,6,7	
FEV-1-08A&B	HOOD #8	CRC	CRC-CLV-HEX10-AL-SS-CT-DPT	SINGLE DUCT VAV	10	1,000	165	1,2,3,5,6,7	
FEV-1-10	HOOD #10	CRC	CRC-CLV-HEX8-AL-SS-CT-DPT	SINGLE DUCT VAV	06	440	60	1,2,3,5,6,7	
FEV-1-11	HOOD #11	CRC	CRC-CLV-HEX8-AL-SS-CT-DPT	SINGLE DUCT VAV	06	440	60	1,2,3,5,6,7	
FEV-1-12A&B	HOOD #12	CRC	CRC-CLV-MEX16-AL-SS-CT-DPT	SINGLE DUCT VAV	16	1,600	240	1,2,3,5,6,7	
FEV-1-12C&D	HOOD #12	CRC	CRC-CLV-MEX16-AL-SS-CT-DPT	SINGLE DUCT VAV	16	1,600	240	1,2,3,5,6,7	
FEV-1-13A	CANOPY #13	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,567	325	1,2,3,5,6,7	
FEV-1-13B	CANOPY #13	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,567	325	1,2,3,5,6,7	
FEV-1-13C	CANOPY #13	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,567	325	1,2,3,5,6,7	
FEV-1-14A	CANOPY #14	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,500	325	1,2,3,5,6,7	
FEV-1-14B	CANOPY #14	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,500	325	1,2,3,5,6,7	
FEV-1-14C	CANOPY #14	CRC	CRC-CLV-MEX14-AL-SS-CT-DPT	SINGLE DUCT VAV	14	2,500	325	1,2,3,5,6,7	
FEV-1-GE	GENERAL EXH	CRC	CRC-CLV-GEX14-AL-GV-DPT	SINGLE DUCT VAV	14	2,400	1095	1,2,4,6,7	

**GENERAL NOTES:**

- AIR PRESSURE DROP THROUGH AIR VALVE SHALL NOT EXCEED 0.5" W.C.
- TYPE 1 NON-CORROSIVE; 16-GAUGE ALUMINUM VALVE BODY.
- STAINLESS STEEL DAMPER
- GALVANIZED DAMPER
- PHENOLIC-COATED ALUMINUM BODY
- FAST-ACTING DAMPER ACTUATOR
- OWNER PURCHASED, CONTRACTOR TO INSTALL ALL AIR VALVES AND CONTROLS. REFER TO SPECIFICATION 230995.**

GRILLES, REGISTERS, AND DIFFUSERS SCHEDULE SD QMF 08-2021: 1													
TAG	MANUF.	SERVES	MODEL	TYPE	MAX CFM	MAX CORE VEL. FPM	MAX NC	FACE SIZE	NECK SIZE	ADJUSTABLE DEFLECTION	MATERIAL	NOTES	
S-1	TITUS	LAB	RADIATECAL		425	125	27	24x48	12" ROUND	0	ALUM.	1,2	
R-1	TITUS	VARIES	50F	4	700	400	17	24X12	24X12	0	STEEL	1,2	
R-2	TITUS	VARIES	50F	4	1500	400	20	24X24	24X24	0	STEEL	1,2	
E-1	TITUS	VARIES	50F	4	1500	400	20	24X24	24X24	0	STEEL	1,2	

**TYPE:**

- HIGH VOLUME, LOW VELOCITY DIFFUSER (2-WAY PATTERN)
- SQUARE CONE DIFFUSER
- ROUND VERTICAL AND HORIZONTAL ADJUSTABLE THROW
- EGG CRATE

**NOTES:**

- VERIFY ALL BORDER TYPES WITH ARCH. PLANS
- STANDARD WHITE COLOR

**GENERAL NOTES FOR ALL GRILLES, REGISTERS, AND DIFFUSER:**

- THIS CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF SUBMITTALS PROVIDING ALL QUANTITIES, REQUIRED FRAME TYPES AND FINISHES.

VFD SCHEDULE SD QMF 08-2040: 1							
TAG	SERVES	SERVICE	MFG	MODEL #	HP	V/PH/Hz	NOTES
VFD-1-SA-A	EX RTU-1	SUPPLY FAN A	ABB	ACH550-DP	15	480/3/60	1,2,3,4
VFD-1-SA-B	EX RTU-1	SUPPLY FAN B	ABB	ACH550-DP	15	480/3/60	1,2,3,4
VFD-1-SA-C	EX RTU-1	SUPPLY FAN C	ABB	ACH550-DP	15	480/3/60	1,2,3,4
VFD-1-SA-D	EX RTU-1	SUPPLY FAN D	ABB	ACH550-DP	15	480/3/60	1,2,3,4
VFD-1-EA	EX ERU-1	EXHAUST FAN	ABB	ACH550-DP	40	480/3/60	1,3,5

**NOTES:**

- WITH FUSED DISCONNECT
- MOUNT IN RTU VESTIBULE
- FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
- VFD TO BE REMOTE MOUNTED ON RTU-1 VESTIBULE INNER WALL OR FREE STANDING UNISTRUT MOUNTING SYSTEM.
- MODIFY EXISTING ERU; PROVIDE NEW MOTOR AND VFD. MOUNT VFD IN MEZZANINE

HUMIDIFIER SCHEDULE												
TAG	SERVES	LOCATION	MANUFACTURER	MODEL	DIMENSIONS	CFM	MAXIMUM LB/HR	WATER/AIR CONN.	DRAIN CONN.	VAPOR LENGTH	V/PH/Hz	NOTES
HU-1A	ASPHALT LAB, RTU-1	MEZZANINE	CAREL	MCHM 015000	76"x60"	18500	386	1/2"	3/4"	3 FEET	120/1	ALL
HU-1B	ASPHALT LAB, RTU-1	MEZZANINE	CAREL	MCHM 015000	76"x60"	18500	386	1/2"	3/4"	3 FEET	120/1	ALL

**NOTES:**

- PROVIDE AIRFLOW SWITCH IN DUCT
- PROVIDE FILTER IN LINE ON DOW LINE TO UNIT; FILTER SHALL BE BY UNIT MANUFACTURER
- INTERFACE WITH BUILDING AUTOMATION SYSTEM PER SPECIFICATIONS
- PROVIDE INSERTION TUBE(S) BY MANUFACTURER, SIZED FOR DUCT NOTED ON PLAN
- COMPLY WITH ALL REQUIREMENTS OF MANUFACTURER FOR INSTALLATION.
- PROVIDE MIST ELIMINATOR, INSTALLED PER MFRG RECOMMENDATIONS

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Project Title:	<b>MnDOT ASPHALT LAB 94 RENOVATION PHASE 3 BUILDING NO: 90986 PROJECT NO: 16-6787 MAPLEWOOD, MN</b>
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Sheet Title:	<b>MECHANICAL SCHEDULES</b>
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Date:	9-23-2015	Revision Number:	0
Drawn By:	HTK	Checked By:	RPC
Project No.:	14-289	Sheet Number:	M402
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