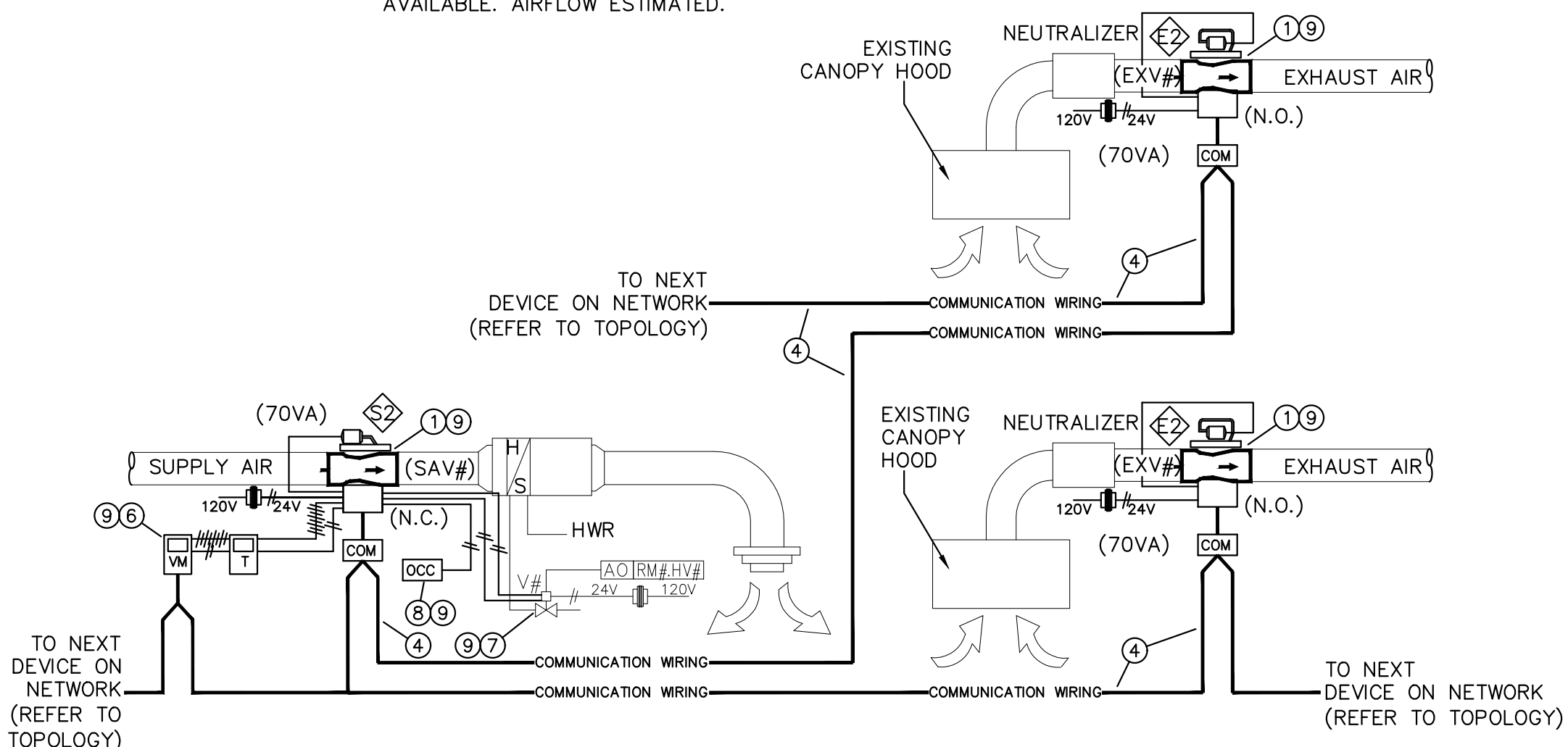


ROOM No. LAB No.	EXHAUST DEVICE	No.	EXHAUST AIR VOLUME/UNIT		TOTAL EXHAUST VOLUME		REMARKS
			MIN.	MAX.	MIN.	MAX.	
509	CANOPY HOOD	2	65	190	130	380	MINIMUM EXHAUST AIRFLOW RESULTS IN 8 ACHs.
							MINIMUM SUPPLY AIRFLOW MAINTAINS NEGATIVE OFFSET. ONE (1) SUPPLY AIR VALVES.
	TOTAL EXHAUST AIR		MIN = 130		MAX = 380		
	TOTAL SUPPLY AIR		MIN = 0		MAX = 130		

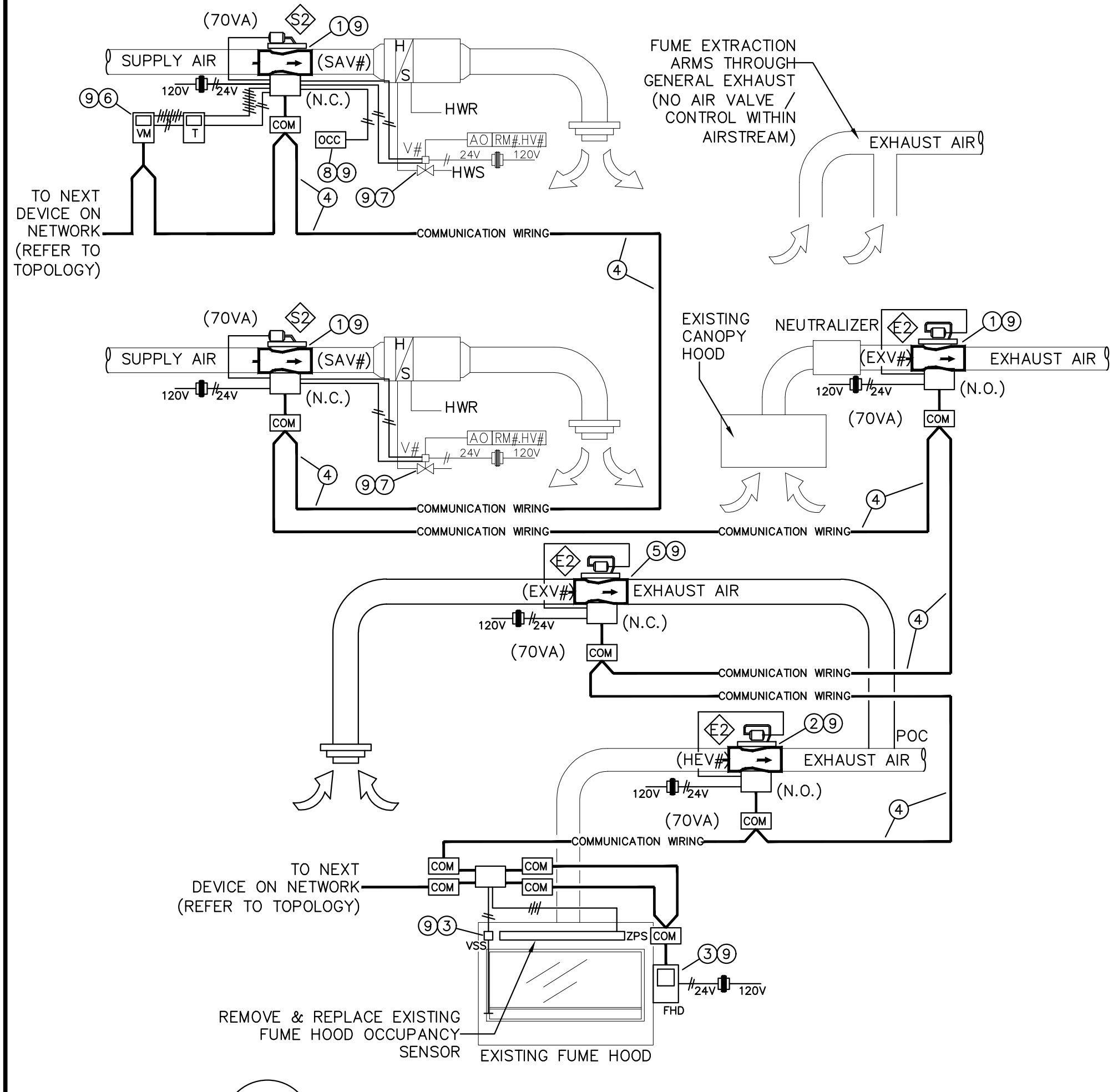
1. SPACE WAS MODIFIED BETWEEN AFTER RECORD DRAWINGS PREPARED. NO UP-TO-DATE TAB REPORT AVAILABLE. AIRFLOW ESTIMATED.



01
H12 LABORATORY 509 CONTROL SCHEMATIC
SCALE: N.T.S.

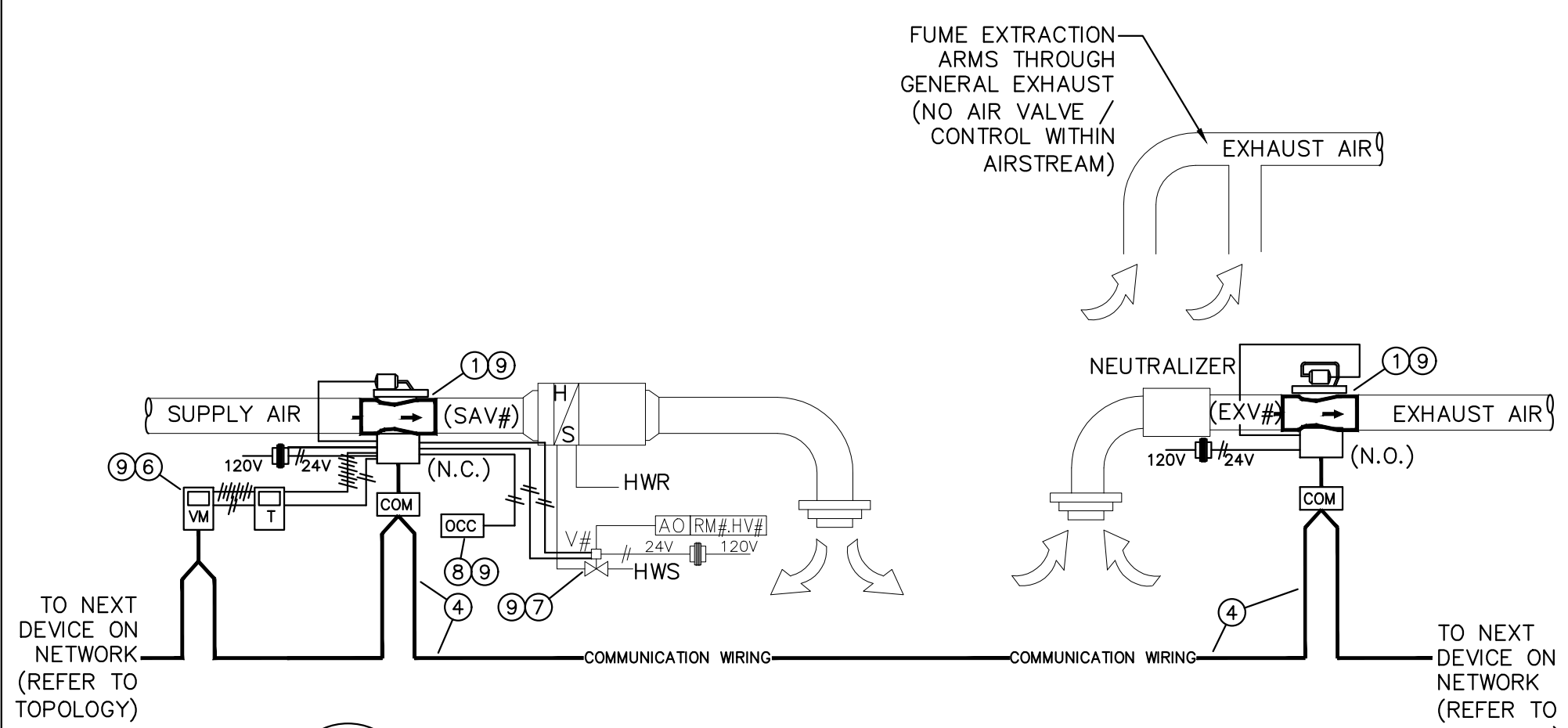
ROOM No. LAB No.	EXHAUST DEVICE	No.	EXHAUST AIR VOLUME/UNIT		TOTAL EXHAUST VOLUME		REMARKS
			MIN.	MAX.	MIN.	MAX.	
510	1800mm FUME HOOD	1	90	355	90	355	MINIMUM EXHAUST AIRFLOW RESULTS IN 25% MINIMUM HOOD FLOW & 8 ACHs. MINIMUM SUPPLY AIRFLOW MAINTAINS NEGATIVE OFFSET. TWO (2) SUPPLY AIR VALVES.
	CANOPY HOOD	1	180	190	180	190	
	TOTAL EXHAUST AIR		MIN = 270		MAX = 545		
	TOTAL SUPPLY AIR		MIN = 100		MAX = 370		

1. SPACE WAS MODIFIED BETWEEN AFTER RECORD DRAWINGS PREPARED. NO UP-TO-DATE TAB REPORT AVAILABLE. AIRFLOW ESTIMATED.



02
H12 LABORATORY 510 CONTROL SCHEMATIC
SCALE: N.T.S.

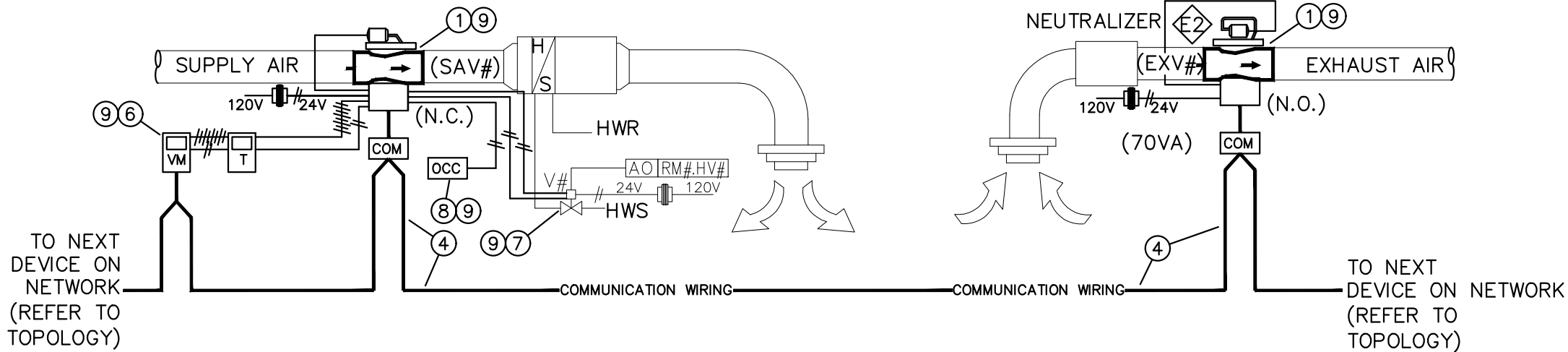
ROOM No. LAB No.	EXHAUST DEVICE	No.	EXHAUST AIR VOLUME/UNIT		TOTAL EXHAUST VOLUME		REMARKS
			MIN.	MAX.	MIN.	MAX.	
511	GENERAL EXHAUST	1	135	250	135	250	MINIMUM EXHAUST AIRFLOW RESULTS IN 8 ACHs. MINIMUM SUPPLY AIRFLOW MAINTAINS NEGATIVE OFFSET. ONE (1) SUPPLY AIR VALVES.
	TOTAL EXHAUST AIR		MIN = 135		MAX = 250		
	TOTAL SUPPLY AIR		MIN = 15		MAX = 130		



03
H12 LABORATORY 511 CONTROL SCHEMATIC
SCALE: N.T.S.

ROOM No. LAB No.	EXHAUST DEVICE	No.	EXHAUST AIR	VOLUME/UNIT	TOTAL EXHAUST VOLUME		REMARKS
			MIN.	MAX.	MIN.	MAX.	
512	GENERAL EXHAUST	1	135	250	135	250	MINIMUM EXHAUST AIRFLOW RESULTS IN 8 ACHs.
	TOTAL EXHAUST AIR		MIN = 135		MAX = 250		MINIMUM SUPPLY AIRFLOW MAINTAINS NEGATIVE OFFSET. ONE (1) SUPPLY AIR VALVES.
	TOTAL SUPPLY AIR		MIN = 15		MAX = 130		

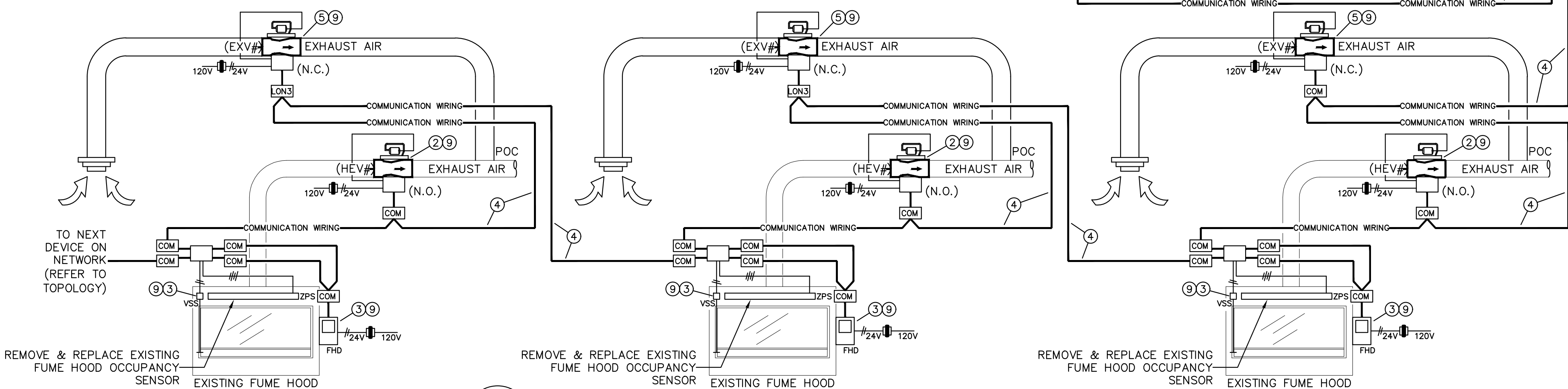
1. SPACE WAS MODIFIED BETWEEN AFTER RECORD DRAWINGS PREPARED. NO UP-TO-DATE TAB REPORT AVAILABLE. AIRFLOW ESTIMATED.



04
H12 LABORATORY 512 CONTROL SCHEMATIC
SCALE: N.T.S.

ROOM LAB No.	EXHAUST DEVICE	No.	EXHAUST AIR VOLUME/UNIT		TOTAL EXHAUST VOLUME		REMARKS
			MIN.	MAX.	MIN.	MAX.	
513	1800mm FUME HOOD	3	90	355	270	1065	MINIMUM EXHAUST AIRFLOW RESULTS IN 25% MINIMUM HOOD FLOW & 8 ACHS. MINIMUM SUPPLY AIRFLOW MAINTAINS NEGATIVE OFFSET. THREE (3) SUPPLY AIR VALVES.
	GENERAL EXHAUST	1	140	250	140	250	
	TOTAL EXHAUST AIR		MIN = 410		MAX = 1315		
	TOTAL SUPPLY AIR		MIN = 315		MAX = 690		

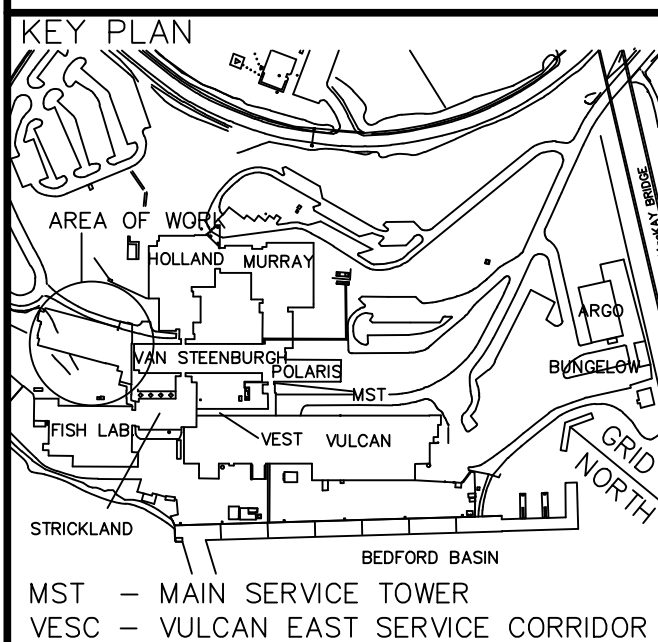
1. SPACE WAS MODIFIED BETWEEN AFTER RECORD DRAWINGS PREPARED. NO UP-TO-DATE TAB REPORT AVAILABLE.
2. ADDITIONAL MINIMUM EXHAUST IS REQUIRED FROM THE NEW GENERAL EXHAUST CONNECTED INTO FUME HOOD EXHAUST BRANCH (SEE BELOW). 135 LPS IS REQUIRED AS A MINIMUM TO MAINTAIN 8 ACHs.



05
H12 LABORATORY 513 CONTROL SCHEMATIC
SCALE: N.T.S.

GENERAL NOTES

- REMOVE ALL EXISTING 2-POSITION SUPPLY AND GENERAL EXHAUST PNEUMATIC-CONTROLLED AIR VALVES AND REPLACE WITH VARIABLE AIR VOLUME SUPPLY AND GENERAL EXHAUST ELECTRONIC-CONTROLLED AIR VALVES. ACTUATORS SHALL BE ELECTRONIC, FAST-ACTING. ALL COMPONENTS SHALL BE REMOVED AND REPLACED (I.E. NONE OF THE EXISTING COMPONENTS MAY BE RE-USED). REMOVE AND REPLACE EXISTING DUCTWORK TO/FROM AIR VALVE AS REQUIRED TO INSTALL NEW AIR VALVE AS REQUIRED BY MANUFACTURER (I.E. WITH REQUIRED STRAIGHT SECTIONS FOR INLET/OUTLET, ETC.). CONFIRM ALL OTHER REQUIREMENTS, PROVIDE ADDITIONAL COMPONENTS, INCLUDING ALL WIRING, TRANSFORMERS, CONTROLLERS AND ROOM INTEGRATORS, AS NECESSARY TO PROVIDE FULLY FUNCTIONAL SYSTEM. SEE DRAWINGS & SPECIFICATIONS FOR ALL REQUIREMENTS. REMOVE ALL EXISTING PNEUMATIC TUBING ASSOCIATED WITH AIR VALVES TO BE REPLACED, CAP TUBING AT NEARBY MAIN.
- REMOVE ALL EXISTING 2-POSITION FUME HOOD EXHAUST PNEUMATIC-CONTROLLED AIR VALVES AND REPLACE WITH VARIABLE AIR VOLUME FUME HOOD EXHAUST ELECTRONIC-CONTROLLED AIR VALVES. ACTUATORS SHALL BE ELECTRONIC, FAST-ACTING. ALL COMPONENTS SHALL BE REMOVED AND REPLACED (I.E. NONE OF THE EXISTING COMPONENTS MAY BE RE-USED). REMOVE AND REPLACE EXISTING DUCTWORK TO/FROM AIR VALVE AS REQUIRED TO INSTALL NEW AIR VALVE AS REQUIRED BY MANUFACTURER (I.E. WITH REQUIRED STRAIGHT SECTIONS FOR INLET/OUTLET, ETC.). CONFIRM ALL OTHER REQUIREMENTS, PROVIDE ADDITIONAL COMPONENTS, INCLUDING ALL WIRING, TRANSFORMERS, CONTROLLERS AND ROOM INTEGRATORS, AS NECESSARY TO PROVIDE FULLY FUNCTIONAL SYSTEM. SEE DRAWINGS & SPECIFICATIONS FOR ALL REQUIREMENTS. REMOVE ALL EXISTING PNEUMATIC TUBING ASSOCIATED WITH AIR VALVES TO BE REPLACED, CAP TUBING AT NEARBY MAIN.
- REMOVE AND REPLACE THE FOLLOWING EXISTING FUME HOOD CONTROL COMPONENTS, INCLUDING ALL OF THEIR ASSOCIATED COMPONENTS AND WIRING, (A) FUME HOOD DISPLAY/MONITOR ("FHD"); (B) VERTICAL SASH MONITOR ("VSS"); AND (C) ZONE PRESENCE / HOOD OCCUPANCY SENSOR ("ZPS"). ALL NEW DEVICES SHALL BE COMPATIBLE WITH NEW VARIABLE AIR VOLUME FUME HOOD EXHAUST AIR VALVES AND CONTROLLERS. CONNECT DEVICES INTO NEW FUME HOOD MONITOR, CONFIRM ALL OTHER REQUIREMENTS, PROVIDE ADDITIONAL COMPONENTS, INCLUDING ALL WIRING, TRANSFORMERS, CONTROLLERS AND ROOM INTEGRATORS, AS NECESSARY TO PROVIDE FULLY FUNCTIONAL SYSTEM. SEE DRAWINGS & SPECIFICATIONS FOR ALL REQUIREMENTS.
- REMOVE AND REPLACE EXISTING COMMUNICATION WIRING. PROVIDE NEW WIRING AS REQUIRED FOR NEW AIR VALVE AND CONTROLLER REQUIREMENTS. CONTRACTOR TO CONFIRM SPECIFIC REQUIREMENTS OF COMMUNICATION WIRING WITH MANUFACTURER (TO BE EITHER LON, BACNET MS/TP OR BACNET IP BASED COMMUNICATION). REMOVE ALL REDUNDANT EXISTING CONTROL WIRING. REMOVE ALL EXISTING PNEUMATIC TUBING ASSOCIATED WITH AIR VALVES TO BE REPLACED, CAP TUBING AT NEARBY MAIN.
- PROVIDE NEW GENERAL EXHAUST ELECTRONIC AIR VALVE. CONNECT INTO EXHAUST AIR DUCTWORK DOWNSTREAM OF EXISTING FUME HOOD EXHAUST AIR VALVE (I.E. DO NOT CONNECT BETWEEN THE FUME HOOD AND THE FUME HOOD CONTROL VALVE). REFER TO VENTILATION LAYOUTS FOR LOCATIONS, SIZING AND CONNECTION REQUIREMENTS.
 - PROVIDE NEW FIRE DAMPER (FD) WITHIN NEW DUCTWORK WHERE IT PENETRATES THE WALL BETWEEN THE SERVICE CORRIDOR AND LABORATORY SPACE.
 - CONNECT NEW SERVICES (n) INTO EXISTING SERVICES (e) TO REMAIN INSTALLED, POINT OF CONNECTION (P.O.C.). MODIFY EXISTING TO THE FULL EXTENT REQUIRED TO COMPLETE CONNECTION. CONFIRM AND DETERMINE EXACT LOCATIONS, SIZES AND ELEVATIONS ON-SITE.
- ACTUATORS SHALL BE ELECTRONIC, FAST-ACTING. INSTALL NEW AIR VALVE AS REQUIRED BY MANUFACTURER (I.E. WITH REQUIRED STRAIGHT SECTIONS FOR INLET/OUTLET, ETC.). CONFIRM ALL OTHER REQUIREMENTS, PROVIDE ADDITIONAL COMPONENTS, INCLUDING ALL WIRING, TRANSFORMERS, CONTROLLERS AND ROOM INTEGRATORS, AS NECESSARY TO PROVIDE FULLY FUNCTIONAL SYSTEM. SEE DRAWINGS & SPECIFICATIONS FOR ALL REQUIREMENTS.
- PROVIDE NEW WALL-MOUNTED VIEW MONITOR / CONTROLLER FOR LABORATORY VENTILATION SYSTEM ("VM"). CONFIRM ALL OTHER REQUIREMENTS, PROVIDE ADDITIONAL COMPONENTS, INCLUDING ALL WIRING, TRANSFORMERS AND CONTROLLERS, AS NECESSARY TO PROVIDE FULLY FUNCTIONAL SYSTEM. REMOVE AND REPLACE EXISTING WALL-MOUNTED THERMOSTATS WITH NEW ELECTRONIC TEMPERATURE THERMOSTAT ("TT") COMPLETE WITH TEMPERATURE SENSOR, HUMIDITY SENSOR, DISPLAY, LABORATORY VENTILATION OVERRIDE AND SET-POINT ADJUSTMENT. THERMOSTAT TO BE COMPATIBLE WITH NEW AIR VALVE CONTROLLERS AND CONTROL PACKAGE. MANUFACTURER TO CONFIRM ALL OTHER REQUIREMENTS. PROVIDE ADDITIONAL COMPONENTS AS NECESSARY TO PROVIDE FUNCTIONAL SYSTEM.
- EXISTING BELIMO MODULATING ZONE REHEAT CONTROL VALVE TO REMAIN, TO BE CONTROLLED VIA THE RESPECTIVE AIR VALVE CONTROLLER. PROVIDE ALL WIRING NECESSARY BETWEEN AIR VALVE CONTROLLER AND CONTROL VALVE. MANUFACTURER TO CONFIRM ALL OTHER REQUIREMENTS. PROVIDE ADDITIONAL COMPONENTS AS NECESSARY TO PROVIDE FUNCTIONAL SYSTEM.
- PROVIDE NEW ROOM OCCUPANCY FOR EACH ENTRY DOORWAY INTO ROOM. CONNECT INTO LABORATORY VENTILATION SYSTEM. CONFIRM ALL OTHER REQUIREMENTS, PROVIDE ADDITIONAL COMPONENTS, INCLUDING ALL WIRING, TRANSFORMERS, CONTROLLERS AND ROOM INTEGRATORS, AS NECESSARY TO PROVIDE FULLY FUNCTIONAL SYSTEM. SEE DRAWINGS & SPECIFICATIONS FOR ALL REQUIREMENTS.
- ALL ELECTRICAL (120V) WIRING, INCLUDING CIRCUIT BREAKERS, SHALL BE PROVIDED (I.E. SUPPLIED & INSTALLED) BY THE CONTRACTOR. ALL LOW VOLTAGE (24V) WIRING, INCLUDING 120/24VDC CONTROL TRANSFORMERS, SHALL BE PROVIDED (I.E. SUPPLIED & INSTALLED) BY THE CONTRACTOR. ALL NETWORK/COMMUNICATION WIRING, INCLUDING DATA CONNECTIONS & DROPS, SHALL BE PROVIDED (I.E. SUPPLIED & INSTALLED) BY THE CONTRACTOR.



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1	ISSUED FOR TENDER	JUL 24 2020
revisions		date
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CONTROL SCHEMATICS

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date JULY 24, 2020	
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date JULY 24, 2020	
approved D.G.I.	approuvé
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Tender	Soumission
PWSSC Project Manager	Administrateur de projets TPSSC
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H12