

C:\Users\stahangj\Documents\15124R1-v2_M15_Olsson 2nd Fl Reno_Mech_DD_bethanyj01.d

DESIGN CONDITIONS				
LOCATION	OUTDOOR SUMMER, dB/wB	INDOOR SUMMER, dB	OUTDOOR WINTER, dB	INDOOR WINTER, dB
VA - RICHMOND	94/75	75/63	17	70
NOTES: 1. OUTDOOR DESIGN CONDITIONS BASED ON ASHRAE CLIMATIC DESIGN DATA. 2. INDOOR DESIGN CONDITIONS BASED ON ASHRAE STANDARD 55-2010.				

23 0719: HYDRONIC PIPING INSULATION SCHEDULE								
SYSTEM	TYPE	MINIMUM INSULATION THICKNESS						
		NOMINAL PIPE SIZE, IN				JACKET	NOTES	
		< 1	1 TO < 1.1/2	1.1/2 TO < 4	4 TO < 8			
HEATING WATER PIPING: 141-200°F	GLASS FIBER, RIGID	1.1/2	1.1/2	2	2	-	-	

23 3100: DUCT & INSULATION SCHEDULE					
SYSTEM	MATERIAL	PRESSURE CLASS, IN WC	INSULATION		NOTES
			TYPE	THICKNESS, IN	
ATU-O SUPPLY	GALV	1	GLASS FIBER, FLEXIBLE	2	
AHU INTAKE	GALV	2	GLASS FIBER, FLEXIBLE	2	
AHU SUPPLY	GALV	3	GLASS FIBER, FLEXIBLE	2	
AHU RETURN	GALV	2	GLASS FIBER, FLEXIBLE	2	1
AHU EXHAUST	GALV	2	NONE	-	
GENERAL EXHAUST	GALV	1	GLASS FIBER, FLEXIBLE	2	1
SNOKEL EXHAUST	GALV	4	GLASS FIBER, FLEXIBLE	2	1
NOTES: 1. OMIT INSULATION WHERE DUCTS ARE INSTALLED WITHIN CONDITIONED AREAS/ CEILING PLENUMS.					

23 3423: FAN SCHEDULE											
MARK	SERVICE	MODEL	TYPE	MOUNTING	CFM	ESP IN WC	DRIVE	MOTOR W (HP)	INLET dBA	V-PH	NOTES
EF-MAKER	MAKER LAB 201	SQ-160-VG	CENTRIFUGAL	INLINE	2,430	0.40	DIRECT	(1)	63	208-1	7,10
EF-IT	IT CLOSET C206	SP-80-VG	CENTRIFUGAL	CABINET	90	0.40	DIRECT	6	25	120-1	11
EF-JC1	JANITOR CLOSET 210	SP-80-VG	CENTRIFUGAL	CEILING	70	0.40	DIRECT	6	25	120-1	8
EF-SNORKEL 1	MAKER LAB SNORKEL	USF-206-10-BI-10	CENTRIFUGAL	BASE	200	3.20	BELT	(1)	72	208-1	8,10
EF-SNORKEL 2	MAKER LAB SNORKEL	USF-206-10-BI-10	CENTRIFUGAL	BASE	200	3.20	BELT	(1)	72	208-1	8,10
NOTES: 1. ALL FANS - DESIGN AND PERFORMANCE BASED ON GREENHECK, UNO. 2. ALL FANS - PROVIDE ALL REQUIRED SHEAVES/DAMPERS/SPEED CONTROLLERS FOR FINAL BALANCING. 3. ALL FANS - PROVIDE FACTORY MOUNTED MEANS OF ELECTRICAL DISCONNECT AND THERMAL OVERLOAD PROTECTION, UNO. 4. ALL BELT DRIVE FANS - PROVIDE GRIP NOTCH BELTS AND AUTOMATIC BELT TENSIONERS, UNO. PROVIDE OSHA GUARDS AND MOTOR COVERS. 5. ALL DIRECT DRIVE FANS - PROVIDE SPEED CONTROLLER, UNO. 6. ALL CABINET/CEILING FANS - PROVIDE OPEN SPRING VIBRATION ISOLATORS. PROVIDE BACKDRAFT DAMPERS. 7. FAN SHALL BE MODULATED BY THE BAS. REFER TO CONTROL DRAWINGS FOR FURTHER DETAIL. 8. FAN CONTROLLED BY WALL SWITCH, PROVIDED BY ELECTRICAL CONTRACTOR. 9. FAN CONTROLLED BY SPACE LIGHTING CONTROLS, COORDINATE WITH ELECTRICAL CONTRACTOR. 10. PROVIDE OPEN SPRING VIBRATION ISOLATORS. 11. FAN CONTROLLED BY LINE VOLTAGE THERMOSTAT, PROVIDED BY MECHANICAL CONTRACTOR.											

23 3600: AIR TERMINAL UNIT - SHUT OFF SCHEDULE																			
MARK	MODEL	TYPE	INLET SIZE, IN	AIR FLOW					HEATING WATER COIL						DIMENSIONS				WEIGHT LBS.
				MIN CFM	MAX CFM	MAX SP DROP IN WC	MAX DISCHARGE, NC	MAX RADIATED, NC	BRANCH PIPE S/R, IN	MBH	GPM	EAT DB, °F	LAT DB, °F	WPD, FT	LENGTH, IN	WIDTH, IN	HEIGHT, IN		
ATU-OA-ZONE:ROOM NO.	VCWF05	SINGLE DUCT	5	45	150	0.03	27	21	1/2	4.4	0.5	55	109	0.5	19	12	10	21	
ATU-OB-ZONE:ROOM NO.	VCWF05	SINGLE DUCT	5	45	225	0.05	31	21	1/2	5.2	0.5	55	98	0.5	19	12	10	21	
ATU-OC-ZONE:ROOM NO.	VCWF06	SINGLE DUCT	6	60	350	0.21	29	26	1/2	9.1	0.5	55	103	0.2	19	12	10	21	
ATU-OD-ZONE:ROOM NO.	VCWF08	SINGLE DUCT	8	110	675	0.61	26	23	1/2	15.2	0.8	55	96	0.1	19	13	12	24	
ATU-OE-ZONE:ROOM NO.	VCWF10	SINGLE DUCT	10	165	1000	0.22	24	25	1/2	22.3	1.1	55	96	0.2	20	16	14	32	
ATU-OF-ZONE:ROOM NO.	VCWF12	SINGLE DUCT	12	235	1500	0.49	21	25	3/4	29.1	1.5	55	91	0.1	21	19	16	40	
ATU-OG-ZONE:ROOM NO.	VCWF14	SINGLE DUCT	14	320	2100	0.38	25	31	3/4	44.0	2.2	55	94	0.2	22	21	20	48	
<div>NOTES:</div> <div><div>1.</div><div>DESIGN AND PERFORMANCE BASED ON TRANE.</div></div> <div><div>2.</div><div>HEATING COIL CAPACITIES ARE BASED ON 160° EWT.</div></div> <div><div>3.</div><div>BRANCH SUPPLY DUCT SHALL MATCH VAV BOX INLET SIZE.</div></div> <div><div>4.</div><div>DISCHARGE DUCT SIZE SHALL MATCH VAV BOX DISCHARGE DIMENSIONS, UNLESS OTHERWISE NOTED.</div></div> <div><div>5.</div><div>MECHANICAL CONTRACTOR TO PROVIDE PIPING PACKAGE. BAS CONTRACTOR TO FURNISH TWO-WAY VALVE & ACTUATOR, INSTALLED BY MECHANICAL CONTRACTOR.</div></div> <div><div>6.</div><div>PROVIDE 1" FOIL FACED INSULATION.</div></div> <div><div>7.</div><div>DDC CONTROLS SHALL BE FURNISHED BY BAS CONTRACTOR AND FACTORY INSTALLED BY EQPT MFR.</div></div> <div><div>8.</div><div>NOISE CRITERIA DISCHARGE/RADIATED VALUES BASED ON AHRI 885-90/885-08.</div></div> <div><div>9.</div><div>PROVIDE INTEGRAL 24V CONTROL TRANSFORMER WITHIN CABINET. COORDINATE WITH BAS CONTRACTOR PRIOR TO FABRICATION.</div></div>																			

ABBREVIATIONS

A	AMPERE
ABV	ABOVE
A/E	ARCHITECT/ENGINEER
ACT	ACOUSTICAL CEILING TILE
AFF	ABOVE FINISHED FLOOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APD	AIR PRESSURE DROP
ARCH	ARCHITECT
ARCH'L	ARCHITECTURAL
ARI	AMERICAN REFRIGERATION INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING AND REFRIGERATION AND AIR-CONDITIONING ENGINEERS
BAS	BUILDING AUTOMATION SYSTEM
BLDG	BUILDING
BTUH	BRITISH THERMAL UNITS PER HOUR
CD	CEILING DIFFUSER, CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	CEILING
CRG	CEILING RETURN GRILLE
dB	DECIBELS
DB	DRY BULB
DIA	DIAMETER
E	EXISTING
EQPT	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EWT	ENTERING WATER TEMPERATURE
°F	DEGREE FAHRENHEIT
FD	FIRE DAMPER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FT	FEET OR FOOT
GALV	GALVANIZED
GPM	GALLONS PER MINUTE

HP	HORSEPOWER
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
IN	INCH, INCHES
LAT	LEAVING AIR TEMPERATURE
LBS, #	POUNDS
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBD	MANUAL BALANCING DAMPER
MBH	THOUSAND BTUH
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTURER
MOP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OAD	OUTSIDE AIR DUCT
PD	PRESSURE DROP
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
RAD	RETURN AIR DUCT
RCP	REFLECTED CEILING PLAN
SAD	SUPPLY AIR DUCT
SENS	SENSIBLE
SP	STATIC PRESSURE
SWRG	SIDEWALL RETURN GRILLE
SWISG	SIDEWALL SUPPLY GRILLE
TOO	TOP OF DUCT
TTL	TOTAL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V-PH	VOLTAGE-PHASE
W	WATT
WB	WET BULB
WC	WATER COLUMN
WPD	WATER PRESSURE DROP

MECHANICAL LEGEND

	WALL SENSOR AT 48" AFF, COORDINATE EXACT LOCATION WITH A/E PRIOR TO ROUGH-IN. IDENTIFIERS INDICATE THE FOLLOWING FUNCTIONS: T TEMPERATURE TH TEMPERATURE & HUMIDITY SP SET POINT CONTROL X NO SET POINT CONTROL
	CARBON DIOXIDE SENSOR
	EXISTING TO BE REMOVED
	EXISTING TO REMAIN
	POINT OF DISCONNECTION, DEMOLITION
	POINT OF CONNECTION, NEW-TO-EXISTING
PIPING	
	DIRECTION OF FLOW INSIDE PIPE
	HEATING WATER SUPPLY
	HEATING WATER RETURN
	CHILLED WATER SUPPLY
	CHILLED WATER RETURN
	CONDENSATE DRAIN
FITTINGS	
	CAP
	CONNECTION, BOTTOM
	CONNECTION, TOP
	ELBOW, 90° TURNED UP
	ELBOW, 90° TURNED DOWN
VALVES	
	BALL
	CHECK
	UNION
	AUTOMATIC TWO-WAY CONTROL
	AUTO-FLOW SETTING
PIPING SPECIALTIES	
	AIRVENT, AUTOMATIC/MANUAL
	RECTANGULAR DUCT SECTION (SUPPLY)
	RECTANGULAR DUCT SECTION (RETURN)
	RECTANGULAR DUCT SECTION (EXHAUST)
	RECTANGULAR ELBOW TURNING UP (SUPPLY)
	RECTANGULAR ELBOW TURNING UP (RETURN)
	RECTANGULAR ELBOW TURNING UP (EXHAUST)
	RECTANGULAR ELBOW TURNING DOWN (SUPPLY)
	RECTANGULAR ELBOW TURNING DOWN (RETURN)
	RECTANGULAR ELBOW TURNING DOWN (EXHAUST)
	ROUND DUCT SECTION (SUPPLY)
	ROUND DUCT SECTION (RETURN)
	ROUND DUCT SECTION (EXHAUST)
	ROUND ELBOW TURNING UP (SUPPLY)
	ROUND ELBOW TURNING UP (RETURN)
	ROUND ELBOW TURNING UP (EXHAUST)
	ROUND ELBOW TURNING DOWN (SUPPLY)
	ROUND ELBOW TURNING DOWN (RETURN)
	ROUND ELBOW TURNING DOWN (EXHAUST)
	RETURN GRILLE, TYPE AS INDICATED
	RECTANGULAR CEILING SUPPLY DIFFUSER, ROUND CONNECTION, TYPE AS INDICATED
	SIDEWALL SUPPLY REGISTER
	SIDEWALL RETURN GRILLE

DUCTWORK

	RECTANGULAR DUCT, FIRST DIMENSION IS SIDE SHOWN, DIMENSION IN INCHES
	ROUND DUCT, DIMENSION IN INCHES
	DOUBLE WALL OVAL DUCT, DIMENSION IN INCHES
	FLEXIBLE CONNECTION
	FLEXIBLE DUCT
	TRANSITION, SLOPE NOT TO EXCEED 4-TO-1, FOT = FLAT ON TOP, FOB = FLAT ON BOTTOM
	TURNING VANES
	STANDARD BRANCH, SUPPLY OR RETURN, NO SPLITTER
	MOTORIZED DAMPER
	MANUAL VOLUME DAMPER
	FIRE DAMPER WITH SLEEVE, PROVIDE ACCESS DOOR.
	RECTANGULAR DUCT SECTION (SUPPLY)
	RECTANGULAR DUCT SECTION (RETURN)
	RECTANGULAR DUCT SECTION (EXHAUST)
	RECTANGULAR ELBOW TURNING UP (SUPPLY)
	RECTANGULAR ELBOW TURNING UP (RETURN)
	RECTANGULAR ELBOW TURNING UP (EXHAUST)
	RECTANGULAR ELBOW TURNING DOWN (SUPPLY)
	RECTANGULAR ELBOW TURNING DOWN (RETURN)
	RECTANGULAR ELBOW TURNING DOWN (EXHAUST)
	ROUND DUCT SECTION (SUPPLY)
	ROUND DUCT SECTION (RETURN)
	ROUND DUCT SECTION (EXHAUST)
	ROUND ELBOW TURNING UP (SUPPLY)
	ROUND ELBOW TURNING UP (RETURN)
	ROUND ELBOW TURNING UP (EXHAUST)
	ROUND ELBOW TURNING DOWN (SUPPLY)
	ROUND ELBOW TURNING DOWN (RETURN)
	ROUND ELBOW TURNING DOWN (EXHAUST)
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	SIDEWALL SUPPLY REGISTER
	SIDEWALL RETURN GRILLE

GENERAL NOTES

- NEW WORK
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH VUSBC 2012, IECC 2012 AND IMC 2012.
 - PROVIDE SINGLE THICKNESS, 1.1/2 IN SPACED, TURNING VANES IN ALL MITERED DUCTWORK ELBOWS.
 - COORDINATE LOCATIONS OF ALL DEVICES, ACCESS PANELS, DIFFUSERS, GRILLES, & LOUVERS WITH ARCHITECTURAL REFLECTED CEILING PLANS.
 - ALL DUCTWORK DIMENSIONS CITED ARE THE INSIDE CLEAR DIMENSIONS.
 - CONTRACTOR SHALL COORDINATE LOCATION OF ALL EQUIPMENT, PIPING AND DUCTWORK WITH OTHER TRADES. MAINTAIN REQUIRED SERVICE ACCESS.
 - AIRFLOW QUANTITIES INDICATED ON THE PLANS ARE FOR OCCUPIED OPERATING MODE.
 - VERIFY ROUTING OF DUCTS & PIPING WITH CEILING HEIGHTS, STRUCTURAL SYSTEM, AND OTHER TRADES PRIOR TO DUCT FABRICATION. UNLESS OTHERWISE NOTED, ALL DUCT & PIPING MAINS SHALL BE INSTALLED AS HIGH AS POSSIBLE TO UNDERSIDE OF STRUCTURE. ROUTE DUCTS BETWEEN AND/OR THROUGH STRUCTURE WHERE INDICATED.
 - FLEX-DUCT RUNS SHALL BE 3' MINIMUM AND 6' MAXIMUM LENGTH.
 - PROVIDE MANUAL BALANCING DAMPERS IN EACH BRANCH OF NEW AND EXISTING SUPPLY, RETURN, AND VENTILATION DUCTWORK. INSTALL DAMPERS IN ACCESSIBLE LOCATIONS.
 - COORDINATE WORK PRIOR TO INSTALLATION OF ARCHITECTURAL FINISHES AS REQUIRED.
 - THE DESIGN IS BASED ON MANUFACTURERS AND MODELS INDICATED, AND IS INTENDED TO SHOW THE GENERAL SIZE, CONFIGURATION, LOCATION, CONNECTIONS AND/OR SUPPORT FOR EQUIPMENT OR SYSTEM OR SYSTEMS SPECIFIED WITH RELATION TO THE OTHER BUILDING/SYSTEMS. SEE SPECIFICATION SECTIONS FOR TECHNICAL REQUIREMENTS.

GENERAL NOTES

- DEMOLITION
- DOCUMENTATION OF EXISTING SYSTEMS IS BASED ON AVAILABLE RECORD DRAWINGS AND CASUAL FIELD OBSERVATION. MAJOR DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT/ENGINEER FOR RESOLUTION PRIOR TO PROCEEDING WITH THE WORK.
 - COMPONENTS EMBEDDED WITHIN OR BENEATH THE EXISTING STRUCTURE MAY BE ABANDONED IN PLACE, CUT BEHIND WALL/FLOOR/CEILING/ROOF SURFACE AS REQUIRED FOR PATCHING OF FINISH.
 - PRIOR TO BIDDING, THE CONTRACTOR SHALL VISIT THE SITE TO BECOME FAMILIAR WITH EXISTING CONDITIONS, AND TO VERIFY LOCATION, SIZE AND QUANTITY OF ITEMS TO BE REMOVED. SUBMITTAL OF A BID SHALL SIGNIFY WILLINGNESS TO COMPLY WITH THE DESIGN AND ACCEPTANCE OF ON-SITE CONDITIONS AS THEY EXIST.
 - WHERE QUESTIONS OR DISCREPANCIES ARISE, THE A/E SHALL BE NOTIFIED IMMEDIATELY FOR RESOLUTION PRIOR TO PROCEEDING WITH THE WORK.
 - THE CONTRACTOR SHALL AVOID DISRUPTION OF THE ACTIVITIES OF THE ADJACENT OCCUPANTS TO THE BEST EXTENT POSSIBLE. SCHEDULE WORK TO AVOID PROLONGED DISRUPTION OF THE USE OF THE ADJACENT SPACES. COORDINATE NEW WORK REQUIREMENTS WITH OTHER TRADES TO ACCOMPLISH THE WORK WHILE THE FACILITY REMAINS IN OPERATION. SCHEDULE ANY DISRUPTIONS TO THE SPACES ADJACENT TO THE PROJECT AREA WITH THE PROJECT MANAGER.
 - CONTRACTOR SHALL PERFORM TESTING, ADJUSTING, AND BALANCING OF ALL HYDRONIC SYSTEMS WITHIN THE PROJECT SCOPE PRIOR TO DECOMMISSIONING AND DEMOLITION. CONTRACTOR TO PROVIDE TAB REPORT FOR A/E REVIEW.

SHEET LIST - MECHANICAL

SHEET NO	SHEET NAME
M0.0	LEGEND, SCHEDULES, ABBREVIATIONS
M0.1	DETAILS, SCHEDULES
M0.2	DETAILS
M0.3	VENTILATION TABLES
MD1.0	SECOND FLOOR DEMOLITION PLAN
MD1.1	ATTIC DEMOLITION PLAN
M1.0	SECOND FLOOR MECHANICAL DUCTWORK
M1.1	ATTIC MECHANICAL DUCTWORK
M2.1	ATTIC MECHANICAL PIPING
M3.0	CONTROLS
M3.1	CONTROLS

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SECOND FLOOR RENOVATIONS
OLSSON HALL; BUILDING NO. 0202

RECORD
DRAWINGS

LEGEND,
SCHEDULES,
ABBREV.

DATE: 04/23/18
DRAWN BY: CJP/BMM
CHECKED BY: PMM
REVISIONS

PROJECT NUMBER
P04406

M0.0

SHEET