GENERAL NOTES

1. EQUIPMENT, PIPING AND DUCTWORK LOCATIONS ARE APPROXIMATE. VERIFY ALL DIMENSIONS FROM ARCHITECTURAL AND STRUCTURAL PLANS AND AT THE JOB SITE DURING CONSTRUCTION. REPORT ALL ANOMALIES TO THE PROJECT REPRESENTATIVES FOR REVIEW. CONTRACTOR SHALL VISIT JOB SITE AND VERIFY SIZE AND LOCATION OF ALL EXISTING ITEMS AND CONDITIONS.
2. BEFORE DEMOLITION BEGINS, ALL AIR HANDLING EQUIPMENT (INCLUDING FAN POWERED TERMINALS, AIR HANDLING UNITS, FAN COIL UNITS, ETC.) SHALL BE FITTED WITH CONSTRUCTION FILTERS OF AT LEAST MERV 7 EFFICIENCY TO PREVENT DUST FROM ENTERING DUCTWORK OR COILS. THESE SHALL BE MONITORED AND SUPPLIED BY THE GENERAL CONTRACTOR AND REPLACED ON AN AS NEEDED BASIS TO PREVENT CLOGGING AND OR REDUCTION OF AIR FLOW.
3. REFER TO ARCHITECTURAL PLANS AND COORDINATE WITH BUILDING MANAGEMENT OR OWNER FOR PHASING OF CONSTRUCTION, AREAS TO REMAIN IN USE, AND ARCHITECTURAL SPECIFICATIONS FOR SUPPLEMENTARY AND GENERAL CONDITIONS WHICH MAY BE APPLICABLE TO THIS WORK. ALL WORK SHALL BE COORDINATED WITH OTHER DIVISIONS.
4. ALL WORK SHALL BE PERFORMED ACCORDING TO BASE BUILDING DESIGN STANDARDS AND SPECIFICATIONS. ALL NEW EQUIPMENT SHALL BE BUILDING STANDARD.
5. CONTRACTOR SHALL CONFORM TO BUILDINGS CONSTRUCTION POLICIES AND PROCEDURES WHILE PERFORMING THIS WORK. CARE SHOULD BE TAKEN TO CONTAIN ALL CONSTRUCTION DUST WITHIN THE REMODELED AREA SO THAT IT DOES NOT TRAVEL TO OTHER AREAS AND INTO THE BUILDING'S HVAC SYSTEM. PROVIDE NEGATIVE AIR MACHINE AS REQUIRED TO ACCOMPLISH THIS.
6. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL EQUIPMENT CLEARANCES SHALL BE PROVIDED.
7. CONFIRM ALL EXISTING TERMINAL UNITS, ETC., ARE IN WORKING CONDITION PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY REPAIRS OR REPLACEMENT OF ANY COMPONENT NECESSARY FOR A FULLY FUNCTIONAL SYSTEM INCLUDING BUT NOT LIMITED TO DAMPER ACTUATORS, DAMPER MOTORS, DAMPER COMPONENTS, DIGITAL CONTROLLERS, TRANSFORMERS, ETC. DURING CONSTRUCTION AND PRIOR TO MOVE-IN. ALL REPAIRS TO BE COMPLETED FOLLOWING THE AIR BALANCE OF THE SPACE.
8. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING BELOW SLAB CONDITIONS AND CONFLICTS PRIOR TO BEGINNING ALL WORK. X-RAY AND CAMERA INVESTIGATIONS SHOULD BE PERFORMED TO DETERMINE BELOW SLAB OBSTRUCTIONS INCLUDING STRUCTURE, PIPING, ETC. CONTRACTOR TO NOTIFY ENGINEER IF CONFLICTS ARE DISCOVERED BELOW SLAB. CONTRACTOR MUST OBTAIN FINAL APPROVAL OF BUILDING OWNER/MANAGER AND ARCHITECT PRIOR TO CUTTING AND/OR CORING OF SLAB. DO NOT CUT, CORE, ALTER OR MANIPULATE SLAB IF SLAB IS "POST-TENSION".
9. SUBMITTALS SHALL BE FURNISHED FOR THE FOLLOWING ITEMS: GRILLES, REGISTERS, XX. TERMINAL UNITS, DUCTWORK CONSTRUCTION STANDARDS, INSULATION, AUTOMATIC TEMPERATURE CONTROLS. FURNISH COPY OF SUBMITTALS TO OWNER. DURING THE SUBMITTAL PROCESS. THE CONTRACTOR SHALL PROVIDE AN ANNOTATED COPY OF THE APPLICABLE SPECIFICATION SELECTION. THE ANNOTATED COPY SHALL INDICATE WHICH SECTIONS THE SUBSTITUTION COMPLIES AND WHICH SECTIONS THE SUBSTITUTION DEVIATES FROM THE SPECIFICATION.
10. PLANS INDICATE FINISHED LAYOUT OF AIR GRILLES AND ARE NOT INTENDED TO SHOW ALL DEMOLITION. ALL DEMOLITION REQUIRED TO ACCOMPLISH THIS RENOVATION SHALL BE PART OF THIS CONTRACT'S SCOPE OF WORK.
11. OBTAIN ALL NECESSARY PERMITS, PAY LEGAL FEES, AND CONFORM TO ALL LOCAL, STATE AND NATIONAL CODES AND ORDINANCES RELATING TO BUILDING AND PUBLIC SAFETY.
12. ALL EXISTING AND NEW FACILITIES SHALL BE PROTECTED DURING THE CONSTRUCTION ACTIVITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE AND STORE ITEMS WHICH ARE SUBJECT TO BREAKAGE.
13. SHUTDOWN OF BUILDING SYSTEMS DURING CONSTRUCTION SHALL BE SCHEDULED WITH THE BUILDING MANAGEMENT OR OWNER AND WORK SHALL BE PERFORMED IN A MANNER TO MINIMIZE DISRUPTION.
14. EXACT LOCATION OF ALL AIR DEVICES, THERMOSTATS, REGULATORS AND ANY OTHER ITEMS EXPOSED TO VIEW ON FINISHED WALLS, FLOORS OR CEILINGS SHALL BE APPROVED BY THE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
15. ALL DUCT CONNECTIONS TO MOVING AIR EQUIPMENT SHALL BE MADE WITH FLEX CONNECTIONS.
16. PROVIDE FIRE/SMOKE DAMPERS IN ALL RETURN AIR OPENINGS, EXHAUST DUCTS, RETURN AIR DUCTS AND SUPPLY AIR DUCTS WHERE THEY PENETRATE FIRE PARTITIONS, FLOOR SLABS (EXCEPT IN RATED CHASES) AND AS REQUIRED BY CODE.
17. VOLUME DAMPERS LOCATED ABOVE INACCESSIBLE CEILINGS SHALL HAVE OPERATORS EXTENDED TO THE CEILING AND FITTED WITH FLUSH TYPE OPERATORS. LOCATIONS SHALL BE APPROVED BY THE ARCHITECT.
18. FURNISH ALL STEEL MEMBERS AND OTHER SUPPORTS REQUIRED FOR PIPING, DUCTWORK, EQUIPMENT, ETC. ITEMS EXPOSED TO THE OUTDOORS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
19. REUSE EXISTING EQUIPMENT AND SPIN-IN TAPS WHERE POSSIBLE AND PROVIDE NEW WHERE REQUIRED. REMOVE ALL UNUSED SPIN-INS. PATCH DUCTS PER S.M.A.C.N.A. STANDARDS AND SEAL AIR TIGHT WITH HARDCAST DT TAPE AND FTA-20 ADHESIVE.
20. DUCT BOARD STYLE DUCTWORK IS NOT ALLOWED.
21. ANY ADHESIVES, PAINTING, VARNISH OR FINISH APPLICATIONS OR USE OF ANY ODOR PRODUCING MATERIALS SHALL NOT BE DONE WITHOUT PRIOR APPROVAL BY THE MANAGEMENT/OWNER. MANAGEMENT/OWNER RESERVES THE RIGHT TO STOP THESE TYPES OF APPLICATION AT ANY TIME.
22. CONTRACTOR TO REUSE EXISTING AIR DEVICES SHOWN ON PLAN WHEREVER POSSIBLE. ALL EXISTING AIR DEVICES SHALL BE CLEANED, PAINTED, AND REFURBISHED TO LIKE NEW CONDITION WHERE POSSIBLE AND PROVIDE NEW GRILLES AS REQUIRED.
23. REMOVE CEILING TILES AS REQUIRED TO INSTALL NEW WORK AND REINSTALL TILES AFTER INSTALLATION OF NEW WORK. ANY TILES DAMAGED BY CONTRACTOR SHALL BE REPLACED WITH NEW TILES TO MATCH.
24. ALL SYSTEMS SHALL BE COMPLETE AND WORKING AT COMPLETION OF CONSTRUCTION. BUILDING FIRE SAFETY SYSTEM SHALL BE FULLY OPERATIONAL THROUGHOUT CONSTRUCTION.
25. REMOVE ALL ABANDONED EQUIPMENT, PIPING, DUCTWORK, AND ASSOCIATED HANGERS, SUPPORTS WITHIN THE AREA OF CONSTRUCTION THAT IS NOT SHOWN TO BE REUSED OR SHOWN TO REMAIN. REMOVE ALL EXCESS MATERIAL AND DEBRIS AND CLEAN ALL EQUIPMENT UPON COMPLETION OF WORK. TOUCH UP WITH PAINT WHERE REQUIRED.
26. PROVIDE ACCESS DOORS IN WALLS AND CEILINGS WHERE ACCESS IS REQUIRED TO CONCEALED MECHANICAL AND PLUMBING EQUIPMENT, VALVES, CONTROLS AND OTHER DEVICES. LOCATION OF ALL ACCESS DOORS SHALL BE APPROVED BY THE ARCHITECT. WHERE POSSIBLE, LOCATE COMPONENTS REQUIRING ACCESS ABOVE LAY-IN CEILING.
27. ALL SUPPLY AIR DIFFUSERS ARE 4-WAY THROW UNLESS NOTED ON THE DRAWINGS WITH FLOW ARROWS.
28. ALL DUCTWORK SHALL BE INSTALLED TO PROVIDE CLEARANCE FOR PIPING, ELECTRICAL CONDUIT AND LIGHT FIXTURES UNLESS NOTED OR SHOWN OTHERWISE ON THE DRAWINGS. INSTALL DUCTWORK TIGHT TO STRUCURE.
29. MECHANICAL EQUIPMENT, DUCTWORK, PIPING, ETC, LOCATED ABOVE CEILING TO BE RAISED, SHALL BE RELOCATED OR REROUTED AS REQUIRED TO ACCOMMODATE THE NEW CEILING HEIGHT.
30. PROVIDE ACCESS PANELS AT EACH FIRE, SMOKE OR COMBINATION FIRE/SMOKE DAMPER. LOCATE TO FACILITATE SERVICE, INSPECTION AND FUSIBLE LINK REPLACEMENT.
31. BLANK-OFF UNUSED PORTIONS OF PERIMETER SLOT WITH GALVANIZED SHEET METAL PAINTED FLAT BLACK TO MATCH BASE BUILDING.
32. ALL RETURN AIR GRILLES SHALL BE FITTED WITH A LIGHT SHIELD PAINTED FLAT BLACK. PLATE SHALL NOT REDUCE RETURN AIR FLOW.
33. CONTRACTOR SHALL VERIFY ALL RETURN AIR PATHWAYS CAN BE ACHIEVED PRIOR TO THE CONSTRUCTION OF NEW DUCTWORK.
34. RELOCATE EXISTING AIR DEVICE TO NEW LOCATIONS SHOWN IF IN GOOD CONDITION. REMOVE EXISTING AIR DEVICE AND PROVIDE NEW TO MATCH EXISTING IF IN POOR CONDITION. FIELD VERIFY QUANTITIES FOR NECK SIZE AND LOCATION. BALANCE TO CFM INDICATED ON PLAN. WHEN NOT SHOWN ON DRAWINGS, SIZE NECK ACCORDING TO SCHEDULE FOR SUPPLY DIFFUSER, AND SIZE NECK TO BE 22" X 22" FOR RETURN DIFFUSER.
35. PROVIDE INSULATED SHEET METAL BLANK OFFS ON ALL UNUSED LOUVER SECTIONS.
36. ALL CONTROLS MODIFICATIONS SHALL BE COMPATIBLE WITH THE BASE BUILDING BMCS. WORK SHALL BE PERFORMED BY CONTRACTOR THAT HAS BEEN APPROVED BY BUILDING MANAGEMENT.
37. PROVIDE VOLUME DAMPERS TO PROVIDE NECESSARY MEANS TO BALANCE OUTSIDE AIR, EXHAUST AIR, AND SUPPLY AIR CFM AIRFLOWS.
38. COORDINATE ALL WALL/ROOF FLASHING DETAILS WITH ARCHITECT.
39. UPON COMPLETION OF THE MECHANICAL WORK, THE CONTRACTOR SHALL DEMONSTRATE TO THE BUILDING CHIEF ENGINEER OR OWNER THAT ALL NEW AND/OR RELOCATED CONTROL COMPONENTS FUNCTION CORRECTLY AND ARE MAPPED BACK TO EXISTING BUILDING AUTOMATION SYSTEM. RECALIBRATE OR REPAIR/REPLACE DAMAGED/MISSING CONTROL COMPONENTS AS REQUIRED. REPLACEMENT COMPONENTS SHALL MATCH EXISTING.
40. THE CONTRACTOR SHALL BALANCE ALL NEW AND EXISTING AFFECTED AIR DEVICES TO INDICATED CFM. BALANCE ALL AIR UNITS AND ZONES AFFECTED BY CONSTRUCTION TO TOTAL CFM OF NEW AND EXISTING AIR DEVICES. PROVIDE NEW SHEAVES AND BELTS AS REQUIRED TO DELIVER REQUIRED CFM. AT COMPLETION OF CONSTRUCTION, SUBMIT A COMPLETE AIR BALANCE REPORT TO BUILDING CHIEF ENGINEER, ARCHITECT, AND ENGINEER. REPORT SHALL INCLUDE CERTIFICATES OF CALIBRATION FOR ALL EQUIPMENT USED AT THE JOB SITE FOR DETERMINING AIR FLOW. REFER TO AIR BALANCE NOTES ON PLANS.
41. ALL PLENUM AREAS SHALL BE INSPECTED AND CLEANED OF ALL DEBRIS AND TRASH PRIOR TO CONSTRUCTION COMPLETION.
42. ALL AIR FLOW READINGS WHEN COMPARED TO DESIGN DRAWINGS OF THE MOST RECENTLY REVISED PRINTS SHALL NOT EXCEED + OR - 10% OF THE DESIGN READINGS SHOWN ON PRINTS.
43. ALL SYSTEMS SHALL BE COMPLETE AND WORKING AT COMPLETION OF CONSTRUCTION. BUILDING FIRE SAFETY SYSTEM SHALL BE FULLY OPERATIONAL THROUGHOUT CONSTRUCTION.
44. FURNISH OWNER WITH COMPLETE OPERATING MANUALS AND INSTRUCTIONS FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.
45. ALL DDC CONTROLLED ITEMS AND ZONES THAT ARE TIED INTO THE BUILDING AUTOMATION SYSTEM SHALL HAVE ALL ASSOCIATED SYSTEM GRAPHICS UPDATED TO REFLECT AS-BUILT CONDITIONS.
46. GUARANTEE ALL WORK AND MATERIALS FURNISHED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
47. WITHIN 90 DAYS OF COMPLETION OF PROJECT, CONTRACTOR SHALL SUBMIT AS BUILT DOCUMENTATION OF SYSTEM CONDITIONS TO OWNER.
48. BALANCE EXISTING AIR HANDLING UNIT AHUB1-01 LOCATED IN BASEMENT. THIS WORK SHALL INCLUDE BUT NOT BE LIMITED TO: BALANCING CHILLED WATER, CLEAN COIL, LUBRICATE FAN AND MOTOR, REPLACING FILTER, SHEAVES, AND BELTS AS REQUIRED TO ACHIEVE DESIGN CFM QUANTITIES. REPAIR AS REQUIRED.

COORDINATION DRAWINGS SHALL BE REQUIRED FOR ALL ABOVE-CEILING WORK. COMPOSITE COORDINATION DRAWINGS SHALL BE DRAWN AT A SUITABLE SCALE NOT LESS THAN ¼-INCH EQUALS ONE FOOT, CLEARLY SHOWING HOW THE WORK OF DIVISIONS 21, 22, 23, 25, 26 AND 28 IS TO BE INSTALLED IN RELATION TO THE WORK OF ALL OTHER TRADES. ANY WORK INSTALLED IN CONFLICT WITH THE WORK OF OTHER TRADES SHALL BE CORRECTED AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL PREPARE A COMPLETE SET OF COORDINATION DRAWINGS INDICATING THE ACTUAL EQUIPMENT TO BE FURNISHED AND INSTALLED UNDER THIS CONTRACT, AND THE LOCATION AND/OR EXACT ROUTING FOR ALL ITEMS INCLUDING, BUT NOT LIMITED TO, LIGHT FIXTURES, CONDUIT, PIPING, DUCTWORK, AND RELATED ABOVE CEILING ITEMS. COORDINATION DRAWINGS SHALL ALSO INCLUDE LOCATIONS OF ALL SLAB PENETRATIONS. THE COORDINATION DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT AND OWNER AS SPECIFIED. THE SHEET METAL DRAWINGS SHALL BE PREPARED IN AN ELECTRONIC FORMAT AND SHALL SERVE AS THE BASE DRAWINGS. THE OTHER SUBCONTRACTORS AND THE GENERAL CONTRACTOR SHALL SIGN OFF EACH COORDINATION DRAWING. IF THE CONTRACTOR ALLOWS ONE TRADE TO INSTALL HIS WORK BEFORE COORDINATING WITH WORK OF OTHER TRADES, THE CONTRACTOR SHALL MAKE NECESSARY CHANGES TO CORRECT THE CONDITION WITHOUT EXTRA CHANGE. THIS REQUIREMENT FOR COORDINATION DRAWING SHALL NOT BE CONSTRUED AS AUTHORIZATION FOR THE CONTRACTOR OR SUBCONTRACTOR TO MAKE ANY UNAUTHORIZED CHANGES TO THE CONTRACT DRAWINGS. THE CONTRACTOR MAY, HOWEVER, SUBJECT TO ACCEPTANCE OF THE ARCHITECT AND WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OF OTHER TRADES, OR FOR THE PROPER EXECUTION OF THE WORK. ALL SPACE ALLOCATIONS ON THE COORDINATION DRAWINGS SHALL BE MAINTAINED, SUCH AS CEILING HEIGHT, CHASE WALLS, AND EQUIPMENT ROOM SIZE, UNLESS PRIOR WRITTEN AUTHORIZATION IS RECEIVED FROM THE ARCHITECT TO CHANGE THEM. PRIOR TO FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL TRANSMIT AN ELECTRONIC COPY OF THE APPROVED COORDINATION DRAWINGS TO THE OWNER.

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
AIR DIFFUSERS AND GRILLES			
	SUPPLY AIR DIFFUSER		RETURN OR EXHAUST AIR GRILLE
	SUPPLY AIR DIFFUSER (1 - WAY THROW)		SUPPLY AIR SIDEWALL DIFFUSER
	SUPPLY AIR DIFFUSER (2 - WAY THROW)		
	SUPPLY AIR DIFFUSER (3 - WAY THROW)		RETURN/EXHAUST AIR SIDEWALL GRILLE
	LINEAR SLOT DIFFUSER		
MISCELLANEOUS HVAC			
FD	FIRE DAMPER	CO2	CARBON DIOXIDE SENSOR
SD	SMOKE DAMPER	CO	CARBON MONOXIDE SENSOR
FSD	FIRE SMOKE DAMPER		SMOKE DETECTOR
H	HUMIDISTAT	T	THERMOSTAT
	SUPPLY FLOW ARROW		RETURN FLOW ARROW
DP	DIFFERENTIAL PRESSURE SENSOR	SP	STATIC PRESSURE SENSOR
HS	HUMIDITY SENSOR	TS	TEMPERATURE SENSOR
MD	MOTORIZED DAMPER	VS	CEILING MOUNTED VACANCY SENSOR
		VS	WALL MOUNTED VACANCY SENSOR
DUCTWORK			
	EXISTING DUCTWORK TO BE REMOVED		EXISTING DUCTWORK TO REMAIN
	NEW DUCTWORK		FLEXIBLE DUCTWORK
	LAGGED DUCTWORK		MANUAL VOLUME DAMPER
	BRANCH DUCT TAKE OFF	VD	
	RADIUS ELBOW		MITERED ELBOW WITH TURNING VANES
	RECTANGULAR DUCT RADIUS ELBOW		ROUND DUCT ELBOW TURNING UP
	RECTANGULAR DUCT MITERED ELBOW		ROUND DUCT ELBOW TURNING DOWN
	RECTANGULAR SUPPLY DUCT UP/DOWN		ROUND SUPPLY DUCT UP/DOWN
	RECTANGULAR RETURN DUCT UP/DOWN		ROUND RETURN DUCT UP/DOWN
	RECTANGULAR EXHAUST DUCT UP/DOWN		ROUND EXHAUST DUCT UP/DOWN
	DUCT TRANSITION - TWO SIDED		DUCT TRANSITION - ONE SIDED
24"x24"	RECTANGULAR DUCT WITH SIZE IN INCHES		TRANSITION IN VERTICAL (RECTANGULAR TO ROUND)
		24"ø	ROUND DUCT WITH SIZE IN INCHES

LEGEND

PIPING

	FLANGE	XX	PIPE SYSTEM DESIGNATION ON PIPE
	UNION		ELBOW DOWN
	ANCHOR		ELBOW UP
	PIPE GUIDE		TEE UP
	PIPE SLEEVE		PIPE CAP
			VALVE IN VERTICAL

PIPE VALVES AND SPECIALTIES

	ISOLATION VALVE	M	WATER METER
	CHECK VALVE		NEW PIPING
	EXISTING PIPING TO REMAIN		EXISTING PIPING TO BE REMOVED
	BALANCING VALVE		THERMOMETER
	2-WAY CONTROL VALVE		
	3-WAY CONTROL VALVE		PRESSURE GAUGE (WITH VALVE)
	PRESSURE RELIEF VALVE		STRAINER

LEGEND

SYMBOL	DESCRIPTION
PLAN TAGS/INDICATORS	
# / M-###	SECTION INDICATOR SECTION NUMBER ON SHEET SHEET REFERENCE NUMBER
# / M-###	CALLOUT INDICATOR CALLOUT NUMBER ON SHEET SHEET REFERENCE NUMBER
M S"xS" CCC M S"ø CCC	DIFFUSER/GRILLE TAG M = DIFFUSER DESIGNATION E= EXISTING DIFFUSER R= RELOCATED EXISTING DIFFUSER S = SIZE IN INCHES C = AIRFLOW (CFM)
#	REVISION TAG

MECHANICAL SHEET LIST

Sheet Number	Sheet Name
M0.0	SYMBOLS & ABBREVIATIONS
M1.0	Ph1.5 MECHANICAL PLANS
M5.0	MECHANICAL SCHEDULES
M6.0	MECHANICAL CONTROL DIAGRAMS
M6.1	VAV CONTROLS ZONING PLAN
M8.0	MECHANICAL DETAILS
M8.1	MECHANICAL DETAILS

HVAC ABBREVIATIONS

%	PERCENT
A/C	AIR CONDITIONING
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
BFF	BELOW FINISHED FLOOR
CA	COLD AIR
EA	EXHAUST AIR
OA	OUTDOOR AIR
RA	RETURN AIR
SA	SUPPLY AIR
TYP	TYPICAL
VAV	VARIABLE AIR VOLUME

HVAC EQUIP. ABBREVIATIONS

AC	AIR CURTAIN
AFMS	AIR FLOW MEASURING STATION
AHU	AIR HANDLING UNIT
B	BOILER
CH	CHILLED WATER
CHP	CHILLED WATER PUMP
CP	CONDENSATE PUMP
CRAC	COMPUTER ROOM AIR CONDITIONER
CT	COOLING TOWER
CVB	CONSTANT VOLUME BOX
CWP	CONDENSER WATER PUMP
DC	DRY COIL
DS	DUCT SILENCER
EF	EXHAUST FAN
ERV	ENERGY RECOVERY VENTILATOR
HC	HEATING COIL
HC-E	HEATING COIL - ELECTRIC
HC-S	HEATING COIL - STEAMER
HC-W	HEATING COIL - WATER
HVU	HEATING AND VENTILATING UNIT
HWP	HOT WATER PUMP
HX	HEAT EXCHANGER
L	LOUVER
MUA	MAKE UP AIR
OAHU	OUTDOOR AIR HANDLING UNIT
PHC	PREHEAT COIL
PTAC	PACKAGED TERMINAL AIR CONDITIONER
RF	RETURN FAN
RFH	RADIANT FLOOR HEAT
RTU	ROOF TOP UNIT
SAF	SUPPY AIR FAN
SEF	SMOKE EXHAUST FAN
SPF	STAIR PRESSURIZATION FAN
UH	UNIT HEATER
VAV	VARIABLE AIR VOLUME

Rice McNair Hall - PHASE 1.5

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△	Date	Description
	05/21/2019	ISSUE FOR PERMIT & PRICING

Seal / Signature

STATE OF TEXAS
LISA A. OSBORNE
66836
LICENSED PROFESSIONAL ENGINEER
05.21.19

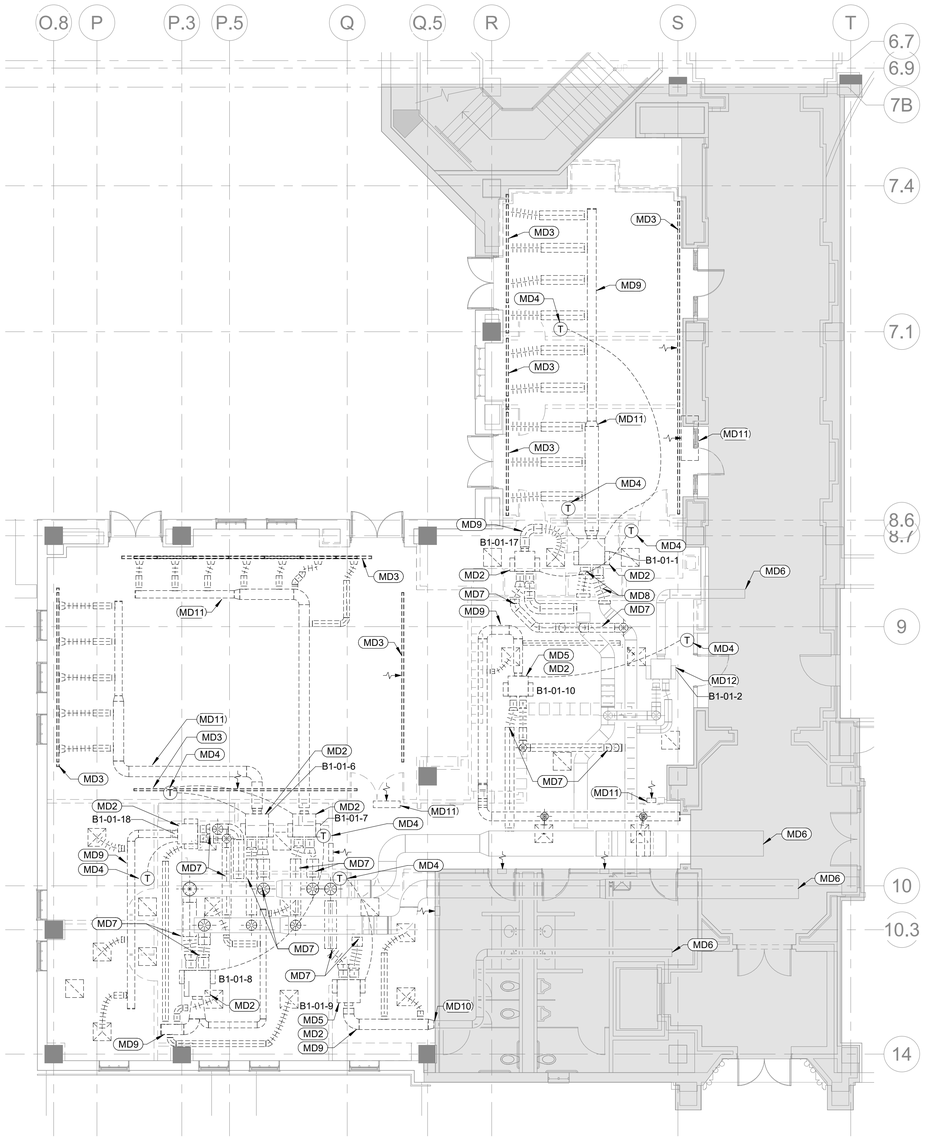
Project Name
RICE ALLIANCE & MULTIPURPOSE ROOM

Project Number
02.8270.500

Description
SYMBOLS & ABBREVIATIONS

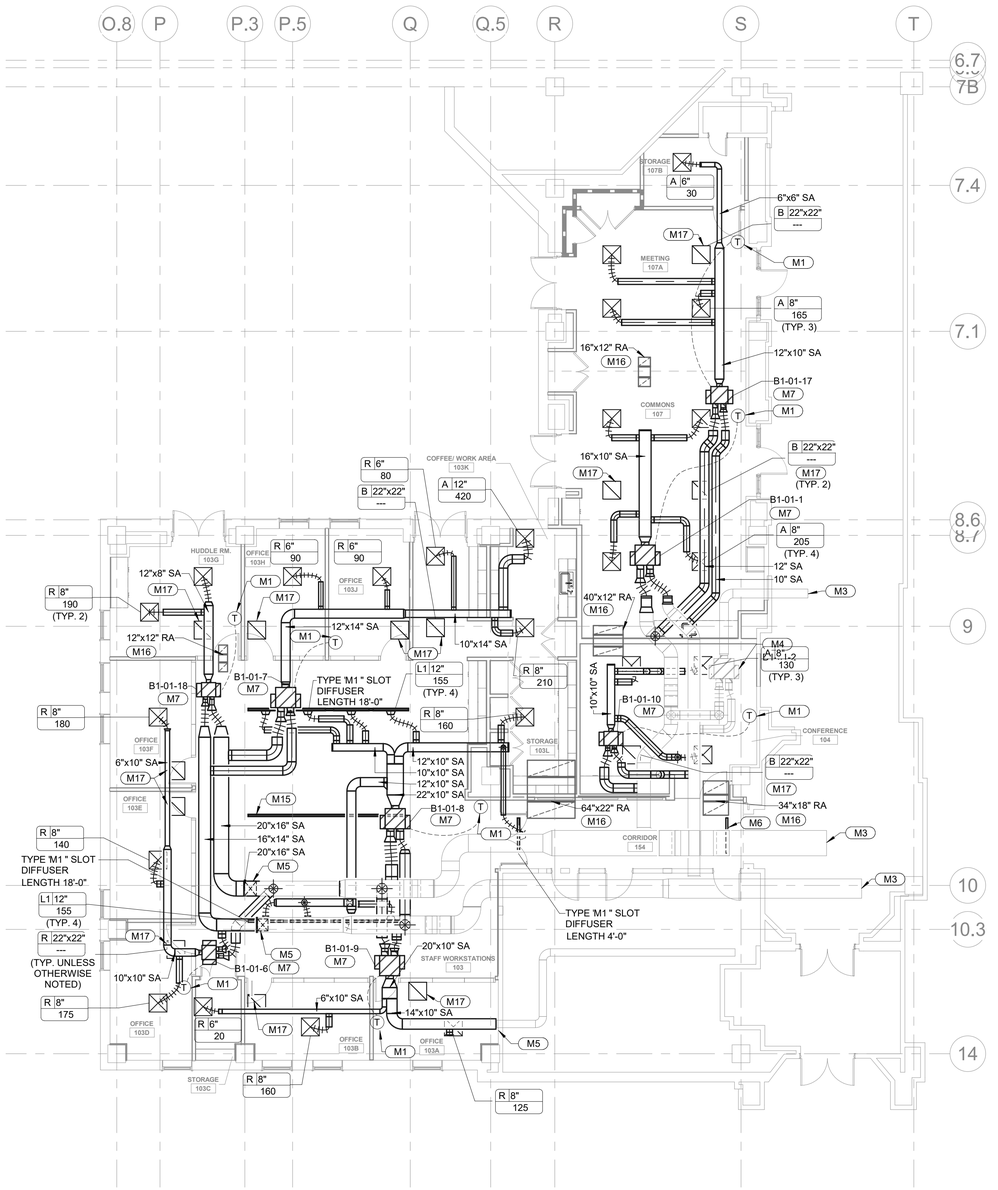
Scale
As indicated

M0.0



2 MECHANICAL DEMO PLAN - LEVEL 01_PHASE 1.5

SCALE: 1/8" = 1'-0"



1 MECHANICAL PLAN - LEVEL 01_PHASE 1.5

SCALE: 1/8" = 1'-0"

SHEET NOTES

M1 NEW THERMOSTAT LOCATION.
M3 REFER TO EXISTING DRAWINGS FOR CONTINUATION.
M4 EXISTING VAV TERMINAL BOX NOT IN SCOPE OF WORK.
M5 CONNECT NEW DUCTWORK TO EXISTING AT THIS APPROXIMATE LOCATION. REPAIR AND RESEAL DUCT INSULATION TO MATCH EXISTING. FIELD VERIFY SIZE OF EXISTING DUCT AND PROVIDE NEW TRANSITIONS AS REQUIRED.
M6 PROVIDE 4'-0" LONG BY 1" SLOT IN HARD CEILING FOR RETURN AIR. PROVIDE LIGHT SHIELD, REFER TO DETAIL 02/M8.0.
M7 INSTALL NEW VAV BOX AT THE APPROXIMATE LOCATION SHOWN. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND PROVIDE ALL REQUIRED CLEARANCES. BALANCE VAV BOX TO SCHEDULED CFM AIR QUANTITIES. CONTRACTOR MUST VERIFY THAT THE NEW LIGHT FIXTURES DO NOT OBSTRUCT WORKING CLEARANCES AROUND FAN POWERED BOX LOCATIONS.
M15 PROVIDE 18'-0" LONG BY 1" SLOT IN HARD CEILING FOR RETURN AIR. PROVIDE LIGHT SHIELD, REFER TO DETAIL 02/M8.0.
M16 RETURN AIR SOUND BOOT IN WALL ABOVE THE CEILING. SIZE AS INDICATED ON THE PLAN, REFER TO DETAIL 01/M8.1.
M17 INSTALL RETURN AIR SOUND ATTENUATION ELBOW AT RETURN DIFFUSER. REFER TO DETAIL 02/M8.1.
MD2 EXISTING VAV BOX TO BE DEMOLISHED AS PER THE OWNER'S RECOMMENDATIONS. CONTROLS CONTRACTOR TO SURVEY AND DOCUMENT EXISTING VAV CONTROLS PRIOR TO DEMOLITION.
MD3 REMOVE EXISTING SUPPLY OR RETURN AIR PERIMETER SLOT AND ASSOCIATED FLEX, SPIN-IN, AND RIGID DUCT BACK TO EXISTING TRUNK DUCT. CAP TRUNK DUCT OPENING AIRTIGHT WITH INSULATED SHEET METAL AND SHEET METAL SCREWS, SEAL WITH HARDCAST. DISPOSE OF SLOT DIFFUSER PER OWNER'S RECOMMENDATIONS.
MD4 EXISTING THERMOSTAT TO BE RELOCATED TO NEW LOCATION DURING RENOVATION PHASE.
MD5 BEFORE BEGINNING DEMOLITION AND CONSTRUCTION THE CONTRACTOR SHALL RECORD EXISTING AIR QUANTITIES FOR EACH SUPPLY AIR DEVICE LOCATED OUTSIDE THE AREA OF WORK. AFTER CONSTRUCTION IS COMPLETE CONTRACTOR SHALL RE-BALANCE ALL EXISTING SUPPLY AIR DEVICES THAT LIE OUTSIDE THE AREA OF CONSTRUCTION BACK TO THEIR ORIGINAL AIR QUANTITIES, PLUS AIR QUANTITIES FOR SUPPLY AIR DEVICES INSIDE AREA OF WORK.
MD6 REFER TO EXISTING DRAWINGS FOR CONTINUATION.
MD7 REMOVE FLEX DUCT AND RUN-OUT AS SHOWN DASHED.
MD8 REMOVE DUCTS AS SHOWN DASHED.
MD9 REMOVE SUPPLY AIR DUCTS AS SHOWN DASHED.
MD10 CUT DUCT AT THIS APPROXIMATE LOCATION. DEMOLISH DUCTWORK SHOWN DASHED.
MD11 DEMOLISH SECTION OF DUCTWORK SHOWN DASHED.
MD12 EXISTING DOUBLE DUCT TERMINAL BOX TO REMAIN. THIS BOX IS OUT OF OUR SCOPE OF WORK.

GENERAL NOTES - CONSTRUCTION

A. REMOVE EXISTING SUPPLY AND RETURN AIR DIFFUSERS, ASSOCIATED FLEX DUCTS AND SPIN IN TAPS IN AREA OF WORK. PATCH AND SEAL TRUNK DUCT OPENING AIR TIGHT WITH SHEETMETAL, SHEETMETAL SCREWS, HARDCAST, REPAIR INSULATION AS REQUIRED. UNLESS OTHERWISE NOTED ON PLANS, CLEAN AND RESTORE TO LIKE NEW CONDITION AND RELOCATE IN RENOVATION PHASE WHERE A DEVICE OF SIMILAR NECK SIZE IS CALLED FOR.

Rice McNair Hall - PHASE 1.5

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△ Date	Description
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Seal / Signature

STATE OF TEXAS — LISA A. OSBORNE — 66836 — LICENSED PROFESSIONAL ENGINEER — 05.21.19

Project Name
RICE ALLIANCE & MULTIPURPOSE ROOM

Project Number
02.8270.500

Description
Ph1.5 MECHANICAL PLANS

Scale
1/8" = 1'-0" Ref North

M1.0

COMMISSIONING OF HVAC SYSTEMS

1. TESTING PREPARATION

A. CERTIFY THAT HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT HAVE BEEN INSTALLED, CALIBRATED, AND STARTED AND ARE OPERATING ACCORDING TO THE CONTRACT DOCUMENTS.

B. CERTIFY THAT HVAC&R INSTRUMENTATION AND CONTROL SYSTEMS HAVE BEEN COMPLETED AND CALIBRATED, THAT THEY ARE OPERATING ACCORDING TO THE CONTRACT DOCUMENTS, AND THAT PRETEST SET POINTS HAVE BEEN RECORDED.

C. CERTIFY THAT TESTING, ADJUSTING, AND BALANCING PROCEDURES HAVE BEEN COMPLETED AND THAT TESTING, ADJUSTING, AND BALANCING REPORTS HAVE BEEN SUBMITTED, DISCREPANCIES CORRECTED, AND CORRECTIVE WORK APPROVED.

D. SET SYSTEMS, SUBSYSTEMS, AND EQUIPMENT INTO OPERATING MODE TO BE TESTED (E.G., NORMAL SHUTDOWN, NORMAL AUTO POSITION, NORMAL MANUAL POSITION, UNOCCUPIED CYCLE, EMERGENCY POWER, AND ALARM CONDITIONS).

E. INSPECT AND VERIFY THE POSITION OF EACH DEVICE AND INTERLOCK IDENTIFIED ON CHECKLISTS.

F. CHECK SAFETY CUTOUTS, ALARMS, AND INTERLOCKS WITH SMOKE CONTROL AND LIFE-SAFETY SYSTEMS DURING EACH MODE OF OPERATION.

G. TESTING INSTRUMENTATION: INSTALL MEASURING INSTRUMENTS AND LOGGING DEVICES TO RECORD TEST DATA AS DIRECTED BY THE CXA.

2. TESTING AND BALANCING VERIFICATION

A. PRIOR TO PERFORMANCE OF TESTING AND BALANCING WORK, PROVIDE COPIES OF REPORTS, SAMPLE FORMS, CHECKLISTS, AND CERTIFICATES TO THE CXA.

B. NOTIFY THE CXA AT LEAST 10 DAYS IN ADVANCE OF TESTING AND BALANCING WORK, AND PROVIDE ACCESS FOR THE CXA TO WITNESS TESTING AND BALANCING WORK.

C. PROVIDE TECHNICIANS, INSTRUMENTATION, AND TOOLS TO VERIFY TESTING AND BALANCING OF HVAC&R SYSTEMS AT THE DIRECTION OF THE CXA.

a. THE CXA WILL NOTIFY TESTING AND BALANCING CONTRACTOR 10 DAYS IN ADVANCE OF THE DATE OF FIELD VERIFICATION. NOTICE WILL NOT INCLUDE DATA POINTS TO BE VERIFIED.

b. THE TESTING AND BALANCING CONTRACTOR SHALL USE THE SAME INSTRUMENTS (BY MODEL AND SERIAL NUMBER) THAT WERE USED WHEN ORIGINAL DATA WERE COLLECTED.

c. FAILURE OF AN ITEM INCLUDES, OTHER THAN SOUND, A DEVIATION OF MORE THAN 10 PERCENT. FAILURE OF MORE THAN 10 PERCENT OF SELECTED ITEMS SHALL RESULT IN REJECTION OF FINAL TESTING, ADJUSTING, AND BALANCING REPORT. FOR SOUND PRESSURE READINGS, A DEVIATION OF 3 DB SHALL RESULT IN REJECTION OF FINAL TESTING. VARIATIONS IN BACKGROUND NOISE MUST BE CONSIDERED.

d. REMEDY THE DEFICIENCY AND NOTIFY THE CXA SO VERIFICATION OF FAILED PORTIONS CAN BE PERFORMED.

3. GENERAL TESTING REQUIREMENTS

A. PROVIDE TECHNICIANS, INSTRUMENTATION, AND TOOLS TO PERFORM COMMISSIONING TEST AT THE DIRECTION OF THE CXA.

B. SCOPE OF HVAC&R TESTING SHALL INCLUDE ENTIRE HVAC&R INSTALLATION, FROM CENTRAL EQUIPMENT FOR HEAT GENERATION AND REFRIGERATION THROUGH DISTRIBUTION SYSTEMS TO EACH CONDITIONED SPACE. TESTING SHALL INCLUDE MEASURING CAPACITIES AND EFFECTIVENESS OF OPERATIONAL AND CONTROL FUNCTIONS.

C. TEST ALL OPERATING MODES, INTERLOCKS, CONTROL RESPONSES, AND RESPONSES TO ABNORMAL OR EMERGENCY CONDITIONS, AND VERIFY PROPER RESPONSE OF BUILDING AUTOMATION SYSTEM CONTROLLERS AND SENSORS.

D. THE CXA ALONG WITH THE HVAC&R CONTRACTOR, TESTING AND BALANCING CONTRACTOR, AND HVAC&R INSTRUMENTATION AND CONTROL CONTRACTOR SHALL PREPARE DETAILED TESTING PLANS, PROCEDURES, AND CHECKLISTS FOR HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT.

E. TESTS WILL BE PERFORMED USING DESIGN CONDITIONS WHENEVER POSSIBLE.

F. SIMULATED CONDITIONS MAY NEED TO BE IMPOSED USING AN ARTIFICIAL LOAD WHEN IT IS NOT PRACTICAL TO TEST UNDER DESIGN CONDITIONS. BEFORE SIMULATING CONDITIONS, CALIBRATE TESTING INSTRUMENTS. PROVIDE EQUIPMENT TO SIMULATE LOADS. SET SIMULATED CONDITIONS AS DIRECTED BY THE CXA AND DOCUMENT SIMULATED CONDITIONS AND METHODS OF SIMULATION. AFTER TESTS, RETURN SETTINGS TO NORMAL OPERATING CONDITIONS.

G. THE CXA MAY DIRECT THAT SET POINTS BE ALTERED WHEN SIMULATING CONDITIONS IS NOT PRACTICAL.

H. THE CXA MAY DIRECT THAT SENSOR VALUES BE ALTERED WITH A SIGNAL GENERATOR WHEN DESIGN OR SIMULATING CONDITIONS AND ALTERING SET POINTS ARE NOT PRACTICAL.

I. IF TESTS CANNOT BE COMPLETED BECAUSE OF A DEFICIENCY OUTSIDE THE SCOPE OF THE HVAC&R SYSTEM, DOCUMENT THE DEFICIENCY AND REPORT IT TO THE OWNER. AFTER DEFICIENCIES ARE RESOLVED, RESCHEDULE TESTS.

J. IF THE TESTING PLAN INDICATES SPECIFIC SEASONAL TESTING, COMPLETE APPROPRIATE INITIAL PERFORMANCE TESTS AND DOCUMENTATION AND SCHEDULE SEASONAL TESTS.

4. HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

A. BOILER TESTING AND ACCEPTANCE PROCEDURES: TESTING REQUIREMENTS ARE SPECIFIED IN HVAC BOILER SECTIONS. PROVIDE SUBMITTALS, TEST DATA, INSPECTOR RECORD, AND BOILER CERTIFICATION TO THE CXA.

B. HVAC&R INSTRUMENTATION AND CONTROL SYSTEM TESTING: FIELD TESTING PLANS AND TESTING REQUIREMENTS ARE SPECIFIED IN SECTION 230900 "INSTRUMENTATION AND CONTROL FOR HVAC" AND SECTION 230993 "SEQUENCE AND OPERATIONS FOR HVAC CONTROLS." ASSIST THE CXA WITH PREPARATION OF TESTING PLANS.

C. PIPE SYSTEM CLEANING, FLUSHING, HYDROSTATIC TESTS, AND CHEMICAL TREATMENT REQUIREMENTS ARE SPECIFIED IN HVAC PIPING SECTIONS. HVAC&R CONTRACTOR SHALL PREPARE A PIPE SYSTEM CLEANING, FLUSHING, AND HYDROSTATIC TESTING PLAN. PROVIDE CLEANING, FLUSHING, TESTING, AND TREATING PLAN AND FINAL REPORTS TO THE CXA. PLAN SHALL INCLUDE THE FOLLOWING:

a. SEQUENCE OF TESTING AND TESTING PROCEDURES FOR EACH SECTION OF PIPE TO BE TESTED, IDENTIFIED BY PIPE ZONE OR SECTOR IDENTIFICATION MARKER. MARKERS SHALL BE KEYED TO DRAWINGS FOR EACH PIPE SECTOR, SHOWING THE PHYSICAL LOCATION OF EACH DESIGNATED PIPE TEST SECTION. DRAWINGS KEYED TO PIPE ZONES OR SECTORS SHALL BE FORMATTED TO ALLOW EACH SECTION OF PIPING TO BE PHYSICALLY LOCATED AND IDENTIFIED WHEN REFERRED TO IN PIPE SYSTEM CLEANING, FLUSHING, HYDROSTATIC TESTING, AND CHEMICAL TREATMENT PLAN.

b. DESCRIPTION OF EQUIPMENT FOR FLUSHING OPERATIONS.

c. MINIMUM FLUSHING WATER VELOCITY.

d. TRACKING CHECKLIST FOR MANAGING AND ENSURING THAT ALL PIPE SECTIONS HAVE BEEN CLEANED, FLUSHED, HYDROSTATICALLY TESTED, AND CHEMICALLY TREATED.

D. REFRIGERATION SYSTEM TESTING: PROVIDE TECHNICIANS, INSTRUMENTATION, TOOLS, AND EQUIPMENT TO TEST PERFORMANCE OF COOLING TOWERS, REFRIGERANT COMPRESSORS AND CONDENSERS, AND OTHER REFRIGERATION SYSTEMS. THE CXA SHALL DETERMINE THE SEQUENCE OF TESTING AND TESTING PROCEDURES FOR EACH EQUIPMENT ITEM AND PIPE SECTION TO BE TESTED.

E. HVAC&R DISTRIBUTION SYSTEM TESTING: PROVIDE TECHNICIANS, INSTRUMENTATION, TOOLS, AND EQUIPMENT TO TEST PERFORMANCE OF HYDRONIC DISTRIBUTION SYSTEMS AND OTHER DISTRIBUTION SYSTEMS, INCLUDING HVAC&R UNITARY EQUIPMENT.

F. VIBRATION AND SOUND TESTS: PROVIDE TECHNICIANS, INSTRUMENTATION, TOOLS, AND EQUIPMENT TO TEST PERFORMANCE OF VIBRATION ISOLATION.

GRILLE - REGISTER - DIFFUSER1

Diffuser Type	Size	Type	Manufacturer & Model	Finish	Description	Notes
A	24"x24"	CEILING SUPPLY	TITUS OMNI-AA	WHITE	SQUARE PLAQUE HIGH CAPACITY, NECK SIZE PER PLANS, T-BAR MOUNTING	
B	24"X24"	CEILING RETURN	TITUS OMNI-AA	WHITE	SAME AS TYPE "A"	
L1	4'-0"	SUPPLY PLENUM	TITUS FBPI	ALUMINIUM	INSULATED PLENUM FOR USE WITH TYPE "M1" & "N1" DIFFUSER. PLENUM SHALL BE 4'-0" LONG UNLESS OTHERWISE NOTED, INLET DIAMETER PER PLANS	
M1	PER PLANS	LINEAR SUPPLY	TITUS FL-10-JT	RE: ARCHITECT	CONTINUOUS SLOT DIFFUSER WITH (1) - 1" SLOT	
R		RELOCATED EXISTING SUPPLY/RETURN (PER PLANS)	TITUS OMNI-AA	WHITE		

DUCT & PIPING MATERIAL & INSULATION SCHEDULE

SYSTEM	DUCT/PIPING MATERIAL	INSULATION MATERIAL
SUPPLY & RETURN DUCT	GALVANIZED SHEET METAL, 2" PRESSURE CLASS PER SMACNA DUCT CONSTRUCTION STANDARDS	FLEXIBLE GLASS FIBER WRAP, K FACTOR 0.25 AT 75f 1.5 LB/CU.FT. MINIMUM DENSITY, 2" THICKNESS WITH FSK FACING, JOHNS MANVILLE MICROLITE EQ OR EQUAL. PROVIDE MINIMUM R-6 INSULATION VALUE.
FLEXIBLE SUPPLY DUCT	UL 181, CLASS 1, INTERLOCKING SPIRAL OF ALUMINUM FOIL	FIBROUS GLASS INSULATION, POLYETHYLENE VAPOR-BARRIER FILM, R-6 MINIMUM
EXHAUST DUCT	GALVANIZED SHEET METAL, UNLINED	NONE

DOUBLE DUCT V.A.V. BOX SCHEDULE

TAG	MANUFACTURER	COOL MAXIMUM CFM	COOL MINIMUM CFM	HEAT MAXIMUM CFM	HEAT MINIMUM CFM	COLD DUCT RUNOUT SIZE	HOT DUCT RUNOUT SIZE	BOX INLET SIZE	NOTES
B1-01-1	TITUS (DEDV)	825	0	540	0	14"	12"	9"	1
B1-01-6	TITUS (DEDV)	485	0	315	0	12"	10"	7"	1
B1-01-7	TITUS (DEDV)	890	0	580	0	14"	12"	9"	1
B1-01-8	TITUS (DEDV)	1250	0	820	0	16"	14"	10"	1
B1-01-9	TITUS (DEDV)	820	0	535	0	14"	12"	9"	1
B1-01-10	TITUS (DEDV)	385	0	250	0	12"	10"	6"	1
B1-01-17	TITUS (DEDV)	500	0	325	0	12"	10"	7"	1
B1-01-18	TITUS (DEDV)	375	0	240	0	12"	10"	6"	1

NOTES:

1. NEW VAV BOX

2. EXISTING VAV BOX. REBALANCE TO AIR QUANTITY SHOWN ON SCHEDULE.

3. VAV BOX IS CONTROLLED BY VACANCY SENSOR.

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05.21.19

Project Name
RICE ALLIANCE & MULTIPURPOSE ROOM

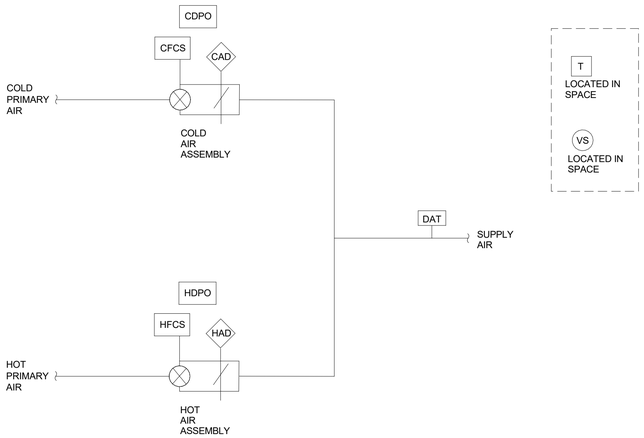
Project Number
02.8270.500

Description
MECHANICAL SCHEDULES

Scale
As indicated

M5.0

ZONE SETPOINTS				
VAV BOX NUMBER	OCCUPIED COOLING	OCCUPIED HEATING	UNOCCUPIED COOLING	UNOCCUPIED HEATING
B1-01-1	75	70	80	65
B1-01-6	75	70	80	65
B1-01-7	75	70	80	65
B1-01-8	75	70	80	65
B1-01-9	75	70	80	65
B1-01-10	75	70	80	65
B1-01-17	75	70	80	65



POINTS LIST KEY	
AI	ANALOG INPUT
BI	BINARY INPUT
FP	FLOATING POINT CONTROL

VAV POINTS LIST					
TYPE	COUNT	LABEL	NAME	DEVICE	NOTES
AI	1	CFCS	COLD FLOW CROSS SENSOR	FLOW CROSS SENSOR	
AI	1	DAT	DISCHARGE AIR TEMPERATURE (UNITS WITH HEAT ONLY)	AIR TEMPERATURE SENSOR	
AI	1	T	SPACE TEMPERATURE	COMBINATION TEMPERATURE / HUMIDITY SENSOR	
AI	1	HDP0	HOT DAMPER PERCENTAGE OPEN	POSITION SENSOR	
FP	1	HAD	HOT PRIMARY AIR DAMPER	FLOATING POINT CONTROL ON DAMPER	
AI	1	HFCS	HOT FLOW CROSS SENSOR	FLOW CROSS SENSOR	
AI	1	CDPO	COLD DAMPER PERCENTAGE OPEN	POSITION SENSOR	
BI	1	VS	VACANCY SENSOR	VACANCY SENSOR	1
FP	1	CAD	COLD PRIMARY AIR DAMPER	FLOATING POINT CONTROL ON DAMPER	

1. PROVIDED BY LIGHTING CONTROL SYSTEM AND CONNECTED VIA AUXILIARY RELAY BY BAS CONTRACTOR

VAV TERMINAL BOX - SEQUENCE OF OPERATIONS

1. VAV TERMINAL BOXES
   a. THE VAV TERMINAL BOX SHALL BE STARTED AND STOPPED BY THE BAS.
   b. WHEN ANY OCCUPANCY SENSOR SERVING THE ZONE HAS BEEN ACTIVE IN THE PREVIOUS 15 MINS. (ADJUSTABLE), THE ZONE SHALL BE PLACED IN THE OCCUPIED MODE. WHERE NO OCCUPANCY SENSORS SERVING THE ZONE HAVE BEEN ACTIVE IN THE PREVIOUS 15 MINUTES. (ADJUSTABLE), THE ZONE SHALL BE PLACED IN UNOCCUPIED MODE.
   c. REFER TO THE TABLE FOR ZONE SETPOINTS.
   d. EACH FLOW CROSS SENSOR SHALL BE A POINT ON THE BAS. THE BAS SHALL ACCOMPLISH SPACE TEMPERATURE CONTROL BY MODULATING EACH VAV DAMPER V/A FLOATING POINT CONTROL BETWEEN MAXIMUM AND MINIMUM AIR FLOWS. UPON A CALL FOR LESS COOLING, A TERMINAL IN FULL COOLING SHALL MODULATE THE COLD PRIMARY AIR DAMPER TOWARDS CLOSED UNTIL IT IS AT THE MAXIMUM HEATING CFM. THEN, UPON A CALL FOR LESS COOLING, THE COLD PRIMARY AIR DAMPER SHALL CONTINUE TO MODULATE TOWARDS ITS MAXIMUM POSITION WHILE THE HOT PRIMARY AIR DAMPER SHALL MODULATE TOWARDS OPEN IN INVERSE PROPORTION TO MAINTAIN TOTAL AIRFLOW AT MAXIMUM HEATING CFM. UPON A CALL FOR MORE COOLING, THIS SEQUENCING SHALL BE REVERSED. REFER TO TERMINAL UNIT SCHEDULE FOR MAXIMUM AND MINIMUM CFMS.

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05.21.19

Project Name
RICE ALLIANCE & MULTIPURPOSE ROOM

Project Number
02.8270.500

Description
MECHANICAL CONTROL DIAGRAMS

Scale
12" = 1'-0"

M6.0

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1 VAV CONTROLS ZONING PLAN - LEVEL 01_PHASE 1.5
SCALE: 1/8" = 1'-0"

SHEET NOTES

M8 VACANCY SENSOR CONTROLS VAV BOX B1-01-1.
M9 VACANCY SENSOR CONTROLS VAV BOX B1-01-6.
M10 VACANCY SENSOR CONTROLS VAV BOX B1-01-7.
M11 VACANCY SENSOR CONTROLS VAV BOX B1-01-8.
M12 VACANCY SENSOR CONTROLS VAV BOX B1-01-9.
M13 VACANCY SENSOR CONTROLS VAV BOX B1-01-10.
M14 VACANCY SENSOR CONTROLS VAV BOX B1-01-17.

GENERAL NOTES

A. UPON ALL SENSORS IN ONE ZONE INDICATING UNOCCUPIED, VAV DAMPERS IN RESPECTIVE VAV TERMINAL BOX SHALL INITIATE TEMPERATURE SETBACK SEQUENCE. SEE KEYNOTE PER VACANCY SENSOR FOR INFORMATION ON RESPECTIVE VAV TERMINAL BOX.

KEY PLAN

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Project Name
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Project Number
02.8270.500

Description
VAV CONTROLS ZONING PLAN

Scale
1/8" = 1'-0"
Ref North

M6.1

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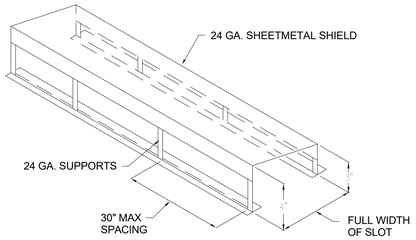
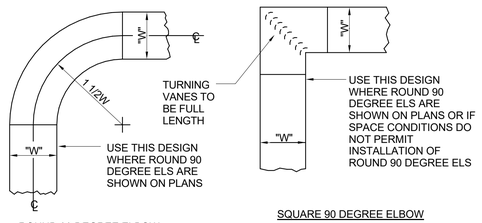


PROVIDE RETURN AIR SHIELD OVER ARCHITECTURAL SLOT AND PAINT EXPOSED SURFACES FLAT BLACK.

RETURN AIR LIGHT SHIELD
NOT TO SCALE

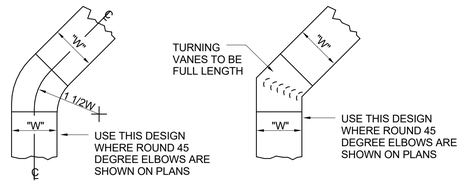
02



ROUND 90 DEGREE ELBOW

SQUARE 90 DEGREE ELBOW

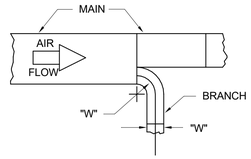
CONSTRUCTION OF 90 DEGREE ELBOWS



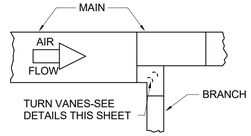
ROUND 45 DEGREE ELBOW

SQUARE 45 DEGREE ELBOW

CONSTRUCTION OF 45 DEGREE ELBOWS

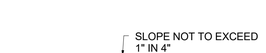


ROUND BRANCH TAKEOFF

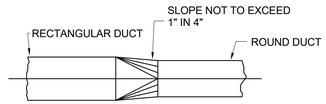


SQUARE BRANCH TAKEOFF

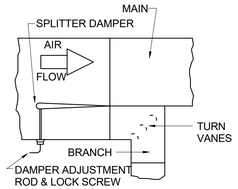
CONSTRUCTION OF BRANCH TAKEOFFS FROM MAIN



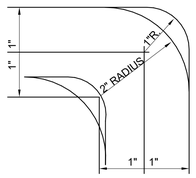
TYPICAL RECTANGULAR TRANSITION



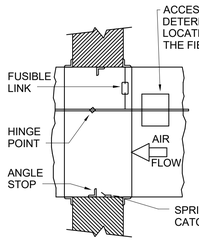
TYPICAL RECTANGULAR TO ROUND TRANSITION



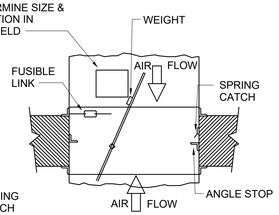
TYPICAL SPLITTER DAMPER



DETAIL OF TURN VANES

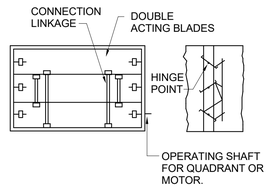


HORIZONTAL



VERTICAL

TYPICAL FIRE DAMPER



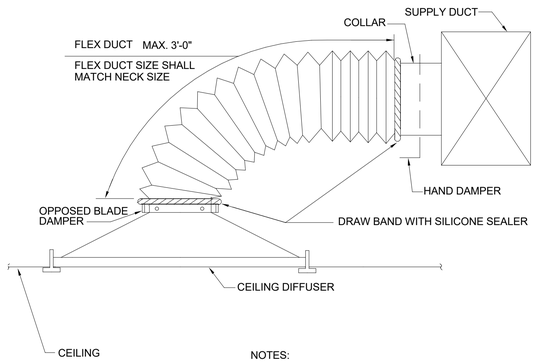
TYPICAL VOLUME DAMPER

INSTALLATION NOTES

1. ALL DUCTS SHALL BE CONSTRUCTED AND ERECTED IN A NEAT AND WORKMANLIKE MANNER.
2. DUCTS SHALL BE CONSTRUCTED OF THE WEIGHTS, GAGES AND MATERIAL SHOWN IN THE SCHEDULE ON THESE DRAWINGS.
3. THE DIMMENSION SHOWN FOR ALL DUCTS SHOWN IN PLAN GIVE THE WIDTH AND THEN THE HEIGHT.
4. AIR TURN SHALL BE INSTALLED IN ALL ABRUPTS ELBOWS TO PREVENT TURBULENCE.
5. DUCTS ARE TO BE MOUNTED WITH VIBRATION ISOLATION PER DIVISION 23 - NOISE AND VIBRATION CONTROL FOR HVAC.
6. DIVERGING TRANSITION PIECES SHALL BE MADE AS GRADUAL AS POSSIBLE.
7. INSTALL FIRE DAMPERS IN ACCORDANCE WITH UL 555.
8. ACCESS PANELS SHOULD BE PLACED BEFORE AND/OR AFTER EQUIPMENT INSTALLED IN THE DUCT.
9. DUCT ARE SHOULD NOT BE DECREASED MORE THAN 10 PERCENT WHEN OBSTRUCTIONS CANNOT BE AVOIDED, AND THEN A STREAMLINED FITTING SHOULD BE USED.
10. FLEXIBLE FABRIC CONNECTIONS (OR EQUAL) SHOULD BE USED ON BOTH INLETS AND OUTLETS OF ALL FANS AND AIR HANDLING UNITS.
11. JOINTS AND SEAMS OF SUPPLY DUCTS SHALL BE FASTENED SECURELY AND MADE AIR TIGHT.

LOW VELOCITY DUCT LAYOUT DETAILS
NOT TO SCALE

01

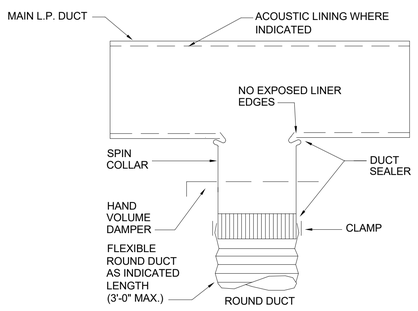


NOTES:

1. OPPOSED BLADE DAMPER NOT TO BE USED IN ROOMS WITH AN RC 30 OR LOWER BACKGROUND NOISE CRITERIA
2. HAND DAMPER NOT TO BE USED IN ROOMS WITH AN RC 30 OR LOWER BACKGROUND NOISE CRITERIA.

TYPICAL DIFFUSER CONNECTION
NOT TO SCALE

05

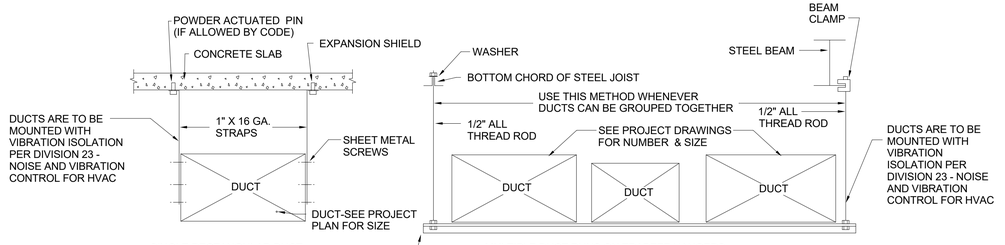


NOTES:

1. HAND VOLUME DAMPER NOT TO BE USED IN ROOMS WITH AN RC 30 OR LOWER BACKGROUND NOISE CRITERIA.

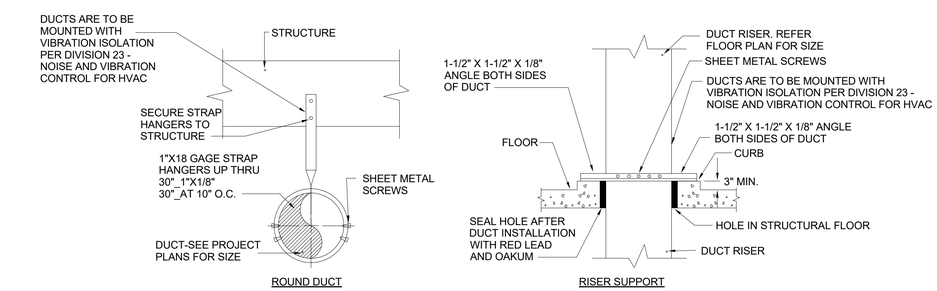
TYPICAL LOW PRESSURE BRANCH DUCT TAKE-OFF NOT TO SCALE

04



SINGLE RECTANGULAR DUCT

MULTIPLE DUCT RUNS ON TRAPEZE HANGERS



ROUND DUCT

RISER SUPPORT

HANGER AND SUPPORT DETAILS FOR LOW PRESSURE DUCTWORK (UP THRU 2" WG)
NOT TO SCALE

03

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Seal / Signature

STATE OF TEXAS
LISA A. OSBORNE
66836
LICENSED PROFESSIONAL ENGINEER
05.21.19

Project Name
RICE ALLIANCE & MULTIPURPOSE ROOM

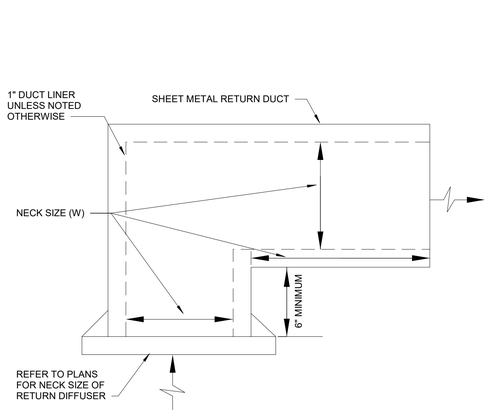
Project Number
02.8270.500

Description
MECHANICAL DETAILS

Scale
12" = 1'-0"

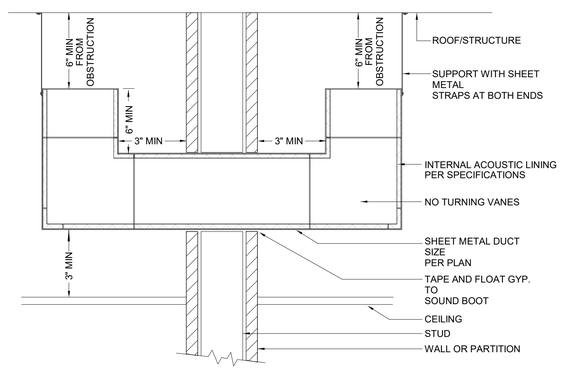
M8.0

5/21/2019 1:18:56 PM C:\Users\yyasri\Documents\2019013000_MEP18_Central_yyasri.rvt



RETURN SOUND ATTENUATION ELBOW 02

SCALE: Not To Scale



NOTES

1. INSTALL SOUND BOOT AS HIGH AS POSSIBLE.

RETURN AIR SOUND BOOT 01

SCALE: Not To Scale

Rice McNair Hall - PHASE 1.5

RICE UNIVERSITY
JANICE AND ROBERT MCNAIR HALL
6100 MAIN STREET
HOUSTON TEXAS 77005

Gensler

711 Louisiana
Suite 300
Houston, Tx 77002
Tel 713.844.000
Fax 713.844.000

Collaborative Engineering
Group
8904 Fairbanks N. Houston
Houston, Texas 77064
Tel 281.598.1170
Fax 281.598.1130

△ Date	Description
05/21/2019	ISSUE FOR PERMIT & PRICING

Seal / Signature

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66836
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PROFESSIONAL ENGINEER
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RICE ALLIANCE & MULTIPURPOSE ROOM

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Description

MECHANICAL DETAILS

Scale

As indicated

M8.1

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