

GENERAL MECHANICAL NOTES

GENERAL

1. WHEN A CONFLICT BETWEEN THE DRAWINGS, NOTES AND/OR SPECIFICATIONS OCCUR, THE MORE STRINGENT, AND/OR LARGER QUANTITY AND/OR MORE EXPENSIVE SHALL APPLY. THE REQUIREMENTS LISTED WITHIN NOTES OR SPECIFICATIONS SHALL BE REQUIRED, PROVIDED AND INSTALLED WHETHER SPECIFICALLY INDICATED ON THE DRAWINGS OR NOT.

2. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO PROVIDE FOR FINISHED WORK, TESTED AND READY FOR OPERATION.

3. ITEMS AND SERVICES NOT SHOWN ON DRAWINGS OR SPECIFICATIONS BUT REQUIRED TO RENDER THE WORK COMPLETE AND READY FOR OPERATION, SHALL BE PROVIDED WITHOUT ADDITIONAL COST.

4. WORK OF THIS SECTION SHALL BE GOVERNED BY THE CONTRACT DOCUMENTS. PROVIDE MATERIALS, LABOR, EQUIPMENT AND SERVICES NECESSARY TO FURNISH, DELIVER AND INSTALL ALL WORK AS SPECIFIED AND AS REQUIRED BY JOB CONDITIONS. WHERE A CONFLICT EXISTS BETWEEN THESE NOTES, THE DRAWINGS AND THE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL APPLY.

5. DRAWINGS ARE DIAGRAMMATIC AND INDICATE A GENERAL ARRANGEMENT OF WORK AND ARE NOT TO BE CONSIDERED SUB-CONTRACTOR DOCUMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND ALL SUBCONTRACTORS TO INCLUDE THE PROVISIONS AND INSTALLATION OF ALL NECESSARY WORK AND MATERIALS FOR COMPLETE, OPERATIONAL AND CODE COMPLIANT SYSTEMS. GENERAL DESIGN CONCEPTS INDICATED MUST BE FOLLOWED OR BETTERED. THE BID SHALL INCLUDE OFFSETS, ADDITIONAL PIPING, VALVES AND EQUIPMENT AND COMPONENTS AS REQUIRED TO MEET CONSTRUCTION CONDITIONS FOR PROPER OPERATION. DO NOT SCALE DRAWINGS. CONSULT ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SPACE CONDITIONS AND ADDITIONAL REQUIREMENTS.

6. PERFORM THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT GENERAL CONDITIONS AND WITH THE PROVISIONS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND LAWS.

7. WORK SHALL INCLUDE ALL INCIDENTALS, LABOR, MATERIAL, EQUIPMENT, APPLIANCES, SERVICES, HOISTING, SCAFFOLDING, SUPPORTS, TOOLS, CONSUMABLE ITEMS, FEES, LICENSES, AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE WORK SHOWN ON THE DRAWINGS, SPECIFIED HEREIN AND AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.

8. STORE MATERIALS INSIDE AND PROTECTED FROM DEBRIS, WEATHER AND MOISTURE.

9. THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL POWER AND CONTROL WIRING REQUIRED FOR EQUIPMENT OPERATION NOT SPECIFICALLY PROVIDED BY OTHERS BUT REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. THIS CONTRACTOR SHALL PROVIDE MOTOR STARTERS. COORDINATE REQUIREMENTS WITH DIVISION 26.

10. COORDINATE ALL HVAC WORK AND EQUIPMENT WITH STRUCTURAL STEEL, FIRE PROTECTION PIPING, PLUMBING PIPING, LIGHT FIXTURES, ELECTRICAL EQUIPMENT AND OWNERS EQUIPMENT.

11. ALL EXISTING CONDITIONS AS INDICATED ARE APPROXIMATIONS OF EXACT CONDITIONS TO BE VERIFIED IN THE FIELD. CONTRACTOR SHALL VISIT THE SITE TO VERIFY THE CONSTRUCTION CONDITIONS BEFORE SUBMITTING BID.

12. WHENEVER THE DOCUMENTS INDICATE FOR NEW PIPING TO CONNECT TO AN EXISTING PIPING SYSTEM (OTHER THAN A STEAM SYSTEM), CONTRACTOR SHALL INSTALL A TEMPORARY CORROSION INHIBITOR SYSTEM TO TREAT THE EXISTING PIPING. THE SYSTEM SHALL CONSIST OF AN INJECTOR, PIPING MODIFICATIONS AND APPLICABLE CHEMICALS REQUIRED TO TREAT THE EXISTING SYSTEM FOR A MINIMUM OF THREE WEEKS PRIOR TO ANY NEW CONNECTIONS. UPON INSTALLATION OF THE NEW PIPING SYSTEM, THE ENTIRE SYSTEM (NEW & EXISTING) SHALL BE FLUSHED WITH A CHEMICAL CLEANSING AGENT.

13. REFER TO ARCHITECTURAL, REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING GRILLES, REGISTERS AND DIFFUSERS.

14. PROVIDE VOLUME DAMPERS IN EACH BRANCH DUCTWORK SERVING REGISTERS, GRILLES AND DIFFUSERS WHETHER INDICATED OR NOT.

15. PROVIDE CABLE OPERATED DAMPERS IN BRANCH DUCTWORK SERVING REGISTERS, GRILLES, AND DIFFUSERS IN INACCESSIBLE CEILING LOCATIONS WHETHER INDICATED OR NOT.

16. LOCATE ALL BALANCING DAMPERS AT MAIN DUCTWORK ABOVE ACCESSIBLE CEILINGS, OR PROVIDE ACCESS DOORS.

17. INSTALL ALL FLOOR MOUNTED HVAC EQUIPMENT, INCLUDING AHU'S, PUMPS, CHILLERS, ETC. ON 4" CONCRETE PADS UNLESS OTHERWISE INDICATED.

18. PROVIDE TRAPPED CONDENSATION DRAIN PIPING FROM COOLING COIL DRAIN PAN TO AN APPROVED POINT OF DISCHARGE WHETHER INDICATED OR NOT. REFER TO PLUMBING PLANS FOR FLOOR DRAIN LOCATIONS.

19. PROVIDE FIRE DAMPERS, SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS AS REQUIRED TO MAINTAIN WALL & FLOOR RATINGS AS DEFINED IN ARCHITECTURAL DRAWINGS.

20. PROVIDE SEISMIC EXPANSION JOINTS AT ALL PIPING AND DUCTWORK PASSING THROUGH SEISMIC EXPANSION JOINTS.

21. REFER TO SPECIFICATION SECTION 230000 AND DIVISION 7 FOR ADDITIONAL PENETRATION SEALING REQUIREMENTS. PENETRATIONS TO COMPLY WITH ASTM E84 & E814 AND APPROVED UL 1479 AND SPECIFIC UL ASSEMBLIES AS REQUIRED TO SUIT PENETRATION CONDITIONS.

22. TEMPERATURE CONTROL CONTRACTOR (TCC) IS RESPONSIBLE FOR ALL CONTROL WIRING 120 VOLT AND LESS. EXTEND POWER FOR VAV BOXES FROM JUNCTION BOXES PROVIDED BY DIVISION 26. REFER TO ELECTRICAL DRAWINGS FOR LOCATIONS. TCC TO EXTEND 120V POWER TO EACH VAV BOX TRANSFORMER. SHARED TRANSFORMERS ARE NOT ALLOWED. RUN POWER PER DIVISION 26 REQUIREMENTS.

23. TCC SHALL EXTEND ALL POWER FOR DAMPER ACTUATORS, VALVE ACTUATORS AND OTHER CONTROL DEVICES FROM LOCAL ELECTRICAL PANEL, DIVISION 26 TO SUPPLY POWER TO TCCPS. REFER TO ELECTRICAL DRAWINGS FOR PANEL LOCATIONS.

24. THE DRAWINGS AND SPECIFICATIONS ARE DIVIDED INTO SECTIONS TO MEET THE NEEDS OF THE ARCHITECT, THE ENGINEERS, AND THE DESIGN CONSULTANTS. THEY ARE NOT PREPARED AS INSTRUCTIONS TO THE CONTRACTOR FOR HOW TO BUY OUT OR SUBCONTRACT THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR ALL THE WORK DESCRIBED IN THE CONTRACT DOCUMENTS, REGARDLESS OF WHERE IT IS SHOWN. FOR EXAMPLE, ELECTRICAL WORK IS SHOWN ON FP-SERIES DRAWINGS AS WELL AS ON M-SERIES DRAWINGS AND E-SERIES DRAWINGS. MISCELLANEOUS METALS AND STRUCTURAL ELEMENTS ARE SHOWN ON A-SERIES DRAWINGS AS WELL AS ON S-SERIES DRAWINGS. STRUCTURAL SUPPORTS ARE REQUIRED BY THE FP DRAWINGS. TO AVOID OMITTING ANY COMPONENT OF THE PROJECT, REFER TO ALL THE CONTRACT DOCUMENTS IN THEIR ENTIRETY.
25. WHEREVER EXISTING SYSTEMS ARE ALTERED OR EXTENDED THE INTEGRITY OF THE SYSTEM IS TO BE MAINTAINED AND FUNCTION FULLY AS BEFORE. COORDINATE SCHEDULE FOR HOOK-UPS TO EXISTING SYSTEMS AND EQUIPMENT REMOVAL OR RELOCATION WITH THE OWNER AND PERFORM THIS WORK AT SUCH TIMES TO ENSURE THAT PERIODS OF SHUTDOWN WILL BE ACCEPTABLE TO THE OWNER.

26. VERIFY EXACT LOCATION OF CONNECTION POINTS (NEW TO EXISTING) IN FIELD PRIOR TO CONSTRUCTION.

27. RELOCATE EXISTING DUCTWORK AND/OR PIPE WORK IN EXISTING CEILING SPACES TO ACCOMMODATE ALL RENOVATIONS AND ADDITIONS.

28. TAKE DOWN AND REINSTALL EXISTING CEILINGS IN ALL AREAS WHERE MECHANICAL WORK IS INDICATED AND EXISTING CEILINGS REMAIN. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN DRAWINGS FOR LOCATIONS WHERE EXISTING CEILINGS REMAIN. REPLACE CEILING TILES DAMAGED DURING WORK.

29. PATCH ALL WALLS, FLOORS, CEILINGS, AND ROOFS TO MATCH EXISTING IN ALL CASES WHERE EXISTING WALLS, FLOORS, CEILINGS, AND ROOFS REMAIN AND HVAC DEMOLITION IS INDICATED.
- ALTERATION WORK AND DEMOLITION

1. ALL EQUIPMENT, DUCTWORK, PIPING, CONTROL DEVICES, ETC. TO BE REMOVED, SHALL BE DISPOSED OF, TURNED OVER TO THE OWNER, OR SALVAGED AS DIRECTED BY THE OWNER. EQUIPMENT, DUCTWORK, PIPING, CONTROL DEVICES, ETC. SHALL NOT BE REMOVED FROM THE PREMISES WITHOUT THE OWNER'S APPROVAL.

2. UPON COMPLETION OF REMOVALS AND MODIFICATIONS, ALL DUCTWORK AND PIPING TO REMAIN SHALL BE PROPERLY VALVED, CAPPED AND/OR BY PASSED SUCH THAT UPON COMPLETION OF WORK ALL SYSTEMS TO REMAIN, REMAIN OPERATIONAL.

3. NO DEAD ENDS SHALL BE LEFT ON ANY DUCTWORK OR PIPING SYSTEM UPON COMPLETION OF WORK.

4. EXISTING DUCTWORK AND PIPING SYSTEMS NOT TO BE REUSED, AND NOT SPECIFICALLY NOTED FOR REMOVAL SHALL BE COMPLETELY REMOVED.

5. ALL SYSTEMS SHALL BE LEFT IN WORKING ORDER TO THE SATISFACTION OF THE OWNER UPON COMPLETION OF ALL NEW WORK.

6. ALL EXISTING UNNECESSARY DUCTWORK AND PIPING NOT RELATED TO NEW WORK SHALL BE COMPLETELY REMOVED.

7. RE-ROUTE ALL EXISTING DUCTWORK, PIPING AND SYSTEMS WHERE NECESSARY TO AVOID NEW EQUIPMENT, STRUCTURAL, OR MASONRY WORK AS REQUIRED BY THE PROPOSED ALTERATIONS.

8. WHERE PORTIONS OF EXISTING DUCT SYSTEMS ARE TO REMAIN CONTRACTOR SHALL TAKE AIRFLOW READINGS AT ALL AIR REGISTER, GRILLES AND DIFFUSERS ASSOCIATED WITH THE DUCT SYSTEM TO BE MODIFIED BEFORE COMMENCEMENT OF WORK AND AFTER ALTERATION WORK IS COMPLETE. AIR BALANCING WORK SHALL BE PERFORMED BY AN INDEPENDENT NEED CERTIFIED COMPANY, NOT ASSOCIATED WITH THE CONTRACTOR. REPORTS ARE TO BE ISSUED TO THE OWNER AND ENGINEER AT BOTH OCCURRENCES. IF AS-BUILTS ARE AVAILABLE, DISCREPANCIES NOTED BETWEEN THE AS BUILT DRAWINGS AND THE INITIAL AIR FLOW READINGS ARE TO BE NOTED ON THE AIR FLOW REPORT. EXISTING AIR REGISTERS, GRILLES AND DIFFUSERS ARE TO BE BALANCED TO THE ORIGINAL READINGS AT COMPLETION OF WORK UNLESS OTHERWISE IDENTIFIED.
- SHOP DRAWINGS

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO BE REVIEWED BY THE ENGINEER PRIOR TO CONSTRUCTION. SHOP DRAWINGS SHALL BE SUBMITTED FOR DUCTWORK LAYOUT, PIPING LAYOUT, SHEET METAL SHOP STANDARDS AND ALL EQUIPMENT FURNISHED.

2. ELECTRONIC DRAWING FILES SHALL BE GENERATED BY THE CONTRACTOR. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC VERSION (AUTOCAD VERSION AS REQUIRED BY THE OWNER) OR AUTOCAD VERSION 2010 IF NOT SPECIFIED.

3. PRIOR TO THE SUBMISSION AND REVIEW OF SHEET METAL SHOP DRAWINGS, THE CONTRACTOR SHALL SUBMIT FOR REVIEW SHEET METAL SHOP STANDARDS. ANY SHEET METAL SHOP DRAWINGS SUBMITTED PRIOR TO THE SUBMISSION OF THE SHOP STANDARDS SHALL BE RETURNED "NOT REVIEWED".
- COORDINATION DRAWINGS

1. ELECTRONIC DRAWING FILES SHALL BE GENERATED BY THE CONTRACTOR. IF REQUESTED, ELECTRONIC FILES OF THE MECHANICAL FLOOR PLANS, SECTIONS AND ELEVATIONS ONLY WILL BE MADE AVAILABLE. ELECTRONIC FILES WILL BE RELEASED ONLY UPON RECEIPT OF THE SIGNED AGREEMENT FOR TRANSFER OF ELECTRONIC FILE DATA, AGREEMENT FOR TRANSFER OF BUILDING INFORMATION MODEL AND ALL FEES INDICATED THEREIN.

2. DEVELOP AND SUBMIT COORDINATION DRAWINGS AS OUTLINED.

A. SHEET METAL, PLUMBING AND FIRE PROTECTION SHOP DRAWINGS THAT HAVE BEEN COORDINATED WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. DRAWINGS MUST BE RETURNED FROM ENGINEER EITHER "REVIEWED" OR "FURNISH AS CORRECTED" PRIOR TO BEING USED AS BASIS FOR COORDINATION DRAWINGS.

B. AFTER SHEET METAL AND PIPING DRAWINGS HAVE BEEN REVISED PER ENGINEERS COMMENTS, REPRODUCIBLE COPIES SHALL BE SENT TO THE TRADES IN THE FOLLOWING SEQUENCE FOR THE INCLUSION OF THEIR WORK.

-MECHANICAL SHEET METAL

-MECHANICAL PIPING

-ELECTRICAL WORK

3. AFTER ALL TRADES HAVE INCLUDED THEIR WORK ON THE COORDINATION DRAWING AND NOTED CONFLICTS, ALL TRADES SHALL MEET TO RESOLVE CONFLICTS AND AGREE TO ACCEPTABLE SOLUTIONS. EACH TRADE SHALL SIGN COORDINATION DRAWINGS. ITEMS NOT SHOWN ON COORDINATION DRAWING IS RESPONSIBILITY OF OMITTING CONTRACTOR AND CONTRACTOR IS SUBJECT TO ADDITIONAL COSTS INCURRED BY OTHER TRADES.

4. THE ARCHITECT AND ENGINEER ARE NOT PART OF THE COORDINATION DRAWING PROCESS. THE ENGINEER WILL PROVIDE ASSISTANCE FOR NOTED CONFLICTS ONLY. COORDINATION DRAWINGS ARE NOT TO BE CONSIDERED PIPING OR DUCT SHOP DRAWINGS. THE CONTRACTOR IS REQUIRED TO SUBMIT INDIVIDUAL PIPING AND DUCTWORK SHOP DRAWINGS FOR REVIEW BY THE ENGINEER. PIPING AND DUCTWORK SHOP DRAWINGS SHALL FOLLOW THE DESIGN INTENT OF THE CONTRACT DOCUMENTS.

5. SUBMIT FINAL SIGNED COORDINATION DRAWING TO ENGINEER FOR REVIEW. ENGINEER WILL REVIEW COORDINATION DRAWINGS FOR GENERAL ARRANGEMENT AND FOR NOTED CONFLICTS ONLY. SPECIFIC INSTALLATION REQUIREMENTS WILL BE REVIEWED ONLY IN INDIVIDUAL TRADE SHOP DRAWINGS.

AS BUILT DRAWINGS

1. PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS REFLECTING AS INSTALLED CONDITIONS. AS-BUILT DRAWINGS SHALL INDICATE ALL INSTALLED CONDITIONS OF SYSTEMS WITHIN THIS DISCIPLINE. DRAWINGS SHALL BE OF SIMILAR SCALE AS THE CONSTRUCTION DOCUMENTS AND INCLUDE DETAILS AS NECESSARY TO CLEARLY REFLECT THE INSTALLED CONDITION. DRAWINGS SHALL BE BOUND IN A COMPLETE AND CONSECUTIVE SET. SUPPLEMENTAL SKETCHES AND LOOSE PAPERWORK WILL NOT BE ACCEPTABLE AND WILL BE RETURNED FOR REVISION. THE CONTRACTOR SHALL COMPLY WITH THE ENGINEERS COMMENTS TO PRODUCE A CLEAR AND CONCISE SET OF DRAWINGS. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC VERSION (AUTO-CAD VERSION AS REQUIRED BY THE OWNER) OR AUTOCAD VERSION 2010 IF NOT SPECIFIED. NUMBER OF COPIES OF EACH AS REQUESTED BY THE OWNER.

2. PROVIDE "AS-BUILT" DRAWINGS" INDICATING IN A NEAT AND ACCURATE MANNER A COMPLETE RECORD OF ALL REVISIONS OF THE ORIGINAL DESIGN OF THE WORK. INDICATE THE FOLLOWING INSTALLED CONDITIONS:

• INCLUDE ALL CHANGES AND AN ACCURATE RECORD IN AUTOCAD DRAWING OR APPROPRIATE SHOP DRAWINGS, OF ALL DEVIATIONS, BETWEEN THE WORK SHOWN AND WORK INSTALLED.

• MAINS AND BRANCHES OF PIPING SYSTEMS, WITH VALVES AND CONTROL DEVICES LOCATED AND NUMBERED, CONCEALED UNIONS LOCATED, AND WITH ITEMS REQUIRING MAINTENANCE LOCATED (I.E., TRAPS, STRAINERS, EXPANSION COMPENSATORS, TANKS, ETC.). VALVE LOCATION DIAGRAMS, COMPLETE WITH VALVE TAG CHART.

• EQUIPMENT LOCATIONS (EXPOSED AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.

• APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.

• CONTRACT MODIFICATIONS, ACTUAL EQUIPMENT AND MATERIALS INSTALLED.

3. SUBMIT FOR REVIEW BOUND SETS OF THE REQUIRED DRAWINGS, MANUALS AND OPERATING INSTRUCTIONS.

4. SUBMIT A COMPLETE MAINTENANCE MANUAL OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT.

HOUSEKEEPING PADS

1. PROVIDE CONCRETE HOUSEKEEPING PADS FOR FLOOR-MOUNTED EQUIPMENT. COORDINATE EXACT LOCATIONS, DIMENSIONS, PIPING LOCATIONS, AND ANCHOR BOLT REQUIREMENTS. PROVIDE CONCRETE HOUSEKEEPING PADS UNDER ALL FLOOR MOUNTED EQUIPMENT. PADS SHALL BE CONSTRUCTED OF 3,000 PSI CONCRETE. PADS SHALL BE 4 INCHES HIGH (OR THE MINIMUM HEIGHT TO ACCOMMODATE THE CONDENSATE TRAP HEIGHT), AND MINIMUM 4 INCHES WIDER THAN THE EQUIPMENT IN BOTH DIRECTIONS.

2. COORDINATE FLOOR DRAIN LOCATIONS WITH RESPECT TO EQUIPMENT HOUSEKEEPING PADS. PLACE DRAINS SUCH THAT EDGE OF THE FLOOR GRATE EXTENDS NO CLOSER THAN 2 INCHES FROM THE SIDE OF THE PAD. FLOOR DRAINS TO BE COORDINATED WITH PLUMBING CONTRACTOR.

HANGERS AND SUPPORT

1. SEISMIC RESTRAINT: PROVIDE SEISMIC RESTRAINT AND EXPANSION OF ALL MECHANICAL EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH STATE AND FEDERAL BUILDING CODE REQUIREMENTS. SUBMIT SHOP DRAWINGS SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT INDICATING ALL NECESSARY COMPONENT CUTS, PLAN LOCATIONS AND CALCULATIONS FOR A COMPLETE SYSTEM.

2. PROVIDE ALL NECESSARY STRUCTURAL MEMBERS INCLUDING ADDITIONAL STRUCTURAL SUPPORT TO SUPPORT PIPING AND EQUIPMENT. HANGERS AND SUPPORTS SHALL BE OF AN APPROVED DESIGN NECESSARY TO SUPPORT DUCTWORK, PIPING, EQUIPMENT AND TO KEEP IN PROPER ALIGNMENT AND PREVENT TRANSMISSION OF INJURIOUS THRUSTS AND VIBRATIONS. IN ALL CASES WHERE HANGERS, BRACKETS, ETC., ARE SUPPORTED FROM CONCRETE CONSTRUCTION, DO NOT WEAKEN CONCRETE OR PENETRATE WATERPROOFING. ALL HANGERS AND SUPPORTS SHALL BE CAPABLE OF SCREW ADJUSTMENT AFTER EQUIPMENT AND PIPING IS ERECTED. HANGERS SUPPORTING PIPING EXPANDING INTO LOOPS, BENDS AND OFFSETS SHALL BE SECURED TO THE BUILDING STRUCTURE IN SUCH A MANNER THAT HORIZONTAL ADJUSTMENT PERPENDICULAR TO THE RUN OF PIPING SUPPORTED MAY BE MADE TO ACCOMMODATE DISPLACEMENT DUE TO EXPANSION. ALL SUCH HANGERS SHALL BE FINALLY ADJUSTED BOTH IN THE VERTICAL AND HORIZONTAL DIRECTION, AS REQUIRED. HANGERS IN CONTACT WITH COPPER OR BRASS PIPE SHALL BE DIELECTRIC, COMPATIBLE WITH COPPER AND BRASS ALLOY OR PROVIDED WITH FELT SLEEVE.

3. PROVIDE ADDITIONAL SUPPORT FOR DUCTWORK PIPING AND EQUIPMENT WHEN DECK IS NOT CAPABLE OF SUPPORT.

4. BEAM CLAMPS - HANGERS SUPPORTED FROM STEEL SHALL BE CENTER LOADING BEAM CLAMPS FOR HANGERS SUPPORTING PIPING 2 INCHES. FOR PIPING 2-1/2 INCHES AND LARGER, I BEAM CLAMPS SHALL BE FORGED STEEL. "C" CLAMPS ARE NOT TO BE USED.

5. PROVIDE AND INSTALL EXPANSION COMPENSATION FOR ALL PIPING. SUBMIT PLANS, CALCULATIONS AND EQUIPMENT DATA.

MECHANICAL DEMOLITION NOTES

1. COORDINATE PHASING OF DEMOLITION WITH C.M./G.C. AND PROPOSED CONSTRUCTION SCHEDULE TO MAINTAIN MECHANICAL SERVICES (HEATING, TEMPERATURE CONTROLS, EXHAUSTS, MAKE UP AIR ETC.) TO OCCUPIED AREAS OF THE BUILDING DURING CONSTRUCTION.

2. THE EXISTING FACILITY WILL BE OCCUPIED AND IN OPERATION DURING THE PERFORMANCE OF THE WORK.

3. WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING PIPING OR DUCTWORK WHICH MAY CAUSE DISRUPTION TO OCCUPIED FACILITIES, CONFER WITH THE OWNER, AND SCHEDULE A MUTUALLY AGREEABLE PERIOD OF INTERRUPTION.

4. WHERE REPLACEMENT, RELOCATION OR MODIFICATION OF EXISTING EQUIPMENT IS INDICATED, PROVIDE AND MAINTAIN ALL TEMPORARY SERVICES, CONNECTIONS, CONTROLS, AND ANY OTHER MATERIALS AND APPURTENANCES REQUIRED TO MAINTAIN SERVICES TO OCCUPIED AREAS.

5. NO WORK SHALL BE LEFT INCOMPLETE, NOR ANY HAZARDOUS SITUATION CREATED, WHICH WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS. AT NO TIME SHALL THE WORK INTERFERE WITH OR CUT OFF ANY OF THE EXISTING SERVICES WITHOUT THE OWNER'S PRIOR WRITTEN PERMISSION.

6. THE OWNER RESERVES THE RIGHT TO OPERATE ALL EXISTING MECHANICAL EQUIPMENT UNTIL THE NEW SYSTEMS COME ON LINE.

7. IT IS REQUIRED THAT THE WORK INDICATED AND/OR SPECIFIED SHALL BE CARRIED OUT WITH A MINIMUM OF INTERFERENCE TO THE ESTABLISHED OPERATIONS OF THE BUILDING.

8. REMOVED MATERIALS SHALL BE DISPOSED OF USING LICENSED CARTING SERVICE.

9. HAZARDOUS MATERIALS - SHALL BE DISPOSED OF BY AN EPA APPROVED, LICENSED DISPOSAL SERVICE. CONTRACTOR SHALL OBTAIN AND HAVE ON FILE, AFFIDAVIT, AND RECEIPTS STATING HOW AND WHERE THE WASTE WAS DISPOSED OF OR CONVERTED.

10. IT IS THE INTENTION OF THESE DEMO DRAWINGS TO INDICATE GENERAL SYSTEMS AND MATERIALS TO BE REMOVED. CONTRACTOR SHALL REMOVE ALL OBSOLETE PIPING, DUCTWORK, EQUIPMENT, CONTROLS, ETC, INDICATED OR NOT.

11. DUCTWORK, EQUIPMENT AND TERMINAL DEVICES HAVE BEEN TAKEN FROM FIELD OBSERVATION AND ARE TO BE USED FOR REFERENCE AND SHALL NOT BE CONSTRUED TO BE ACTUAL FIELD CONDITIONS. CONTRACTOR IS RESPONSIBLE TO VERIFY ALL SYSTEMS PRIOR TO COMMENCEMENT OF DEMOLITION WORK.

12. ALL EQUIPMENT TO BE REMOVED SHALL BE DISPOSED OF PER OR STORED PER DIRECTION OF OWNER, ANY ITEM NOT RETAINED BY OWNER SHALL BE REMOVED FROM SITE AND DISCARDED IN AN APPROVED MANNER.

13. IT IS THE INTENTION OF THESE SPECIFICATION TO REMOVE ALL MATERIALS ABANDONED BY THE SCOPE OF THIS CONSTRUCTION PROJECT. NO OBSOLETE MATERIALS (I.E. HANGERS, SUPPORTS, INSULATION, DUCTWORK, ETC.) SHALL REMAIN.

14. DISCONNECT AND REMOVE ALL DUCTWORK AND ASSOCIATED SUPPLY, RETURN OR EXHAUST GRILLES INCLUDING BUT NOT LIMITED TO ALL HANGERS, SUPPORTS, VOLUME DAMPERS AND FLEXIBLE DUCTWORK.

15. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION TO ANY EXPOSED OR UNCAPPED NEW OR EXISTING DUCTWORK TO REMAIN TO MINIMIZE DUST CONTAMINATION IN ANY AND ALL OF THE AIR SYSTEMS. THIS SHALL INCLUDE BUT IS NOT LIMITED TO TEMPORARY FILTERS, CAPS, ENCLOSURES, ETC.

MECHANICAL DRAWING LIST

DRAWING NUMBER	DRAWING DESCRIPTION
M-01	COVER SHEET - MECHANICAL
M-02	COVER SHEET - MECHANICAL
MD-1	DEMO FLOOR PLAN - MECHANICAL
M-1	FLOOR PLAN - MECHANICAL
M-2	SCHEDULES & DETAILS - MECHANICAL

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SEAL:

HOLZMAN MOSS BOTTINO
ARCHITECTURE
R
ARCHITECTS

ISSUE: 7/29/2014
REVISION 1 - ISSUED FOR CONSTRUCTION 9/23/2014
REVISION 2 - ISSUED FOR CONSTRUCTION 10/03/2014

COVER SHEET -
MECHANICAL

SCALE: NONE

M-01

GENERAL MECHANICAL SYMBOLS

	EXISTING DUCTWORK TO REMAIN
	EXISTING DUCTWORK TO BE REMOVED
	SUPPLY DUCT UP / DN
	RETURN AIR DUCT UP / DN
	DOUBLE LINE DUCTWORK WITH INDICATION OF INSIDE DIMENSIONS
	DOUBLE LINE DUCTWORK WITH INTERNAL ACOUSTICAL INSULATION AND INDICATION OF INSIDE DIMENSIONS
	DOUBLE LINE DUCTWORK WITH DUCT LAGGING AND INDICATION OF INSIDE DIMENSIONS
	ACCESS DOOR IN DUCT
	ROUND DUCT DIAMETER SIZE
	FLEXIBLE DUCT CONNECTION
	UNDERCUT DOOR
	SUPPLY AIR FLOW
	EXHAUST/RETURN AIR FLOW
	90° ELBOW WITH AIRFOIL TURNING VANES
	DUCT TAKE-OFF
	VANE EXTRACTOR
	CEILING DIFFUSER REFER TO SCHEDULE FOR SIZE & TYPE
	RETURN / EXHAUST GRILLE REFER TO SCHEDULE FOR SIZE & TYPE
	LINEAR DIFFUSER REFER TO SCHEDULE FOR SIZE & TYPE
	THERMOSTAT
	TEMPERATURE SENSOR
	RELATIVE HUMIDITY SENSOR OR HUMIDISTAT
	SMOKE DETECTOR IN DUCT
	STATIC PRESSURE SENSOR
	SMOKE DAMPER
	FIRE DAMPER
	COMBINATION SMOKE & FIRE DAMPER
	MOTORIZED DAMPER
	MANUAL VOLUME DAMPER/CABLE OPERATED DAMPER (COD)
<u>XXX</u>	UNDERLINED TEXT DENOTES EQUIPMENT REFER TO SCHEDULES
	DIFFUSER LEGEND LTR= TYPE DESIGNATION, REFER TO SCHEDULES CFM= CFM QUANTITY #= BLOW ARRANGEMENT, 4-WAY BLOW IS TYPICAL OTHERWISE NOTED 3= 3-WAY BLOW 2= 2-WAY BLOW 1= 1-WAY BLOW
	VARIABLE FREQUENCY DRIVE
	COMBINATION MOTOR STARTER/DISCONNECTOR
	TEMPERATURE CONTROL PANEL
	POINT OF CONNECTION
	POINT OF DEMOLITION
	OCCUPANCY SENSOR
	CARBON MONOXIDE SENSOR
	CARBON DIOXIDE SENSOR

GENERAL MECHANICAL ABBREVIATIONS

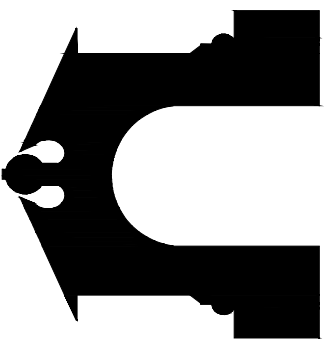
ABV	ABOVE	EF-#	EXHAUST FAN	HVAC	HEATING, VENTILATING & AIR CONDITIONING	PHC	PREHEAT COIL
AC	AIR COMPRESSOR	EAT	ENTERING AIR TEMPERATURE		AIR CONDITIONING	PPH	POUND PER HOUR
ACC-#	AIR COOLED CONDENSER	EER	ENERGY EFFICIENCY RATIO	HX-#	HEAT EXCHANGER CONVERTOR	PRV	PRESSURE REDUCING VALVE
ACU-#	AIR CONDITIONING UNIT	EG	EXHAUST GRILLE	IBT	INVERTED BUCKET TRAP	PSI	POUND PER SQUARE INCH
ACCU-#	AIR COOLED CONDENSING UNIT	EHC-#	ELECTRIC HEATING COIL	ID	INSIDE DIMENSION	RA	RETURN AIR
AD	ACCESS DOOR	ENT	ENTERING	IN	INCHES	RAD	RETURN AIR DAMPER
AF	AIRFOIL	HEPA	HIGH EFFICIENCY PARTICULATE FILTER	IP	INTAKE PENTHOUSE	RAF-#	RETURN AIR FAN
AFC	ADJUSTABLE FREQUENCY CONTROLLER	ER	EXHAUST REGISTER	IV	INLET GUIDE VANES	RAT	RETURN AIR TEMPERATURE
AFF	ABOVE FINISHED FLOOR	ES	END SUCTION	KW	KILOWATT	REG	REGISTER
AFMS	AIR FLOW MEASURING STATION	ESP	EXTERNAL STATIC PRESSURE	KWH	KILOWATT HOUR	RH	RELATIVE HUMIDITY
AHU-#	AIR HANDLING UNIT	ET-#	EXPANSION TANK	IL	INLINE	RHC	REHEAT COIL
AL	ACOUSTIC LINING	ETR	EXISTING TO REMAIN	LAT	LEAVING AIR TEMPERATURE	RLA	RATED LOAD AMPERES
ALD	AUTOMATIC LOUVER DAMPER	EUH-#	ELECTRIC UNIT HEATER	LD	LINEAR DIFFUSER	RM	ROOM
ALP	ACOUSTICALLY LINED PLENUM	EWT	ENTERING WATER TEMPERATURE	LIN	LINEAR	RP	RELIEF PENTHOUSE
APD	AIR PRESSURE DROP	EXP-#	EXPANSION LOOP	LRA	LOCKED ROTOR AMPERES	RPM	REVOLUTIONS PER MINUTE
AUTO	AUTOMATIC	EX	EXISTING	LPR	LOW PRESSURE RETURN	RTU-#	ROOFTOP AIR CONDITIONING UNIT
B-#	BOILER	EXH	EXHAUST	LPS	LOW PRESSURE SUPPLY	RV	RADIATION VALVE
BC	BACKWARD CURVED	EXT	EXTERNAL	LVG	LEAVING	SA	SUPPLY AIR
BD	BYPASS DAMPER	*F	DEGREES FAHRENHEIT	LWT	LEAVING WATER TEMPERATURE	SAF-#	SUPPLY AIR FAN
BMCS	BUILDING MANAGEMENT & CONTROL SYSTEM	F&B	FACE & BYPASS DAMPER	MAN	MANUAL	SAT	SUPPLY AIR TEMPERATURE
BTU	BRITISH THERMAL UNIT	FA	FACE AREA	MAT	MIXED AIR TEMPERATURE	SB	SECURITY BARS
BV	BYPASS VALVE	FC	FORWARD CURVE	MAX	MAXIMUM	VSC	VERTICAL SPLIT CASE
CH-#	CHILLER	F.C.	FLEX CONNECTION	MBH	1000 BTUS	HSC	HORIZONTAL SPLIT CASE
CHR	CHILLED WATER RETURN	FC-#	FAN COIL	MCA	MINIMUM CIRCUIT AMPACITY	SD	SMOKE DAMPER
CHS	CHILLED WATER SUPPLY	FCU-#	FAN COIL UNIT	MD	MOTORIZED DAMPER	SG	SUPPLY GRILLE
CAP	CAPACITY	FD	FIRE DAMPER WITH ACCESS DOOR	MER	MECHANICAL EQUIPMENT ROOM	SP	STATIC PRESSURE
CB-#	CONTROL BOX	FF	FINAL FILTER	MEZZ	MEZZANINE	SQ FT	SQUARE FOOT (AREA)
CC-#	COOLING COIL	FIN FL	FINISH FLOOR	MFS	MAXIMUM FUSE SIZE	ST	SINGLE POLE SWITCH
CD	CEILING DIFFUSER	FL	FLOOR	MIN	MINIMUM	T'STAT	THERMOSTAT
CFM	CUBIC FEET PER MINUTE	FLX	FLEXIBLE	MTR	MOTOR	TB	TERMINAL BOX
CG	CEILING GRILLE	FO	FLAT OVAL	MUA	MAKE-UP AIR	TCP	TEMPERATURE CONTROL PANEL
CLG	CEILING	PFF	FINS PER FOOT	MV	MOTORIZED VALVE	TD	TEMPERATURE DIFFERENCE
C-#	CONVECTOR	FT	FEET	NC	NOISE CRITERIA	TEMP	TEMPERATURE
C.O.D.	CABLE OPERATED DAMPER	F.T.	FLOAT & THERMOSTATIC TRAP	NFA	NET FREE AREA	TG	AIR TRANSFER GRILLE
CP	CONDENSATE RECEIVER/PUMPING SYSTEM	F.T.	FLOAT & THERMOSTATIC TRAP	NIC	NOT IN THIS CONTRACT	TOT	TOTAL
CR	CEILING REGISTER	FT-#	FACE VELOCITY	NO	NORMALLY OPEN	TN-HR	TON HOUR REFRIGERATION
CT-#	COOLING TOWER	GC	GENERAL CONTRACTOR	NTS	NOT TO SCALE	TR	TOP REGISTER
CTD	CEILING TRANSFER DUCT	GIH	GRAVITY INTAKE HOOD	OA	OUTSIDE AIR	TRD	TRANSFER DUCT
CUH-#	CABINET UNIT HEATER	GPH	GALLONS PER HOUR	OAT	OUTDOOR AIR TEMPERATURE	TT	THERMOSTATIC TRAP
CY	CONTROL VALVE	GPM	GALLONS PER MINUTE	OAI	OUTDOOR AIR INTAKE	TYP	TYPICAL
D&T	DRIp AND TRAP	HIC	HEATING/COOLING	OB	OPPOSED BLADE DAMPER	UC	UNDERCUT DOOR
DB	DRY BULB	H-#	HUMIDIFIER	OD	OUTSIDE DIMENSION	UH-#	UNIT HEATER HOT WATER
DD	DIRECT DRIVE	H-O-A	HAND-OFF-AUTOMATIC	O.E. T.D.	OPEN END TRANSFER DUCT	UV-#	UNIT VENTILATOR
DDC	DIRECT DIGITAL CONTROL	H-#	HEATING COIL	OED	OPEN END DUCT	VD	VOLUME DAMPER
DIFF	DIFFUSER	HD	FEET OF HEAD	P-#	PUMP	VE	VOLUME EXTRACTOR
DL	DOOR LOUVER	HP	HORSEPOWER	PB	PUSH BUTTON	VFD	VARIABLE FREQUENCY DRIVE
DN	DOWNDRAFT	HTG	HEATING	PBD	PARALLEL BLADE DAMPER	VI	VIBRATION ISOLATOR
DP	DEWPOINT TEMPERATURE	HTER	HEATER	PD	PRESSURE DROP	VSF	VARIABLE SPEED FAN SWITCH
DR	DROP	HV-#	HEATING AND VENTILATING UNIT	PF	PREFILTER	W	WITH
DX	DIRECT EXPANSION			PH	PHASE	WB	WET BULB

* ALL ABBREVIATIONS MAY NOT BE USED IN THESE DOCUMENTS.

MECHANICAL SPECIFICATIONS

<p>EQUIPMENT & PIPING IDENTIFICATION</p> <p>1. CONSULT THE OWNER AS TO ANY LABELING STANDARDS INCLUDING NAMING CONVENTIONS, STANDARD LABELING MATERIALS AND LABELING COLOR CONVENTIONS. ALL NEW VALVE AND EQUIPMENT TAGS SHALL MATCH THE BUILDING STANDARD, WHERE NO STANDARD EXISTS, PROVIDE THE FOLLOWING:</p> <p>2. FURNISH AND ATTACH TO EACH VALVE A 2" DIAMETER TAG OF SOLID BRASS WITH NUMBER AND SERVICE ABBREVIATED AS NOTED ON CONTRACT DRAWINGS. NUMBERS TO CORRESPOND TO CONSECUTIVE NUMBERS ON VALVE CHART IDENTIFYING EACH INDIVIDUAL VALVE. ATTACH TAGS TO STEM OF VALVES WITH BRASS "S" HOOKS. PROVIDE ONE VALVE CHART MOUNTED IN EACH MECHANICAL ROOM & ONE COPY TO THE OWNER.</p> <p>3. IDENTIFY ALL EQUIPMENT BY A PERMANENTLY ATTACHED MINIMUM 1-1/2" X 3-1/2" NAMEPLATE OF WHITE CORE LAMINATED BAKE LITE WITH BLACK SURFACE AND INCISED LETTERS. INCLUDE THE EQUIPMENT IDENTIFICATION NUMBER, MANUFACTURERS NAME, SERIAL AND MODEL NUMBER, AND RATED CAPACITY.</p> <p>DUCTWORK</p> <p>1. REFER TO "HVAC DUCT MATERIAL" SCHEDULE. FOR DUCT MATERIALS PER APPLICATION. CONSTRUCT DUCTWORK OF SHEET STEEL OF LOCK-FORMING QUALITY</p> <p>2. DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESSES, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS, ELBOWS, TURNING VANES, AND HANGERS AND SUPPORTS, SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" LATEST EDITION, AND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA BASED ON PRESSURE & LEAKAGE CLASSES INDICATED BELOW.</p> <p>PRESSURE CLASS</p> <p>A. SUPPLY DUCTS (EXCEPT IN MECHANICAL ROOMS): 1-INCH WG.</p> <p>B. SUPPLY DUCTS (UPSTREAM FROM AIR TERMINAL UNITS): 4-INCH WG.</p> <p>C. SUPPLY DUCTS (DOWNSTREAM FROM AIR TERMINAL UNITS): 2-INCH WG.</p> <p>D. SUPPLY DUCTS (IN MECHANICAL EQUIPMENT ROOMS): 2-INCH WG.</p> <p>E. RETURN DUCTS (NEGATIVE PRESSURE): 1-INCH WG.</p> <p>F. EXHAUST DUCTS (NEGATIVE PRESSURE): 1-INCH WG.</p> <p>LEAKAGE CLASS:</p> <p>A. ROUND SUPPLY-AIR DUCT: 3 CFM/100 SQ. FT. AT 1-INCH WG.</p> <p>B. FLAT-OVAL SUPPLY-AIR DUCT: 3 CFM/100 SQ. FT. AT 1-INCH WG.</p> <p>C. RECTANGULAR SUPPLY-AIR DUCT: 6 CFM/100 SQ. FT. AT 1-INCH WG.</p> <p>D. FLEXIBLE SUPPLY-AIR DUCT: 6 CFM/100 SQ. FT. AT 1-INCH WG.</p> <p>3. DUCT ACCESS DOORS SHALL BE CONSTRUCTED OF DOUBLE WALL OF THE SAME OR GREATER GAUGE AS DUCTWORK. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. GASKET ALL EDGES AIRTIGHT, SIZE ACCESS DOORS TO PERMIT MAINTENANCE. MINIMUM SIZE 19" x 15" OR AS LARGE AS AVAILABLE DUCT SPACE WILL ALLOW. ACCESS DOORS LESS THAN 12 INCHES SQUARE: NO HINGES AND TWO SASH LOCKS. ACCESS DOORS UP TO 18 INCHES SQUARE: TWO HINGES AND TWO SASH LOCKS.</p> <p>4. SOLVENT-BASED JOINT AND SEAM SEALANT: PPLICATION BRUSH ON, SYNTHETIC RUBBER RESIN BASE, SOLVENT: TOLUENE AND HEPTANE, SOLIDS CONTENT: MINIMUM 60 PERCENT, SHORE A HARDNESS: MINIMUM 60, WATER RESISTANT, MOLD AND MILDEW RESISTANT, VOC: MAXIMUM 385 G/L, MAXIMUM STATIC-PRESSURE CLASS: 10-INCH WG. POSITIVE OR NEGATIVE SERVICE, INDOOR OR OUTDOOR, SUBSTRATE: COMPATIBLE WITH GALVANIZED SHEET STEEL (BOTH PVC COATED AND BARE), STAINLESS STEEL, OR ALUMINUM SHEETS.</p> <p>5. FLANGED JOINT SEALANT: COMPLY WITH ASTM C 820, GENERAL: SINGLE-COMPONENT, ACID-CURING, SILICONE, ELASTOMERIC, TYPE: S, GRADE: NS, CLASS: 25, USE: O.</p> <p>6. FLANGE GASKETS: BUTYL RUBBER, NEOPRENE, OR EPDM POLYMER WITH POLYISOBUTYLENE PLASTICIZER.</p> <p>7. MAKE CONNECTIONS TO EQUIPMENT WITH FLEXIBLE CONNECTORS OF FLAME-RETARDANT OR NONCOMBUSTIBLE FABRICS. MANUFACTURERS: DUCTMATE INDUSTRIES, INC., DURO DYNE INC., VENTFABRICS, INC., WARD INDUSTRIES, INC., A DIVISION OF HART & COOLEY, INC.</p> <p>8. VOLUME DAMPERS-GALVANIZED STEEL, PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION, PROVIDE AXLES FULL LENGTH OF DAMPER BLADES AND BEARINGS AT BOTH ENDS OF OPERATING SHAFT.</p> <p>9. SEAL OPENING AROUND DUCTS THROUGH WALLS WITH MINERAL WOOL OR OTHER NON-COMBUSTIBLE MATERIAL.</p>	<p>10. SEAL ALL PENETRATIONS THROUGH FIRE SEPARATION WITH AN APPROVED UL LISTED ASSEMBLY AND FIRE STOPPING MATERIALS.</p> <p>11. CONSTRUCT FLEXIBLE CONNECTIONS OF NEOPRENE-COATED FLAMEPROOF FABRIC CRIMPED INTO DUCT FLANGES FOR ATTACHMENT TO DUCT AND EQUIPMENT. FLEXIBLE DUCT SHALL BE CONSTRUCTED OF TWO-PLY LAMINATE MECHANICALLY CORRUGATED BONDED ALUMINUM INNER CORE COVERED BY ONE INCH THICK FIBERGLASS INSULATION OF ONE POUND DENSITY. FIBERGLASS SHALL BE COVERED WITH A 2.5 MIL POLYETHYLENE VAPOR BARRIER. FLEXIBLE DUCT SHALL MEET THE LATEST REQUIREMENTS OF UL STANDARD 181, CLASS 1, FLEXIBLE AIR DUCT. DUCT TO BE RATED FOR 10 INCHES POSITIVE OR NEGATIVE PRESSURE.. MANUFACTURERS: FLEXMASTER U.S.A. INC., MCGILL AIRFLOW LLC., WARD INDUSTRIES, INC., A DIVISION OF HART & COOLEY, INC.</p> <p>DUCT LINING</p> <p>1. REFER TO "HVAC DUCT INSULATION" SCHEDULE FOR APPLICATIONS & VALUES.</p> <p>2. FIBROUS-GLASS DUCT LINER: COMPLY WITH ASTM C 1071, NFPA 90A, OR NFPA 90B, AND WITH NAIMA AH124, "FIBROUS GLASS DUCT LINER STANDARD."</p> <p>3. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: CERTAINTED CORPORATION INSULATION GROUP, JOHNS MANVILLE, OWENS CORNING.</p> <p>4. MAXIMUM THERMAL CONDUCTIVITY: TYPE II, RIGID: 0.23 BTU x IN./H X SQ. FT. x DEG F AT 75 DEG F MEAN TEMPERATURE.</p> <p>5. ANTIMICROBIAL EROSION-RESISTANT COATING: APPLY TO THE SURFACE OF THE LINER THAT WILL FORM THE INTERIOR SURFACE OF THE DUCT TO ACT AS A MOISTURE REPELLENT AND EROSION-RESISTANT COATING. ANTIMICROBIAL COMPOUND SHALL BE TESTED FOR EFFICACY BY AN NRTL AND REGISTERED BY THE EPA FOR USE IN HVAC SYSTEMS.</p> <p>6. SOLVENTWATER-BASED LINER ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH ASTM C 916.</p> <p>7. INSULATION PINS AND WASHERS:</p> <p>A. CUPPED-HEAD, CAPACITOR-DISCHARGE-WELD PINS: COPPER, OR ZINC-COATED STEEL PIN, FULLY ANNEALED FOR CAPACITOR-DISCHARGE WELDING, Ø 1/16-INCH DIAMETER SHANK, LENGTH TO SUIT DEPTH OF INSULATION INDICATED WITH INTEGRAL 1-1/2-INCH GALVANIZED CARBON-STEEL WASHER.</p> <p>B. INSULATION-RETAINING WASHERS: SELF-LOCKING WASHERS FORMED FROM 0.016-INCH- THICK OF MATERIAL TO MATCH DUCTWORK, WITH BEVELED EDGE SIZED AS REQUIRED TO HOLD INSULATION SECURELY IN PLACE BUT NOT LESS THAN 1-1/2 INCHES IN DIAMETER.</p> <p>DUCT INSULATION</p> <p>1. REFER TO "HVAC DUCT INSULATION" SCHEDULE FOR APPLICATIONS & VALUES.</p> <p>2. COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION CODE 2006.</p> <p>3. PRODUCTS SHALL NOT CONTAIN ASBESTOS, LEAD, MERCURY, OR MERCURY COMPOUNDS.</p> <p>4. ACCEPTABLE MANUFACTURERS INCLUDE: CERTAINTED CORP.; COMMERCIAL BOARD, FIBREX INSULATIONS INC., FBX., JOHNS MANVILLE, 800 SERIES SPIN-GLAS, KNAUF INSULATION; INSULATION BOARD., MANSON INSULATION INC.; AK BOARD., OWENS CORNING, FIBERGLAS 700 SERIES.</p> <p>CUTTING, ALTERING AND PATCHING</p> <p>1. PROVIDE ALL CUTTING, CHASING, DRILLING, ALTERING AND ROUGH PATCHING REQUIRED FOR THE WORK OF THIS DIVISION.</p> <p>2. INCLUDING THE RESTORING OF EXISTING WORK CUT FOR OR DAMAGED BY INSTALLATION OF NEW WORK, AND WHERE PRESENT WORK IS REMOVED.</p> <p>3. ALL MATERIALS AND WORKMANSHIP REQUIRED IN CONNECTION WITH CUTTING, ALTERING AND ROUGH PATCHING SHALL MATCH THE EXISTING WORK IN EVERY RESPECT.</p> <p>4. DO ALL SHORING, BRACING, CUTTING, PATCHING, PIECING OUT, FILLING IN, REPAIRING AND REFINISHING OF ALL PRESENT WORK AS MADE NECESSARY BY THE ALTERATION AND THE INSTALLATION OF NEW WORK.</p> <p>5. ALL HOLES AND OPENINGS OCCURRING IN THE EXISTING FLOORS AFTER EQUIPMENT, PARTITIONS, FLOORS, STEEL WORK, CONDUITS AND PIPES ARE REMOVED OR INSTALLED SHALL BE CLOSED UP WITH MATERIALS SIMILAR TO THE ADJACENT WORK.</p> <p>6. THE SIZE AND LOCATION OF ITEMS REQUIRING AN OPENING, CHASE OR OTHER PROVISIONS TO RECEIVE IT SHALL BE GIVEN BY THE TRADE REQUIRING SAME IN AMPLE TIME TO AVOID UNDE CUTTING OF ANY NEW WORK TO BE INSTALLED. THESE PROVISIONS SHALL NOT RELIEVE THE CONTRACTOR FROM KEEPING INFORMED AS TO</p>	<p>THE REQUIRED OPENING, CHASES, ETC., NOR FROM RESPONSIBILITY FOR THE CORRECTNESS THEREOF, NOR FOR CUTTING AND REPAIRING AFTER THE NEW WORK IS IN PLACE.</p> <p>7. INCLUDE ALL CUTTING, REPAIRING AND PATCHING IN CONNECTION WITH THE WORK THAT MAY BE REQUIRED TO MAKE THE SEVERAL PARTS COME TOGETHER PROPERLY AND FIT IT TO RECEIVE OR BE RECEIVED BY THE WORK OF OTHER TRADES, AS SHOWN ON THE DRAWINGS AND/OR SPECIFIED, OR REASONABLY IMPLIED BY THE DRAWINGS AND SPECIFICATIONS.</p> <p>8. ALL REPAIRING, PATCHING, PIECING-OUT, FILLING-IN, RESTORING AND REFINISHING SHALL BE NEATLY DONE BY MECHANICS SKILLED IN THEIR TRADE TO LEAVE SAME IN CONDITION SATISFACTORY TO THE OWNER.</p> <p>9. MATERIALS AND THEIR METHODS OF APPLICATION FOR PATCHING SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF THE SPECIFICATIONS.</p> <p>10. MATERIALS AND WORKMANSHIP NOT COVERED BY THE SPECIFICATIONS AND ITEMS OF WORK EXPOSED TO VIEW ADJOINING EXISTING WORK TO REMAIN SHALL CONFORM TO SIMILAR</p> <p>11. MATERIALS AND WORKMANSHIP EXISTING IN OR ADJACENT TO THE SPACES TO BE ALTERED.</p> <p>12. CUTTING, REPAIRING AND PATCHING SHALL INCLUDE ALL ITEMS SHOWN ON THE DRAWINGS, SPECIFIED IN THE SPECIFICATIONS OR REQUIRED BY THE INSTALLATION OF NEW WORK OR THE REMOVAL OF EXISTING WORK.</p> <p>13. REMOVE PARTITIONS, WALLS, SUSPENDED CEILINGS, ETC., AS NECESSARY TO PERFORM THE REQUIRED ALTERATIONS OR NEW CONSTRUCTION WORK.</p> <p>14. AVOID DAMAGE TO CONSTRUCTION AND FINISHES THAT ARE TO REMAIN.</p> <p>15. PROTECT AND BE RESPONSIBLE FOR THE EXISTING BUILDING, FACILITIES AND IMPROVEMENTS.</p> <p>16. ANY DISTURBANCE OR DAMAGE TO THE WORK, THE EXISTING BUILDING, AND IMPROVEMENTS, OR ANY IMPAIRMENTS OF FACILITIES RESULTING FROM THE CONSTRUCTION OPERATIONS, SHALL BE PROMPTLY RECTIFIED, WITH THE DISTURBED, DAMAGED, OR IMPAIRED WORK, RESTORED, REPAIRED OR REPLACED AT NO EXTRA COST.</p> <p>17. ALL ALTERATIONS WHICH ARE NOT INDICATED ON THE DRAWINGS NOR SPECIFIED HEREIN BUT NECESSARY TO MAKE GOOD EXISTING WORK DISTURBED BY REASON OF THE WORK SHALL BE RESTORED TO A CONDITION SATISFACTORY TO THE OWNER.</p> <p>18. ALL HOLES IN MASONRY FLOORS AND WALLS ARE TO BE CORE DRILLED.</p> <p>19. DISTURBED CONCRETE AND /OR CEMENT FLOOR AREAS SHALL BE PATCHED WITH APPROVED TYPE LATEX MORTAR.</p> <p>20. WHEN CEMENT MORTAR IS USED FOR PATCHING, THE SURFACES SHALL BE DEPRESSED A MINIMUM DEPTH OF 1".</p> <p>TEMPORARY OPENINGS</p> <p>1. ALL TEMPORARY OPENINGS CUT IN WALLS, FLOORS OR CEILINGS FOR PIPE OR DUCTWORK SHALL BE CLOSED OFF WITH TRANSITE OR AN EQUALLY NON-COMBUSTIBLE MATERIAL EXCEPT WHEN MECHANICS ARE ACTUALLY WORKING AT THE PARTICULAR OPENING.</p> <p>SHUTDOWN OF EXISTING BUILDING SYSTEMS</p> <p>1. DO NOT INTERRUPT EXISTING SERVICES OR SYSTEMS IN THE BUILDING UNLESS ABSOLUTELY NECESSARY. SUCH INTERRUPTIONS AND INTERFERENCES MUST BE MADE AS BRIEF AS POSSIBLE AND ONLY AFTER COORDINATION WITH THE OWNER. THE OWNER REQUIRES A MINIMUM OF SEVEN (7) DAYS NOTICE. OBTAIN PRIOR PERMISSION, IN WRITING.</p> <p>2. WHERE THE WORK MAKES TEMPORARY INTERRUPTIONS UNAVOIDABLE, THEY SHALL BE MADE DURING OFF HOURS OR AS OTHERWISE DIRECTED BY THE OWNER.</p> <p>3. ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVERTIME, IF REQUIRED, TO ASSURE THAT SYSTEMS WILL SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO EXISTING WORK.</p> <p>WARRANTY</p> <p>1. THE CONTRACTOR SHALL WARRANTY ALL WORK FOR A PERIOD OF 12 MONTHS FROM ACCEPTANCE BY OWNER. DURING THIS WARRANTY PERIOD, CONTRACTOR SHALL RESPOND TO ALL CALLS FOR SERVICE, REPAIRS AND ADJUSTMENTS REQUIRED BY OWNER. CONTRACTOR SHALL INSTALL REPLACEMENT PARTS AND MATERIAL REQUIRED AT NO COST TO THE OWNER. ALL EQUIPMENT WARRANTIES SHALL BE TRANSFERRED TO OWNER AND SERVICED BY CONTRACTOR AS PART OF THIS CONTRACT.</p>
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* ALL SYMBOLS MAY NOT BE USED IN THESE DOCUMENTS.



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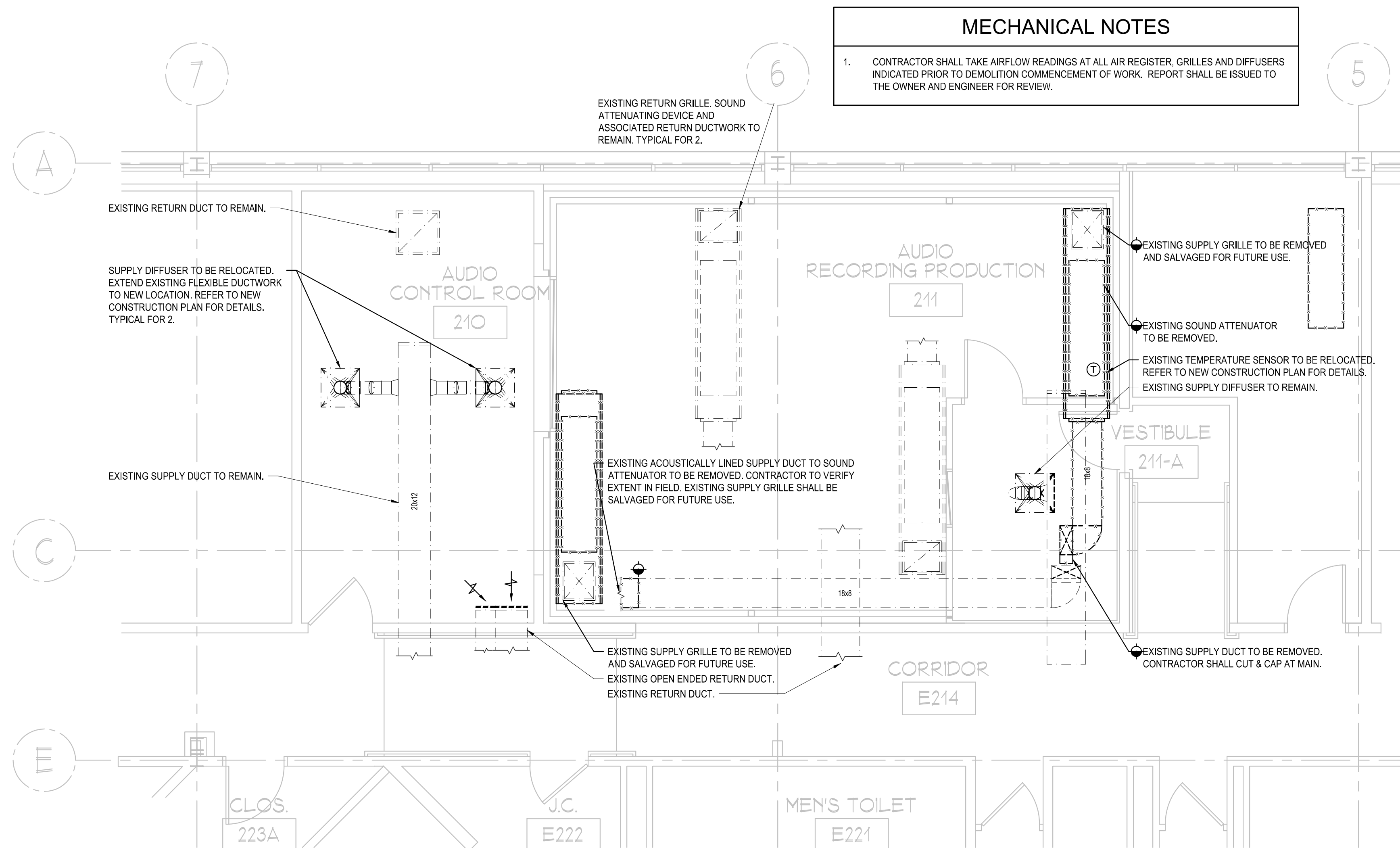


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COVER SHEET -
MECHANICAL
SCALE: NONE

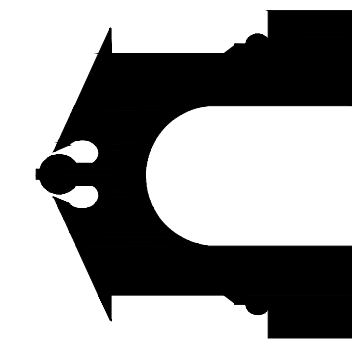
M-02



MECHANICAL NOTES

1. CONTRACTOR SHALL TAKE AIRFLOW READINGS AT ALL AIR REGISTER, GRILLES AND DIFFUSERS INDICATED PRIOR TO DEMOLITION COMMENCEMENT OF WORK. REPORT SHALL BE ISSUED TO THE OWNER AND ENGINEER FOR REVIEW.

1 DEMOLITION FLOOR PLAN
MD-1 SCALE: 1/4" = 1'-0"



H-WING 2nd FLOOR
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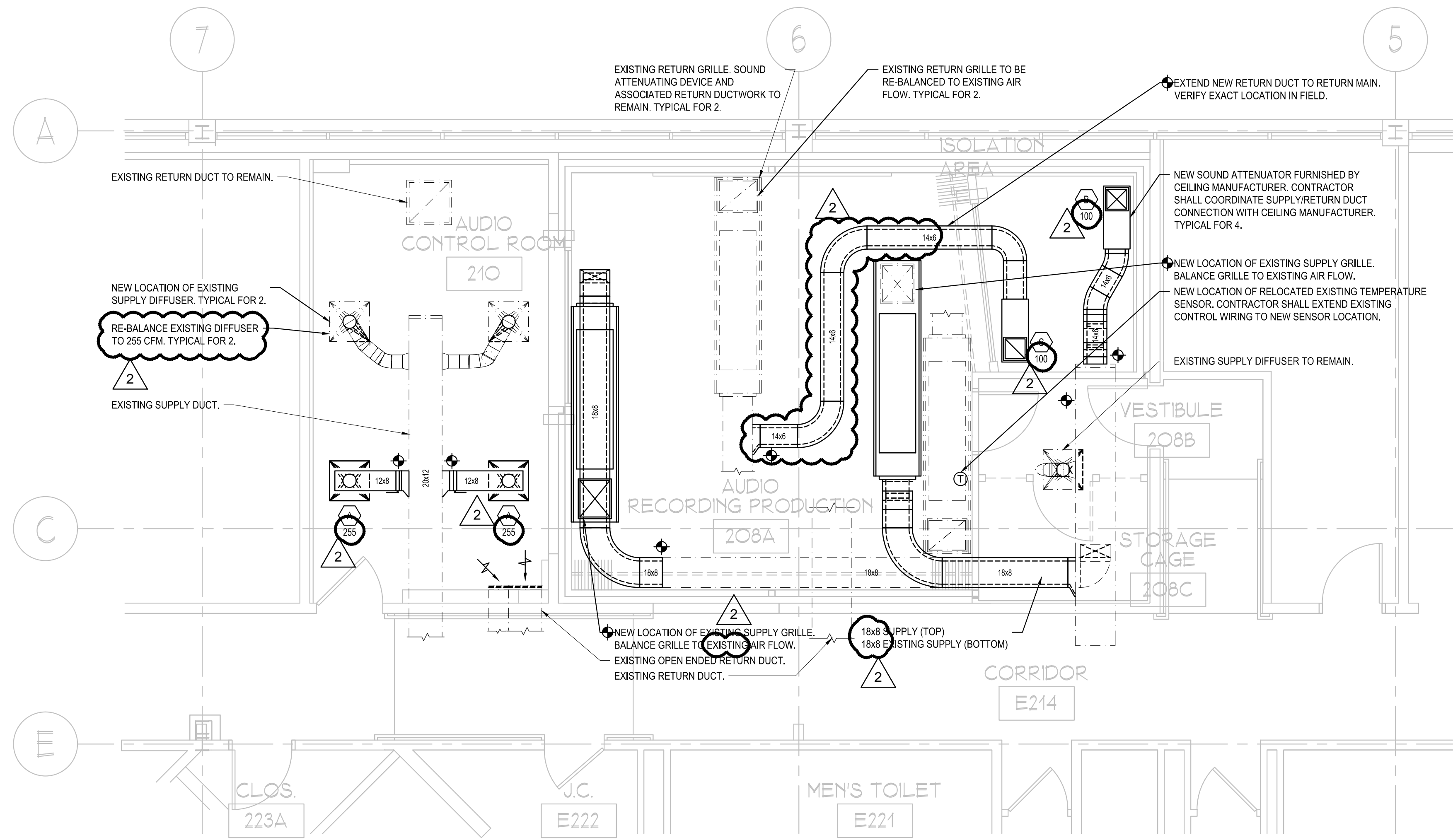


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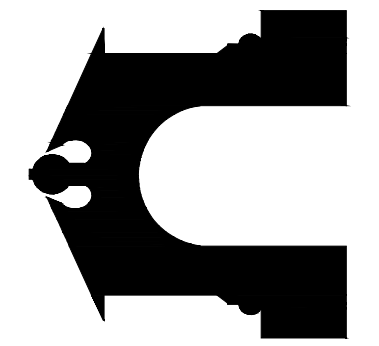
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DEMO FLOOR PLAN
- MECHANICAL
SCALE: 1/4" = 1'-0"

MD-1



1 FLOOR PLAN
M-1 SCALE: 1/4" = 1'-0"



H-WING 2nd FLOOR LES PAUL STUDIO RAMAPO COLLEGE OF NEW JERSEY

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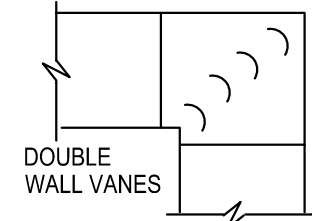


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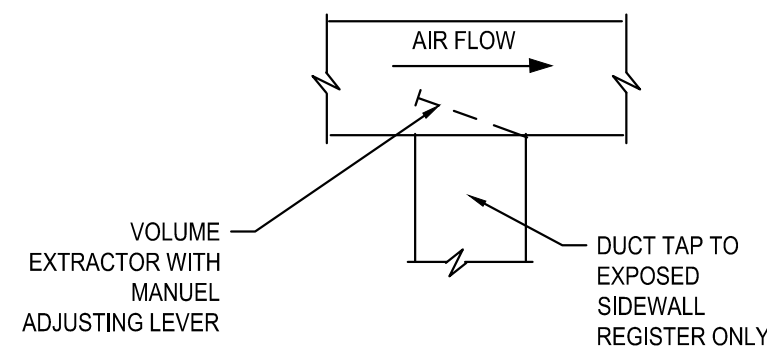
FLOOR PLAN -
MECHANICAL
SCALE: 1/4" = 1'-0"

M-1



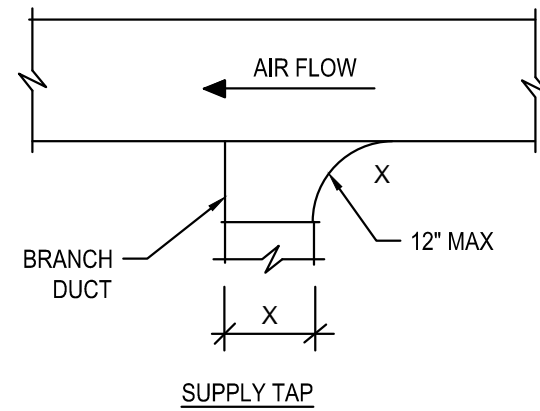
ONLY ACCEPTABLE WHERE SPACE DOES NOT PERMIT THE USE OF RADIUS ELBOWS

SQUARE ELBOW

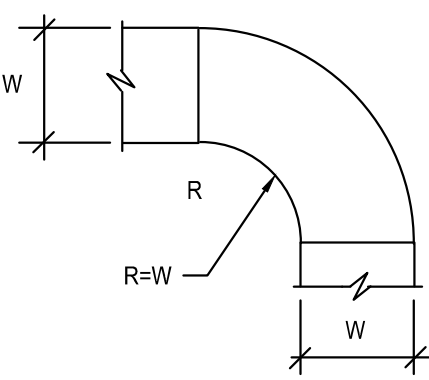


TAKE-OFF TO EXPOSED SIDEWALL REGISTER

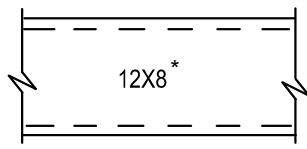
NOTE:
SPECIFICATIONS EXCEED SMACNA STANDARDS IN SOME INSTANCES. SMACNA SHALL BE CONSIDERED THE MINIMUM STANDARD UNLESS OTHERWISE NOTED ON THE DRAWINGS, DETAILS OR IN THE SPECIFICATIONS.



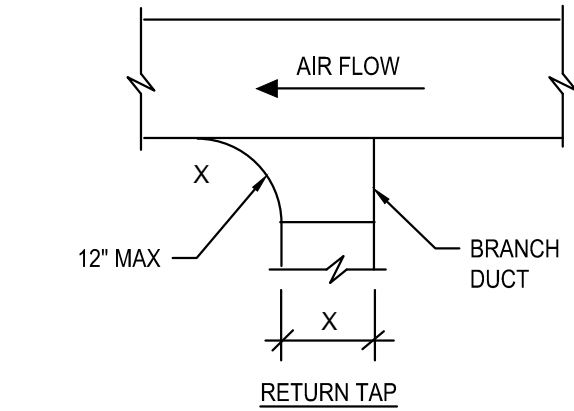
SUPPLY TAP



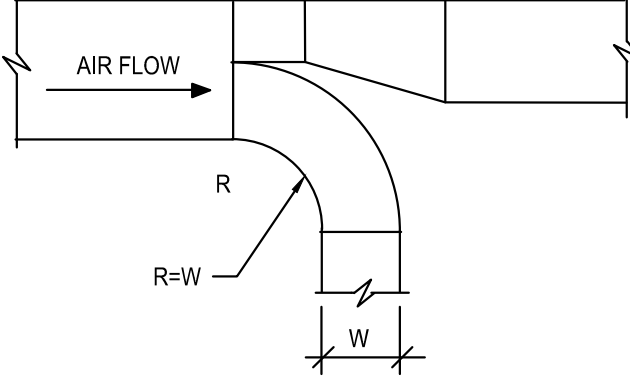
RADIUS ELBOW



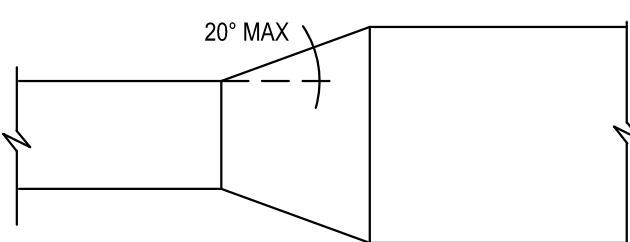
ACOUSTICALLY LINED DUCT



RETURN TAP



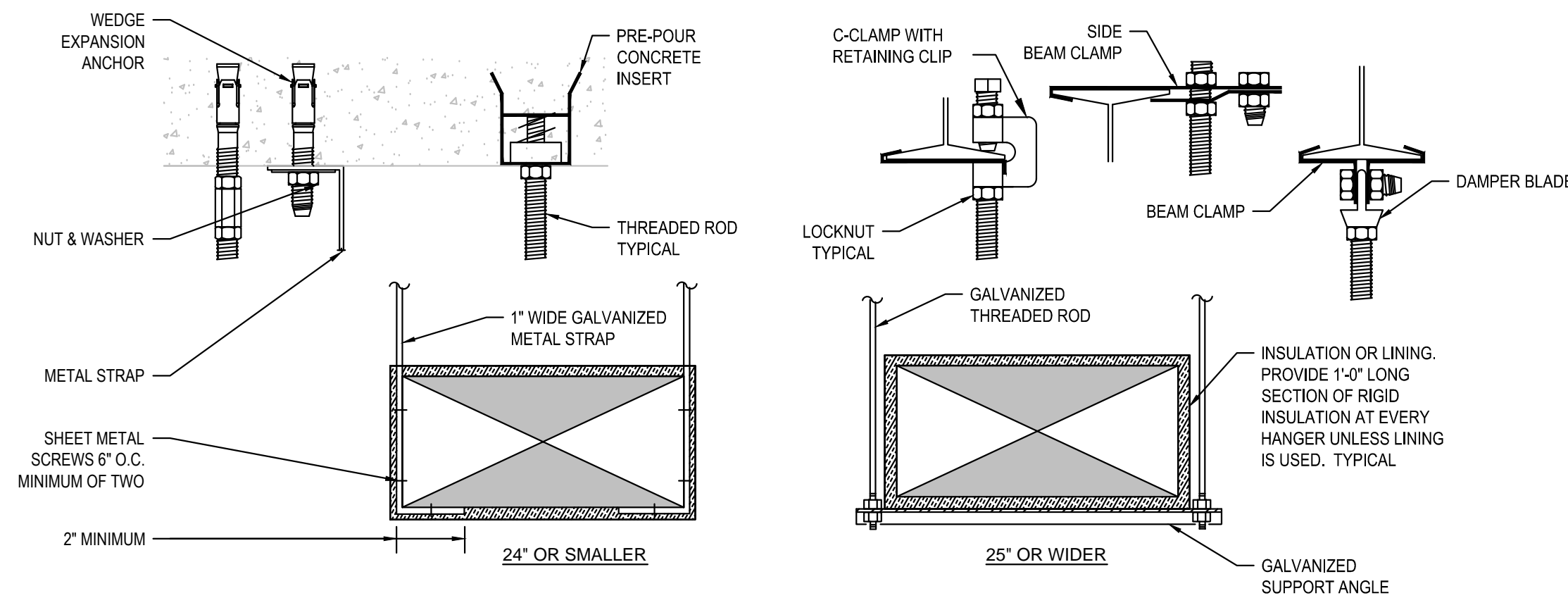
SUPPLY SPLIT



TRANSITION

1 DUCT CONSTRUCTION DETAIL

M-2 NOT TO SCALE

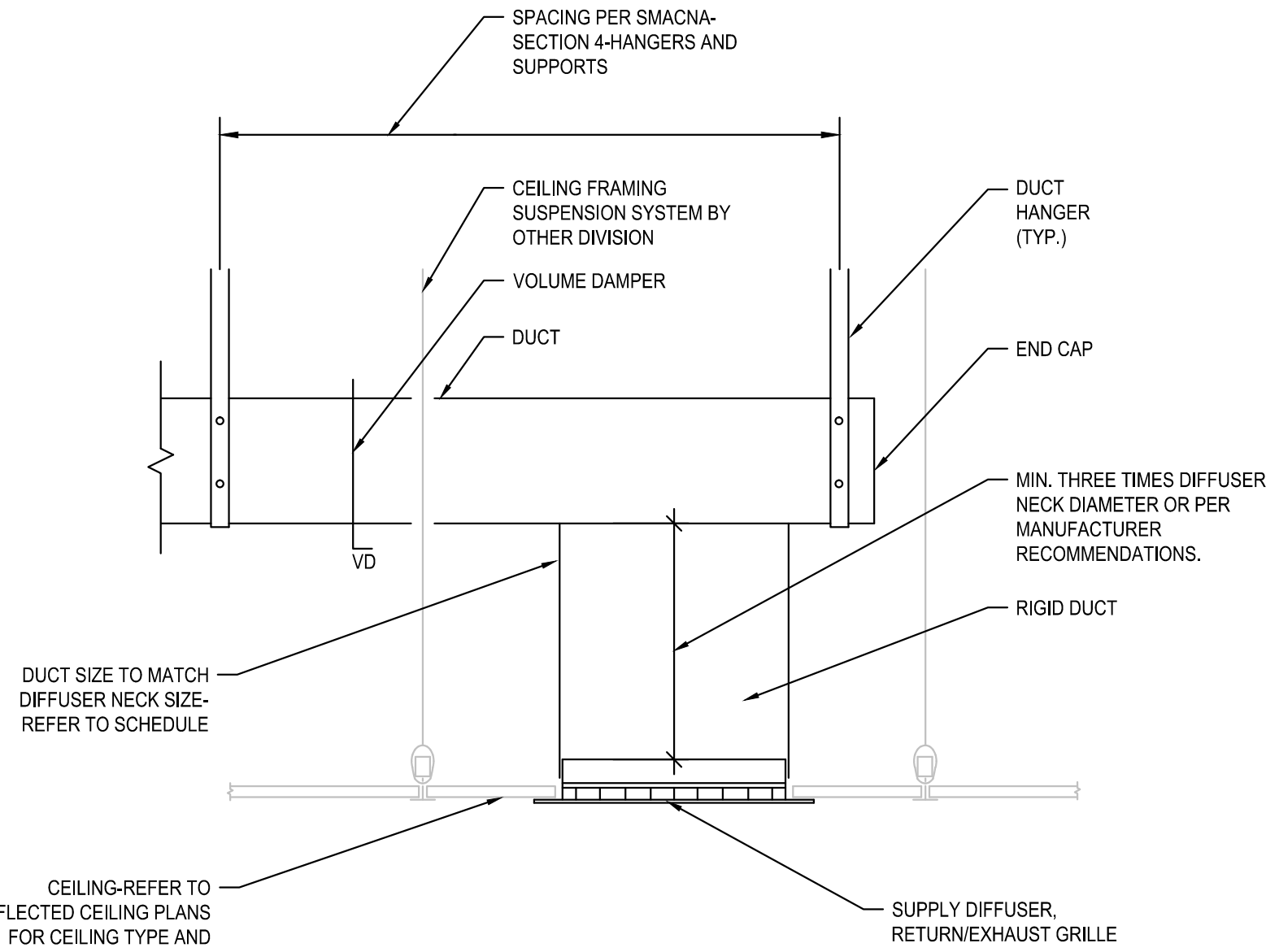


DUCT WIDTH	SUPPORT ANGLE OR EQUIV. CHANNEL	ROD DIA.	MAXIMUM SPACING	MAXIMUM AREA *
25" TO 30"	1 1/2" X 1 1/2" X 1/8"	3/8"	8'-0" O.C.	4 SQ. FT.
31" TO 42"	1 1/2" X 1 1/2" X 1/8"	3/8"	6'-0" O.C.	10 SQ. FT.
43" TO 60"	1 1/2" X 1 1/2" X 1/8"	1/2"	6'-0" O.C.	10 SQ. FT.
61" TO 84"	2" X 2" X 1/4"	1/2"	4'-0" O.C.	-
85" AND UP	2" X 2" X 1/4"	1/2"	4'-0" O.C.	-

* REDUCE SPACING TO NEXT SMALLER INTERVAL IF DUCT AREA EXCEEDS MAXIMUM

3 DUCT SUPPORT DETAIL

M-2 NOT TO SCALE



- NOTES:
1. PROVIDE DIFFUSER W/OPOSED BLADE CABLE OPERATED DAMPERS W/ IN-AIRSTREAM OPERATORS WHERE INSTALLED IN HARD INACCESSIBLE CEILING.

2 TYPICAL GRILLE/DIFFUSER DETAIL WITH RIGID DUCTWORK CONNECTION

M-2 NOT TO SCALE

HVAC DUCT/PLENUM MATERIAL

APPLICATION	SUPPLY	RETURN	EXHAUST
TYPICAL (UNLESS OTHERWISE SPECIFIED)	G90 GALVANIZED STEEL	G90 GALVANIZED STEEL	G90 GALVANIZED STEEL

1. DUCT CONSTRUCTION SHALL MEET SMACNA METAL & FLEXIBLE 2005 3RD EDITION STANDARDS.

HVAC DUCT/PLENUM INSULATION

SYSTEM	INSULATION TYPE	MINIMUM INSTALLED INSULATION VALUES	NOMINAL DENSITY
INDOOR DUCT/PLENUM CONCEALED SA, RA, OA; OTHER THAN PRE-MANUFACTURED LINEAR SUPPLY AND RETURN GRILLE PLENUMS.	MINERAL FIBER BLANKET	1-1/2" R-3.5	3/4 LB/FT ³
	MINERAL FIBER BOARD WITH REFLECTIVE VAPOR BARRIER.	1-1/2" R-3.5	3 LB/FT ³
DUCT LINING DUCTS/PLENUMS INSTALLED IN INDOOR SPACES AND CRAWL SPACES; EXPOSED AND CONCEALED SA OR RA DUCTWORK WHERE INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION, 15 FT DOWNSTREAM OF SUPPLY FANS, RETURN FANS AND 10 FT DOWNSTREAM OF TERMINAL BOXES WHETHER INDICATED OR NOT.	FIBROUS-GLASS DUCT LINER WITH CLEANABLE COMPOSITE COATING ON AIRSTREAM SIDE. METAL NOSING SHALL BE FURNISHED ON ALL LEADING EDGES. (REFER TO NOTES #2, #4)	1" R-3.5	3 LB/FT ³

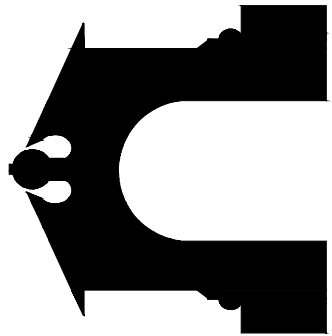
1. ALL DUCTWORK INSTALLED OUTDOOR. PROVIDE A PRE-MANUFACTURED SELF-ADHERING PRODUCT WITH AN UV RESISTANT, STUCCO EMBOSSED FACING, WATER VAPOR TRANSMISSION OF THE INSTALLED PRODUCT SHALL BE .020 PERMS OR LESS. PRODUCT SHALL BE SUITABLE FOR CONTINUOUS USE IN LOW TEMPERATURES OF -10°F. MANUFACTURERS SHALL BE SIMILAR TO FLEX-CLAD 400, MFM BUILDING PRODUCTS CORP. OR ALUMAGUARD 60, POLYGUARD PRODUCTS, INC.
2. DUCT LINING SHALL NOT BE INSTALLED WITHIN 10 FT UPSTREAM OR DOWNSTREAM OF A DUCT MOUNTED HUMIDIFIER DISPERSION TUBE OR DISPERSION GRID.
3. INSULATION TYPES INDICATED IN THE SCHEDULE SHALL USED UNLESS OTHERWISE INDICATED ON THE PLANS OR SPECIFICATIONS.
4. CLOSED CELL, FIBER FREE, ANTI-MICROBIAL COATED, LOW VOC CERTIFIED, MOISTURE AND MOLD RESISTANT DUCT LINING SHALL BE PROVIDED IN DUCTWORK AND EQUIPMENT WITHIN HOSPITAL AND HEALTHCARE FACILITIES AND ROOMS CLASSIFIED AS MOIST OR WET ENVIRONMENTS WHERE THIS SCHEDULE, DRAWINGS AND SPECIFICATION INDICATE DUCT LINING.
5. DUCTWORK SHALL BE FIRE WRAPPED FROM THE APPLIANCE CONNECTION TO THE TERMINATION POINT.

OA = OUTDOOR AIR DUCTWORK
SA = SUPPLY AIR DUCTWORK
RA = RETURN AIR DUCTWORK
EA = EXHAUST AIR DUCTWORK

REGISTERS, GRILLES & DIFFUSERS

SYM	SERVICE	TYPE	MAKE	MODEL	MATERIAL FINISH	CFM	NECK SIZE	FACE SIZE	NC LEVEL	REMARKS
A	SUPPLY	CD	PRICE	ASCD	ALUMINUM PER ARCHITECT	0 - 115 116 - 215	6" 8"	24" x 24"	SELECTION SHALL BE ≤ NC-25	
B	SUPPLY	CD	PRICE	ASCD	ALUMINUM PER ARCHITECT	0 - 100 101 - 150	6" 8"	12" x 12"	SELECTION SHALL BE ≤ NC-20	
C	RETURN	CD	PRICE	60L	ALUMINUM PER ARCHITECT	0 - 180	-	12" x 12"	SELECTION SHALL BE ≤ NC-20	

- NOTES:
1. PROVIDE 3 WAY DIFFUSER AT ALL LOCATIONS WHERE DIFFUSER IS LOCATED WITHIN 2' OF ANY WALL. ALL OTHER DIFFUSERS ARE TO BE 4 WAY.
 2. COORDINATE AIR TERMINAL LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS, AND SECTIONS.
 3. PROVIDE STANDARD COLOR CHART FOR COLOR SELECTION BY ARCHITECT.
 4. BORDER, FRAME, & MOUNTING STYLE SHALL BE COORDINATED WITH ARCHITECT. REFER TO PLANS FOR ADDITIONAL BORDER, FRAME & MOUNTING REQUIREMENTS.
 5. PROVIDE CONCEALED MOUNTING FOR ALL REGISTERS, GRILLES AND DIFFUSERS.



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REVISION 2 - ISSUED FOR CONSTRUCTION	10/03/2014

SCHEDULES & DETAILS
- MECHANICAL
SCALE: AS NOTED

M-2