

MECHANICAL PROJECT NOTES

1. REFER TO FLOOR PLANS AND AIR SYSTEM RISER DIAGRAMS FOR DUCTWORK SIZES. PROVIDE DUCTWORK WITH EQUIVALENT FRICTION FACTOR AND VELOCITY WHERE CHANGES ARE REQUIRED TO ACCOMMODATE FIELD CONDITIONS. ALL DUCTWORK TO HAVE A MAXIMUM FRICTION FACTOR OF 0.1" PER 100 FT AND A MAXIMUM VELOCITY OF 2000 FEET PER MINUTE AT DESIGN AIRFLOW RATE.
2. INSULATION AND ADHESIVE USED ON THIS PROJECT SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NO MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NOT MORE THAN 50.
3. ALL MECHANICAL EQUIPMENT AND DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE "SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION" (SMACNA) MANUALS
4. ALL DUCTWORK SHALL BE GALVANIZED STEEL SHEET FOR 2" CLASS DUCTWORK SYSTEM UNLESS NOTED OTHERWISE IN ACCORDANCE WITH THE LATEST ISSUE OF THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) AND THE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE).
5. ALL FLEXIBLE DUCTWORK SHALL BE FLEX MASTER TYPE 4 WITH FACTORY APPLIED UL LISTED MINERAL WOOL INSULATION BLANKET OR APPROVED EQUAL. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH.
6. ALL CONCEALED DUCTWORK SHALL BE INSULATED WITH 2" EXTERNAL FIBERGLASS INSULATION WITH VAPOR BARRIER, MANVILLE CORPORATION "MICRO-AIRE" OR APPROVED EQUAL.
7. PIPING SHALL BE INSTALLED IN ACCESSIBLE AREAS, IN CASES WHERE THE PIPING WILL EXTEND THROUGH A SUPPORTING WALL, PERMANENT CEILING OR FLOOR, SLEEVES MUST BE INSTALLED WITH A UL RATING TO MATCH WALL RATING.
8. ALL DUCTWORK JOINTS SHALL BE SEALED AND CAULKED. DUCTWORK SYSTEM SHALL HAVE A MAXIMUM OF 2% LEAKAGE.
9. ALL DUCTWORK SIZES ARE INTERNAL FREE AREA.
10. ALL SUPPLY, RETURN, & EXHAUST ELBOWS TO HAVE DOUBLE WIDTH TURNING VANES.
11. PROVIDE ALL DUCTWORK OFFSETS AS REQUIRED TO ACCOMMODATE NEW LAYOUT FOR A FULLY FUNCTIONAL SYSTEM, COORDINATE WITH EXISTING CONDITIONS.
12. PROVIDE INCREASERS/REDUCERS AND ACCESS DOORS ON BOTH SIDES OF ALL REHEAT COILS/VAV BOXES.
13. BALANCE ALL MECHANICAL SYSTEMS USING A CERTIFIED NEBB BALANCER.
14. PENETRATIONS TO FIRE RATED WALLS, FLOORS, PARTITIONS OR SLABS SHALL BE FILLED & SEALED W/FIRE SEALANT CREATING A FIRE STOP EQUAL TO OR EXCEEDING FIRE RATING OF CONSTRUCTION MATERIAL BEING PENETRATED. FIRE SEALANT SHALL PREVENT SPREAD OF FLAME, SMOKE, AIR, & WATER, & SHALL PASS A 3 HOUR TEST PER ASTM E814 & U.L. 1479. FIRE SEALANT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
15. ALL FIRE DAMPERS SHALL BE OF THE LOW LOSS W/DAMPERS OUT OF AIR STREAM (SMACNA TYPE B).
16. PROVIDE 1/4" SCALE DUCTWORK & EQUIPMENT SHOP DRAWINGS PRIOR TO START OF WORK. ALL AIR DEVICES TO COORDINATE WITH LIGHTING LAYOUT.
17. ALL WORK SHALL BE IN ACCORDANCE WITH LATEST CODES AS ADOPTED BY LOCAL CODE OFFICIAL.
18. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATION/COORDINATION OF ALL FIXTURES, LIGHTS, SPRINKLER HEADS, AIR DEVICES, & ALL MPE & FP ITEMS.
19. ALL ABBREVIATIONS AND SYMBOLS MAY NOT APPEAR ON THE DRAWINGS.
20. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING TYPES, PROVIDE APPROPRIATE FRAMES AND MOUNTING HARDWARE FOR ALL AIR DEVICES, MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL MOUNTING DETAILS AND REQUIREMENTS WITH CEILING CONTRACTOR.
21. LOCATE ALL PIPING AND DUCTWORK AS HIGH AS POSSIBLE. COORDINATE EXACT LOCATION AND ROUTING WITH ALL OTHER TRADES.
22. ROUTE EQUIPMENT DRAIN PIPING TO FLOOR DRAINS TO PREVENT TRIPPING HAZARDS. DO NOT INSTALL PIPING ON FLOOR IN ANY EQUIPMENT ACCESS AISLES.
23. PIPING AND DUCTWORK DRAWINGS ARE DIAGRAMMATIC. PROVIDE ADDITIONAL OFFSETS AS REQUIRED TO COORDINATE WITH OTHER TRADES.
24. NO PIPING OR DUCTWORK FOREIGN TO ELECTRICAL, TELEPHONE, DATA, OR ELEVATOR MACHINE ROOMS IS PERMITTED TO BE INSTALLED IN THESE SPACES.
25. MOUNT MOTOR FOR IN-LINE CENTRIFUGAL FANS IN MOST ACCESSIBLE POSITION.
26. PROVIDE ALL PIPING, VALVING & EQUIPMENT SHOWN ON FLOW DIAGRAMS AND DETAILS EVEN IF NOT SHOWN ON FLOOR PLANS.
27. ACCESS DOORS FOR FIRE DAMPERS INSTALLED IN FLOOR SLABS SHOULD BE LOCATED ON FLOOR ABOVE, UNLESS INDICATED OTHERWISE.
28. PROVIDE A VOLUME DAMPER IN BRANCH RUN OUTS (AS CLOSE TO MAIN AS POSSIBLE) TO EVERY AIR DEVICE. PROVIDE CONCEALED DAMPER REGULATORS WHEN INSTALLED ABOVE INACCESSIBLE CEILINGS.
29. PROVIDE SHUT-OFF VALVES IN ACCESSIBLE LOCATIONS (AS CLOSE AS POSSIBLE TO TAKE-OFF) FOR ALL BRANCH PIPING SERVING MORE THAN FIVE COILS. IN ALL BRANCH PIPING CONNECTING DIRECTLY TO MAIN SERVICE, IN ALL RISERS, AT CONNECTIONS TO ALL MECHANICAL EQUIPMENT, AND IN ALL BRANCHES LONGER THAN 100 FEET.
30. BEFORE ANY EQUIPMENT OR MATERIALS ARE ORDERS. THE CONTRACTORS SHALL PRODUCE CEILING COORDINATION DRAWINGS IN WHICH THE CONTRACTORS FOR ALL TRADES SHALL SHOW PIPING, DUCTWORK, EQUIPMENT, CONDUIT, AND LIGHTING FIXTURE LOCATION, ROUTING, SIZE AND INSTALLATION HEIGHT. ALL CONFLICTS SHALL BE COORDINATED ON THESE PLANS PRIOR TO THE INSTALLATION OF ANY IN OR ABOVE CEILING EQUIPMENT OR UTILITIES.
31. COORDINATE WITH ALL TRADES TO MAINTAIN THE MANUFACTURERS' RECOMMENDED ACCESS TO ALL EQUIPMENT AND TO MAINTAIN ACCESS TO ALL VALVES, VOLUME DAMPERS, GAGES AND CONTROL/ELECTRICAL DEVICES. CEILING TILES WHICH CANNOT BE READILY REMOVED WITHOUT DAMAGE (IF DUE TO IN CEILING DEVICES OR ABOVE CEILING OBSTRUCTIONS) SHALL NOT BE CONSIDERED AS A MEANS OF ACCESS.

AIR DEVICE SCHEDULE					
TAG	DESCRIPTION	MANUFACTURER/MODEL	MAX. NC	NOM. FACE SIZE	REMARKS
CD-1	CEILING DIFFUSER	TITUS/TDCA-AA	22	12x12	4-WAY BLOW U.N.O W/OBD
CD-2	CEILING DIFFUSER	TITUS/TDCA-AA	22	24x24	4-WAY BLOW U.N.O W/OBD
RR-1	RETURN REGISTER	TITUS/350RS	17	24x24	-
ER-1	EXHAUST REGISTER	TITUS/350RS	17	10x10	
NOTES:					
1. REFER TO MECHANICAL PLANS FOR DESIGN CFM'S FOR ALL AIR DEVICES			DIFFUSER NECK & FLEX DUCT SIZE SCHEDULE		
2. CONTRACTOR TO PROVIDE SUBMITTALS TO ARCHITECT & ENGINEER FOR APPROVAL IN ACCORDANCE WITH AIR DEVICE, DIFFUSER NECK AND FLEX DUCT SCHEDULES.			CFM RANGE	SQUARE NECK SIZE	ROUND NECK SIZE
3. ALL AIR DEVICES TO BE PROVIDED WITH VOLUME DAMPERS AT TAKE OFF FROM DUCKWORK MAIN FOR FINAL BALANCING.			0-100	6x6	6"Ø
4. REFER TO ARCHITECTURAL DRAWING FOR CEILING TYPE, PROVIDE MOUNTING FRAMES AS REQUIRED BY CEILING TYPE.			105-195	9x9	8"Ø
5. ALL FLEXIBLE DUCT SIZES TO MATCH NECK SIZE, PROVIDE DRYWALL MOUNTING FRAMES AS REQUIRED.			200-295	12x12	12"Ø
			300-450	12x12	12"Ø
			455-530	15x15	14"Ø
			531-950	18x18	16"Ø
			MAXIMUM FLEX DUCT LENGTH NOT TO EXCEED 5'-0"		

DUCTWORK SCHEDULE						
FAN SYSTEM	DUCT MATERIAL	PRESSURE CLASS	INTERNAL LINER		EXTERNAL INSULATION	
			TYPE	THICKNESS	TYPE	THICKNESS
RETURN DUCTWORK	GALVANIZED STEEL	2"	INTERNAL LINER	1"	FIBERGLASS BLANKET	2"
MEDIUM PRESSURE SUPPLY	GALVANIZED STEEL	3/2"	INTERNAL LINER	1"	FIBERGLASS BLANKET	2"
LOW PRESSURE SUPPLY	GALVANIZED STEEL	1"	INTERNAL LINER	1/2"	FIBERGLASS BLANKET	2"
OUTSIDE AIR SUPPLY	GALVANIZED STEEL	1/2"	-	-	FIBERGLASS BLANKET	2"

- NOTES:
1. PROVIDE INTERNALLY LINED DUCTWORK WHERE SHOWN.
2. DUCTWORK DOWNSTREAM OF VAV BOXES TO BE LINED FOR THE FIRST 5'-0", THEN EXTERNALLY INSULATED.
3. ALL DUCTWORK SHALL HAVE SEAL CLASS A, EXCEPT FOR RELIEF & TRANSFER DUCTS.
4. DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
5. 2" DOUBLE WALL DUCT WITH PERFORATED INNER LINER FOR MEDIUM PRESSURE SUPPLY FROM RTU TO RISER.
6. RISERS SHALL BE 1" LINED DUCTWORK; DUCT LOOPS SHALL BE EXTERNALLY WRAPPED AND BE 2" P.C.
7. MEDIUM PRESSURE SUPPLY DUCTWORK SHALL BE 2" PRESSURE CLASS FROM RTU THRU RISERS.
8. DUCT LOOPS ON THE FLOORS SHALL BE 2" PRESSURE CLASS.

DESIGNATIONS	
	POINT OF CONNECTION BETWEEN NEW WORK AND EXISTING WORK
	POINT BETWEEN EXIST'G WORK TO REMAIN AND EXIST'G WORK TO BE REMOVED.
	EQUIPMENT DESIGNATION EQUIPMENT DESIGNATION EQUIPMENT NUMBER
	SECTION DESIGNATION SECTION LETTER/NUMBER DRAWING SECTION SHOWN
	DETAIL DESIGNATION DETAIL LETTER/NUMBER DRAWING NUMBER CONTAINING DETAIL

- NOTES TO BIDDERS:
1. ALL PARTIES USING THESE DOCUMENTS SHALL VERIFY AND BE RESPONSIBLE FOR ALL FIELD DIMENSIONS AND CONDITIONS PRIOR TO PREPARATION OF SPACE PLANNING OR CONSTRUCTION DOCUMENTATION, OR ACTUAL CONSTRUCTION OF ANY AREA.
2. PRIOR TO SUBMISSION TO BID, CONTRACTOR SHALL VISIT PROJECT SITE AND CAREFULLY EXAMINE EXISTING CONDITIONS AND COMPARE THEM WITH ISSUED PLANS. CONTRACTOR TO ADVISE ARCHITECT AND ENGINEERING OF ANY DISCREPANCIES.
3. SUBMITTAL OF BID SHALL INDICATE THAT CONTRACTOR HAS EXAMINED THE SITE, AND HAS INCLUDED ALL REQUIRED ALLOWANCES IN BID. NO ALLOWANCES SHALL BE MADE FOR ANY ERROR RESULTING FROM CONTRACTOR'S FAILURE TO VISIT JOB SITE.

MECHANICAL SYMBOLS	
	NEW DUCTWORK (SIZE INDICATES INTERNAL FREE AREA)
	CONNECT TO EXISTING VERIFY EXACT LOCATION IN FIELD
MFG	MANUFACTURER
AFF	ABOVE FINISHED FLOOR
UNO	UNLESS NOTED OTHERWISE
V-PH-HZ	VOLTAGE-PHASE-HERTZ
S.P.	STATIC PRESSURE
GPM	GALLONS PER MINUTE
ENT	ENTERING
C	CONDENSATE
LVG	LEAVING
NO.	NUMBER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
	THERMOMETER
	NEW CEILING DIFFUSER AIR DEVICE NO. SUPPLY AIR DEVICE CD-3/100 AIR DEVICE TYPE CFM
	NEW RETURN GRILL (REFER TO AIR DEVICE SCHEDULE)
	DIRECTION OF FLOW
	REDUCTION IN DIRECTION OF FLOW
	CAP
	FLEXIBLE CONNECTOR
(E)	EXISTING TO REMAIN
S,R	SUPPLY REGISTER
R,R	RETURN REGISTER
EHC	ELECTRIC HEAT COIL
	MOD
(RB)	REBALANCE EXISTING TO CFMS INDICATED
VD	VOLUME DAMPER
FD	FIRE DAMPER WITH ACCESS PANEL
NO.	NUMBER
FPM	FEET PER MINUTE
#	NUMBER
W/	WITH
@	AT
VFD	VARIABLE FREQUENCY DRIVE
FLR	FLOOR
MOD	MODULATING MOTORIZED DAMPER
TYP	TYPICAL
WP	WEATHERPROOF
VIF	VERIFY IN FIELD
(RE)	RELOCATE EXISTING
B.D.D.	BACK DRAFT DAMPER
HD FT	DYNAMIC HEAD IN FEET OF WATER
PD FT	PRESSURE DROP IN FEET OF WATER
EWT	ENTERING WATER TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
FPM	FEET PER MINUTE
P/T	PRESSURE/TEMPERATURE TEST PLUG
F.C.	FLEXIBLE CONNECTION
A.P.	ACCESS PANEL
CLG	CEILING
T.A.	TRANSFER AIR SLEEVE WITH FIRE DAMPER
	THERMOSTAT 48" ABOVE FINISHED FLOOR WITH LOCKABLE COVER (FINAL LOCATION TO BE APPROVED BY OWNER PRIOR TO INSTALLATION)
	FLEXIBLE DUCT
DN	DOWN
CFM	CUBIC FEET PER MINUTE
	H/VAC SMOKE DETECTOR
	FIRE DAMPER

DUCT/EQUIPMENT SYMBOLS	
SINGLE LINE SYMBOLS	DESCRIPTION
	NEW DUCTWORK
	EXISTING DUCTWORK/EQUIPMENT TO REMAIN
	EXISTING DUCTWORK/EQUIPMENT TO BE REMOVED
	NEW THERMOSTAT WIRE
	DROP IN DUCT ELEVATION
	RISE IN DUCT ELEVATION
	MANUAL VOLUME DAMPER
	ACCESS DOOR /ACCESS PANEL
	VANED ELBOW
	90-DEG ELBOW WITH RADIUS/DIAMETER RATIO EQUAL TO OR GREATER THAN 1.5 INSTALL MITERED ELBOW WITH VANES ONLY IF RADIUS ELBOW DOES NOT FIT
	SIDEWALL SUPPLY REGISTER
	RETURN REGISTER/GRILLE
	FLEXIBLE CONNECTION (FC)
	BRANCH DUCT TAKE-OFF
	90 DEG SPLIT (TEE, WITH VANES)
	ROUND DUCT TURNING UP
	ROUND DUCT TURNING DOWN
	RECTANGULAR DUCT TURNING UP
	RECTANGULAR DUCT TURNING DOWN
	FLEXIBLE DUCTWORK
	TRANSITION
	HUMIDIFIER
	TERMINAL UNIT WITH REHEAT
	TERMINAL UNIT
	EXHAUST FAN (IN-LINE TYPE)
	FIRE DAMPER
	COMBINATION FIRE/SMOKE DAMPER
	MOTOR-OPERATED DAMPER
	MOTOR-OPERATED SMOKE DAMPER
	TRANSFER DUCT
	ELECTRIC DUCT HEATER
	HUMIDITY SENSOR, DUCT MOUNTED
	TEMPERATURE SENSOR, DUCT OR PIPE MOUNTED
	PRESSURE SENSOR PIPE MOUNTED
	STATIC PRESSURE SENSOR, DUCT MOUNTED
	SMOKE DETECTOR, DUCT MOUNTED
	THERMOSTAT/TEMP SENSOR, WALL MOUNTED
	HUMIDISTAT, WALL MOUNTED
	FIRESTAT
	DIFFUSER/GRILLE/REGISTER DESIGNATION
	1 HOUR FIRE RATED
	2 HOUR FIRE RATED
	1 HOUR SMOKE BARRIER

TEMPERATURE CONTROL SYSTEM - SEQUENCE OF OPERATIONS	
GAS FIRED ROOFTOP UNITS	EXHAUST FANS
<p>1. PROVIDE A SPACE SEVEN DAY, ELECTRONIC, PROGRAMMABLE WALL MOUNTED CONTROLLER FOR BOTH HEATING AND COOLING FOR THIS SYSTEM. SPACE SENSOR TO BE MOUNTED IN RETURN AIR DUCTWORK.</p>	<p>OCCUPIED MODE FAN SHALL RUN CONTINUOUSLY UNOCCUPIED MODE, FAN SHALL BE OFF, BASED ON DEMAND OF SEVEN DAY ELECTRONIC PROGRAMMABLE TIME CLOCK.</p>
<p>OCCUPIED MODE</p> <p>1. SUPPLY FAN SHALL RUN CONTINUOUSLY</p> <p>2. OUTSIDE AIR DAMPER SHALL BE OPEN TO MINIMUM POSITION UNLESS OVERRIDDEN BY ECONOMIZER CONTROLS</p> <p>3. COMPRESSOR SHALL ENERGIZE ON A CALL FOR COOLING, SHOULD UNIT HAVE MULTIPLE COOLING STAGES, UNIT CONTROLLER SHALL BE CAPABLE OF SEQUENCING STAGES.</p>	
<p>UNOCCUPIED MODE</p> <p>1. DURING THE UNOCCUPIED TIMES THE FAN SHALL CYCLE ON A CALL FOR HEAT AT THE NIGHT SETBACK TEMPERATURE.</p>	

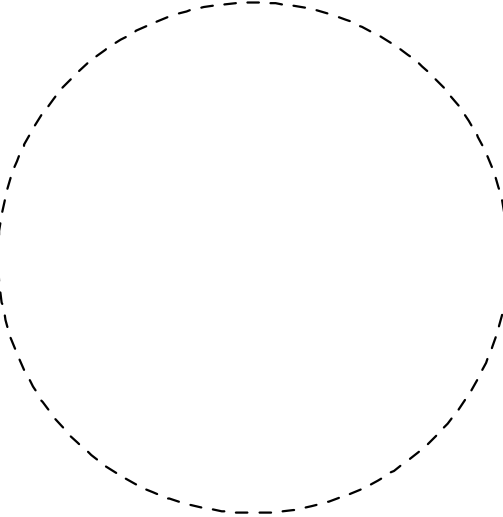
PIPING LEGEND						
SYMBOL	SERVICE	SIZE	MATERIAL	JOINTS	INSULATION	REMARKS
	REFRIGERANT PIPING	ALL	ACR COPPER TYPE "L" HARD	BRAZED	1/2" ARMAFLEX	-
	AC CONDENSATE	ALL	COPPER TYPE "L" HARD	SOLDERED	1/2" FIBERGLASS	-

REFER TO PIPING SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

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CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE BEFORE PROCEEDING WITH THE WORK



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Addition / Renovations
to an Existing Building

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MECHANICAL
COVER SHEET

REVISIONS:

DATE DESCRIPTION

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