MECHANICAL/PLUMBING SPECIFICATIONS

PART ONE - GENERAL

1. THE CONTRACTOR SHALL PROVIDE THE WORK SHOWN ON THE DRAWINGS AND SPECIFIED FOR THEIR INDIVIDUAL SECTIONS OF WORK. THE WORD "WORK" SHALL MEAN ALL LABOR, TRANSPORTATION, MATERIAL, EQUIPMENT, TOOLS, INSTALLATION, SUPERVISION AND ANY OTHER INCIDENTAL ITEMS OR SERVICES NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF THE COMPLETE SYSTEMS, WHICH SHALL BE PROVIDED WHETHER OR NOT SPECIFICALLY INDICATED OR NOTED.
2. ALL GENERAL CONDITIONS, SPECIAL REQUIREMENTS OR GENERAL REQUIREMENTS OF THE CONSTRUCTION SPECIFICATIONS ARE MADE PART OF THIS SPECIFICATION AND HAVE THE SAME FORCE AND AFFECT AS IF COMPLETELY REPRODUCED.
3. THE WORD "PROVIDE" SHALL MEAN FURNISH AND INSTALL, MAKE ALL FINAL CONNECTIONS AND LEAVE IN AN APPROVED COMPLETE OPERATING CONDITION.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADOPTED EDITIONS OF THE APPLICABLE INTERNATIONAL BUILDING CODE (IBC), UNIFORM MECHANICAL CODE (UMC), UNIFORM PLUMBING CODE (UPC), NATIONAL ELECTRIC CODES (NEC) AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING ALL FEES AND OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR THE WORK.
6. THE CONTRACTOR SHALL CAREFULLY EXAMINE ALL CONTRACT DOCUMENTS. THE CONTRACTOR SHALL COORDINATE THE WORK WITH ALL OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE CONTRACT DOCUMENTS, SHOP DRAWINGS, ETC. FOR ALL GENERAL CONSTRUCTION, STRUCTURAL, MECHANICAL, ELECTRICAL AND SPECIALTY CONTRACTOR WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FITTING OF MATERIAL INTO THE BUILDING AS PLANNED, WITHOUT INTERFERENCE WITH OTHER WORK, AND SHALL MAKE REASONABLE MODIFICATIONS IN THE LAYOUTS NEEDED TO PREVENT CONFLICT WITH OTHER TRADES, TO PROVIDE ACCESS AND FOR THE PROPER EXECUTION OF THE WORK.
7. DRAWINGS ARE DIAGRAMMATIC AND SCHEMATIC IN NATURE, AND INDICATE THE TYPE, SIZE, ARRANGEMENT AND LOCATION OF MATERIALS AND EQUIPMENT. WORK INCLUDES CERTAIN COMPONENTS, APPURTENANCES AND RELATED SPECIALTIES THAT MAY NOT BE SHOWN. CONTRACTOR SHALL PROVIDE ALL NECESSARY ITEMS TO COMPLETE THE WORK ACCORDING TO INDUSTRY STANDARDS. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS TO CALL OUT FOR FINISHED WORK, TESTED AND READY FOR OPERATION. DO NOT SCALE DRAWINGS. ARRANGEMENT OF EQUIPMENT AND ROUTING OF PIPES AND DUCTWORK, ETC. INDICATED ON DRAWINGS SHALL BE ROUTED PLUMB AND AT RIGHT ANGLES TO BUILDING CONSTRUCTION AND MAY REQUIRE MODIFICATION DUE TO UNFORESEEN CONDITIONS AND REQUIRE ON SITE REVISIONS DURING CONSTRUCTION. (SEE ALSO "BIDDING").
8. ALL WORK REQUIRED FOR IDENTICAL ITEMS SHOWN ON THE DRAWINGS SHALL BE PROVIDED, ALTHOUGH EACH SPECIFIC IDENTICAL ITEM MAY NOT BE SHOWN IN DETAIL.
9. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND TECHNICAL DATA SHEETS FOR ALL EQUIPMENT AND MATERIALS SPECIFIED HEREIN TO THE ENGINEER. THE ENGINEER SHALL REVIEW SHOP DRAWINGS AND TECHNICAL DATA SHEETS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS AND ISSUE A WRITTEN ASSESSMENT TO THE OWNER PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ENGINEERING FEES NECESSARY TO CHANGE PERMIT DOCUMENTS BASED ON ALTERNATE SUBMITTAL PACKAGES/EQUIPMENT SUBSTITUTIONS.
10. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER FOR CONSIDERATION PRIOR TO BIDDING. THE OWNER'S REPRESENTATIVE SHALL PREAPPROVE ANY PROPOSED SUBSTITUTION IN WRITING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS ASSOCIATED WITH SUBSTITUTED EQUIPMENT OR MATERIALS WITH OTHER BUILDING TRADES, INCLUDING ALL ELECTRICAL, STRUCTURAL, OR ARCHITECTURAL ELEMENTS. THE CONTRACTOR SHALL IDENTIFY AND ANNOTATE ALL REVISED REQUIREMENTS PER BUILDING TRADE ON THE SHOP DRAWINGS. THE CONTRACTOR SHALL ALSO IDENTIFY ALL COST DEBITS OR CREDITS IN WRITING FOR THE PROPOSED CHANGES PER BUILDING TRADE.
11. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL SUPPLY THE ENGINEER WITH FIVE (5) COMPLETE SETS OF AS-BUILT DOCUMENTS ACCURATELY SHOWING THE MATERIALS AND EQUIPMENT AS INSTALLED.
12. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A MINIMUM OF ONE (1) YEAR FROM DATE OF ACCEPTANCE BY OWNER. REFRIGERATION COMPRESSORS SHALL BE GUARANTEED FOR A MINIMUM OF FIVE (5) YEARS FROM DATE OF OWNER'S ACCEPTANCE. IN ADDITION, THE CONTRACTOR SHALL GUARANTEE THAT THE INSTALLATION WHEN OPERATED IN ACCORDANCE WITH THE CONTRACTOR'S INSTRUCTIONS WILL DEVELOP CAPACITY AND CHARACTERISTICS AS SPECIFIED AND WILL FULFILL EACH AND EVERY REQUIREMENT OF THE DRAWINGS AND SPECIFICATIONS. SHOULD THE INSTALLATION IN ANY WAY FAIL TO DO SO, THE CONTRACTOR WILL, WITHOUT DELAY OR WITHOUT COST TO THE OWNER, PROVIDE WHATEVER ADDITIONAL EQUIPMENT, MATERIAL, AND LABOR REQUIRED TO CORRECT THE DEFICIENCY AND COMPLY WITH THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
13. CONTRACTOR SHALL CHECK AND VERIFY ALL SIZES, DIMENSIONS, AND CONDITIONS BEFORE STARTING ANY WORK. ANY DEVIATIONS OR PROBLEMS SHALL BE TRANSMITTED TO THE ENGINEER FOR REVIEW.
14. PROVIDE BASE AND COUNTER FLASHING FOR ITEMS PENETRATING THE ROOF OR EXTERIOR WALLS.
15. STARTERS AND CONTROLS FOR MOTORS, ETC. TO BE FURNISHED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO INSTALL THE AFOREMENTIONED ITEMS, AND FURNISH ALL POWER WIRING. ALL CONTROL AND INTERLOCKING WIRING SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
16. ALL WORK SHOWN IS NEW UNLESS NOTED OTHERWISE.

BIDDING

1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS. THE CONTRACTOR SHALL COMPARE THE WORK SPECIFIED IN THE CONTRACT DOCUMENTS WITH THE EXISTING CONDITIONS. THE CONTRACTOR SHALL IDENTIFY AND NOTATE ALL WORK OR CONDITIONS THAT ARE DIFFERENT FROM THE CONTRACT DOCUMENTS OR THEIR INTENT. THE CONTRACTOR SHALL, UPON DISCOVERY, IMMEDIATELY NOTIFY AND REPORT, IN WRITING, ANY DISCREPANCIES TO THE ENGINEER. NO EXTRAS OR CHANGE ORDERS WILL BE ALLOWED FOR FAILURE TO PERFORM THE PRE-BID SITE VISIT.
2. BASE PROPOSAL ON MANUFACTURER NAMES LISTED UNLESS "OR EQUAL" IS INDICATED. PROVIDE SUBSTITUTION REQUESTS A MINIMUM OF FIVE (5) BUSINESS DAYS PRIOR TO BID DATE CLOSING TO ALLOW TIME FOR DUE CONSIDERATION OF PROPOSED ALTERNATE. DETERMINATION OF SUBSTITUTION OF EQUALITY RESTS SOLELY WITH THE ENGINEER.

PART TWO - PRODUCTS

HVAC EQUIPMENT

1. PROVIDE HVAC EQUIPMENT AS SPECIFIED AND/OR SCHEDULED HEREIN AND IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. EQUIPMENT SHALL OPERATE ACCORDING TO THE MANUFACTURER'S "OWNER'S OPERATING AND MAINTENANCE MANUAL" TROUBLE-FREE PRIOR TO STARTING TEST AND BALANCE (TAB) WORK.

DUCTWORK

1. DUCTWORK SHALL BE ASTM A525 OR A527 GALVANIZED SHEET METAL LOCK-FORMING QUALITY HAVING ZINC COATING OF 1.25 OZ PER SQ. FT. FOR EACH SIDE PER ASTM A90 AND INSTALLED ACCORDING TO ASHRAE RECOMMENDATIONS, AND SMACNA DUCT CONSTRUCTION STANDARDS. DUCTWORK SYSTEMS SHALL BE (2" CLASSIFICATION SUPPLY, AND 1" CLASSIFICATION RETURN AND EXHAUST).
2. PROVIDE MANUAL VOLUME DAMPERS WITH LOCKING QUADRANTS AND IDENTIFYING RIBBONS AT DAMPER HANDLES FOR AIR BALANCING EACH BRANCH DUCT TAKE-OFF OR PIECE OF AIR DISTRIBUTION EQUIPMENT.
3. SEAL ALL DUCT PENETRATIONS THROUGH WALLS, FLOOR AND ROOF. SEAL ALL TRANSVERSE DUCT SEAMS WITH APPROVED MASTIC. DUCT TAPES SHALL NOT BE ALLOWED FOR RIGID DUCTWORK. SUPPLY AND RETURN DUCTWORK SHALL BE INSULATED WITH 1 1/2" THICK FLEXIBLE GLASS FIBER ANSI/ASTM C612: MAXIMUM 'K' VALUE OF 0.29 AT 75°F, WITH FOIL-KRAFT FLAME RESISTANT VAPOR BARRIER, 3/4 #/CUFT. DENSITY.
4. ALL DUCTWORK SIZES SHOWN ARE FREE AREA DIMENSIONS. EXHAUST DUCTWORK SHALL BE UNINSULATED. DUCTWORK INTERIOR BEHIND DEVICES SHALL BE PAINTED FLAT BLACK.
5. FLEXIBLE DUCTWORK WHERE INDICATED ON THE DRAWINGS SHALL BE INSULATED, WITH PLASTIC VAPOR BARRIER AT INTERIOR AND EXTERIOR, STEEL WIRE COIL REINFORCED. JOINTS SHALL BE BAND-CLAMPED AND TAPE SEALED TO MAINTAIN INTEGRITY OF VAPOR BARRIER. FLEXIBLE INSTALLATION SHALL BE SUPPORTED TO ELIMINATE SAGS. FLEXIBLE GLASS FIBER INSULATION SHALL HAVE A MAXIMUM 0.23 K VALUE AT 75°F.

MECHANICAL PRODUCTS

1. ACCEPTABLE MANUFACTURERS VIBRO-ACOUSTICS, IAC OR COMMERCIAL ACOUSTICS.
2. PIPE HANGERS: PIPE SIZES 1/2" TO 1 1/2": MALLEABLE IRON, CARBON STEEL, ADJUSTABLE SWIVEL, SPLIT RING. PIPE SIZES 2" TO 4": CARBON STEEL, ADJUSTABLE, CLEVIS. PIPE SIZES 6" AND OVER: ADJUSTABLE STEEL YOKE, CAST IRON ROLL, DOUBLE HANGER.
3. REFRIGERANT PIPING: PROVIDE PIPING BETWEEN AIR-COOLED CONDENSING UNIT AND FAN COIL UNIT OR HEAT PUMP. PROVIDE ALL NECESSARY AUXILIARIES AND APPARATUSES TO MAKE SYSTEM COMPLETE AND OPERABLE UNDER FULLY AUTOMATIC CONTROL. PIPING SHALL BE ACR COPPER TUBING MADE UP WITH WROUGHT COPPER FITTINGS USING SILVER SOLDER OF SIZES AS RECOMMENDED BY MANUFACTURER. SUCTION LINES, HOT GAS BYPASS AND OUTDOOR LIQUID LINES SHALL BE INSULATED WITH 3/4" THICK RIGID CLOSED CELL FOAM INSULATION. DO NOT RUN PIPE INSULATION IN RETURN AIR PLENUM.
4. DIFFUSERS, REGISTERS AND GRILLES: MAXIMUM SOUND PRESSURE LEVELS SHALL NOT EXCEED NC 30. COORDINATE FINISH AND MOUNTING TYPE WITH ARCHITECT. ACCEPTABLE MANUFACTURERS: TITUS, METAL AIRE, TUTTLE AND BAILEY, PRICE
5. PACKAGED ELECTRIC ROOFTOP UNITS: UNIT SHALL BE COMPLETE WITH HERMETICALLY SEALED COMPRESSOR WITH HIGH AND LOW PRESSURE CUT-OFFS, COILS, HEATING SECTION, AIR COOLED CONDENSER, CONDENSER BLOWER OR FAN, AUTOMATIC CONTROLS, CONTROL PANEL WITH STARTERS AND DISCONNECT SWITCH, RELAYS, ETC. FOR SINGLE POINT POWER CONNECTION. UNITS SHALL BE FURNISHED WITH 2 SETS OF 1" THROWAWAY PLEATED 30% FILTERS. UNITS SHALL BE COMPLETELY FACTORY WIRED FOR TERMINAL CONNECTIONS OF THERMOSTAT WITH A FAN-AUTO/MANUAL SWITCH AND A SYSTEM HEAT/OFF/COOL/AUTO SWITCH. UNITS TO BE INSTALLED AS PER MANUFACTURER RECOMMENDATIONS, WITH MANUAL OUTSIDE AIR DAMPER, 12" ROOF CURB, ITEMS AS SCHEDULED AND ALL NECESSARY ACCESSORIES REQUIRED FOR EFFICIENT AND PROPER OPERATION. ACCEPTABLE MANUFACTURERS:TRANE, LENNOX, McQUAY, CARRIER.

AUTOMATIC TEMPERATURE CONTROLS

4. THE MECHANICAL CONTRACTOR SHALL PROVIDE A COMPLETE SYSTEM OF AUTOMATIC TEMPERATURE CONTROLS. THIS SYSTEM SHALL INCLUDE BUT NOT BE LIMITED TO: HEAT/OFF/COOL/AUTO - THERMOSTAT, AUTO/MANUAL - FAN, TRANSFORMERS AND ALL REQUIRED RELAYS, WIRING AND CONDUIT. THERMOSTAT SHALL BE 7 DAY PROGRAMMABLE WITH AUTOMATIC CHANGE OVER FROM HEATING TO COOLING AND VICE VERSA.
5. SUBMIT SHOP DRAWINGS OF TEMPERATURE CONTROL WIRING, LOCATION OF DEVICES AND INSTALLATION DATA FOR REVIEW PRIOR TO INSTALLATION.
6. DUCT MOUNTED SMOKE DETECTORS SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR AND INSTALLED BY THE MECHANICAL CONTRACTOR WHEN THE DUCT TYPE SMOKE DETECTOR IS REQUIRED TO BE PART OF THE DESIGN BUILD FIRE ALARM SYSTEM. WHEN NOT PART OF THE FIRE ALARM SYSTEM, THE DUCT MOUNTED SMOKE DETECTORS SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR AND PROVIDED AT 24 VAC. DUCT MOUNTED SMOKE DETECTORS SHALL SHUT DOWN THE RESPECTIVE UNIT AND ALL ADDITIONAL UNITS IN A COMMON AREA IF THE SUMMATION OF THE AIRFLOWS EXCEED 2000 CFM TOTAL.

PLUMBING EQUIPMENT

1. PROVIDE PLUMBING EQUIPMENT AS SPECIFIED AND/OR SCHEDULED HEREIN AND IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. EQUIPMENT SHALL OPERATE ACCORDING TO THE MANUFACTURER'S "OWNER'S OPERATING AND MAINTENANCE MANUAL" TROUBLE FREE AND CONFORMING TO THE ONE-YEAR WARRANTEE.

PLUMBING PRODUCTS

1. PIPE INSULATION: ALL DOMESTIC COLD WATER PIPING (IN UNCONDITIONED SPACES ONLY) AND ALL DOMESTIC HOT WATER PIPING ABOVE GROUND SHALL BE INSULATED WITH 1" THICK FIBERGLASS PIPE INSULATION WITH ALL-SERVICE JACKET AND MAXIMUM K VALUE OF 0.27 AT 75°F. WHERE CLEARANCE LIMITATIONS PREVENT THE USE OF FIBERGLASS INSULATION, A MINIMUM 3/4" THICK CLOSED CELL NEOPRENE PIPE INSULATION MAY BE USED.
2. PIPE HANGERS: PIPE SIZES 1/2" TO 1 1/2": MALLEABLE IRON, CARBON STEEL, ADJUSTABLE SWIVEL, SPLIT RING. PIPE SIZES 2" TO 4": CARBON STEEL, ADJUSTABLE, CLEVIS. PIPE SIZES 6" AND OVER: ADJUSTABLE STEEL YOKE, CAST IRON ROLL, DOUBLE HANGER.
3. CONDENSATE DRAIN PIPING: TYPE "M" COPPER (ASTM B-88), WROUGHT FITTINGS (ASME B16.22), JOINTS: ANSI/ASTM B32, SOLDER, GRADE 95 TA, 0.2% MAX LEAD.

TEST AND BALANCE REPORT (TAB)

1. BALANCE ALL DUCTS, DIFFUSERS, AND GRILLES TO OBTAIN THE AIR QUANTITIES AS SHOWN ON PLANS. TEST AND BALANCE WORK SHALL BE PERFORMED BY AN INDEPENDENT, APPROVED, AND CERTIFIED AABC OR NEBB CONTRACTOR.
2. THE TEST AND AIR BALANCE (TAB) REPORT SHALL INCLUDE DESIGN AIR QUANTITIES AND AIR QUANTITIES AFTER ADJUSTMENTS. FURNISH OWNER'S REPRESENTATIVE WITH THREE (3) COPIES OF THE FINAL TAB REPORT.

NOTES

1. DIELECTRIC FITTINGS SHALL BE USED WHEREVER DISSIMILAR METALS ARE JOINED.
2. PROVIDE ACCESS PANELS IN CEILING TO ACCESS VOLUME DAMPERS WHERE REQUIRED.
3. FIRE AND SMOKE FIRE DAMPERS SHALL MEET UL 555 AND UL 555S AND FIRE DAMPERS SHALL HAVE BLADES OUT OF AIR STREAM IN COILED POSITION.
4. PLUMBING FIXTURES: PROVIDE CHROME PLATED ANGLE STOPS WITH ESCUTCHEON PLATES AT PLUMBING FIXTURES. ALL PLUMBING FIXTURES SHALL COMPLY WITH LOCAL REGULATIONS AND ADOPTED WATER CONSERVATION CODES.
5. DISINFECT ALL POTABLE WATER SYSTEMS IN ACCORDANCE WITH PLUMBING CODE AND/OR, AWWA STANDARD. PROVIDE WRITTEN CONFIRMATION TO OWNERS REPRESENTATIVE THAT THIS WORK HAS BEEN COMPLETED.

PART THREE - EXECUTION

1. THE CONTRACTOR SHALL PROVIDE ALL SLEEVES, OPENINGS, CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF THE WORK. CUTTING AND PATCHING SHALL BE DONE BY WORKMEN SKILLED IN THE TRADES REQUIRED AND PAID BY THE CONTRACTOR REQUIRING THE WORK COMPLETED.
2. THE CONTRACTOR SHALL PROVIDE ALL RIGGING, HANDLING OF MATERIALS AND EQUIPMENT, AND THE NECESSARY PROTECTION FOR MATERIALS AND EQUIPMENT.
3. THE CONTRACTOR WILL PROTECT THE WORK AND MATERIAL AGAINST DIRT, THEFT, INJURY OR DAMAGE UNTIL ACCEPTED BY OWNER. ALL WORK SHALL BE TURNED OVER TO OWNER CLEAN AND IN NEW CONDITION.
4. PIPES AND/OR CONDUITS PASSING THROUGH WALL, FLOORS AND PARTITIONS SHALL BE PROVIDED WITH SLEEVES. SLEEVES PASSING THROUGH WATER PROOFING OR DAMP PROOFING SHALL BE WATER TIGHT. SLEEVES PASSING THROUGH FIRE RATED CONSTRUCTION SHALL BE FIRE PROOFED WITH MATERIAL APPROVED FOR THE FIRE RATING OF THE SEPARATION AREA AND U.L. LISTED.
5. EACH CONTRACTOR SHALL PROVIDE ALL FOUNDATIONS, HANGERS, AND SUPPORTS FOR ALL EQUIPMENT SUPPLIED AND/OR INSTALLED UNDER THEIR WORK. ANY EQUIPMENT WITH MOVING PARTS SHALL BE PROVIDED WITH VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS TO PIPING AND OR DUCTWORK IF APPLICABLE.
6. WHERE PIPES OR CONDUITS PASS THROUGH WALLS, FLOORS, OR CEILINGS IN FINISHED AREAS, THEY SHALL BE FURNISHED WITH ESCUTCHEON PLATES (COLOR PER ARCHITECT AND/OR INTERIOR DESIGNER).
7. AT THE CONCLUSION OF THE JOB, EACH PIECE OF EQUIPMENT, VALVE, SWITCH, STARTER, PANEL, PIPE LINE, CONDUIT, DUCT, ETC., SHALL BE CLEARLY IDENTIFIED WHETHER EXPOSED OR CONCEALED, COVERED OR UNCOVERED, IN ACCORDANCE WITH OSHA AND ANSI REGULATIONS. IDENTIFY PIPES NEAR EACH VALVE WITH "BRANDY-PERMA' CODE PIPE TAPE" OR T. & B. WESTLINE "TEL-A-PIPE" INDICATING DIRECTION OF FLOW, SERVICE, ZONE, AND SIZE. TAPE SHALL BE APPLIED TO PIPE, CONDUIT, OR COVERING. VALVES, CONTROLS, AND DAMPERS SHALL BE IDENTIFIED BY 2-INCH LACQUERED BRASS TAGS WITH STAMPED LETTERS FASTENED WITH "S" HOOKS OR CHAINS. EQUIPMENT IS TO BE IDENTIFIED AS TO FUNCTION AND PURPOSE BY MEANS OF PERMANENTLY ATTACHED LAMINATED ENGRAVED PHENOLIC NAMEPLATES WITH BEVELED EDGES, AND WHITE LETTERS ON BLACK BACKGROUND. (NO ADHESIVE LABELS ALLOWED).
8. AT THE CONCLUSION OF THE WORK, ALL EQUIPMENT AND SYSTEMS SHALL BE BALANCED, ADJUSTED, AND TESTED TO PROVIDE A QUIET-OPERATING, STABLE, AND SAFELY OPERATING SYSTEM(S). DEMONSTRATE OPERATION OF ALL SYSTEMS TO THE OWNER'S DESIGNATED REPRESENTATIVE. THE TEST AND BALANCE WORK SHALL BE PERFORMED IN ACCORDANCE WITH NEBB OR AABC STANDARDS, BY INDEPENDENT, APPROVED, AND CERTIFIED TEST AND BALANCE PERSONNEL.
9. THE MECHANICAL/PLUMBING CONTRACTOR IS RESPONSIBLE FOR RETAINING AND PAYING FOR THE DESIGN SERVICES OF A STRUCTURAL ENGINEER TO CREATE THE DESIGN AND INSTALLATION DRAWINGS FOR MECHANICAL/PLUMBING SYSTEMS SEISMIC RESTRAINT SUPPORT, PER THE PROJECT BUILDING CODE. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT MECHANICAL SYSTEMS SHOP DRAWINGS BASED UPON MULTI DISCIPLINE COORDINATION. INCLUDED WITH THE SHOP DRAWING SUBMISSION SHALL BE SEISMIC RESTRAINT DRAWINGS NOTING WHERE SEISMIC SUPPORT IS REQUIRED. FOR EACH AREA NOTED NEEDING SEISMIC SUPPORT FOR THE MECHANICAL SYSTEMS, THERE SHALL BE A SEISMIC DRAWING DETAILING THE REQUIRED SUPPORT. THE SEISMIC SUPPORT DRAWINGS SHALL BE SIGNED AND SEALED BY A REGISTERED STRUCTURAL ENGINEER IN THE SAME STATE AS THE PROJECT. IN ADDITION TO THE PROJECT DESIGN TEAM REVIEW, THE SEISMIC SUPPORT DRAWINGS WILL BE ISSUED TO THE LOCAL BUILDING DEPARTMENT FOR REVIEW AS PART OF A DEFERRED SUBMITTAL FOR THE BUILDING DOCUMENTS. COMMENCEMENT OF CONSTRUCTION PRIOR TO BUILDING DEPARTMENT REVIEW IS AT THE CONTRACTOR'S RISK.
10. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF GRILLES, REGISTERS AND DIFFUSERS.
11. PIPE HANGERS: PIPE SIZES 1/2" TO 1 1/2" - 6'-0" MAX SPACING, 3/8" ROD DIAMETER; PIPE SIZES 2" TO 3" - 10'-0" MAX SPACING, 1/2" ROD DIAMETER; PIPE SIZES 4 TO 6"-10'-0" MAX SPACING, 5/8" ROD DIAMETER. DAMPERS.
12. WATER PROOFING AND FLASHING OF PIPE PENETRATIONS THROUGH EXTERIOR WALL AND ROOF SHALL BE BY THIS CONTRACTOR. PLUMBING CONTRACTOR SHALL COORDINATE LOCATIONS AND METHODS WITH GENERAL CONTRACTOR PRIOR TO CONSTRUCTION OF ROOF DECK.
13. CONTRACTOR SHALL OBTAIN FROM THE ARCHITECT THE EXACT LOCATION OF EQUIPMENT, PLUMBING FIXTURES, FLOOR DRAINS AND ANY OTHER APPARATUS SPECIFIED IN THESE DRAWINGS.

MECHANICAL/PLUMBING SYMBOL LIST

NOTE: THIS IS A MASTER SCHEDULE. NOT ALL SYMBOLS CONTAINED HEREIN MAY APPEAR ON THE DRAWINGS.

Symbol	Description
	ITEM TO BE REMOVED
	POINT OF CONNECTION/DISCONNECTION
	SHEET NOTE
	REVISION NUMBER
TAG UNIT	EQUIPMENT MARK
TAG CFM	DIFFUSER TAG
	ACCESS PANEL
	SUPPLY AIR DUCT UP/DOWN
	RETURN AIR DUCT UP/DOWN
	EXHAUST AIR DUCT UP/DOWN
	RETURN GRILLE
	EXHAUST GRILLE
	4-WAY BLOW SUPPLY DIFFUSER
	3-WAY BLOW SUPPLY DIFFUSER
	2-WAY BLOW SUPPLY DIFFUSER
	1-WAY BLOW SUPPLY DIFFUSER
	AIRFLOW DIRECTION
--"ø	ROUND DUCTWORK
--"X--"	RECTANGULAR DUCTWORK
	ROUND FLEXIBLE DUCT
	SQUARE TO ROUND TRANSITION
	SINGLE LINE RIGID DUCT
	SINGLE LINE RIGID DUCT (ACOUSTICALLY LINED)
	DOUBLE LINE RIGID DUCT
	DOUBLE LINE RIGID DUCT (ACOUSTICALLY LINED)
	EXISTING DUCTWORK
FD	FIRE DAMPER
SD	SMOKE DAMPER
FSD	FIRE/SMOKE DAMPER
	MOTORIZED DAMPER (OPPOSED BLADE TYPE)
	MOTORIZED DAMPER (PARALLEL BLADE TYPE)
	BACKDRAFT DAMPER
	MANUAL VOLUME DAMPER
RVD	REMOTE VOLUME DAMPER
SD	SMOKE DETECTOR
T	THERMOSTAT
H	HUMIDISTAT
S	SENSOR
C	CARBON DIOXIDE SENSOR
C	CARBON MONOXIDE SENSOR
U	DOOR UNDERCUT
	CLEAN OUT
	WALL CLEAN OUT
	FLOOR CLEAN OUT
	GRADE CLEAN OUT
	FLOOR DRAIN
	FLOOR SINK
	FLOOR SINK W/ GRATE
	ROOF DRAIN
	OVERFLOW ROOF DRAIN
	VENT THRU ROOF
FS	FLOW SWITCH
	GAS REGULATOR
G	GAS METER
M	WATER METER
	WATER HAMMER ARRESTOR
	SHUT-OFF VALVE IN IRRIGATION BOX
	BACKFLOW PREVENTION STATION
	HOSE BIBB
CHR	CHILLED WATER RETURN PIPING
CHS	CHILLED WATER SUPPLY PIPING
CR	CONDENSER WATER RETURN PIPING
CS	CONDENSER WATER SUPPLY PIPING

Symbol	Description
HWR	HEATING WATER RETURN PIPING
HWS	HEATING WATER SUPPLY PIPING
RL	REFRIGERANT LIQUID PIPING
RS	REFRIGERANT SUCTION PIPING
A	COMPRESSED AIR LINES
CD	CONDENSATE DRAIN PIPING
PC	PUMPED CONDENSATE DRAIN PIPING
D	DRAIN PIPING
	COLD WATER PIPING
ICW	INDUSTRIAL COLD WATER PIPING
ISCW	INDUSTRIAL SOFTENED COLD WATER PIPING
SCW	SOFTENED COLD WATER PIPING
F	FIRE PROTECTION PIPING
HPG	HIGH PRESSURE GAS PIPING
G	LOW PRESSURE GAS PIPING
MPG	MEDIUM PRESSURE GAS PIPING
----GV----	GAS VENT PIPING
	HOT WATER PIPING
140°	140° HOT WATER PIPING
	HOT WATER RETURN PIPING
TW	TEMPERED WATER PIPING
ORD	OVERFLOW ROOF DRAIN PIPING
RD	ROOF DRAIN PIPING
----AV----	ACID VENT PIPING
AW	ABOVE GROUND ACID WASTE PIPING
---AW---	UNDERGROUND ACID WASTE PIPING
	VENT PIPING
	ABOVE GROUND WASTE PIPING
	UNDERGROUND WASTE PIPING
GW	ABOVE GROUND GREASE WASTE PIPING
---GW---	UNDERGROUND GREASE WASTE PIPING
GW	ABOVE GROUND GREASE WASTE PIPING W/HEAT TRACE
GW	UNDERGROUND GREASE WASTE PIPING W/HEAT TRACE
	CIRCUIT SETTER
	2-WAY ELECTRONIC CONTROL VALVE
	3-WAY ELECTRONIC CONTROL VALVE
	2-WAY PNEUMATIC CONTROL VALVE
	3-WAY PNEUMATIC CONTROL VALVE
S	SOLENOID VALVE
	BUTTERFLY VALVE
	PLUG VALVE
	GAS COCK
	BALL VALVE
	CHECK VALVE
	GATE VALVE
	HOSE END DRAIN VALVE
	PRESSURE REDUCING VALVE
	RELIEF VALVE
	TEMPERATURE PRESSURE RELIEF VALVE
	THERMOMETER
	PRESSURE GAUGE WITH GAUGE COCK
	MANUAL AIR VENT
	PRESSURE TEMPERATURE PORT
	Y-STRAINER WITH BLOWDOWN
	PIPE GUIDE
	UNION
	PIPE ANCHOR
	FLEXIBLE CONNECTOR
	PIPE CAP/STUB-OUT
	DIRECTION OF FLOW
	PIPE DOWN
	PIPE UP
	PIPE TEE UP
	PIPE TEE DOWN

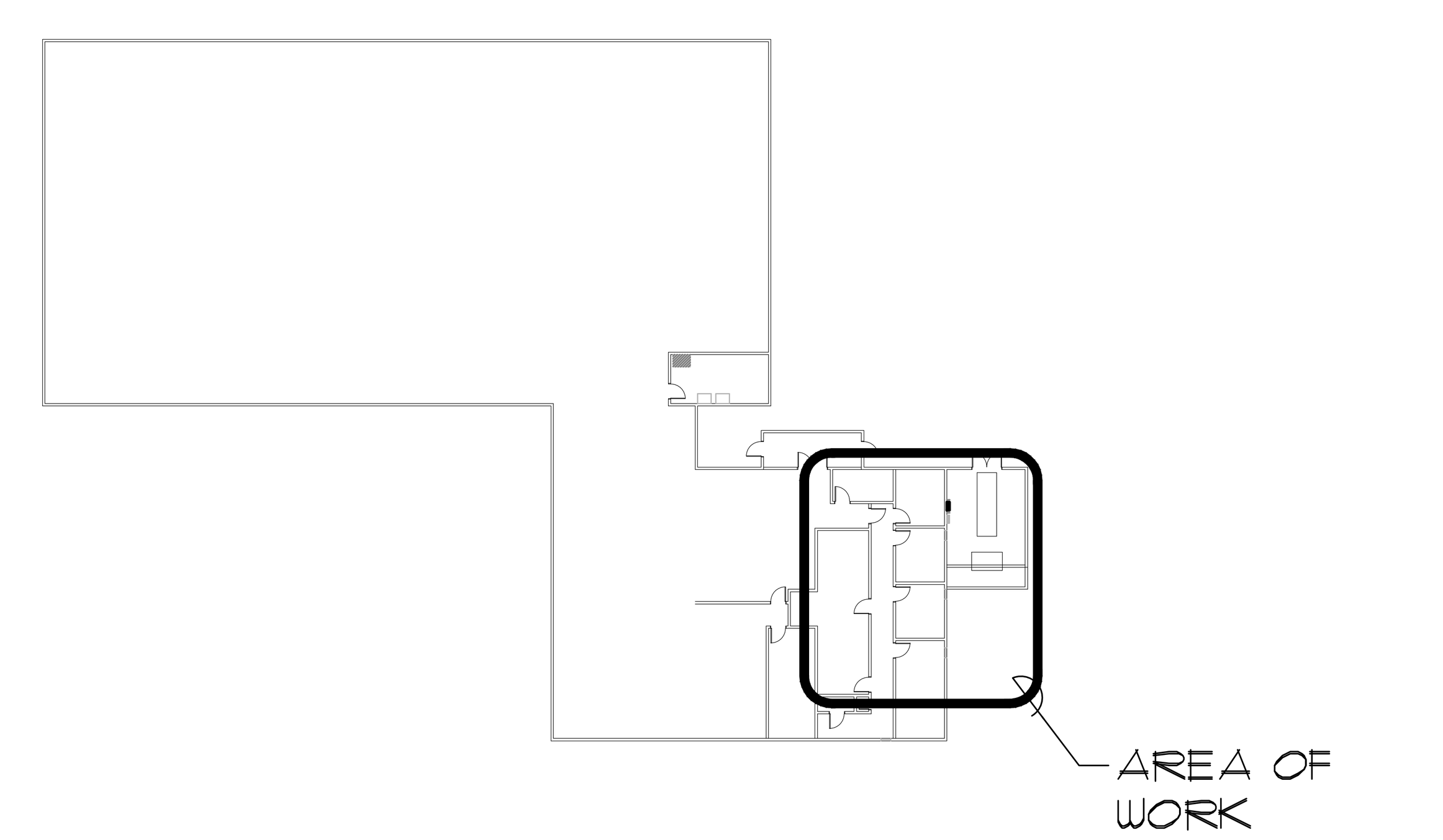
MECHANICAL/PLUMBING ABBREVIATIONS

NOTE: THIS IS A MASTER SCHEDULE. NOT ALL ABBREVIATIONS CONTAINED HEREIN MAY APPEAR ON THE DRAWINGS.

Abbr.	Meaning
AABC	AMERICAN AIR BALANCE COUNCIL
ACD	AUTOMATIC CONTROL DAMPER
AFF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS
ASPE	AMERICAN SOCIETY OF PLUMBING ENGINEERS
AV	ACID VENT
AW	ACID WASTE
BFD	BACKFLOW PREVENTION DEVICE
BHP	BRAKE HORSE POWER
BTUH	BRITISH THERMAL UNIT PER HOUR
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CHAR	CHARACTERISTICS
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CO	CLEANOUT
CR	CONDENSER WATER RETURN
CS	CONDENSER WATER SUPPLY
CW	COLD WATER
D	DRAIN
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DN	DOWN
DX	DIRECT EXPANSION
(E)	EXISTING TO REMAIN
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
ELEC	ELECTRICAL
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
°F	FAHRENHEIT
FCO	FLOOR CLEANOUT
FD	FIRE DAMPER
FPM	FEET PER MINUTE
FSD	FIRE/SMOKE DAMPER
G	GAS
GA	GAGE OR GAUGE
GAL	GALLONS
GCO	GRADE CLEANOUT
GI	GREASE INTERCEPTOR
GPF	GALLONS PER FLUSH
GPM	GALLONS PER MINUTE
GR	GLYCOL RETURN
GS	GLYCOL SUPPLY
GW	GREASE WASTE
HD	HEAD
HP	HORSEPOWER
HPG	HIGH PRESSURE GAS
HR	HOUR
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
HW	HOT WATER
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
IBC	INTERNATIONAL BUILDING CODE
IE	INVERT ELEVATION
IMC	INTERNATIONAL MECHANICAL CODE
IPC	INTERNATIONAL PLUMBING CODE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	ONE THOUSAND BTUH
MCA	MINIMUM CIRCUIT AMPS
MIN	MINIMUM
MOCP	MAXIMUM OVER CURRENT PROTECTION
MPG	MEDIUM PRESSURE GAS
MVD	MANUAL VOLUME DAMPER
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NEBB	NATIONAL ENVIRONMENTAL BALANCING BUREAU
NEC	NATIONAL ELECTRIC CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OBD	OPPOSED BLADE DAMPER
OED	OPEN END DUCT
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
(R)	EXISTING TO BE RELOCATED
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RL/S	REFRIGERANT LIQUID/SUCTION
RPM	REVOLUTIONS PER MINUTE
RPPA	REDUCED PRESSURE PRINCIPAL ASSEMBLY
RVD	REMOTE VOLUME DAMPER
SA	SUPPLY AIR
SD	SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SOI	SAND OIL INTERCEPTOR
"SP	STATIC PRESSURE (INCHES OF)
SPECS	SPECIFICATIONS
SQ	SQUARE
SQFT	SQUARE FEET
SS	STAINLESS STEEL
T	TEMPERATURE
TAB	TEST AND BALANCE WORK AND REPORT
TSP	TOTAL STATIC PRESSURE
TW	TEMPERED WATER
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UMC	UNIFORM MECHANICAL CODE
UON	UNLESS OTHERWISE NOTED
UPC	UNIFORM PLUMBING CODE
V	VENT
V/PH/HZ	VOLTAGE/PHASE/HERTZ
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
WB	WET BULB TEMPERATURE
WCO	WALL CLEANOUT
WG	WATER GAUGE
WMS	WIRE MESH SCREEN
(X)	EXISTING TO BE REMOVED

DRAWING INDEX

SHEET NUMBER	SHEET TITLE	PERMIT ISSUE DATE:12.03.12	: :	: :	: :	: :
MP0.0	SYMBOL LIST, SPECIFCATIONS AND ABBREVIATIONS	●				
MP1.0	MECHANICAL AND PLUMBING PLAN AND DEMOLITION PLAN	●				
	TOTAL	2				



A MP0.0 **OVERVIEW PLAN**
1/32" = 1'-0"

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12.03.12

PROJECT:
DUCTWORK RECONFIGURATION SALLISAW, OK

SHEET TITLE:
SYMBOL LIST, SPECIFCATIONS AND ABBREVIATIONS

DRAWN: MSA
CHECKED: PE
DATE: 12.03.12
SCALE: AS NOTED
JOB NO.: L12269
SHEET: MP0.0

PACKAGED COOLING ONLY ROOFTOP UNIT SCHEDULE

MARK	GENERAL DATA			SUPPLY FAN DATA						COOLING CAPACITY						ELECTRICAL DATA				REMARKS
	MANUFACTURER MODEL	LOCATION	SERVICE	SUPPLY AIR CFM	MIN. OUTSIDE AIR CFM	ESP (IN WG)	RPM	BHP	HP	TOTAL (MBH)	SENSIBLE (MBH)	EAT (DB)	EAT (WB)	AMBIENT TEMP (°F)	EER	MCA	MOCP	V/PH/HZ	OPERATING WEIGHT (LBS)	
RTU 1	MCQUAY MPS-A12B	GROUND	I.T.	4000	0	0.75	1133	3.3	5.0	139.0	102.7	80	67	105	12	71.0	90.0	208/3/60	1250	1, 2, 3, 4

1. AIR CONDITIONING SYSTEM SHALL COMPLY WITH ASHRAE 90.1-2004 STANDARDS.
2. PROVIDE 3/4" CONDENSATE DRAIN AND ROUTE TO APPROVED PLUMBING FIXTURE.
3. PROVIDE 4" HOUSEKEEPING PAD.
4. PROVIDE 1" REPLACEABLE FILTER.
5. PROVIDE PROGRAMMABLE THERMOSTAT.

AIR DISTRIBUTION SCHEDULE

MARK	MANUFACTURER MODEL	AIRFLOW RANGE	SERVICE TYPE	MAX NC	NECK SIZE	PANEL SIZE	REMARKS
D-1 CFM	TITUS FAR	500	CEILING SUPPLY	30	14"ø	24"X24"	1
R-1 CFM	TITUS FAR	0-2000	CEILING RETURN	30	22"X22"	24"X24"	1

1. COORDINATE BORDER, COLOR, FINISH AND EXACT LOCATION WITH ARCHITECT
2. PROVIDE OBD.
3. PROVIDE DUCT TRANSITION AS REQUIRED.
4. PROVIDE RA BOOT AS PER DIAGRAM.
5. PROVIDE RVD AS PER DIAGRAM.

GENERAL NOTES:

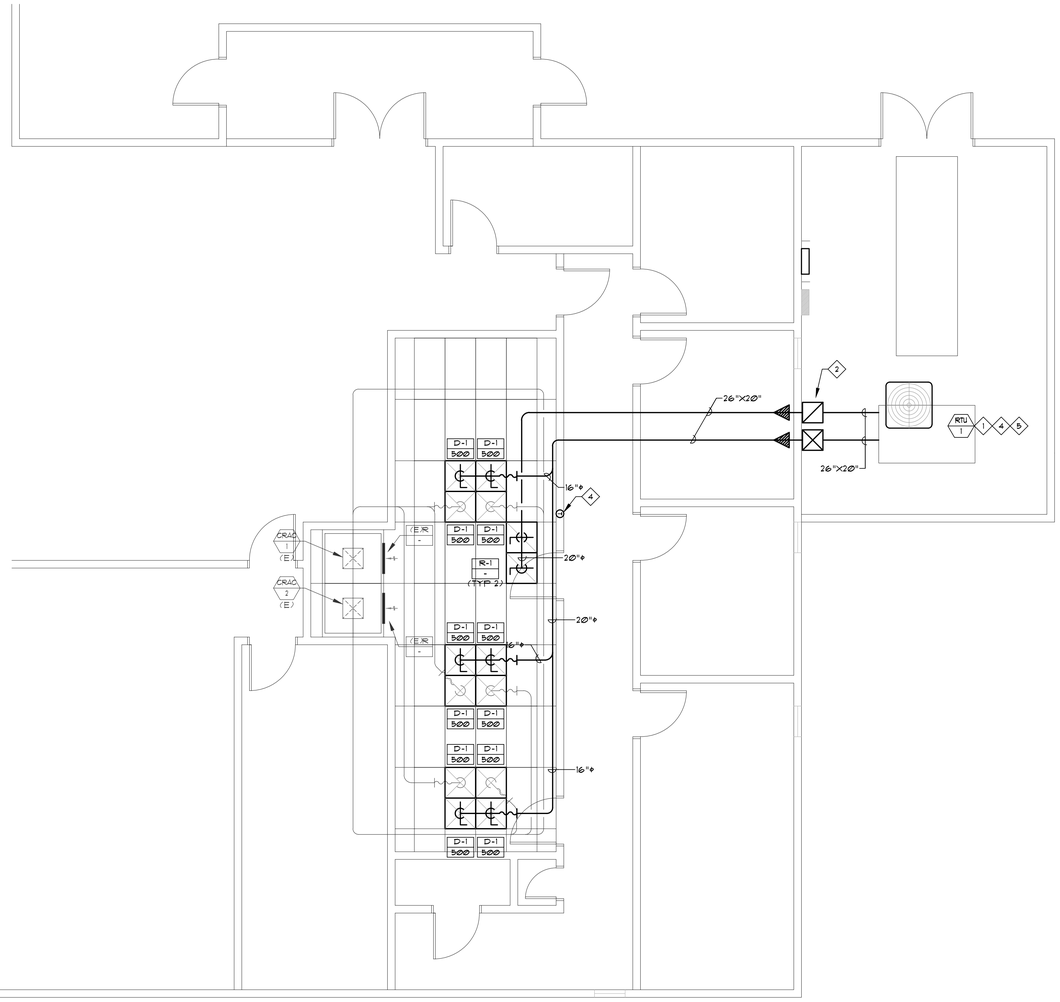
1. ACCESS DOORS ARE REQUIRED FOR ALL DAMPERS INSTALLED ABOVE INACCESSIBLE CEILINGS. COORDINATE EXACT LOCATION OF ALL ACCESS DOORS WITH ARCHITECT PRIOR TO INSTALLATION.
2. VERIFY LOCATION OF ALL THERMOSTATS WITH ARCHITECT PRIOR TO INSTALLATION. MOUNT ALL THERMOSTATS @48" AFF. IN ACCORDANCE WITH ADA STANDARDS. PROVIDE LOCKING COVERS FOR T-STATS.
3. VERIFY AND COORDINATE FRAME AND BORDER TYPE REQUIREMENTS FOR AIR DEVICES WITH ARCHITECTURAL CEILING PLANS PRIOR TO ORDERING.
4. DUCT SIZES SHOWN ARE THE CLEAR INSIDE DIMENSIONS.
5. THE MECHANICAL CONTRACTOR SHALL VERIFY THE LOCATION OF ALL ROOF MOUNTED EQUIPMENT AND ROOF PENETRATIONS WITH ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO COMMENCING WORK.
6. THE MECHANICAL CONTRACTOR SHALL COORDINATE LOCATION AND ROUTING OF HVAC EQUIPMENT AND DUCTWORK WITH OTHER TRADES PRIOR TO COMMENCING WORK.
7. ALL EXHAUST OUTLETS SHALL BE LOCATED MIN. OF 10'-0" FROM ANY OUTSIDE AIR INTAKES.
8. THE CUTTING, NOTCHING AND BORING OF HOLES IN FLOOR JOIST AND WALL STUDS SHALL BE IN ACCORDANCE WITH THE LATEST APPROVED EDITION OF THE INTERNATIONAL BUILDING CODE.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING AS REQUIRED TO ACCOMMODATE HIS WORK.
10. REFER TO THE MECHANICAL DIAGRAMS THAT APPLY TO THE WORK ON THIS DRAWING. THESE DIAGRAMS PROVIDE GUIDANCE AS TO INSTALLATION INTENT AND DO NOT NECESSARILY SHOW ALL COMPONENTS REQUIRED.

DEMOLITION NOTES:

1. EQUIPMENT AND PIPING LOCATIONS SHOWN FROM BEST AVAILABLE INFORMATION. CONTRACTOR SHALL FIELD VERIFY SIZES AND LOCATIONS.
2. EQUIPMENT THAT IS BEING REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE JOB SITE, EXCEPT EQUIPMENT SELECTED BY OWNER. OWNER SELECTED EQUIPMENT WILL BE TAGGED AND SHALL BE MOVED BY CONTRACTOR TO OWNER'S STORAGE ON SITE.
3. WHERE PIPING OR DUCTWORK IS TO BE CUT OFF AT A POINT, IT SHALL BE CAPPED OR BLANKED OFF AT THAT POINT. INSULATION ON REMAINING PIPE OR DUCT TO BE REPAIRED TO NEW CONDITION.
4. PIPING CONNECTED TO EQUIPMENT THAT IS BEING REMOVED SHALL BE CUT AND CAPPED IN WALLS, FLOORS OR CEILING SO AS NOT TO INTERFERE WITH NEW CONSTRUCTION OR EQUIPMENT.

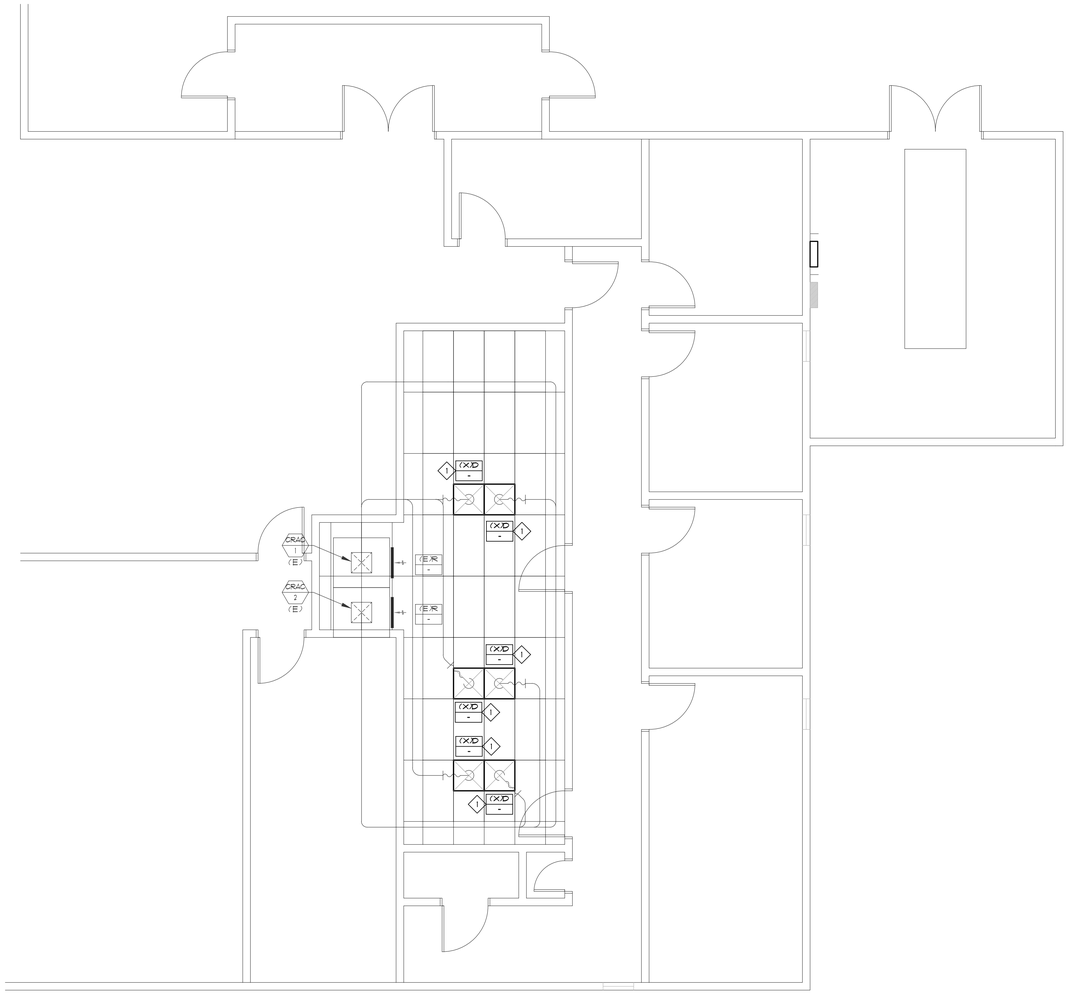
SHEET NOTES:

1. PROVIDE HOUSEKEEPING PAD.
2. 26"X20" SUPPLY AND RETURN DUCT UP. CONTRACTOR TO FIELD COORDINATE ELEVATOR PRIOR TO INSTALLATION.
3. PROVIDE PROGRAMMABLE THERMOSTAT AND WIRING UP TO UNIT AS INDICATED.
4. PROVIDE 2" INTERNAL LINING.
5. ROUTE 3/4" CONDENSATE TO GRADE.



A MP1.0 MECHANICAL AND PLUMBING PLAN
1/4" = 1'-0"

NORTH



B MP1.0 DEMOLITION PLAN
1/4" = 1'-0"

NORTH

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12.03.12

PROJECT:
DUCTWORK RECONFIGURATION
SALLISAW, OK

SHEET TITLE:
MECHANICAL AND PLUMBING PLAN AND DEMOLITION PLAN

DRAWN	MSA
CHECKED	FE
DATE	12.03.12
SCALE	AS NOTED
JOB NO.	L2269
SHEET	MP1.0