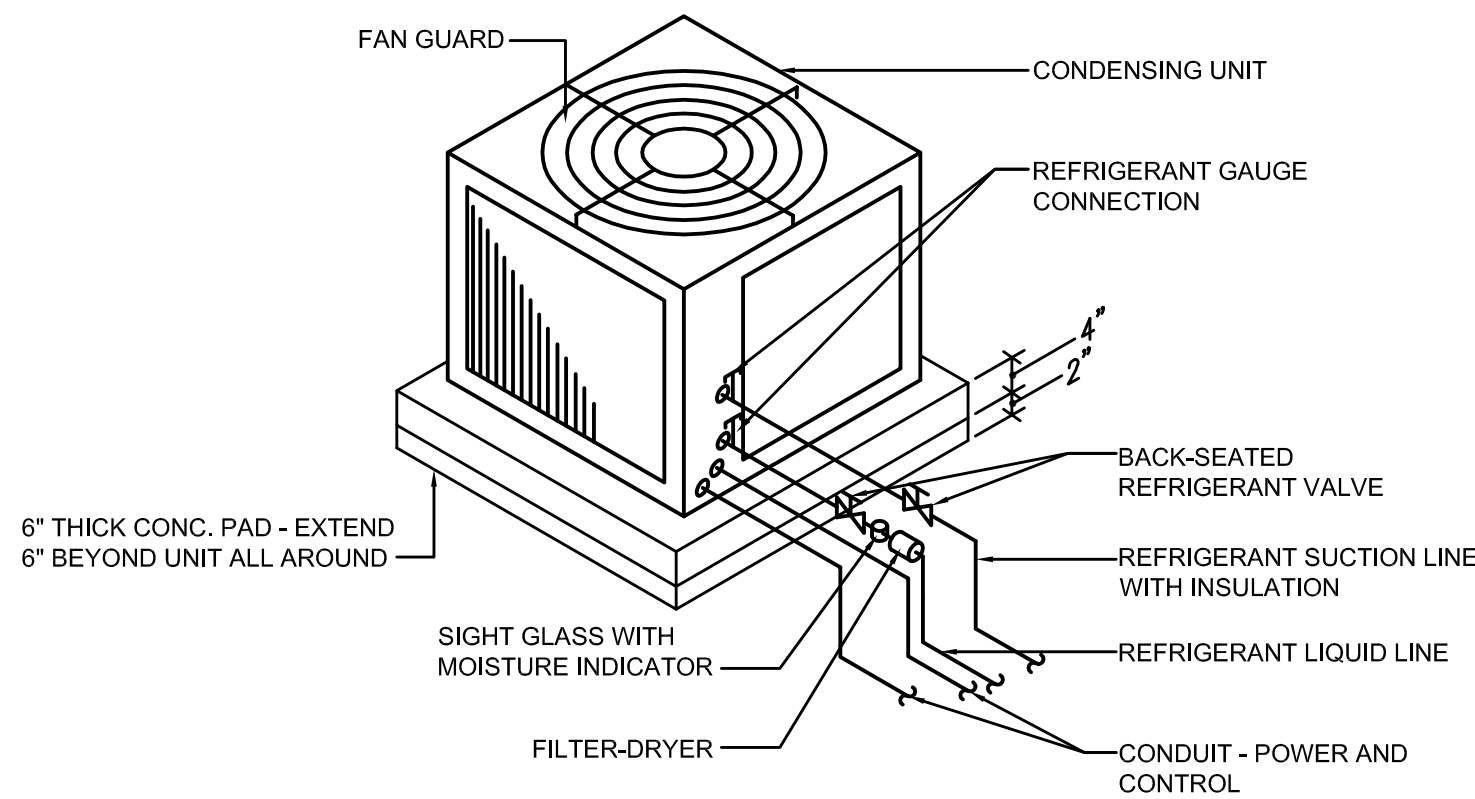


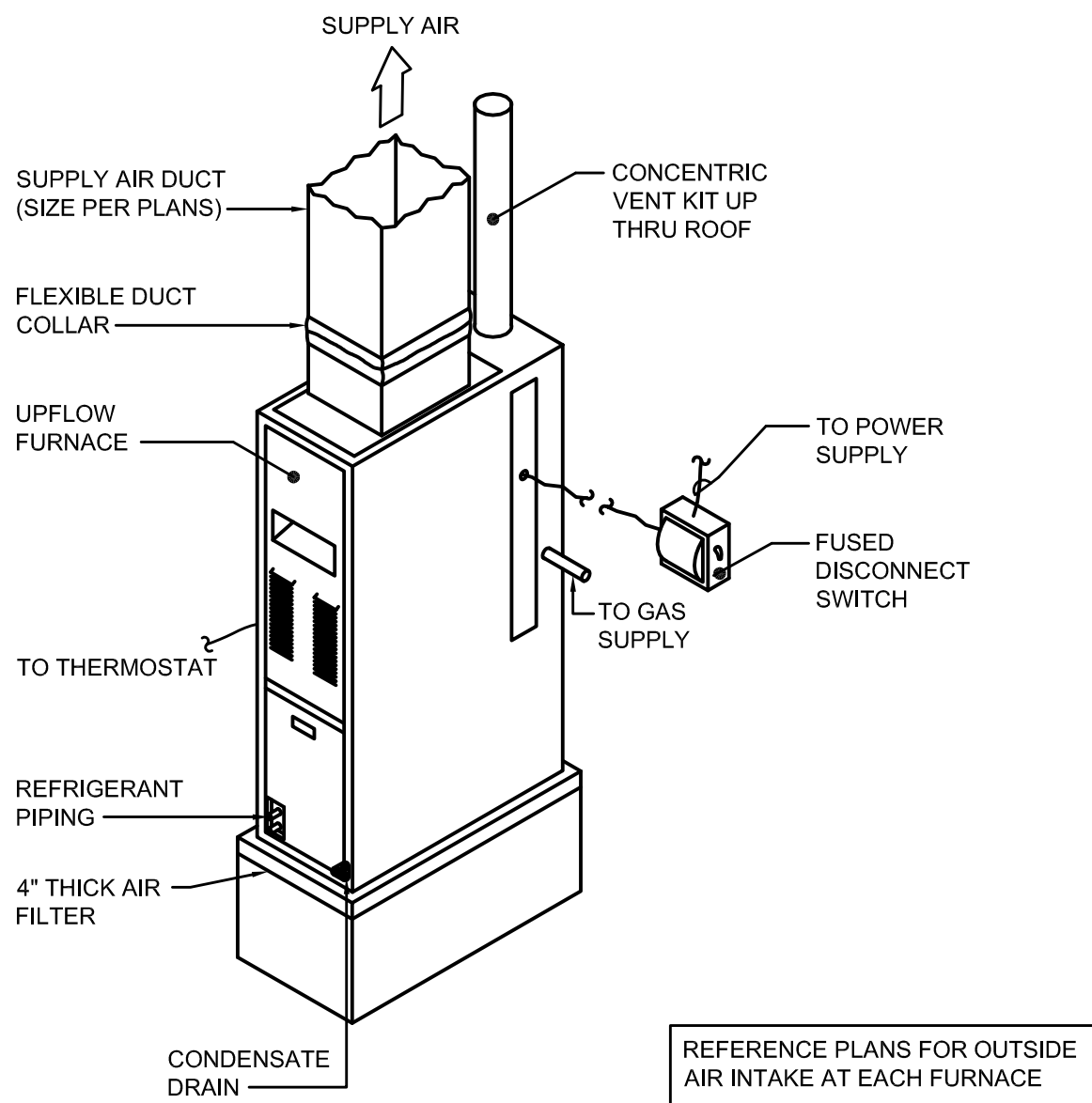
05 CONDENSATE DRAIN DETAIL

N.T.S.



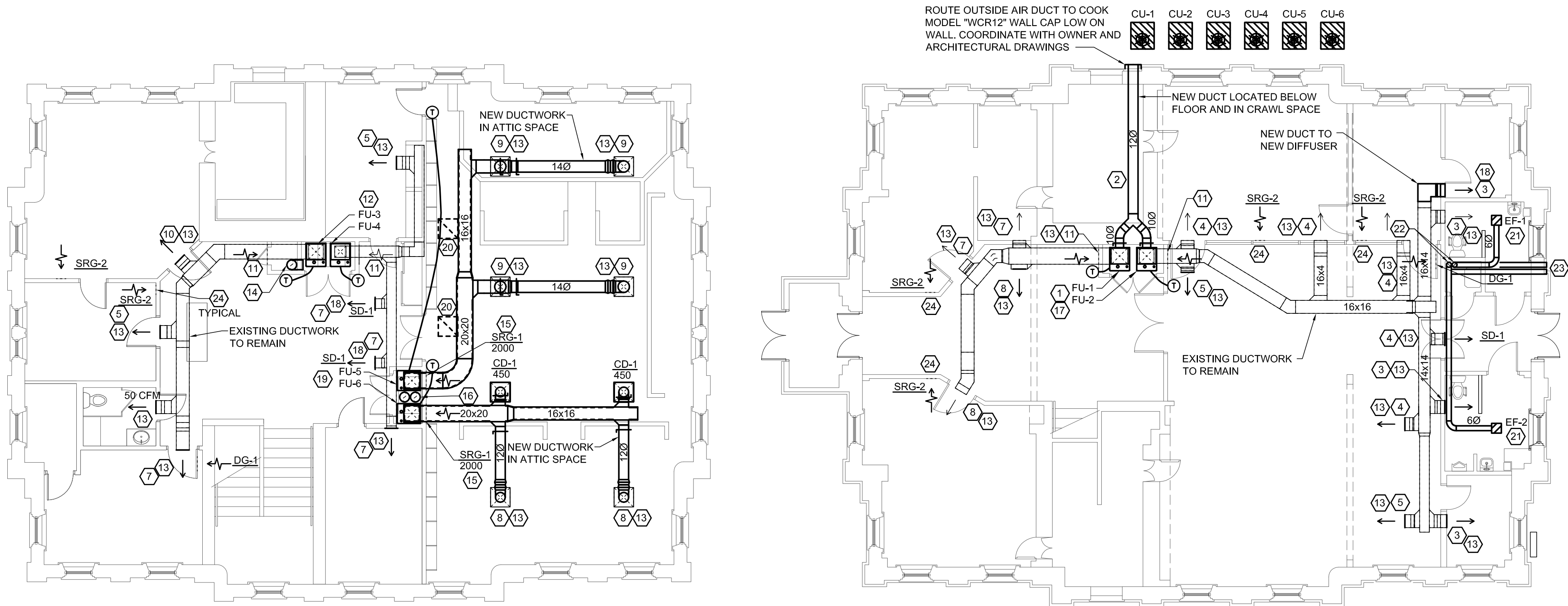
04 AIR-COOLED CONDENSING UNIT - SLAB MOUNTED AT GRADE

N.T.S.



03 GAS FIRED UPFLOW FURNACE DETAIL

N.T.S.



02 SECOND FLOOR MECHANICAL PLAN

1/8" = 1'-0"

01 FIRST FLOOR MECHANICAL PLAN

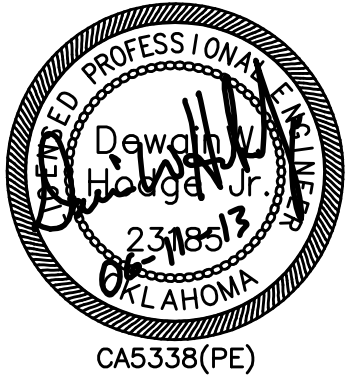
1/8" = 1'-0"

HEX KEY LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
1	REPLACE EXISTING FURNACES WITH (2) 5 TON FURNACES AS SCHEDULED. PROVIDE SEPARATE SUPPLY AND RETURN AIR PLENUMS TO EACH FURNACE RESPECTIVELY. CLEAN EXISTING DUCTWORK AND RETURN AIR PLENUMS. PROVIDE NEW RETURN AIR PLENUM BOX. PLACE UNITS ON NEW MCDANIEL METALS FILTER HOUSING. INSTALL NEW CONCENTRIC VENT KIT AT ROOF. TERMINATION LOCATION MUST BE APPROVED BY ARCHITECT.	13	EXISTING SUPPLY AIR GRILLE TO REMAIN. REPAIR AND PAINT TO LIKE NEW FINISH. COORDINATE COLOR WITH ARCHITECT.
2	ROUTE NEW OUTSIDE AIR DUCT FROM EXTERIOR WALL INTO BUILDING CRAWL SPACE, SPLIT, AND TURN UP INTO FU-1 AND FU-2 RETURN AIR PLENUM(S). PROVIDE MOTORIZED DAMPER FOR EACH BRANCH TAKE OFF TO RETURN AIR PLENUMS. DAMPER OPERATOR TO BE CONTROLLED VIA SUPPLY FAN.	14	ROUTE 12" OUTSIDE AIR DUCT FROM RETURN AIR PLENUM BOX UP TO ATTIC SPACE AND TERMINATE WITH IN 12" OF ATTIC LOUVER. FIELD VERIFY EXACT LOCATION OF LOUVER.
3	BALANCE EXISTING DIFFUSER TO 100 CFM.	15	PROVIDE NEW SIDEWALL RETURN GRILLE AS SCHEDULED MOUNT DOWN LOW DIRECT ADJACENT TO THE FURNACE UNIT(S) RETURN AIR PLENUM BOX
4	BALANCE EXISTING DIFFUSER TO 200 CFM.	16	ROUTE (2)10" OUTSIDE AIR DUCT FROM RETURN AIR PLENUM BOX OF FU-5 AND FU-6 RESPECTIVELY UP TO ATTIC SPACE AND TERMINATE WITH IN 12" OF EXISTING ATTIC LOUVER. FIELD VERIFY EXACT LOCATION OF LOUVER.
5	BALANCE EXISTING DIFFUSER TO 300 CFM.	17	REVISE GAS AND CONDENSATE PIPING TO BE ROUTED UP WALL IN VAULT AND PENETRATE BACK OF FURNACE CLOSET ABOVE RETURN AIR PLENUM.
6	BALANCE EXISTING DIFFUSER TO 350 CFM.	18	NEW SUPPLY GRILLE. MATCH EXISTING
7	BALANCE EXISTING DIFFUSER TO 400 CFM.	19	DEMO EXISTING FURNACE UNIT AND ALL ITS ASSOCIATED DUCTWORK, PLENUM, PIPING, ETC.
8	BALANCE EXISTING DIFFUSER TO 450 CFM.	20	DEMO EXISTING RETURN AIR GRILLE. REPAIR CEILING AS NECESSARY. FIELD VERIFY EXACT LOCATION.
9	BALANCE EXISTING DIFFUSER TO 500 CFM.	21	DEMO EXISTING WALL EXHAUST FANS AND PROVIDE NEW AS SCHEDULED. ROUTE DUCT ABOVE CEILING IN JOIST SPACE. REPAIR CEILINGS AS NECESSARY.
10	BALANCE EXISTING DIFFUSER TO 600 CFM.	22	ROUTE EXHAUST DUCT DOWN TO BASEMENT.
11	EXISTING RETURN AIR GRILLE TO REMAIN. DEMO EXISTING RETURN AIR PLENUM AND CONSTRUCT NEW WOODEN CODE COMPLIANT RETURN AIR PLENUM. MATCH DIMENSIONS OF EXISTING PLENUM. PROVIDE RETURN AIR PARTITION IN PLENUM TO SEPARATE AIR STREAMS. RETURN PLENUMS SHALL BE FREE OF ANY GAS, REFRIGERANT, ELECTRICAL, OR CONDENSATE LINES, TYPICAL.	23	ROUTE EXHAUST DUCT TO EXTERIOR WALL AND TERMINATE AT COOK MODEL "WCR6" WALL CAP. REMOVE ANY UN-USED EXISTING PIPING OR DUCTWORK THAT CONFLICTS WITH ROUTING OF NEW EXHAUST DUCT.
12	REPLACE EXISTING 7.5 TON FURNACE WITH (2) INDIVIDUAL FURNACES AS SCHEDULED. CLEAN EXISTING DUCTWORK AND RETURN AIR PLENUMS. PROVIDE NEW RETURN AIR PLENUM BOX.	24	INSTALL SRG-2 ON BOTH SIDES OF WALL. MATCH ELEVATION OF EXISTING SIDEWALL SUPPLY AIR GRILLES. FIELD VERIFY.

MECHANICAL LEGEND			
	DUCTED AIR DEVICE		RECTANGULAR DUCT (FIRST DIMENSION, SIDE SHOWN)
	PLENUM AIR DEVICE		ROUND DUCT
	SIDEWALL AIR DEVICE		THERMOSTAT (INSTALL 54" A.F.F.)
	MANUAL BALANCE DAMPER		DUCT MOUNTED SMOKE DETECTOR
	EQUIPMENT OR DEVICE TAG	A.F.F.	ABOVE FINISHED FLOOR
	AIR FLOW ARROW	A.F.G.	ABOVE FINISHED GRADE
	CONDENSATE PIPE	CFM	STANDARD CUBIC FEET PER MINUTE
	REFRIGERANT PIPE	(RECT.)	CONTINUATION SYMBOLS
		(ROUND)	

NOTES:

1. PROVIDE NEW CONDENSATE LINES FOR ALL FURNACE UNITS. ROUTE ALL CONDENSATE LINES FROM AIR HANDLING UNITS TO NEAREST FLOOR DRAIN.
2. PROVIDE NEW REFRIGERANT LINES FOR ALL SPLIT SYSTEMS. ROUTE ALL REFRIGERANT LINES DOWN IN EXTERIOR WALL NEAREST ASSOCIATED OUTDOOR UNIT. SIZE PER MANUFACTURER'S RECOMMENDATIONS FOR TONNAGE, DISTANCE, AND ELEVATION CHANGE
3. REFERENCE SHEET M300 FOR GENERAL MECHANICAL NOTES.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CLEARANCE AROUND LADDER LEADING TO CUPOLA IN ATTIC. CONTRACTOR SHALL INCLUDE IN SCOPE OF WORK, THE REMOVAL/RE-ROUTING OF EXISTING DUCT WORK, PIPING, ETC. WITH NEW MECHANICAL AND ELECTRICAL DEFINED IN THIS SCOPE OF WORK. REINSTALL EXISTING TO MAINTAIN PROPER OPERATION UNLESS SPECIFIED OTHERWISE.
5. CONTRACTOR SHALL REMOVE ALL FLUES FOR FURNACE UNITS BEING DEMOLISHED. REPAIR WALL AND ROOF PENETRATIONS AS NECESSARY. REPAIR ROOFING AS REQUIRED.
6. NEW CONCENTRIC VENTING FOR SECOND FLOOR FURNACES SHALL BE ROUTED THROUGH THE ATTIC SPACE AND PENETRATE THE ROOF ON THE NORTH SIDE OF THE BUILDING. TERMINATION LOCATION MUST BE APPROVED BY ARCHITECT/OWNER



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10/15/12

Cherokee Nation Enterprises/ Culture & Tourism

Cherokee Nation Capitol - Phase One

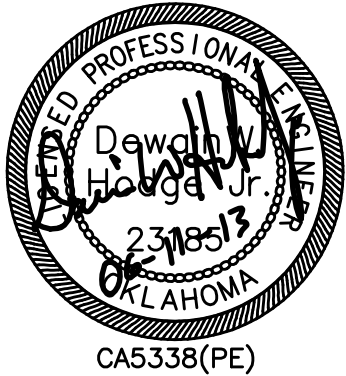
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SHEET TITLE:
MECHANICAL
PLAN AND
DETAILS

M100

MECHANICAL FAN SCHEDULE													
TAG	FAN TYPE	MFR	MODEL	DRIVE	CFM	ESP	RPM	VOLT/PH	hp / w	SONES	CONTROL TYPE	ACCESSORIES	REMARKS
EF-1	CABINET EXHAUST FAN	COOK	GC-140	DIRECT	75	0.25	1386	120/1	58.1 w	2.7	SWITCHED WITH LIGHTS	1 4 6 8	SEE GENERAL REQUIREMENTS BELOW
EF-2	CABINET EXHAUST FAN	COOK	GC-140	DIRECT	75	0.25	1386	120/1	58.1 w	2.7	SWITCHED WITH LIGHTS	1 4 6 8	SEE GENERAL REQUIREMENTS BELOW
GENERAL REQUIREMENTS (ALL FANS)													
A. PROVIDE PRE-WIRED FACTORY MOUNTED INTEGRAL DISCONNECT DEVICE (NEMA 3R FOR EXTERIOR). B. PROVIDE VARIABLE SPEED CONTROLLER (FACTORY INSTALLED IF AVAILABLE) ON ALL DIRECT DRIVE FANS FOR FAN BALANCING. C. PROVIDE WALL SLEEVE, FAN GUARD, EXTERIOR WEATHER HOOD AND MOTORIZED DAMPER WITH TIME DELAY CONTROLS ON ALL WALL MOUNTED PROPELLER FANS. E. PROVIDE ROOF CURB TO MATCH ROOF TYPE AND SLOPE AT ALL ROOF MOUNTED FANS.													
ACCESSORIES LEGEND													
1 PROVIDE BACK DRAFT DAMPER. 2 PROVIDE MOTORIZED DAMPER WITH TIME DELAY FAN START. MECHANICAL CONTRACTOR RESPONSIBLE FOR INSTALLING FAN, ROOF CURB, BACK DRAFT DAMPER, AND ALL INTERNAL POWER AND CONTROL WIRING AS REQUIRED TO PROVIDE FULLY OPERATIONAL FAN AND DAMPER.							4 PROVIDE SPUN ALUMINUM VENT CAP, COOK MODEL "PR" WITH ROOF CURB. 5 PROVIDE MANUFACTURER'S BRICK VENT. 6 PROVIDE MANUFACTURER'S WHITE ALUMINUM GRILLE. 7 PROVIDE BIRD SCREEN. 8 PROVIDE ISOLATOR KIT.						



MECHANICAL PIPING AND INSULATION SCHEDULE			
EQUIPMENT DRAINS, COOLING CONDENSATE LINES, AND OVERFLOWS	TYPE "L" HARD COPPER	ELASTOMERIC	3/8" IF INTERIOR SPACE N/A EXTERIOR SPACE
REFRIGERANT PIPING	COPPER REFRIGERANT PIPING	ELASTOMERIC	1" ON SUCTION LINE

CONDENSING UNIT SCHEDULE												
TAG	DESCRIPTION	MFR	MODEL	NOM TON	SEER	VOLTS/PH	FLA	MCA	MOCP	WEIGHT	REMARKS	ELECTRICAL REQUIREMENTS
CU-1	CONDENSING UNIT	TRANE	4TTB5-060	5	15	208/1	26.2	32	50	267	PAIRED WITH FU-1	CONNECT TO EXISTING
CU-2	CONDENSING UNIT	TRANE	4TTB5-060	5	15	208/1	26.2	32	50	267	PAIRED WITH FU-2	CONNECT TO EXISTING
CU-3	CONDENSING UNIT	TRANE	4TTB5-048	4	15	208/1	20	25	40	271	PAIRED WITH FU-3	40A/2P CIRCUIT BREAKER, 1/2"C, 2#8, 1#10 GR
CU-4	CONDENSING UNIT	TRANE	4TTB5-036	3	13	208/1	11	13	20	189	PAIRED WITH FU-4	20A/2P CIRCUIT BREAKER, 1/2"C, 2#12, 1#12 GR
CU-5	CONDENSING UNIT	TRANE	4TTB5-060	5	15	208/1	26.2	32	50	267	PAIRED WITH FU-5	40A/2P CIRCUIT BREAKER, 1/2"C, 2#8, 1#10 GR
CU-6	CONDENSING UNIT	TRANE	4TTB5-048	4	15	208/1	20	25	40	271	PAIRED WITH FU-6	CONNECT TO EXISTING
NOTES:												
1. ALL CONDENSORS TO INCLUDE: ANTL RECYLCE TIMERS, LOW AMBIENT CONTROLS, CRANKCASE HEATERS, HIGH AND LOW PRESSURE CONTROLS, TXV, AND COIL GUARDS. COOLING COIL TO MATCH ORIENTATION OF FURNACE OR AIR-HANDLING UNIT EFFICIENCY AND EFFICIENCY OF CONDENSING UNIT.												

AIR DEVICE SCHEDULE								
TAG	DESCRIPTION	MFR	MODEL	FACE SIZE	FRAME SIZE	NECK	MATERIAL / FINISH	REMARKS
CD-1	CEILING DIFFUSER LOUVERED FACE, ADJUSTABLE	TITUS	TDCA	18x18 FACE	24x24 FRAME	14"	ALUMINUM / WHITE	SURFACE MOUNTED, UP TO 650 CFM
SRG-1	SIDEWALL RETURN GRILLE 45° DEFLECTION 3/4" O.C. SPACING. BLADES PARALLEL TO LONG DIMENSION	TITUS	33	42x34 FACE	44x36 FRAME	42x34	ALUMINUM / WHITE	SURFACE MOUNTED, UP TO 2000 CFM
SRG-2	SIDEWALL RETURN GRILLE 45° DEFLECTION 3/4" O.C. SPACING. BLADES PARALLEL TO LONG DIMENSION	TITUS	33	24x20 FACE	26x22 FRAME	24x20	ALUMINUM / WHITE	SURFACE MOUNTED, UP TO 800 CFM
DG-1	DOOR GRILLE. SIGHT PROOF BLADES PARALLEL TO LONG DIMENSION	TITUS	CT-700	18x18 FACE	20x20 FRAME	18x18	ALUMINUM / WHITE	DOOR MOUNTED, UP TO 600 CFM
COORDINATE AIR DEVICE DEFLECTION ADJUSTMENTS WITH MECHANICAL ENGINEER DURING AIR BALANCE.								

MECHANICAL DUCTWORK AND INSULATION SCHEDULE			
SERVICE	DUCT TYPE	INSULATION TYPE	INSULATION THICKNESS
ALL LOW PRESSURE CONSTANT VOLUME SUPPLY AIR DUCT FROM AIR HANDLER OR PACKAGED UNIT	ROUND WRAPPED OR RECTANGULAR LINED, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER	2" WRAP OR 1" LINER
ALL RUNOUTS TO SUPPLY DIFFUSERS AND RETURN GRILLES CONCEALED ABOVE CEILINGS	ROUND WRAPPED OR RECTANGULAR LINED, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER	2" WRAP OR 1" LINER
ALL ROUND RUNOUTS TO SUPPLY DIFFUSERS AND RETURN GRILLES VISIBLE TO OCCUPIED SPACE	DOUBLE WALL SPIRAL WITH PERFORATED METAL LINER	FIBERGLASS EQUAL TO UNITED MCGILL ACOUSTIC - K27	1"
ALL SUPPLY AIR DIFFUSERS (BACKSIDE, NOT EXPOSED TO SPACE)	N/A	FIBERGLASS WRAP	2" WRAP
ALL SUPPLY AND RETURN DUCT SERVING SOUND SENSITIVE ROOMS	DOUBLE WALL SPIRAL WITH PERFORATED METAL LINER	FIBERGLASS EQUAL TO UNITED MCGILL ACOUSTIC - K27	1"
VENTILATED ATTIC DUCTWORK	ROUND WRAPPED OR RECTANGULAR LINED, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER	R-6 WRAP OR R-6 LINER
NOTE: PROVIDE SPIRAL OVAL DUCT IN PLACE OF ROUND SPIRAL WHERE SHOWN ON PLANS OR AS REQUIRED DUE TO LIMITED SPACE.			

FURNACE SCHEDULE																				
TAG	UNIT CONFIGURATION	MFR	MODEL	NOM. TONS	COOL CFM	O/A CFM	E.S.P. (In w.c.)	COOLING EDB/EWB °F	HEAT MBH IN / OUT	AFUE	VOLTS/PH	FAN hp	FLA	MCA	MOCP	WEIGHT (lb)	CONTROL TYPE	ACCESSORIES	REMARKS	ELECTRICAL REQUIREMENTS
FU-1	FURNACE, GAS FIRED, UPFLOW	TRANE	TUX120	5	2000	200	0.5	80/67	120 / 113	90	120/1	3/4	13.8	12.9	15	193	PROG. T-STAT	CONCENTRIC VENT KIT	PROVIDE 24"X24"X2" EXTERNAL FILTER HOUSING WITH MERV 8 FILTER. PROVIDE DUCT DETECTOR IN RETURN AIR PLENUM.	CONNECT TO EXISTING
FU-2	FURNACE, GAS FIRED, UPFLOW	TRANE	TUX120	5	2000	200	0.5	80/67	120 / 113	90	120/1	3/4	13.8	12.9	15	193	PROG. T-STAT	CONCENTRIC VENT KIT	PROVIDE 24"X24"X2" EXTERNAL FILTER HOUSING WITH MERV 8 FILTER. PROVIDE DUCT DETECTOR IN RETURN AIR PLENUM.	CONNECT TO EXISTING
FU-3	FURNACE, GAS FIRED, UPFLOW	TRANE	TUX100	4	1600	160	0.5	80/67	100 / 93	90	120/1	1/2	9.8	12.5	15	160	PROG. T-STAT	CONCENTRIC VENT KIT	PROVIDE 24"X24"X2" EXTERNAL FILTER HOUSING WITH MERV 8 FILTER. PROVIDE DUCT DETECTOR IN RETURN AIR PLENUM.	CONNECT TO EXISTING
FU-4	FURNACE, GAS FIRED, UPFLOW	TRANE	TUX100	3	1200	120	0.5	80/67	100 / 93	90	120/1	1/2	9.8	12.5	15	160	PROG. T-STAT	CONCENTRIC VENT KIT	PROVIDE 24"X24"X2" EXTERNAL FILTER HOUSING WITH MERV 8 FILTER. PROVIDE DUCT DETECTOR IN RETURN AIR PLENUM.	CONNECT TO EXISTING
FU-5	FURNACE, GAS FIRED, UPFLOW	TRANE	TUX120	5	2000	200	0.5	80/67	120 / 113	90	120/1	3/4	13.8	12.9	15	193	PROG. T-STAT	CONCENTRIC VENT KIT	PROVIDE 24"X24"X2" EXTERNAL FILTER HOUSING WITH MERV 8 FILTER. PROVIDE DUCT DETECTOR IN RETURN AIR PLENUM.	CONNECT TO EXISTING
FU-6	FURNACE, GAS FIRED, UPFLOW	TRANE	TUX100	4	1600	160	0.5	80/67	100 / 93	90	120/1	1/2	9.8	12.5	15	160	PROG. T-STAT	CONCENTRIC VENT KIT	PROVIDE 24"X24"X2" EXTERNAL FILTER HOUSING WITH MERV 8 FILTER. PROVIDE DUCT DETECTOR IN RETURN AIR PLENUM.	15A/1P CIRCUIT BREAKER, 1/2"C, #12W PANEL B

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ELECTRICAL NOTES

1. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH THE NATIONAL ELECTRIC CODE, STATE LAWS, AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
2. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIAL, AND LABOR TO SATISFY A COMPLETE AND WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
3. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES AS REQUIRED.
4. CONTRACTOR TO CONFIRM EXACT LOCATION OF EXISTING AND NEW EQUIPMENT WITH OWNERS AGENTS.
5. CONDUIT RUNS ARE DIAGRAMMATICALLY SHOWN ON THE DRAWINGS. FINAL ROUTING OF THE CONDUITS SHALL BE DETERMINED BY THE ELECTRICAL CONTRACTOR.
6. FIELD MOUNTED DEVICES SUCH AS SWITCHES, MOTOR STARTERS, RECEPTACLES, ETC., ARE SHOWN IN THEIR APPROXIMATE LOCATION. SWITCH MOUNTING HEIGHT SHALL BE 48" ABOVE FINISHED FLOOR AND RECEPTACLE MOUNTING HEIGHT SHALL BE 18" ABOVE FINISHED FLOOR. REFER TO THE TYPICAL MOUNTING HEIGHT DETAIL.
7. POWER WIRING SHALL BE COPPER STRANDED CONDUCTOR WITH "THHN" OR "THWN" INSULATION RATED 600 VOLTS. MINIMUM WIRE SIZE OF POWER WIRING SHALL BE #12 AWG. LIGHTING AND RECEPTACLE BRANCH CIRCUIT WIRING SHALL BE #12 AWG UNLESS OTHERWISE NOTED ON DRAWINGS OR SCHEDULES.
8. HOME RUN CIRCUITS MORE THAN 75 FEET FROM THE PANELBOARD SHALL BE MADE WITH #10 AWG OR LARGER AS REQUIRED TO LIMIT VOLTAGE DROP TO 3% MINIMUM.
9. THE TYPE OF CONDUIT SHALL BE AS FOLLOWS FOR ALL FEEDERS AND DISTRIBUTION CIRCUITS, UNLESS OTHERWISE SPECIFIED.

APPLICATION	TYPE OF CONDUIT
BURIED IN CONCRETE OR OUTDOORS	PVC WITH RIGID GALVANIZED
SERVICE ENTRANCE STEEL OR UTILITY SPECIFICATIONS	GALVANIZED RIGID SERVICE
SUPPLY TO DISTRIBUTION PANELS AND HVAC EQUIPMENT	EMT
BRANCH CIRCUITS	EMT

10. ALL RECEPTACLES SHALL BE GROUNDING TYPE.
11. ALL ELECTRIC MATERIALS AND EQUIPMENT FOR THE PROJECT SHALL BE NEW AND U.L. OR EQUALLY LISTED.
12. FIRE ALARM CONTRACTOR SHALL FURNISH AND WIRE DUCT MOUNTED SMOKE DETECTORS. THE DETECTORS SHALL BE INSTALLED IN DUCT BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL MAKE ALL FINAL ELECTRICAL CONNECTIONS AS REQUIRED. HVAC UNIT SHALL SHUT DOWN UPON ACTIVATION OF SMOKE DETECTOR.
13. FIELD VERIFY LOCATIONS OF EXISTING ELECTRICAL EQUIPMENT, INCLUDING POWER POLES, TELEPHONE PEDESTALS, OVERHEAD AND UNDERGROUND FEEDERS, METERS, PANELS, DEVICES, ETC. PROVIDE FOR COORDINATION WITH EXISTING EQUIPMENT.
14. COORDINATE MECHANICAL EQUIPMENT CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE FEEDERS, DISCONNECTS AND MAINTENANCE RECEPTACLES SO THAT THEY WILL NOT INTERFERE WITH OPERATION OR MAINTENANCE OF MECHANICAL EQUIPMENT.

HVAC GENERAL NOTES

1. SUBMISSION OF PROPOSAL IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
2. ALL RECTANGULAR DUCT SIZES SHOWN ARE THE OUTSIDE METAL DIMENSIONS. DUCT DIMENSIONS ALREADY HAVE ALLOWANCES FOR THE INSULATION LINER WHERE APPLICABLE IN THE RECTANGULAR DUCTS. AT DUAL WALL DUCTS, THE DIMENSION SHOWN IS THE OUTSIDE METAL DUCT SIZE AND ALREADY HAVE ALLOWANCES FOR THE INSULATION THICKNESS.
3. ALL WORK SHALL CONFORM TO STATE AND LOCAL CODES, RULES, REGULATIONS, AND ORDINANCES, WHICH SHALL TAKE PRECEDENCE OVER THE PLANS IF CONFLICTS EXIST BETWEEN THEM.
4. THE DRAWINGS INDICATE THE GENERAL LAYOUT REQUIREMENTS FOR EQUIPMENT, FIXTURES, PIPING, DUCTWORK, ETC. FINAL LAYOUT SHALL BE MODIFIED TO FIT ACTUAL SITE CONDITIONS.
5. COORDINATE ALL WORK WITH THE OWNER AND ALL OTHER CONTRACTORS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING, AND PROTECTION OF MATERIALS. PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT, AND TRANSFER TO POINT OF INSTALLATION OF ANY OWNER FURNISHED ITEMS.
6. IN CASES OF EQUIPMENT SUBSTITUTION, CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT ALL SYSTEMS AND COMPONENTS WILL FIT PROPERLY PRIOR TO FABRICATION OR ORDERING. INSTALLED DUCTS MAY BE RESIZED BY THE CONTRACTOR TO FIT FIELD CONDITIONS AS LONG AS THE INSTALLED DUCTS SHALL HAVE EQUAL FRICTION LOSS TO THOSE SHOWN. RECTANGULAR DUCTS SHALL NOT BE CHANGED TO ROUND DUCTS. PROVIDE COMPLETE SHEET METAL SHOP DRAWINGS TO ENGINEER SHOWING ACTUAL DUCT SIZES, ARRANGEMENTS, AND UNIT LOCATIONS TO BE INSTALLED. THIS SHALL BE DONE PRIOR TO FABRICATION OR INSTALLATION.
7. INSTALL ACOUSTIC TURNING VANES IN ELBOWS IN RECTANGULAR DUCTS 20" AND LARGER. INSTALL RADIUS TYPE ELBOWS IN RECTANGULAR DUCTS SMALLER THAN 20".
8. USE 45 DEGREE TAKE-OFF FITTINGS AT ALL ROUND SUPPLY BRANCH TAKEOFFS. PROVIDE BALANCE DAMPERS AT ALL SUPPLY DUCT RUNOUTS TO GRILLES. LOCATE AS FAR AS POSSIBLE FROM GRILLES IN AN ACCESSIBLE LOCATION. PROVIDE ACCESS PANELS IN SOLID WALLS AND CEILINGS FOR BALANCING DAMPERS.
9. USE FLEX DUCTS FOR FINAL CONNECTION TO ALL CEILING DIFFUSERS, AND WHERE NECESSARY, SIDEWALL DIFFUSERS, AND LIMIT TO 6' MAX. LENGTHS.
10. PROVIDE A COMPLETE AND OPERATING MECHANICAL SYSTEM, INCLUDING ALL INCIDENTAL ITEMS AND CONNECTIONS NECESSARY FOR PROPER OPERATION OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM MAY NOT BE INDICATED.
11. THE MECHANICAL INSTALLATION SHALL BE SAFE, RELIABLE, ENERGY EFFICIENT AND EASILY MAINTAINED WITH ADEQUATE PROVISIONS ALLOWED FOR ACCESS TO EQUIPMENT.
12. THE MECHANICAL SYSTEM SHALL OPERATE QUIETLY WITH NOISE LEVELS BELOW THE CRITERIA RECOMMENDED FOR THE APPLICATION BY ASHRAE. PROVIDE CORRECTIVE ACTION AS REQUIRED TO REDUCE OBJECTIONABLE NOISE OR VIBRATION.
13. UNDERCUT DOORS 3/4 INCH WHERE NO RETURN NOR EXHAUST GRILLE IS SHOWN TO ALLOW FOR AIR TRANSFER (DO NOT UNDERCUT FIREDOORS.)
14. REFER TO ARCH. PLANS AND DETAILS FOR EXACT LOCATION OF ALL WALL AND CEILING MOUNTED DEVICES. ADJUST LOCATION OF SIDEWALL DEVICES AS NECESSARY TO AVOID INTERFERENCE WITH MOLDING OR OTHER ELECTRICAL DEVICES.
15. WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE SLEEVEES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATETERIAL THAT IS UL LISTED AND ACCEPTED BY LOCAL AUTHORITIES HAVING JURISDICTION (AHJ) AS BEING SUITABLE FOR THIS SERVICE SUCH AS DOWN CORNING CORP "SILICONE ELASTOMER, RTV FOAM, OR SIMILAR MATERIAL TO MAINTAIN FIRE RATING OF THE WALL OR FLOOR.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AND BEAM PENETRATIONS AS IT RELATES TO HIS WORK.
17. CONTRACTOR SHALL NOT INSTALL ANY MAINTENANCE ITEMS ABOVE HARD CEILINGS. THIS SHALL INCLUDE VALVES, DAMPERS, OR ANY OTHER ITEMS THAT REQUIRE ACCESS AFTER CONSTRUCTION IS COMPLETED. IF INSTALLATION ABOVE A HARD CEILING OF THESE ITEMS CANNOT BE AVOIDED, THEN PROVIDE CEILING ACCESS DOORS EQUAL TO ACUDOR MODEL FW-505 WHERE REQUIRED. AT FIRE-RATED WALLS, USE EQUIVALENT OF ACUDOR MODEL FB-5060. MINIMUM SIZE SHALL BE 12"x12". USE 18"x18" WHEN PERSONNEL ACCESS IS REQUIRED.
18. PROVIDE AN INSULATED BACK ON ALL THERMOSTATS AND TEMPERATURE SENSORS THAT ARE MOUNTED ON CMU OR HOLLOW WALLS. PROVIDE SHALLOW DEVICE EXTENSION BOX BEHIND T-STATS AND SENSORS ON MASONRY WALLS IN COMMERCIAL/RETAIL SPACES.
19. PROVIDE FIRE DAMPERS AT ALL FIRE-RATED WALLS AND FLOOR PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE BARRIER WALLS AND CEILINGS.

MECHANICAL SPECIFICATIONS

1. SUMMARY OF WORK

A. THE DRAWINGS INDICATE DIAGRAMMATICALLY THE EXTENT, GENERAL CHARACTER AND LOCATION OF THE WORK INCLUDED. OFFSETS AND/OR CHANGES IN ELEVATION OF PIPING AND DUCTWORK DUE TO STRUCTURAL OR OTHER INTERFERENCES SHALL BE PROVIDED WITHOUT EXTRA COST.

B. CONTRACTOR SHALL VERIFY AND EVALUATE ALL EXISTING CONDITIONS PRIOR TO THE COMMENCEMENT OF WORK.

C. PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF COMPLETE AND OPERATING SYSTEMS.

D. PROVIDE ONE YEAR GUARANTEE AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP AFTER FINAL ACCEPTANCE BY OWNER.

E. ENTIRE DEMOLITION AND NEW WORK INSTALLATION SHALL CONFORM WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF MUNICIPAL, STATE AND FEDERAL AUTHORITIES INCLUDING BOCA, ASME, ASTM, ANSI, ASHRAE, SMACNA AND NFPA.
2. MOTORS AND DRIVES

A. MOTOR MANUFACTURERS: GENERAL ELECTRIC TRI-CLAD 700 LINCOLN, GOULD E-PLUS.

B. BELT DRIVE MANUFACTURERS: T.B. WOODS, BROWNING, EATON.

C. MOTOR CHARACTERISTICS: SEE EQUIPMENT SCHEDULES FOR ALL MOTOR SIZE AND VOLTAGE CHARACTERISTICS.

D. MOTOR TYPE:

1. HIGH EFFICIENCY (NEMA IEEE 112B), CONSTANT SPEED, 1.15 SERVICE FACTOR, CLASS B INSULATION, SQUIRREL CAGE INDUCTION TYPE.

2. PROVIDE TEFC OR TEOA MOTORS.

E. DRIVES: V-BELT, UNLESS OTHERWISE SPECIFIED, DESIGNED FOR 150 PERCENT OF HP RATING; BELT TENSIONER, VARIABLE PITCH SHEAVES FOR BALANCING AND PERMANENT FIXED PITCH SHEAVES. DELIVER VARIABLE PITCH SHEAVES TO OWNER AFTER FIXED PITCH SHEAVE REPLACEMENT.

F. GUARDS: IN ACCORDANCE WITH OSHA. PROVIDE GREASE FITTING EXTENSIONS TO GUARD EXTERIOR AND TACHOMETER HOLE COVERPLATES.
3. MECHANICAL EQUIPMENT AND PIPING IDENTIFICATION

A. PROVIDE IDENTIFICATION OF ALL PIPES, VALVES, AND EQUIPMENT

B. IDENTIFICATION DEVICES TO BE USED SHALL INCLUDE THE FOLLOWING:

1. PLASTIC PIPE MARKERS

2. VALVE TAGS AND EQUIPMENT TAGS

3. VALVE SCHEDULE

C. IDENTIFICATION MATERIALS MANUFACTURED BY ONE OF THE FOLLOWING:

1. SETON NAMEPLATE CORP.

2. ALLEN SYSTEMS INC.

3. BRADY CO.
4. REFRIGERANT PIPING

A. PIPE: REFER TO MECHANICAL PIPING AND INSULATION SCHEDULE FOR MATERIAL TYPES FOR ALL SERVICES OF PIPE. USE WROUGHT COPPER FITTINGS AND BRAZED JOINTS; INSTALL REFRIGERANT PIPING IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS AND ASHRAE STANDARD 15.
5. INSULATION

ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS IN ACCORDANCE WITH ASTM E84 AND NFPA 90A.

A. DUCTWORK INSULATION

1. REFER TO MECHANICAL DUCTWORK AND INSULATION SCHEDULE FOR INSULATION TYPES FOR ALL SERVICES OF DUCT.

B. REFRIGERANT PIPING INSULATION

1. REFER TO MECHANICAL PIPING AND INSULATION SCHEDULE FOR INSULATION TYPE AND THICKNESS. COAT WITH WATER BASED LATEX ENAMEL COATING RECOMMENDED BY MANUFACTURER.

C. EXISTING DUCTWORK AND PIPING INSULATION

1. ALL EXISTING INSULATION FOR DUCTWORK AND PIPING SYSTEMS PERTAINING TO THIS WORK, SHALL BE PATCHED AND/OR REPLACED AS REQUIRED TO MAINTAIN A VAPOR BARRIER.
6. SUPPORTS AND ANCHORS

A. MANUFACTURERS: GRINNELL, B-LINE, O.Z. GEDNEY, MICHIGAN HANGER, BERGEN/CARPENTER AND PATERSON.

B. USE MATERIALS COMPATIBLE WITH PIPING SYSTEMS AVOIDING ELECTROLYTIC ACTION AND CONFORM TO ANSI/ASME B31, NFPA, MSS SP-58, 69, 89. 7.
7. TESTING AND BALANCING

A. AIR BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF ADJUSTABLE FAN SHEAVES. EXISTING BRANCH DAMPERS ARE TO BE USED FOR ANY REQUIRED TRIM ADJUSTMENT.

B. UPON COMPLETION OF THE INSTALLATION, THE CONTRACTOR SHALL REPLACE ANY ANY EXISTING PORTION OF THE ASSOCIATED SYSTEM(S) AFFECTED BY THE RENOVATIONS.

C. THE CONTRACTOR SHALL PROVIDE ALL LABOR AND EQUIPMENT REQUIRED TO BALANCE ALL AIR SYSTEMS IN ACCORDANCE WITH QUANTITIES SHOWN.

D. BALANCING SHALL BE PERFORMED UNDER THE SUPERVISION OF A PROFESSIONAL ENGINEER AND REPORT SHALL BE PROVIDED ON AABC TYPE FORMS.
8. STEAM AND CONDENSATE PIPING AND SPECIALTIES

A. PIPE: REFER TO MECHANICAL PIPING AND INSULATION SCHEDULE FOR MATERIAL TYPES FOR ALL SERVICES OF PIPE.

B. JOINTS: 1-1/2 INCH AND SMALLER: THREADED

C. FITTINGS: 1-1/2 INCH AND SMALLER: FORGED STEEL, THREADED, 3000 PSI; ANSI B2.1, SCREWED, ASTM

D. UNIONS (1-1/2 INCH AND SMALLER): FORGED STEEL, BRONZE TO IRON GROUND JOINT, THREADED, 3000 PSI; ASTM A105, ANSI B21.

E. SHUT-OFF VALVES: 1-1/2 INCH AND SMALLER: 150 PSI BRONZE GATE, THREADED ENDS, SOLID WEDGE, RISING STEM, UNION BONNET, GRINNELL FIGURE 3080 WITH TFE PACKING.

F. STEAM TRAPS - FLOAT & THERMOSTATIC: FLOAT AND THERMOSTATIC TRAPS: ASTM A126, CAST IRON BODY AND BOLTED COVER FOR 125 PSI SWP; PROVIDE ACCESS TO INTERNAL PARTS WITHOUT DISTURBING PIPING; WITH BOTTOM DRAIN PLUG, STAINLESS STEEL CAPSULE TYPE AIR VENT, STAINLESS STEEL FLOAT, STAINLESS STEEL LEVER AND VALVE ASSEMBLY. SPIRAX/SARCO OR EQUAL. SIZED FOR .5 PSI PRESSURE DIFFERENTIAL.

G. STEAM TRAPS - INVERTED BUCKET TRAPS: INVERTED BUCKET TRAPS: ASTM A126A/ 216M, STEEL BODY, BUCKET, VALVE AND ORIFICE. STEAM RATING OF 450 PSIG.

H. STRAINERS: 1-1/2 INCH AND SMALLER: BRONZE BODY, SCREWED, Y PATTERN WITH 1/32 INCH STAINLESS STEEL PERFORATED SCREEN, 250 PSI, SPIRAX/SARCO MODEL BT OR EQUAL.
9. AIR DISTRIBUTION SYSTEMS

A. AIR TERMINALS

1. REFER TO AIR DEVICE SCHEDULE FOR MODEL, SIZE, FINISH, MOUNTING AND REQUIRED ACCESSORIES FOR ALL DIFFUSERS, REGISTERS, AND GRILLES.

B. SHEET METAL WORK

1. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE GALVANIZED SHEET STEEL AND SHALL BE INSTALLED IN ACCORDANCE WITH SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA) DUCT CONSTRUCTION STANDARDS. DUCT SYSTEMS TO BE 2" PRESSURE CLASS.

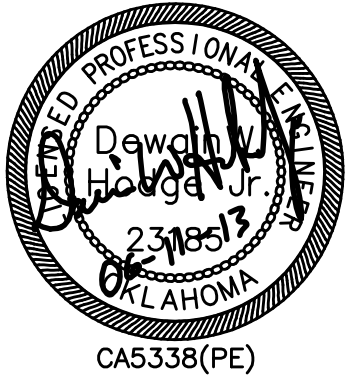
2. ALL DUCT DIMENSIONS INDICATED ON THE PLANS ARE SHEET METAL DIMENSIONS. ALLOWANCES HAVE BEEN MADE FOR INTERIOR DUCT LINER WHERE APPLICABLE.

3. RECTANGULAR SUPPLY DUCTWORK TO BE HEMMED "S" LONGITUDINAL SEAMS AND DUCTMATE TRANSVERSE JOINTS.

4. MANUAL VOLUME DAMPERS: GALVANIZED STEEL, PER SMACNA EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT, WITH LEVER AND LOCKSCREW AT THE OPPOSITE END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION. LEVERS MUST BE ACCESSIBLE.

5. ROUND EXHAUST DUCTWORK ELBOWS TO BE LONG RADIUS TYPE.

6. ACCESS DOORS SHALL BE PROVIDED IN DUCTWORK WHEREVER CONTROLS, CONTROL DAMPERS, COILS, & INSTRUMENTS ARE INSTALLED.



DRAWN BY:	DF
CHECKED BY:	BH
ISSUED:	06/11/13
REVISIONS	