GENERAL MECHANICAL NOTES

1. COMPLETE INSTALLATION OF THE MECHANICAL SYSTEM SHALL BE PER THE STATE BUILDING, MECHANICAL ENERGY, FIRE, PLUMBING AND HEALTH CODES, AND REGULATIONS AS ADOPTED BY LOCAL JURISDICTIONS.

2. ALL EQUIPMENT SHALL BE THE CAPACITY AND TYPE AS SHOWN ON THE EQUIPMENT SCHEDULE AND SHALL BE THE LISTED MANUFACTURER AND MODEL NUMBER OR SHALL BE AN EQUAL APPROVED BY THE OWNER/ENGINEER.

3. ENTIRE INSTALLATION OF ALL EQUIPMENT, CONTROL, PIPING, DUCTWORK, AND RELATED ACCESSORIES SHALL BE PER BASIC OWNER'S STANDARDS. MECHANICAL CONTRACTOR IS TO FAMILIARIZE HIMSELF WITH THESE STANDARDS.

4. MECHANICAL CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ROUTING AND INTALLATION FEASABILITY OF ALL EQUIPMENT, PIPING, AND DUCTWORK, AND INCLUDE IN HIS BID ADDITIONAL PIPING, DUCTWORK, FITTINGS, OFFSETS, ETC. WHICH MIGHT BE REQUIRED FOR A COMPLETE SYSTEM READY FOR OWNER'S BENEFICIAL USE.

5. CONTRACTOR SHALL PAY FOR AND OBTAIN ALL REQUIRED PERMITS AND CERTIFICATES REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.

6. HVAC NOTES:
   A. PROVIDE FLEXIBLE CONNECTION IN ALL DUCTS CONNECTING TO AIR MOVING EQUIPMENT AS CLOSE TO FAN AS POSSIBLE. FLEXIBLE CONNECTION SHALL CONSIST OF 6" OR MORE OF AIR TIGHT, FIRE PROOF FLEXIBLE NEOPRENE COATED WOVEN FIBROUS GLASS MATERIAL. VENT FABRICS, INC. OR APPROVED EQUAL.
   B. ALL DUCTWORK SHALL BE SHEET METAL.
   C. ALL SUPPLY & RETURN FLEXIBLE DUCTS SHALL BE CONSTRUCTED OF DOUBLE LAMINATION OF POLYESTER ENCAPSULATED STEEL WIRE HELIX FOR INNER CORE HIGH DENSITY FIBERGLASS INSULATION AND GRAY POLYESTER FILM WITH SPIRAL REINFORCEMENTS, EQUAL TO ATCO-70 SERIES (MIN. POS. PRESS. = 6" W.G. NEG. PRESS. = 0.75" W.C. & R=5.79).
   D. SEAL ALL DUCTWORK JOINTS WITH TUFF-BOND #12 SEALER AND DURO-DYNE TYPE FT-2 TAPE OR EQUAL.
   E. ALL EQUIPMENT, DUCTWORK AND PIPING SHALL BE STRUCTURALLY SUPPORTED AND SECURELY FASTENED TO BUILDING STRUCTURE IN AN ACCEPTABLE MANNER TO OWNER, ARCHITECT, ENGINEER AND LOCAL JURISDICTION AND SHALL BE SEISMICALLY BRACED PER THE SMACNA AND/OR REQUIRED BY LOCAL JURISDICTIONS.
   F. PROVIDE LOCKABLE VOLUME DAMPERS IN ALL AIR DISTRIBUTION OUTLETS.
   G. DUCT HANGERS, SUPPORTS AND METHODS OF INSTALLATION SHALL CONFORM TO ASHRAE & SMACNA RECOMMENDATIONS.
   H. DUCT SIZES SHOWN ON PLANS INDICATE INSIDE FREE AREA.
   I. ALL DUCTWORK SHALL BE CLASS-1 AIR DUCT AS APPROVED BY U.L.-181.
   J. ALL DUCTWORK IN UNHEATED SPACES AND SUPPLY AIR IN ANY SPACE SHALL HAVE INSULATION WITH VAPOR BARRIER JACKET WITH MINIMUM THERMAL RESISTANCE VALUE OF "R-7". INTERIOR SOUNDLINING WITH MINIMUM "R-7" SATISFIES THE INSULATION REQUIREMENT WHICH MAY BE USED IN LIEU OF EXTERIOR INSULATION.

7. ALL FIRE RATED STRUCTURE SHALL BE FIRE DAMPERED AS REQUIRED BY THE JURISDICTION.

8. FLEXIBLE DUCTS SHALL HAVE MAXIMUM 6 FEET LENGTH UNLESS SHOWN OTHERWISE AND SHALL NOT PENETRATE THROUGH ANY FIRE RATED WALLS. DO NOT INSTALL FLEXIBLE DUCTS WITHIN 6 FEET OF HEATING ELEMENT.

9. TESTING: REFRIGERATION PIPING SHALL BE TESTED UNDER PRESSURE AND PROVEN TO BE LEAK FREE. HVAC SYSTEM SHALL BE STARTED UP, BALANCED TO DESIGN SPECIFICATIONS, AND OPERATED IN BOTH HEATING AND COOLING MODES. REFRIGERATION SYSTEM SHALL BE STARTED UP AND BROUGHT DOWN TO DESIGN TEMPERATURE.

10. MECHANICAL, HVAC, AND PLUMBING ELEMENTS SHALL AT NO TIME COME IN CONTACT WITH CEILING CONSTRUCTION EXCEPT AS NECESSARY PENETRATIONS MAY REQUIRE.

11. ACCESS SHALL BE PROVIDED BY GC AS REQUIRED FOR INSTALLATION AND MAINTENANCE OF MECHANICAL, ELECTRICAL, AND OTHER ELEMENTS WITHIN CEILING SPACE AND AS REQUIRED BY CODE. LOCATIONS FOR SPECIAL ACCESS DOORS, HATCHES, ETC. SHALL BE COORDINATED WITH OTHER TRADES.

12. INSPECTIONS, AS REQUIRED BY LOCAL AUTHORITIES, SHALL BE COORDINATED BY GC PRIOR TO CLOSING OF CEILING.

13. SHOP DRAWINGS FOR ALL RELATED TRADES (PLUMBING, SPRINKLER, HVAC) SHALL BE SUBMITTED FOR REVIEW/APPROVAL PRIOR TO MANUFACTURING AND INSTALLATION.

14. ALL HVAC ELEMENTS SHALL MATCH ADJACENT WALL OR CEILING FINISH COLOR, INSTALLED FLUSH AND TRUE AND CENTERED WITHIN THE CEILING GRID. LOCATIONS SHALL BE PER APPROVED MECHANICAL PLANS.

15. INSULATION OF COLD WATER LINES SHALL BY PROVIDED TO PREVENT CONDENSATION DAMAGE AND IN OBSERVANCE OF ENERGY CONSERVATION PRACTICES, HOT WATER HEATING LINES SHALL BE INSULATED - SEE SPECIFICATIONS.

16. THERMOSTATS SHALL BE MOUNTED AT 4'-0" A.F.F. LOCATIONS PER MECHANICAL PLAN AND TO BE COORDINATED BY GC WITH OTHER TRADES AND APPROVED BY BUILDING MANAGEMENT REPRESENTATIVE AND ARCHITECT. MOUNT TO ALIGN VERTICALLY WITH LIGHT SWITCHES.

17. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO THE OWNER AT JOB COMPLETION. ALL PRODUCT WARRANTY REGISTRATION CARDS, APPLICATIONS, AND CERTIFICATES SHALL BE COMPLETED AND TURNED OVER TO THE OWNER.

MECHANICAL ABBREVIATIONS

ABV	ABOVE	ESP	EXTERNAL STATIC PRESSURE	NIC	NOT IN CONTRACT
AC	ALTERNATING CURRENT	ET	EXISTING AIR TERMINAL	NO.	NUMBER
AD	ACCESS DOOR, AUTOMATIC DAMPER	EWT	ENTERING WATER TEMPERATURE	NTS	NOT TO SCALE
AFF	ABOVE FINISHED FLOOR	EXIST	EXISTING	O/A	OUTDOOR AIR
AHU	AIR HANDLING UNIT	F	DEGREES FAHRENHEIT	OC	ON CENTER
ASL	ACOUSTICAL LINING	FC	FLEXIBLE CONNECTOR	OD	OUTER DIAMETER
AMP	AMPERE	FD	FIRE DAMPER	OPNG	OPENING
APPROX	APPROXIMATE OR APPROXIMATELY	FIN	FINISH OR FINISHED	PCF	POUNDS PER CUBIC FOOT
ARCH.	ARCHITECT OR ARCHITECTURAL	FL	FLOOR	PF	POWER FACTOR
AUTO	AUTOMATIC	FLEX	FLEXIBLE	PH or Ø	PHASE (ELECTRICAL)
BE	BOTTOM ELEVATION	FOB	FLAT ON BOTTOM	PRESS.	PRESSURE
BHP	BRAKE HORSEPOWER	FOT	FLAT ON TOP	PSI	POUNDS PER SQUARE INCH
BLDG	BUILDING	FPM	FEET PER MINUTE	R/A	RETURN AIR
BOD	BOTTOM OF DUCT	FT	FOOT OR FEET	REQD.	REQUIRED
BOG	BOTTOM OF GRILLE	FWE	FURNISH WITH EQUIPMENT	RG	RETURN GRILLE
BTU	BRITISH THERMAL UNIT	GA	GAUGE	RR	RETURN AIR REGISTER
BTUH	BRITISH THERMAL UNIT PER HOUR	GAL	GALLON	RH	RELATIVE HUMIDITY
CC	COOLING COIL	GPM	GALLONS PER MINUTE	RPM	REVOLUTIONS PER MINUTE
CD	CEILING DIFFUSER	HC	HEATING COIL	S/A	SUPPLY AIR
CEIL	CEILING	HOR	HORIZONTAL	SF	SERVICE FACTOR
CFM	CUBIC FEET PER MINUTE	HP	HEAT PUMP OR HORSEPOWER	SP	STATIC PRESSURE
CL	CENTER LINE	HR	HOUR	SPEC	SPECIFICATIONS
CO	CARBON MONOXIDE	HRV	HEAT RECOVERY VENTILATOR	STD	STANDARD
CO2	CARBON DIOXIDE	HVAC	HEATING, VENTILATING, AND AIR CONDITIONING	SVK	SOLENOID VALVE KIT
CR	CEILING REGISTER			TAB	TESTING, ADJUSTING, AND BALANCING
CP	CIRCULATION PUMP	HZ	ALTERNATING CURRENT FREQUENCY		
DB	DRY BULB	I.D.	INSIDE DIAMETER	TEMP	TEMPERATURE
DC	DIRECT CURRENT	IN.	INCH	TG	TRANSFER GRILLE
DIA	DIAMETER	IN H2O	INCHES OF WATER COLUMN	TOD	TOP OF DUCT
DN	DOWN	INSUL	INSULATE OR INSULATION	TOG	TOP OF GRILLE
DPR	DAMPER	KW	KILOWATT	TSP	TOTAL STATIC PRESSURE
DWG	DRAWING	KWH	KILOWATT-HOUR	TYP	TYPICAL
DX	DIRECT EXCHANGE	LAT	LEAVING AIR TEMPERATURE	V	VOLT
E/A	EXHAUST AIR	LB	POUND	VEL	VELOCITY
EA	EACH	LIN	LINEAR	VENT	VENT, VENTILATE, VENTILATING OR VENTILATION
EAT	ENTERING AIR TEMPERATURE	LVG.	LEAVING		
EL	ELEVATION	LWT	LEAVING WATER TEMPERATURE	VFD	VARIABLE FREQUENCY DRIVE
ELEV	ELEVATOR	MAN.	MANUAL	VOL	VOLUME
ELEC	ELECTRIC OR ELECTRICAL	MAX	MAXIMUM	W	WATT
ENT	ENTERING	MD	MANUAL DAMPER	WB	WET BULB
EQUP	EQUIPMENT	MECH	MECHANICAL	WG	WATER GAUGE
ER	EXHAUST REGISTER	MIN	MINIMUM	WMS	WIRE MESH SIZE
ERV	ENERGY RECOVERY VENTILATOR	NC	NORMALLY CLOSED	WT	WEIGHT

DUCTWORK

- SUPPLY AIR DIFFUSER
- RETURN AIR GRILL
- EXHAUST AIR GRILL
- 12 x 12 — RECTANGULAR DUCTWORK. SIZE INDICATED IN INCHES, FIRST NUMBER IS SIDE SHOWN
- 12" Ø — ROUND DUCTWORK. DIAMETER INDICATED IN INCHES
- FLEXIBLE DUCT
- SUPPLY OR OUTSIDE AIR DUCT
- RETURN AIR DUCT
- EXHAUST AIR DUCT
- 90° ELBOW WITH TURNING VANES
- RADIUS DUCTWORK ELBOWS ROUND OR RECTANGULAR
- BRANCH TAKE-OFF WITH VOLUME DAMPER
- S-1 / 100 CFM — DIFFUSER/GRILL LABEL: - DESIGNATION - AIRFLOW (CFM)

MISC. SYMBOLS

- SCHEDULE TAG SYMBOL
- T — THERMOSTAT
- H — HUMIDISTAT
- V — HEAT RECOVERY VENTILATOR CONTROL
- T — TEMPERATURE SENSOR
- H — HUMIDITY SENSOR
- P — ROOM PRESSURE MONITOR
- CONTROL WIRING

MECHANICAL DUCT LEGEND

- SUPPLY AIR
- RETURN AIR
- OUTDOOR AIR
- EXHAUST AIR

CODE COMPLIANCE

BUILDING MECHANICAL SYSTEMS ARE DESIGNED IN ACCORDANCE WITH THE FOLLOWING CODES:

- 2014 OREGON MECHANICAL SPECIALTY CODE
- 2014 OREGON PLUMBING SPECIALTY CODE
- 2011 OREGON ENERGY SPECIALTY CODE
- ANSI/ASHRAE STANDARD 62.1-2007 VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY

HVAC DESIGN CRITERIA

EUGENE, OREGON
ANNUAL DESIGN CONDITIONS: ASHRAE FUNDAMENTALS 2013
ELEVATION: 108' LAT: 44.05N LONG: 123.08W WINTER: 22 (99.6%) SUMMER: 91.4 DRY BULB (0.4%) 66.8 WET BULB (0.4%)
INDOOR DESIGN CONDITIONS: WINTER: 70 ± 2º F SUMMER: 74 ± 2º F

EXHAUST FAN SCHEDULE

TAG	DESCRIPTION	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	AREA SERVED	DESIGN FLOW (CFM)	MOTOR HP	STATIC PRESSURE	ELECTRICAL DATA V/Ø/Hz	MOTOR FLA	MOP	WEIGHT (LBS)	NOTES
EF-1	ROOF MOUNTED EXHAUST FAN	GREENHECK	G-098	MEN'S / WOMEN'S BATHROOMS	480	1/6	0.6"	115/1/60	3.4	15	39	PROVIDE WITH MOTORIZED BACKDRAFT DAMPER
EF-2	ROOF MOUNTED EXHAUST FAN	GREENHECK		3D PRINTERS	500	2	6.5"	115/1/60	12.5	20	70	PROVIDE WITH MOTORIZED BACKDRAFT DAMPER

FURNACE SCHEDULE

TAG	DESCRIPTION	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	FAN HP	FAN SPEED	FAN FLOW	FAN ESP	HEATING CAPACITY (MBH)	HEATING AFUE	COOLING TOTAL CAPACITY (MBH)	COOLING SENSIBLE CAPACITY (MBH)	V/Ø/HZ	MCA	MOP	WEIGHT	NOTES
F-1	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB080ACV3VA	1/2	VARIABLE	1200	0.60	60	95.0	42	36	115/1/60	11.1	15.0	146.0	PROVIDE WITH DX COOLING COIL AND MATCHING CONDENSER
F-2	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB060ACV3VA	1/2	VARIABLE	1200	0.60	60	95.0	NO COOLING	NO COOLING	115/1/60	11.1	15.0	146.0	
F-3	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB080ACV3VA	1/2	VARIABLE	1500	0.60	80	95.0	NO COOLING	NO COOLING	115/1/60	11.1	15.0	146.0	
F-4	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB080ACV3VA	1/2	VARIABLE	1720	0.60	80	95.0	NO COOLING	NO COOLING	115/1/60	11.1	15.0	146.0	
F-5A	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB080ACV3VA	1/2	VARIABLE	1770	0.60	80	95.0	NO COOLING	NO COOLING	115/1/60	11.1	15.0	146.0	
F-5B	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB060ACV3VA	1/2	VARIABLE	700	0.60	60	95.0	NO COOLING	NO COOLING	115/1/60	11.1	15.0	146.0	
F-6	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB080ACV3VA	1/2	VARIABLE	1600	0.60	80	95.0	NO COOLING	NO COOLING	115/1/60	11.1	15.0	146.0	
F-7	HORIZONTAL GAS FIRED FURNACE	TRANE	TUHMB060ACV3VA	1/2	VARIABLE	1400	0.60	60	95.0	NO COOLING	NO COOLING	115/1/60	11.1	15.0	146.0	

AIR INLETS AND OUTLETS SCHEDULE

TAG	DESCRIPTION	MANUFACTURER	MODEL	NECK SIZE	BORDER	FACE SIZE	NOTES
E-1	EXHAUST GRILLE	KRUEGER	ECG10	SEE PLANS	SURFACE MOUNTED	12"x12"	OBD
R-1	RETURN GRILLE	KRUEGER	ECG10	SEE PLANS	LAY-IN	24"x24"	
R-2	RETURN GRILLE	KRUEGER	S80	SEE PLANS	WALL MOUNTED	18"x18"	
S-1	SUPPLY DIFFUSER	KRUEGER	880HOBD	10"x6"	DUCT/WALL MOUNTED	12"x8"	OBD
S-2	SUPPLY DIFFUSER	KRUEGER	1240	SEE PLANS	LAY-IN	24"x24"	
S-3	SUPPLY DIFFUSER	KRUEGER	1240	SEE PLANS	SURFACE MOUNTED	12"x12"	OBD

CONDENSING UNIT SCHEDULE

TAG	DESCRIPTION	SYSTEM SERVED	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL #	NOMINAL SIZE	TOTAL COOLING CAP. (MBH)	SEER @ ARI	ELECTRICAL DATA V/Ø/Hz	MCA (A)	MOP (A)	OUTDOOR FAN FLA (A)	OUTDOOR FAN HP	WEIGHT (LBS)	NOTES
CU-1	CONDENSING UNIT	F-1	TRANE	4TTB4030	3.5 TON	30	14	208/1/60	15	25	1.2	1/5	201	PROVIDE WITH LOW AMBIENT CONTROL

DUCTLESS SPLIT SYSTEM SCHEDULE

TAG	MANUFACTURER	INDOOR UNIT MODEL	INDOOR UNIT SUPPLY AIRFLOW (CFM)	INDOOR UNIT COOLING CAP. (MBH)	INDOOR UNIT HEATING CAP. (MBH)	INDOOR UNIT WEIGHT (LBS)	OUTDOOR UNIT MODEL	OUTDOOR UNIT COOLING CAP. (MBH)	OUTDOOR UNIT AMBIENT TEMP.	OUTDOOR UNIT SEER	OUTDOOR UNIT WEIGHT (LBS)	REFRIGERANT USED	ELECTRICAL DATA V/Ø/Hz	MCA	MOP	NOTES
DSS-1	DAIKIN	FTK24NMVJU	700	21.2	N/A	27	RK24NMVJU	21.2	95/75	18	110	R-410A	208/1/60	18.30	20	PROVIDE WITH PROGRAMMABLE THERMOSTAT AND CONDENSATE PUMP.

VENTILATION & EXHAUST SCHEDULE

Zone	Space Name	Space Number	Number of People	Area	Specified OA CFM per Person	Specified OA CFM per FT²	Specified Additional Ventilation Flow	Calculated Ventilation Flow	Specified Exhaust Airflow
1	COMPUTER LAB	127	23	861 SF	10 CFM	0.12 CFM/SF	0 CFM	333 CFM	0 CFM
			23	861 SF				333 CFM	0 CFM
2	3D PRINTERS	126	13	976 SF	5 CFM	0.06 CFM/SF	0 CFM	124 CFM	600 CFM
			13	976 SF				124 CFM	600 CFM
3	CLASSROOM	110	32	828 SF	10 CFM	0.12 CFM/SF	0 CFM	419 CFM	0 CFM
3	JANITOR	116	0	141 SF	0 CFM	0.12 CFM/SF	0 CFM	17 CFM	0 CFM
3	MENS	114	0	244 SF	0 CFM	0 CFM/SF	0 CFM	0 CFM	200 CFM
3	STORAGE	111	0	110 SF	0 CFM	0.12 CFM/SF	0 CFM	13 CFM	0 CFM
3	WOMENS	115	0	219 SF	0 CFM	0 CFM/SF	0 CFM	0 CFM	200 CFM
			32	1542 SF				449 CFM	400 CFM
4	COPY / PRINT	107	1	67 SF	5 CFM	0.06 CFM/SF	0 CFM	9 CFM	34 CFM
4	HOTELING / COWORKING	106A	20	1122 SF	5 CFM	0.06 CFM/SF	0 CFM	167 CFM	0 CFM
4	SMALL CONF 1	108	6	143 SF	5 CFM	0.06 CFM/SF	0 CFM	39 CFM	0 CFM
4	SMALL CONF 2	109	6	147 SF	5 CFM	0.06 CFM/SF	0 CFM	39 CFM	0 CFM
4	WORK AREA	106B	7	473 SF	5 CFM	0.06 CFM/SF	0 CFM	83 CFM	0 CFM
			40	1953 SF				317 CFM	34 CFM
5	CIRCULATION1	101A	0	627 SF	0 CFM	0.06 CFM/SF	0 CFM	38 CFM	0 CFM
5	DISTANCE CONFERENCE	105	20	563 SF	5 CFM	0.06 CFM/SF	0 CFM	134 CFM	0 CFM
5	ENTRY	101	10	675 SF	5 CFM	0.06 CFM/SF	0 CFM	90 CFM	0 CFM
5	INVENTION GREEN SPACE	104	6	260 SF	5 CFM	0.06 CFM/SF	0 CFM	46 CFM	0 CFM
5	OPEN MEETING	103	10	312 SF	5 CFM	0.06 CFM/SF	0 CFM	69 CFM	0 CFM
5	WAR ROOM	102	12	546 SF	5 CFM	0.06 CFM/SF	0 CFM	93 CFM	0 CFM
			58	2983 SF				469 CFM	0 CFM
6	BREAK AREA	528	10	582 SF	5 CFM	0.06 CFM/SF	0 CFM	85 CFM	0 CFM
6	ELEC	119	0	69 SF	0 CFM	0.12 CFM/SF	0 CFM	8 CFM	0 CFM
6	FLEX SPACE	117	30	746 SF	5 CFM	0.06 CFM/SF	0 CFM	595 CFM	0 CFM
6	MECHANICAL	120	0	45 SF	0 CFM	0.12 CFM/SF	0 CFM	5 CFM	0 CFM
6	UNISEX	113	0	66 SF	0 CFM	0 CFM/SF	0 CFM	0 CFM	50 CFM
			40	1507 SF				293 CFM	50 CFM
7	CIRCULATION2	121	0	520 SF	0 CFM	0.06 CFM/SF	0 CFM	31 CFM	0 CFM
7	DESIGN STUDIO	123	24	1227 SF	10 CFM	0.12 CFM/SF	0 CFM	387 CFM	0 CFM
7	FIRE SPRINKLER	125	0	34 SF	0 CFM	0.12 CFM/SF	0 CFM	4 CFM	0 CFM
7	STORAGE STUDIO	124	0	152 SF	0 CFM	0.12 CFM/SF	0 CFM	18 CFM	0 CFM
			24	1933 SF				441 CFM	0 CFM
8	IT / TELE	118	0	46 SF	5 CFM	0.06 CFM/SF	0 CFM	3 CFM	0 CFM
			0	46 SF				3 CFM	0 CFM
28			230	11801 SF				2429 CFM	3084 CFM

GENERAL SHEET METAL

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MAY 14, 2013
AARON RAYMOND WOZNIAK
EXPIRES: 6/30/2016

942 OLIVE STREET
942 OLIVE STREET
EUGENE, OREGON

SHEET
GENERAL HVAC NOTES, SYMBOLS, & SCHEDULES

DRAWN: TLH
CHECKED: ARW
DATE: 9-15-2015
JOB#: 150402-WA

REVISIONS:

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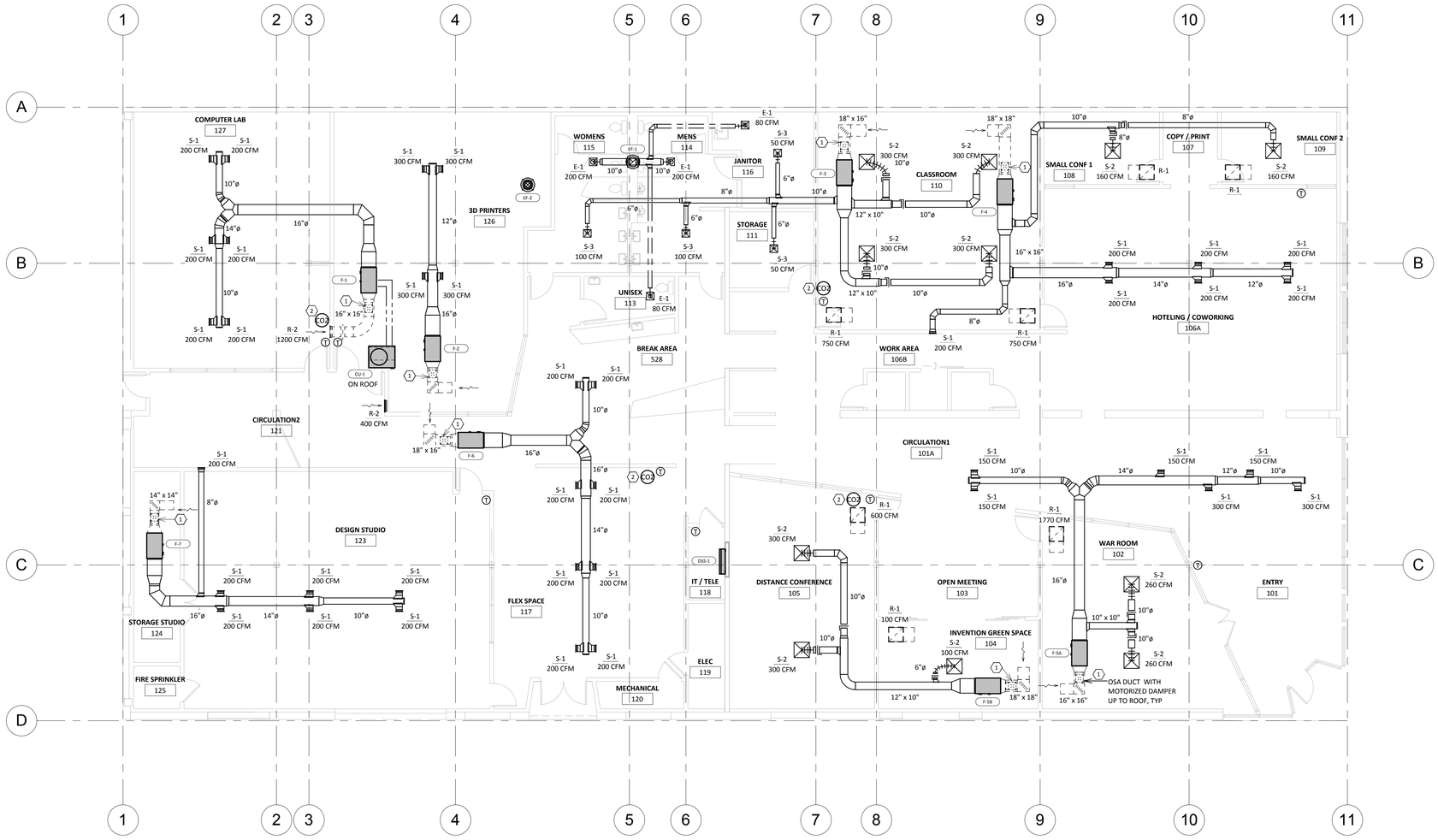
M0.0

HVAC KEYNOTES	
1	PROVIDE GREENHECK MODEL GRSI-15 INTAKE HOOD OR APPROVED EQUAL. PROVIDE MOTORIZED DAMPER TO CLOSE DURING UN-OCCUPIED HOURS. WHERE ZONE IS SERVED BY CO2 SENSOR, PROVIDE FULLY MODULATING DAMPER AND CONTORL CONTACTS.
2	PROVIDE CO2 SENSOR TO MODULATE OUTDOOR AIR DAMPER BETWEEN MINIMUM AND MAXIMUM SETTINGS TO MAINTAIN 1200 PPM OF CO2. MINIMUM OUTDOOR AIR SETTING SHALL BE 0.12 CFM PER SQ FT AND MAXIMUM SETTING SHALL BE CALCULATED VENTILATION FLOW SHOWN ON DRAWING M0.0



1 FIRST FLOOR HVAC PLAN

1/8" = 1'-0"

GENERAL SHEET METAL

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942 OLIVE STREET

942 OLIVE STREET
EUGENE, OREGON

SHEET

HVAC PLAN

DRAWN: TLH
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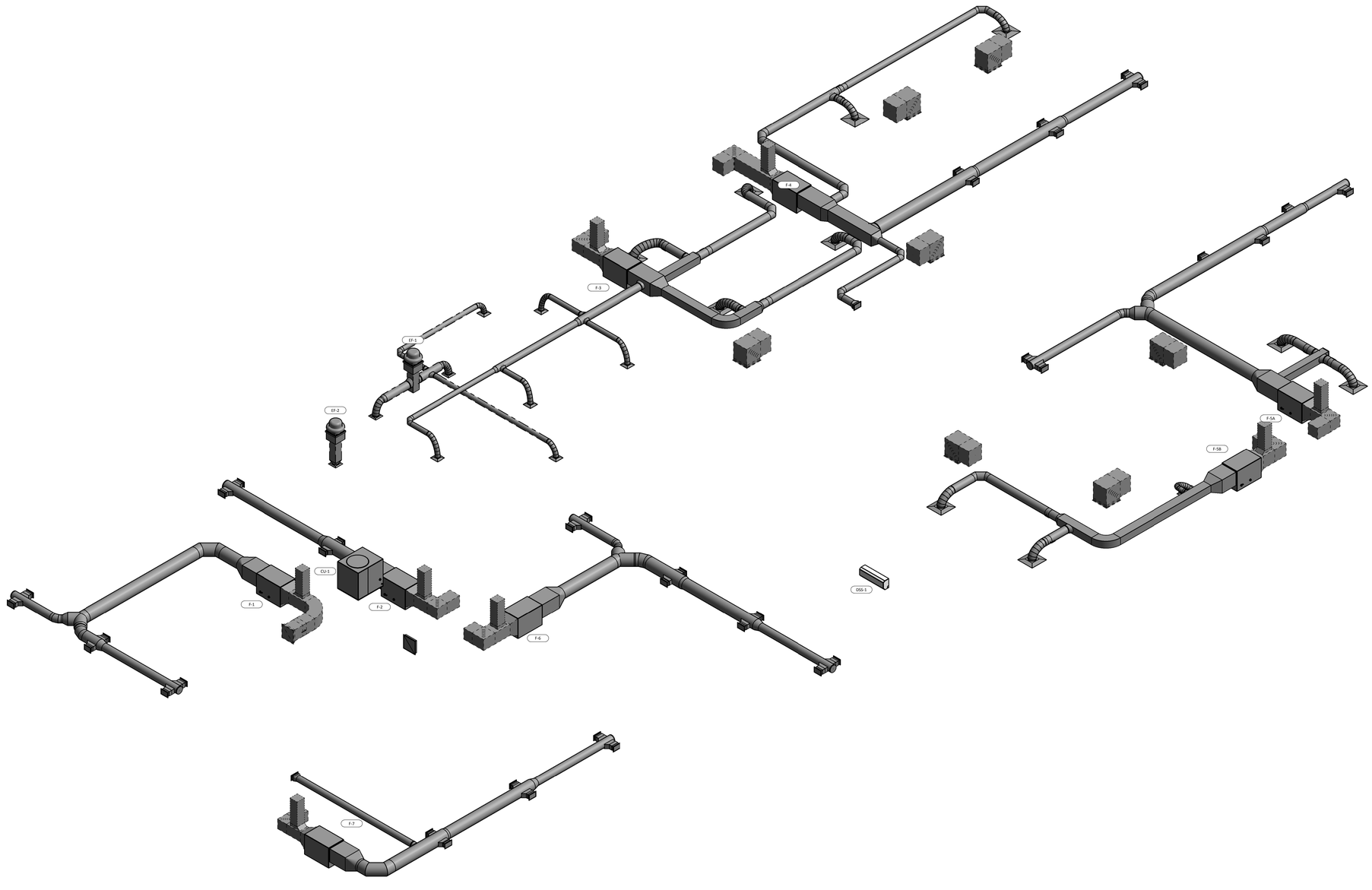

1 HVAC ISOMETRIC

GENERAL SHEET METAL

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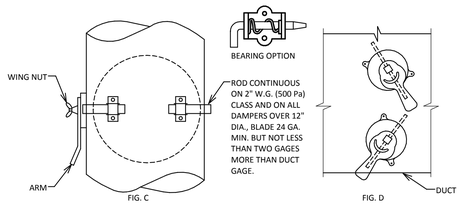


FIG. C
ROUND
DAMPER

FIG. D
ELEVATION TWO BLADE
ARRANGEMENT

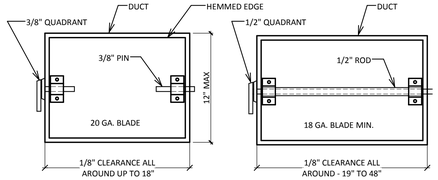


FIG. A

FIG. B NOTE: OVER 12"HIGH USE MULTIPLE BLADES

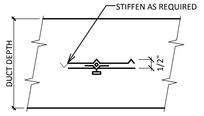


FIG. A OR B
SIDE ELEVATION

CLOSED OUTSIDE
END BEARING

SEE NOTES BELOW

CLOSED INSIDE END
BEARING

REQUIRED ON 3" W.G.
(750Pa) CLASS DUCT
AND OVER. OPTIONAL
FOR OTHERS

1. DAMPER HARDWARE MUST BE DURABLE AND INSTALLED PROPERLY.
2. DAMPERS MUST BE STABLE UNDER OPERATING CONDITIONS. ROUND AND RECTANGULAR DAMPER BLADES MUST BE STIFFENED BY FORMING OR OTHER METHOD IF REQUIRED FOR THE DUTY.
3. ALL SINGLE BLADE DAMPERS MUST HAVE A LOCKING DEVICE TO HOLD THE DAMPERS IN A FIXED POSITION WITHOUT VIBRATION.
4. DAMPER COMPONENT PENETRATION OF DUCTS MUST BE CLOSED, IN KEEPING WITH THE SEALING CLASSIFICATION APPLICABLE FOR THE PRESSURE CLASS. END BEARINGS OR OTHER SEALS ARE REQUIRED ON 3" W.G. (750 PA) STATIC PRESSURE CLASS.
5. THE INSTALLATION OF A DAMPER IN A LINED DUCT MUST NOT DAMAGE THE LINER OR CAUSE LINER EROSION.

1 VOLUME DAMPER DETAILS

MINIMUM HANGER SIZES FOR ROUND DUCT				
DIAMETER	MAXIMUM SPACING	WIRE DIAMETER	ROD	STRAP
10" DOWN	12'	ONE 12 GA.	1/4"	1"x22 GA.
11-18"	12'	TWO 12 GA. OR ONE 8 GA.	1/4"	1"x22 GA.
19-24"	12'	TWO 10 GA.	1/4"	1"x22 GA.
25-36"	12'	TWO 8 GA.	3/8"	1"x20 GA.
37-50"	12'		3/8"	1"x20 GA.
51-60"	12'		3/8"	1"x18 GA.
61-84"	12'		3/8"	1"x16 GA.

NOTES:
1. STRAPS ARE GALVANIZED STEEL; RODS ARE UNCOATED OR GALVANIZED STEEL; WIRE IS BLACK ANNEALED, BRIGHT BASIC, OR GALVANIZED STEEL. ALL ARE ALTERNATIVES.
2. SEE C6/M0.2 FOR LOWER SUPPORTS.
3. SEE C3 & E2/M0.2 FOR UPPER ATTACHMENTS.
4. TABLE ALLOWS FOR CONVENTIONAL WALL THICKNESS, AND JINT SYSTEMS PLUS ONE lb/sf INSULATION WEIGHT. IF HEAVIER DUCTS ARE TO BE INSTALLED, ADJUST HANGER SIZES TO BE WITHIN THEIR LOAD LIMITS; SEE ALLOWABLE LOADS WITH TABLE A6/M0.2 HANGER SPACING MAY BE ADJUSTED BY SPECIAL ANALYSIS.

2 ROUND DUCT HANGERS TABLE

RECTANGULAR DUCT HANGERS MINIMUM SIZE								
MAXIMUM HALF OF DUCT PERIMETER	PAIR AT 10' SPACING		PAIR AT 8' SPACING		PAIR AT 5' SPACING		PAIR AT 4' SPACING	
	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD
P/2=30"	1"x22 GA.	10 GA. (.135")	1"x22 GA.	10 GA. (.135")	1"x22 GA.	12 GA. (.106")	1"x22 GA.	12 GA. (.106")
P/2=72"	1"x18 GA.	3/8"	1"x20 GA.	1/4"	1"x22 GA.	1/4"	1"x22 GA.	1/4"
P/2=96"	1"x16 GA.	3/8"	1"x18 GA.	3/8"	1"x20 GA.	3/8"	1"x22 GA.	1/4"
P/2=120"	1.5"x16 GA.	1/2"	1"x16 GA.	3/8"	1"x18 GA.	3/8"	1"x20 GA.	1/4"
P/2=168"	1.5"x16 GA.	1/2"	1.5"x16 GA.	1/2"	1"x16 GA.	3/8"	1"x18 GA.	3/8"
P/2=192"	NOT GIVEN	1/2"	1.5"x16 GA.	1/2"	1"x16 GA.	3/8"	1"x16 GA.	3/8"
P/2=193" UP	SPECIAL ANALYSIS REQUIRED							

WHEN STRAPS ARE LAP JOINED USE THESE MINIMUM FASTENERS:

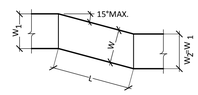
1"x18,20,22 GA. -TWO #10 OR ONE 1/4" BOLT
1"x16 GA. -TWO 1/4" DIA.
1.5"x16 GA. -TWO 3/8" DIA.
PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE.

SINGLE HANGER MAXIMUM ALLOWABLE LOAD	
STRAP	WIRE OR ROD (DIA.)
1"x22 GA.-260 lbs. 1"x20 GA.-320 lbs. 1"x18 GA.-420 lbs. 1"x16 GA.-700 lbs. 1.5"x16 GA.-1100 lbs.	0.106"-80 lbs. 0.135"-120 lbs. 0.162"-160 lbs. 1/4"-270 lbs. 3/8"-680 lbs. 1/2"-1250 lbs. 5/8"-2000 lbs. 3/4"-3000 lbs.

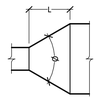
NOTES:
1. DIMENSIONS OTHER THAN GAGE ARE IN INCHES.
2. TABLES ALLOW FOR DUCT WEIGHT, 1 lb/sf INSULATION WEIGHT AND NORMAL REINFORCEMENT AND TRAPEZE WEIGHT, BUT NO EXTERNAL LOADS!
3. FOR CUSTOM DESIGN OF HANGERS, DESIGNERS MAY CONSULT SMACNA'S RECTANGULAR INDUSTRIAL DUCT STANDARDS, THE AISI COLD FORMED STEEL DESIGN MANUAL AND THE AISC STEEL CONSTRUCTION MANUAL.
4. STRAPS ARE GALVANIZED STEEL; OTHER MATERIALS ARE UNCOATED STEEL.
5. ALLOWABLE LOADS FOR P/2 ASSUME THAT DUCTS ARE 16 GA. MAXIMUM, EXCEPT THAT WHEN MAXIMUM DUCT DIMENSIONS (W) IS OVER 60" THEN p/2 MAXIMUM IS 1.25 w.
6. FOR UPPER ATTACHMENTS SEE C3/M0.2.
7. FOR LOWER ATTACHMENTS SEE C6/M0.2.
8. FOR TRAPEZE SIZES SEE TABLE E6/M0.2.
9. 12,10, OR 8 GA. WIRE IS STEEL OF BLACK ANNEALED, BRIGHT BASIC, OR GALVANIZED TYPE.

3 RECTANGULAR DUCT HANGER TABLE

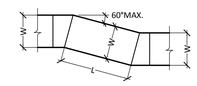
OFFSETS TYPE 2 AND 3 AND TRANSITIONS MAY HAVE EQUAL OR UNEQUAL INLET AND OUTLET AREAS. TRANSITIONS MAY CONVERT DUCT PROFILES TO ANY COMBINATION FOR RECTANGULAR, ROUND OR FLAT OVAL SHAPES.



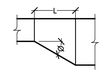
OFFSET TYPE 1 (ANGLED)



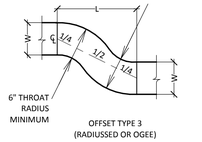
CONCENTRIC TRANSITION
Ø MAX. 45° DIVERGING, 60° CONVERGING



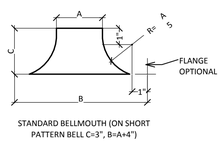
OFFSET TYPE 2
(MITERED)



ECCENTRIC TRANSITION Ø MAX. 30°(EXCEPT 45° IS PERMITTED AT ROUND TO FLAT OVAL.)

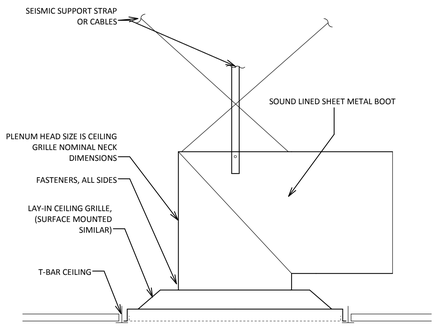


OFFSET TYPE 3
(RADIUSSED OR OGEE)

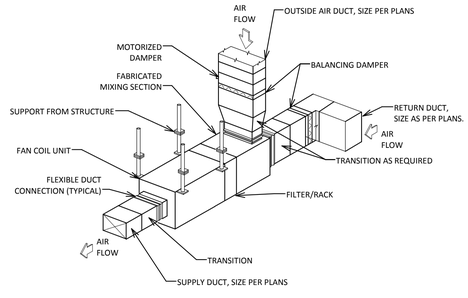


STANDARD BELLMOUTH (ON SHORT
PATTERN BELL C=3", B=A+4")

4 DUCT OFFSET AND TRANSITIONS

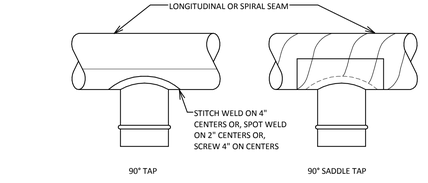


5 RETURN BOOT



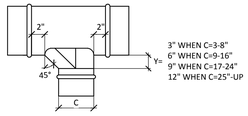
6 FURNACE DETAIL

3/32" = 1'-0"

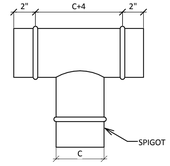


90° TAP

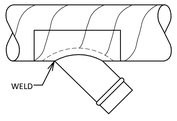
90° SADDLE TAP



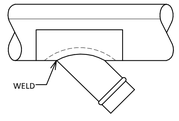
90° TEE WITH OVAL TO ROUND TAP



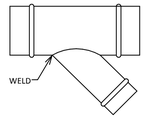
90° TEE FITTING



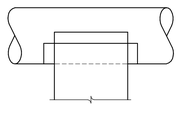
45° LATERAL TAP



45° LATERAL SADDLE TAP



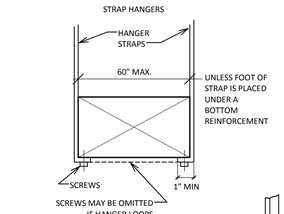
45° LATERAL FITTING

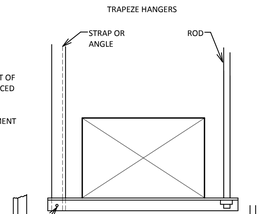


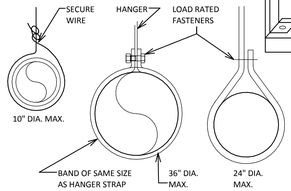
RECT. TAP STRAIGHT OR 45 LEAD IN

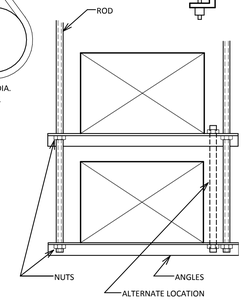
STANDARD SPIGOT LENGTH IS 2".

7 90° TEES AND LATERALS





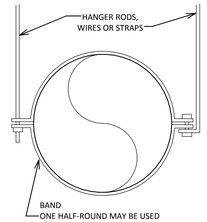




REINFORCEMENT MAY BE USED FOR ATTACHMENT IF IT QUALIFIES FOR BOTH DUTIES.

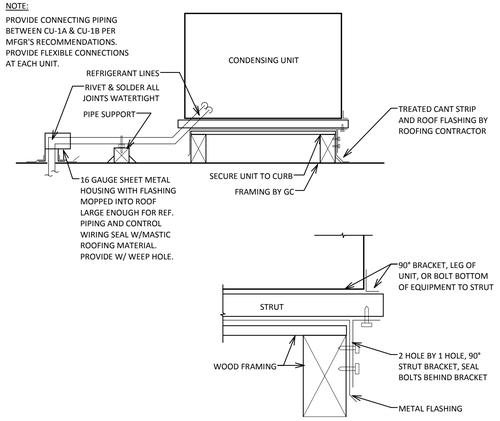
DO NOT EXCEED ALLOWABLE LOAD LIMITS.

HANGERS MUST NOT DEFORM DUCT SHAPE

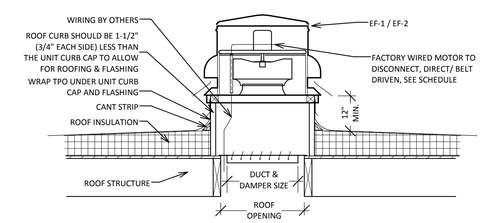


9 LOWER ATTACHMENT DETAILS

NOTE:
PROVIDE CONNECTING PIPING BETWEEN CU-1A & CU-1B PER MFGR'S RECOMMENDATIONS. PROVIDE FLEXIBLE CONNECTIONS AT EACH UNIT.



8 CONDENSING UNIT



DIRECT DRIVE SPECIFICATIONS

SPUN ALUMINUM EXHAUST FANS SHALL BE CENTRIFUGAL DIRECT BELT DRIVE TYPE. THE FAN WHEEL SHALL BE CENTRIFUGAL BACKWARD INCLINED, CONSTRUCTED OF ALUMINUM AND SHALL INCLUDE A WHEEL CONE CAREFULLY MATCHED TO THE INLET CONE FOR PRECISE RUNNING TOLERANCES. WHEELS SHALL BE STATICALLY AND DYNAMICALLY BALANCED. THE FAN HOUSING SHALL BE CONSTRUCTED OF HEAVY GAUGE ALUMINUM WITH A RIGID INTERNAL SUPPORT STRUCTURE.
MOTORS SHALL BE MOUNTED OUT OF THE AIRSTREAM ON VIBRATION ISOLATORS. FRESH AIR FOR MOTOR COOLING SHALL BE DRAWIN INTO THE MOTOR COMPARTMENT FREE OF DISCHARGE CONTAMINANTS. MOTORS SHALL BE READILY ACCESSIBLE FOR MAINTENANCE. A DISCONNECT SWITCH SHALL BE FACTORY INSTALLED AND WIRED FROM THE FAN MOTOR TO A JUNCTION BOX WITHIN THE MOTOR COMPARTMENT. A CONDUIT CHASE SHALL BE PROVIDED THROUGH THE CURB CAP TO THE MOTOR COMPARTMENT FOR EASE OF ELECTRICAL WIRING.
ALL FANS SHALL BEAR THE AMCA CERTIFIED RATINGS SEAL FOR SOUND AND AIR PERFORMANCE.
EACH FAN SHALL BEAR A PERMANENTLY AFFIXED MANUFACTURER'S ENGRAVED METAL NAMEPLATE CONTAINING THE MODEL NUMBER AND INDIVIDUAL SERIAL NUMBER FOR FUTURE INDENTIFICATION.
A LEAKPROOF FAN HOUSING SHALL BE CONSTRUCTED WITH A ONE PIECE WINDBAND WITH AN INTEGRAL ROLLED BEAD FOR ADDED STRENGTH

10 EXHAUST FAN DETAIL

GENERAL SHEET METAL

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REGISTERED PROFESSIONAL ENGINEER
71072PE
OREGON
MAY 14, 2013
AARON RAYMOND WOZNIAK
EXPIRES: 6/30/2016

942 OLIVE STREET
942 OLIVE STREET
EUGENE, OREGON

SHEET
HVAC DETAILS

DRAWN: TLH
CHECKED: ARW
DATE: 9-15-2015
JOB#: 150402-WA

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