OUTSIDE AIR CALCULATIONS

1. OUTSIDE AIR/MAKEUP AIR:
   - RTU-1 = 726 CFM
   - RTU-2 = 400 CFM
   - RTU-3 = 400 CFM
   - SF-FU2 = 2220 CFM
   - SF-FU4 = 2683 CFM
   - SF-FU6 = 600 CFM
2. HOOD EXHAUST/TOILET EXHAUST:
   - EF-FU1 = 2775 CFM
   - EF-FU3 = 3354 CFM
   - EF-FU5 = 600 CFM
   - EF-1 = 150 CFM
   - EF-2 = 150 CFM
3. TOTAL OUTSIDE AIR = 7029 CFM
   TOTAL EXHAUST AIR = 7029 CFM

SYMBOL LEGEND

SYMBOL	DESCRIPTION (DISREGARD ITEMS NOT SHOWN ON PLANS)
GENERAL	
(#)	KEY NOTE TAG
(#)	NOTE SPECIFIC TO DETAIL TAG
(#)	REVISION TAG
	NEW EQUIPMENT
DUCTWORK	
	SUPPLY AIR DUCTWORK
	RETURN AIR AND OUTSIDE AIR DUCTWORK
	EXHAUST AIR DUCTWORK
	FLEXIBLE DUCTWORK
	SUPPLY AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	RETURN AIR AND OUTSIDE AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	EXHAUST AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	FIRE DAMPER (VERTICAL)
	MANUAL BALANCING DAMPER (SEE DAMPER SCHEDULE)
	MOTORIZED DAMPER (SEE DAMPER SCHEDULE)
SENSORS	
(T)	THERMOSTAT AND TEMPERATURE SENSOR
(H)	HUMIDISTAT
(S)	SMOKE DETECTOR
AIR DEVICES	
(A)	AIR DEVICE TAG (REFER TO AIR DEVICE SCHEDULE)
	SUPPLY AIR GRILLE WITH FOUR-WAY THROW
	RETURN AIR GRILLE WITH SOUND BOOT
	EXHAUST AIR GRILLE
PIPING	
—CD—	CONDENSATE DRAIN LINE

MECHANICAL SPECIFICATIONS

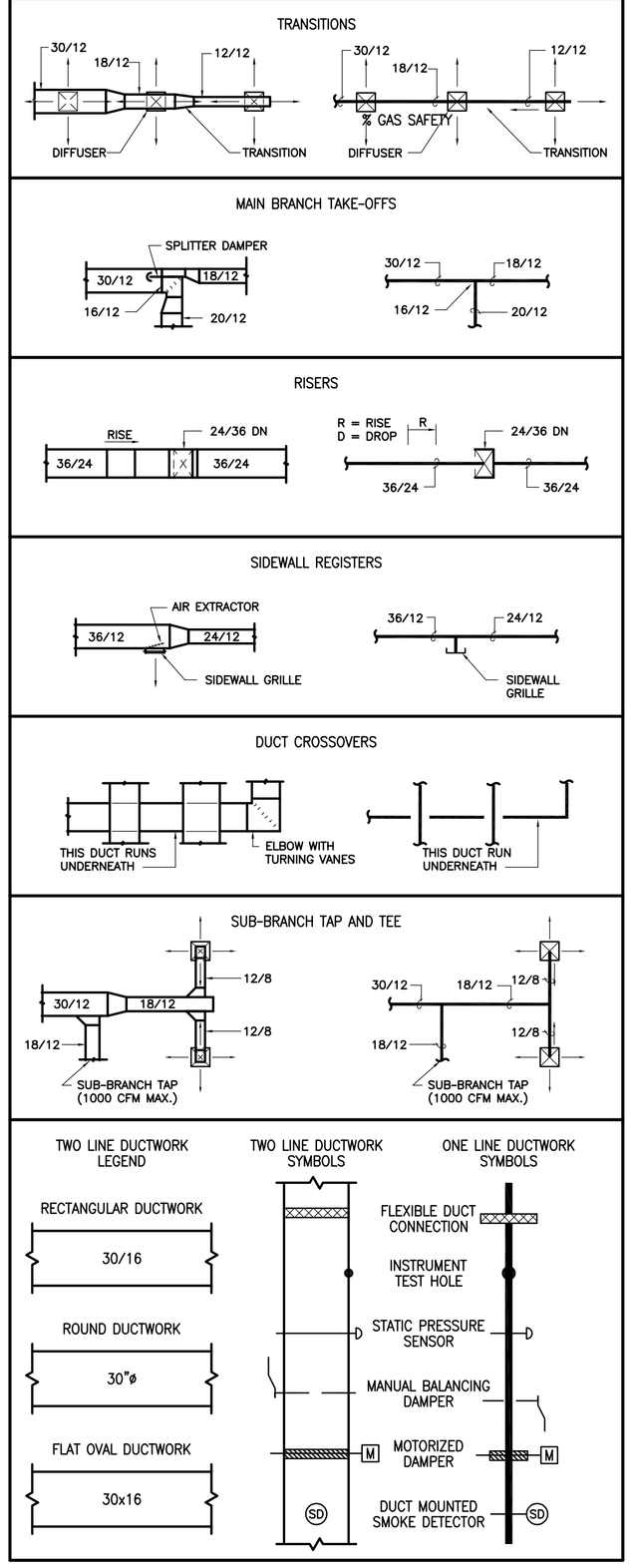
1. THE CONTRACTOR SHALL PROVIDE A COMPLETE AND FUNCTIONAL AIR CONDITIONING SYSTEM. ALL APPURTENANCES REQUIRED BUT NOT SHOWN SHALL BE PROVIDED.
2. THE CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES. ALL VOLTAGES AND POWER REQUIREMENTS SHALL BE COORDINATED WITH THE ELECTRICAL CONTRACTOR.
3. THE EXHAUST FANS SHALL BE MANUFACTURED BY COOK, GREENHECK, PENN OR ACME.
4. DUCTWORK SHALL BE GALVANIZED SHEETMETAL CONSTRUCTED TO SMACNA STANDARDS FOR 2" WG PRESSURE. EXHAUST DUCTS SHALL BE CONSTRUCTED TO 2" NEG. PRESSURE. SEAL ALL SEAMS IN THE DUCT WITH HARDCAST IRON GRIP UNLESS OTHERWISE INDICATED.
5. SUPPLY, RETURN AND EXHAUST DUCTWORK ABOVE CEILING SHALL BE EXTERNALLY WRAPPED WITH 1-1/2" MINIMUM DUCT INSULATION. THE INSULATION SHALL BE MANUFACTURED BY OWENS CORNING, SCHULLER, KNAUF, OR CERTAINTEED. THE INSTALLED R-VALUE OF THE INSULATION SHALL BE 6.0 OR BETTER WITH VAPOR BARRIER. THE INSULATION SHALL BE STAPLED ON 6" CENTERS AND SEALED WITH PRESSURE SENSITIVE TAPE. THE R-VALUE MUST BE INDICATED ON THE EXTERIOR SIDE OF THE INSULATION FOR THE CITY INSPECTOR TO VERIFY.
6. THE AIR DEVICES SHALL BE MANUFACTURED BY TITUS, KRUEGER OR METALAIRE.
7. FLEXIBLE DUCTWORK TO BE INSULATED WITH R-6 INSULATION. INSULATION SHALL BE UL 181 LABELED. PROVIDE WITH 1" OVERLAP. INSTALL AND SUPPORT PER MANUFACTURERS INSTRUCTIONS. INSULATED FLEXIBLE DUCTWORK TO BE 20/50 RATED FOR SMOKE AND FLAME.
8. KITCHEN HOOD EXHAUST DUCTWORK FABRICATION: FABRICATE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND NFPA 96. KITCHEN HOOD EXHAUST DUCTS SHALL BE CONSTRUCTED OF 16 GAUGE BLACK CARBON STEEL WITH WELDED JOINTS AND GREASE TIGHT. PROVIDE DUCTWORK IN 2 HOUR RATED ENCLOSURE. INSULATION SHALL BE 1-1/2" THICK REFACTORY CERAMIC BLANKET OR CALCIA, MAGNESIA AND SILICA WITH ALUMINUM FOIL, FIBERGLASS-REINFORCE SCRIM ENCAPSULATION. MANUFACTURER SHALL BE 3M FIRE BARRIER DUCT WRAP; PROVIDE CLEAN OUT PANELS IN DUCT AS REQUIRED BY CODE.
9. THE ROOFTOP AIR CONDITIONING UNITS SHALL BE MANUFACTURED BY TRANE, RUUD, LENNOX, CARRIER, OR YORK. PROVIDE UNITS WITH PREFABRICATED ROOF CURB, UNIT MOUNTED DISCONNECT, PRE-WIRED MOTORIZED DAMPER, PRE-WIRED ELECTRICAL CONVENIENCE OUTLET AND TRANSFORMER, HEAD PRESSURE CONTROL TO OPERATE DOWN TO 0'F AMBIENT, CORROSION RESISTANT HEAT EXCHANGER, AND SHORT CYCLE CIRCUIT. PROVIDE 2" THROW-AWAY FILTERS. PROVIDE COMPRESSOR WITH FIVE YEAR WARRANTY, VIBRATION ISOLATION, SERVICE VALVES, CRANK CASE HEATER, SIGHT GLASS AND FILTER DRYER. FURNISH UNIT WITH OUTSIDE AIR HOOD AND VOLUME DAMPER. UNITS SHALL BE EQUIPPED WITH NATURAL GAS HEAT. UNITS SHALL BE WIRED FOR SINGLE POINT ELECTRICAL CONNECTION. PROVIDE WITH 7-DAY PROGRAMMABLE THERMOSTAT WITH AUTOMATIC CHANGE-OVER. THE CONTRACTOR SHALL INSTALL UNIT PER MANUFACTURER INSTRUCTION. ALL CONTROL WIRING BY MECHANICAL CONTRACTOR. CONTRACTOR SHALL VERIFY SLOPE OF ROOF BEFORE ORDERING ROOF CURB.
10. CONDENSATE DRAIN TO BE PVC WITH DRAINAGE PATTERN FITTINGS. CONDENSATE DRAIN PIPING IN PLENUM AREAS OR BELOW ROOF SHALL BE TYPE "L" COPPER WITH DRAINAGE PATTERN FITTINGS. PROVIDE CLEANOUTS EVERY 50 FEET AND AT EACH CHANGE OF DIRECTION. MAINTAIN POSITIVE SLOPE AND SUPPORT TO PREVENT SAGGING. INSULATE PIPING WITH 3/4" ELASTOMERIC INSULATION FOR ALL PIPE BELOW ROOF. SUPPORT PIPING IN THE VERTICAL. INSULATION TO BE 20/50 FLAME AND SMOKE RATING. CONDENSATE PIPING ON ROOF TO BE SUPPORTED BY 4"x4" PRETREATED REDWOOD BLOCKS AND SPACED 4'-0" ON CENTER AND AT EACH CHANGE OF DIRECTION. SECURE PIPE TO BLOCKS WITH NON CORROSIVE PIPE STRAPPING.

PACKAGE DX ROOFTOP A/C UNIT SCHEDULE

UNIT TAG	SERVICE	MANUFACT.	MODEL #	UNIT CONFIGURATION	NOMINAL TONS	UNIT SEER	INDOOR BLOWER DATA				COOLING COIL SECTION					NATURAL GAS HEATING MBH (MIN.)	UNIT ELECTRICAL			UNIT WEIGHT LBS.	REMARKS
							SUPPLY CFM	OA CFM	EXT.SP IN./W.G.	HP	CFM OVER COIL	SENS.CAP. (MBTUH)	TOT.CAP. (MBTUH)	E.A.T. (°F) DB/WB	OUTDOOR AMBIENT (F°DB)		MCA	MROPD	V/PH/HZ		
RTU-1	DINING	GOODMAN	CPC090	DOWN-FLOW	7.5	13	3,100	726	-	-	-	-	-	-	-	-	-	-	-	-	EXISTING UNIT TO REMAIN.
RTU-2	DINING	CARRIER	48TCM06	DOWN-FLOW	5.0	12	2,000	400	1.0"	1.5	2,100	43,200	240,000	80.0/67.0	100'	115.0	26.2	40	230/3/60	700	NEW UNIT ON EXISTING ROOF
RTU-3	KITCHEN	CARRIER	48TCM06	DOWN-FLOW	5.0	12	2,500	400	1.0"	1.5	2,100	43,000	293,000	80.0/67.0	100'	115.0	26.2	40	230/3/60	700	NEW UNIT ON EXISTING ROOF
								1													

NOTES:
1. PROVIDE SINGLE POINT OF POWER CONNECTION.
2. ESTIMATED EXTERNAL STATIC PRESSURE INCLUDES LOSSES THRU DUCTWORK, AIR DEVICES, SOUND ATTENUATORS, ETC.
3. AIR HANDLING UNIT INTERNAL STATIC PRESSURE SHALL INCLUDE LOSSES THROUGH COILS, CASING INTERNAL DAMPERS, AND 0.65" W.G. FOR DIRTY FILTERS.
4. CASING - DOUBLE WALL 3/4" INSULATION OR FOIL FACED INSULATION.
5. PROVIDE R410a REFRIGERANT.
6. PROVIDE FACTORY PREFABRICATED 14" ROOF CURB.
7. COORDINATE ELECTRICAL REQUIREMENTS FROM MANUFACTURER WITH ELECTRICIAN.
8. PROVIDE LOW AMBIENT CONTROL DOWN TO 0'F.
9. PROVIDE SMOKE DUCT DETECTORS.
10. REFER TO MECHANICAL SPECIFICATIONS FOR FURTHER RTU REQUIREMENTS.
11. PROVIDE "HUMIDIMIZER" DEHUMIDIFICATION CONTROL.
12. COORDINATE UNIT LOCATION WITH EXISTING STRUCTURAL MEMBERS.
13. PROVIDE A 2-POSITION MOTORIZED OUTSIDE AIR DAMPER AND VOLUME DAMPER.
14. (1) INSTALL AN AUTOMATIC FLOAT SWITCH IN THE CONDENSATE DRAIN PAN OF EACH UNIT TO DEENERGIZE UNIT IN THE EVENT OF CONDENSATE OVER FLOW.

DUCTWORK SYMBOLS LEGEND



FAN

MARK	LOCATION	CFM	MAXIMUM RPM	EXT. STATIC PRESSURE (IN. W.C.)	HORSE POWER	CURRENT CHARAC.	LOCALLY SWITCHED BY	INTERLOCKED WITH	FAN TYPE	MANUFACTURER	MODEL NUMBER	REMARKS
EF-FU1	KITCHEN HOOD	2,775	1,750	0.75"	1.0	230/3/60	HOOD CONTROL	-	ROOF MOUNTED	CAPTIVE AIRE	5424	1,3,4,6
SF-FU2	KITCHEN HOOD	2,220	1,750	0.5"	1.0	230/3/60	-	EF-FU1	ROOF MOUNTED	CAPTIVEAIRE	NSAU1	1,3,4,6
EF-FU3	KITCHEN HOOD	3,354	1,750	0.75"	1.5	230/3/60	HOOD CONTROL	-	ROOF MOUNTED	CAPTIVEAIRE	5424	1,3,4,6
SF-FU4	KITCHEN HOOD	2,683	1,750	0.50"	1.0	230/3/60	-	EF-FU3	ROOF MOUNTED	CAPTIVEAIRE	NSAU2	1,3,4,6
EF-FU5	KITCHEN HOOD	600	1,750	0.75"	.33	120/1/60	HOOD CONTROL	-	ROOF MOUNTED	CAPTIVEAIRE	4824	1,3,4,6
SF-FU6	KITCHEN HOOD	600	1,750	0.5"	.33	120/1/60	-	EF-FU6	ROOF MOUNTED	ACME	AFSN-106E	1,3,5,6
EF-1,2	TOILET EXHAUST	150	1,200	0.2"	125W	120/1/60	-	RTU-3	CEILING	ACME	VQ150	2,7

GENERAL NOTES:
1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES, AND DAMPERS WHERE APPLICABLE.
2. FAN SHALL BE CENTRIFUGAL, DIRECT DRIVEN TYPE UNLESS OTHERWISE SCHEDULED.
3. ALL CAPTIVE AIRE FANS SHALL BE FURNISHED BY HOOD SUPPLIER AND INSTALLED BY MECHANICAL CONTRACTOR. SEE SHEETS K-4.1, K4.2 & K4.3.

REMARKS:
1. CENTRIFUGAL ROOF MOUNTED EXHAUST FAN.
2. PROVIDE WITH BACKDRAFT DAMPER.
3. PREMANUFACTURED ROOF CURB.
4. FAN AND CURB PROVIDED BY KITCHEN HOOD SUPPLIER.
5. FAN AND CURB INSTALLED BY MECHANICAL CONTRACTOR.
6. PROVIDE WITH MOTORIZED DAMPER.
7. CEILING MOUNTED FAN WITH GRILLE.

GRILLE

MARK	SERVICE	TYPE	DAMPER	CONSTRUCTION MATERIAL	FINISH COLOR	MANUFACTURER	MODEL NUMBER	REMARKS
A	SUPPLY AIR	DIFFUSER	-	STEEL	OFF WHITE	METALAIRE	5500S-6	EXPOSED T-BAR CEILING FRAME STYLE WITH A 24"X24" FACE.
B	SUPPLY AIR	DIFFUSER	-	STEEL	OFF WHITE	METALAIRE	5500S-1	SURFACE MOUNTED CEILING FRAME STYLE WITH A 24"X24" FACE.
C	SUPPLY AIR	REGISTER	-	STEEL	OFF WHITE	METALAIRE	VHD	SURFACE MOUNTED SIDE WALL REGISTER DOUBLE DEFLECTION
D	SUPPLY AIR	DIFFUSER	-	STEEL	OFF WHITE	METALAIRE	LD	LAY-IN 1-WAY THROW WITH CURVED BLADES
E	RETURN AIR	FILTER GRILLE	-	STEEL	OFF WHITE	METALAIRE	CC5	RETURN AIR FILTER GRILLE 48"X24" EGGCRATE

NOTES:
1. ALL AIR DEVICES SHALL BE COMPATIBLE WITH SCHEDULED CEILING TYPE.
2. ALL AIR DEVICES SHALL BE AS APPROVED BY ARCHITECT.
3. INSTALL VOLUME DAMPERS AT ALL DUCT TAKEOFFS TO SUPPLY AIR DEVICES FOR BALANCING.

DAMPER

MARK	ACTUATOR	DUTY	BLADE ACTION	MANUFACTURER	MODEL NUMBER	REMARKS
D-1	MANUAL BALANCING	UNDER 9" WIDE	N/A	N/A	N/A	SEE SMACNA CONSTRUCTION DETAILS REFERENCED "TYPICAL CONSTRUCTION DETAILS FOR LOW VELOCITY DUCTS."
D-2	MANUAL BALANCING	OVER 9" WIDE	OPPOSED	RUSKIN	MD-35	MANUAL DAMPER WITH STANDARD CONSTRUCTION FEATURES AND VENTLOCK #637 LOCKING REGULATOR.
D-3	MOTORIZED	OVER 9" WIDE	OPPOSED	RUSKIN	CD-60	LOW LEAKAGE DAMPER WITH BLADE SEALS
D-4	MANUAL BALANCING	OVER 9" WIDE	OPPOSED	RUSKIN	VFBD25	MANUAL DAMPER WITH STANDARD CONSTRUCTION FEATURES AND INCREMENTAL LOCKING HAND QUADRANT

RANDALL W. HOLSTE
95561
REGISTERED
PROFESSIONAL ENGINEER
02/23/12

ISSUE
- 01/25/12 ISSUED FOR PERMIT
- 02/16/12 ISSUE FOR BID
- 02/23/12 (1) CITY COMMENTS

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PROJECT NUMBER

11078

SHEET NAME

MECHANICAL SCHEDULES

SHEET NUMBER

M3.1