

## HVAC LEGEND

SYMBOL	DESCRIPTION
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BDD	BACKDRAFT DAMPER
BTU	BRITISH THERMAL UNIT
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB (°F)
EAT	ENTERING AIR TEMPERATURE
ESP	EXTERNAL STATIC PRESSURE
LAT	LEAVING AIR TEMPERATURE
MA	MIXED AIR
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
MVD	MANUAL VOLUME DAMPER
QD	OUTDOOR AIR
RA	RETURN AIR
RAG	RETURN AIR GRILLE
SA	SUPPLY AIR
SR	SUPPLY REGISTER
TG	TRANSFER GRILLE
FCU-1	HVAC EQUIPMENT DESIGNATION (FAN COIL UNIT NO. 1)
④	GRILLE/DIFFUSER DESIGNATION, TYPE "A". SEE SCHEDULE THIS SHEET
①	THERMOSTAT
12x6 SR 200 CFM	SUPPLY REGISTER SIZE, 3-WAY THROW
12x6 SR 200 CFM	SUPPLY REGISTER, SR, TWO WAY THROW
12x6 SR 200 CFM	SUPPLY REGISTER, SR, ONE WAY THROW
DUCT ELBOW WITH TURNING VANES	
DUCT ELBOW WITHOUT TURNING VANES	
HVAC EQUIPMENT	
FLEX DUCT	
NEW DUCT OR EQUIP (SHOWN AS SOLID)	
NEW DUCT LINED (LINER SHOWN AS DASHED)	
EQUIPMENT LOCATED ON ROOF, (DASHED)	
CRD	CEILING RADIATION DAMPER
FD	FIRE DAMPER
FSD	FIRE/SMOKE DAMPER

## SHOP DRAWINGS NOTES:

SHOP DRAWINGS SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO ORDERING, PURCHASING, OR FABRICATING MECHANICAL EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE: NEW EQUIPMENT SCHEDULED OR SPECIFIED ON THE DRAWINGS OR SPECS INCLUDING, BUT NOT LIMITED TO SPLIT SYSTEMS, DIFFUSERS, FANS, DUCTWORK, DUCT INSULATION, AND DUCT LINER, ETC.

SHOP DRAWINGS SHALL HAVE THE EQUIPMENT SUBMITTALS CLEARLY LABELED TO MATCH THE EQUIPMENT UNIT DESIGNATION ("TAG" AS NOTED IN SCHEDULE) SHOWN ON THE DRAWINGS. PROVIDE ALL INFORMATION INDICATED IN THE SCHEDULES OR ON THE DRAWINGS. CLEARLY ADDRESS ALL NOTES AND ACCESSORIES IN THE SCHEDULES.

SUBMIT ALL EQUIPMENT TOGETHER IN A CLEARLY LABELED AND ORGANIZED MANNER AT THE SAME TIME (IN SAME SUBMITTAL PACKAGE) OR ALL EQUIPMENT WILL BE REJECTED REGARDLESS OF LEAD TIMES OR DIFFERENT EQUIPMENT SUPPLIERS. NO EXCEPTIONS ALLOWED! IF THE ORIGINAL SUBMITTALS HAVE BEEN REVIEWED AND MARKED AS "REJECTED" OR "REVISE AND RESUBMIT," THEN ONLY THE EQUIPMENT THAT IS REQUIRED BY ENGINEER TO BE RESUBMITTED SHOULD BE RESUBMITTED AGAIN (DO NOT RESUBMIT EQUIPMENT NOTED AS "APPROVED" OR "EXCEPTIONS NOTED"), IF MULTIPLE ITEMS WERE NOT APPROVED, RESUBMIT ITEMS THAT NEED TO BE REVIEWED AGAIN AT THE SAME TIME OR THEY WILL BE REJECTED AGAIN.

## BI-POLAR IONIZATION AIR PURIFICATION UNITS

TAG	MAKE & MODEL NO.	ASSOCIATED AIR HANDLER	TOTAL CFM	OA CFM	PRESSURE DROP	VOLTAGE	WATTS	NOTES
APU-A	GPS MODEL RN	FCU-3.0 (DOG SPA)	1200	200	0.05"	24VAC	0.24	1,2,3
1. BASIS OF DESIGN IS GLOBAL PLASMA SOLUTIONS (GPS) APPROVED EQUALS BY ARGONICS AND BIOGEN ONLY. SUBMITTALS FOR PRODUCTS BY MANUFACTURERS OTHER THAN GPS MUST PROVIDE DESIGN CALCULATIONS SHOWING THAT LEVELS OF TYPICAL OA CONTAMINANTS WILL BE BELOW RECOMMENDED LEVELS. 2. UNIT SCHEDULED IS A BI-POLAR ION GENERATOR. UNIT SHALL BE MOUNTED AT THE AIR HANDLING UNIT. UNIT SHALL BE INSTALLED AND WIRED BY THE MECHANICAL CONTRACTOR. 3. BI-POLAR IONIZATION SYSTEMS REQUIRING FERROUS GLASS TUBES ARE NOT ACCEPTABLE. 4. POWER UNIT FROM FCU. UNIT SHALL BE ENERGIZED ANYTIME FAN IN FCU IS ENERGIZED. 5. AIR PURIFICATION UNITS SHALL COMPLY WITH UL 867-2007, INCLUDING THE CLOSED CHAMBER OZONE TEST.								

## SPLIT SYSTEM – HEAT PUMP

ALL NOTES APPLY

TAG	CARRIER INDOOR UNIT MODEL #	CARRIER OUTDOOR UNIT MODEL #	NOMINAL TONS	AREA SERVED	TOTAL CFM	OA CFM	ESP	FAN HP	COOLING, NOTE 1 TOTAL MBH SENS. MBH MIN. SEER	COIL EAT DB/WB	HEATING, HEAT PUMP HEATING MBH MIN. HSPF	ELEC HEAT KW 240V NO. OF STAGES	MAX FCU WEIGHT, LBS NOTE 3	MAX HP WEIGHT, LBS	ACCESSORIES				
APARTMENT SYSTEMS ALL BUILDINGS																			
FCU/HP-A	FFMA 018	25HCD4 018	1.5	APARTMENTS	600	NOTE 9	0.50	1/3	17.8	12.8	14.0	80.0/67.0	17.8	8.0	5.0	1	150	200	1 THRU 12
FCU/HP-B	FFMA 024	25HCD4 024	2.0	APARTMENTS	800	NOTE 9	0.50	1/3	23.0	17.4	14.0	80.0/67.0	23.0	7.8	5.0	1	150	200	1 THRU 12
FCU/HP-C	FFMA 030	25HCD4 030	2.5	APARTMENTS	1000	NOTE 9	0.50	1/2	30.0	21.6	14.0	80.0/67.0	30.0	8.0	7.5	1	150	200	1 THRU 12
FCU/HP-D	FFMA 036	25HCD4 036	3.0	APARTMENTS	1200	NOTE 9	0.50	1/2	34.8	25.1	14.0	80.0/67.0	34.8	8.0	7.5	1	150	200	1 THRU 12
COMMON AREA SYSTEMS																			
FCU/HP-1.5	FX4D 019	25HCD4 018	1.5	CORRIDOR/AMENITY	600	NOTE 10	0.50	1/3	17.8	12.8	14.0	80.0/67.0	17.8	8.0	5.0	1	150	200	1 THRU 14
FCU/HP-2.0	FX4D 025	25HCD4 024	2.0	CORRIDOR	800	NOTE 10	0.50	1/3	23.0	17.4	14.0	80.0/67.0	23.0	7.8	5.0	1	150	200	1 THRU 14
FCU/HP-2.5	FX4D 031	25HCD4 030	2.5	CORRIDOR	1000	NOTE 10	0.50	1/2	30.0	21.6	14.0	80.0/67.0	30.0	8.0	8.0	1	150	200	1 THRU 14
FCU/HP-3.0	FX4D 037	25HCD4 036	3.0	AMENITY	1200	NOTE 10	0.50	1/2	34.8	25.1	14.0	80.0/67.0	34.8	8.0	8.0	1	175	200	1 THRU 14
FCU/HP-4.0	FX4D 049	25HCD4 048	4.0	AMENITY	1600	NOTE 10	0.50	3/4	46.2	35.0	14.0	80.0/67.0	46.2	8.0	10.0	1	200	275	1 THRU 14
FCU/HP-5.0	FX4D 061	25HCD4 060	5.0	AMENITY	1900	NOTE 10	0.50	3/4	59.5	44.9	14.0	80.0/67.0	59.5	8.0	15.0	1	225	300	1 THRU 14
NOTES																			
1. COOLING CAPACITIES ARE BASED ON ENTERING AIR TEMPERATURES SHOWN AT FAN COIL UNIT & 95°F db ENTERING AIR AT OUTDOOR UNIT. CAPACITIES OF UNITS SUBMITTED SHALL NOT BE LESS THAN 5% OF SCHEDULED VALUES INCLUDING LINE LOSSES – SEE ACCESSORY NOTE BELOW REGARDING LONG LINE SETS.																			
2. HEAT KW IS MINIMUM REQUIRED.																			
3. FCU WEIGHT INCLUDES ELECTRIC HEAT. INDICATE A TOTAL WEIGHT VALUE IN THE SUBMITTAL.																			
4. SEER VALUE IS BASED ON ARI STANDARD 210																			
5. ESP VALUES DO NOT INCLUDE INTERNAL PRESSURE DROPS SUCH AS THE COOLING COIL, CASING, OR ELECTRIC HEAT																			
6. SUBMIT CLEARLY LABELED SHOP DRAWINGS INDICATING THE PROPOSED UNIT'S CAPACITIES.																			
7. MECHANICAL CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR REGARDING SINGLE CIRCUIT OR DUAL CIRCUIT CONNECTIONS FOR SPLIT SYSTEMS.																			
8. UNIT SHALL HAVE R-410A REFRIGERANT. R-22 WILL NOT BE ACCEPTABLE.																			
9. OUTSIDE AIR IS PROVIDED THRU OPERABLE WINDOWS IN APARTMENT UNITS.																			
10. SEE FLOOR PLANS FOR O.A. QUANTITIES.																			
11. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR MAXIMUM LINE LENGTHS.																			
12. FAN COIL UNIT CABINETS SHALL HAVE A MAXIMUM CABINET LEAKAGE OF LESS THAN OR EQUAL TO 2%. UNIT SHALL BE CLEARLY LABELED BY THE MANUFACTURER WITH THIS INFORMATION.																			
ACCESSORIES																			
1. STANDARD THROW-AWAY FIBERGLASS FILTER																			
2. FACTORY INSTALLED ELECTRIC HEAT WITH SINGLE POINT POWER FOR FCU. MANUFACTURER SHALL PROVIDE TRANSFORMER AS NECESSARY FOR BLOWER FAN.																			
3. ACCUMULATOR, FACTORY INSTALLED (OUTDOOR UNIT, HP)																			
4. 5-YEAR COMPRESSOR WARRANTY																			
5. BASED ON ENAMEL FINISH																			
6. PROGRAMMABLE NEST THERMOSTAT																			
7. FILTER DRIVER																			
8. ANTI-SHORT-CYCLE KIT																			
9. PROVIDE FCU WITH THERMAL EXPANSION VALVE AND TIME DELAY RELAY.																			
10. COMPRESSOR CRANKCASE HEATER																			
11. REFRIGERANT LINES SHALL BE SIZED PER THE MANUFACTURER'S RECOMMENDATION. PROVIDE LONG LINE REFRIGERATION LINE SET WHERE REQUIRED BY MANUFACTURER. – LINES SHALL BE SIZED BY MANUFACTURER TO MAINTAIN SCHEDULED CAPACITY. SHOW MANUFACTURER'S RECOMMENDED LINE SET SIZE IN SUBMITTALS. MANUFACTURER SHALL DETERMINE IF LONG LINE APPLICATION KIT IS REQUIRED. PROVIDE DOCUMENTATION IN SHOP DRAWINGS. PROVIDE ALL ACCESSORIES REQUIRED BY THE MANUFACTURER FOR LONG LINE APPLICATIONS.																			
12. DISCONNECT SWITCH FOR EACH FOU FACTORY PROVIDED; DISCONNECT FOR EACH CONDENSING UNIT PROVIDED BY AND INSTALLED BY ELECTRICAL.																			
13. PROVIDE ACCESSORIES TO ALLOW UNIT TO OPERATE IN COOLING MODE AT LOW AMBIENT TEMPERATURES (DOWN TO AT LEAST 20°F).																			
14. PROVIDE WITH GLOBAL PLASMA SOLUTIONS BI-POLAR IONIZATION DEVICE EQUAL TO GPS-0N, SEE O.A. CALCULATION WORK SHEETS ON SHEETS M0-03.																			
BASIS OF DESIGN AS NOTED OR EQUAL BY TRANE, YORK, LENOX.																			

## DUCTLESS SPLIT SYSTEMS

TAG	AREA SERVED	MITSUBISHI MODEL # AHU/CU	NOMINAL TONS	TOTAL CFM	OA CFM	COIL EAT DB/WB	TOTAL COOL. MBH	SENS. COOL. MBH	HEAT MBH	SEER	MAX. WEIGHT LBS FCU CU	NOTES	ACCESSORIES	
DSFC-EV/DSHP-EV	ELEVATOR SHAFT	PKA-A18HA/PUZ-A18NHA3	1.5	370	0	80/67	18.0	13.5	19.0	15.2	30	99	1,2,3	1,2,3,4,5,6,7
NOTES: 1. COOLING CAPACITIES BASED ON 95° F db AIR ENTERING OUTDOOR UNIT 2. COOLING CAPACITIES SCHEDULED IS AN ARI RATED CAPACITY. UNIT SHALL BE ARI RATED 3. UNIT IS A DUCTLESS SPLIT SYSTEM WALL MOUNT FCU 4. UNIT IS A DUCTLESS SPLIT SYSTEM CEILING RECESSED FCU 5. UNIT SHALL BE INVERTER DUTY-VARIABLE CAPACITY.														
BASIS OF DESIGN: AS NOTED; EQUAL BY: SANYO, CARRIER														
ACCESSORIES: 1. FILTER DRIVER 2. ROUTE CONDENSATE AS SHOWN ON PLANS; PROVIDE CONDENSATE PUMP AS REQUIRED. 3. CLEANABLE FILTERS. 4. WALL MOUNTED T'STAT IN LOCKING COVER 5. MOUNTING KIT FOR FAN COIL UNIT 6. COOLING OPERATION DOWN TO 20 DEGREES. PROVIDE ALL MANUFACTURER RECOMMENDED ACCESSORIES NECESSARY TO ACCOMMODATE THE LOW AMBIENT COOLING. 7. REFRIGERANT LINES SHALL BE SIZED PER THE MANUFACTURER'S RECOMMENDATION. PROVIDE LONG LINE REFRIGERATION LINE SET WHERE REQUIRED BY MANUFACTURER. – LINES SHALL BE SIZED BY MANUFACTURER TO MAINTAIN SCHEDULED CAPACITY. SHOW MANUFACTURER'S RECOMMENDED LINE SET SIZE IN SUBMITTALS. MANUFACTURER SHALL DETERMINE IF LONG LINE APPLICATION KIT IS REQUIRED. PROVIDE DOCUMENTATION IN SHOP DRAWINGS. PROVIDE ALL ACCESSORIES REQUIRED BY THE MANUFACTURER FOR LONG LINE APPLICATIONS.														

## FANS

TAG	GREENHECK MODEL NO.	TYPE	DUTY	CFM	ESP	POWER	FAN RPM	MAX. SONES	DRIVE	WEIGHT (LBS)	CONTROLS	ACCESSORIES	NOTES
TEF-A	PARANSON FCV-05V12	CEILING MOUNTED	APARTMENT TOILET EXHAUST	50	0.15"	16.5 W	917	2.0	DIRECT	15	A	1,2,4	1,2
TEF-B	SP-A90	CEILING MOUNTED	AMENITY TOILET EXHAUST	70	0.15"	48 W	746	2.0	DIRECT	15	A	1,2,3,4	1,2
TEF-C	SP-A200	CEILING MOUNTED	AMENITY TOILET EXHAUST	210	0.125"	60 W	900	3.0	DIRECT	20	A	1,2,3,4	1,2
EF-T	SP-A70	CEILING MOUNTED	TRASH DROP OFF ROOM	50	0.15"	20 W	850	1.4	DIRECT	12	B	1,2,3,4	1,2
EF-TR	GB-121-4	ROOF DOWNBLAST	TRASH COMPACTOR RISER	780	0.30"	2.0 HP	983	27	BELT	115	C	1,2,5	1,2
GEF-A	PENBERG HORIZONTAL PROPELLER	GARAGE EXHAUST	GARAGE EXHAUST	50, 617	0.30"	5.0 HP	956	70	BELT	200	D	9	1,2
GEF-B	PENBERG HORIZONTAL PROPELLER	GARAGE EXHAUST	GARAGE EXHAUST	5, 1857	0.30"	5.0 HP	956	70	BELT	200	D	9	1,2
EF-P	BSO-70-4	IN-LINE	POOL EQUIPMENT ROOM	220	0.5"	1/4 HP	1600	14.0	BELT	75	E	1,2,6,7,8,10	1,2,3
EF-J	SP-A190	CEILING MOUNTED	JANITOR/MAINTENANCE ROOM	150	0.15"	113 W	1400	2.0	DIRECT	17	F	1,2,3,4	1,2
EF-D	SP-A190	CEILING MOUNTED	DOG WASH	100	0.15"	113 W	1400	2.0	DIRECT	17	F	1,2,3,4	1,2
CONTROLS: A. WIRE INTO WALL SWITCH (SEE ELECTRICAL). B. FAN SHALL RUN CONTINUOUSLY. PROVIDE FAN SWITCH IN TRASH DROP OFF ROOM WITH LOCKING COVER. C. FAN SHALL RUN CONTINUOUSLY AS INDICATED ON FLOOR PLANS. PROVIDE SWITCH IN TRASH COMPACTOR ROOM. D. FAN TO BE CONTROLLED BY CARBON MONOXIDE/NITROGEN DIOXIDE AND OCCUPANCY SENSOR SYSTEM. SEE M0-03 FOR ADDITIONAL INFORMATION. E. WALL SWITCH. SEE FLOOR PLANS FOR SEQUENCE OF OPERATION. F. 0-60 MINUTE TIMER.													
ACCESSORIES: 1. BACKDRAFT DAMPER AT FAN DISCHARGE. 2. DISCONNECT SWITCH. 3. PROVIDE WITH FACTORY C.R.D. 4. PROVIDE WITH MATCHING WALL CAP. 5. PROVIDE 12" INSULATED ROOF CURB. 6. INTEGRAL THERMAL OVERLOAD PROTECTION. 7. BROODSCREEN AT FAN INLET. 8. FAN HANGING KIT WITH NEOPRENE PAD VIBRATION ISOLATORS. 9. FAN SHALL HAVE WASH DOWN MOTOR (MOTOR EXPOSED TO RAIN AND WEATHER), MOTOR ABOVE BLADES, HORIZONTAL MOUNTING KIT. SEE M0-03 FOR ADDITIONAL INFORMATION. 10. PROVIDE WITH MOTOR OUT OF AIRSTREAM AND PROVIDE A COATING ON ALL COMPONENTS IN CONTACT WITH THE AIR STREAM AND THE OUTER CABINET. COATING (EPOXY, PHENOLIC, POLYESTER, ETC.) SHALL PASS A 1000 HR SALT SPRAY TEST PER ASTM B-117-97.													
NOTES: 1. SOME VALUES ARE VALUES MEASURED 5 FT FROM THE FAN – OPEN ENDED. SOME VALUES MUST NOT EXCEED SCHEDULED AMOUNT BY MORE THAN 10%. 2. FAN SHALL BE AMCA CERTIFIED FOR SOUND AND PERFORMANCE AND SHALL BE UL LISTED. 3. FAN SIZED FOR 20 ACH. PROVIDE AMCA TYPE B SPARK RESISTANT CONSTRUCTION AND CORROSION RESISTANT COATING.													
BASIS OF DESIGN: AS NOTED. EQUAL BY: COOK, PENN.													

## ELECTRIC HEATERS

BASIS OF DESIGN: AS NOTED; EQUAL BY: MARKEL, Q-MARK, BERKO

TAG	MAKE & MODEL	TYPE	CFM	KW	SERVES	ACCESSORIES	NOTES
EMH-1.5	RAYWALL AFA	WALL MTD	125	1.5	SEE DWGS	1,2,3,4	1,2
EMH-3.0	RAYWALL AFA	WALL MTD	310	3.0	SEE DWGS	1,2,3,4	1,3
NOTES: 1. UNITS SHALL BE MADE OF STEEL. 2. AUTO – RESET THERMAL OVERLOADS 3. HANG UNIT SO THAT TOP OF UNIT IS 12" BELOW CLG. 4. WALL MOUNT KIT (RECESSED WHERE SHOWN ON PLANS)							
ACCESSORIES: 1. PROVIDE UNIT WITH INTEGRAL T'STAT AND DISCONNECT 2. AUTO – RESET THERMAL OVERLOADS 3. TAMPER PROOF CONTROLS 4. WALL MOUNT KIT (RECESSED WHERE SHOWN ON PLANS)							

## HVAC GENERAL NOTES

- MECHANICAL EQUIPMENT AND INSTALLATIONS SHALL CONFORM WITH THE REQUIREMENTS OF THE 2012 INTERNATIONAL MECHANICAL CODE, THE 2012 INTERNATIONAL BUILDING CODE, THE 2009 INTERNATIONAL ENERGY CONSERVATION CODE, AND ALL APPLICABLE LOCAL CODES, AMENDMENTS AND ORDINANCES.
- PRIOR TO PURCHASING MATERIALS OR STARTING WORK, CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS, VERIFY DUCTWORK SIZES, DUCTWORK LOCATIONS, EQUIPMENT SIZES, EQUIPMENT LOCATIONS, VOLTAGES, ETC. SHOWN ON THE DRAWINGS OR CONDITIONS AFFECTING THIS WORK. REPORT ANY DEVIATIONS TO THE ARCHITECT.
- THE MECHANICAL CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR THAT A FACE TO FACE MEETING IS REQUIRED BETWEEN ELECTRICAL AND MECHANICAL CONTRACTORS PRIOR TO ORDERING AND INSTALLING EQUIPMENT TO COORDINATE VOLTAGE, PHASE, AMPS, AND OTHER ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT. AFTER THIS MEETING HAS OCCURRED THE GENERAL CONTRACTOR SHALL PROVIDE NOTICE IN WRITING THAT THIS MEETING HAS OCCURRED AND ANY DISCREPANCIES HAVE BEEN RESOLVED.
- FOR UL LISTED EQUIPMENT, CONTRACTOR SHALL SUBMIT AN ADDITIONAL REVIEW TO THE ARCHITECT TO CONFIRM THAT THE EQUIPMENT BEING SUBMITTED IS UL LISTED FOR THE APPLICABLE UL ASSEMBLIES AS LISTED ON THE ARCHITECT'S DRAWINGS.
- IF THE CONTRACTOR REQUESTS THE ENGINEER'S CAD DRAWINGS OR IF THE DRAWINGS ARE REQUESTED BY OTHERS TO BE USED BY CONTRACTOR (FOR AS-BUILTS, COORDINATION, ETC.), DRAWINGS SENT OUT (BY THE ENGINEER) WILL BE OF FLOOR PLANS AND SECTIONS, BUT WILL NOT HAVE DETAILS, GENERAL NOTES, SCHEDULES, OR OTHER ITEMS DEEMED PROPRIETARY BY THE ENGINEER.
- CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF MECHANICAL EQUIPMENT WITH ELECTRICAL DRAWINGS PRIOR TO ORDERING EQUIPMENT OR SUBMITTING SHOP DRAWINGS, AND SHALL FURNISH EQUIPMENT WIRED FOR THE VOLTAGES SHOWN ON THE ELECTRICAL DRAWINGS.
- MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE INSTALLED WITH DISCONNECT SWITCHES AT EACH PIECE OF EQUIPMENT. COORDINATE SWITCH TYPE (FUSED OR NON-FUSED) WITH EQUIPMENT CHARACTERISTICS, MANUFACTURER'S RECOMMENDATIONS, AND ELECTRICAL DRAWINGS.
- INCLUDE CONTROL WIRING AS A PART OF THE MECHANICAL WORK; UNLESS SHOWN ON THE ELECTRICAL DRAWINGS. CONTROL WIRING INCLUDING THERMOSTAT WIRING SHALL BE PLENUM RATED (MEETING THE 25/50 FLAME AND SMOKE DEVELOPED RATING OF ASTM E84)
- UNLESS NOTED OTHERWISE, STARTERS, SMOKE DETECTORS, TRANSFORMERS, CONTROLS AND CONTROL WIRING REQUIRED FOR ALL MECHANICAL SYSTEMS SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- INSTALL MECHANICAL EQUIPMENT ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- GUARANTEE MECHANICAL EQUIPMENT AND SYSTEMS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY OWNER.
- PROVIDE HVAC COMPRESSORS WITH AN EXTENDED 5-YEAR MANUFACTURER'S WARRANTY.
- SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF OUTDOOR AIR CONDITIONING UNITS.
- INSTALL OUTDOOR AIR CONDITIONING EQUIPMENT LEVEL AS SHOWN IN DETAIL.
- DUCT INSULATION: FIBERGLASS DUCT WRAP, WITH FOIL FACED VAPOR BARRIER INSULATION SHALL BE U.L. LISTED, GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II, WITHOUT FACING AND WITH ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCORIM, ALUMINUM FOIL, AND VINYL FILM. JOHNS MANVILLE, OWENS CORNING, OR EQUAL. IF DUCTWORK SUPPORT STRAPS ARE ATTACHED TO THE DUCT, THEN LOCATE STRAPS INSIDE THE INSULATION AND SEAL WITH MASTIC AT PUNCTURE. ALL PUNCTURES (STAPLES) AND PENETRATIONS OF THE FOIL VAPOR BARRIER SHALL BE SEALED AIRTIGHT WITH FOIL TAPE AND/OR MASTIC – DO NOT USE DUCT TAPE (FABRIC OR CLOTH TYPE EVEN IF IT HAS A FOIL FACE). MASTIC MUST BE APPLIED THICK ENOUGH TO COMPLETELY COVER STAPLES. PERIMETER JOINTS SHALL BE FORMED SUCH THAT THE INSULATION ON THE TOP OF THE DUCT OVERLAPS THE INSULATION ON THE SIDES AND THE SIDES OVERLAP THE BOTTOM. DO NOT COMPRESS THE INSULATION WITH SUPPORTS (STRAPS, HANGERS, ETC.) – WHERE NECESSARY PROVIDE RIGID BOARD (6 LB DENSITY) THE SAME THICKNESS AS THE INSULATION INSERTED INTO THE INSULATION AT THE HANGER.
- APARTMENT UNIT DUCT: SUPPLY DUCTWORK SHALL BE CONSTRUCTED WITH FIBERGLASS DUCTBOARD HAVING THE FOLLOWING CHARACTERISTICS: FIBERGLASS DUCTWORK AND TAPING SYSTEM SHALL BE UL 181 LISTED AND SHALL BEAR THE UL LABEL. GLASS FABRIC REINFORCED VAPOR BARRIER. ALL FIBERGLASS DUCTWORK AND ACCESSORIES SHALL BE FABRICATED BY A MANUFACTURER'S AUTHORIZED FABRICATOR AND SHALL BE INSTALLED WITH THE FABRICATOR'S SUPERVISION AND ACCORDING TO THE MANUFACTURER'S RECOMMENDATION. SUPPLY DUCT LOCATED IN ATTIC OR TOP FLOOR FLOOR/CEILING ASSEMBLY SHALL BE 2" THICK, MINIMUM R=8.0, JOHNS MANVILLE TYPE 800 OR EQUAL. DUCT IN ALL OTHER AREAS (FLOOR SYSTEMS, RA PLENUMS) SHALL BE 1.5" THICK, MINIMUM R=6.0, JOHNS MANVILLE TYPE 800 OR EQUAL. TOILET EXHAUST AND DRYER EXHAUST DUCT SHALL BE SHEET METAL – SEE ADDITIONAL NOTES IN THIS LIST FOR DRYER EXHAUST DUCT REQUIREMENTS.
- DUCT: DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED PER THE GUIDELINES OF SMACNA, 2005 EDITION, EXCEPT WHERE NOTED. ALL DUCTWORK MATERIAL SHALL BE GALVANIZED SHEETMETAL, NOT LESS THAN 28 GAGE (0.019 INCHES) AND HAVING A ZINC COATING DESIGNATION OF G60 OR GREATER. DUCTS AND EQUIPMENT SHALL BE SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT REST ON CEILING TILES OR CEILING STRUCTURE. DUCT SUPPORTS AND ATTACHMENTS TO STRUCTURE SHALL BE PER SMACNA STANDARDS. ALL EXHAUST DUCTS AND ALL RETURN DUCTS UNDER A NEGATIVE PRESSURE AND LOCATED IN CEILING PLENUMS SHALL BE CONSTRUCTED TO A MINIMUM PRESSURE CLASS OF NEGATIVE ½" W.C. AND ALL JOINTS SHALL BE SEALED TO A SEAL CLASS OF "C" AS DEFINED BY SMACNA. SUPPLY (CONDITIONED AIR) DUCTS SHALL BE CONSTRUCTED TO A PRESSURE CLASSIFICATION OF 2" W.C. AND SEALED TO A CLASS "C". ALL JOINTS AND SEAMS IN ALL DUCTWORK SHALL BE SEALED WITH DUCT SEALER, UL LISTED 181A OR 181B FOR TAPES AND MASTICS. DO NOT USE DUCT TAPE.
- SHEETMETAL DUCT ELBOWS SHALL BE STANDARD RADIUS TYPE OR RECTANGULAR TYPE WITH SINGLE THICKNESS TURNING VANES. DO NOT USE RADII ELBOWS WITH A SQUARE THROAT. DO NOT USE TURNING VANES ON RETURN, EXHAUST, OR OA DUCT ELBOWS UNLESS NOTED OR SPECIFICALLY SHOWN ON THE DRAWINGS. INSTEAD USE STANDARD RADII ELBOWS.
- FLEXIBLE DUCT SHALL BE UL LISTED AS A CLASS I AIR DUCT COMPLYING WITH UL STANDARD 181, NFPA 90A & 90B AND HAVE A FLAME SPREAD RATING OF NOT OVER 25 AND A SMOKE DEVELOPMENT RATING OF NOT OVER 50. FLEXIBLE DUCT SHALL HAVE A POSITIVE OPERATING PRESSURE OF 10" MINIMUM. FLEXIBLE DUCT SHALL BE TESTED FOR A MAXIMUM INTERNAL OPERATING TEMPERATURE OF 200°F UNDER CONTINUOUS OPERATION AND SHALL BE RATED FOR A MINIMUM OF 5000 FPM AIR VELOCITY. INSULATION SHALL BE A MINIMUM OF 2" THICK, 3/4 POF DENSITY FIBERGLASS. SUPPLY DUCTS LOCATED IN THE ATTIC SHALL HAVE INSULATION WITH A MINIMUM R-VALUE OF 8.0. ALL OTHER DUCTS SHALL HAVE INSULATION WITH A MINIMUM R-VALUE OF 6.0. OUTER LINES SHALL BE A BI-DIRECTIONAL FIBERGLASS REINFORCED METALIZED VAPOR BARRIER. FLEXIBLE DUCTWORK SHALL BE INSTALLED AS STRAIGHT AS POSSIBLE, AND SHALL BE ROUTED AND SUPPORTED WITHOUT FORMING CRUMPS OR OTHER AIR FLOW RESTRICTIONS. PROVIDE SUPPORTS TO ROUND ADAPTERS OR BOOTS TO CONNECT TO AIR DEVICE NECK WHEN REQUIRED.
- FLEXIBLE DUCT IN RESIDENTIAL AREAS SHALL HAVE A FULL 5-YEAR WARRANTY. INNER LINER SHALL CONSIST OF A FULLY-LAMINATED POLYESTER FILM INNER LINER ADHERED TO A SPRING STEEL WIRE HELIX. FLEXIBLE DUCT SHALL BE THERMAFLEX TYPE KM, FLEXMASTER TYPE 3M OR EQUAL.
- FLEXIBLE DUCT IN COMMON AREAS SHALL HAVE A FULL 10-YEAR WARRANTY. INNER LINER SHALL CONSIST OF A CPE CORE PERMANENTLY BONDED TO A COATED SPRING STEEL WIRE HELIX (MIN. .041" THICK). FLEXIBLE DUCT SHALL BE THERMAFLEX TYPE M-KE, FLEXMASTER TYPE 8M OR EQUAL.
- ROUND AND FLEXIBLE DUCTWORK SHALL BE CONNECTED TO MAIN DUCTS WITH SPIN-IN OR DOVE-TAIL FITTINGS. ALSO PROVIDE BALANCING DAMPERS WHERE INDICATED IN THESE GENERAL NOTES AND ON THE DRAWINGS. DO NOT PROVIDE A SCOOP FITTING.
- DUCT LINER: SHEET METAL DUCTWORK SHOWN OR CALLED OUT AS BEING INTERNALLY LINED SHALL BE LINED WITH 1" THICK 1-1/2 LB./CU. FT. DENSITY DUCTLINER, R=4.2 PER INCH, MANVILLE UNACUSTIC OR EQUAL. DUCT LINER SHALL MEET REQUIREMENTS OF NFPA 90A & 90B, FLAME SPREAD OF 25 AND SMOKE DEVELOPED OF 50, MEET ASTM G-21 AND G-22, A MIN NOISE REDUCTION COEFFICIENT OF 0.70. LINE ALL DUCTWORK MIN. 10'-0" DOWNSTREAM OF ALL AIR HANDLING