

GRILLES, REGISTERS, AND DIFFUSERS SCHEDULE									
TAG	SERVICE	CFM RANGE	FACE SIZE (IN)	NECK SIZE (IN)	TYPE	OBD	MANUFACTURER PRICE & MODEL	ADDITIONAL OPTIONS	
A	SUPPLY	0 – 100	24x24	6"ø	SQUARE PLAQUE	NO	SPD		
B	SUPPLY	105 – 175	24x24	8"ø	SQUARE PLAQUE	NO	SPD		
C	SUPPLY	180 – 270	24x24	10"ø	SQUARE PLAQUE	NO	SPD		
D	SUPPLY	275 – 425	24x24	12"ø	SQUARE PLAQUE	NO	SPD		
E	SUPPLY	430 – 700	24x24	14"ø	SQUARE PLAQUE	NO	SPD		
F	SUPPLY	0 – 100	12x12	6"ø	SQUARE PLAQUE	NO	SPD		
G	SUPPLY	105 – 250	12x12	8"ø	SQUARE PLAQUE	NO	SPD		
H	SUPPLY	175 – 275	24x24	8"ø8"	MODULAR 4-WAY	NO	SPD		
A	RETURN	0 – 175	24x24	8"ø	PERFORATED FACE	NO	PDDR		
B	RETURN	180 – 270	24x24	10"ø	PERFORATED FACE	NO	PDDR		
C	RETURN	275 – 400	24x24	12"ø	PERFORATED FACE	NO	PDDR		
D	RETURN	405 – 620	24x24	14"ø	PERFORATED FACE	NO	PDDR		
E	RETURN	625 – 1250	24x24	16"ø	PERFORATED FACE	NO	PDDR		
F	RETURN	0 – 100	16x16	6"ø	PERFORATED FACE	NO	PDDR		
G	RETURN	105 – 210	16x16	8"ø	PERFORATED FACE	NO	PDDR		
H	RETURN	215 – 330	16x16	10"ø	PERFORATED FACE	NO	PDDR		
I	RETURN	130 – 350	MFG	18"x4"	45° DEFL. LVRD FACE, 3/4" SPACING	NO	530 D		B.E.
A	EXHAUST	0 – 175	24x24	8"ø	PERFORATED FACE	NO	PDDR		
B	EXHAUST	180 – 270	24x24	10"ø	PERFORATED FACE	NO	PDDR		
C	EXHAUST	275 – 390	24x24	12"ø	PERFORATED FACE	NO	PDDR		
D	EXHAUST	395 – 620	24x24	14"ø	PERFORATED FACE	NO	PDDR		
E	EXHAUST	625 – 1250	24x24	16"ø	PERFORATED FACE	NO	PDDR		
F	EXHAUST	0 – 100	16x16	6"ø	PERFORATED FACE	NO	PDDR		
G	EXHAUST	105 – 210	16x16	8"ø	PERFORATED FACE	NO	PDDR		
H	EXHAUST	215 – 330	16x16	8"ø	PERFORATED FACE	NO	PDDR		
ADDITIONAL OPTIONS (AS NOTED)									
A: ADJUST FROM HORIZONTAL DISCHARGE TO VERTICAL DISCHARGE. PROVIDE DIFFUSER WITH SQUARE TO ROUND NECK ADAPTOR, MODEL #SR									
B: PROVIDE REGISTER WITH ROUND NECK ADAPTOR WHERE REQUIRED.									
C: PROVIDE LINEAR SLOT AND/OR LINEAR BAR GRILLE WITH END CAPS, BORDER SUITABLE FOR INSTALLING ON GYB CEILING/SIDEWALL.									
D: PROVIDE SPIRAL DUCT GRILLE SIZED TO MATCH DUCT SIZE O.D., END FRAMES TO MATCH DUCT SIZE O.D., CLOSED CELL FOAM GASKET FACTORY COLOR TO MATCH DUCTWORK COLOR, AIR SCOOP ACCESSORY, AND OPPOSED BLADE DAMPER, NO EXCEPTIONS.									
E: PROVIDE LOUVERED FACE GRILLE WITH STEEL OBD, FACTORY INSTALLED.									
NOTES:									
1. ALL DEVICES SHALL BE FINISHED WITH AN ENAMEL FINISH, COLOR BY ARCHITECT. COORDINATE DEVICE COLOR(S) WITH ARCHITECT PRIOR TO ORDERING. COLOR COORDINATION SHALL INCLUDE BUT NOT BE LIMITED TO DIFFUSER FACE, CENTER TEE, FRAME INTERIOR, PATTERN CONTROLLER, ETC.									
2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR TYPE OF INSTALLATION REQUIRED, NO EXCEPTIONS.									
3. PROVIDE EXTERNAL FOIL-BACK INSULATION, FACTORY INSTALLED FOR ALL DIFFUSER/GRILLE HOUSING.									
4. ALL LINEAR SLOT DIFFUSERS AND BAR GRILLES SHALL BE FURNISHED WITH END CAPS.									
5. ALL DEVICES INSTALLED IN HARD CEILINGS, WALLS, OR DIRECTLY ATTACHED TO DUCTS SHALL BE PROVIDED WITH OBD'S.									
6. UNLESS OTHERWISE NOTED, ALL LINEAR SLOTS, BAR GRILLES, LOUVERED AND/OR EGGRATE FACE GRILLES/REGISTERS SHALL BE PROVIDED WITH AN INSULATED PLENUM BOX FACTORY INSTALLED BY MANUFACTURER. PLENUM BOX SHALL BE FACTORY INSULATED WITH FIBER FREE FOAM, COLOR BLACK. PROVIDE PLENUM BOX WITH DUCT COLLAR AND WITH CABLE/FACE OPERATED FULL FLOW MANUAL CONTROL DAMPER ACCESSIBLE FROM FACE OF LINEAR SLOT OR BAR GRILLE.									
7. COORDINATE GRILLES/DIFFUSERS WITH ARCHITECTURAL CEILING AND STRUCTURAL FRAMING LAYOUTS PRIOR TO ORDERING. COORDINATION SHALL INCLUDE TYPE OF INSTALLATION, MOUNTING REQUIREMENTS, T-BAR SPACING/SIZE, CYPOBOARD FRAMING, INSTALLATION CLEARANCES, ETC.									
8. ADJUST PATTERN CONTROLLERS ON ALL LINEAR SLOTS AND LINEAR BAR GRILLES PRIOR TO AIR BALANCE (TAB).									
9. SEE AIR DEVICE TAG FOR DUCT INLET SIZE. ALL DUCT RUNOUTS TO BE SIZED PER GRD AIR TERMINAL NECK SIZE ON SCHEDULE AND/OR AS INDICATED ON PLANS IN CONJUNCTION WITH REQUIREMENTS BY GRD MANUFACTURER. COORDINATE ALL DUCT SIZES PRIOR TO BIDDING. NO EXCEPTIONS. DUCT SIZE SHALL MATCH GRILLE/LOUVER SIZE IF NO DUCTWORK SIZE INDICATED ON PLANS. CONTRACTOR SHALL REFERENCE DUCTWORK INSULATION SCHEDULE FOR ALL DUCTWORK INSULATION REQUIREMENTS.									
10. CONTRACTOR SHALL PAINT ALL VISIBLE SURFACES THROUGH GRD'S FLAT BLACK. PLENUM BOX INSULATION SHALL BE COLOR BLACK FROM FACTORY.									
11. PROVIDE TAPERED TRANSITIONS FOR ALL SUPPLY DIFFUSERS WITH NECK SIZES DIFFERENT THAN SUPPLY DUCT RUN-OUT SIZES.									
12. PROVIDE SPIN-IN TAP WITH MANUAL VOLUME DAMPER AT EACH BRANCH TAKE-OFF. SEE DETAILS SHEET AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.									
13. 9/16" TEE-BAR CEILING GRID IS USED. GENERAL CONTRACTOR SHALL MAKE SURE THE GRILLES/DIFFUSERS/LIGHTING FIXTURES WILL FIT PROPERLY IN THE NARROW GRID.									

FAN SCHEDULE																							
TAG	SYSTEM SERVED	FAN TYPE	CFM	E.S.P. (IN.WC)	DRIVE TYPE	RPM	ELECTRICAL DATA			SONES	OPERATING WEIGHT	MANUFACTURER GREENHECK & MODEL	OPTIONS										
							H.P.	WATTS	VOLTAGE														
EF-1	141 MENS RR	CEILING EXHAUST	70	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-2	142 WOMENS RR	CEILING EXHAUST	70	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-3	162 PUBLIC RR	CEILING EXHAUST	70	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-4	243 MENS RR	CEILING EXHAUST	70	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-5	249 MENS SHOWER	CEILING EXHAUST	70	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-6	223 JANITOR	CEILING EXHAUST	30	0.25	DIRECT	900	–	16.4	115V-1ø	1.3	12 LBS	SP-A70	A,B,F,S										
EF-7	226 WOMENS SHOWER	CEILING EXHAUST	70	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-8	242 WOMENS RR	CEILING EXHAUST	70	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-9	155 02 CLOSET	CEILING EXHAUST	25	0.5	DIRECT	900	–	17	115V-1ø	2.0	9 LBS	SP-B80	A,B,F,G										
EF-10	173 JANITOR CLOSET	CEILING EXHAUST	30	0.25	DIRECT	900	–	17.6	115V-1ø	1.1	12 LBS	SP-A90	A,B,F,S										
EF-11	232 FELINE HOLD 2	INLINE EXHAUST	300	0.25	DIRECT	1050	1/30	–	115V-1ø	4.0	27 LBS	SO-95-VG	A,B,F,L,Y										
EF-12	116 FELINE CONDOS 1	INLINE EXHAUST	180	0.25	DIRECT	1050	1/30	–	115V-1ø	4.0	27 LBS	SO-95-VG	A,B,F,L,Y										
EF-13	112 FELINE CONDOS 2	INLINE EXHAUST	120	0.25	DIRECT	1050	1/30	–	115V-1ø	2.8	27 LBS	SO-80-VG	A,B,F,L,Y										
EF-14	143 JANITOR	CEILING EXHAUST	30	0.25	DIRECT	900	–	17.6	115V-1ø	1.3	12 LBS	SP-A70	A,B,F,S										
EF-15	171 FELINE HOLD CONDOS	INLINE EXHAUST	150	0.25	DIRECT	1050	1/30	–	115V-1ø	4.0	27 LBS	SO-95-VG	A,B,F,L,Y										
EF-16	156/158 ISO AREAS	INLINE EXHAUST	210	0.25	DIRECT	1050	1/30	–	115V-1ø	4.0	27 LBS	SO-95-VG	A,B,F,L,Y										
RF-1	ECONOMIZER RELIEF FAN	IN-LINE EXHAUST	2800	1.0	VARI GREEN	1336	2	–	208V-1ø	9.7	122 LBS	SO-160-VG	A,B,J,X										
OPTIONS:																							
A: DISCONNECT SWITCH		G: WALL MOUNTED HAND-OFF-AUTO (HOA) SWITCH WITH MOTOR STARTER / (200 VOLTS OR HIGHER – 3 PHASES) WITH AUXILIARY CONTACT AND RELAY. STARTER PROVIDED BY M.C.			I: INTERLOCK WITH ASSOCIATED DOAS SYSTEM			O: PROVIDE FAN WITH FREE STANDING SPRING ISOLATORS AND VIBRATION ISOLATION RAILS, W/ WIND RESTRAINTS			T: RUN CONTINUOUSLY DURING OCCUPIED HOUR USE, CONNECTED VIA LIGHTING CONTROL (CONTROL PROVIDED BY E.C. – SEE ELEC. DWGS FOR LOCATION)												
B: BACKDRAFT DAMPER		H: WALL MOUNTED HAND-OFF-AUTO (HOA) SWITCH WITH MAGNETIC MOTOR STARTER (120 VOLTS – SINGLE PHASE) AND AUXILIARY CONTACT AND RELAY. STARTER PROVIDED BY M.C.			J: PROVIDE FACTORY FAN SPEED CONTROLLER TO BALANCE FAN			P: WASHABLE ALUMINUM FILTERS			U: INTERLOCK WITH CO/200 MONITORS/DETECTORS												
C: PREFAB. ROOF CURB					K: INTERLOCKED WITH LIGHTING FIXTURE SWITCH			Q: CONTINUOUS RUN 24/7			V: DISCHARGE SHUTTER (OUTLET DAMPER)												
D: BROSUREEN					L: WL. WALL LOUVER DISCHARGE			R: EXHAUST METAL GRILLE			W: FOR OUTDOOR INSTALLATION												
E: SHORT BASE OPTION					M: RFC, ROOF CAP (FLAT ROOF) RL, ROOF CAP ( PITCHED ROOF) WITH MANUAL DAMPER			S: INTERLOCKED WITH LIGHTING OCCUPIED SENSOR (PROVIDED BY E.C. – SEE ELEC. DWGS FOR LOCATION)			X: INTERLOCKED WITH ECONOMIZER/AHU TO ENERGIZE WHEN SYSTEM IN ECONOMIZER MODE; COORDINATE ALL CONTROLS INVOLVED												
F: HANGING BRACKETS WITH VIBRATION ISOLATION					N: MOTORIZED DAMPER – 120V			Y: RUN CONTINUOUSLY 24/7 FOR CAT CONDO EXHAUST SYSTEM															
NOTES:																							
1. ALL FANS SHALL BE U.L. LABELED.																							
2. ALL FANS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE.																							
3. BACKDRAFT DAMPER ON ROOF SUPPLY FANS SHALL BE MOTORIZED.																							

ELECTRIC HEATER SCHEDULE								
TAG	AREA SERVED	HEATER TYPE	ELECTRICAL DATA			OPERATING WEIGHT	MANUFACTURER MARKEL & MODEL	ADDITIONAL OPTIONS
			KW	AMPS	VOLTAGE			
EWH-1	FIRE RISER ROOM	WALL	5	24.1	208V-1Ø	41 LBS	F3425T	A
EWH-2,3	STAIRWELL	WALL	3	14.4	208V-1Ø	– LBS	F3423T	A
OPTIONS (ALL UNITS)			ADDITIONAL OPTIONS (UNITS AS NOTED)					
• BUILT-IN THERMOSTAT			A: FLUSH MOUNTING KIT, FULLY RECESSED					
• TAMPER PROOF CONTROLS			B: WALL MOUNTED THERMOSTAT /W INSULATED SUB BASE					
• MOUNTING BRACKETS/HARDWARE			C: WET LISTED FOR USE IN WET ENVIRONMENT					
			D: STAINLESS STEEL FINNED HEATING ELEMENTS					
			E: SUSPENDED HEATER SUPPORTS					
			F: ADJUSTABLE DISCHARGE LOUVERS					
NOTES:								
1. ALL HEATERS SHALL BE U.L. LABELED.								
2. ALL HEATERS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE.								
3. VERIFY MOUNTING HEIGHTS AND EXACT LOCATION WITH THE OWNER/ARCHITECT PRIOR TO INSTALLING UNIT.								

HVAC SEQUENCE OF OPERATIONS	
MECHANICAL CONTRACTOR SHALL PROVIDE CONTROLS THAT MATCH THE MANUFACTURER'S RECOMMENDATION FOR ALL EQUIPMENT PROVIDED. SEE SPECIFICATIONS FOR ADDITIONAL CONTROLS INFORMATION.	OCCUPANCY OVERRIDE EACH SYSTEM WILL BE AVAILABLE FOR OCCUPANCY OVERRIDE. DURING UNOCCUPIED MODE, THE UNIT CONTROLLER WILL OVERRIDE THE ASSOCIATED SYSTEM INTO OCCUPIED MODE FOR 3 HOURS (ADJ.).
THE SEQUENCE OF OPERATIONS PROVIDED IN THE CONTRACT DOCUMENTS IS INTENDED TO COMMUNICATE THE GENERAL DESIGN INTENT TO THE CONTROLS SUBCONTRACTOR AND IS NOT INTENDED TO BE FULLY DEVELOPED OR COMPLETE. IN THE CONTROLS SUBMITTAL, THE SUBCONTRACTOR SHALL FULLY DEVELOP THE SEQUENCE OF OPERATIONS FOR ALL SYSTEMS IDENTIFIED AND SHALL PRESENT ALL SETPOINTS, CONTROL PARAMETERS, AND ALARM POINTS. THE CONTROLS SUBCONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS FROM SETPOINTS TO PREVENT EQUIPMENT FROM SHORT CYCLING AND WHEN HOVERING AROUND SETPOINTS. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO HAVING TO TAKE CORRECTIVE ACTIONS OR EQUIPMENT SHUTDOWNS. TRANSMITTERS SHALL INCLUDE OUT-OF-RANGE, FAIL-SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION. CONTROL CONTRACTOR SHALL SPECIFY TO FAIL-DE-ENERGIZER, HOLD LAST STATE, OR DEFAULT TO A PREDETERMINED SETPOINT. THESE BASIC FEATURES THAT ARE NECESSARY AND ARE PART OF A ROBUST CONTROLS INSTALLATION SHALL BE ASSUMED INCLUDED IN THE SCOPE OF SERVICES FOR DELIVERABLES AT NO ADDITIONAL COSTS TO THE OWNER.	SUPPLY FAN CONTROL WHEN THE AHU IS ENERGIZED, THE SUPPLY FAN VFD OR ECM MOTOR, WILL MODULATE TO MAINTAIN THE DUCT STATIC PRESSURE SET POINT (ADJ.). FAN SHALL MODULATE CAPACITY TO MAINTAIN 55" FLAT.
GENERAL AREAS:	MECHANICAL COOLING IF OUTSIDE AIR IS NOT SUFFICIENT TO PROVIDE COOLING, THE DX COMPRESSORS WILL BE TASKED WITH MAINTAINING THE DISCHARGE AIR TEMPERATURE SET POINT WHEN THE SYSTEM IS ENERGIZED AND NOT IN MORNING WARM-UP. STAGES OF DX COOLING WILL BE ENERGIZED AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET POINT. COMPRESSOR STAGING CONTROL WILL BE DETERMINED BY THE AHU'S INTERNAL CONTROLS. THE DISCHARGE AIR TEMPERATURE SET POINT SHALL MODULATE TO CONTROL SPACE TEMPERATURE AND/OR HUMIDITY AS SCHEDULED.
THE AHU'S WILL BE FULLY CONTROLLED BY INTERNAL CONTROLS. THE UNITS WILL BE PROVIDED WITH STAND-ALONE CONTROLLERS.	THE AIR ECONOMIZER WILL BE ENABLED BY A COMPARATIVE ENTHALPHY. AHU-12 SHOULD BE PROVIDED WITH AN OUTSIDE AIR TEMP AND HUMIDITY SENSOR AS WELL AS A RETURN AIR TEMP AND HUMIDITY SENSOR. OUTSIDE AIR ENTHALPHY AND RETURN AIR ENTHALPHY WILL BE CALCULATED. IF THE OUTSIDE ENTHALPHY IS LESS THAN THE RETURN AIR ENTHALPHY, FREE COOLING IS AVAILABLE AND THE ECONOMIZER WILL BE ENABLED. AFTER BEING ENABLED, INTERNAL TRANE AHU CONTROLS WILL MODULATE THE OUTSIDE AIR AND RETURN AIR DAMPERS TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET POINT.
AHU'S SHALL BE CONTROLLED BY 7-DAY PROGRAMMABLE THERMOSTAT WITH HUMIDISTAT FEATURE OR ZONE SENSORS /W UNIT SENSORS/CONTROLS (SEE PLANS FOR INFORMATION). ROOFTOP UNITS SHALL SWITCH TO OCCUPIED MODE (74° F + ADJUSTABLE, ± 4°) ONE HOUR PRIOR TO BUILDING OCCUPANCY AND SHALL SWITCH TO UNOCCUPIED MODE (65° COOLING, 68° HEATING) ONE HOUR AFTER BUILDING OCCUPANCY. OCCUPANCY TIME TO BE DETERMINED BY OWNER. SHORT-TERM OCCUPANCY (E.G. 7-DAY PROGRAMMABLE THERMOSTAT) SHALL BE USED TO MOUNTED HUMIDITY SENSORS SHALL BE INSTALLED IN R.A. DUCTWORK.	HUMIDITY CONTROL RETURN TEMPERATURE AND HUMIDITY WILL BE MONITORED AT EACH AHU, AND ZONE CONTROLLER LOCATION. IF THE RETURN AND/OR SPACE HUMIDITY RISES ABOVE SET POINT, THE HUMIDITY CONTROL SYSTEM WILL RESET AND UNIT FAN SPEED AND CAPACITY SHALL MODULATE AS REQUIRED TO MAINTAIN SPACE HUMIDITY SETPOINTS.
OPTIMAL START/STOP THE AHU SYSTEM WILL BE STARTED AND STOPPED AS DEFINED BY OWNER BUILDING SCHEDULE. THE SYSTEM WILL START/STOP BY SCHEDULED OCCUPANCY TIME.	MINIMUM QW DAMPER POSITION IF THE OUTSIDE AIR DAMPER WILL GO TO MINIMUM POSITION DURING SCHEDULED UNOCCUPIED TIMES IF NOT IN ECONOMIZER MODE. THE MINIMUM POSITION WILL BE SET BY THE OWNER. THE OUTSIDE AIR DAMPER WILL BE BASED ON OUTDOOR AIR INTAKE AS LISTED IN R7U SCHEDULE.
UNOCCUPIED COOLING THE AHU'S TO HAVE AN UNOCCUPIED COOLING SET POINT (65 DEG F, ADJUSTABLE AT EACH AHU), TO MAINTAIN DURING UNOCCUPIED PERIODS. ONCE ENERGIZED, THE PRT-1000	