MECHANICAL AND DDC LEGEND

SYMBOL – PLAN	SYMBOL – ELEVATION	SYMBOL – SCHEMATIC	DESCRIPTION	SYMBOL – PLAN	SYMBOL – ELEVATION	SYMBOL – SCHEMATIC	DESCRIPTION
DHC			HOT WATER RECIRC PIPING				GATE VALVE
DHW			HOT WATER PIPING				
DCW			COLD WATER PIPING				GLOBE VALVE
V			VENT PIPING				
SAN			SANITARY DRAIN PIPING	OR PSIG			PRESSURE GAGE
*			MECHANICAL PIPES SEE ABBREVIATION TABLE FOR *				
			POINT OF CONNECTION OR DISCONNECTION				THERMOMETER
		ES	EMERGENCY SHUT-DOWN				
		TW	TEMPERATURE WELL				CIRCUIT SETTER
		AI	ANALOG INPUT TO DDC				
		A0	ANALOG OUTPUT TO DDC				BALL VALVE
		DI	DIGITAL INPUT TO DDC				
		DO	DIGITAL OUTPUT TO DDC				BUTTERFLY VALVE
		T	THERMOSTATIC RADIATOR VALVE				
			TEMPERATURE SENSOR (EMCS)				CHECK VALVE
		M	MANUAL OVERRIDE (EMCS)				
		H	HUMIDISTAT (EMCS)				TRIPLE DUTY VALVE
		T *	THERMOSTATS SENSORS * INDICATES UNIT				
		T *	THERMOSTAT * INDICATES UNIT				RELIEF VALVE
		S	STATIC PRESSURE SENSOR				
		FM	FLOW METER				THREE WAY CONTROL VALVE
		S	DUCT SMOKE DETECTOR				
			PRESSURE TAP				TWO WAY CONTROL VALVE
			TEMPERATURE WELL				
	FD	FD	FIRE DAMPER				STRAINER
			BALANCING DAMPER				IN-LINE PUMP
			HANGER			FD	AD - AREA DRAIN FD - FLOOR DRAIN FS - FLOOR SINK RD - ROOF DRAIN
TT			TEMPERATURE TRANSMITTER				COCK OR PLUG
			DISCONNECT				STARTER

ABBREVIATIONS

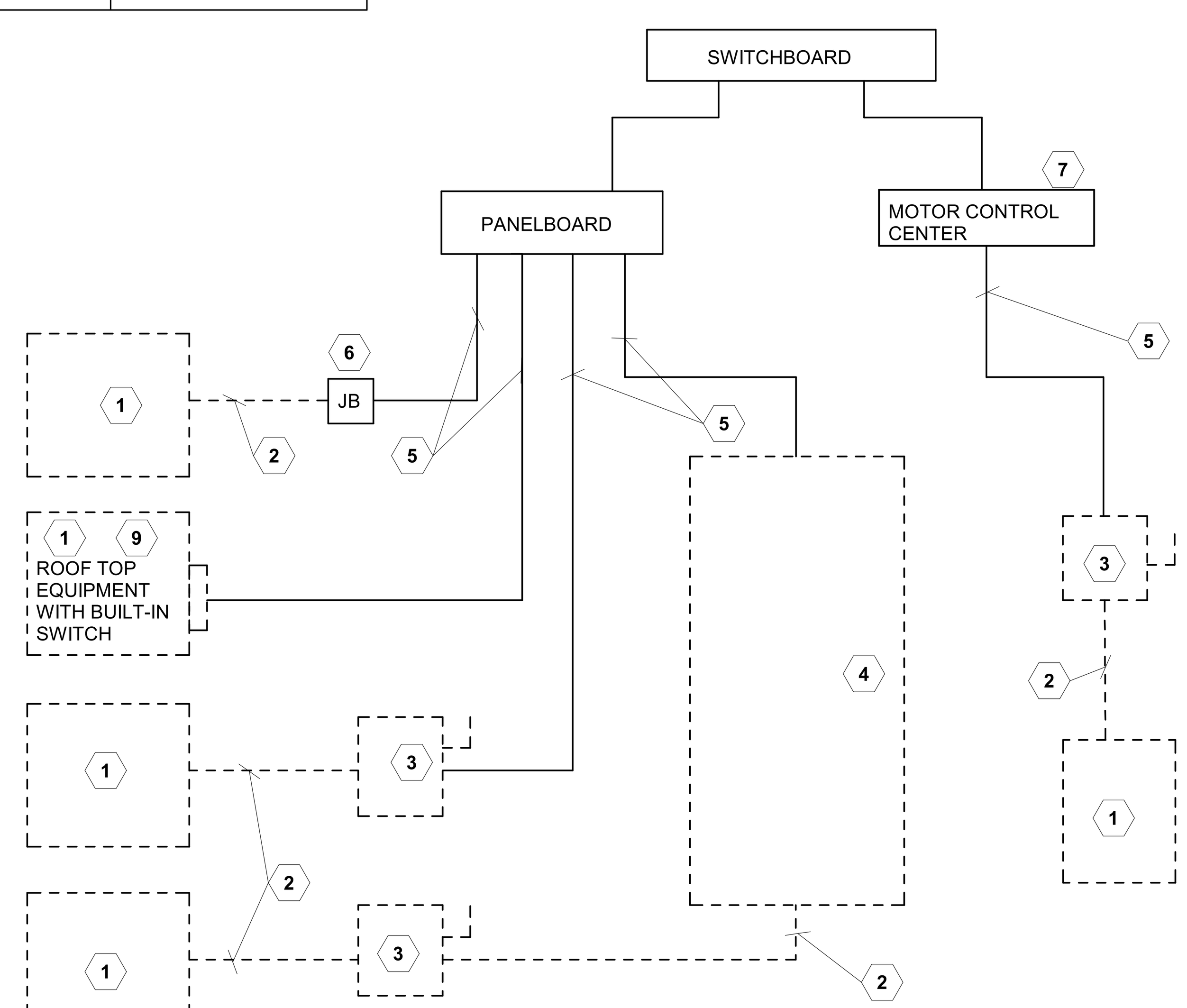
A/C	AIR CONDITIONING	DTRR	DUAL TEMP. REVERSE RETURN	M.C.	MECHANICAL CONTRACTOR
ABV	ABOVE	DTS	DUAL TEMP. SUPPLY	MANUF.	MANUFACTURER
AC	ACRE	DWGS	DRAWING	MAS	MASONRY
ACOUST	ACOUSTICAL	E.C.	ELECTRICAL CONTRACTOR	MAX.	MAXIMUM
AD	ACCESS DOOR	EA.	EACH	MBTU	THOUSAND BRITISH THERMAL UNITS
AFF	ABOVE FINISHED FLOOR	EDC	ELECTRIC DUCT COIL	MECH	MECHANICAL
AFG	ABOVE FINISHED GRADE	EH	ELECTRIC HEATER	MET	METAL
AHU	AIR HANDLING UNIT	EJ	EXPANSION JOINT	MIN	MINIMUM
ATV	ATMOSPHERIC VENT	EL	ELEVATION	MPS	MEDIUM PRESSURE STEAM
BBD	BOILER BLOWDOWN	ELEC	ELECTRICAL	MUW	MAKEUP WATER
BD	BOARD	EMCS	ENERGY MANAGEMENT CONTROL SYSTEM	O.A.	OUTDOOR AIR
BFF	BELOW FINISH FLOOR	EQ	EQUAL	O.C.	ON CENTER
BOT'M	BOTTOM	EQUIP	EQUIPMENT	OZ	OUNCE
BTU	BRITISH THERMAL UNITS	EX	EXISTING	P.C.	PLUMBING CONTRACTOR
C.O.	CLEAN OUT	FCC	FAN COIL CONTRACTOR PANEL	PC	PUMPED CONDENSATE
C.U.	CONDENSING UNIT	FCU	FAN COIL UNIT	PERIM	PERIMETER
CD	CONDENSATE DRAIN	FD / EFD	FIRE DAMPER / EX FIRE DAMPER	PSI	POUNDS PER SQUARE INCH
CEIL	CEILING	FIN	FINISH	PVMT	PAVEMENT
CFM	CUBIC FEET PER MINUTE	FL	FLOOR	R.A.	RELIEF AIR
CFS	CUBIC FEET PER SECOND	FPS	FEET PER SECOND	R.V.	RELIEF VENT
CHWR	CHILLED WATER RETURN	FL DR	FLOOR DRAIN	REFRIG	REFRIGERANT
CHWR	CHILLED EATER REVERSE RETURN	FT	FOOT	REINF	REINFORCING
CHWS	CHILLED WATER SUPPLY	G	GAS	REQ'D	REQUIRED
COL	COLUMN	G.C.	GENERAL CONTRACTOR	RET. A.	RETURN AIR
CONC	CONCRETE	GA	GAUGE	RM	ROOM
COND	CONDUIT	GALV	GALVANIZED	S.F.	SQUARE FOOR
CONST	CONSTRUCTION	GSHP	GROUND SOURCE HEAT PUMP	SCHED	SCHEDULE
CP	CONTROL PANEL	HORIZ	HORIZONTAL	SHT. MET.	SHEET METAL
CR	CONDENSATE RETURN (STEAM)	HP	HORSEPOWER	SPECS	SPECIFICATIONS
CW	COLD WATER SUPPLY	HP-__	HEAT PUMP - #	SPRN	FIRE PROTECTION SPRINKLER PIPING
CWR	CONDENSTER WATER RETURN	HPS	HIGH - PRESSURE STEAM	SQ. IN.	SQUARE INCH
DD	DUCT SMOKE DETECTOR	HR	HOUR	STL	STEEL
DDC	DIRECT DIGITAL CONTROL	HTWR	HOT WATER RETURN (HEATING)	STM	STORM
DEMO	DEMOLITION	HTWRR	HOT WATER REVERSE RETURN (HEATING)	SW	SOURCE WATER
DEPT	DEPARTMENT	HTWS	HOT WATER SUPPLY (HEATING)	TLT	TOILET
DIA	DIAMETER	HVAC	HEATING, VENTILATING & AIR CONDITIONING	TYP	TYPICAL
DM	DOMESTIC	HX	HEAT EXCHANGER	U.O.N.	UNLESS OTHERWISE NOTED
DM WH	DOMESTIC WATER HEATER	JST	JOIST	UL	UNDERWRITERS LABORATORIES
DMC	DOMESTIC COLD	LG	LONG	W/	WITH
DTR	DUAL TEMP. RETURN	LPS	LOW - PRESSURE STEAM	WSHP	WATER SOURCE HEAT PUMP

LINE STYLE LEGEND

(solid heavy line)	NEW
(solid light line)	EXST.
(dashed line)	DEMO.

ELECTRICAL NOTES

1. EQUIPMENT OF TRADES OTHER THAN ELECTRICAL.
2. CONDUIT AND WIRING BY HVAC, PLUMBING CONTRACTOR OR OTHER TRADES.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC IT SHALL BE PROVIDED AND INSTALLED BY THE EQUIPMENT CONTRACTOR.
4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONECT SWITCH AND STARTER. LOCATE ADJACENT TO THE EQUIPMENT.
5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
6. JUNCTION BOX MAY BE SHOWN ON THE ELECTRICAL PLANS FOR SOME EQUIPMENT. IF NO STARTER OR DISCONNECT IS SUPPLIED A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO THE EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL CONTRACTOR OR OTHER TRADES.
7. PROJECTS UTILIZING AN MCC, THE STARTER, CIRCUIT BREAKER OR VFD IN THE MCC ARE PROVIDED BY THE ELECTRICAL CONTRACTOR.
8. IN ALL CASES THE EQUIPMENT CONTRACTOR SHALL MAKE FINAL CONNECTIONS, START UP, AND TEST EQUIPMENT.
9. IF ROOF TOP EQUIPMENT (RTE) IS NOT PROVIDED WITH A BUILT-IN DISCONNECT SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.
10. IN A SINGLE PRIME CONTRACT, IT IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR TO COORDINATE BETWEEN THE ELECTRICAL AND OTHER TRADES.



ELECTRICAL EQUIPMENT CONNECTION

NTS

GENERAL NOTES (ALL NOTES ON THIS PAGE APPLY TO ALL MECHANICAL SHEETS U.O.N.)

1. DRAWINGS ARE DIAGRAMMATIC. DRAWINGS ARE NOT INTENDED TO BE ABSOLUTELY PRECISE, AND DO NOT SPECIFY OR SHOW EVERY OFFSET, FITTING, AND COMPONENT. THE PURPOSE OF THE DRAWINGS IS TO INDICATE A SYSTEM CONCEPT, THE MAIN COMPONENTS OF THE SYSTEMS, AND THE APPROXIMATE GEOMETRICAL RELATIONSHIPS. BASED ON THE SYSTEMS CONCEPT, THE MAIN COMPONENTS AND APPROXIMATE GEOMETRICAL RELATIONSHIPS, THE CONTRACTOR SHALL PROVIDE ALL OTHER COMPONENTS AND MATERIALS NECESSARY TO MAKE THE SYSTEMS FULLY COMPLETE AND OPERATIONAL. THE CONTRACTOR SHALL ROUTE PIPING OR PROVIDE OFFSETS TO AVOID INTERFERENCE WITH STRUCTURAL ELEMENTS, EQUIPMENT, ELECTRICAL PANELS, AND JUNCTION BOXES, ETC. VERIFY LOCATIONS, DIMENSIONS, EXISTING FLOW DIRECTIONS, AVAILABLE POWER CHARACTERISTICS (VOLTS/PHASE), ETC., BEFORE CONSTRUCTION.
2. WORKMANSHIP: COMPETENT SKILLFUL WORKMEN SHALL DO ALL WORK IN A FINISHED, THOROUGHLY SUBSTANTIAL AND CRAFTSMAN LIKE MANNER. THIS IS INTENDED TO REFER PARTICULARLY TO SMALLER DETAILS NECESSARY BUT USUALLY NOT SPECIFIED OR INDICATED ON THE DRAWINGS. ALL SUB-STANDARD WORK, INSTALLED BY THIS CONTRACTOR, SHALL BE REPLACED BY THIS CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. IF THIS CONTRACTOR DAMAGES EXISTING WORK, HE SHALL PAY THE COST OF REPLACEMENT OF THE DAMAGED WORK AT NO ADDITIONAL EXPENSE TO THE OWNER. THE ENGINEER SHALL BE THE JUDGE OF WORKMANSHIP AND HIS/HER OPINION SHALL BE FINAL.
3. THE DESIGN DOCUMENTS INDICATE THE PRODUCTS THAT WERE USED AS THE BASIS OF THE DESIGN. THIS ESTABLISHES THE PRODUCT PARAMETERS AND OTHER SYSTEMS INTERACTING WITH THE PRODUCT (SIZE, POWER REQUIREMENTS, PIPE SIZES, PUMP CAPACITY, ETC.). CONTRACTOR SHALL SPECIFICALLY BRING TO THE DESIGNER'S ATTENTION ANY CHANGES IN OTHER SYSTEMS REQUIRED WHEN PRODUCTS, OTHER THAN THOSE USED AS THE BASIS OF THE DESIGN, ARE USED. THE CONTRACTOR SHALL BEAR ALL COSTS, INCLUDING DESIGN, FOR THE CHANGES.
4. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS, DIMENSIONS, AND SIZES BEFORE FABRICATING OR ORDERING EQUIPMENT.
5. MECHANICAL CONTRACTOR SHALL CUT FLOORS, WALLS, CEILINGS, AND PAVEMENT AS REQUIRED FOR DEMOLITION AND CONSTRUCTION. THE GENERAL CONTRACTOR SHALL CUT THE ROOF WHERE REQUIRED. THE GENERAL CONTRACTOR SHALL REPAIR AND PATCH ALL (NEW AND DEMOLISHED) FLOORS, WALLS, CEILINGS, ROOF, AND PAVEMENT TO MATCH EXISTING FINISH. MECHANICAL CONTRACTOR SHALL SEAL ALL PENETRATIONS OF FIRE RATED WALLS/FLOORS IN ACCORDANCE WITH UL SPECIFICATIONS. REFER TO DRAWINGS FOR WALL RATINGS. IF RATING IS NOT SHOWN, TREAT CORRIDOR WALLS AS ONE HOUR FIRE BARRIERS. TREAT ALL FLOORS AS TWO-HOUR RATED.
6. WELDING PROCEDURE QUALIFICATIONS AND WELDER QUALIFICATIONS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO THE START OF ANY FABRICATIONS. PROCEDURES SHALL COMPLY WITH APPLICABLE SECTIONS OF ASME AND ANSI CODES.
7. SUPPORT ALL PIPING FROM BUILDING STRUCTURE, FLOOR, ROOF, OR PAVEMENT. REFER TO SPECIFICATION SECTION PERTAINING TO "SUPPORTS, ANCHORS AND VIBRATION ISOLATION", AND DETAIL DRAWINGS FOR REQUIREMENTS.
8. LABEL ALL EQUIPMENT, PIPES, DUCTS, ETC. IN ACCORDANCE WITH SPECIFICATIONS.
9. PROVIDE WARNING TAPE OR TRACER WIRE IN THE BACKFILL OF ALL PIPE TRENCHES. INSTALL AT LEAST 6 INCHES BELOW GRADE, BUT NOT DEEPER THAN 24 INCHES BELOW GRADE, DIRECTLY OVER PIPING.
   A. METALLIC LINES SHALL BE IDENTIFIED WITH DURABLE PRINTED PLASTIC WARNING TAPES, MINIMUM 3 INCHES WIDE WITH LETTERING TO IDENTIFY BURIED LINE BELOW.
   B. NON-METALLIC PIPES SHALL BE MARKED USING AN APPROVED TRACER. A YELLOW INSULATED COPPER TRACER WIRE OR OTHER APPROVED CONDUCTOR SHALL BE INSTALLED ADJACENT TO AND OVER THE FULL LENGTH OF UNDERGROUND NONMETALLIC PIPING. ACCESS SHALL BE PROVIDED TO THE TRACER WIRE OR THE TRACER WIRE SHALL TERMINATE AT THE CLEANOUT BETWEEN THE BUILDING DRAIN AND THE BUILDING SEWER. THE TRACER WIRE SIZE SHALL NOT BE LESS THAN 14 AWG AND THE INSULATION SHALL BE LISTED FOR DIRECT BURIAL.
10. AFTER COMPLETION OF CONSTRUCTION, TEST AND BALANCE THE WATER AND AIR DISTRIBUTION SYSTEMS TO THE FLOW VALUES INDICATED IN THE PLANS. THE TEST AND BALANCE CONTRACTOR SHALL REMOVE STARTUP STRAINERS BEFORE BALANCING THE SYSTEM. A TEST AND BALANCE REPORT SHALL BE SUBMITTED, AND ANY DISCREPANCIES SHALL BE NOTED AND BROUGHT TO THE ATTENTION OF THE ENGINEER. SEE SPECIFICATION SECTION PERTAINING TO "TEST AND BALANCING".
11. UNLESS OTHERWISE NOTED, ALL MECHANICAL EQUIPMENT SHALL BE MOUNTED ON 4" THICK, 3000 PSI POURED IN PLACE CONCRETE HOUSEKEEPING PADS, MINIMUM 4" LARGER THAN EQUIPMENT ON EACH SIDE.
12. SLOPE PIPE SLIGHTLY TO ALLOW IT TO BE DRAINED. PROVIDE MANUAL DRAINS WITH HOSE BIBS AT ALL LOW POINTS AND AIR VENTS AT ALL HIGH POINTS IN THE PIPING SYSTEM. IN MECHANICAL ROOMS PIPE VENTS AND DRAINS TO THE NEAREST FLOOR DRAIN, RUN PIPE DOWN WALL AND INSTALL BALL VALVE 4 FEET ABOVE FLOOR. SEE AIR VENT DETAIL.
13. THE DELINEATION OF THE WORK BETWEEN THE MECHANICAL AND THE ELECTRICAL CONTRACTORS. REFER TO SCHEMATIC TITLED "ELECTRICAL EQUIPMENT CONNECTION" ON THIS SHEET.
14. PROVIDE FIRE DAMPERS WHERE INDICATED ON THE DRAWINGS. REFER TO FLOOR PLANS FOR LOCATIONS AND RATINGS OF FIRE RATED WALLS. CONSIDER ALL FLOORS TO BE TWO-HOUR RATED. SEE DETAIL SHEETS FOR INSTALLATION DETAILS. ALL NEW AND EXISTING FIRE DAMPERS SHALL BE TESTED FOR PROPER FUNCTION. TESTS SHALL BE WITNESSED BY DESIGNER OR DESIGNER'S REPRESENTATIVE.
15. REFER TO PLANS, EQUIPMENT SCHEDULES AND DETAILS FOR CAPACITIES AND ADDITIONAL REQUIREMENTS.
16. INSTALL ALL EQUIPMENT IN COMPLIANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATION AND REQUIREMENTS. IF RECOMMENDATIONS CONFLICT WITH DRAWINGS, REQUEST CLARIFICATIONS FROM ENGINEER BEFORE PROCEEDING.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR SAFETY AT THE SITE. PROVIDE BARRICADES AND COVERS AT THE EXCAVATION AREAS AS APPROPRIATE. COMPLY WITH SAFETY REQUIREMENTS OF OSHA, ETC. EXCEPT FOR INTERRUPTIONS SPECIFICALLY PERMITTED BY THE OWNER, VEHICULAR AND PEDESTRIAN TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. COORDINATE WITH THE OWNER.
18. FIELD-VERIFY EXISTING AND COORDINATE NEW EQUIPMENT SIZES WITH ASSOCIATED CONTRACTORS (ELECTRICAL, KITCHEN VENDORS ETC.) AFTER COMPLETION OF SHOP DRAWING REVIEW. ADJUST VOLTAGE RATING, CAPACITY AND SIZE OF WIRING, STARTERS, DISCONNECT SWITCHES AND OVERCURRENT PROTECTION DEVICES AS REQUIRED. NOTIFY ENGINEER OF ANY DISCREPANCIES BEFORE ORDERING SUPPLIES AND START OF CONSTRUCTION. FAILURE TO COMPLY WILL REQUIRE THE CONTRACTOR TO BEAR THE COST FOR CORRECTLY SIZED EQUIPMENT AND WIRING.
19. THE DDC CONTROL CONTRACTOR SHALL RUN THE POWER WIRING TO ALL DAMPER AND VALVE ACTUATORS. THE ACTUATORS ARE TO BE 24V. REFER TO SPECIFICATIONS.
20. THE MECHANICAL CONTRACTOR SHALL INSTALL THE DUCT SMOKE DETECTORS PROVIDED BY THE ELECTRICAL CONTRACTOR WHERE REQUIRED.
21. EQUIPMENT SHALL BE INSTALLED WITH MANUFACTURER'S RECOMMENDED SERVICE CLEARANCES OR STATE BUILDING CODE SERVICE CLEARANCES WHICHEVER IS GREATER.
22. WHERE DUCTS ARE SHOWN GOING THROUGH A FLOOR, WALL, OR THE ROOF THEY SHALL GO BETWEEN JOISTS OR JOISTS AND BEAMS. NO TRUSSES, BEAMS, COLUMNS, OR OTHER STRUCTURAL MEMBERS ARE TO BE CUT WITHOUT PRIOR APPROVAL OF THE ENGINEER. EXISTING OPENINGS SHALL BE USED WHERE APPROPRIATE. NEW OPENINGS FOR DUCTS SHALL BE SAW CUT. NEW OPENINGS FOR PIPES SHALL BE CORE DRILLED.
23. INSTALLING CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE ROOF DURING INSTALLATION OF NEW HVAC EQUIPMENT. PROTECT ROOF FROM DAMAGE THROUGHOUT CONSTRUCTION. PROVIDE AS A MINIMUM PRECAUTION 4' X 8' X 1/2" PLYWOOD SHEETS IN WORK AREAS. MAKE PROVISIONS TO AVOID DISPLACEMENT BY POTENTIAL HIGH WINDS. CONTRACTOR TO PHOTOGRAPH EXISTING ROOF CONDITIONS PRIOR TO COMMENCEMENT OF WORK AND PROVIDE THE OWNER AND ENGINEER WITH DIGITAL COPIES OF THE PHOTOS. ALL ROOFING WORK AND REPAIRS SHALL BE DONE ACCORDING TO ROOFING MANUFACTURER'S STANDARDS AND BY A CONTRACTOR CERTIFIED TO WORK ON THIS BRAND OF ROOFING.
24. WHEREVER EXISTING OR NEW LINED DUCT IS CUT OR TAKEN APART LEAVING A RAW EDGE ON THE DUCT LINER, AND THIS DUCT IS TO CONTINUE IN USE, THE RAW EDGES OF THE DUCT LINER SHALL BE SEALED WITH ADHESIVE MADE FOR THIS PURPOSE, OR WITH METAL NOSING.
25. ALL DEMOLISHED MATERIALS TO BE THE PROPERTY OF THE CONTRACTOR.
26. PROVIDE MANUAL VOLUME DAMPERS IN ALL BRANCHES OF SUPPLY, RETURN, EXHAUST, RELIEF, AND OUTSIDE AIR DUCTS WHERE REQUIRED TO BALANCE SYSTEMS WHETHER OR NOT SPECIFICALLY SHOWN ON THE DRAWINGS.

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PLEASANT GROVE ELEMENTARY SCHOOL BOND PROJECT RENOVATIONS
ALAMANCE BURLINGTON SCHOOL SYSTEM
2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

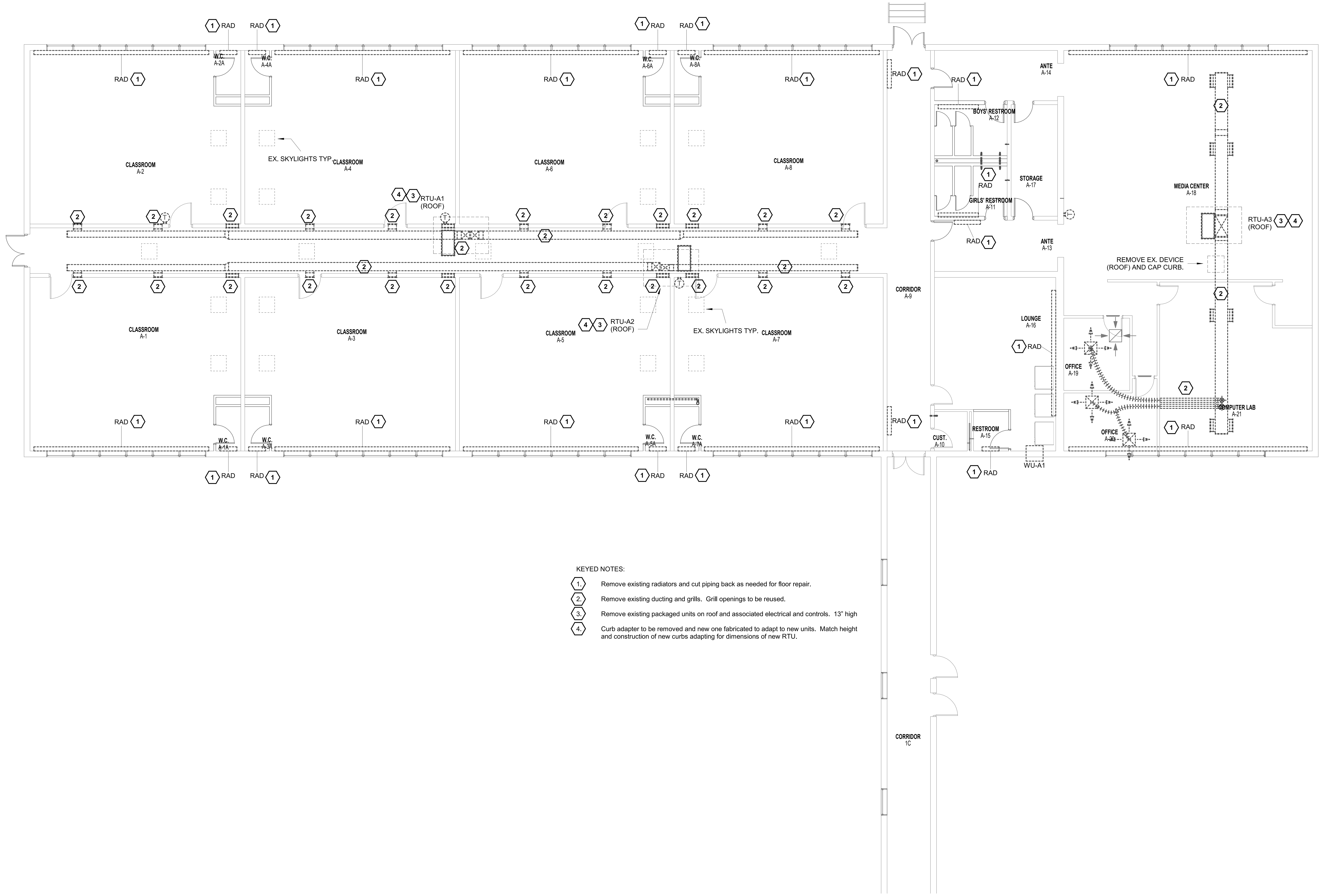
MECHANCIAL COVER

Revision		
ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021

SHEET NUMBER

M-100



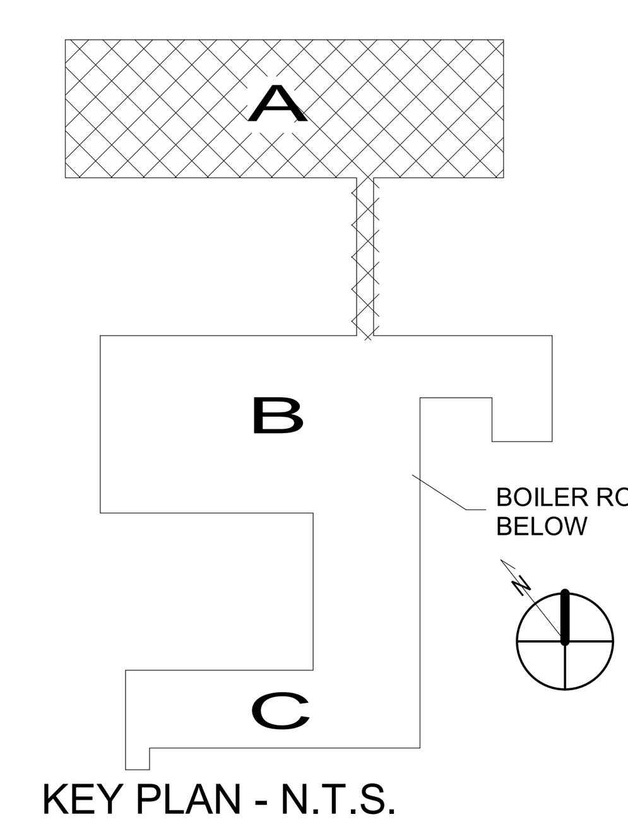
KEYED NOTES:

1. Remove existing radiators and cut piping back as needed for floor repair.
2. Remove existing ducting and grills. Grill openings to be reused.
3. Remove existing packaged units on roof and associated electrical and controls. 13" high
4. Curb adapter to be removed and new one fabricated to adapt to new units. Match height and construction of new curbs adapting for dimensions of new RTU.

1 AREA A MAIN LEVEL MECHANCIAL DEMOLITION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 16' 1/8"=1'-0"



KEY PLAN - N.T.S.

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AREA A MAIN LEVEL DEMOLITION PLAN

Revision		
ID	Date	Description

PROJECT NUMBER	19253
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DRAWING DATE	07/01/2021

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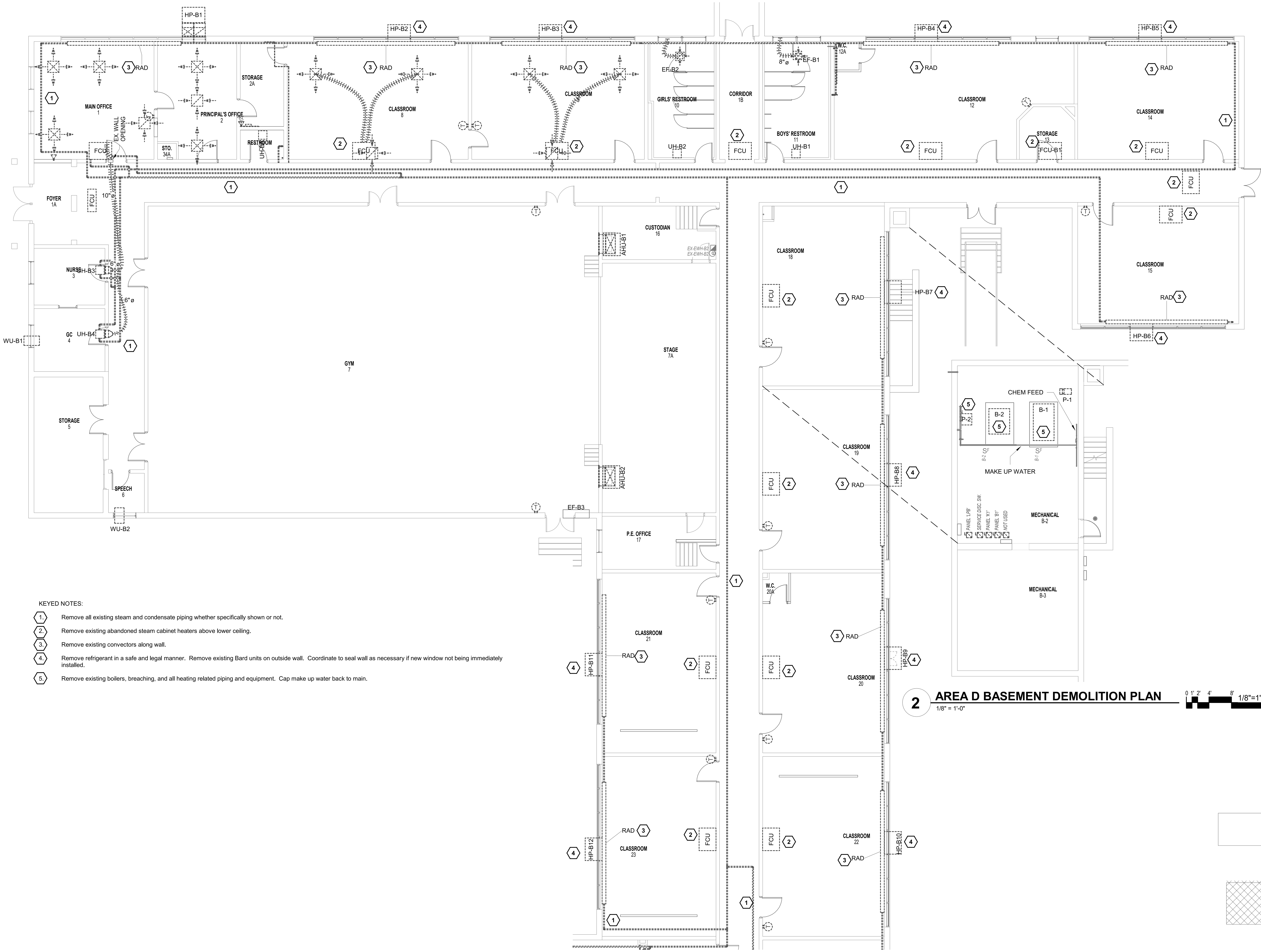


KEYED NOTES:

1. Remove all existing steam and condensate piping whether specifically shown or not.
2. Remove existing abandoned steam cabinet heaters above lower ceiling.
3. Remove existing convectors along wall.
4. Remove refrigerant in a safe and legal manner. Remove existing Bard units on outside wall. Coordinate to seal wall as necessary if new window not being immediately installed.
5. Remove existing boilers, breaching, and all heating related piping and equipment. Cap make up water back to main.

2 AREA D BASEMENT DEMOLITION PLAN

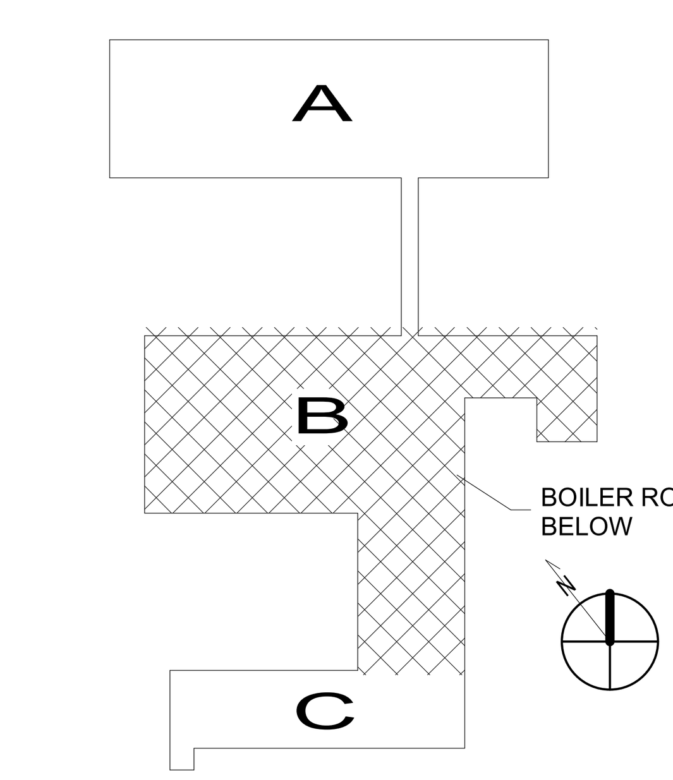
1/8" = 1'-0"

0 1' 2' 4' 8' 16' 1/8"=1'-0"

1 AREA B MAIN LEVEL MECHANCIAL DEMOLITION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 16' 1/8"=1'-0"



KEY PLAN - N.T.S.

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AREA B MAIN LEVEL DEMOLITION PLAN

Revision

ID	Date	Description

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MD-102

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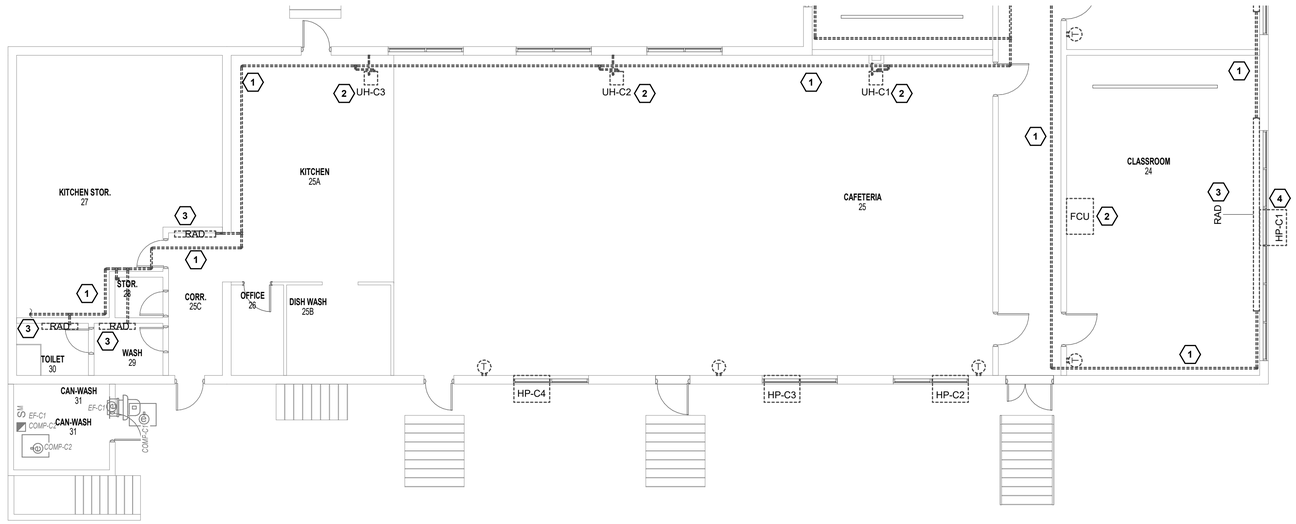
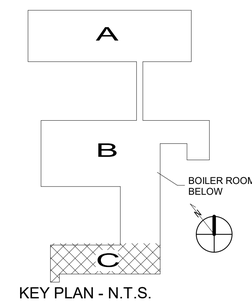


1 AREA C MAIN LEVEL MECHANCIAL DEMOLITION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 1/8"=1'-0" 16'

1. Remove all existing steam piping and condensate piping whether specifically shown or not.
2. Remove existing unit heaters.
3. Remove existing convectors along wall.
4. Remove refrigerant in a safe and legal manner. Remove existing Bard units on outside wall. Coordinate to seal wall as necessary if new window not being immediately installed.



KEY PLAN - N.T.S.

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AREA C MAIN LEVEL DEMOLITION PLAN

Revision		
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DRAWING DATE	07/01/2021
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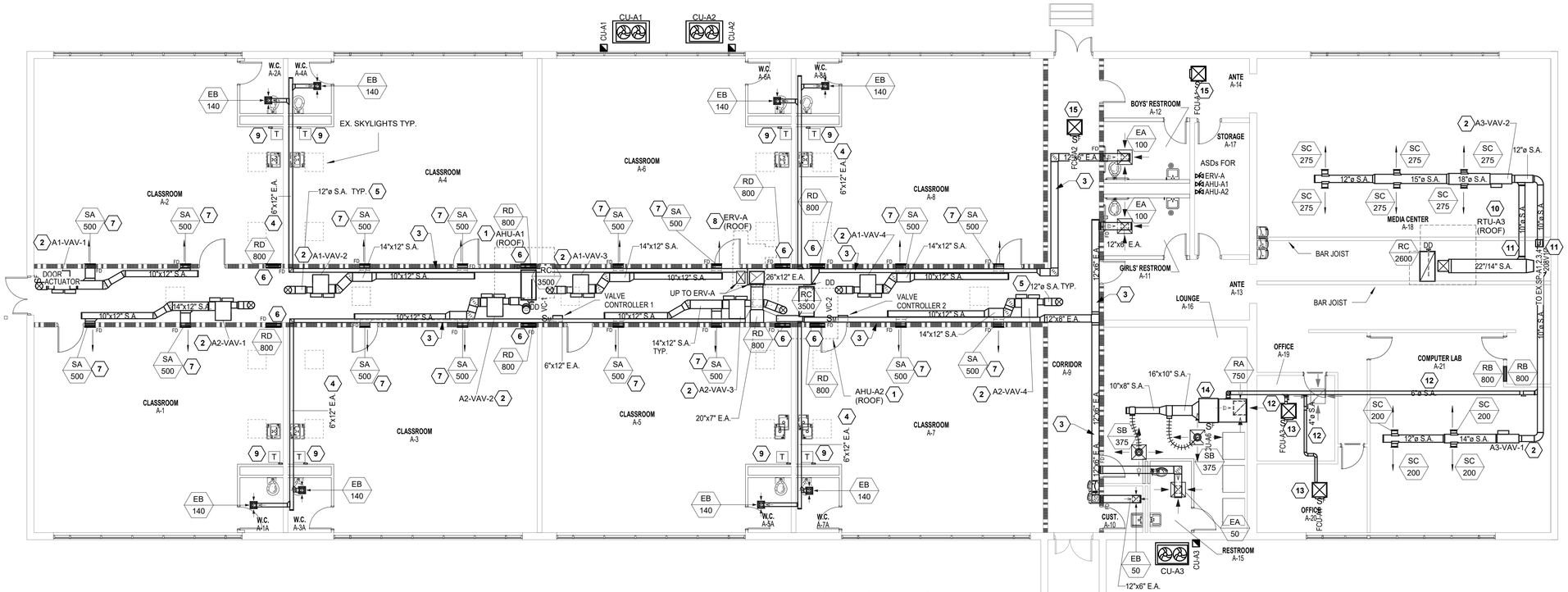


1 AREA A MAIN LEVEL NEW CONSTRUCTION PLAN

1/8" = 1'-0"

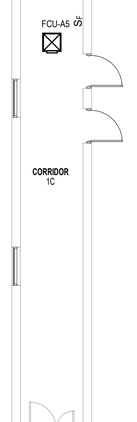
0 1' 2' 4' 8' 1/8"=1'-0" 16'

GENERAL NOTES:

1. All units require temperature sensors at an approved location. No surface conduit allowed unless specifically approved.
2. All units require condensate drain piping. Coordinate for specific locations with engineer.

KEYED NOTES:

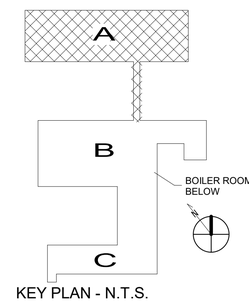
1. AHU A1 and A2 located above. Return air will offset within curb to allow use of existing ceiling opening. Supply air will extend down using existing opening for part of the air and branch off in attic as shown on M-102. AHUs will be split system heat pump DX. Refrigerant piping shown on sheet M-500 Note VSD is located in storage room, install disconnect at unit.
2. Carefully locate fan powered VAV boxes to maintain service clearance as shown. The new ceiling in the corridor is 8' 8" A.F.F., so VAV box must be located within 2" of tectum ceiling.
3. Exhaust duct that runs in corridor routes above supply ceiling diffusers and take offs. This ducting should be routed first to avoid having to work around lower ducting.
4. Exhaust duct in classrooms routes exposed just below beam to bathroom. This duct to be 16 gauge paint grip galvanized. Mount short 2" by 2" angle bracket to wall to support duct. Transition up to main exhaust line in corridor routed above. Once in bathroom above new ceiling level tee for grill in adjacent bathroom.
5. Primary air routed to a VAV box to be 12" round, reducing to 10" round galvanized ducting just before box. Carefully make new round penetration in ceiling to allow ducting from attic to drop through opening. Allow a short section of straight duct before box.
6. Install new transfer grill for return air same size as existing. Install fire damper in wall on corridor side. General contractor will be installing 4" by 4" block in existing opening to raise level above new ceiling. Remove exiting return grills at corridor ceiling.
7. Install new supply grills on wall using existing opening. Install fire damper on corridor side of wall. Install supply ducting from VAV box as shown.
8. New ERV located on new curb above. Align exhaust air duct routed to inlet connection carefully. There are multiple ducts in the vicinity. Supply air from the ERV is put into ceiling space used as return plenum and drawn into the RTUs.
9. Install temperature sensor on classroom side of new bathroom wall. Route sensor wire on wall behind exhaust duct for both classrooms. Coordinate during construction to conceal wiring. Mount 48" AFF.
10. New Packaged heat pump will be installed to serve media at same location as existing. Unit will supply two VAV boxes and provide fresh air to spaces shown. Oval double wall exposed spiral duct, paint grip, must be used to allow installation of bar joist cross bracing after installation. Existing cross bracing will be removed where it conflicts with duct.
11. Use 10" double wall duct to feed VAV boxes. This duct will fit through webbing of joist if not more than 12". Confirm before ordering
12. Route 6" double wall to be used for fresh air as shown. Connect to 4" tap for ceiling cassettes and route to return plenum on ducted units.
13. Install ceiling cassette VRF unit at location shown. Follow manufacturer's piping guidelines. See piping details on sheet M-503 for one manufacturer sizing recommendation. Route condensate to janitor's closet.
14. Install ducted VRF FCU at location shown. Follow pipe sizes per manufacture's recommendation. Route condensate to janitor's closet.
15. Install VRF ceiling cassette in corridor and Ante 14. Combine condensate and route ¾" copper pipe down wall to near grade.



FIRE RATED WALL LEGEND

1 - HOUR FIRE PARTITION

2 - HOUR FIRE BARRIER



KEY PLAN - N.T.S.

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ALAMANCE BURLINGTON SCHOOL SYSTEM
2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

AREA A MAIN LEVEL NEW CONSTRUCTION PLAN

Revision		
ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021
SHEET NUMBER	M-101

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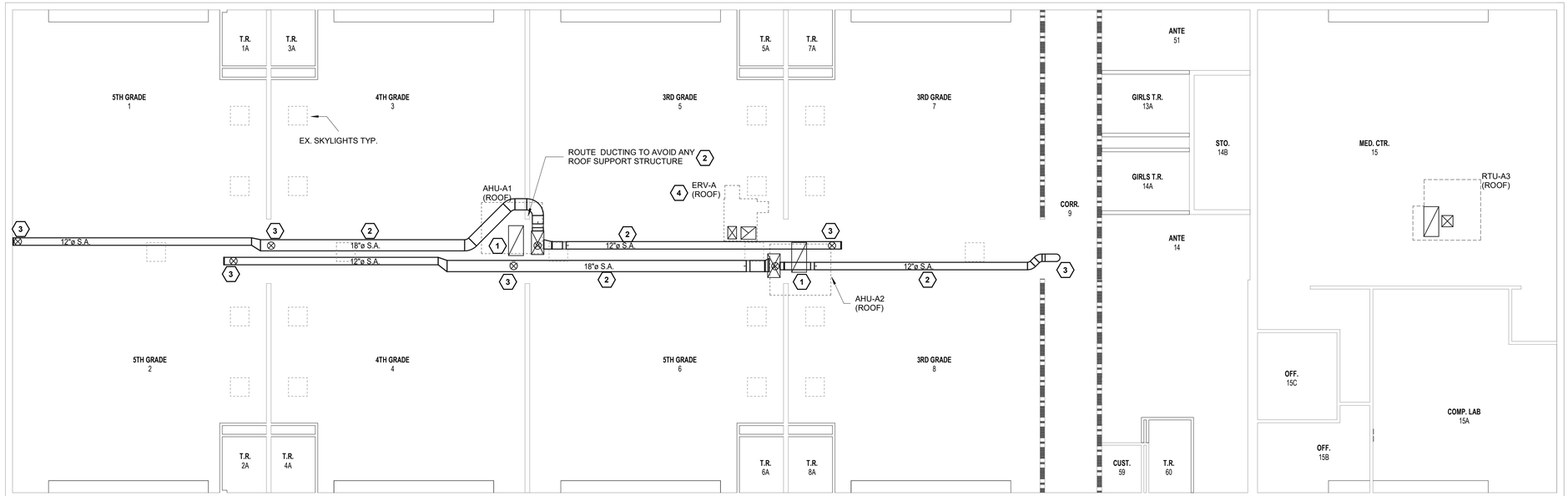
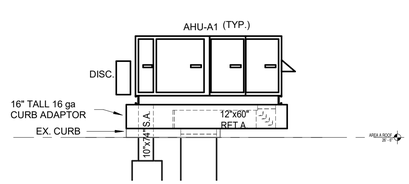
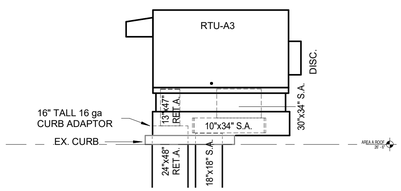


1 AREA A ATTIC LEVEL NEW CONSTRUCTION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 1/8"=1'-0" 16'





2 AHU-A1 ELEVATION TYP.

1/4" = 1'-0"

0 6" 1' 2' 4' 1/4"=1'-0" 8'

3 RTU-A3 ELEVATION

1/4" = 1'-0"

0 6" 1' 2' 4' 1/4"=1'-0" 8'

GENERAL NOTES:

1. All units require temperature sensors at an approved location. No surface conduit allowed unless specifically approved.
2. All units require condensate drain piping. Coordinate for specific locations with engineer.

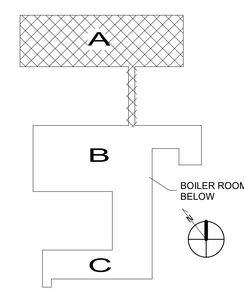
KEYED NOTES:

1. Return ducting down from offset in roof curb above. Align with existing opening that was used for return.
2. Supply duct feeding down from unit above will branch off to run in attic as shown and also continue on to supply VAV box in corridor. Adjust route to avoid structure, if necessary after consulting with engineer.
3. At location required turn down through original roof and ceiling to supply VAV boxes in corridor. Coordinate to carefully cut round holes correct diameter for 12" duct insulated with 1" Armaflex insulation.
4. Ducting for ERV to route down to corridor below. Supply will stop at ceiling, return is ducted as shown on M-101. Align ERV to avoid structure and have ducts go straight to corridor below. See structural drawings for curb details.

FIRE RATED WALL LEGEND

1 - HOUR FIRE PARTITION

2 - HOUR FIRE BARRIER



KEY PLAN - N.T.S.

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2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

AREA A ATTIC LEVEL NEW CONSTRUCTION PLAN

Revision		
ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021

SHEET NUMBER

M-102

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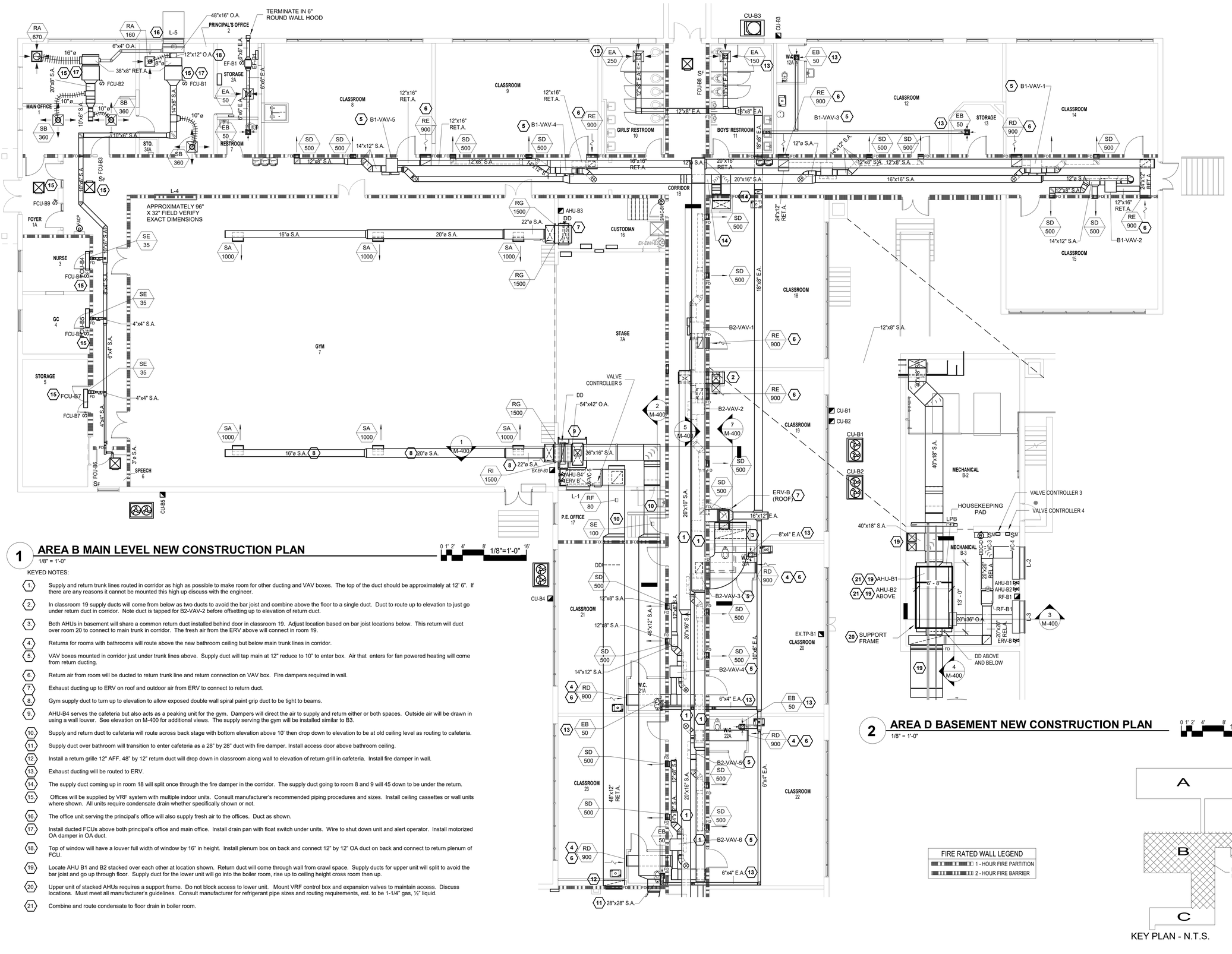

1 AREA B MAIN LEVEL NEW CONSTRUCTION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 1/8"=1'-0" 16'

KEYED NOTES:

1. Supply and return trunk lines routed in corridor as high as possible to make room for other ducting and VAV boxes. The top of the duct should be approximately at 12' 6". If there are any reasons it cannot be mounted this high up discuss with the engineer.
2. In classroom 19 supply ducts will come from below as two ducts to avoid the bar joist and combine above the floor to a single duct. Duct to route up to elevation to just go under return duct in corridor. Note duct is tapped for B2-VAV-2 before offsetting up to elevation of return duct.
3. Both AHUs in basement will share a common return duct installed behind door in classroom 19. Adjust location based on bar joist locations below. This return will duct over room 20 to connect to main trunk in corridor. The fresh air from the ERV above will connect in room 19.
4. Returns for rooms with bathrooms will route above the new bathroom ceiling but below main trunk lines in corridor.
5. VAV boxes mounted in corridor just under trunk lines above. Supply duct will tap main at 12" reduce to 10" to enter box. Air that enters for fan powered heating will come from return ducting.
6. Return air from room will be ducted to return trunk line and return connection on VAV box. Fire dampers required in wall.
7. Exhaust ducting up to ERV on roof and outdoor air from ERV to connect to return duct.
8. Gym supply duct to turn up to elevation to allow exposed double wall spiral paint grip duct to be tight to beams.
9. AHU-B4 serves the cafeteria but also acts as a peaking unit for the gym. Dampers will direct the air to supply and return either or both spaces. Outside air will be drawn in using a wall louver. See elevation on M-400 for additional views. The supply serving the gym will be installed similar to B3.
10. Supply and return duct to cafeteria will route across back stage with bottom elevation above 10' then drop down to elevation to be at old ceiling level as routing to cafeteria.
11. Supply duct over bathroom will transition to enter cafeteria as a 28" by 28" duct with fire damper. Install access door above bathroom ceiling.
12. Install a return grille 12" AFF. 48" by 12" return duct will drop down in classroom along wall to elevation of return grill in cafeteria. Install fire damper in wall.
13. Exhaust ducting will be routed to ERV.
14. The supply duct coming up in room 18 will split once through the fire damper in the corridor. The supply duct going to room 8 and 9 will 45 down to be under the return.
15. Offices will be supplied by VRF system with multiple indoor units. Consult manufacturer's recommended piping procedures and sizes. Install ceiling cassettes or wall units where shown. All units require condensate drain whether specifically shown or not.
16. The office unit serving the principal's office will also supply fresh air to the offices. Duct as shown.
17. Install ducted FCUs above both principal's office and main office. Install drain pan with float switch under units. Wire to shut down unit and alert operator. Install motorized OA damper in OA duct.
18. Top of window will have a louver full width of window by 16" in height. Install plenum box on back and connect 12" by 12" OA duct on back and connect to return plenum of FCU.
19. Locate AHU B1 and B2 stacked over each other at location shown. Return duct will come through wall from crawl space. Supply ducts for upper unit will split to avoid the bar joist and go up through floor. Supply duct for the lower unit will go into the boiler room, rise up to ceiling height cross room then up.
20. Upper unit of stacked AHUs requires a support frame. Do not block access to lower unit. Mount VRF control box and expansion valves to maintain access. Discuss locations. Must meet all manufacturer's guidelines. Consult manufacturer for refrigerant pipe sizes and routing requirements, est. to be 1-1/4" gas, ½" liquid.
21. Combine and route condensate to floor drain in boiler room.

2 AREA D BASEMENT NEW CONSTRUCTION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 1/8"=1'-0" 16'

FIRE RATED WALL LEGEND

- 1 - HOUR FIRE PARTITION
- 2 - HOUR FIRE BARRIER

KEY PLAN - N.T.S.

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AREA B MAIN LEVEL AND AREA D BASEMENT NEW CONSTRUCTION PLAN

Revision

ID	Date	Description

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DESIGNED BY	MS
DRAWN BY	AN
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M-103

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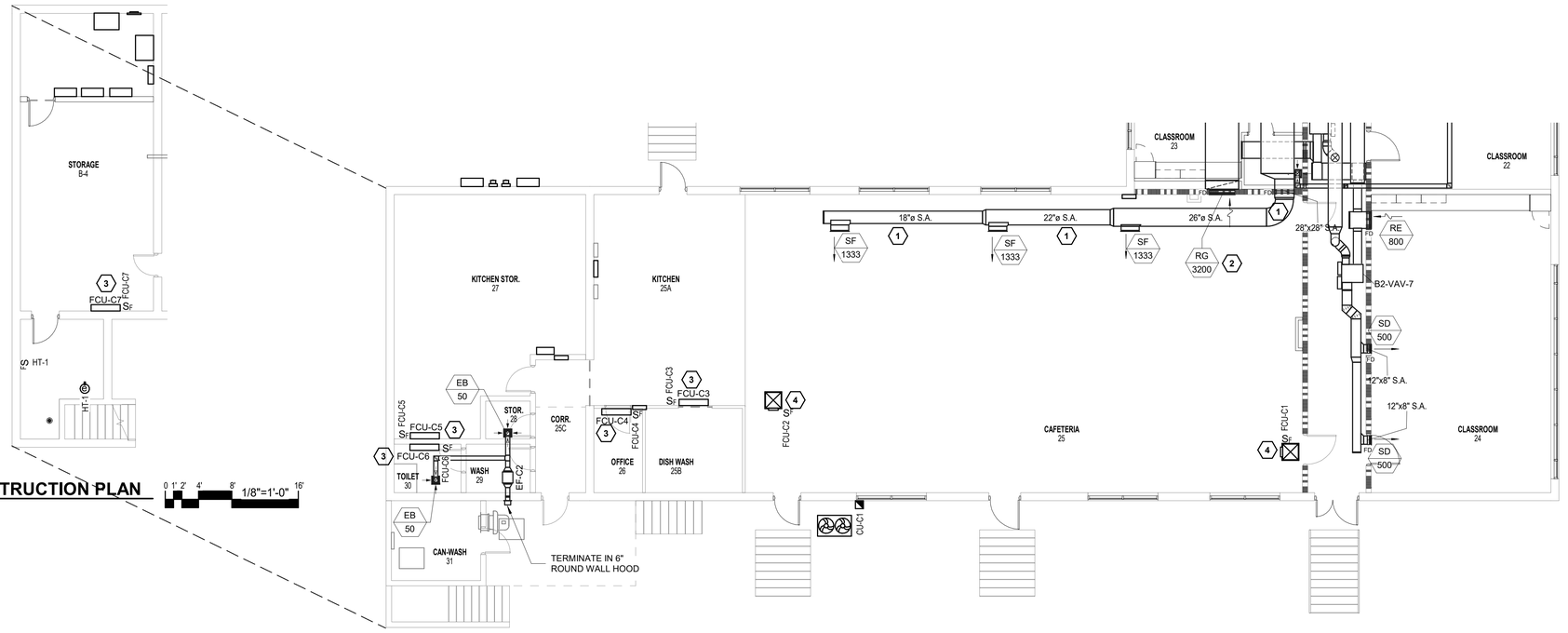


2 AREA C BASEMENT NEW CONSTRUCTION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 16' 1/8"=1'-0"

1 AREA C MAIN LEVEL NEW CONSTRUCTION PLAN

1/8" = 1'-0"

0 1' 2' 4' 8' 16' 1/8"=1'-0"

KEYED NOTES:

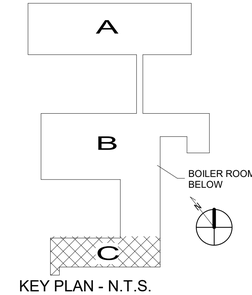
1. Install new double wall spiral paint grip ducting approximately 6" below ceiling. Offset up as required.
2. Install return grill approximately 12' AFF. Requires FD at wall.
3. Install wall mounted VRF units where shown pipe condensate to floor drain. Discuss routing.
4. Install ceiling mounted ceiling cassettes where shown. Coordinate for condensate drain.

GENERAL NOTES:

1. All units require temperature sensors at an approved location. No surface conduit allowed unless specifically approved.
2. All units require condensate drain piping. Coordinate for specific locations with engineer.

FIRE RATED WALL LEGEND

- 1 - HOUR FIRE PARTITION
- 2 - HOUR FIRE BARRIER



KEY PLAN - N.T.S.

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2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

AREA C MAIN LEVEL AND BASEMENT NEW CONSTRUCTION PLAN

Revision		
ID	Date	Description

PROJECT NUMBER	19253
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DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021
SHEET NUMBER	M-104

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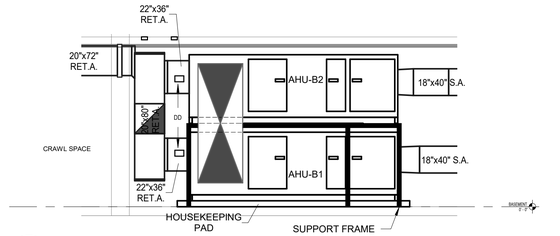
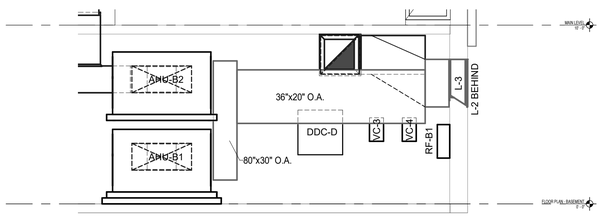


4 COAL RM. SIDE ELEVATION

1/4" = 1'-0"

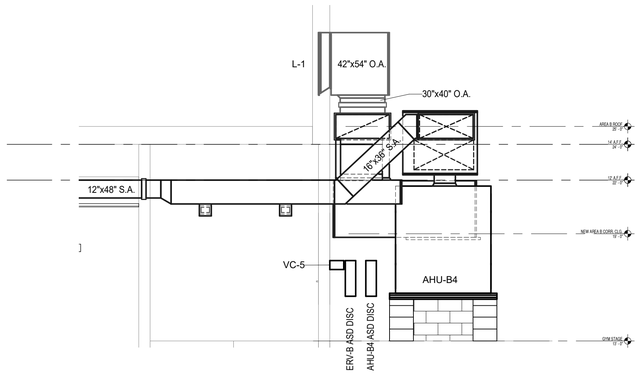
0 6" 1' 2' 4' 1/4"=1'-0" 8'



3 COAL RM. END ELEVATION

1/4" = 1'-0"

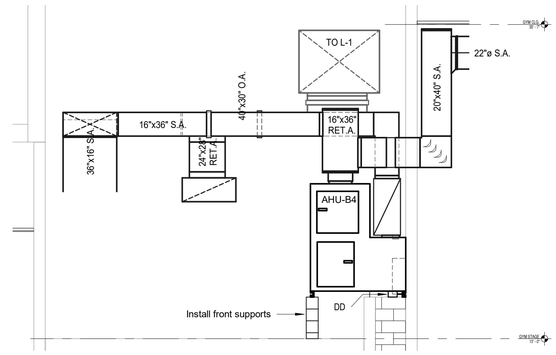
0 6" 1' 2' 4' 1/4"=1'-0" 8'



2 AHU-B4 FRONT ELEVATION

1/4" = 1'-0"

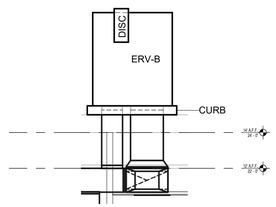
0 6" 1' 2' 4' 1/4"=1'-0" 8'



1 AHU-B4 SIDE ELEVATION

1/4" = 1'-0"

0 6" 1' 2' 4' 1/4"=1'-0" 8'



7 ERV B ELEVATION

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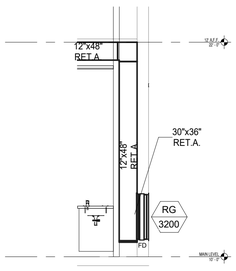

6 CAFETERIA RET. A DUCT ELEVATION

1/4" = 1'-0"

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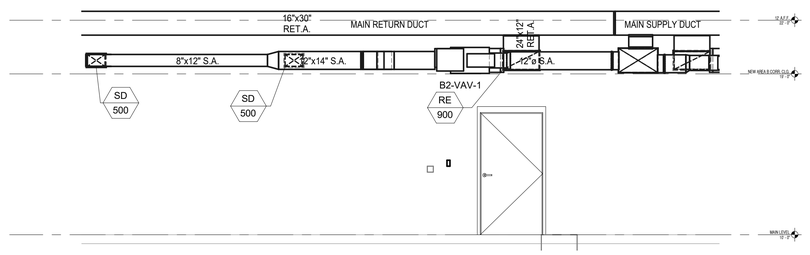

5 CORRIDOR DUCT ELEVATION

1/4" = 1'-0"

0 6" 1' 2' 4' 1/4"=1'-0" 8'

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ALAMANCE BURLINGTON SCHOOL SYSTEM
2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

MECHANICAL ELEVATIONS

Revision

ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021

SHEET NUMBER

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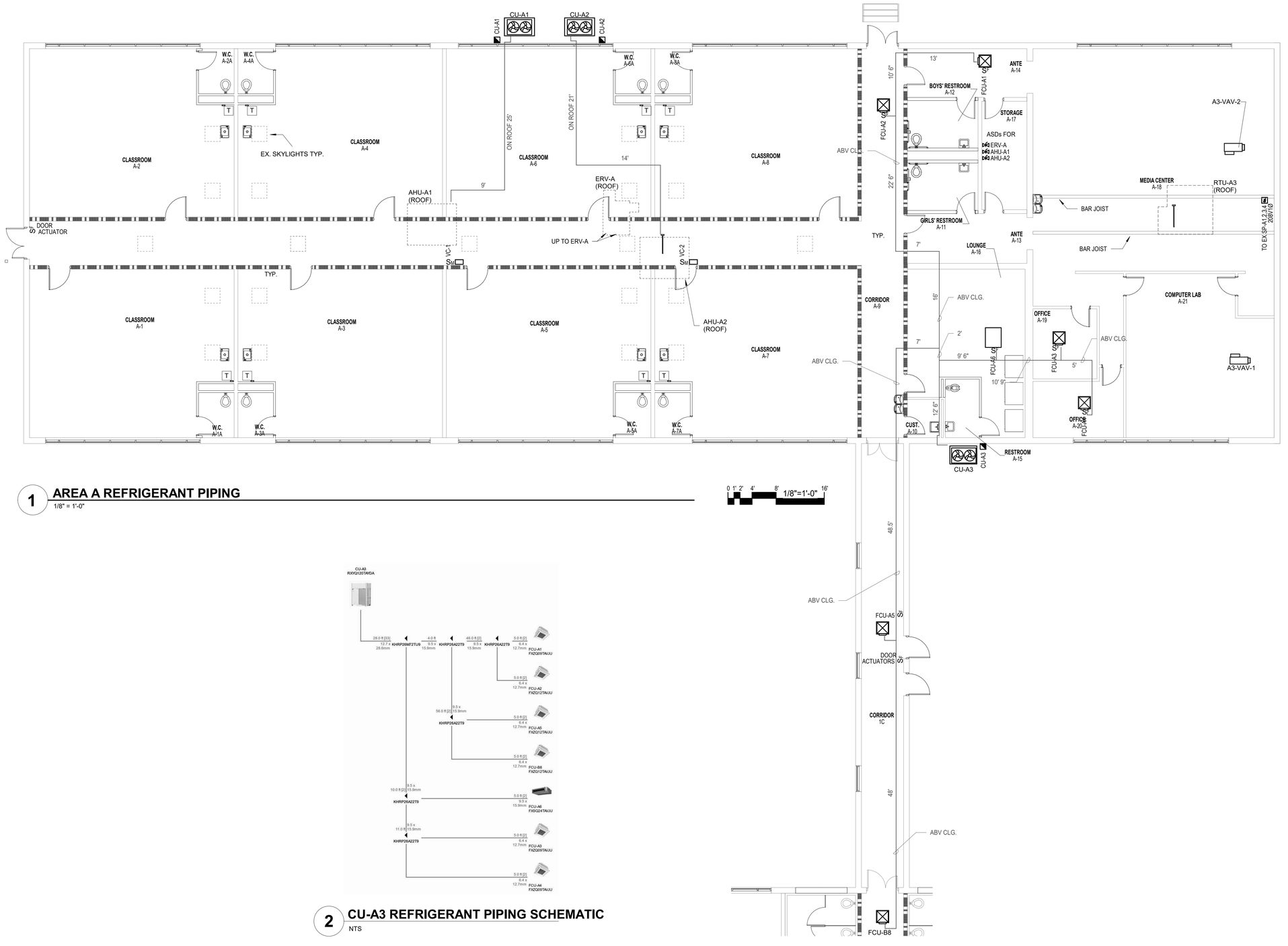
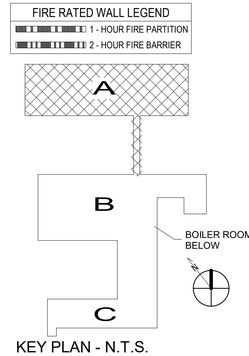


1 AREA A REFRIGERANT PIPING

1/8" = 1'-0"

2 CU-A3 REFRIGERANT PIPING SCHEMATIC

NTS



KEY PLAN - N.T.S.

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2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

AREA A REFRIGERANT PIPING LAYOUT

Revision		
ID	Date	Description

PROJECT NUMBER	19253
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DRAWN BY	AN
DRAWING DATE	07/01/2021

SHEET NUMBER

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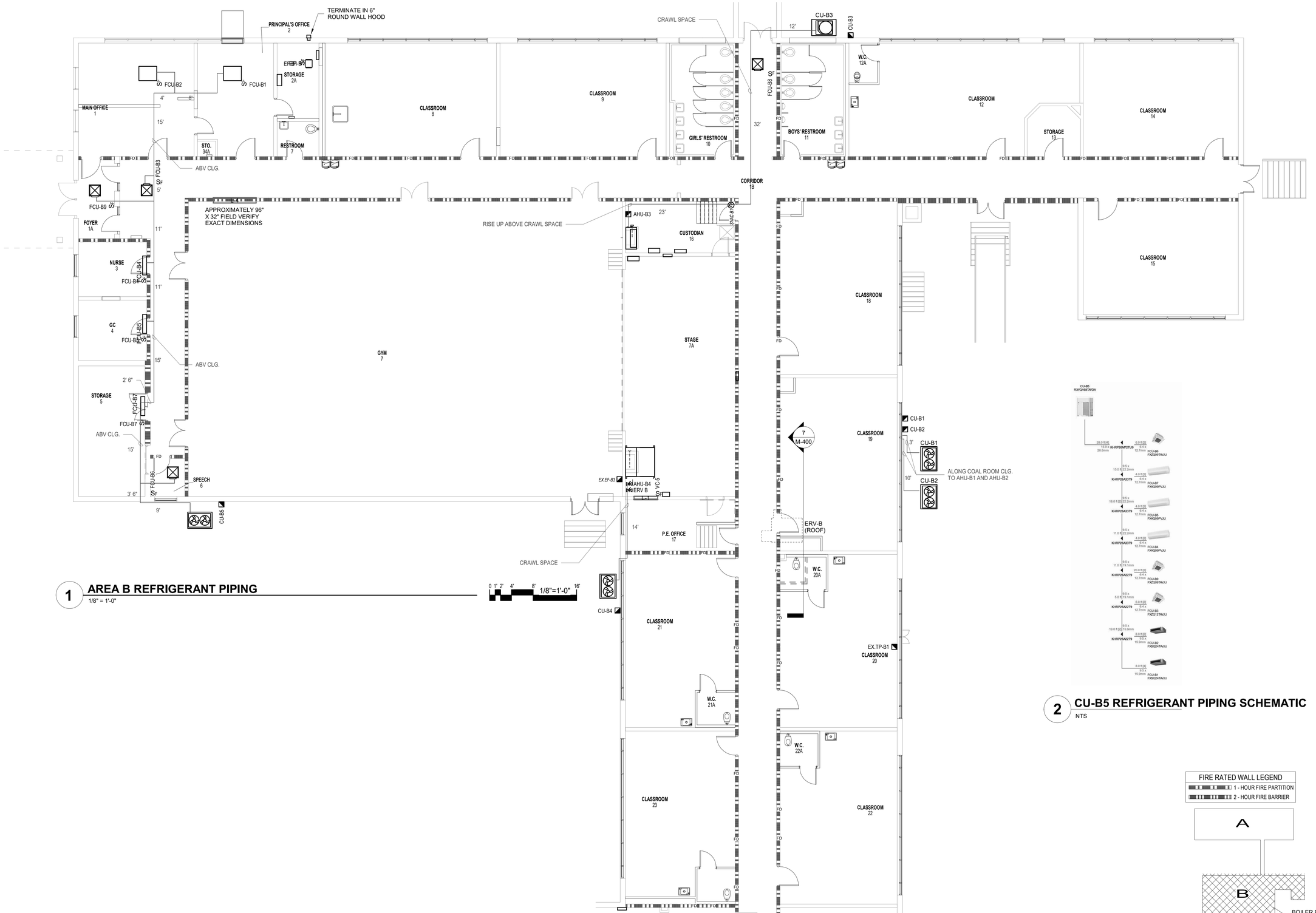

1 AREA B REFRIGERANT PIPING

1/8" = 1'-0"

2 CU-B5 REFRIGERANT PIPING SCHEMATIC

NTS

FIRE RATED WALL LEGEND

1 - HOUR FIRE PARTITION

2 - HOUR FIRE BARRIER

KEY PLAN - N.T.S.

SUD ASSOCIATES, P.A.

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2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

AREA B REFRIGERANT PIPING LAYOUT

Revision		
ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
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DRAWN BY	AN
DRAWING DATE	07/01/2021
SHEET NUMBER	M-501

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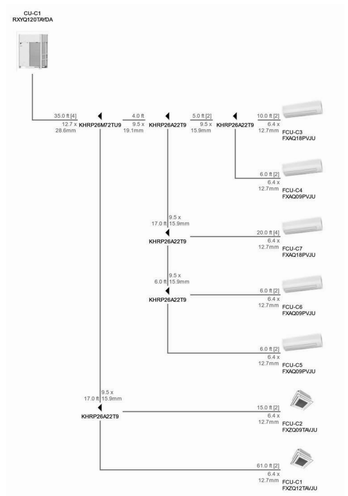
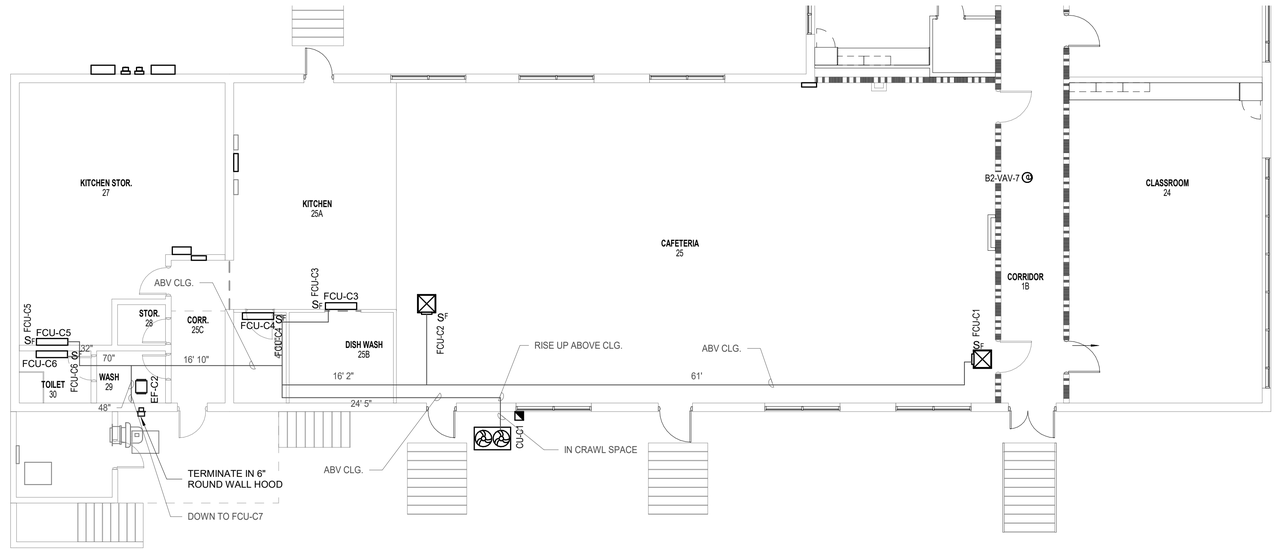


2 CU-C1 REFRIGERANT PIPING SCHEMATIC

NTS



1 AREA C REFRIGERANT PIPING

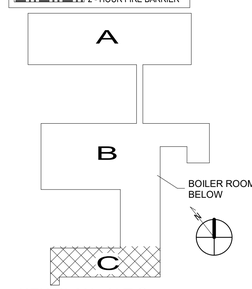
1/8" = 1'-0"

0 1' 2' 4' 8' 1/8"=1'-0" 16'

FIRE RATED WALL LEGEND

1 - HOUR FIRE PARTITION

2 - HOUR FIRE BARRIER



KEY PLAN - N.T.S.

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AREA C REFRIGERANT PIPING LAYOUT

Revision

ID	Date	Description

PROJECT NUMBER	19253
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DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021

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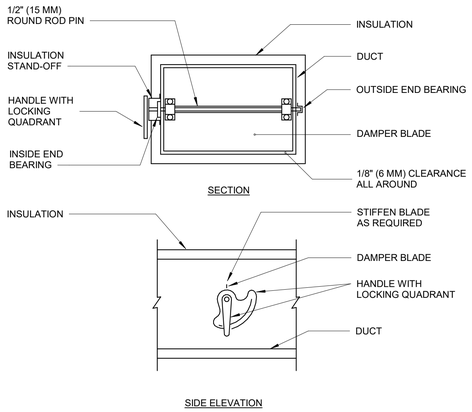
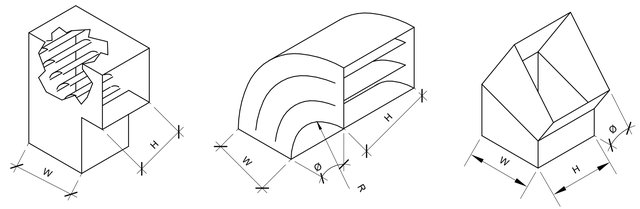


NOTES:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

7 VOLUME DAMPER DETAIL

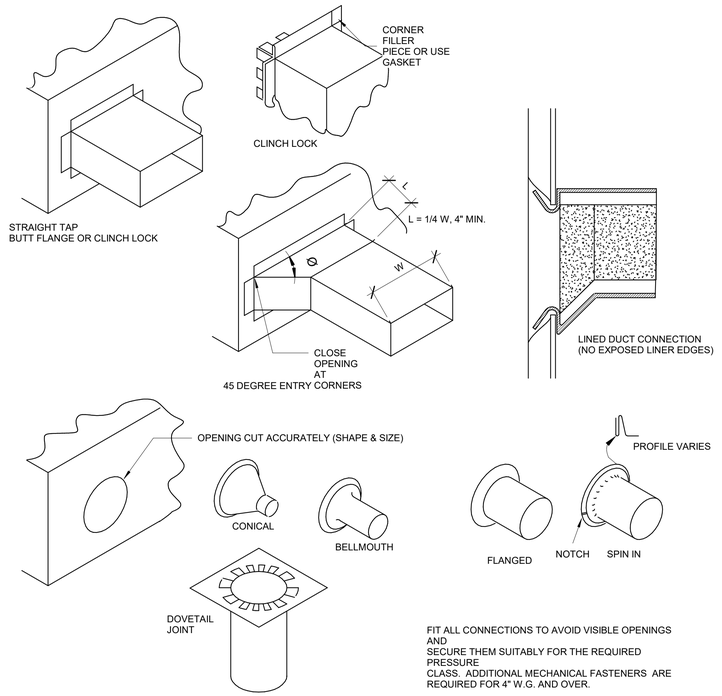
NTS



BEAD, CROSSBREAK AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT

4 RECTANGULAR ELBOWS DETAIL

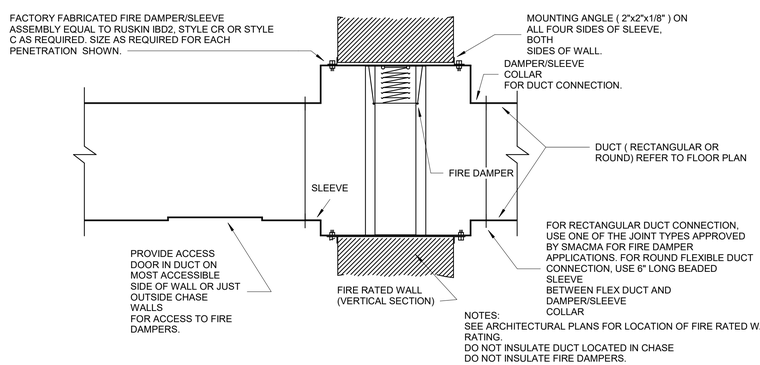
NTS



FIT ALL CONNECTIONS TO AVOID VISIBLE OPENINGS AND
SECURE THEM SUITABLY FOR THE REQUIRED PRESSURE
CLASS. ADDITIONAL MECHANICAL FASTENERS ARE REQUIRED FOR 4" W.G. AND OVER.

5 BRANCH CONNECTIONS DETAIL

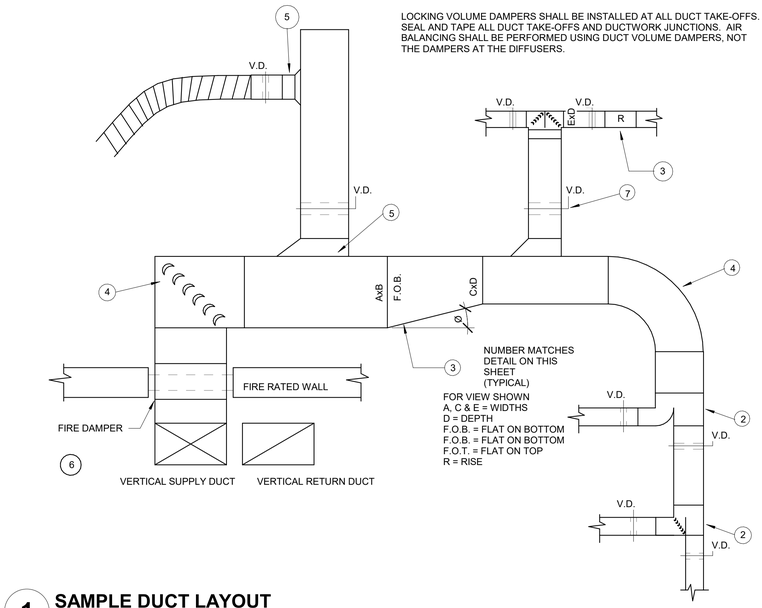
NTS



NOTES:
SEE ARCHITECTURAL PLANS FOR LOCATION OF FIRE RATED WALLS AND RATING.
DO NOT INSULATE DUCT LOCATED IN CHASE
DO NOT INSULATE FIRE DAMPERS.

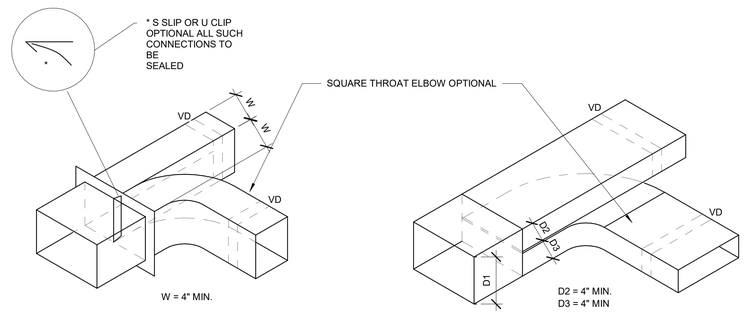
6 FIRE DAMPER INSTALLATION DETAIL

NTS



1 SAMPLE DUCT LAYOUT

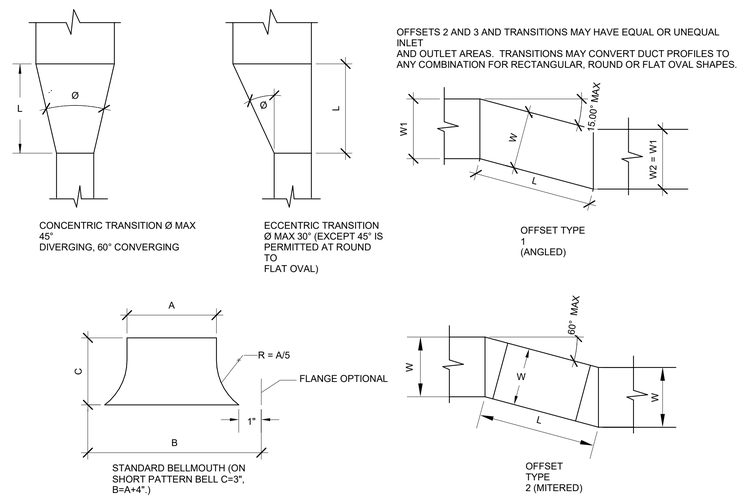
NTS



VOLUME CONTROL SHOULD BE BY BRANCH DAMPERS. PROVIDE SPLITTER WHETHER SHOWN
OR
NOT. ITS LENGTH SHOULD BE 1.5W OR 1.5 D3.

2 PARALLEL FLOW BRANCHES

NTS



3 OFFSETS AND TRANSITIONS

NTS

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ALAMANCE BURLINGTON SCHOOL SYSTEM
2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

MECHANICAL DETAILS

Revision		
ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021

SHEET NUMBER

M-503

7/1/2021 6:57:06 AM

System No. C-AJ-1044

March 15, 2007

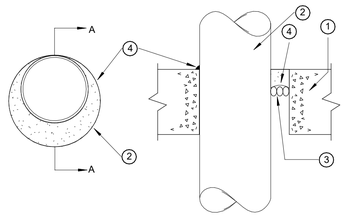
F Ratings — 2, 3, and 4 Hr (See Items 2A and 4)

T Rating — 0 Hr

L Rating At Ambient — 2 CFM/sq ft

L Rating At 400 F — less than 1 CFM/sq ft

W Rating — Class 1 (See Item 4)



SECTION A-A

1. **Floor or Wall Assembly** — Lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Except as noted in table under Item 4, min thickness of solid concrete floor or wall assembly is 4-1/2 in. (114 mm). Floor may also be constructed of any min 6 in.(152 mm) thick UL Classified hollow core **Precast Concrete Units***. When floor is constructed of hollow core precast concrete units, packing material (Item 3) and caulk fill material (Item 4) to be installed symmetrically on both sides of floor, flush with floor surface. Wall assembly may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening in solid lightweight or normal weight concrete floor is 32 in. (813 mm). Max diam of opening in floor constructed of hollow-core precast concrete units is 7 in. (178 mm)
See **Concrete Blocks** (CAZT) and **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.

1A. **Steel Sleeve** — (Optional, Not Shown) - Nom 16 in. (406 mm) diam (or smaller) Schedule 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly. Sleeve may extend a max of 2 in. (51 mm) above top of floor or beyond either surface of wall. As an alternate, nom 16 in. (406 mm) diam (or smaller) min 0.028 (0.71 mm) thick galvanized sheet steel sleeve cast or grouted into floor or wall assembly flush with floor or wall surfaces.

2. **Through Penetrants** — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Max annular space between pipe, conduit or tubing and edge of through opening or sleeve is dependent on the parameters shown in Item 4. Min annular space between pipe or conduit and edge of through opening is 0 in. (point contact). Max annular space to be as shown in the table in Item 4. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. **Steel Pipe** — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe** — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.

C. **Conduit** — Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.

D. **Conduit** — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.

E. **Copper Tubing** — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tube.

F. **Copper Pipe** — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. **Packing Material** — Polyethylene backer rod or nom 1 in. (25 mm) thickness of tightly-packed mineral wool batt or glass fiber insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of caulk fill material (Item 4).

3A. **Forming Material*** — As an alternate to the packing material in Item 3, nom 4 in. (102 mm) wide strips of min 1/2 in (13 mm) thick compressible mat to be stacked to a thickness greater than the width of the annular space and compression-fitted, edge-first, to fill the annular space to a min 4 in. (102 mm) depth. As an option, the strips of min 1/2 in. (13mm) thick compressible mat may be folded in half, lengthwise, and stacked to a thickness greater than the width of the annular space and compression-fitted, edge-first, to fill the annular space to a min 2 in. (51 mm) depth. Top of forming material to be recessed from top surface of floor or from both surfaces of wall as necessary to accommodate the required thickness of caulk fill material.

3M COMPANY — Fire Barrier Packing Material

4. **Fill, Void or Cavity Material* — Caulk, Sealant** — Applied to fill the annular space flush with top surface of floor. In wall assemblies, required caulk thickness to be installed symmetrically on both sides of wall, flush with wall surface. At point contact location between penetrant and sleeve or between penetrant and concrete, a min 1/4 in. (6 mm) diam bead of caulk shall be applied at top surface of floor and at both surfaces of wall. The hourly F Ratings and the min required caulk thicknesses are dependent upon a number of parameters, as shown in the following table:

Min Floor or Wall Thkns In.	Nom Pipe Tube or Conduit Diam In.	Max Annular Space In.	Min Caulk Thkns In.	F Rating Hr
2-1/2 (64)	1/2-12 (13-305)	1-3/8 (35)	1/2 (13)	2
2-1/2 (64)	1/2-12 (13-305)	3-1/4 (83)	1 (25)	2
4-1/2 (114)	1/2-6 (13-152)	1-3/8 (35)	1/4 (6) (a)	2
4-1/2 (114)	1/2-12 (13-305)	1-1/4 (32)	1/2 (13)	3
4-1/2 (114)	1/2-20 (13-508)	2 (51)	1 (25)	3
4-1/2 (114)	1/2-20 (13-508)	2 (51)	1 (25)	3
4-1/2 (114)	1/2-12 (13-305)	3-1/4 (83)	1 (25)	3
4-1/2 (114)	22-30 (558-762)	2 (51)	2 (51)	3
5-1/2 (140)	1/2-6 (13-152)	1-3/8 (35)	1 (25) (b)	4

(a)Min 2 in (51 mm) thickness of mineral wool batt insulation or forming material (Item 3A) required in annular space.

(b)Min 1 in. (25 mm) thickness of mineral wool batt insulation required in annular space on both sides of floor or wall assembly. Min 1 in.(25 mm) thickness of caulk to be installed flush with each surface of floor or wall assembly.

3M COMPANY — CP 25WB+ or FB-3000 WT.

(Note - W Rating applies only when FB-3000 WT is used.)

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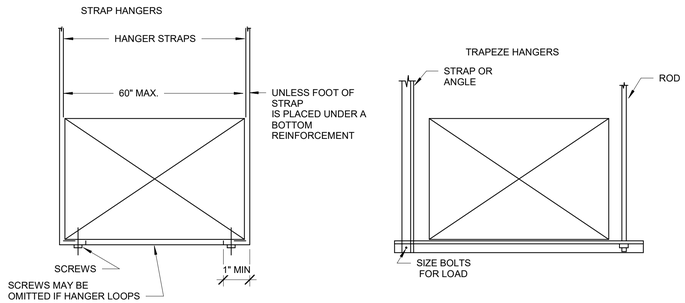
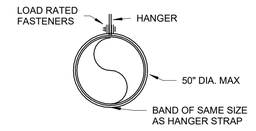
5 C-AJ-1044

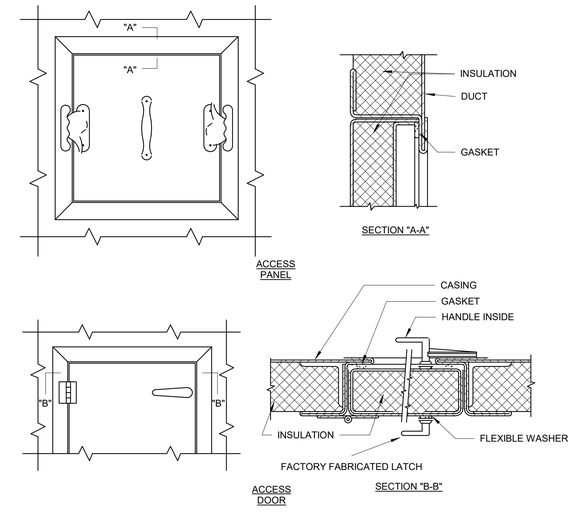
NTS



2 DUCT HANGER DETAIL

NTS



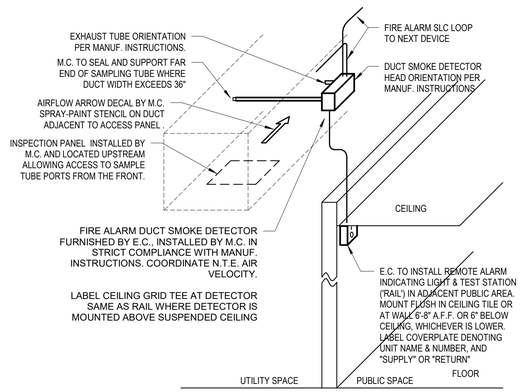


NOTES:
1. LATCHES SHALL BE OF THE WEDGE TYPE TO CLOSE DOORS TIGHTLY.
2. HINGES ON THE ACCESS DOORS SHALL HAVE NON-CORROSIVE PINS.

DESIGNERS NOTES:
1. USE ACCESS DOORS ON AIR HANDLING UNITS AND DUCTWORK INSTALLED IN EQUIPMENT ROOMS.
2. USE ACCESS PANELS ON ALL EQUIPMENT AND DUCTWORK INSTALLED ABOVE FINISHED CEILINGS.

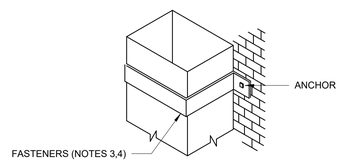
1 ACCESS PANEL/DOOR DUCT SYSTEMS DETAIL

NTS



4 DUCT DETECTOR SCHEMATIC DETAIL2

12" = 1'-0"



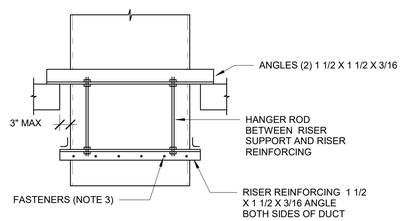
SUPPORT FROM WALL

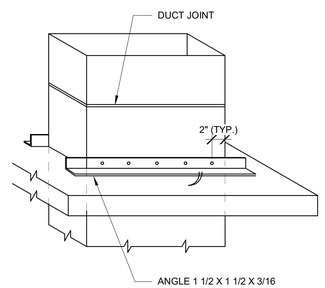
NOTES

1. RISER SUPPORTS FROM SMACNA, HVAC DUCT CONSTRUCTION STANDARDS.
2. SUPPORT RISERS SO THAT THEY ARE IN TENSION.
3. MINIMUM NUMBER OF FASTNERS ON EACH OF TWO SUPPORT BARS.

LARGEST DUCT DIM.	MINIMUM NUMBER OF FASTNERS
16" AND DOWN	2
17" - 24"	3
OVER 24"	LARGEST DUCT DIM. DIVIDED BY 8

4. LOCATE A FASTNER WITHIN 2" IF THE DUCT EDGES. LOCATE OTHERS AT EVENLY SPACED INTERVALS.





3 DUCT RISER SUPPORTS DETAIL

NTS

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ALAMANCE BURLINGTON SCHOOL SYSTEM
2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

MECHANICAL DETAILS

Revision		
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PROJECT NUMBER	19253
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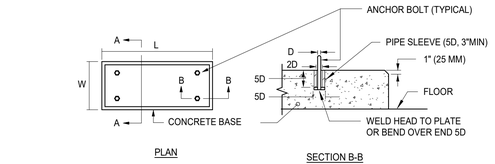
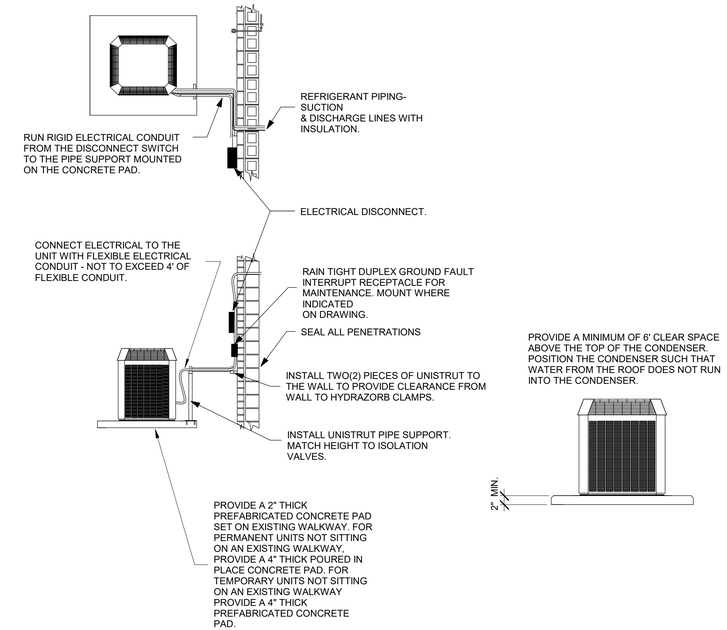


NOTES:

1. L AND W DIMENSIONS SHALL BE 6 IN. (150 MM) GREATER THAN THE EQUIPMENT BASE PLATE.

2 CONCRETE MECHANICAL EQUIPMENT BASES DETAIL

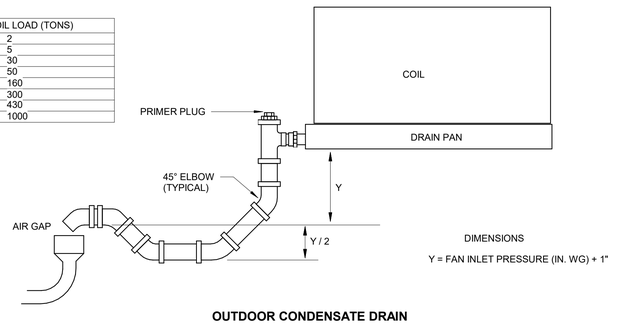
NTS



1 CONDENSING UNIT INSTALLATION DETAIL

NTS

PIPE SIZE	MAX. COIL LOAD (TONS)
3/4"	2
1"	5
1-1/4"	30
1-1/2"	50
2"	160
3"	300
4"	430
5"	1000



OUTDOOR CONDENSATE DRAIN

3 CONDENSATE DRAIN PIPING DETAIL

NTS

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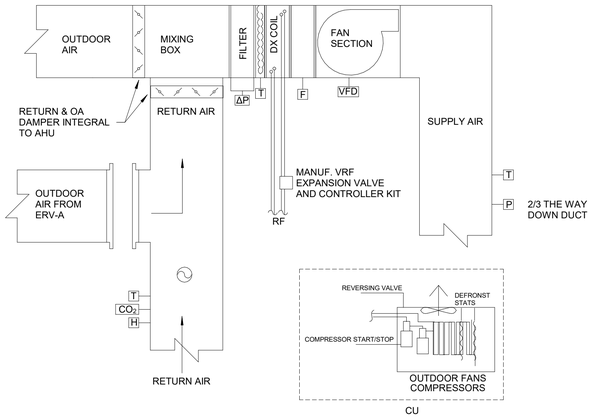
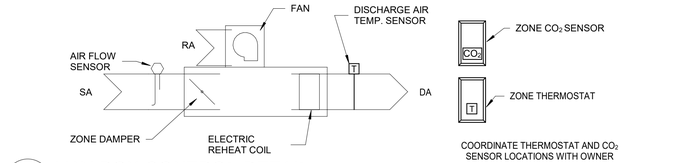


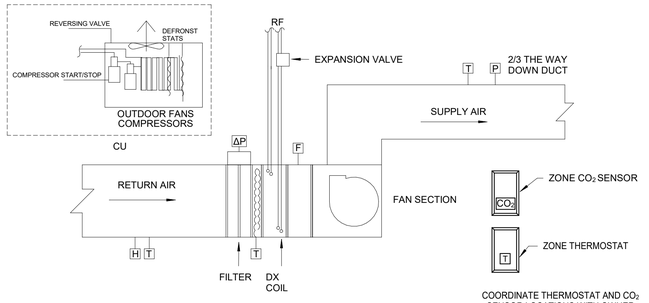
1 AHU A1 AND A2 CONTROL DETAIL

NTS



4 VAV BOX CONTROL DETAIL

NTS



5 AHU B3 CONTROL DETAIL

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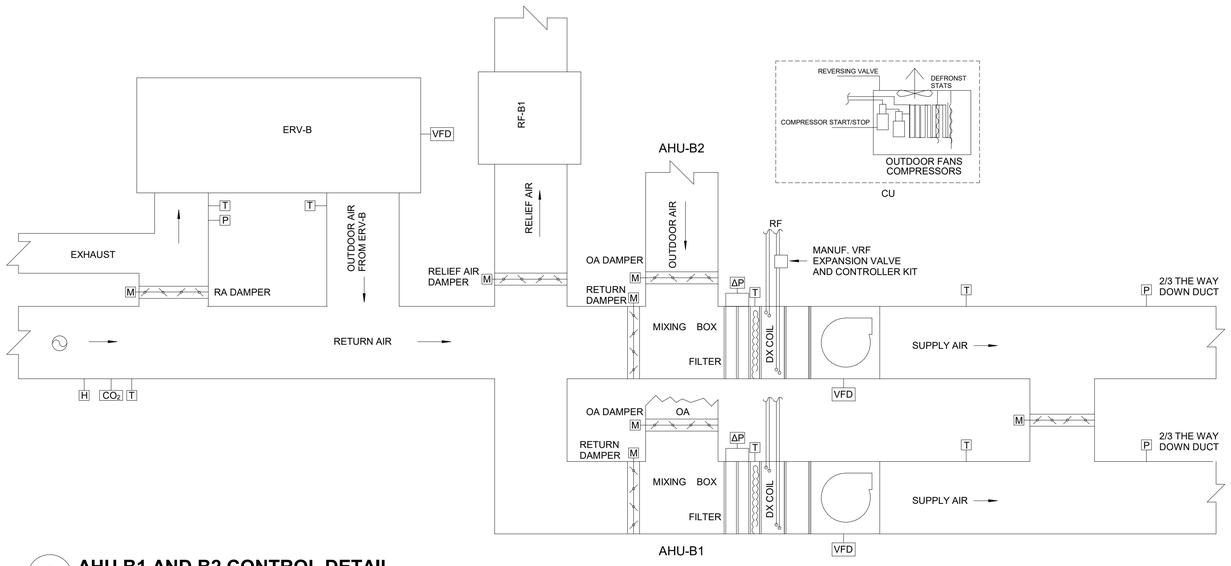
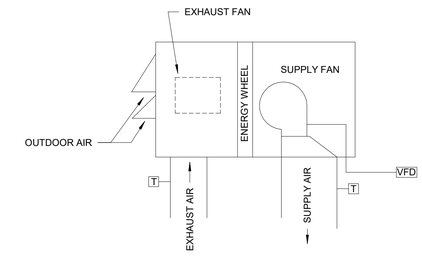


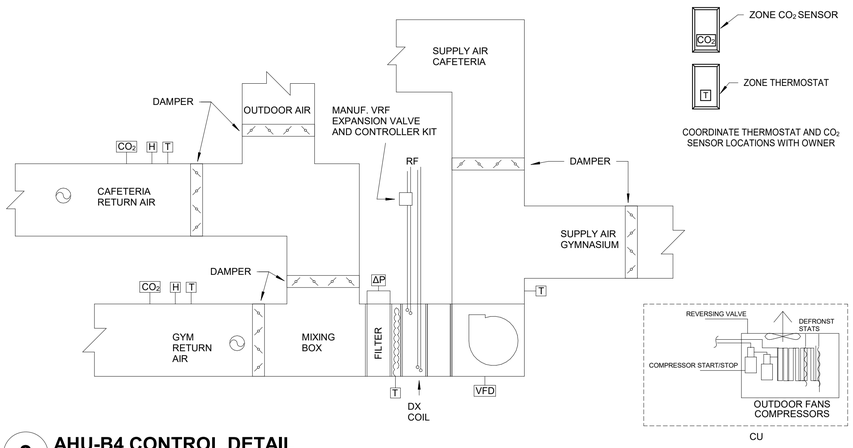
2 AHU B1 AND B2 CONTROL DETAIL

NTS



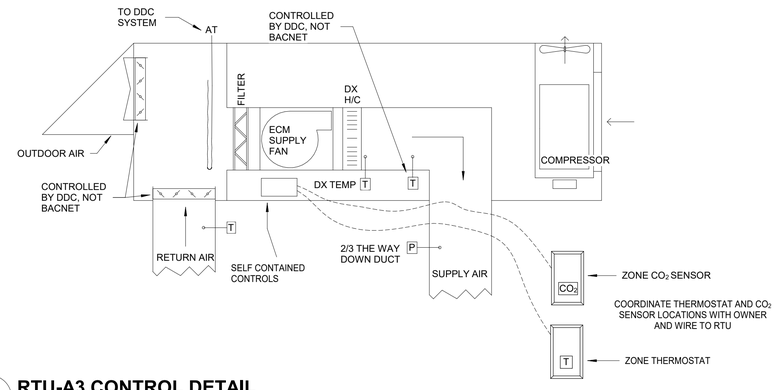
6 ERV A CONTROL DETAIL

NTS



3 AHU-B4 CONTROL DETAIL

NTS



7 RTU-A3 CONTROL DETAIL

NTS

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SHEET NUMBER

M-600A

GENERAL PLEASANT GROVE DDC SYSTEM SEQUENCES

A. ALL SCHEDULES AND TEMPERATURE AND HUMIDITY SETPOINTS AND ADJUSTMENTS SHALL BE ADJUSTABLE BY FACILITY PERSONNEL FROM THE EMCS PANEL AND CENTRAL SITE. NO SUCH PARAMETERS WHICH MAY NEED ADJUSTMENT MAY BE IMBEDDED IN THE PROGRAMMING.

B. THE DDC CONTRACTOR IS TO REVIEW THE SEQUENCES AND DISCUSS WITH THE ENGINEER DURING THE SUBMITTAL PROCESS THE BEST WAY TO ACHIEVE THE OPTIMUM SEQUENCE. ANY IMPROVEMENTS THEY MAY FEEL WOULD BENEFIT THE SYSTEM BASED ON THEIR EXPERIENCE SHOULD BE SUGGESTED AT THAT TIME. THIS MEETING WILL BE A REQUIRED PART OF THE SUBMITTAL PROCESS.

C. ALL AHU VALVES AND OUTDOOR AIR DAMPERS ARE TO BE SPRING RETURN - OUTDOOR AIR DAMPERS TO THE CLOSED POSITION, RETURN DAMPERS TO THE OPEN POSITION, AND VALVES TO THE OPEN POSITION. LOW TEMPERATURE LIMIT SHUT DOWN IS TO INCLUDE CUTTING CONTROL POWER TO THE DAMPERS AND VALVES.

D. THE SYSTEM SHALL BE PROGRAMMED TO BE SCHEDULED WITH HOLIDAY, OCCUPIED, AND UNOCCUPIED PERIODS.

E. DIFFERENT PIECES OF EQUIPMENT AND DIFFERENT AREAS OF THE BUILDING SHALL BE CAPABLE OF BEING SCHEDULED INDEPENDENTLY. COORDINATE WITH OWNER BEFORE PROGRAMMING.

F. THE HOLIDAY PERIOD SHALL PUT ALL EQUIPMENT IN THE BUILDING IN THE UNOCCUPIED MODE. ANY AREA OR PIECE OF EQUIPMENT CAN BE RETURNED TO THE OCCUPIED MODE THROUGH THE USE OF A MANUAL OVERRIDE SWITCH IN THE SPACE, OR BY THE SYSTEM OPERATOR.

SEPARATE HEATING AND COOLING SETPOINTS MUST BE SPECIFIED (INITIALLY 74°F FOR COOLING AND 70°F FOR HEATING). THERMOSTATS WILL HAVE ADJUSTMENT CAPABILITY OF PLUS OR MINUS 2°F, BUT A DEADBAND OF AT LEAST 4°F MUST BE MAINTAINED BETWEEN THE HEATING AND COOLING SETPOINTS AT ALL TIMES. ALL SINGLE ZONE VAV AHUS, VAV BOXES, AND THE HP REQUIRE THERMOSTATS THAT ONCLUDE CO2 SENSORS. VRF SYSTEMS ARE TO BE SET UP SIMILARLY FOR TEMPERATURE CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH SPACE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
- LOW SPACE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
- HIGH SPACE HUMIDITY: IF THE ZONE HUMIDITY IS GREATER THAN 65% (ADJ.)
- AHU SUPPLY AIR TEMPERATURE IS MORE THAN 3 DEGREES FROM SETPOINT FOR A PERIOD OF 5 MINUTES.
- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- SUPPLY FAN VFD FAULT.

SEQUENCE FOR AHUs -A1,A2, B1, AND B2

A. THE SYSTEM SHALL BE SCHEDULED TO BE ON DURING OCCUPIED PERIODS AND OFF DURING UNOCCUPIED PERIODS. ALLOW FOR SETBACK TEMPERATURES AND CYCLE THE FAN DURING UNOCCUPIED PERIODS. THE CFM TOTAL OF THE CONNECTED BOXES WILL BE DISPLAYED ON THE SCREEN. THIS AIR FLOW MUST STAY ABOVE THE MINIMUM SET BY THE MANUFACTURER. OVERRIDE THE CO2 CONTROLLED AIR FLOW REDUCTION IF THE CFM IS TOO LOW. THIS WILL NOT APPLY TO THE B AHU SYSTEMS THAT CAN REDUCE TO ONE AHU OPERATION.

THE MORNING WARM_UP AND COOL_DOWN PERIODS SHALL BE OPTIMIZED DEPENDING ON THE OUTDOOR AND INDOOR AIR CONDITIONS.

DURING THE UNOCCUPIED PERIOD AND MORNING WARM_UP/COOL-DOWN THE OA DAMPER SHALL BE CLOSED UNLESS THERE IS THE POTENTIAL FOR FREE COOLING USING THE ECONOMIZER CYCLE.

B. THE DDC SYSTEM WILL SEND A 0 TO 10 VOLT SIGNAL TO THE VRF CONTROLLER THAT WILL CONTROL SUPPLY AIR TEMPERATURE. RESET THE DISCHARGE AIR TEMPERATURE BASED ON OUTDOOR AIR TEMPERATURE. (DOES NOT APPLY TO B4) THE INITIAL SCHEDULE SHALL BE 55F AT 76 OA AND ABOVE, RESET BASED ON OA FOR 55F AT 75 F OA TO 85F AT 40F OA, AND BELOW. IF THREE OR MORE ZONE SENSORS ARE MORE THAN TWO DEGREE BELOW 70, RESET THE DISCHARGE TEMPERATURE 1 DEGREE HIGHER AT 10 MINUTE INTERVALS. ONCE ONLY TWO PROBLEM ZONES ARE BELOW 70, GO BACK TOWARD THE OA RESET SCHEDULE 1 DEGREE AT 10 MINUTE INTERVALS. RESET THE DISCHARGE TEMPERATURE 1 DEGREE COOLER AT 10 MINUTE INTERVALS IF THE AVERAGE OF THE ZONE SENSOR IS ABOVE 73F. ONCE THE AVERAGE IS BELOW 73 GO BACK TOWARD THE OA RESET SCHEDULE 1 DEGREE AT 10 MINUTE INTERVALS. SUPPLY AIR MINIMUM IS 54F, SUPPLY AIR MAXIMUM IS 85F(ADJ.).

C. IF RETURN AIR RELATIVE HUMIDITY RISES ABOVE 60% THE HUMIDITY SHALL BE CONTROLLED BY INDEXING DOWN THE COIL DISCHARGE TEMPERATURE TO 55F TO MAINTAIN THE RETURN AIR RELATIVE HUMIDITY AT OR BELOW 60%. IF SPACES ARE TOO COLD ALERT THE OPERATOR AND COME OUT OF DEHUMIDIFICATION MODE.

D. DURING OCCUPIED PERIODS THE OUTDOOR AIR DAMPER SHALL BE CLOSED. FRESH AIR WILL PROVIDED BY THE ERV TO THE RETURN AIR.

E. ECONOMIZER SEQUENCE:

1. WHEN THE OUTDOOR AIR ENTHALPY IS LOWER THAN 27.5 BTU/LB AND THE OUTDOOR AIR TEMPERATURE IS LOWER THAN 65OF THE SYSTEM SHALL BE IN THE ECONOMIZER MODE. MODULATE THE OA AND RETURN DAMPER TO FOLLOW THE RESET SCHEDULE. FOR AHUS B1 AND B2 OPEN THE RELIEF DAMPER AND TURN ON THE RELIEF FAN ONCE THE OA DAMPER IS 50% OPEN, REMAINING ON UNTIL THE OA DAMPER IS LESS THAN 30% OPEN.

2. IF SUFFICIENT FREE COOLING IS NOT AVAILABLE, OR RETURN HUMIDITY RISES ABOVE 60%, THE COIL SHALL BE USED TO SUPPLEMENT THE COOLING. THIS MIXED AIR TEMPERATURE SHALL NOT DROP BELOW 55OF.

F. A MANUAL RESET LOW LIMIT CONTROLLER WITH SENSOR LOCATED DOWNSTREAM OF THE COIL SHALL DE-ENERGIZE THE SUPPLY FAN AND CLOSE THE OUTDOOR AIR DAMPERS IF THE TEMPERATURE FALLS BELOW 40OF.

G. WHEN A MANUAL OVERRIDE SIGNAL IS RECEIVED FROM A VAV ZONE, THE SYSTEM SHALL SWITCH FROM UNOCCUPIED MODE TO OCCUPIED MODE FOR A PROGRAMMABLE LENGTH OF TIME.

1. A VARIABLE SPEED DRIVE SHALL MODULATE THE SUPPLY FAN SPEED. MONITOR VAV BOXES AND RESET STATIC PRESSURE SETPOINT TO SATISFY THE CRITICAL ZONE AIR FLOW SETOINT. THE CRITICAL ZONE IS ANY ZONE THAT HAS ITS VAV BOX DAMPER FULLY OPEN BUT IS NOT RECEIVING ITS DESIRED VOLUME OF AIR. THE FAN SPEED (STATIC PRESSURE SETPOINT) SHALL BE MAINTAINED AT THE MINIMUM SPEED REQUIRED TO SATISFY ALL ZONES' CFM SETPOINT. A DIFFERENTIAL PRESSURE SENSOR LOCATED 2/3RDS OF THE WAY DOWN THE DUCT WORK WILL BE USED. RESET BETWEEN .5" and 1.25"

2. SPECIFIC TO B1 AND B2 THE SYSTEMS WILL HAVE A DUCT WITH DAMPER CONNECTING THE TWO SUPPLY DUCTS. THIS DUCT WILL BE OPEN WHEN OPERATING AT VARY HIGH COOLING LOADS AND THERE IS A SHORTAGE OF AIR FLOW FROM B2 THAT SUPPLIES 7 CLASSROOMS. AIR WILL BE SHARED FROM B1 WHICH ONLY SERVES 5 CLASSROOMS. AT THE OTHER EXTREME, WHEN VERY LOW AIR FLOW NEEDED, IF THE AIR FLOW IS TOO LOW TO MEET THE MINIUM AIR FLOW THE MANUFACTURER REQUIRES, INITIALLY USE 42% OR 2300 cfm, THE DAMPER WILL OPEN AND ONLY ONE AHU WILL BE USED. TURN THE COMPRESSOR OFF ON B1 AND OPERATE THE FAN AT MINIUM SPEED. ONCE CFMS ARE AT 100% OF THE AHU CAPACITY(5,500 CFM) CLOSE THE DAMPER IN THE CONNECTOR DUCT AND OPERATE AS TWO INDEPENDENT SYSTEMS.

H. SMOKE DETECTORS AS INDICATED ON THE DRAWINGS SHALL SEND A DIRECT SIGNAL THE FIRE ALARM SYSTEM. ACTIVATION OF THE FIRE ALARM SHALL DE-ENERGIZE THE SUPPLY FANS THROUGH A CONTROL RELAY NOT RELATED TO THE BUILDING DDC SYSTEM. AN AUXILIARY CONTACT ON THE SMOKE DETECTORS SHALL ALARM THE DDC SYSTEM FOR INFORMATIONAL PURPOSES.

SEQUENCE FOR RTU-A3

A. A3 IS A PACKAGED HEATPUMP SUPPLYING TWO VAV BOXES, ONE FOR THE MEDIA AND ONE FOR A CLASSROOM. THESE VAV BOXES ARE NOT FAN POWERED AND WILL NOT USE SPACE CO2 SENSORS.

B. TEMPERATURE RESET IS THE SAME AS FOR A1, A2, B1, B2. INSTEAD OF A 0 TO 10 VOLT SIGNAL USE THE BACNET INTERFACE TO CONTROL THE DISCHARGE AIR TEMPERATURE. STATIC PRESSURE CONTROL IS TO BE THE SAME AS FOR THE OTHER UNITS SUPPLYING VAV BOXES.

C. DAMPER AND ECONOMIZING CONTROL WILL BE THE SAME AS FOR B4

SEQUENCE FOR AHU-B4

A. THE UNITS OPERARTES AS A SINGLE ZONE VAV SYSTEM. THE UNIT WILL MONITOR BOTH THE GYM AND CAFETERIA SPACES. ONLY MANITAIN SPACE CONDITIONS FOR THE CAFETERIA.

B. MONITOR THE SPACE CO2, AND VARY THE OA DAMPER FROM DESIGN MINIMUM FOR THE CAFETERIA TO 25% OF DESIGN MINIUM IF THE SPACE CO2 SENSOR IS SATISFIED.

C. MONITOR THE CO2 OF THE GYM. IF THE CO2 SENSOR IS ABOVE SETPOINT SWITCH THE SYSTEM TO DELIVER ½ OF THE AIR TO THE GYM AND OPEN THE OA DAMPER TO DELIVER TO DELIVER THE GYM DESIGN MINIUMUM.

D. MINIMUM OUTSIDE AIR WILL BE SETUP IN COORDINATION WITH THE BALANCING CONTRACTOR. THE CORRECT OA DAMPER POSITION IS TO BE DETERMINED FOR BOTH MIN FAN SPEED AND MAXIMUM FAN SPEED. MODULATE DAMPER POSITION WITH FAN SPEED.

E. WHEN THE OUTDOOR AIR ENTHALPY IS LOWER THAN 27.5 BTU/LB AND THE OUTDOOR AIR TEMPERATURE IS LOWER THAN 65OF THE SYSTEM SHALL BE IN THE ECONOMIZER MODE. MODULATE THE OA AND RETURN DAMPER TO FOLLOW THE RESET SCHEDULE.

F. ECONOMIZER SEQUENCE

1. WHEN THE OUTDOOR AIR ENTHALPY IS LOWER THAN 27.5 BTU/LB AND THE OUTDOOR AIR TEMPERATURE IS LOWER THAN 65OF THE SYSTEM SHALL BE IN THE ECONOMIZER MODE. MODULATE THE OA AND RETURN DAMPER TO FOLLOW THE RESET SCHEDULE. OPEN THE RELIEF DAMPER AND TURN ON THE RELIEF FAN ONCE THE OA DAMPER IS 50% OPEN, REMAINING OPEN UNTIL THE OA DAMPER IS LESS THAN 30% OPEN.

2. IF SUFFICIENT FREE COOLING IS NOT AVAILABLE, OR RETURN HUMIDITY RISES ABOVE 60%, THE COIL SHALL BE USED TO SUPPLEMENT THE COOLING. THIS MIXED AIR TEMPERATURE SHALL NOT DROP BELOW 55OF.

G. DISCHARGE AIR TEMPERATURE RESET

THERE ARE TO BE SEPARATE HEATING AND COOLING TEMPERATURE SET POINTS FOR THE SPACE. INITIAL SPACE TEMPERATURE SET POINTS ARE 70°F HEATING AND 74°F COOLING (ADJUSTABLE FROM THE AHU SCREEN). IF THE SPACE TEMPERATURE IS ABOVE COOLING SET POINT THE DISCHARGE AIR TEMPERATURE SET POINT IS TO BE 55°F. IF THE SPACE TEMPERATURE IS BELOW HEATING SET POINT THE DISCHARGE AIR TEMPERATURE IS TO BE 105°F. IF THE AVERAGE SPACE TEMPERATURE IS AT OR BETWEEN COOLING AND HEATING TEMPERATURE SET POINTS, THE DISCHARGE AIR TEMPERATURE SET POINT IS TO BE DETERMINED BASED ON A PID LOOP WITH A MINIMUM OF 55°F AND A MAXIMUM OF 105°F. THE PID LOOP SHOULD BE WRITTEN SUCH THAT WHEN THE SPACE TEMPERATURE IS 0.5°F OR MORE BELOW THE COOLING SET POINT THE COOLING VALVE IS CLOSED. SIMILARLY, WHEN THE SPACE TEMPERATURE IS 0.5°F OR MORE ABOVE THE HEATING SET POINT THE HEATING VALVE SHOULD BE CLOSED. DISPLAY THE DAT SETPOINT AND ACTUAL.

H. DEHUMIDIFICATION CONTROL

DEHUMIDIFICATION CONTROL OVERRIDES DISCHARGE AIR TEMPERATURE RESET. IF THE RETURN AIR RELATIVE HUMIDITY IS ABOVE 61%, BUMP DISCHARGE AIR TEMPERATURE SET POINT DOWN 1°F EVERY 10 MINUTES UNTIL RELATIVE HUMIDITY REDUCES TO 58% OR LOWER. IF THE SPACE TEMPERATURE DROPS TO MORE THAN 2°F BELOW THE SPACE COOLING SET POINT (THIS WOULD MEAN REHEAT WAS NOT AVAILABLE), BUMP COOLING COIL LEAVING AIR TEMPERATURE BACK UP 1°F EVERY 10 MINUTES UNTIL THE SPACE REACHES 2°F BELOW COOLING SET POINT. OR IF RELATIVE HUMIDITY HAS REACHED 58% OR LOWER BUMP THE DISCHARGE AIR TEMPERATURE SET POINT BACK UP AT 1 DEGREE PER 10 MINUTES UNTIL IT MATCHES THE PID CALCULATED DISCHARGE AIR TEMPERATURE SET POINT. AT THAT POINT NORMAL SINGLE ZONE VAV DISCHARGE AIR TEMPERATURE RESET CONTROL STRATEGY IS RESUMED.

WHILE DEHUMIDIFICATION CONTROL IS OVERRIDING THE DAT LOWER THE REHEAT COIL IS TO BE USED TO REHEAT TO THE CALCULATED SETPOINT.

I. SUPPLY FAN
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES.

THE SUPPLY FAN ARRAY, EQUIPPED WITH A VARIABLE SPEED DRIVES, SHALL RUN AT THE MINIMUM SPEED OF 50% (ADJ.) OF THE DESIGN SPEED, EXCEPT DURING THE FOLLOWING CONDITIONS WHEN THE SPEED SHALL BE INCREASED:

1. WHEN SPACE COOLING OR HEATING SET POINT CANNOT BE SATISFIED BY RESETTING DISCHARGE AIR TEMPERATURE (I.E., WHEN THE DISCHARGE AIR TEMPERATURE HAS REACHED ITS MINIMUM FOR COOLING OR ITS MAXIMUM FOR HEATING). WHEN THE MAXIMUM HEATING OR MINIMUM COOLING DISCHARGE AIR TEMPERATURE SET POINT HAS BEEN REACHED, INCREASE THE FAN SPEED IF THE SPACE IS BELOW HEATING SET POINT OR ABOVE COOLING SET POINT. RESET FAN SPEED TO THE FOLLOWING SCHEDULE: IF IN DEADBAND OR WITHIN 0.5°F FROM SET POINT, RUN FAN AT MIN SPEED (50%). USING A LINEAR RESET SCHEDULE INCREASE FAN SPEED TO 100% AT 1.5°F FROM SETPOINT.

2. DURING ECONOMIZER OPERATION WHEN THE SPACE CALLS FOR FURTHER COOLING AND THE OA DAMPER IS AT THE MAXIMUM ALLOWED OPEN POSITION.

3. IF THE UNIT STARTS TO MAINTAIN UNOCCUPIED SPACE CONDITIONS AND DURING MORNING WARM UP/COOL DOWN, OPERATE FAN AT 90% OF MAXIMUM CFM WITH SYSTEM HEAT OR COOLING VALVE AT THE MAXIMUM OR MINIMUM ALLOWED DISCHARGE AIR TEMPERATURE.

SEQUENCE FOR AHU-B3

A. AHU-B3 IS A CONSTANT VOLUME SPLIT HEAT PUMP SYSTEM. THE SYSTEM IS COMPRISED OF THE OUTDOOR CONDENSING UNIT (COMPRESSOR, FAN, AND COIL), AND THE INDOOR AIR HANDLING UNIT AIR FILTER, COOLING/HEATING DX COIL, AND SUPPLY AIR FAN.

B. PROVIDE CONTROLLING FUTURE SPLIT SYSTEM HEAT PUMPS HAVING TWO STAGES OF HEATING AND COOLING,

C. SYSTEM UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE SYSTEM INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE SYSTEM SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

D. EMERGENCY SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL FROM THE FIRE ALARM.

E. SYSTEM OPTIMAL START:
THE SYSTEM SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE, ZONE TEMPERATURES AND PRIOR HISTORY.

F. SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

G. HEAT/COOL CHANGEOVER:
AUTOMATIC HEAT/COOL CHANGEOVER SHALL BE ACHIEVED BY CONTROLLING THE REVERSING VALVE ACCORDING TO THE SPACE TEMPERATURE.

H. COOLING CONTROL:
UPON A RISE IN SPACE TEMPERATURE ABOVE THE ACTIVE COOLING SETPOINT FOR 15 SECONDS, THE COMPRESSOR SHALL START AND THE REVERSING VALVE SHALL BE ENERGIZED. WHEN THE SPACE TEMPERATURE FALLS 1˚F BELOW THE ACTIVE COOLING SETPOINT FOR 15 SECONDS, THE COMPRESSOR SHALL STOP. THE COMPRESSOR OUTPUT SHALL HAVE A 5-MINUTE DELAY OFF. THE COOLING CYCLE SHALL BE DISABLED IF THE FAN PROOF OPTION IS ENABLED AND THE FAN PROOF IS NOT PRESENT.

THE COOLING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
- AND THE ECONOMIZER IS DISABLED OR FULLY OPEN.
- AND THE SUPPLY FAN STATUS IS ON.

I. HEATING CONTROL:
UPON A FALL IN SPACE TEMPERATURE BELOW THE ACTIVE HEATING SETPOINT FOR 15 SECONDS, THE COMPRESSOR SHALL START AND THE REVERSING VALVE SHALL NOT ENERGIZE. IF THE SPACE TEMPERATURE CONTINUES TO FALL TO 1˚F BELOW THE ACTIVE HEATING SETPOINT FOR 15 SECONDS, THE AUXILIARY ELECTRIC HEAT SHALL START. WHEN THE SPACE TEMPERATURE RISES ABOVE THE ACTIVE HEATING SETPOINT FOR 15 SECONDS, THE AUXILIARY HEAT SHALL STOP. WHEN THE SPACE TEMPERATURE RISES TO 1˚F ABOVE THE ACTIVE HEATING SETPOINT FOR 15 SECONDS, THE COMPRESSOR SHALL STOP AND THE REVERSING VALVE SHALL BE RETURNED TO THE NORMAL POSITION. DURING THE HEAT PUMP HEATING CYCLE, THE UNIT'S ON-BOARD CONTROLS SHALL CONTROL THE DEFROST CYCLE. THE COMPRESSOR OUTPUT SHALL HAVE A 5-MINUTE DELAY OFF. THE HEATING CYCLE SHALL BE DISABLED IF THE FAN PROOF OPTION IS ENABLED AND THE FAN PROOF IS NOT PRESENT.

J. THE HEATING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 60°F (ADJ.).
- AND THE SPACE TEMPERATURE IS BELOW SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.

K. SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

L. SPACE AIR HUMIDITY:
- THE CONTROLLER SHALL MONITOR THE SPACE AIR HUMIDITY.

VAV-REHEAT BOXES

A. THE VAV BOX DAMPER SHALL MODULATE TO CONTROL COOLING AIR FLOW. IF THE AHU IS IN COOLING, SUPPLY AIR BELOW 68F, MODULATE THE DAMPER CLOSED IF THE SPACE IS BELOW THE COOLING SETPOINT TO THE DESIGN MINIMUM. MODULATE THE DAMPER OPEN IF ABOVE THE COOLING SETPOINT UP TO THE DESIGN MAXIMUM CFM. IF THE AHU IS IN HEATING, SUPPLY AIR ABOVE 72F, DAMPER OPERATION IS REVERSED. IF THE SPACE TEMPERATURE IS ABOVE THE HEATING SETPOINT MODULATE THE DAMPER CLOSED TO THE MINIMUM CFM. IF THE SPACE TEMPERATURE IS BELOW HEATING SETPOINT THE VAV DAMPER SHALL BE MODULATED TOWARD THE OPEN POSITION UP TO MAXIMUM HEATING CFM. IF THE SPACE REQUIRES ADDITIONAL HEATING, DROPS TO 0.5°F (ADJUSTABLE) BELOW THE HEATING SETPOINT, THE HEAT COIL SHALL BE OPERATED TO REHEAT THE AIR. THIS HEATING SEQUENCE SHALL REMAIN IN EFFECT UNTIL THE SPACE TEMPERATURE IS 0.5°F (ADJUSTABLE) ABOVE THE HEATING SETPOINT. WHILE IN HEATING THE FAN SHALL BE OPERATED FOR ALL FAN POWERED BOXES. THE HEATING MINIUM FOR THE TWO MEDIA UNIT BOXES IN 75%.

B. THE CLASSROOM SPACE TEMPERATURE SENSOR WILL INCLUDE A CO2 SENSOR. IF THE SENSOR IS BELOW SETPOINT THE MINIMUM AIR FLOW RATE CAN BE REDUCED TO ½ OF DESIGN MINIMUM. THIS MAY AVOID REHEAT IN UNOCCUPIED CLASSROOMS WHEN THE AHU DISCHARGE IS 55F.

C. SEPARATE HEATING AND COOLING SETPOINTS MUST BE SPECIFIED (INITIALLY 74°F FOR COOLING AND 70°F FOR HEATING). THERMOSTATS WILL HAVE ADJUSTMENT CAPABILITY OF PLUS OR MINUS 2°F, BUT A DEADBAND OF AT LEAST 4°F MUST BE MAINTAINED BETWEEN THE HEATING AND COOLING SETPOINTS AT ALL TIMES. IF THE AHU SUPPLY AIR IS BETWEEN 68F AND 72F VAV BOXES ARE TO SUPPLY 50% OF DESIGN CFM.

D. IF THE SPACE IS SCHEDULED TO BE UNOCCUPIED, BUT THE AHU IS STILL IN THE OCCUPIED MODE, THE VAV DAMPER SHALL CLOSE 100%. THIS IS OVERRIDDEN IF THE CFM TOTAL IS BELOW MIN ON THE AHU.

EXHAUST FANS

A. NEW EXHAUSTS B1 AND C2 SHALL BE CONTROLLED BY THE DDC SYSTEM TO COME ON DURING THE OCCUPIED PERIOD, OFF DURING THE UNOCCUPIED PERIOD.

ENERGY RECOVERY VENTILATOR (ERV)

A. THE ERV SUPPLY AND EXHAUST FANS SHALL OPERATE DURING THE OCCUPIED PERIOD, AND BE OFF DURING THE UNOCCUPIED PERIOD. ADJUST THE VSD TO DELIVER THE DESIGN OA AND EXHAUST RATE. ERV-A PROVIDES BATHROOM EXHAUST AND PRECONDITIONED OUTSIDE AIR TO THE PLENUM. THE SUPPLY AIR FLOW RATE WILL VARY DEPENDING ON THE AVERAGE CO2 ENTERING THE AHU. IF THE LEVEL IS ABOVE SETPOINT MODULATE THE VSD SPEED UP TO 100%. MODULATE THE FAN SPEED TOWARD 60% IF THE SPACE IS BELOW SETPOINT. INITIAL SETPOINT 900 PPM. PROVIDE A "LIGHTLY OCCUPIED MODE" AVAILABLE ON THE SCREEN WHERE THE CFM IS 1/3 DESIGN..

B. ERV-B PROVIDES A COMBINATION OF BATHROOM EXHAUST AND RELIEF AIR WHERE ENERGY IS RECOVERED. MODULATE THE DAMPER IN THE RETURN DUCT TO MAINTAIN THE REQUIRED NEGATIVE PRESSURE FOR BATHROOM EXHAUST. THE SUPPLY AIR FLOW RATE WILL VARY DEPENDING ON THE AVERAGE CO2 ENTERING THE AHU. IF THE LEVEL IS ABOVE SETPOINT MODULATE THE VSD SPEED UP TO 100%. MODULATE THE FAN SPEED TOWARD 60% IF THE SPACE IS BELOW SETPOINT. INTITIAL SETPOINT 900 PPM. AS THE FANS SLOW DOWN THE DAMPER IN THE RETURN AIR DUCT CONNECTION TO THE ERV EXHAUST WILL MODULATE CLOSED TO MAINTAIN THE REQUIRED NEGATIVE PRESSURE. PROVIDE A "LIGHTLY OCCUPIED MODE" AVAILABLE ON THE SCREEN WHERE THE CFM IS 1/3 DESIGN.

THE HEAT WHEEL WILL BE OFF DURING ECONOMIZING.

VRF

A. THE VRF SYSTEM WILL COME WITH ITS OWN CONTROL SYSTEM TO BE SET UP TO RUN IN THE SAME OCCUPIED AND UNOCCUPIED TIMES AND TEMPERATURE SETPOINTS AS FOR OTHER SPACES. DO NOT INITIALLY CONNECT THE SYSTEM BY BACNET FOR THE FIRST 6 MONTHS OF OPERATION. AFTER CONFIRMATION THE VRF SYSTEM IS WORKING CORRECTLY CONNECT THE BACNET COMMUNICATION TO ALLOW MONITORING OF THE VRF SYSTEM AND SPACE TEMPERATURE FOR AREAS SERVED.

B. THE BUILDING DDC SYSTEM IS TO PROVIDE DISCHARGE AIR TEMPERATURE AND RETURN AIR TEMPERATURE MONITORING OF THE TWO DUCTED VRF UNITS SERVING THE OFFICES.

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PLEASANT GROVE ELEMENTARY SCHOOL BOND PROJECT RENOVATIONS
ALAMANCE BURLINGTON SCHOOL SYSTEM
2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

MECHANICAL CONTROLS

Revision		
ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021
SHEET NUMBER	

M-600B

7/1/2021 6:57:17 AM

FAN SCHEDULE

MARK	SERVES / LOCATION	MANUF.	DESC.	MODEL	FLOW	ESP	DRIVE	MOTOR POWER (hp)	VOLTS / FREQ / Ph	NOTES
EF-B1	STO. 35 and T.R. 36 / ABOVE CEILING	GREENHECK	INLINE	SQ-70-VG	125 CFM	0.40 in-wg	DIRECT	1/15	115 / 60 / 1	1, 2
EF-C2	CUST 47 and T.R. 49 / ABOVE CEILING	GREENHECK	INLINE	SQ-70-VG	125 CFM	0.40 in-wg	DIRECT	1/15	115 / 60 / 1	1, 2
RF-B1	AHU-B1 AND AHU-B2 / COAL RM. B-3	GREENHECK	INLINE	SQ-160-VG	4000 CFM	0.75 in-wg	DIRECT	2	480 / 60 / 3	1

NOTES:
1. APPROVED EQUALS BY CARNES, PENN BARRY, OR TWIN CITY FAN.
2. TERMINATE IN 6" ROUND WALL HOOD

AIR TERMINAL SCHEDULE

MARK	MANUF.	MODEL	TYPE, MATERIAL	FLOW	FACE SIZE, NECK SIZE	USE	NOTES
EA	PRICE	80	CEILING, ALUMINUM	250 CFM	24 x 24 Face, 12 x 12 Connection	Exhaust Air	
EB	PRICE	80	CEILING, ALUMINUM	140 CFM	12 x 12 Face, 10 x 10 Connection	Exhaust Air	
RA	PRICE	PDR	WALL, ALUMINUM	750 CFM	24 x 24 Face, 22 x 22 Connection	Return Air	
RB	PRICE	630	WALL, ALUMINUM	800 CFM	24 x 24 Connection	Return Air	
RC	PRICE	630	WALL, ALUMINUM	3500 CFM	48 x 24 Connection	Return Air	
RD	PRICE	630	WALL, ALUMINUM	800 CFM	24 x 16 Connection	Return Air	
RE	PRICE	630	WALL, ALUMINUM	900 CFM	24 x 12 Connection	Return Air	
RF	PRICE	630	WALL, ALUMINUM	80 CFM	6 x 4 Connection	Return Air	
RG	PRICE	93	WALL, STEEL	3200 CFM	36 x 30 Connection	Return Air	
RI	PRICE	93	WALL, STEEL	1500 CFM	22 x 22 Connection	Return Air	
SA	PRICE	620	WALL, ALUMINUM	500 CFM	16 x 8 Connection	Supply Air	
SA	PRICE	620	WALL, ALUMINUM	1000 CFM	24 x 12 Connection	Supply Air	
SB	PRICE	PDS	CEILING, ALUMINUM	375 CFM	24 x 24 Face, 12Ø Connection	Supply Air	
SC	PRICE	620	WALL, ALUMINUM	275 CFM	10 x 8 Connection	Supply Air	
SD	PRICE	620	WALL, ALUMINUM	500 CFM	12 x 8 Connection	Supply Air	
SE	PRICE	620	WALL, ALUMINUM	100 CFM	6 x 4 Connection	Supply Air	
SF	PRICE	620	WALL, ALUMINUM	1333 CFM	26 x 16 Connection	Supply Air	

NOTES:
1. INTEGRATED FIRE DAMPER
2. TERMINATE IN 6" ROUND WALL HOOD

LOUVER SCHEDULE

MARK	LOCATION	SERVICE	LOUVER WIDTH	LOUVER HEIGHT	CFM	MANU F.	MODEL	MATERIAL
L-1	GYM 39	INTAKE	4' - 6"	3' - 6"		Ruskin	ELF375DX	Aluminum
L-2	COAL RM. 54	INTAKE	6' - 2"	2' - 8"		Ruskin	ELF375DX	Aluminum
L-3	COAL RM. 54	RELIEF	6' - 2"	2' - 8"		Ruskin	ELF375DX	Aluminum
L-4	GYM 39	RELIEF	8' - 0"	2' - 8"		Ruskin	ELF375DX	Aluminum
L-5	PRINCIPAL'S OFFICE	INTAKE	4' - 0"	1' - 4"	250 CFM	Ruskin	ELF375DX	Aluminum

NOTES:
1. FURNISH LOUVERS WITH FACTORY APPLIED BAKED ON PRIMER, FINISH PAINT SHALL MATCH BRICKS. SUBMIT COLOR SELECTIONS FOR OWNER'S APPROVAL.
2. MANUFACTURER: RUSKIN OR REFER TO SPECIFICATIONS FOR OTHER ACCEPTABLE MANUFACTURERS.
3. INSTALLATION OF LOUVERS SHALL BE BY GENERAL CONTRACTOR (GC).

VARIABLE AIR VOLUME BOX SCHEDULE

	MARK	Type	MODEL *	COOLING CFM MAX	COOLING CFM MIN**	HEATING CFM	ELEC REHEAT (KW @ 460 /3)	INLET SIZE (IN)	NOTES
									-
FAN POWERED VAV (FPB)	A1-1	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	A1-2	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	A1-3	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	A1-4	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
FAN POWERED VAV (FPB)	A2-1	PRICE	FDV5-3010	1,000	300	1,000	4.0	10	FAN
	A2-2	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	A2-3	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	A2-4	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
SINGLE DUCT VAV	A3-1	PRICE	SDV	1,650	545	1,000	6.0	12	-
	A3-2	PRICE	SDV	800	264	800	6.0	10	-
FAN POWERED VAV (FPB)	B1-1	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B1-2	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B1-3	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B1-4	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B1-5	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
FAN POWERED VAV (FPB)	B-2-1	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B2-2	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B2-3	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B2-4	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B2-5	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B2-6	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN
	B2-7	PRICE	FDV5-3010	1,000	300	1,000	3.0	10	FAN

* BASIS OF DESIGN, APPROVED EQUAL BY TRANE OR CARRIER
**CLASSROOM REDUCED TO 350 if CO2 sensor is satified
1. FOR FAN POWERED BOXES PROVIDE LISTED CFM AT 0.5" ESP

VRF SPLIT SYSTEM A SCHEDULE

INDOOR AIR HANDLING UNIT										OUTDOOR CONDENSING UNIT									
MARK	MANUF. *	MODEL *	SERVICE	NOMINAL CFM	ESP (IN)	COOLING (MBH) TOTAL	COOLING (MBH) SENS.	HEATING (MBH)	VOLTS / PHASE	NOTES	MARK	MANUF. *	MODEL *	COOLING (MBH)	HEATING (MBH)	REFRIG.	MCA	MOCP	VOLTS / PHASE	NOTES
FCU-A1	DAIKIN	FXZQ09TAVJU	ANTE A-14	300	-	9.5	6.6	10.5	208 / 1	1	CU-A3	DAIKIN	RXYQ120TAYDA	114	129	R410A	20.6	25	460 / 3	1
FCU-A2	DAIKIN	FXZQ12TAVJU	CORRIDOR A-9	350	-	12.0	7.8	13.5	208 / 1											
FCU-A3	DAIKIN	FXZQ09TAVJU	OFFICE A-19	300	-	9.5	6.6	10.5	208 / 1											
FCU-A4	DAIKIN	FXZQ09TAVJU	OFFICE A-20	300	-	9.5	6.6	10.5	208 / 1											
FCU-A5	DAIKIN	FXZQ12TAVJU	CORRIDOR 1C	350	-	12.0	7.8	13.5	208 / 1											
FCU-A6	DAIKIN	FXSQ24TAVJU	LOUNGE A-16	740	0.55	24.0	17.1	27.0	208 / 1											
FCU-B8	DAIKIN	FXZQ12TAVJU	CORRIDOR 1B	350	-	12.0	7.8	13.5	208 / 1											

* BASIS OF DESIGN, COOLING RATED AT 95° F OUTSIDE AIR, HEATING RATED AT 47° F OUTSIDE AIR
1. MANUFACTURER TO PROVIDE ANY REFRIGERANT PIPING SPECIALTIES, WIRED WALL MOUNTED THERMOSTATS, AND THE I TOUCH MANAGER

VRF SPLIT SYSTEM B SCHEDULE

INDOOR AIR HANDLING UNIT										OUTDOOR CONDENSING UNIT									
MARK	MANUF. *	MODEL *	SERVICE	NOMINAL CFM	ESP (IN)	COOLING (MBH) TOTAL	COOLING (MBH) SENS.	HEATING (MBH)	VOLTS / PHASE	NOTES	MARK	MANUF. *	MODEL *	COOLING (MBH)	HEATING (MBH)	REFRIG.	MCA	MOCP	VOLTS / PHASE	NOTES
FCU-B1	DAIKIN	FXSQ24TAVJU	LOUNGE A-16	740	0.55	24.0	17.1	27.0	208 / 1	1	CU-B5	DAIKIN	RXYQ120TAYDA	114	129	R410A	20.6	25	460 / 3	1
FCU-B2	DAIKIN	FXSQ24TAVJU	LOUNGE A-16	740	0.55	24.0	17.1	27.0	208 / 1											
FCU-B3	DAIKIN	FXZQ12TAVJU	CORRIDOR 1B	350	-	12.0	7.8	13.5	208 / 1											
FCU-B4	DAIKIN	FXAQ09PVJU	NURSE 3	280	-	9.5	7.3	10.5	208 / 1											
FCU-B5	DAIKIN	FXAQ09PVJU	GC 4	280	-	9.5	7.3	10.5	208 / 1											
FCU-B6	DAIKIN	FXZQ09TAVJU	STORAGE 5	300	-	9.5	6.6	10.5	208 / 1											
FCU-B7	DAIKIN	FXAQ09PVJU	SPEECH 6	280	-	9.5	7.3	10.5	208 / 1											
FCU-B9	DAIKIN	FXZQ09TAVJU	FOYER 1A	300	-	9.5	6.6	10.5	208 / 1											

* BASIS OF DESIGN, COOLING RATED AT 95° F OUTSIDE AIR, HEATING RATED AT 47° F OUTSIDE AIR
1. MANUFACTURER TO PROVIDE ANY REFRIGERANT PIPING SPECIALTIES, WIRED WALL MOUNTED THERMOSTATS, AND THE I TOUCH MANAGER

VRF SPLIT SYSTEM C SCHEDULE

INDOOR AIR HANDLING UNIT										OUTDOOR CONDENSING UNIT									
MARK	MANUF. *	MODEL *	SERVICE	NOMINAL CFM	ESP (IN)	COOLING (MBH) TOTAL	COOLING (MBH) SENS.	HEATING (MBH)	VOLTS / PHASE	NOTES	MARK	MANUF. *	MODEL *	COOLING (MBH)	HEATING (MBH)	REFRIG.	MCA	MOCP	VOLTS / PHASE	NOTES
FCU-C1	DAIKIN	FXZQ12TAVJU	CAFETERIA 25	350	-	12.0	7.8	13.5	208 / 1	1	CU-C1	DAIKIN	RXYQ120TAYDA	114	129	R410A	20.6	25	460 / 3	1
FCU-C2	DAIKIN	FXZQ09TAVJU	CAFETERIA 25	300	-	9.5	6.6	10.5	208 / 1											
FCU-C3	DAIKIN	FXAQ18PVJU	KITCHEN 25A	500	-	18.0	13.7	20.0	208 / 1											
FCU-C4	DAIKIN	FXAQ09PVJU	OFFICE 26	280	-	9.5	7.3	10.5	208 / 1											
FCU-C5	DAIKIN	FXAQ09PVJU	KITCHEN STORAGE 27	280	-	9.5	7.3	10.5	208 / 1											
FCU-C6	DAIKIN	FXAQ09PVJU	TOILET 30	280	-	9.5	7.3	10.5	208 / 1											
FCU-C7	DAIKIN	FXAQ18PVJU	STORAGE B-4	500	-	18.0	13.7	20.0	208 / 1											

* BASIS OF DESIGN, COOLING RATED AT 95° F OUTSIDE AIR, HEATING RATED AT 47° F OUTSIDE AIR
1. MANUFACTURER TO PROVIDE ANY REFRIGERANT PIPING SPECIALTIES, WIRED WALL MOUNTED THERMOSTATS, AND THE I TOUCH MANAGER

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PLEASANT GROVE ELEMENTARY SCHOOL BOND PROJECT RENOVATIONS
ALAMANCE BURLINGTON SCHOOL SYSTEM
2847 PLEASANT GROVE UNION SCHOOL RD, BURLINGTON, NC 27217

MECHANICAL SCHEDULES

Revision		
ID	Date	Description

PROJECT NUMBER	19253
REVIEWED BY	IS
DESIGNED BY	MS
DRAWN BY	AN
DRAWING DATE	07/01/2021

SHEET NUMBER

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INDOOR DX AIR HANDLING UNIT AND VRF CONDENSER SCHEDULE

	INDOOR AIR HANDLING UNIT																	OUTDOOR CONDENSING UNIT											
	MARK	MANUF. *	MODEL *	SERVES	TYPE / DISCHARG	CFM	MIN OA	ESP (IN)	MIN HP	MCA	MOCP	VOLTS / PHASE	COOLING (MBH) TOTAL	COOLING (MBH) SENS.	EAT (F) DB	EAT (F) WB	AIR PD (IN)	SECTIONS	NOTES	MARK	MANUF. *	MODEL *	COOLING (MBH)	EAT (F)	HEATING (MBH)	EAT (F)	REF.	MCA	MOCP	VOLTS / PHASE	EER	NOTES
BELT	AHU-B1	DAIKIN	CAH012GDAC	AREA B CLASS ROOMS	HORIZ. SPLIT DX / TOP	5500	1200*	3.5	7.5	12.1	30	460 / 3	182	116	80	67	0.73	MIXING BOX, FLAT FILTERS, FAN	1, 2	CU-B1	DAIKIN	RXYQ168TAYDU	158	95	174	43	R-410A	26	35	460 / 3	10.9	3
BELT	AHU-B2	DAIKIN	CAH012GDAC	AREA B CLASS ROOMS	HORIZ. SPLIT DX / TOP	5500	1200*	3.5	7.5	12.1	30	460 / 3	182	116	80	67	0.69	MIXING BOX, FLAT FILTERS, FAN	1, 2	CU-B2	DAIKIN	RXYQ168TAYDU	158	95	174	43	R-410A	26	35	460 / 3	10.9	3

* BASIS OF DESIGN
1. PROVIDE PREMIMUM EFFICIENCY INVERTER DUTY RATED MOTOR
2. COIL TO BE DUAL CONNECTIONS AND OVERSIZED TO ALLOW FOR POSSIBLE FUTURE SECOND CONDENSER.
3. MANUFACTURER TO PROVIDE ANY REFRIGERANT PIPING SPECIALITIES INCLUDING EXPANSION VALVES & EXPANSION VALVE CONTROLLERS
* OUTDOOR AIR IS PROVIDED FROM ERV

ROOF MOUNTED DX AIR HANDLING UNIT AND VRF CONDENSER SCHEDULE

	OUTDOOR AIR HANDLING UNIT																		OUTDOOR CONDENSING UNIT											
	MARK	MANUF. *	MODEL *	SERVICE	TYPE / DISCHARGE	CFM	MIN OA	ESP (in)	MIN HP	MCA	MOCP	VOLTS / PHASE	COOLING (MBH) TOTAL	COOLING (MBH) SENSIBLE	EAT (F) DB	EAT (F) WB	AIR PD (IN)	SECTIONS	NOTES	MARK	MANUF. *	MODEL *	COOLING (MBH)	EAT (F)	HEATING (MBH)	EAT (F)	REFRIG.	MCA	MOCP	VOLTS / PHASE	EER	NOTES
BELT	AHU-A1	DAIKIN	OAH015GDAM	CLASS ROOMS A East	HORIZ. SPLIT DX / BOTTOM	3500	1000*	2	5	8.2	20	460 / 3	158.8	106.7	80	67	0.74	MIXING BOX, ANGLED FILTERS, FAN	1, 3	CU-A1	DAIKIN	RXYQ120TYDN	114	95	129	43	R-410A	20	25	460 / 3	12.3	2, 4
BELT	AHU-A2			CLASS ROOMS A West																CU-A2											

* OUTDOOR AIR IS PROVIDED FROM ERV
1. PROVIDE PREMIMUM EFFICIENCY INVERTER DUTY RATED MOTOR AND VFD
2. MANUFACTURER TO PROVIDE ANY REFRIGERANT PIPING SPECIALITIES INCLUDING EXPANSION VALVES & EXPANSION VALVE CONTROLLERS
3. PROVIDE 16" FACTORY INSULATED ROOF CURB, SECURE ROOF CURB TO STRUCTURE
4. PROVIDE 24" DEEP PIPING VESTIBULE.

VARIABLE VOLUME PACKAGED ROOF TOP UNIT SCHEDULE

	MARK	MANUF. *	MODEL *	AREA SERVED	TYPE	SUPPLY FAN TOTAL CFM	SUPPLY FAN MIN OA CFM	SUPPLY FAN ESP (in)	SUPPLY FAN MIN HP	DX COOLING COIL COOLING (MBH) TOTAL	DX COOLING COIL COOLING (MBH) SENSIBLE	DX COOLING COIL EA (F) DB	DX COOLING COIL EA (F) WB	DX COOLING COIL AMB. A (F)	DX COOLING COIL REFRIG.	HEATING (MBH) COP at 47F	HEATING (MBH) OUTPUT	ELECTRIC MCA	ELECTRIC MOCP	ELECTRIC VOLTS / PHASE	ELECTRIC IEER
DIRECT VAV	RTU-A3	DAIKIN	DPS007A	MEDIA CENTER	VARIABLE VOLUME PACKAGED HP/ BOTTOM DISHARGE	3,000	500	1.5	4	84.1	74.5	75	62	95	R410A	3.6	78	16.4	20	460 / 3	19.8

* BASIS OF DESIGN, APPROVED EQUAL BY DAIKIN OR CARRIER
1. PROVIDE 16" FACTORY INSULATED SLOPED ROOF CURB, SECURE UNIT TO CURB
2. PROVIDE 2" MERV 13 FILTERS
3. PROVIDE SERVICE DISCONNECT
4. PROVIDE BACNET CONTROL INTERFACE FOR DDC CONTROL SYSTEM

SPLIT DX AIR HANDLING UNIT AND CONDENSER SCHEDULE

	AIR HANDLING UNIT												OUTDOOR CONDENSING UNIT											
	MARK	MANUF. *	MODEL *	SERVICE	TYPE / DISCHARGE	CFM	ESP (in)	MIN HP	MCA	MOCP	VOLTS / PHASE	COOLING (MBH) TOTAL	NOTES	MARK	MANUF. *	MODEL *	COOLING (MBH)	EAT (F)	HEATING (MBH)	EAT (F)	REFRIG.	MCA	MOCP	VOLTS / PHASE	EER	NOTES
BELT	AHU-B3	DAIKIN	DAT09044	GYM	VERT. SPLIT DX / TOP	3000	0.75	2	3.63	15	460 / 3	90	1,2	CU-B3	DAIKIN	DZ11TA0904	93	95	82	43	R-410A	18.5	30	460 / 3	11	1, 3

1. MANUFACTURER TO PROVIDE ANY REFRIGERANT PIPING SPECIALITIES.
2. 2 SPEED
3. 2 STAGE

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DRAWN BY	AN
DRAWING DATE	07/01/2021
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