LATHAN · McKEE
ARCHITECTS

300 CHASE PARK SOUTH • SUITE 200 • HOOVER, ALABAMA 35244
205-988-9112

ADDENDUM NO. 1
CLASSROOM ADDITION TO ELVIN HILL ELEMENTARY SCHOOL
Architect Job No. 25-34
December 2, 2025
DCM #2025854

BIDS DUE:
Tuesday, January 13, 2025, until
2:00 p.m., local time, held at
Shelby County Board of Education,
Facilities and Maintenance Building
125 Industrial Parkway
Columbiana, AL 35051

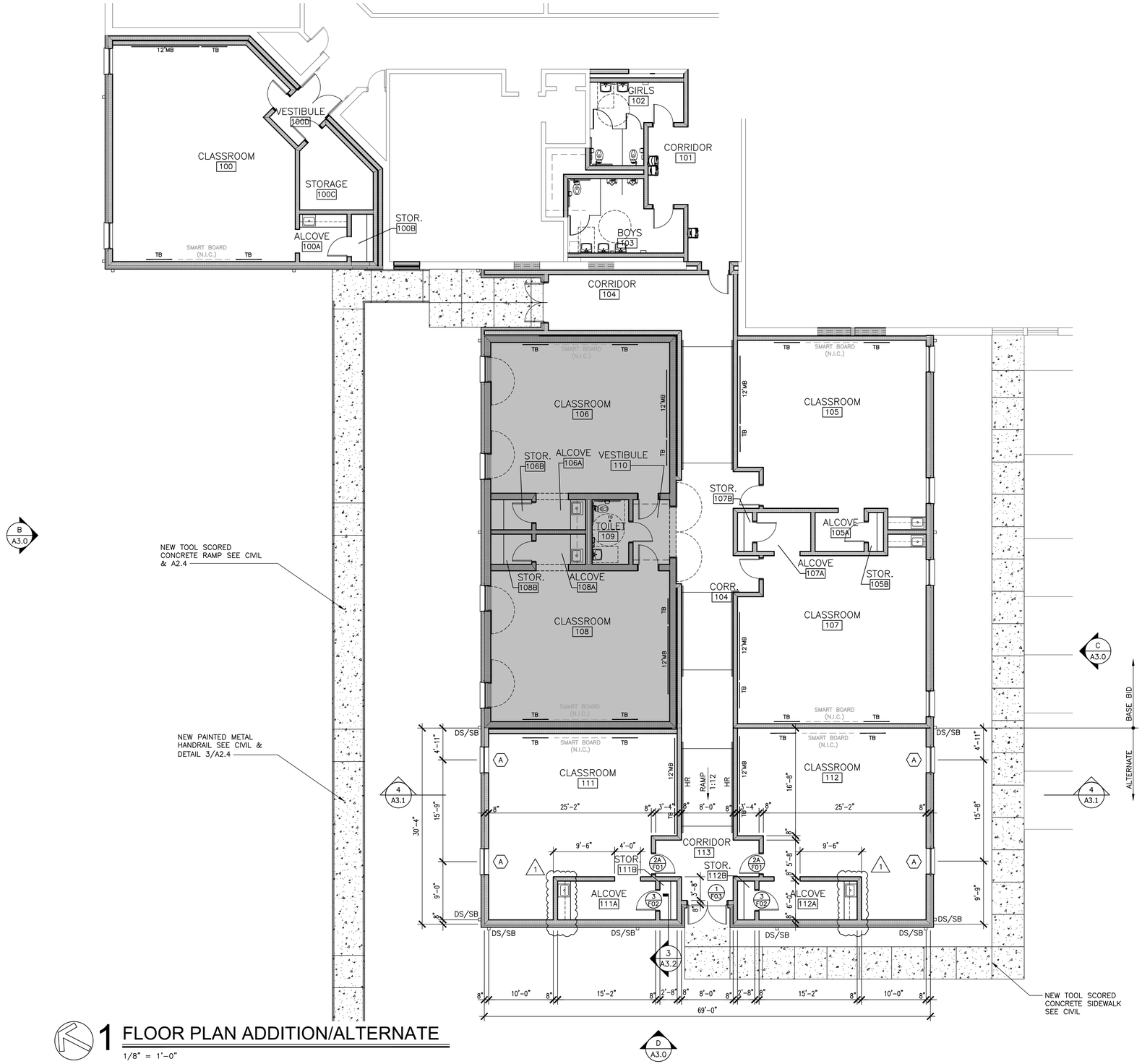
The Plans and Specifications are here by amended. The following supersedes all contrary and/or conflicting information and is made part of the contract documents.

GENERAL

1. **BIDS DUE:** The date of the bid has changed to **Tuesday, January 13, 2025**.

DRAWINGS

1. **Sheet A2.0.1** – Floor Plan Additional Alternate: See clouded for revisions.
2. **Sheet A10.0** – Plans and Details – Berm Removal & New Brick Facade: See clouded for revisions.
3. **Sheet M0.2** – Mechanical Schedules: See clouded for revisions.
4. **Sheet M0.5** – Mechanical Calculations and Controls: See clouded for revisions.
5. **Sheet M0.6** – Mechanical Controls: See clouded for revisions.



1 FLOOR PLAN ADDITION/ALTERNATE

1/8" = 1'-0"

GENERAL NOTES

- PROVIDE SLOPE FOR POSITIVE DRAINAGE IN AREAS WITH FLOOR DRAINAGE SYSTEM.
- EXTEND & KEY RATED WALLS TO BOTTOM OF RATED ASSEMBLY ABOVE -SEE LIFE SAFETY DRAWINGS FOR RATED WALL LOCATIONS. EXTEND ALL NON-RATED WALLS TO BOTTOM OF STRUCTURE ABOVE
- SEE ELEVATIONS AND ROOF PLAN FOR DOWNSPOUT LOCATIONS. PROVIDE DOWNSPOUT & SPLASHBLOCKS
- SEE CIVIL DRAWINGS FOR EXTENTS OF SITE RELATED WORK.
- PLAN DIMENSIONS ARE TYPICALLY SHOWN FACE TO FACE OF CMU AND FACE OF STUD WALL UNLESS NOTED OTHERWISE.
- SLOPE ALL SIDEWALKS AWAY FROM BUILDING AND BUILDING ENTRIES SEE CIVIL FOR SLOPE.
- BRICK POCKET SHALL BE 6" UNLESS NOTED OTHERWISE

SYMBOLS LEGEND

A300	ROOM NUMBER		DOOR TYPE
FE	SURFACE MOUNT FIRE EXTINGUISHER	1A / A	RATING / HARDWARE SYMBOL HOLD OPEN
F.D.	FLOOR DRAIN		
MB	MARKER BOARD	A / A.1	ELEV. MARK / SHEET NUMBER
OH	OPPOSITE HAND		
DS/BT/ SB	DOWNSPOUT / BOOT/SPLASHBLOCK	1 / A.1	SECT. MARK / SHEET NUMBER EXT. ELEVATION
A	WINDOW MARK		
1	STOREFRONT MARK	5 / A5.1	ELEV. MARK / SHEET NUMBER INT. ELEVATION
HR	HANDRAIL		
	LIGHTING - SEE ELECTRICAL		NEW DOOR AND SWING
CR	CARD READER	WA	WINDSTOP ANGLE

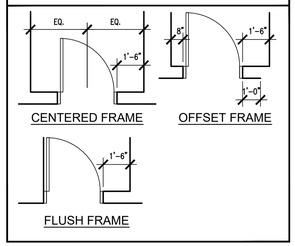
WALL TYPE LEGEND

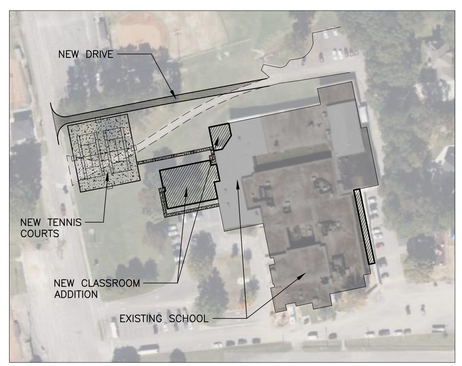
CMU PARTITION	CONCRETE MASONRY UNIT WALL. SEE PLAN FOR WIDTH
EXTERIOR WALL	NEW BRICK VENEER W/ AIR SPACE AND REINFORCED CMU W/ DAMPROOFING. PROVIDE WALL TIES @ 16" O.C.

DOOR AND WINDOW LEGEND

DOOR TYPE (1)	NO RATING
DOOR TYPE + A (1A)	20 MINUTE RATING
DOOR TYPE + D (1D)	90 MINUTE RATING
HMF	HOLLOW METAL FRAME
HMD	HOLLOW METAL DOOR
SCWD	SOLID CORE WOODEN DOOR

DOOR PLACEMENT SCHEDULE





2 KEYPLAN

LATHAN McKEE ARCHITECTS

CLASSROOM ADDITION TO
ELVIN HILL ELEMENTARY SCHOOL
201 WASHINGTON STREET, COLUMBIANA, ALABAMA 35051
SHELBY COUNTY BOARD OF EDUCATION

SHEET TITLE:
FLOOR PLAN ADDITION/ALTERNATE

STATE OF ALABAMA
No. 7007
RYAN D. VERNON
REGISTERED ARCHITECT

PROJ. MGR.: H. RASCO
DRAWN: JWW
DATE: NOV. 7, 2025
REVISIONS
1 11.20.25 ADD #1

JOB NO. 25-34
SHEET NO:
A2.0.1
4 OF 22

GENERAL NOTES

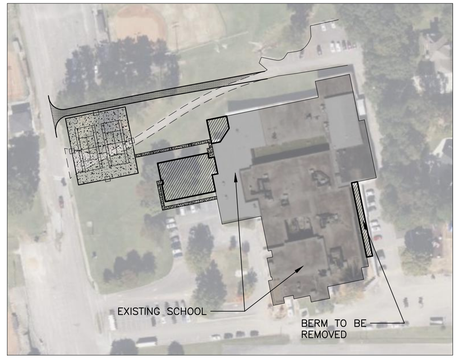
SOD AREAS DISTURBED BY REMOVAL OF BERMS.
PLAN DIMENSIONS ARE TYPICALLY SHOWN FACE TO FACE OF CMU AND FACE OF STUD WALL UNLESS NOTED OTHERWISE.
SLOPE ALL NEWLY EXPOSED DIRT AWAY FROM BUILDING AND BUILDING ENTRIES.
BRICK POCKET SHALL BE 6" UNLESS NOTED OTHERWISE

SYMBOLS LEGEND

1 / A.1 — SECT. MARK / SHEET NUMBER EXT. ELEVATION	A / A.1 — ELEV. MARK / SHEET NUMBER

WALL TYPE LEGEND

EXT. CMU PARTITION	EXISTING CONCRETE MASONRY UNIT WALL.
EXTERIOR WALL	NEW BRICK VENEER W/ AIR SPACE AND W/ DAMPROOFING. PROVIDE WALL TIES @ 16" O.C OVER EXISTING CMU



3 KEYPLAN

DEMOLITION NOTES

1. DEMOLITION SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING: ALL EXISTING FLOOR FINISHES, ALL CEILING SYSTEMS, GYPSUM BOARD SOFFITS, WALL & ASSOCIATED DOOR AS INDICATED, ALL PLUMBING FIXTURES & ACCESSORIES, MARKER BOARDS, TACK BOARDS, FOLDING PARTITION SYSTEMS, MILLWORK/CASEWORK, ETC.

   IT IS THE INTENT OF THESE DOCUMENTS FOR ALL DEMOLITION WORK AS REQUIRED TO PROVIDE NEW CONSTRUCTION TO BE INCLUDED IN BASE BID, WHETHER INDICATED OR NOT.

   DASHED LINES INDICATE GENERAL EXISTING CONSTRUCTION TO BE REMOVED. CONTACT ARCHITECT FOR DEMOLITION CLARIFICATION IF UNCLEAR ON WHICH ITEMS ARE TO BE REMOVED.

2. GENERAL CONTRACTOR SHALL REMOVE ALL ABANDONED ARCHITECTURAL, PLUMBING, MECHANICAL , ELECTRICAL CONSTRUCTION. PROTECT ITEMS TO BE RELOCATED OR DESIGNATED AS SALVAGED.

3. CONTRACTOR SHALL PROTECT EXISTING CONSTRUCTION & SYSTEMS TO REMAIN AND CORRECT ANY DAMAGE RESULTING FROM DEMOLITION WORK. PROTECT FIRE ALARM SYSTEM AND MAINTAIN OPERATIONAL. MAINTAIN EXISTING FIRE WALL FUNCTIONAL.

4. COORDINATE WITH FINISH LEGEND AND SCHEDULE TO DETERMINE EXISTING SURFACES TO RECEIVE NEW FINISHES REMOVE EXISTING FINISHES AS REQUIRED AND MAKE EXISTING SURFACES READY TO RECEIVE NEW FINISHES. PATCH AND/OR REPAIR EXISTING ADJACENT CONSTRUCTION TO REMAIN.

5. DISCONNECT & REMOVE ANY EXISTING ABANDONED FLOOR CONDUIT AND OUTLETS. PATCH AND REPAIR SLAB.

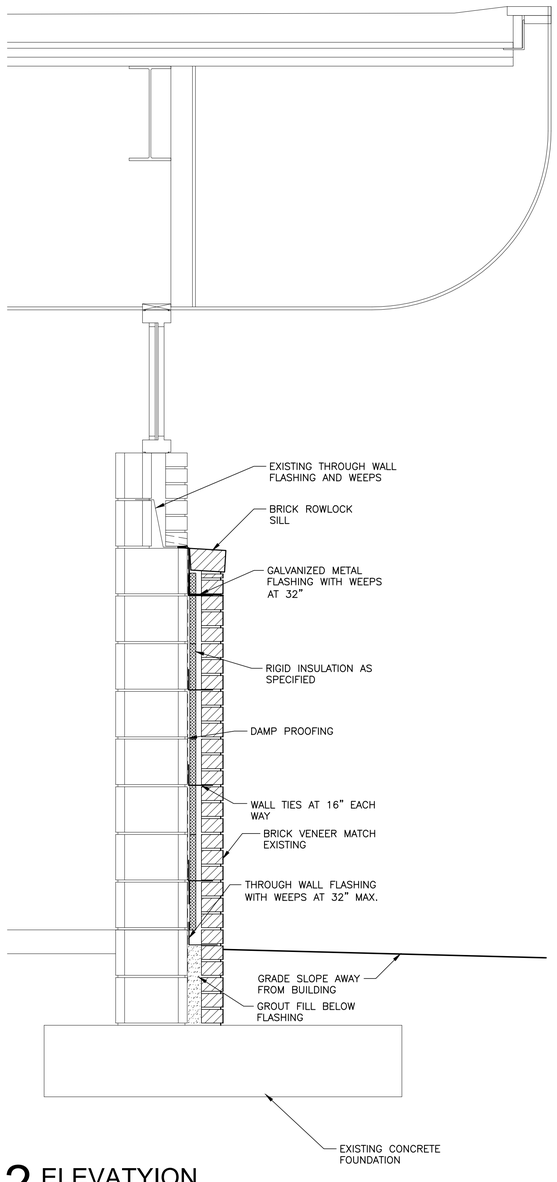
6. CONTACT AND COORDINATE W/ ARCHITECT & STRUCTURAL ENGINEER BEFORE REMOVING OR ALTERING ANY STRUCTURAL COMPONENTS.

   SEE RESPECTIVE CIVIL, STRUCTURAL, PLUMBING, HVAC AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

7. COORDINATE WITH THE OWNER BEFORE REMOVING ANY SALVAGEABLE MATERIALS & EQUIPMENT.

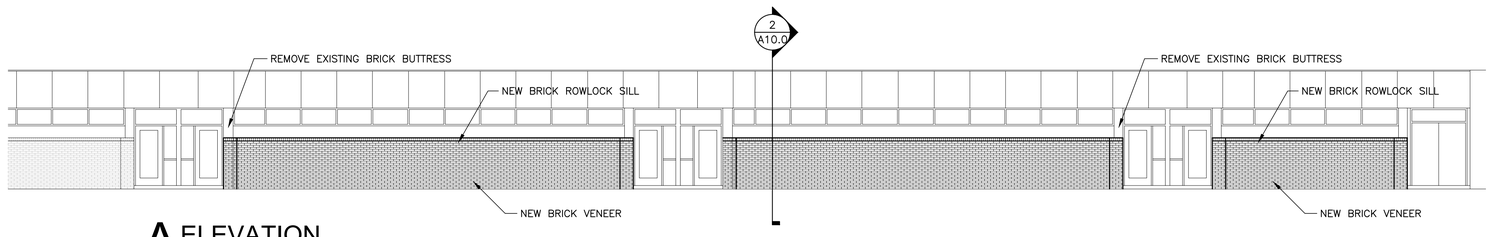
8. DEMOLITION WORK SHALL NOT CHANGE THE INTEGRITY OF EXISTING STRUCTURE, FIRE ALARM SYSTEM & FIRE RATED CONSTRUCTION TO REMAIN. ANY EXISTING FIRE RATED CONSTRUCTION TO REMAIN WHICH HAS BEEN AFFECTED BY DEMOLITION WORK MUST BE CORRECTED AND MADE TO MEET THE ORIGINAL RATING.

9. COORDINATE WITH ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, PLUMBING & ELECTRICAL DRAWINGS TO DETERMINE LIMITS OF DEMOLITION REQUIRED FOR NEW CONSTRUCTION.



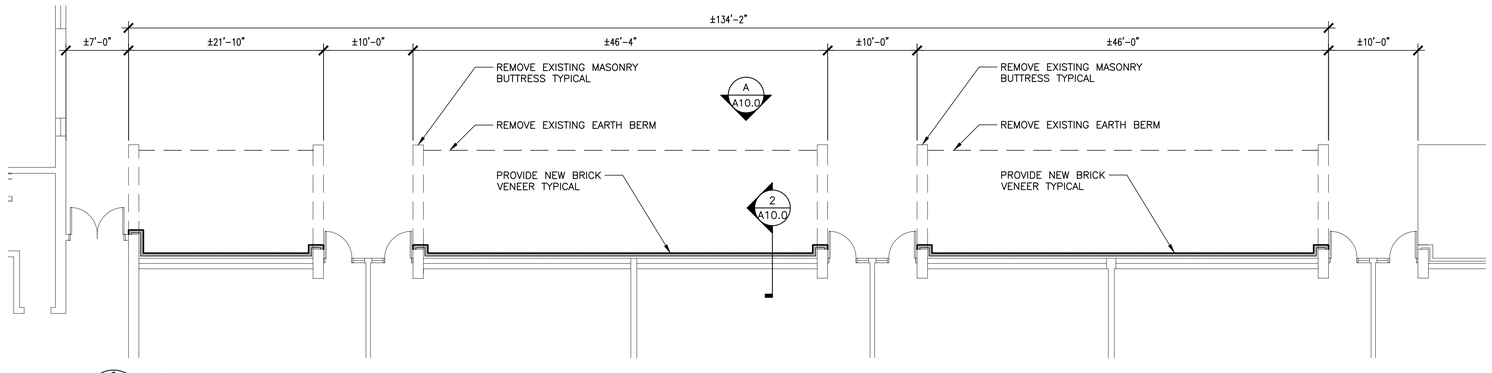
2 ELEVATYION

1" = 1'-0"



A ELEVATION

1/8" = 1'-0"



1 FLOOR PLAN

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CLASSROOM ADDITION TO
ELVIN HILL ELEMENTARY SCHOOL
201 WASHINGTON STREET, COLUMBIANA, ALABAMA 35051
SHELBY COUNTY BOARD OF EDUCATION

SHEET TITLE:
PLANS AND DETAILS - BERM REMOVAL & NEW BRICK FACADE

STATE OF ALABAMA
No. 7007
RYAN D. VERNON
REGISTERED ARCHITECT

PROJ. MGR.: H. RASCO
DRAWN: JWW
DATE: NOV. 7, 2025
REVISIONS

JOB NO. 25-34
SHEET NO:
A10.0
1 OF 1

0 1" 2"

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Suite 205
Hoover, AL 35244
(205) 988-2069
www.dewberry.com
Project Number :
50189343

LATHAN
McKEE
ARCHITECTS

FAN SCHEDULE

FAN TYPE:
1. CEILING MOUNTED EXHAUST FAN.
2. CENTRIFUGAL SQUARE INLINE - DIRECT DRIVE.

FAN ACCESSORIES:
1. BACKDRAFT DAMPER.
2. DISCONNECT SWITCH.
3. ALUMINUM CEILING GRILLE.
4. FAN SPEED CONTROLLER.
5. SPRING VIBRATION ISOLATORS.
6. FLEXIBLE CONNECTIONS.
7. BIRDSCREEN.
8. ROOF CURB
9. DIRECT DRIVE WITH FAN MOUNTED SOLID STATE SPEED CONTROL EC MOTOR W/ VFD FOR SOFT START.
10. WALL SWITCH FOR SF-1, SF-2, & EF-1 AND ALL ASSOCIATED CONTROLS TO BE ON EMERGENCY POWER.
11. PROVIDE TRANSFORMER REQUIRED TO TIE TO ROOM LIGHTS.

MARK	FAN TYPE	AIRFLOW (CFM)	E.S.P. (IN.-W.G.)	WHEEL SIZE (INCHES)	SOUND CRITERIA (SONES/dBA)	MOTOR RPM	MOTOR (HP / W)	ELECTRICAL			INTERLOCK WITH	WEIGHT (LBS)	ACCESSORIES	BASIS OF DESIGN	
								V	PH	HZ				MANUFACTURER	MODEL NUMBER
EF-1	1	70	0.75	8	4 (SONNES)	1060	40 W	120 V	1	60	LIGHTS/SHELTER SWITCH	25	1,2,3,4,5,10,11	COOK	GC-148
SF-1	2	485	0.75	8	13 (SONES)	1725	1/4 HP	120 V	1	60	SHELTER SWITCH	75	1,2,3,4,5,6,9,10	COOK	100SQN-B
SF-2	2	485	0.75	8	13 (SONES)	1725	1/4 HP	120 V	1	60	SHELTER SWITCH	75	1,2,3,4,5,6,9,10	COOK	100SQN-B

AIR PURIFICATION SCHEDULE

FLOW	MFG MODEL NO.	GPS QUANTITY	MINIMUM NEEDLE SPACING	V/Ø	MOUNTING LOCATION	MINIMUM ION DENSITY (IONS/CC)
CV	GPS-iRIB	1 PER UNIT	1 EVERY 3/4"	265	UNIT SERVED	40 MILLION PER 0.75"

NOTES:
1. BASIS OF DESIGN: GLOBAL PLASMA SOLUTIONS: APPROVED EQUALS BY PHENOMENAL AIRE, ACTIVE AIR, AIRGENICS AND BIOXGEN SUBJECT TO SPECIFICATION COMPLIANCE.
2. MOUNT GPS-IMOD TO AIR INLET SIDE OF COOLING COIL.
3. IF CONTRACTOR SUBSTITUTES BASIS OF DESIGN WITH ANOTHER MANUFACTURER, CONTRACTOR SHALL COORDINATE ALL ELECTRICAL AND MECHANICAL CHANGES.
4. BI-POLAR IONIZATION SYSTEMS REQUIRING PERISHABLE GLASS TUBES ARE NOT ACCEPTABLE.
5. ALL MFGS MUST PASS UL-867-2007 OZONE CHAMBER TESTING BY EITHER UL OR ETL.
6. PROVIDE STAND ALONE ION DETECTOR TO COMMUNICATE WITH THE BAS. SYSTEMS WITHOUT ION DETECTORS SHALL NOT BE ACCEPTABLE.
7. IONIZATION BAR TO HAVE A MINIMUM OF 1 NEEDLEPOINT EVERY 0.75" OF COIL WIDTH. SYSTEMS WITH NEEDLES FURTHER APART SHALL NOT BE ACCEPTABLE.
8. IONIZATION SYSTEMS WITH MULTIPLE ION MODULES MOUNTED TO A BAR SHALL NOT BE AN ACCEPTABLE SUBSTITUTE.
9. IONIZATION SYSTEMS THAT DO NOT USE EPOXY TO PROTECT THE ION CIRCUITRY SHALL NOT BE ACCEPTABLE.
10. IONIZATION OUTPUT SHALL BE A MINIMUM OF 40 MILLION IONS/CC FOR EVERY 0.75" OF COIL WIDTH.
11. BIPOLAR IONIZATION UNIT SHALL DE-ENERGIZE UPON SYSTEM SHUTDOWN.

PROVIDE FOR ALL TWHP UNITS

PACKAGED THRU-WALL AC UNIT

TYPE:
1. PACKAGED THRU-WALL HEAT PUMP WITH ELECTRIC HEAT.

NOTES:
IF ANOTHER APPROVED MANUFACTURER IS USED, THE MECHANICAL CONTRACTOR IS SOLELY RESPONSIBLE FOR COORDINATING ANY DEVIATIONS FROM THE SCHEDULED ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR. ALL DEVIATIONS SHALL BE IDENTIFIED ON THE PRODUCT SUBMITTAL DATA.

ACCESSORIES:
1. WALL SLEEVE - COORDINATE SLEEVE DEPTH WITH WALL CONDITIONS.
2. EXTRUDED ALUMINUM ARCH. GRILLE WITH ANODIZED ALUMINUM FINISH. (COORDINATE GRILLE STYLE AND FINISH WITH ARCHITECT PRIOR TO ORDERING.)
3. CONDENSATE DRAIN KIT.
4. SUB-BASE KIT.
5. POWER DISCONNECT SWITCH

MARK	TYPE	SUPPLY FAN AIRFLOW (CFM)	OUTSIDE AIR (CFM)	DX COOLING COIL CAPACITY TOTAL (MBH)	DX HEATING CAPACITY TOTAL (MBH)	ELEC HEAT (KW)	ELECTRICAL					EER	COP	DIMENSIONS (H x W x D)	WEIGHT (LBS.)	ACCESSORIES	QUANTITY BASE / ALTERNATE	BASIS OF DESIGN
							V	PH	HZ	MCA (A)	MOCP (A)							
TWHP-A	1	341	75 CFM	14.2	13.3	5	208 V	1	60	27.5	30	10.4	3.1	16"x42"x21"	150	1, 2, 3, 4, 5	6/10	FRIEDRICH

OUTDOOR HEAT PUMP (MINI-SPLIT SYSTEM) SCHEDULE

TYPE:
1. OUTDOOR HEAT PUMP

NOTES:
1. REFRIGERANT PIPING SHALL BE SIZED AND ROUTED PER MANUFACTURER'S RECOMMENDATIONS.
2. POWER TO INDOOR UNITS IS PROVIDED THRU OUTDOOR UNITS
3. REFRIGERANT CIRCUIT ACCESS PORTS LOCATED OUTDOORS SHALL BE FITTED WITH LOCKING-TYPE TAMPER-RESISTANT CAPS.
4. UNIT SHALL BE CAPABLE OF MINIMUM LINE LENGTH OF 65FT.

MARK	TYPE	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	ELECTRICAL						EFFICIENCY		WEIGHT (LBS)	BASIS OF DESIGN
				V	PH	HZ	MCA (A)	MOCP (A)	RECOMENDED FUSE SIZE (A)	SEER	HSPF		
OHP-1	1	30	32.6	208	1	60	22	37	25	21.9	10.3	170	MITSUBISHI
OHP-2	1	30	32.6	208	1	60	22	37	25	21.9	10.3	170	MITSUBISHI
OHP-3	1	30	32.6	208	1	60	22	37	25	21.9	10.3	170	MITSUBISHI
OHP-4	1	30	32.6	208	1	60	22	37	25	21.9	10.3	170	MITSUBISHI
OHP-5	1	9	12	208	1	60	13	22	15	21	11.8	170	MITSUBISHI
OHP-6	1	9	12	208	1	60	13	22	15	21	11.8	170	MITSUBISHI
OHP-7	1	30	32.6	208	1	60	22	37	25	21.9	10.3	170	MITSUBISHI
OHP-8	1	42	48	208	1	60	34	56	35	21	10.1	250	MITSUBISHI

INDOOR HEAT PUMP (MINI-SPLIT SYSTEM) SCHEDULE

TYPE:
1. INDOOR, WALL MOUNT
2. INDOOR, 2x2 CEILING CASSETTE
3. INDOOR, 33x33 CEILING CASSETTE

NOTES:
1. AIRFLOW RATED AT HIGH FAN SPEED.
2. POWER FOR INDOOR UNIT IS FED FROM OUTDOOR UNIT.
3. COOLING CAPACITY RATED AT 95°F.
4. HEATING CAPACITY RATED AT 47°F.

REFRIGERANT: R454B

ACCESSORIES:
1. 3-POLE DISCONNECT SWITCH.
2. HARD WIRED UNIT CONTROLLER.
3. FULL PORT BALL VALVES & SCHRADER VALVES WITH FLARED CONNECTIONS.
4. FIELD-INSTALLED CONDENSATE PUMP (120/1/60) - 1 GPH @ 33 FT. HD.
5. INTEGRAL CONDENSATE PUMP.
6. SUPPLY AIR DUCT OUTLET.

MARK	TYPE	AIRFLOW (CFM)	NOMINAL TONS	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	DIMENSIONS (IN.) (WxLxH)	ELECTRICAL				WEIGHT (LBS.)	ACCESSORIES	BASIS OF DESIGN
							V	PH	HZ	MCA (A)			
IHP-1	3	880	2.5	27	32.6	33"x33"x12"	208 V	1	60	1	75	1,2,3,5	MITSUBISHI
IHP-2	3	880	2.5	27	32.6	33"x33"x12"	208 V	1	60	1	75	1,2,3,5	MITSUBISHI
IHP-3	3	880	2.5	27	32.6	33"x33"x12"	208 V	1	60	1	75	1,2,3,5	MITSUBISHI
IHP-4	3	880	2.5	27	32.6	33"x33"x12"	208 V	1	60	1	75	1,2,3,5	MITSUBISHI
IHP-5	2	300	0.75	9	12	22"x22"x8"	208 V	1	60	1	50	1,2,3,5	MITSUBISHI
IHP-6	2	300	0.75	9	12	22"x22"x8"	208 V	1	60	1	50	1,2,3,5	MITSUBISHI
IHP-7	3	880	2.5	27	32.6	33"x33"x12"	208 V	1	60	1	75	1,2,3,5	MITSUBISHI
IHP-8	3	1200	3.5	42	48	33"x33"x12"	208 V	1	60	1	75	1,2,3,5	MITSUBISHI

ENERGY RECOVERY UNIT

TYPE:
DOWNFLOW PACKAGED, CONSTANT VOLUME, WITH DX COOLING COIL, ELECTRIC HEAT, HOT GAS RE-HEAT COIL, ENERGY RECOVERY WHEEL, AND MATCHED CONDENSER.

NOTES:
1. COOLING CAPACITY IS NET CAPACITY @ 95°F AMBIENT.
2. UNIT SHALL BE ASHRAE 90.1 - 2013 COMPLIANT.
3. CKT 1: SPP
4. CKT 2: ELECTRIC HEAT
5. UL LISTED

ACCESSORIES:
1. 2" THICK THROWAWAY FILTER, 30% EFFICIENT.
2. CONDENSER COIL GUARD.
3. DIRECT DRIVE SUPPLY W/ VFD AND EXHAUST FAN W/ VFD.
4. HEAD PRESSURE CONTROL TO 10°F AMBIENT.
5. HINGED ACCESS DOORS....
7. OSA INTAKE HOOD AND EXHAUST HOOD WITH AUTO DAMPERS.
8. MODULATING HOT GAS REHEAT COIL.
9. FACTORY ROOF CURB
10. MICROPROCESSOR CONTROLLER WITH BACNET INTERFACE. CONTROLLER SHALL BE CAPABLE OF PROVIDING SEQUENCES ON CONTROLS DRAWINGS.

MARK	SUPPLY FAN			EXHAUST FAN			WHEEL IN SUMMER			WHEEL IN WINTER			ELECTRICAL					ELECTRIC HEAT		DX COOLING COIL				ISMRE2	WEIGHT (LBS)	ACCESSORIES	BASIS OF DESIGN	
	CFM	"W.G. E.S.P.	HP	CFM	"W.G. E.S.P.	HP	OUTSIDE AIR EAT (DB/WB) °F	OUTSIDE AIR LAT (DB/WB) °F	EXHAUST ENTERING (DB/WB) °F	OUTSIDE AIR EAT (DB/WB) °F	OUTSIDE AIR LAT (DB/WB) °F	EXHAUST ENTERING (DB/WB) °F	V	PH	Hz	MCA CKT 1/ CKT 2	MOCP CKT 1/ CKT 2	KW	STAGES	LAT (DB/WB)	TOTAL (MBH)	SENS (MBH)	NOM. TONS				MANUFACTURER	MODEL
ERU-1	1525 (1)	1.1	1	1375 (1)	1.1	3/4	95/78	75/62.5	62.5/50.2	17/13.6	70/58	70/58	208	3	60	84.9	90	15.5	SCR	54.1/54.0	67.6	43.7	5.5	8.0	1800	1,2,3,4,5,6,7,8,9,10	VALENT	VXE-12-30 D-5J-1-A2

ENGINEERS
WADE STEWART
No. 24747
PROFESSIONAL
12-02-2025

CLASSROOM ADDITION TO
ELVIN HILL ELEMENTARY SCHOOL
201 WASHINGTON STREET, COLUMBIANA, ALABAMA 35051
SHELBY COUNTY BOARD OF EDUCATION

SHEET TITLE:
MECHANICAL SCHEDULES

PROJ. MGR.:	JWS
DRAWN:	JWS
DATE:	11-07-2025

REVISIONS

1	12/2/25 ADDENDUM #1

JOB NO. 25-34

SHEET NO:
M0.2

BASE BID

OSA CALCULATIONS

Room	Room Type	Rp	Pz	Ra	Az	Vbz	Ez	Voz	Provided OSA (IAQP)
		cfm / P	People	cfm/ft²	ft²	cfm		cfm	cfm
100 CLASSROOM	Classrooms (ages 9 plus)	10	31	0.12	893	417	0.80	521	170
109 CLASSROOM	Classrooms (ages 9 plus)	10	23	0.12	672	311	0.80	388	115
106 CLASSROOM	Classrooms (ages 9 plus)	10	23	0.12	665	310	0.80	387	115
108 CLASSROOM	Classrooms (ages 9 plus)	10	23	0.12	665	310	0.80	387	115
107 CLASSROOM	Classrooms (ages 9 plus)	10	26	0.12	748	350	0.80	437	180
105 CLASSROOM	Classrooms (ages 9 plus)	10	26	0.12	748	350	0.80	437	180
1103 BOYS TOILET	Toilets-public	0	0	0.00	177	0	0.80	0	0
102 GIRLS TOILET	Toilets-public	0	0	0.00	146	0	0.80	0	0
SHELTER TOILET	Toilets-public	0	0	0.00	60	0	0.80	0	50
104 CORRIDOR	Corridors	0	0	0.06	660	40	0.80	50	225
101 CORRIDOR	Corridors	0	0	0.06	330	20	0.80	25	375
					Total Required by ERU-1:			2,633	
					Total Provided by ERU-1:				1,525

EXHAUST AIR CALCULATIONS

# OF FIXTURES	# OF SHOWERS	EXHAUST RATE CFM/FT²	EXHAUST RATE CFM / FIXTURE	EXHAUST RATE CFM/ SHOWER	REQUIRED EXHAUST CFM	PROVIDED EXHAUST CFM
0	0	N/A	N/A	N/A	0	170
0	0	N/A	N/A	N/A	0	115
0	0	N/A	N/A	N/A	0	115
0	0	N/A	N/A	N/A	0	115
0	0	N/A	50	N/A	0	180
0	0	N/A	N/A	N/A	0	180
3	0	N/A	70	N/A	210	220
2	0	N/A	70	N/A	140	140
1	0	N/A	70	N/A	70	70
0	0	N/A	N/A	N/A	0	140
0	0	N/A	N/A	N/A	0	0
			Total Required Exhaust		420	
			Total Provided Exhaust			1445

ALTERNATE BID

OSA CALCULATIONS

Room	Room Type	Rp	Pz	Ra	Az	Vbz	Ez	Voz	Provided OSA (IAQP)
		cfm / P	People	cfm/ft²	ft²	cfm		cfm	cfm
100 CLASSROOM	Classrooms (ages 9 plus)	10	31	0.12	893	417	0.80	521	170
109 CLASSROOM	Classrooms (ages 9 plus)	10	23	0.12	672	311	0.80	388	115
106 CLASSROOM	Classrooms (ages 9 plus)	10	23	0.12	665	310	0.80	387	115
108 CLASSROOM	Classrooms (ages 9 plus)	10	23	0.12	665	310	0.80	387	115
107 CLASSROOM	Classrooms (ages 9 plus)	10	26	0.12	748	350	0.80	437	130
105 CLASSROOM	Classrooms (ages 9 plus)	10	26	0.12	748	350	0.80	437	130
110 CLASSROOM	Classrooms (ages 9 plus)	10	25	0.12	712	335	0.80	419	125
111 CLASSROOM	Classrooms (ages 9 plus)	10	25	0.12	712	335	0.80	419	125
1103 BOYS TOILET	Toilets-public	0	0	0.00	177	0	0.80	0	0
102 GIRLS TOILET	Toilets-public	0	0	0.00	146	0	0.80	0	0
SHELTER TOILET	Toilets-public	0	0	0.00	60	0	0.80	0	50
104 CORRIDOR	Corridors	0	0	0.06	660	40	0.80	50	100
101 CORRIDOR	Corridors	0	0	0.06	330	20	0.80	25	350
				Total Required by ERU-1:				3,472	
				Total Provided by ERU-1:					1,525

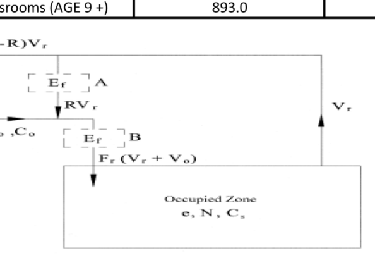
EXHAUST AIR CALCULATIONS

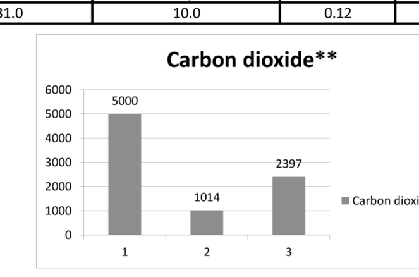
# OF FIXTURES	# OF SHOWERS	EXHAUST RATE CFM/FT²	EXHAUST RATE CFM / FIXTURE	EXHAUST RATE CFM/ SHOWER	REQUIRED EXHAUST CFM	PROVIDED EXHAUST CFM
0	0	N/A	N/A	N/A	0	170
0	0	N/A	N/A	N/A	0	115
0	0	N/A	N/A	N/A	0	115
0	0	N/A	N/A	N/A	0	115
0	0	N/A	50	N/A	0	130
0	0	N/A	N/A	N/A	0	130
0	0	N/A	N/A	N/A	0	125
0	0	N/A	N/A	N/A	0	125
3	0	N/A	70	N/A	210	220
2	0	N/A	70	N/A	140	140
1	0	N/A	70	N/A	70	70
0	0	N/A	N/A	N/A	0	0
0	0	N/A	N/A	N/A	0	0
			Total Required Exhaust		420	
			Total Provided Exhaust			1455

IAQP OSA CALCULATION - TYPICAL CLASSROOM

Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Az	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
TYPICAL CLASSROOM (893 SF)	Educational Facilities	Classrooms (AGE 9 +)	893.0	31.0	10.0	0.12	310	107	0.8	521 OA required per VRP

Zone Height (feet)	10.0
Desired Outside Air (Vo) IAQP	170
Supply Air (Vs)	682
Return Air (Vr)	682
Recirc. Flow Factor (R)	1.00
Ventilation Effectiveness (Ez)	1.0
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant





***OSHA, NIOSH & WHO most conservative values used
http://www.cdc.gov/niosh/npg/npgsyn-a.html
1 = ASHRAE & NIOSH C02 Limit
2 = C02 Level at Ventilation Rate OA Flow Rate
3 = C02 Level at IAQ Procedure OA Flow Rate
**Carbon dioxide has been provided for reference only for gathering demand control ventilation (DCV) setpoints. The National Research Council was commissioned by the US Navy to prove C02 is not a contaminant of concern when using air purification to control the other contaminants of concern, as found on submarines.

Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value (PPM)	Steady State Using the VRP* (Prescribed OA) Plasma Off	Steady State Using the IAQ Method (Reduced OA) Plasma On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate (PPM)	Filtration Effectiveness	Cognizant Authority***
Acetaldehyde	100.0	0.01111	0.00186	Yes	0.00032	50%	OSHA
Acetone	250.0	0.00152	0.00047	Yes	0.00433	50%	NIOSH
Ammonia	25.00	0.01017	0.00891	Yes	0.14210	50%	NIOSH
Benzene	1.0000	0.00251	0.00043	Yes	0.00015	50%	OSHA
2- Butanone (MEK)	200.0	0.00015	0.00007	Yes	0.00088	50%	NIOSH
Carbon dioxide**	5000	1014	2397	Yes	292	0%	NIOSH
Chloroform	2.0000	0.00011	0.00002	Yes	0.00003	50%	NIOSH
Dioxane	100.0	0.00000	0.00000	Yes	0.00000	50%	OSHA
Hydrogen Sulfide	10.0	0.00000	0.00000	Yes	0.00000	50%	NIOSH
Methane	NA	1.68094	1.68094	Yes	0.00000	0%	NA
Methanol	200.0	0.00000	0.00000	Yes	0.00000	0%	NIOSH
Methylene Chloride	25.0	0.00074	0.00016	Yes	0.00080	50%	OSHA
Propane	1000.0	0.00998	0.00998	Yes	0.00000	0%	NIOSH
Tetrachloroethane	5.0000	0.00000	0.00000	Yes	0.00000	50%	OSHA
Tetrachloroethylene	100.0000	0.00037	0.00006	Yes	0.00001	50%	OSHA
Toluene	100.0000	0.00532	0.00090	Yes	0.00021	50%	NIOSH
1,1,1 - Trichloroethane	350.0000	0.00076	0.00015	Yes	0.00038	50%	NIOSH
Xylene	100.0000	0.00230	0.00038	Yes	0.00000	50%	OSHA

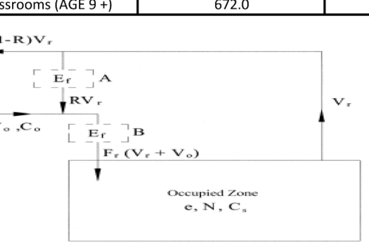
Building materials and furnishings assumed to have no VOCs and off-gassing is complete

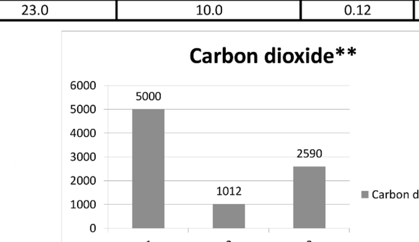
Is IAQ acceptable at reduced outside air levels? Yes

IAQP OSA CALCULATION - TYPICAL CLASSROOM

Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Az	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
TYPICAL CLASSROOM (672 SF) CR 106/108/109	Educational Facilities	Classrooms (AGE 9 +)	672.0	23.0	10.0	0.12	230	81	0.8	388 OA required per VRP

Zone Height (feet)	10.0
Desired Outside Air (Vo) IAQP	115
Supply Air (Vs)	682
Return Air (Vr)	682
Recirc. Flow Factor (R)	1.00
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant





***OSHA, NIOSH & WHO most conservative values used
http://www.cdc.gov/niosh/npg/npgsyn-a.html
1 = ASHRAE & NIOSH C02 Limit
2 = C02 Level at Ventilation Rate OA Flow Rate
3 = C02 Level at IAQ Procedure OA Flow Rate
**Carbon dioxide has been provided for reference only for gathering demand control ventilation (DCV) setpoints. The National Research Council was commissioned by the US Navy to prove C02 is not a contaminant of concern when using air purification to control the other contaminants of concern, as found on submarines.

Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value (PPM)	Steady State Using the VRP* (Prescribed OA) Plasma Off	Steady State Using the IAQ Method (Reduced OA) Plasma On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate (PPM)	Filtration Effectiveness	Cognizant Authority***
Acetaldehyde	100.0	0.01111	0.00142	Yes	0.00032	50%	OSHA
Acetone	250.0	0.00158	0.00043	Yes	0.00433	50%	NIOSH
Ammonia	25.00	0.01225	0.00918	Yes	0.14210	50%	NIOSH
Benzene	1.0000	0.00252	0.00033	Yes	0.00015	50%	OSHA
2- Butanone (MEK)	200.0	0.00017	0.00007	Yes	0.00088	50%	NIOSH
Carbon dioxide**	5000	1012	2590	Yes	292	0%	NIOSH
Chloroform	2.0000	0.00011	0.00001	Yes	0.00003	50%	NIOSH
Dioxane	100.0	0.00000	0.00000	Yes	0.00000	50%	OSHA
Hydrogen Sulfide	10.0	0.00000	0.00000	Yes	0.00000	50%	NIOSH
Methane	NA	1.68094	1.68094	Yes	0.00000	0%	NA
Methanol	200.0	0.00000	0.00000	Yes	0.00000	0%	NIOSH
Methylene Chloride	25.0	0.00075	0.00014	Yes	0.00080	50%	OSHA
Propane	1000.0	0.00998	0.00998	Yes	0.00000	0%	NIOSH
Tetrachloroethane	5.0000	0.00000	0.00000	Yes	0.00000	50%	OSHA
Tetrachloroethylene	100.0000	0.00037	0.00005	Yes	0.00001	50%	OSHA
Toluene	100.0000	0.00532	0.00068	Yes	0.00021	50%	NIOSH
1,1,1 - Trichloroethane	350.0000	0.00076	0.00012	Yes	0.00038	50%	NIOSH
Xylene	100.0000	0.00230	0.00029	Yes	0.00000	50%	OSHA

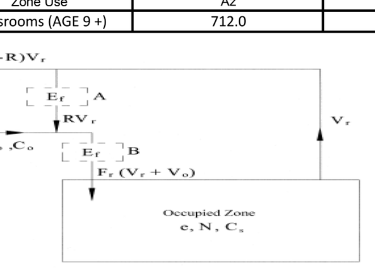
Building materials and furnishings assumed to have no VOCs and off-gassing is complete

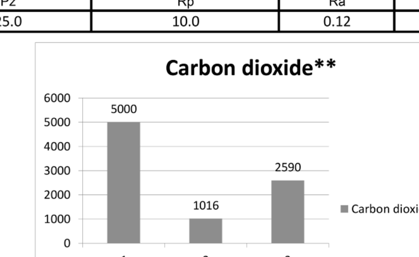
Is IAQ acceptable at reduced outside air levels? Yes

IAQP OSA CALCULATION - TYPICAL CLASSROOM

Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Az	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
TYPICAL CLASSROOM (712 SF) CR 110/111	Educational Facilities	Classrooms (AGE 9 +)	712.0	25.0	10.0	0.12	250	85	0.8	419 OA required per VRP

Zone Height (feet)	10.0
Desired Outside Air (Vo) IAQP	125
Supply Air (Vs)	682
Return Air (Vr)	682
Recirc. Flow Factor (R)	1.00
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant





***OSHA, NIOSH & WHO most conservative values used
http://www.cdc.gov/niosh/npg/npgsyn-a.html
1 = ASHRAE & NIOSH C02 Limit
2 = C02 Level at Ventilation Rate OA Flow Rate
3 = C02 Level at IAQ Procedure OA Flow Rate
**Carbon dioxide has been provided for reference only for gathering demand control ventilation (DCV) setpoints. The National Research Council was commissioned by the US Navy to prove C02 is not a contaminant of concern when using air purification to control the other contaminants of concern, as found on submarines.

Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value (PPM)	Steady State Using the VRP* (Prescribed OA) Plasma Off	Steady State Using the IAQ Method (Reduced OA) Plasma On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate (PPM)	Filtration Effectiveness	Cognizant Authority***
Acetaldehyde	100.0	0.01111	0.00151	Yes	0.00032	50%	OSHA
Acetone	250.0	0.00159	0.00046	Yes	0.00433	50%	NIOSH
Ammonia	25.00	0.01232	0.00976	Yes	0.14210	50%	NIOSH
Benzene	1.0000	0.00252	0.00035	Yes	0.00015	50%	OSHA
2- Butanone (MEK)	200.0	0.00017	0.00007	Yes	0.00088	50%	NIOSH
Carbon dioxide**	5000	1016	2590	Yes	292	0%	NIOSH
Chloroform	2.0000	0.00011	0.00002	Yes	0.00003	50%	NIOSH
Dioxane	100.0	0.00000	0.00000	Yes	0.00000	50%	OSHA
Hydrogen Sulfide	10.0	0.00000	0.00000	Yes	0.00000	50%	NIOSH
Methane	NA	1.68094	1.68094	Yes	0.00000	0%	NA
Methanol	200.0	0.00000	0.00000	Yes	0.00000	0%	NIOSH
Methylene Chloride	25.0	0.00075	0.00015	Yes	0.00080	50%	OSHA
Propane	1000.0	0.00998	0.00998	Yes	0.00000	0%	NIOSH
Tetrachloroethane	5.0000	0.00000	0.00000	Yes	0.00000	50%	OSHA
Tetrachloroethylene	100.0000	0.00037	0.00005	Yes	0.00001	50%	OSHA
Toluene	100.0000	0.00533	0.00073	Yes	0.00021	50%	NIOSH
1,1,1 - Trichloroethane	350.0000	0.00076	0.00012	Yes	0.00038	50%	NIOSH
Xylene	100.0000	0.00230	0.00031	Yes	0.00000	50%	OSHA

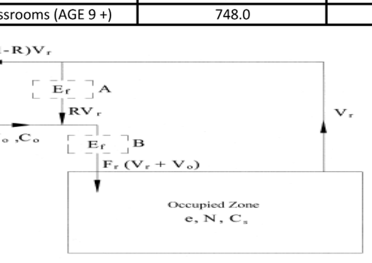
Building materials and furnishings assumed to have no VOCs and off-gassing is complete

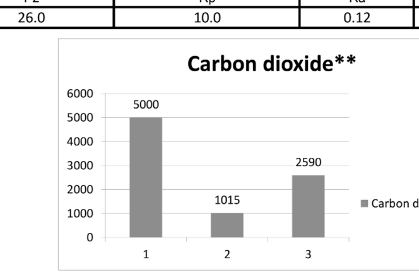
Is IAQ acceptable at reduced outside air levels? Yes

IAQP OSA CALCULATION - TYPICAL CLASSROOM

Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Az	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
TYPICAL CLASSROOM (748 SF) CR 105/107	Educational Facilities	Classrooms (AGE 9 +)	748.0	26.0	10.0	0.12	260	90	0.8	437 OA required per VRP

Zone Height (feet)	10.0
Desired Outside Air (Vo) IAQP	130
Supply Air (Vs)	682
Return Air (Vr)	682
Recirc. Flow Factor (R)	1.00
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant





***OSHA, NIOSH & WHO most conservative values used
http://www.cdc.gov/niosh/npg/npgsyn-a.html
1 = ASHRAE & NIOSH C02 Limit
2 = C02 Level at Ventilation Rate OA Flow Rate
3 = C02 Level at IAQ Procedure OA Flow Rate
**Carbon dioxide has been provided for reference only for gathering demand control ventilation (DCV) setpoints. The National Research Council was commissioned by the US Navy to prove C02 is not a contaminant of concern when using air purification to control the other contaminants of concern, as found on submarines.

Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value (PPM)	Steady State Using the VRP* (Prescribed OA) Plasma Off	Steady State Using the IAQ Method (Reduced OA) Plasma On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate (PPM)	Filtration Effectiveness	Cognizant Authority***
Acetaldehyde	100.0	0.01111	0.00155	Yes	0.00032	50%	OSHA
Acetone	250.0	0.00158	0.00047	Yes	0.00433	50%	NIOSH
Ammonia	25.00	0.01229	0.01004	Yes	0.14210	50%	NIOSH
Benzene	1.0000	0.00252	0.00036	Yes	0.00015	50%	OSHA
2- Butanone (MEK)	200.0	0.00017	0.00008	Yes	0.00088	50%	NIOSH
Carbon dioxide**	5000	1015	2590	Yes	292	0%	NIOSH
Chloroform	2.0000	0.00011	0.00002	Yes	0.00003	50%	NIOSH
Dioxane	100.0	0.00000	0.00000	Yes	0.00000	50%	OSHA
Hydrogen Sulfide	10.0	0.00000	0.00000	Yes	0.00000	50%	NIOSH
Methane	NA	1.68094	1.68094	Yes	0.00000	0%	NA
Methanol	200.0	0.00000	0.00000	Yes	0.00000	0%	NIOSH
Methylene Chloride	25.0	0.00075	0.00015	Yes	0.00080	50%	OSHA
Propane	1000.0	0.00998	0.00998	Yes	0.00000	0%	NIOSH
Tetrachloroethane	5.0000	0.00000	0.00000	Yes	0.00000	50%	OSHA
Tetrachloroethylene	100.0000	0.00037	0.00005	Yes	0.00001	50%	OSHA
Toluene	100.0000	0.00533	0.00075	Yes	0.00021	50%	NIOSH
1,1,1 - Trichloroethane	350.0000	0.00076	0.00013	Yes	0.00038	50%	NIOSH
Xylene	100.0000	0.00230	0.00032	Yes	0.00000	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete

Is IAQ acceptable at reduced outside air levels? Yes

AMOUNT OF REFRIGERANT PER OCCUPIED SPACE CALCULATIONS (ERU-1)

ROOM	AREA (sq. ft.)	VOLUME (cu. ft.)	SERVED BY	REFRIGERANT TYPE	REFRIGERANT CONCENTRATION LIMIT (lb/MCf)	REFRIGERANT CHARGE (lb)	MAX. ALLOWED REFRIGERANT (lb)	NOTES
106 CLASSROOM	665	6,650	ERU-1	R-454B	3.1	0.8	20.6	1
108 CLASSROOM	665	6,650	ERU-1	R-454B	3.1	0.8	20.6	1
100 CLASSROOM	893	8,332	ERU-1	R-454B	3.1	0.9	25.8	1
105 CLASSROOM	748	6,979	ERU-1	R-454B	3.1	0.8	21.6	1
107 CLASSROOM	748	6,979	ERU-1	R-454B	3.1	0.8	21.6	1
110 CLASSROOM	712	6,643	ERU-1	R-454B	3.1	0.8	20.6	1
111 CLASSROOM	712	6,643	ERU-1	R-454B	3.1	0.8	20.6	1
EXISTING CLASSROOM	672	6,270	ERU-1	R-454B	3.1	0.7	19.4	1
SHELTER TOILET	60	560	ERU-1	R-454B	3.1	0.1	1.7	1
102 TOILET	146	1,362	ERU-1	R-454B	3.1	0.2	4.2	1
104 CORRIDOR	734	6,848	ERU-1	R-454B	3.1	0.8	21.2	1
103 TOILET	177	1,651	ERU-1	R-454B	3.1	0.2	5.1	1
101 EXISTING CORRIDOR	321	2,995	ERU-1	R-454B	3.1	0.3	9.3	1
109 ALT CORRIDOR	255	2,379	ERU-1	R-454B	3.1	0.3	7.4	
					MAXIMUM ALLOWED REFRIGERANT:		212.5	
					TOTAL REFRIGERANT CHARGE:	7.80		

1. OCCUPIED SPACE COMPLIES WITH 2024 IMC CHAPTER 11, ASHRAE 15-2022, AND ASHRAE 34-2022.

AMOUNT OF REFRIGERANT PER OCCUPIED SPACE CALCULATIONS (IHPs)

ROOM	AREA (sq. ft.)	VOLUME (cu. ft.)	SERVED BY	REFRIGERANT TYPE	REFRIGERANT CONCENTRATION LIMIT (lb/MCf)	REFRIGERANT CHARGE (lb)	MAX. ALLOWED REFRIGERANT (lb)	NOTES
106 CLASSROOM	665	6,650	IHP-1	R-454B	3.1	7.7	20.6	1
108 CLASSROOM	665	6,650	IHP-2	R-454B	3.1	7.7	20.6	1
100 CLASSROOM	893	8,332	TWHP-A x 2	R-32	3.1	3.2	25.8	1
105 CLASSROOM	748	7,480	TWHP-A x 2	R-32	3.1	3.20	23.2	1
107 CLASSROOM	748	7,480	TWHP-A x 2	R-32	3.1	3.2	23.2	1
110 CLASSROOM	712	7,120	TWHP-A x 2	R-32	3.1	3.2	22.1	1
111 CLASSROOM	712	7,120	TWHP-A x 2	R-32	3.1	3.2	22.1	1
EXISTING CLASSROOM	672	6,270	IHP-7	R-454B	3.1	3.2	19.4	1
SHELTER TOILET	60	560	ERU-1 ONLY					1
102 TOILET	146	1,362	IHP-6	R-454B	3.1	2.3	4.2	1
104 CORRIDOR	734	6,848	IHP-3	R-454B	3.1	4.5	21.2	1
103 TOILET	177	1,651	IHP-5	R-454B	3.1	2.3	5.1	1
101 EXISTING CORRIDOR	321	2,995	ERU-1 ONLY					
109 ALT CORRIDOR	255	2,379	IHP-4	R-454B	3.1	4.5	7.4	1
					MAXIMUM ALLOWED REFRIGERANT:		215.0	
					TOTAL REFRIGERANT CHARGE:	48.10		

1. OCCUPIED SPACE COMPLIES WITH 2024 IMC CHAPTER 11, ASHRAE 15-2022, AND ASHRAE 34-2022.

AMOUNT OF REFRIGERANT PER OCCUPIED SPACE CALCULATIONS SUMMARY

ROOM	AREA (sq. ft.)	VOLUME (cu. ft.)	REFRIGERANT CHARGE (lb)	MAX. ALLOWED REFRIGERANT (lb)	NOTES
106 CLASSROOM	645	6,450	8.5	20.6	1,2
108 CLASSROOM	645	6,450	8.5	20.6	1,2
100 CLASSROOM	893	8,332	4.1	25.8	1,2
105 CLASSROOM	712	6,643	4.0	21.6	1,2
107 CLASSROOM	712	6,643	4.0	21.6	1,2
110 CLASSROOM	712	6,643	4.0	20.6	1,2
111 CLASSROOM	712	6,643	4.0	20.6	1,2
EXISTING CLASSROOM	672	6,270	3.9	19.4	1,2
SHELTER TOILET	54	504	0.1	1.7	1,2
102 TOILET	146	1,362	2.4	4.2	1,2
104 CORRIDOR	734	6,848	5.3	21.2	1,2
103 TOILET	177	1,651	2.4	5.1	1,2
101 EXISTING CORRIDOR	321	2,995	0.3	9.3	1,2
109 ALT CORRIDOR	255	2,379	4.8	7.4	
	MAXIMUM ALLOWED REFRIGERANT:			219.9	
	TOTAL REFRIGERANT CHARGE:		56.17		

1. OCCUPIED SPACE COMPLIES WITH 2024 IMC CHAPTER 11, ASHRAE 15-2022, AND ASHRAE 34-2022.
2. THE MAX. ALLOWED REFRIGERANT IS THE WORST CASE BETWEEN R-32 AND R-454B.

REFRIGERANT LEAK DETECTION CONTROLS:

1. THE LEAK DETECTION SYSTEM SHALL CONSIST OF ONE OR MORE REFRIGERANT LEAK DETECTION SENSORS INSTALLED IN THE HVAC EQUIPMENT BY THE HVAC EQUIPMENT MANUFACTURER.
   A. UTILIZE A SET POINT, NONADJUSTABLE IN THE FIELD, TO GENERATE AN OUTPUT SIGNAL TO INITIATE MITIGATION ACTIONS.
   B. FIELD RECALIBRATION OF THE REFRIGERANT DETECTION SYSTEM SHALL NOT BE PERMITTED.
   C. BE CAPABLE OF DETECTING THE PRESENCE OF A SPECIFIED REFRIGERANT CORRESPONDING TO THE REFRIGERANT DESIGNATION OF THE REFRIGERANT CONTAINED IN THE REFRIGERATION SYSTEM.
   D. HAVE ACCESS FOR REPLACEMENT OF REFRIGERANT DETECTION SYSTEM COMPONENTS.
   E. HALF SELF-DIAGNOSTICS TO DETERMINE OPERATIONAL STATUS OF THE SENSING ELEMENT.
   F. ENERGIZE AIR CIRCULATION FANS OF THE EQUIPMENT UPON FAILURE OF A SELF DIAGNOSTIC CHECK.
   G. GENERATE AN OUTPUT SIGNAL IN NOT MORE THAN 30 SECONDS WHEN EXPOSED TO A REFRIGERANT CONCENTRATION OF 25% LFL (+0%,-1%).
2. WHEN THE SYSTEM DETECTS A LEAK, THE FOLLOWING MITIGATION ACTIONS WILL BE INITIATED UNTIL REFRIGERANT HAS NOT BEEN DETECTED FOR 5 MINUTES:
   A. SUPPLY FANS SHALL BE ENERGIZED TO RUN AT 100% FAN SPEED.
   B. COMPRESSOR OPERATION SHALL BE DISABLED.
   C. ALL ZONING DAMPERS, SUCH AS VAV TERMINAL UNITS SHALL BE OPENED TO 100%.
   D. ALL ELECTRIC HEAT OR GAS HEAT SHALL BE DISABLED.
3. THE BUILDING FIRE AND SMOKE SYSTEMS SHALL OVERRIDE THIS FUNCTION.
4. IF THE REFRIGERANT SENSOR HAS A FAULT, IS AT THE END OF ITS USEFUL LIFE, OR IS DISCONNECTED, THE AC UNIT WILL INITIATE THE ABOVE MITIGATION ACTIONS. MITIGATION ACTIONS SHALL BE VERIFIED BY DISCONNECTING THE SENSOR.
5. THE REFRIGERANT SENSORS DO NOT NEED ROUTINE MAINTENANCE. USE ONLY MANUFACTURER-APPROVED SENSORS WHEN REPLACEMENT IS REQUIRED.

HVAC EQUIPMENT REFRIGERANT GENERAL NOTES:

1. THIS PROJECT IS DESIGNED WITH HVAC EQUIPMENT WHICH USE A2L REFRIGERANT.
2. THE MECHANICAL DESIGN WILL COMPLY WITH THE 2024 INTERNATIONAL MECHANICAL CODE, ASHRAE 15-2022, AND ASHRAE 34-2022.
3. THE INSTALLATION SHALL ALSO COMPLY WITH THESE STANDARDS.
4. HVAC EQUIPMENT SHALL BE MANUFACTURED TO COMPLY WITH THESE STANDARDS, AS WELL AS UL 484, UL/CSA 60335-2-40, AND UL/CSA 60355-2-89.

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50189343

LATHAN McKEE ARCHITECTS

CLASSROOM ADDITION TO
ELVIN HILL ELEMENTARY SCHOOL
201 WASHINGTON STREET, COLUMBIANA, ALABAMA 35051
SHELBY COUNTY BOARD OF EDUCATION

SHEET TITLE:
MECHANICAL CALCULATIONS AND CONTROLS

No. 24747
PROFESSIONAL
12-02-2025
ENGINEER
WADE STEWART

PROJ. MGR.:	JWS
DRAWN:	JWS
DATE:	11-07-2025

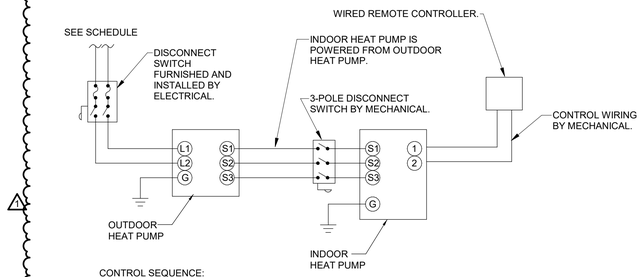
REVISIONS

1	12/2/25	ADDENDUM #1

JOB NO. 25-34

SHEET NO:

M0.5

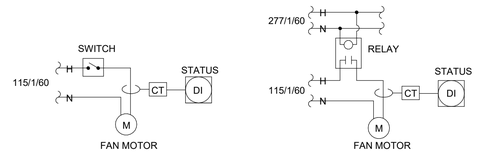


CONTROL SEQUENCE:

THE AC UNIT SHALL BE CONTROLLED BY A WIRED WALL MOUNTED REMOTE CONTROLLER. THE CONTROLLER SHALL CYCLE ON COMPRESSOR(S) TO MAINTAIN COOLING SETPOINT (74°F - ADJUSTABLE) AND HEATING SETPOINT (70°F - ADJUSTABLE). ALL MINI-SPLIT AC UNITS THAT SERVE ELECTRICAL AND IT ROOMS SHALL NOT SET THEIR TEMPERATURE BACK AT NIGHT. FOR ALL MINI-SPLIT AC UNITS THAT SERVE OFFICES, CLASSROOMS, ETC. SHALL SET THEIR TEMPERATURE BACK TO 4°F ABOVE SETPOINT IN SUMMER AND 4°F BELOW SETPOINT IN THE WINTER. COORDINATE WITH OWNER TO ESTABLISH OCCUPIED / UNOCCUPIED SCHEDULES.

DUCTLESS SPLIT SYSTEM CONTROLS

NO SCALE

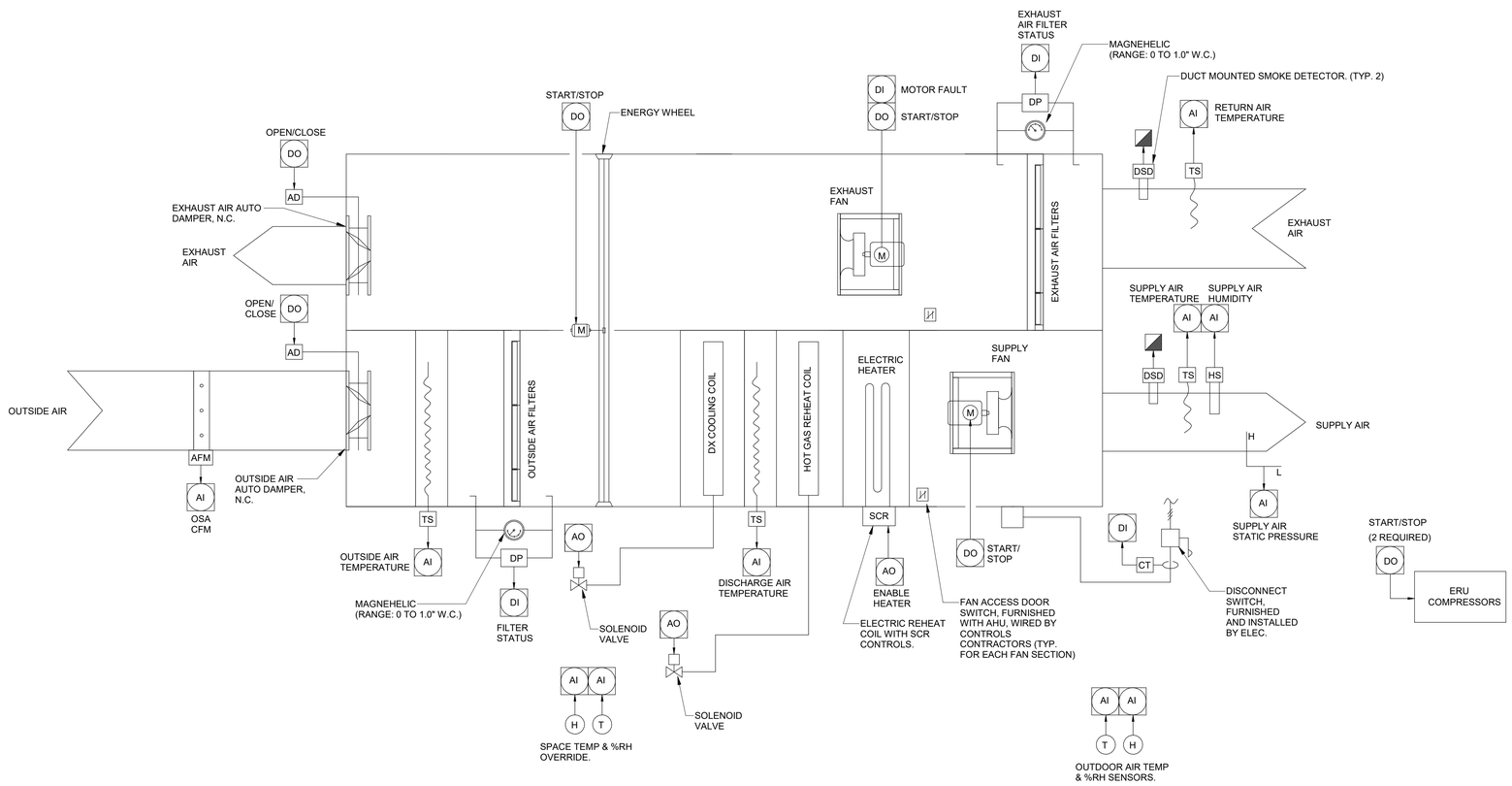


EXHAUST FAN CONTROLLED BY SWITCH. EXHAUST FAN CONTROLLED BY LIGHTING CIRCUIT.

THE BAS SHALL MONITOR FAN STATUS VIA A CURRENT TRANSDUCER.

EXHAUST FAN CONTROLS

NO SCALE



ENERGY RECOVERY UNIT CONTROL SEQUENCE:

THE ENERGY RECOVERY UNIT (ERU) SHALL BE STARTED AND STOPPED BY THE BUILDING AUTOMATION SYSTEM SUBJECT TO AN OWNER'S OCCUPANCY SCHEDULE AND SUBJECT TO ALL INTERNAL UNIT SAFETIES. OCCUPIED AND UNOCCUPIED HOURS SHALL BE DETERMINED BY THE OWNER AND SHALL BE FULLY ADJUSTABLE AT THE BUILDING AUTOMATION SYSTEM FRONT END BY THE OWNER.

UNOCCUPIED MODE:
DURING UNOCCUPIED MODE, THE EXHAUST AIR AND OUTSIDE AIR AUTO DAMPERS SHALL BE CLOSED AND THE EXHAUST AIR AND OUTSIDE AIR FANS SHALL BE OFF.

OCCUPIED MODE:
DURING OCCUPIED HOURS, THE EXHAUST AIR AND OUTSIDE AIR DAMPERS SHALL OPEN. ONCE THE DAMPERS ARE PROVEN TO BE OPEN, THE SUPPLY FAN AND EXHAUST FAN SHALL BE STARTED BY THE BUILDING AUTOMATION SYSTEM AND SHALL RUN CONTINUOUSLY. TEST AND BALANCE SHALL ADJUST THE FAN SPEED AT THE VARIABLE FREQUENCY DRIVE FOR EACH FAN TO PROVIDE THE SCHEDULED OUTSIDE AIR AND EXHAUST AIR CFM. THIS FAN SPEED SHALL BE SET AND SHALL BE DISPLAYED AT THE BAS FRONT END. THE FAN SPEED FOR THE OUTSIDE AIR AND EXHAUST AIR FANS SHALL NOT VARY.

THE BAS SHALL STAGE ON COMPRESSORS AND OPEN/CLOSE SOLENOID VALVE(S) AT THE DX COIL TO MAINTAIN A 54°F SUPPLY AIR TEMPERATURE AS MEASURED AT THE TEMPERATURE SENSOR DOWNSTREAM OF THE DX COIL. THE HOT GAS REHEAT COIL IN THE ERU SHALL STAGE ON/OFF TO MAINTAIN A TEMPERATURE LEAVING THE ERU OF 72°F (SUMMER) AND 70°F (WINTER) AS MEASURED AT THE DISCHARGE AIR TEMPERATURE SENSOR. IN THE WINTER, THE ELECTRIC HEATER SHALL STAGE ON/OFF TO PROVIDE A LEAVING TEMPERATURE OF 70°F (ADJUSTABLE).

DEHUMIDIFICATION MODE:
IF THE SPACE MOUNTED RELATIVE HUMIDITY SENSOR RISES ABOVE 60% RH FOR LONGER THAN 10 MINUTES DURING OCCUPIED OR UNOCCUPIED MODES. THE ERU SHALL GO INTO DEHUMIDIFICATION MODE. IN DEHUMIDIFICATION MODE, THE EXHAUST AIR AND OUTSIDE AIR DAMPERS SHALL BE OPEN, THE EXHAUST AIR AND OUTSIDE AIR FANS SHALL RUN, THE CONDENSING UNIT SHALL BE ON AND PROVIDING 100% COOLING, AND THE HOT GAS REHEAT COIL SHALL STAGE ON/OFF TO MAINTAIN A SPACE TEMPERATURE OF 72°F (SUMMER) AND 70°F (WINTER). ONCE THE HUMIDITY RETURNS TO BELOW 60%RH, THE ERU SHALL RETURN TO NORMAL OCCUPIED OR UNOCCUPIED MODE.

OUTSIDE AIR UNIT CONTROLS - ENERGY RECOVERY WHEEL, DX COOLING, WITH ELECTRIC HEAT

NO SCALE

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