MECHANICAL NOTES:

1. ALL HVAC EQUIPMENT AND DUCTWORK TO BE INSTALLED IN ACCORDANCE WITH STATE AND LOCAL CODES.
2. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL DUCTWORK, PIPING, AND ELECTRICAL REQUIREMENTS WITH ALL OTHER TRADES PRIOR TO BEGINNING INSTALLATION TO AVOID CONFLICTS AND INTERFERENCE WITH OTHER TRADES.
3. ALL EQUIPMENT TO BE INSTALLED AS SUGGESTED BY MANUFACTURER.
4. INSULATE SUPPLY AND RETURN DUCTWORK LOCATED ABOVE LAY-IN CEILINGS BY WRAPPING WITH INSULATION WITH A MINIMUM INSTALLED R-VALUE OF 6.0. DIMENSIONS SHOWN ARE INSIDE CLEAR AREA DIMENSIONS.
5. EXTERIOR HVAC DUCTWORK AND DUCTWORK LOCATED IN UNCONDITIONED SPACES MUST BE INSULATED WITH INSULATION OF R-VALUE OF 8.0 OR GREATER.
6. EQUIP AIR HANDLER WITH RETURN AIR FILTER RACK.
7. PROGRAMMABLE THERMOSTAT SHALL BE CAPABLE OF CONTROLLING BOTH HEATING AND COOLING, SET POINT OVERLAP RESTRICTION (DEADBAND OF AT LEAST 5°F), OFF HOURS CONTROL AND SET BACK CAPABILITIES AS REQUIRED BY SECTION C403.2.4 OF THE NC ECC.
8. COORDINATE EXACT LOCATION OF THERMOSTAT WITH OWNER.
9. EXHAUST FAN TO BE FURNISHED, INSTALLED AND DUCTED TO OUTDOORS BY THE MECHANICAL CONTRACTOR. EXHAUST FAN TO BE WIRED BY THE ELECTRICAL CONTRACTOR.
10. EXHAUST FAN DISCHARGE TO BE AT LEAST TEN FEET AWAY FROM HVAC FRESH AIR IN-TAKE.
11. FINAL UTILITY CONNECTIONS (GAS, ELECTRIC, ETC.) TO EQUIPMENT SHALL BE MADE BY THE CONTRACTOR INSTALLING THE EQUIPMENT REQUIRING THE UTILITIES.
12. DUCT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE INTENT OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY ADDITIONAL TRANSITIONS, OFFSETS, OR TURNS, IN THE DUCTWORK AND/OR PIPING, NOT SHOWN BUT REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.
13. ALL DUCTWORK SHALL BE INSTALLED TIGHT AGAINST THE STRUCTURE UNLESS OTHERWISE NOTED OR SHOWN.
14. AIR DISTRIBUTION LOCATIONS SHOWN ON MECHANICAL PLANS ARE APPROXIMATE. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR ACTUAL LOCATIONS.
15. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS OF WALLS AND PARTITIONS AND FOR PARTITION THICKNESS AND CONSTRUCTION MATERIALS.
16. ELECTRICAL POWER REQUIREMENTS ARE BASED ON MANUFACTURER'S PUBLISHED DATA. IF ACTUAL UNIT IS A DIFFERENT MANUFACTURER OR THE ACTUAL PURCHASED UNIT(S) OTHERWISE HAVE DIFFERENT ELECTRICAL LOAD (MCA) OR CIRCUIT BREAKER (MCB) REQUIREMENTS THAN WHAT IS PUBLISHED ON THE DRAWING SCHEDULE, THE MECHANICAL CONTRACTOR MUST SUBMIT THE CORRECT DATA IN WRITING TO THE GENERAL CONTRACTOR AND ELECTRICAL CONTRACTOR (IF KNOWN). IT IS THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE GC AND ELECTRICAL CONTRACTOR ARE NOTIFIED OF CHANGES IN THE MECHANICAL EQUIPMENT, WHICH WILL CHANGE THE ELECTRICAL WIRING, BREAKER SIZES OR QUANTITY OF CIRCUITS.
17. PRIMARY CONDENSATE DRAIN TO BE ROUTED TO OUTDOORS OR HUB DRAIN. VERIFY TERMINATION LOCATION WITH MECHANICAL INSPECTOR PRIOR TO INSTALLATION. THE PIPING FROM THE SECONDARY DRAIN PAN SHALL BE CONFIGURED SUCH THAT THE SAFETY FLOAT SWITCH WILL SHUT THE UNIT DOWN YET PREVENT THE PAN FROM OVERFLOWING SHOULD THE SAFETY SWITCH FAIL.
18. INSULATE REFRIGERANT LINES WITH 1-1/2" INSULATION WITH A THERMAL CONDUCTIVITY OF 0.27 BTU PER INCH/H.FT2.°F. ALTERNATE THICKNESS CAN BE USED IF ADJUSTED IN ACCORDANCE WITH TABLE C403.2.10 NOTE B OF THE NC ENERGY CONSERVATION CODE (NC ECC).
19. HEAT PUMPS SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST, PREVENT SUPPLEMENTAL HEAT OPERATION WHEN THE HEAT PUMP COMPRESSOR CAN MEET THE HEATING LOAD. A HEAT STRIP OUTDOOR TEMPERATURE LOCKOUT SHALL BE PROVIDED TO PREVENT SUPPLEMENTAL HEAT OPERATION IN RESPONSE TO THE THERMOSTAT BEING CHANGE TO A WARMER SETTING. THE LOCKOUT SHALL BE SET NO LOWER THAN 35°F AND NO HIGHER THAN 40°F. SEE SECTION C403.2.4 OF THE NC ECC.
20. ALL DUCTS, AIR HANDLERS, AND FILTER BOXES SHALL BE SEALED. JOINTS AND SEAMS SHALL COMPLY WITH SECTION 603.9 OF THE NC MECHANICAL CODE.
21. SYSTEM SHALL BE BALANCED BY THE HVAC CONTRACTOR IN ACCORDANCE WITH SECTION C408.2.2 OF THE NC ECC. A CERTIFIED AIR BALANCE REPORT IS NOT REQUIRED BY CODE, BUT MAY BE DESIRED BY THE OWNER OR GC. VERIFY WITH GC PRIOR TO PRICING.
22. AN OPERATING AND MAINTENANCE MANUAL FOR EACH HVAC SYSTEM SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR TO THE OWNER IN ACCORDANCE WITH SECTION C408.2.5.2 OF THE NC ECC.
23. FLEX DUCT LENGTHS SHOULD NOT EXCEED 15' IN LENGTH UNLESS PHYSICAL CONSTRAINTS PROHIBIT INSTALLATION OF ADDITIONAL HARD DUCT.
24. FLEX DUCT SUPPORTS SHOULD BE AT LEAST 1-1/2" WIDE. SPACE SUPPORTS NO MORE THAN 4 FEET APART (A CONNECTION TO A RIGID DUCT OR TO EQUIPMENT COUNTS AS A SUPPORT POINT). IN LONG HORIZONTAL RUNS WITH BENDS, USE EXTRA SUPPORTS BEFORE AND AFTER THE BENDS. SUPPORT STRAPS SHOULD NOT COMPRESS THE INNER CORE OR CONSTRICT AIRFLOW. SUPPORTS SHOULD NOT CONSTRICT THE INSULATION.
25. FLEX DUCTS SHOULD NOT SAG MORE THAN 1/2" PER 1'-0" BETWEEN SUPPORTS; MAXIMUM SAG SHOULDN'T EXCEED 2-1/2".

SPLIT SYSTEM A/C WITH HEAT PUMP

MARK	TONS	MANUFACTURER	INDOOR UNIT					OUTDOOR UNIT				FAN DATA					COOLING CAPACITY				HEATING CAPACITY AT 47 °F (BTUH)	MINIMUM HEATING EFFICIENCY	ACTUAL HEATING EFFICIENCY
			* MODEL NO.	STRIP HEAT	POWER	MCA	MCB	MODEL NO.	POWER	MCA	MCB	AIR FLOW (CFM)	R.A. FLOW (CFM)	O.A. FLOW (CFM)	E.S.P. (IN. W.G.)	MOTOR SIZE (H.P.)	SENSIBLE (BTUH)	TOTAL (BTUH)	MIN. EFF.	ACTUAL EFF.			
AHU-1/HP-1	3	TRANE	TAM9A0C36V31	7.68 KW	240V/1ø	44	45	4TWR5036H1	230V/1ø	18	30	1,200	1,020	180	0.25	1/2	27,005	36,104	14 SEER	15 SEER	33,800	8.2 HSPF	9.5 HSPF

* AIR HANDLER SHALL HAVE AUTOMATIC OR GRAVITY DAMPER ON THE OUTSIDE AIR INTAKE THAT CLOSE WHEN THE FAN IS NOT OPERATING.

Ventilation Calculations

Occupancy Classification (Per Table 403.3.1.1)	NET Square Footage, Az	Occupancy Persons per 1,000 S.F.	Calculated # of People, Pz	People CFM Per Person, Rp	People CFM Total, Rp x Pz	Area CFM Per S.F., Ra	Area CFM Total, Ra x Az	Outside Air CFM Required, Vbz*	Outside Air CFM Provided	Exhaust Air Required (CFM)	Exhaust Air Provided, CFM
Office - 1	82	5	1	5.0	5	0.06	5	10	10	0	0
Office - 2	148	5	1	5.0	5	0.06	9	14	15	0	0
Corridor	54	0	0	0.0	0	0.06	3	3	5	0	0
Training Room	520	35	18	7.5	135	0	0	135	135	0	0
Closet - 1	34	0	0	0.0	0	0.12	4	4	5	0	0
Closet - 2	36	0	0	0.0	0	0.12	4	4	5	0	0
Mech / Elec	29	0	0	0.0	0	0.12	3	3	5	0	0
Toilet	61	0	0	0.0	0	0	0	0	0	120	120
							Total	163	**180**	120	**120**

* Vbz = (Rp x Pz) + (Ra x Az)

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	CFM	SP	MOTOR	POWER	SONES	WATTS	CONTROL
EF-1	GREENHECK	SP-A125	CEILING EXHAUST	120	0.25" W.G.	FHP	120V/1ø	0.6	23	OCC. SENSOR

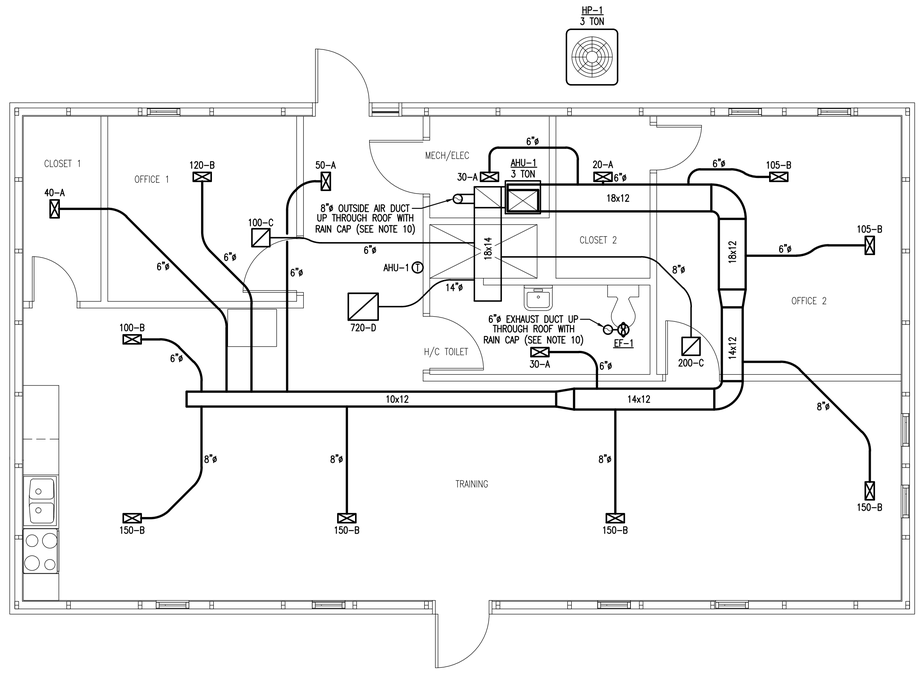
* EXHAUST FAN SHALL HAVE AUTOMATIC OR GRAVITY DAMPER THAT CLOSES WHEN THE FAN IS NOT OPERATING.

AIR DISTRIBUTION SCHEDULE

MARK	MANUFACTURER	NECK SIZE	PANEL SIZE	CFM RANGE	USE	TYPE	MODEL	MATERIAL	REMARKS
A	E.H. PRICE	–	9x6	0-180	SUPPLY	LOUVERED FACE DIRECTIONAL DIFFUSER	SMD-6	STEEL	–
B	E.H. PRICE	–	12x6	181-250	SUPPLY	LOUVERED FACE DIRECTIONAL DIFFUSER	SMD-6	STEEL	–
C	E.H. PRICE	–	12x12	0-300	RETURN	NON-FILTERED RETURN GRILLE	530	STEEL	–
D	E.H. PRICE	–	20x18	0-900	RETURN	NON-FILTERED RETURN GRILLE	530	STEEL	–

SYMBOLS & ABBREVIATIONS LEGEND

SYMBOL	DESCRIPTION
T	PROGRAMMABLE THERMOSTAT (SEE NOTE 7)
	CEILING SUPPLY DIFFUSER
	CEILING RETURN GRILLE
	SUPPLY DUCT SECTION
	RETURN DUCT SECTION
ø	DIAMETER OR POWER PHASE
O.A.	OUTSIDE AIR
R.A.	RETURN AIR
S.A.	SUPPLY AIR
A.F.F.	ABOVE FINISHED FLOOR
EF	EXHAUST FAN



1 M-1 MECHANICAL PLAN
SCALE: 1/4" = 1'-0"

Alamance Consulting Engineers
961-F Burlington Ave.
Gibsonville, N.C. 27249
Phone: (336) 449-4558
www.ace-nc.net
N.C. Firm License Number C-2071

GROOMS EQUIPMENT
3254 Boywood Rd.
Graham, NC 27253

GROOMS EQUIPMENT TRAINING BUILDING
Graham, North Carolina

DRAWING NAME: MECHANICAL PLAN

NORTH CAROLINA PROFESSIONAL SEAL 050989 ENGINEER
8/24/22

DRAWN	JNK
CHECKED	SJB
DATE	8/24/22
SCALE	AS NOTED
JOB NO.	22052
SHEET	M-1

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHOD OF COMPLIANCE

PRESCRIPTIVE ☒ ENERGY COST BUDGET ☐

THERMAL ZONE 4A

EXTERIOR DESIGN CONDITIONS
- WINTER DRY BULB: 15 °F
- SUMMER DRY BULB: 90 °F

INTERIOR DESIGN CONDITIONS
- WINTER DRY BULB: 70 °F
- SUMMER DRY BULB: 75 °F
- RELATIVE HUMIDITY: 50 %

BUILDING HEATING LOAD: 29,478 BTU/HR

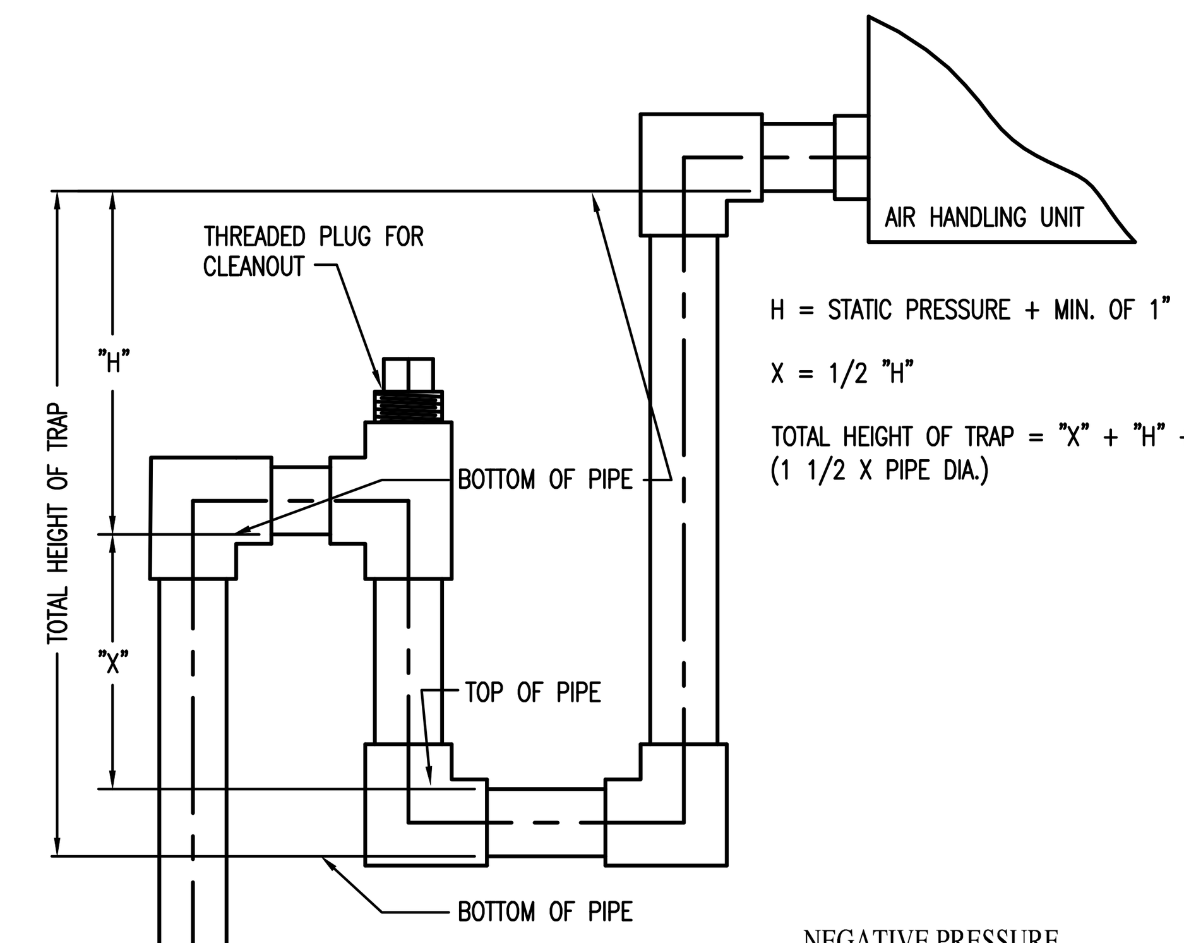
BUILDING COOLING LOAD: 2.97 TONS

MECHANICAL CONDITIONING SYSTEM
- DESCRIPTION OF UNIT: SPLIT SYSTEM HEAT PUMP
- HEATING EFFICIENCY: 9.5 HSPF
- COOLING EFFICIENCY: 15 SEER
- HEATING OUTPUT OF UNIT: 33,800 BTU/HR
- COOLING OUTPUT OF UNIT: 3 TONS

LIST EQUIPMENT EFFICIENCIES

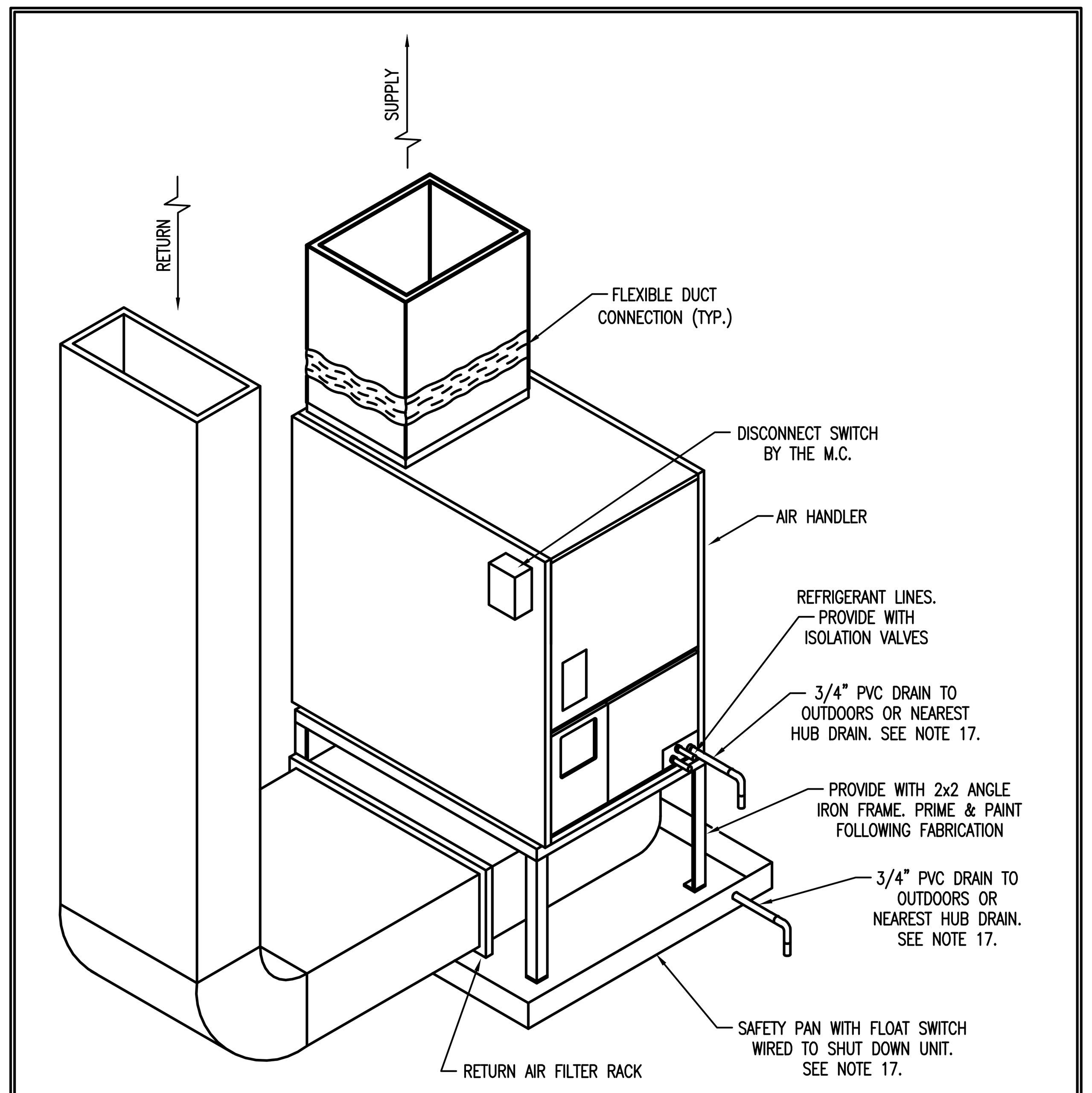
EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEM)
- MOTOR HORSEPOWER ______ HP
- NUMBER OF PHASES ______ ø
- MINIMUM EFFICIENCY ______ %
- MOTOR TYPE ______
- #OF POLES ______

DESIGNER STATEMENT:
TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT REQUIREMENTS OF NORTH CAROLINA STATE BUILDING CODES.



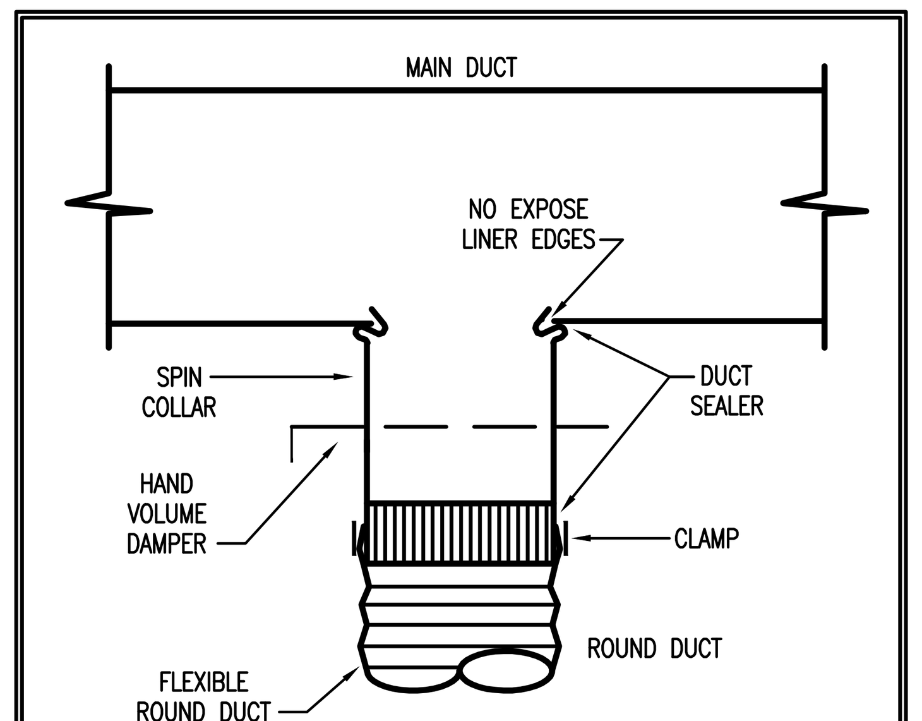
3 / M-2 NEGATIVE PRESSURE "P" TRAP DETAIL

SCALE: N.T.S.



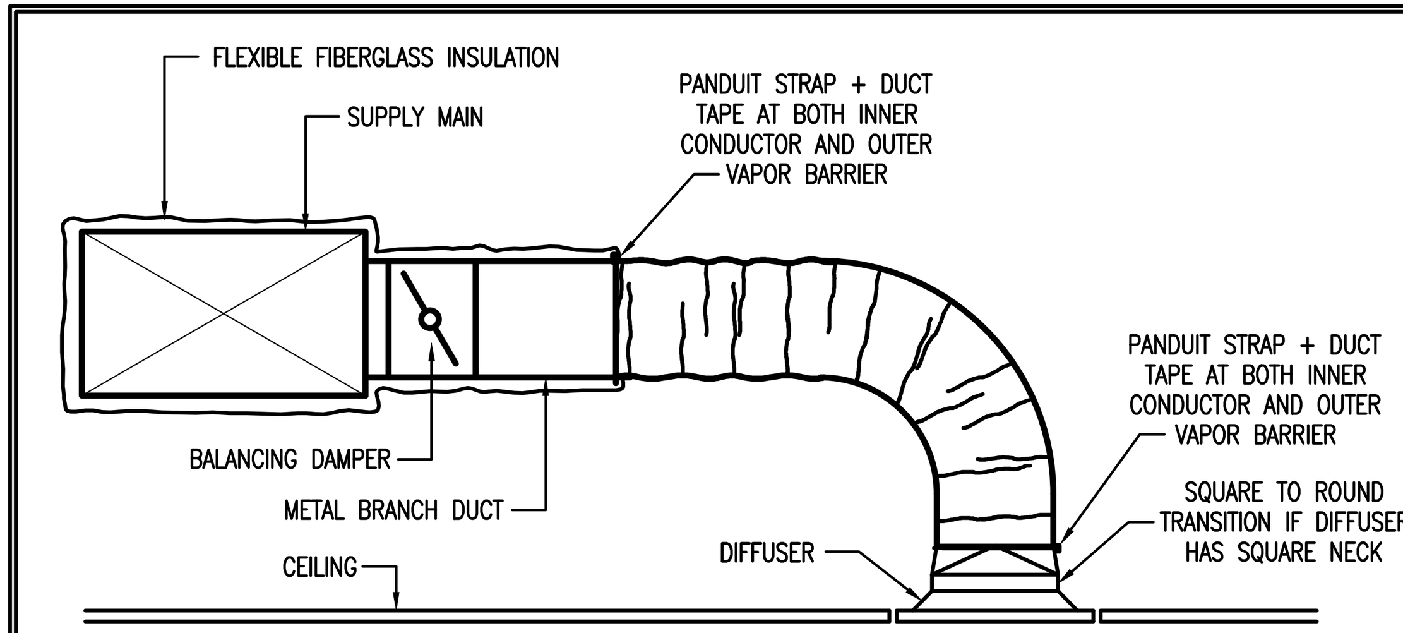
1 / M-2 VERTICAL AIR HANDLER DETAIL

SCALE: N.T.S.



4 / M-2 BRANCH DUCT TAKE-OFF DETAIL

SCALE: N.T.S.



2 / M-2 SUPPLY DIFFUSER DETAIL

SCALE: N.T.S.

Alamance Consulting Engineers
961-F Burlington Ave.
Gibsonville, N.C. 27249
Phone: (336) 449-4558
www.ace-nc.net
N.C. Firm License Number C-2071

GROOMS EQUIPMENT
3254 Boywood Rd.
Graham, NC 27253

GROOMS EQUIPMENT TRAINING BUILDING
Graham, North Carolina

DRAWING NAME: MECHANICAL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 050989 ENGINEER

8/24/22

DRAWN: JNK

CHECKED: SJB

DATE: 8/24/22

SCALE: AS NOTED

JOB NO.: 22052

SHEET: M-2