

GENERAL MECHANICAL NOTES AND SPECIFICATIONS:

- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 VIRGINIA UNIFORM STATEWIDE BUILDING CODE, ALL FEDERAL, STATE, AND CITY CODES, ORDINANCES, AND STANDARDS.
- IT IS THE INTENT OF THESE DOCUMENTS THAT THE CONTRACTOR PROVIDE ALL LABOR, MATERIAL, EQUIPMENT AND TOOLS FOR THE COMPLETE INSTALLATION OF ALL WORK SHOWN ON THE PLANS AND/OR DESCRIBED HEREIN, INCLUDING ALL DEVICES AND CONTROLS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.
- THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE. NOT ALL FITTINGS, OFFSETS, VENTS, OR DRAINS ARE SHOWN. THE CONTRACTOR SHALL INCLUDE ALL OFFSETS, VENTS, AND DRAINS AS REQUIRED FOR A FULLY FUNCTIONING SYSTEM.
- IN AREAS WITH UNFINISHED CEILINGS, DUCTWORK AND PIPING SHALL BE ROUTED AS TIGHT TO THE STRUCTURE AS POSSIBLE.
- ENSURE MECHANICAL EQUIPMENT IS INSTALLED TO PROVIDE SUFFICIENT CLEARANCE FOR COIL PULL, AND MINIMUM MANUFACTURER RECOMMENDED MAINTENANCE ACCESS TO EQUIPMENT.
- ALL SUPPLY AIR DIFFUSERS, RETURN, AND EXHAUST GRILLES SHALL BE INSTALLED WITH BALANCING DAMPER LOCATED IN DUCT RUN OUT. DIFFUSERS AND GRILLES SHALL HAVE AN OPPOSED BLADE DAMPER ONLY WHEN DUCT DAMPERS ARE INACCESSIBLE.
- ALL PIPING SHALL BE LABELED FOR ITS USAGE. ALL EQUIPMENT SHALL BE PROVIDED WITH AN ENGRAVED EQUIPMENT TAG.
- ALL DUCTWORK CONSTRUCTION AND INSTALLATION SHALL COMPLY WITH THE LATEST EDITION OF THE SMACNA DUCT CONSTRUCTION HANDBOOK.
- DUCT INSULATION SHALL BE IN COMPLIANCE WITH THE 2021 IECC STANDARDS.
- FLEXIBLE DUCTS SHALL BE MECHANICALLY CORRUGATED SINGLE PLY ALUMINUM WITH CONTINUOUS WATERTIGHT LOCK SEAMS, SELF-SUPPORTING WITH 1" THICK FIBER GLASS INSULATION, MAXIMUM C FACTOR OF 0.23 BTU/HR./SQ.FT./°F AT 75°F MEAN TEMPERATURE, AND MINIMUM 4 MIL SEAMLESS VAPOR BARRIER JACKET, REINFORCED ALUMINUM FOIL, METALIZED POLYESTER LAMINATE. DUCT SHALL HAVE A WORKING PRESSURE OF NOT LESS THAN 8 INCHES W.G. AND SUITABLE FOR VELOCITIES UP TO 5000 FPM. THE ENTIRE ASSEMBLY SHALL BE RATED AND MARKED AS UL RATED.
- DUCTWORK EXPOSED TO OUTSIDE CONDITIONS SHALL BE INSULATED WITH MINIMUM 2" THICK INSULATION AND COVERED WITH MINIMUM .025 INCH THICK ALUMINUM JACKET WITH SEAMS LAPPED A MINIMUM 3", SEALED WITH SILICON CAULK. COVERS SHALL BE NEATLY FINISHED AND COMPLETELY WATERTIGHT.

BOILER SCHEDULE

MARK	WATER		CAPACITY (MBH)			AMP DRAW DATA			DIRECT VENTING		BASIS OF DESIGN	REMARKS
	DELTA T.	FUEL	INPUT	OUTPUT	AHRI EFF.	TOTAL AMPS	PUMP FLA	BLOWERS & CONTROLS	INTAKE	EXHAUST		
B-1	40	NAT. GAS	800	752	94.0	11.5	8.8	2.7	4"	6"	LOCHINVAR KBN801	

NOTES:

- BOILERS HAVE 1" GAS CONNECTION.
- SET BOILER WATER TEMPERATURE TO 135F E.W.T. AND LEAVING 175F L.W.T.
- WATER INLET AND OUTLET CONNECTIONS ARE 2".

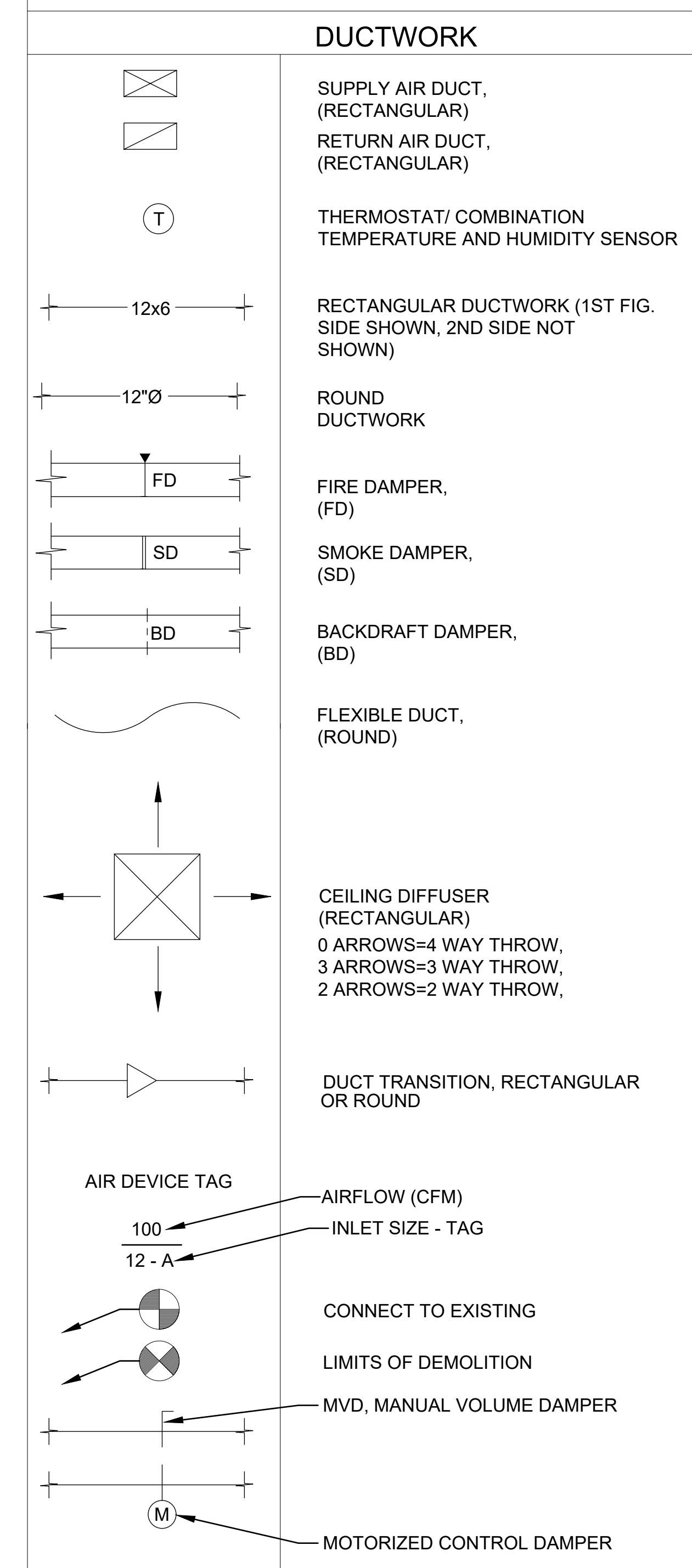
NOTES:

- BASIS OF DESIGN IS DAIKIN, MODEL OAH024GDCM.
- EXTERNAL DIMENSIONS: HEIGHT= 58", WIDTH=82", LENGTH=246"
- PROVIDE R-13 INJECTED FOAM INSULATION IN UNIT CASING.
- PROVIDE PIPING ENCLOSURES FOR CHILLED WATER AND HOT WATER PIPING TO UNIT.
- PROVIDE SINGLE POINT POWER CONNECTION WITH FACTORY MOUNTED FUSED DISCONNECT.
- PROVIDE UNIT WITH MERV13 FILTERS.
- PROVIDE WITH FACTORY CUSTOM 16" ROOF CURB.
- WATER SHALL BE 30% PROPYLENE GLYCOL.
- PROVIDE PROGRAMMABLE COMBINATION THERMOSTAT/HUMIDISTAT FOR UNIT OPERATION.
- UNIT LEAVING AIR TEMPERATURE SHALL MODULATE AS REQUIRED TO MEET SPACE TEMPERATURE AND HUMIDITY SETPOINTS.

ROOFTOP UNIT SCHEDULE

MARK	SUPPLY AIR FLOW (CFM)	OUTDOOR AIR FLOW (CFM)	SUPPLY FANS		COOLING COIL PERFORMANCE						HEATING COIL PERFORMANCE						ELECTRICAL				
			ESP (IN H2O)	QUANTITY x FAN HP	EAT DB/WB (°F)	LAT DB/WB (°F)	TOTAL CAPACITY (MBH)	UNIT GROSS SENSIBLE COOLING (MBH)	EWT/LWT (°F)	GPM	PRESSURE DROP (FT H2O)	PIPE RUNOUT SIZE (IN.)	EAT/LAT (°F)	TOTAL CAPACITY (MBH)	EWT/LWT (°F)	GPM	PRESSURE DROP (FT H2O)	PIPE RUNOUT SIZE (IN.)	V / PH	MCA/MOCP (AMP.)	OPERATING WEIGHT (LBS.)
RTU-1	9,500	9,500	1.0"	2x 7.5	91.0/74.0	52.7/52.5	674.7	398.2	44.0/53.8	144	15.4	3	-10 / 99.1	1,133.6	175/134.4	58.7	6.4	2	208 / 3	35.5/50	6,180

HVAC LEGEND



DATE: 04 MAR 2025
 COMM No: 25-02
 DRAWN BY: JNB
 CHECKED BY:
 STATE PROJECT No:

MECHANICAL GENERAL NOTES, LEGEND, & SCHEDULES

MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DATE
DESCRIPTION	
No.	◀ ◀ ◀ ◀

M001

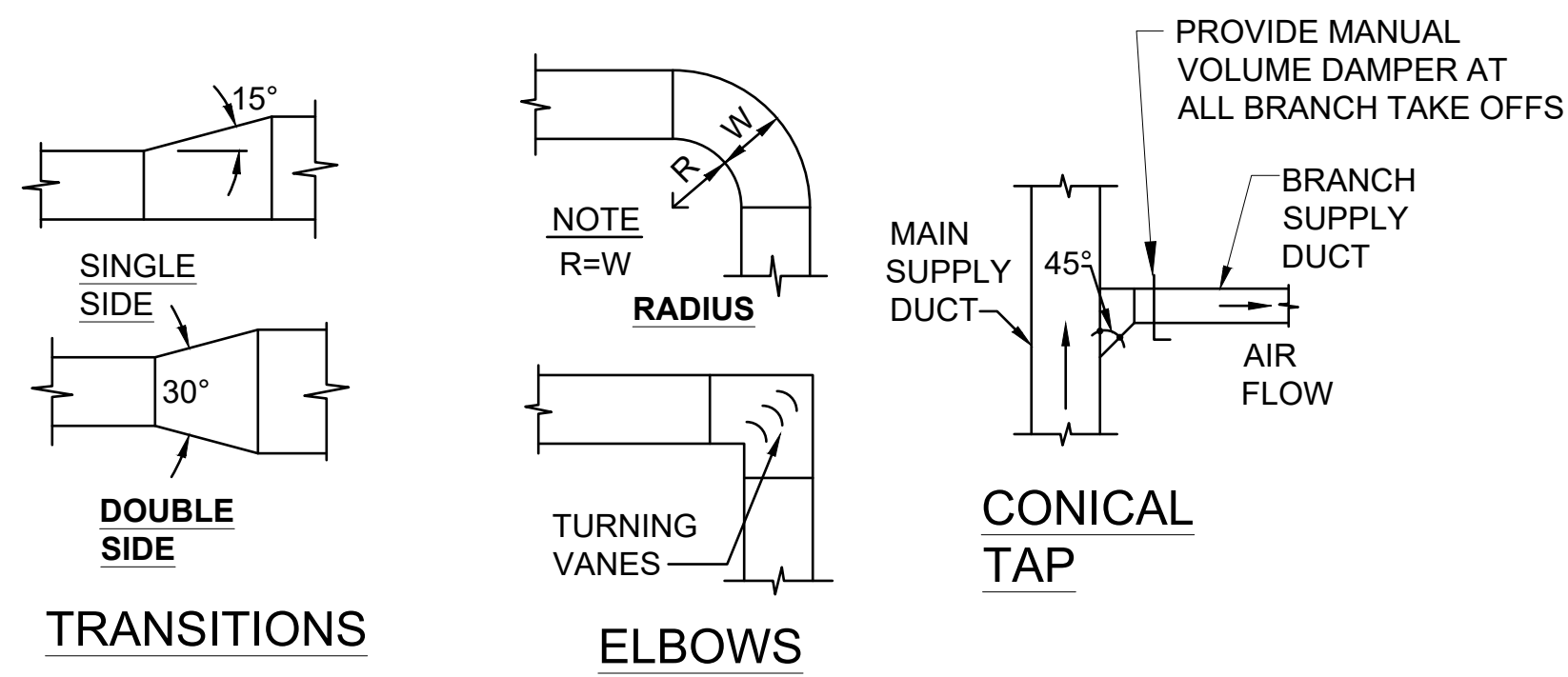
AIR DEVICE SCHEDULE					
MARK	SERVICE	MOUNTING	FINISH	BASIS OF DESIGN	NOTES
A	SUPPLY	LAY-IN	WHITE	PRICE, AMD - LOUVERED FACE DIRECTIONAL DIFFUSER	-
B	RETURN	LAY-IN	WHITE	PRICE, 80 - EGG CRATE GRILLE	-
C	EXHAUST	SURFACE / LAY-IN	WHITE	PRICE, RCG	1
D	SUPPLY	DUCT	ALUM. POWDER COAT	PRICE, HCD1, HIGH CAPACITY DRUM LOUVER	-

NOTES:
 1. PROVIDE WITH OPPOSED BLADE DAMPER IF MANUAL VOLUME DAMPER IS NOT PROVIDED FOR BALANCING AT TAKEOFF.

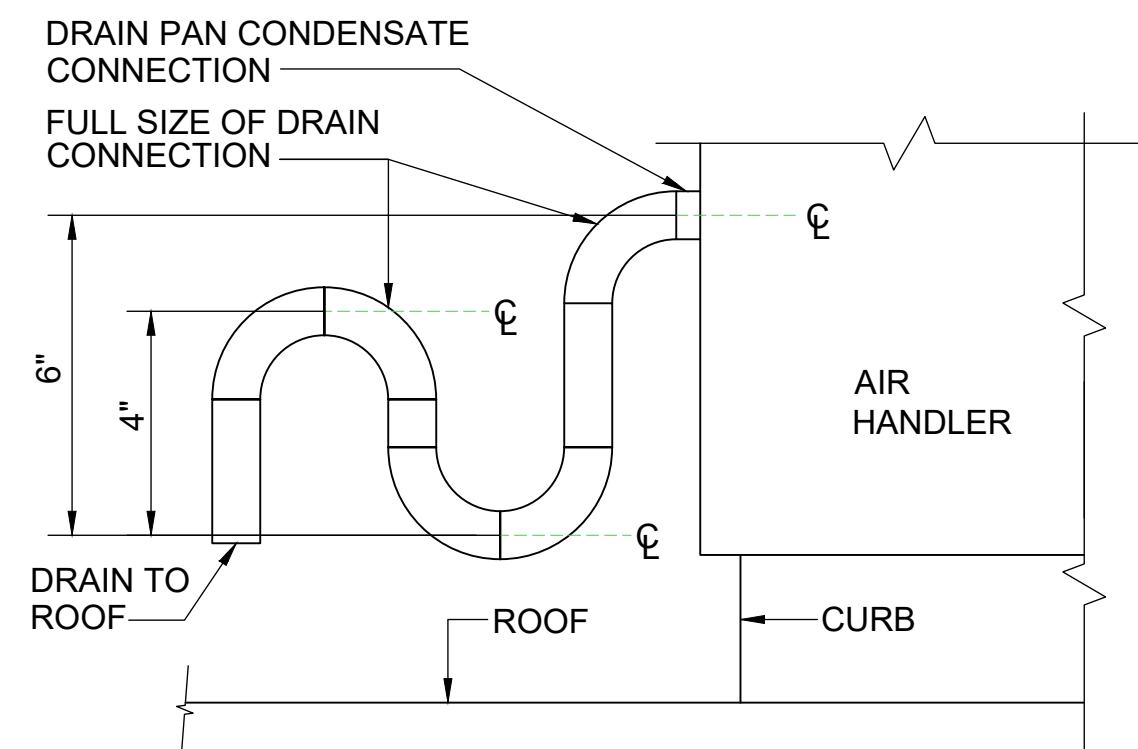
EXHAUST FAN SCHEDULE								
MARK	QUANTITY	AIR FLOW (CFM)	ESP	BRAKE HP	NOM HP	DRIVE TYPE	V/FREQ./PH	BASIS OF DESIGN
F-1	1	850	0.30"	0.07	1/4	DIRECT	115/60/1	GREENHECK, G-123-VG

NOTES:
 1. INTERLOCK WITH RTU-1
 2. PROVIDE ALL FANS WITH GRAVITY BACKDRAFT DAMPER EITHER IN CURB OR AT FAN DISCHARGE.
 3. ROOF MOUNTED FANS SHALL BE PROVIDED WITH 12" ROOF CURB.

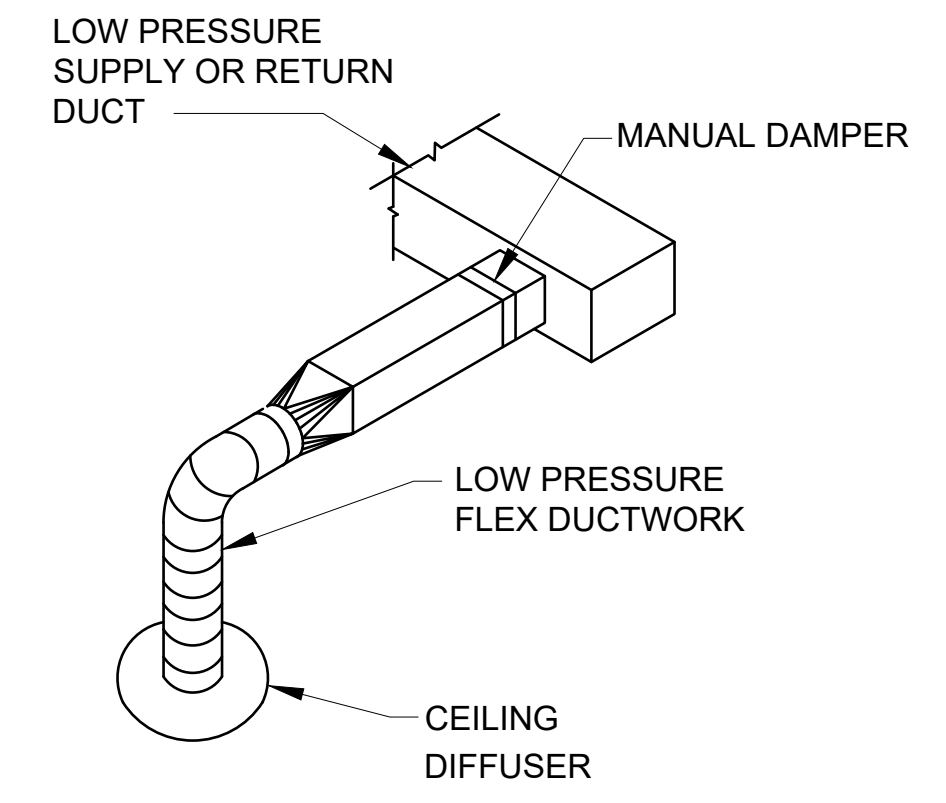
PUMP SCHEDULE									
MARK	QUANTITY	FLUID FLOW (GPM)	FLUID	PUMP HEAD FT.	NOM HP	RPM	TYPE	V/FREQ./PH	BASIS OF DESIGN
P-1	1	106.8	HOT WATER	85.0	5.0	1750	BASE MOUNTED	208/60/3	BELL & GOSSETT 1531
P-2	2	59.0	HOT WATER	29.0	1.0	1750	INLINE	208-230/60/3	BELL & GOSSETT PD 38T
BP-1	3	70.0	HOT WATER	20.0	1.0	1750	INLINE	208-230/60/3	BELL & GOSSETT PD38T



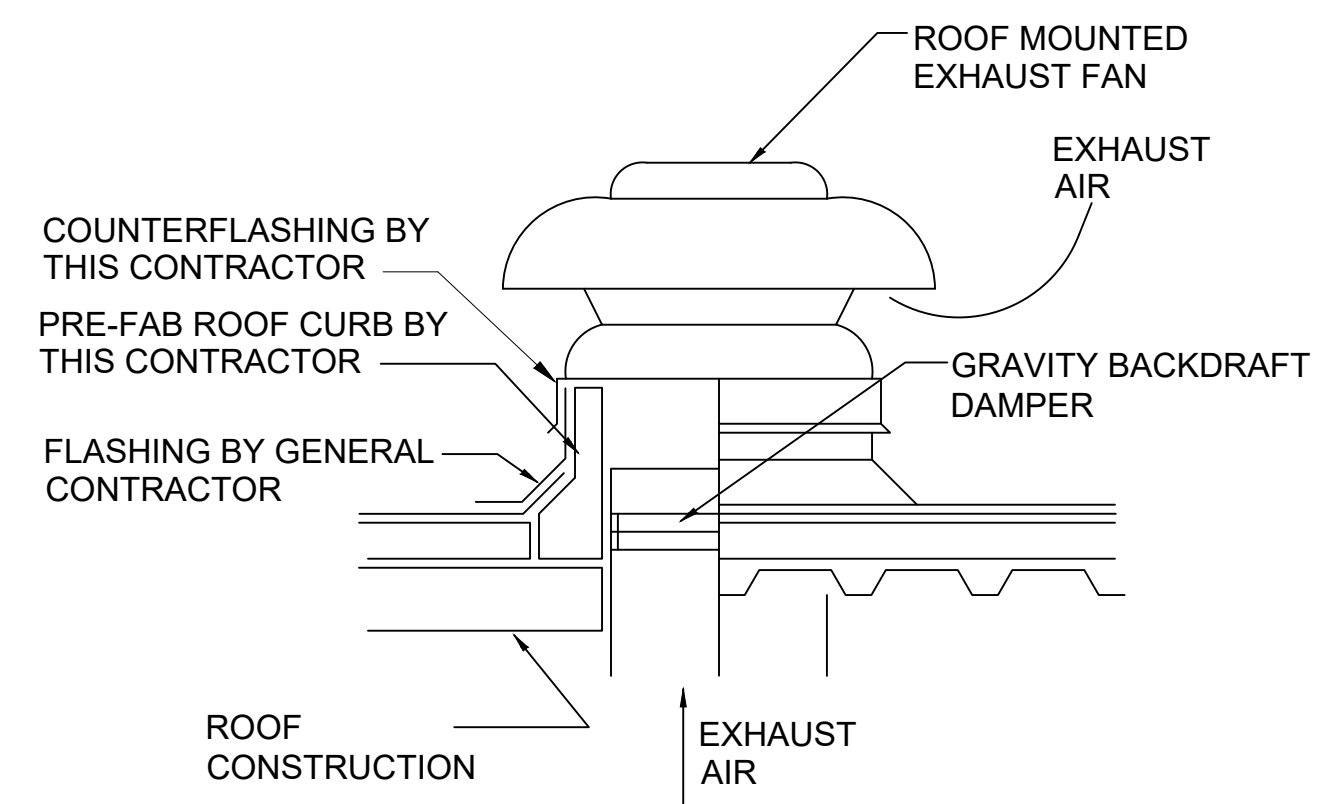
1 M002 SCALE = N/A
DUCTWORK DETAILS



NOTE: CONDENSATE TRAP SHALL BE CONSTRUCTED OF GALVANIZED STEEL OR PVC PIPING.
 3 M002 SCALE = N/A
CONDENSATE DRAIN DETAIL



2 M002 SCALE = N/A
FLEX DUCT TO DIFFUSER DETAIL



4 M002 SCALE = N/A
EXHAUST FAN (ROOF DOWN BLAST)

DATE: 04 MAR 2025
 COMM No: 25-02
 DRAWN BY: JNB
 CHECKED BY:
 STATE PROJECT No:

MECHANICAL DETAILS & SCHEDULES

MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS

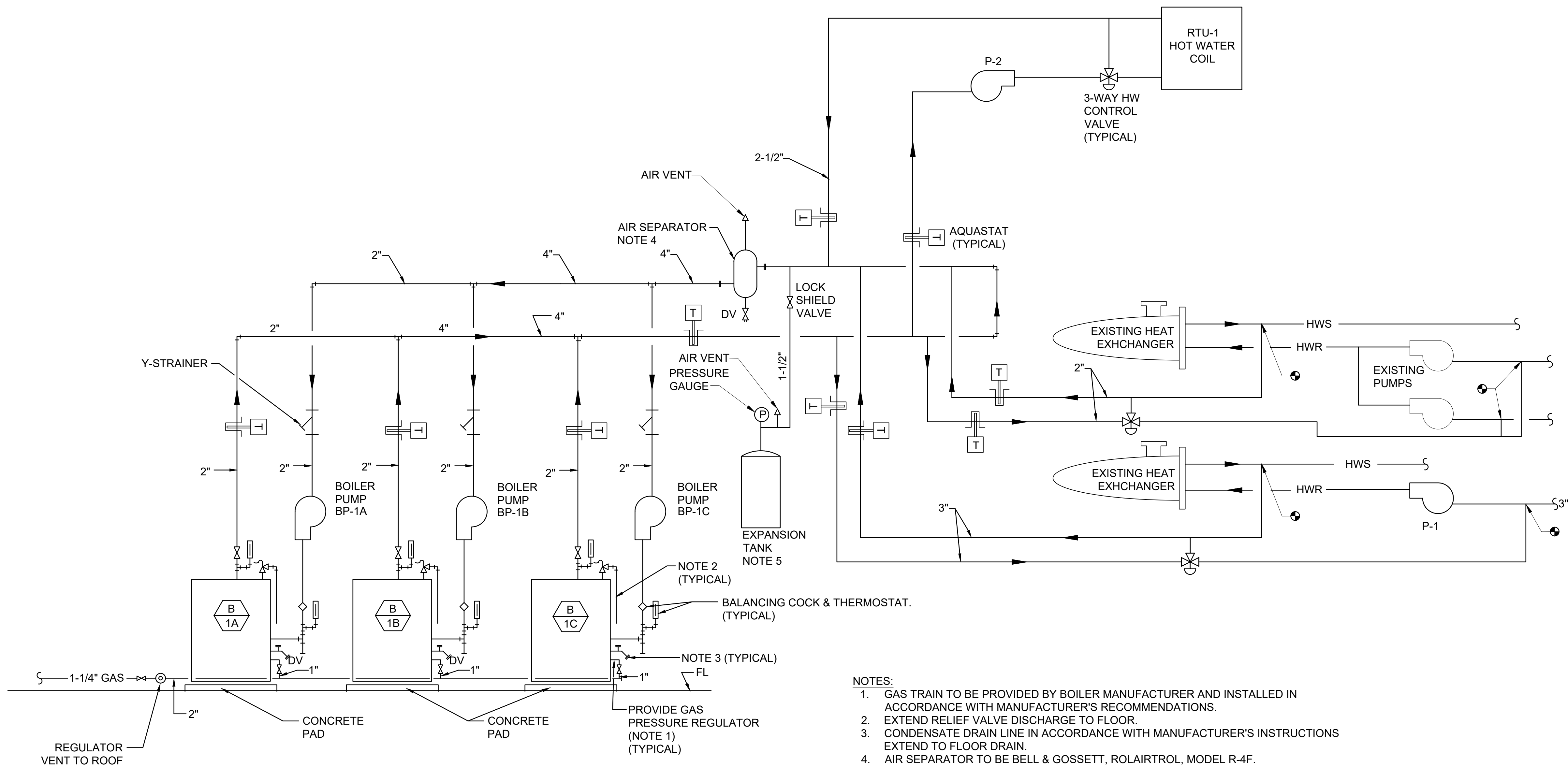


5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DATE

STOTTSBERG ENGINEERING
 www.stottsbergeng.com
 Project #25002

M002



1 HEATING WATER SYSTEM
 M003 SCALE = N/A

- NOTES:**
1. GAS TRAIN TO BE PROVIDED BY BOILER MANUFACTURER AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 2. EXTEND RELIEF VALVE DISCHARGE TO FLOOR.
 3. CONDENSATE DRAIN LINE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS EXTEND TO FLOOR DRAIN.
 4. AIR SEPARATOR TO BE BELL & GOSSETT, ROLAIRTROL, MODEL R-4F.
 5. EXPANSION TANK TO BE BELL & GOSSETT, SERIES "B", MODEL B400 W/ 106 GALLON ACCEPTANCE VOLUME.

DATE: 04 MAR 2025
 COMM No: 25-02
 DRAWN BY: JNB
 CHECKED BY:
 STATE PROJECT No:

MECHANICAL DETAILS

MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DESCRIPTION	DATE
No. <<<<		

STOTTSBERG ENGINEERING
 www.stottsbergeng.com
 Project #25002

M003

GENERAL SPECIFICATIONS

1. SCOPE:
 PROVIDE ALL MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO INSTALL AND MAKE READY FOR OWNER'S USE COMPLETE SYSTEMS OF HEATING, VENTILATION, AIR CONDITIONING (HVAC), PLUMBING, FOR THE PROPOSED WORK AND BUILDING RENOVATIONS AS SHOWN ON THE DRAWINGS AND CALLED FOR IN THESE SPECIFICATIONS.
 VISIT THE SITE TO OBTAIN DIMENSIONS, EXISTING LAYOUTS AND LOCATIONS AND EXISTING CONSTRUCTION DETAILS NOT SHOWN ON THESE DRAWINGS.
 THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION WITH OTHER DIVISIONS OF WORK FOR THE FULL EXTENT OF THE SCOPE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL ASPECTS, COMPONENTS, SYSTEMS, ETC. AND ACCOMMODATE THE PERFORMANCE INTENT OF THE CONSTRUCTION DOCUMENTS THROUGHOUT THE PROJECT SCOPE.

2. BIDDERS RESPONSIBILITY:
 EXAMINE THE DRAWINGS AND SPECIFICATIONS AND VISIT THE WORK SITE. BECOME FAMILIAR WITH THE CHARACTER OF THE WORK, THE COORDINATION WITH OTHER TRADES REQUIRED, AND ANY OTHER CONDITIONS THAT AFFECT THE COMPLETION OF THIS WORK. GENERAL CONTRACTOR SHALL BE REQUIRED TO COORDINATE WORK WITH TENANT FINISH CONTRACTOR IN A SIDE BY SIDE SCENARIO.

3. PERMITS, CODES AND LAWS:
 APPLY FOR ALL PERMITS AND PAY ALL FEES.
 ALL WORK SHALL BE IN ACCORDANCE WITH LATEST EDITIONS OF THE FOLLOWING RULES AND REGULATIONS, HEREIN REFERRED TO AS "CODES":
 THE LATEST OR ADOPTED EDITION OF THE APPLICABLE LOCAL, STATE, AND FEDERAL BUILDING, MECHANICAL, SANITATION, PLUMBING, ETC. CODES.
 UNDERWRITER'S LABORATORIES, INC. (U.L) NATIONAL FIRE PROTECTION ASSOCIATION (N.F.P.A.) OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (O.S.H.A)
 WHERE ANY OF THESE CODES ARE AT VARIANCE WITH THE DRAWINGS AND SPECIFICATIONS, THEIR REQUIREMENTS SHALL TAKE PRECEDENCE, UNLESS THE DRAWINGS AND SPECIFICATIONS REQUIREMENTS EXCEED THESE CODES. INCLUDE ANY COST NECESSARY TO MEET THESE CODES IN THE BID PRICE.

4. MECHANICAL PLANS:
 THE MECHANICAL PLANS ARE DIAGRAMMATIC AND BASED ON ONE MANUFACTURER'S EQUIPMENT.
 THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT. VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO BE USED.
 INSTALLATION SHALL BE WITHIN THE LIMITATIONS IMPOSED BY THE ARCHITECTURAL, STRUCTURAL, HVAC, ELECTRICAL, AND PLUMBING REQUIREMENTS WITH ADEQUATE SPACE FOR MAINTENANCE.

5. QUESTIONS AND CLARIFICATIONS OF BID DOCUMENTS:
 BIDDERS SHALL NOT RELY ON ANY ORAL CLARIFICATION OF THE DRAWINGS OR SPECIFICATIONS. ANY QUESTIONS OR CLARIFICATIONS SHALL BE REFERRED IN WRITING TO THE ARCHITECT.

6. GUARANTEES:
 ALL EQUIPMENT, MATERIALS, AND WORKMANSHIP SHALL BE GUARANTEED IN WRITING FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. WARRANTIES SHALL BE IN WRITING AND SHALL INCLUDE FACTORY WARRANTIES FOR EACH PIECE OF EQUIPMENT. PROVIDE A CERTIFICATE FOR EACH PIECE OF EQUIPMENT. CLEARLY INDICATE ON EACH WARRANTY CERTIFICATE THE MODEL NO., SERIAL NO., LOCATION, AND OWNER'S NAME.

7. COMPLETE SYSTEM:
 ALL PRODUCTS, MATERIALS AND ACCESSORIES SHALL BE FURNISHED AND INSTALLED AS REQUIRED FOR A COMPLETE SYSTEM READY FOR OWNER'S BENEFICIAL USE.

8. WORKMANSHIP:
 ALL WORK SHALL BE PERFORMED BY COMPETENT MECHANICS USING PROPER TOOLS AND EQUIPMENT TO PRODUCE FIRST QUALITY WORK. ALL WORK SHALL BE NEATLY INSTALLED, ACCESSIBLE FOR MAINTENANCE, AND COMPLETE WITH ALL ACCESSORIES REQUIRED.

9. ACCESSIBILITY:
 INSTALL ALL EQUIPMENT AND THEIR APPURTENANCES SUCH AS, BUT NOT LIMITED TO, VALVES, COILS, DRAIN PANS, DRAINS, DAMPERS, CONTROLS, MOTORS, CONTROLLERS, ETC., SO THAT THEY CAN BE SERVICED, RESET, REPLACED OR RECALIBRATED, ETC. INSTALL ALL NECESSARY ACCESS PANELS AND BUILDING ACCESS DOORS, AS BELOW, WHERE REQUIRED TO ACCOMPLISH THIS. IF ANY EQUIPMENT OR COMPONENTS DO NOT FIT WHERE INTENDED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING, REQUESTING FURTHER GUIDANCE.
 PROVIDE BUILDING ACCESS DOORS FOR ALL MECHANICAL EQUIPMENT REQUIRING SERVICE, INCLUDING BUT NOT LIMITED TO, AHU'S, FANS, DAMPERS, DUCT ACCESS PANELS, CONTROLS, PIPING, VALVES, REGULATORS, TRAPS, ETC., INSTALLED ABOVE HARD CEILINGS, BEHIND WALLS, AND BELOW FLOORS, FOR INSTALLATION BY OTHER DIVISIONS OF THE WORK. BUILDING ACCESS DOORS ARE NOT REQUIRED WHERE THE MECHANICAL EQUIPMENT IS INSTALLED ABOVE LAY-IN AND ACCESSIBLE SPLINE CEILINGS. OTHER TYPES OF SPLINE CEILINGS REQUIRE BUILDING ACCESS DOORS.
 SIZE THE BUILDING ACCESS DOORS FOR THE USE INTENDED, BUT NOT LESS THAN 12 INCHES BY 12 INCHES. WHERE HUMAN ACCESS IS REQUIRED, PROVIDE 24 INCHES BY 24 INCHES, OR LARGER. WHERE BUILDING ACCESS DOORS CANNOT BE INSTALLED FOR STRUCTURAL OR ARCHITECTURAL REASONS, NOTIFY THE ARCHITECT.
 PRIME COAT BUILDING ACCESS DOORS IN PAINTED AREAS WITH FINISH PAINTING AS SPECIFIED IN OTHER DIVISIONS.
 IN WET AREAS, TOILET ROOMS, OR AREAS WITH CERAMIC TILE FLOORS OR WALLS, PROVIDE STAINLESS STEEL BUILDING ACCESS DOORS.
 PROVIDE BUILDING ACCESS DOORS WITH A CONCEALED KEY OPERATED LOCK AND CONCEALED HINGES. ALL LOCKS SHALL BE KEYED ALIKE.
 PROVIDE BUILDING ACCESS DOORS AS SPECIFIED IN OTHER DIVISIONS OF THE WORK OR PROVIDE MILCOR DOORS, OR EQUIVALENT, SUITABLE FOR THE INSTALLATION INTENDED. PROVIDE FIRE RATED DOORS FOR ALL FIRE RATED WALLS, PARTITIONS, AND CEILINGS.

10. WORK BY OTHER TRADES:
 FURNISH ALL SLEEVE FRAMES, BUILDING ACCESS DOORS, PREFABRICATED EQUIPMENT CURBS, ROOF CURBS, ETC. FOR INSTALLATION BY OTHER TRADES.
 INSTALL ALL MOTORS AND FURNISH THE STARTING EQUIPMENT AND DISCONNECTS TO THE DIVISION 26000 SUBCONTRACTOR FOR INSTALLATION. CONTROL WIRING, INCLUDING SWITCHES, THERMOSTATS, INTERLOCKS, ETC. SHALL BE FURNISHED BY DIVISION 23000. ENSURE THAT THE ELECTRICAL EQUIPMENT MOUNTED NEAR THE MECHANICAL EQUIPMENT DOES NOT BLOCK ACCESS TO SERVICE AREAS OF THE MECHANICAL EQUIPMENT. DO NOT ALLOW ANY EQUIPMENT TO BE INSTALLED ON THE HVAC EQUIPMENT ENCLOSURES.

11. FIRE STOPPING:
 ALL PENETRATIONS OF FLOORS AND OTHER FIRE-RATED ASSEMBLIES SHALL BE FIRE AND SMOKE-STOPPED IN STRICT ACCORDANCE WITH THE APPLICABLE CODES.

12. FOUNDATIONS AND SPECIAL SUPPORTS:

FURNISH AND INSTALL ALL SPECIAL FOUNDATIONS AND SUPPORTS REQUIRED FOR EQUIPMENT INSTALLED UNDER THIS SECTION, UNLESS THEY ARE A PART OF THE BUILDING STRUCTURE AND ARE SHOWN IN OTHER SECTIONS.

13. CLEANING AND PAINTING:
 THOROUGHLY CLEAN ALL EQUIPMENT AND REMOVE ALL TRASH, CARTONS, ETC. MAKE ANY NECESSARY CORRECTIONS OR REPAIR/REPLACE ANY DAMAGED MATERIALS OR EQUIPMENT. LEAVE THE ENTIRE SYSTEM IN A THOROUGHLY CLEAN AND ORDERLY MANNER.
 ANY FINISHED SURFACES THAT HAVE BEEN SCRATCHED OR DISCOLORED SHALL BE TOUCHED-UP OR REPAINTED BREAK TO BREAK WITH PAINT TO MATCH THE ORIGINAL COLOR. TOUCH UP PAINTED SURFACES OR REPAINT THE ENTIRE PAINTED SURFACE IF TOUCH UP IS UNACCEPTABLE. SEE ARCHITECTURAL PAINTING SPECIFICATIONS.
 ALL METAL ITEMS SUBJECT TO RUSTING, INSIDE OR EXPOSED TO WEATHER SHALL BE GIVEN ONE COAT OF PROPER TYPE RUST PREVENTATIVE PRIMER AS SOON AS INSTALLED. APPLY TWO FINISH COATS WITH COLOR TO BE SELECTED BY THE ARCHITECT.
 FOR ALL INTERIOR OR EXTERIOR STRUCTURAL GALVANIZED STEEL, COLD GALVANIZE ALL EXPOSED METAL CUT ENDS, HOLES, WELDS, SCRATCHES, ETC., OR HOT DIP GALVANIZE THE ENTIRE STRUCTURE OR FRAME AFTER FABRICATION AND MOUNTING HOLES ARE CUT.
 UPON COMPLETION OF THE INSTALLATION, BUT NOT BEFORE, AND BEFORE ACCEPTANCE, THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, PIPING, DUCTWORK, INSULATION JACKETS, ETC., REMOVING ALL STICKERS, LABELS, MARKING, WRITING, FABRICATION MARKINGS, IDENTIFICATION, ADHESIVE, SEALER, GLUE, RUST, CORROSION, ETC., FROM THEIR EXTERIOR SURFACES.
 THE CLEANLINESS AND PAINTING ACCEPTABILITY IS AT THE SOLE DISCRETION OF THE ARCHITECT AND MAY REQUIRE ADDITIONAL CLEANING AND COATS OF PAINT BEFORE ANY SURFACE IS ACCEPTED.

14. SUBMITTAL AND SHOP DRAWINGS:
 SUBMIT MANUFACTURER'S CERTIFIED DATA RELATIVE TO ALL EQUIPMENT, PIPING, CONTROLS, ETC. REQUIRED FOR THE INSTALLATION OF THE HVAC, PLUMBING AND FIRE PROTECTION SYSTEMS. SUBMIT FOR REVIEW ALL NECESSARY ENGINEERING, PRODUCT AND INSTALLATION DATA, SHOP DRAWINGS, SAMPLES ETC. FOR ALL EQUIPMENT, MATERIAL, AND SYSTEMS TO ASCERTAIN COMPLIANCE WITH THE TECHNICAL REQUIREMENTS OF THE CONTRACT DOCUMENTS. SUBMIT SIX (6) COPIES OF ALL NECESSARY DATA, CUTS, MANUFACTURER'S SELECTIONS, CATALOGS, BULLETINS, INSTALLATION INSTRUCTIONS, DRAWINGS, DIAGRAMS, CURVES, ETC. CLEARLY INDICATE ON THE SUBMITTED DATA, THE MANUFACTURER'S NAME, PRODUCT NUMBER(S), OPTIONS, EQUIPMENT CAPACITY, DIMENSIONAL DATA, WEIGHTS, AND OTHER APPLICABLE TECHNICAL DATA FOR THE PROJECT.
 TRADE NAMES, MANUFACTURERS, AND CATALOGUE NUMBERS ARE MENTIONED HEREIN AND ON THE DRAWINGS SOLELY IN ORDER TO ESTABLISH A STANDARD FOR THE TYPE, GENERAL DESIGN, AND QUALITY OF PRODUCT REQUIRED. OTHER PRODUCTS SIMILAR IN DESIGN OF EQUIVALENT QUALITY CAPABLE OF FITTING WITHIN THE SPACES ALLOCATED AND COMPLYING WITH THE DRAWINGS AND SPECIFICATIONS WILL BE CONSIDERED AFTER THE CONTRACT IS LET UNLESS "PRIOR APPROVAL" REQUIREMENTS ARE SET FORTH IN THESE DOCUMENTS.
 WHERE TWO OR MORE MANUFACTURERS OR MATERIALS ARE NAMED, THE CONTRACTOR MAY SUBMIT ANY OF THOSE NAMES, PROVIDED THEY CONFORM TO THE SPECIFICATIONS AND DESIGN INTENT. CONTRACTOR SHALL INCLUDE WITH THE SUBMITTAL A LIST OF ALL COMPARATIVE FEATURES INDICATING COMPLIANCE WITH THE SPECIFICATIONS.
 THE ARCHITECT AND/OR ENGINEER MAY REQUIRE THE SUBMISSION OF SAMPLES, PARTICULARLY WHEREVER EQUIPMENT OR APPLIANCES ARE VISIBLE IN FINISHED AREAS, SUCH AS CEILINGS, INTERIOR AND EXTERIOR WALLS. THE CONTRACTOR AND SUPPLIER SHALL ARRANGE FOR DEMONSTRATIONS OF THE INSTALLATION OF ANY OF THESE PRODUCTS AND THEIR ABILITY TO PERFORM AS SPECIFIED, IF REQUIRED.
 REVIEW OF SUBMITTALS AND SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR FITTING THE EQUIPMENT IN THE SPACE ALLOTTED WITH SPACE FOR ALL CONNECTIONS AND SERVICING AND FOR THE COORDINATION OF THE WORK WITH WORK OF OTHER TRADES.

THE CONTRACTOR SHALL REVIEW ALL SUBMITTALS AND SHOP DRAWINGS AND INDICATE BY STAMP OR LETTER THAT HE HAS REVIEWED THEM, BEFORE FORWARDING THEM TO THE ARCHITECT AND/OR ENGINEER. SUBMITTALS AND DRAWINGS WILL BE RETURNED AFTER REVIEW INDICATING WHETHER EXCEPTIONS ARE TAKEN, THE SUBMITTAL RETURNED WITH CORRECTIONS, OR IS COMPLETELY REJECTED. RESUBMISSION OF REVISED SUBMITTALS AND SHOP DRAWINGS, IF REQUIRED, SHALL BE DONE BEFORE INSTALLATION AND CONSTRUCTION IS BEGUN.
 CORRECTIONS OR COMMENTS MADE ON THE SUBMITTALS AND DRAWINGS DURING THIS REVIEW DOES NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THIS REVIEW IS FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, FABRICATION PROCESSES, TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING WORK IN A SAFE AND SATISFACTORY MANNER. REVIEW OF THE SUBMITTALS SHALL NOT PERMIT ANY DEVIATION FROM PLANS AND SPECIFICATIONS.
 SUBMITTALS FOR A SPECIFIC CLASS OF PRODUCTS, SYSTEMS, INSTALLATION PROCEDURES, SHOP DRAWINGS, ETC. WILL BE REVIEWED BY THE ENGINEER ONE TIME AND ITS RESUBMITTAL ONE TIME, IF NECESSARY, AS ABOVE, AT NO COST TO THE CONTRACTOR. THE CONTRACTOR WILL BEAR THE FULL COST FOR ALL SUBSEQUENT RESUBMITTAL REVIEWS AT THE ENGINEER'S STANDARD HOURLY RATES. PAYMENT WILL BE REQUIRED AT COMPLETION OF RESPECTIVE REVIEW.
 REQUIRED SHOP DRAWINGS:
 SUBMIT THE FOLLOWING SHOP DRAWINGS BEFORE ANY MECHANICAL DUCTWORK, PIPING, EQUIPMENT, ETC. IS FABRICATED AND INSTALLED. SUBMIT THESE SHOP DRAWINGS IN 1/4 INCH PER FOOT MINIMUM SCALE WITH NECESSARY PLANS, ELEVATIONS, SECTIONS, DETAILS, AND ISOMETRICS. SUBMIT SIX (6) PAPER COPIES AND ONE (1) CD-ROM WITH ALL THESE DRAWINGS IN AUTOCAD DRAWING DWG FILES, LATEST AUTOCAD FORMAT.
 SOON AFTER AWARD OF THE CONTRACT, DETERMINE WHERE THERE MAY BE INSTALLATION, SPACE CONCERNS, AND/OR WHERE OTHER CONFLICTS MAY OCCUR. SUBMIT COORDINATION DRAWINGS, RELATING TO THESE CONFLICTS WITH THE MECHANICAL EQUIPMENT, DUCT, PIPING, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL SYSTEMS ETC., SHOWING CLEARANCES AND RELATIONSHIP TO STRUCTURAL MEMBERS, PIPING, LIGHTS, CONDUITS, ELECTRICAL EQUIPMENT, AND BUILDING COMPONENTS. IN PREPARING THESE SHOP DRAWINGS, ESTABLISH LINES AND LEVELS FOR ALL DIVISIONS OF THE WORK IN THE AFFECTED AREA. IMMEDIATELY CALL TO THE ATTENTION OF THE ARCHITECT ANY INTERFERENCE OR CONFLICT FOR CLARIFICATION IN WRITING.
 SUBMIT SHOP DRAWINGS FOR ALL DUCTWORK.
 SUBMIT LAYOUT DRAWINGS OF EACH MECHANICAL SYSTEM SHOWING THE LOCATION, ARRANGEMENT, ETC. OF ALL EQUIPMENT, ALL TRADES, ETC. TO BE INSTALLED RELATED TO THE

RESPECTIVE SYSTEM.

15. AS-BUILT DRAWINGS:
 MAINTAIN DAILY UPDATED DRAWINGS SHOWING DEVIATIONS FROM CONSTRUCTION DOCUMENTS. AT THE END OF THE PROJECT, PROFESSIONALLY PREPARE AS-BUILT DRAWINGS AND SUBMIT THREE COPIES, ONE REPRODUCIBLE.

16. OPERATION AND MAINTENANCE MANUALS:
 UPON COMPLETION OF THE PROJECT, SUBMIT THREE COPIES OF ALL OPERATION AND MAINTENANCE MANUALS, WARRANTIES, SPARE PARTS LIST, AS-BUILT DRAWINGS, TEST AND BALANCE REPORTS, AND LETTER OF GUARANTEE ALL BOUND IN THREE RING BINDERS, CLEARLY SHOWING WHICH EQUIPMENT WAS SUPPLIED TO THE JOB.

17. PROJECT COMPLETION:
 BEFORE STARTING AND TESTING ANY SYSTEM, HVAC, OR PLUMBING, TO PREVENT INADVERTENT OPERATION OF THE MECHANICAL EQUIPMENT BEFORE THE MANUFACTURER'S INSPECTION AND TESTING, THE CONTRACTOR SHALL:
 VERIFY THAT ALL ELECTRICAL POWER IS OFF TO ALL MECHANICAL EQUIPMENT, INCLUDING THE AHU'S, ACCU'S, BOOSTER PUMPS, FIRE PUMPS, ETC.
 LOCK OUT EACH SYSTEM USING SETON MODEL NUMBER 70329; "DO NOT OPERATE" LOCK ON LOCKOUT TAGS, OR EQUIVALENT. INSTALL LOCKOUT TAGS AT EACH PIECE OF EQUIPMENT, ELECTRICAL DISCONNECTS, STARTERS, SWITCHES, ETC.
 REMOVE THESE TAGS ONLY WHEN THE MANUFACTURER APPROVES OF THE EQUIPMENT INSTALLATION IN WRITING.
 EACH MANUFACTURER OR THEIR REPRESENTATIVE SHALL INSPECT THEIR EQUIPMENT FOR COMPLIANCE TO THEIR INSTALLATION REQUIREMENTS AND RECOMMENDATIONS.
 IN ADDITION, THE COMPRESSOR MANUFACTURER SHALL INSPECT EACH REFRIGERANT PIPING INSTALLATION FOR ADHERENCE TO THE APPROVED REFRIGERANT PIPING DIAGRAMS, ROUTING.
 EACH MANUFACTURER SHALL PREPARE A PUNCH LIST OF ALL DEFICIENCIES, IN WRITING WITH COPIES TO THE ARCHITECT AND CONTRACTOR.
 EACH MANUFACTURER SHALL REINSPECT THE EQUIPMENT AFTER THE CONTRACTOR HAS CORRECTED ALL DEFICIENCIES.
 WHEN THE MANUFACTURER HAS GIVEN THEIR WRITTEN APPROVAL WITH COPIES TO THE ARCHITECT AND CONTRACTOR, THE CONTRACTOR MAY REMOVE THE LOCKOUT TAGS, SAFELY START, AND TEST THE EQUIPMENT, AS REQUIRED HEREIN.
 CONTRACTOR SHALL PROVIDE FOR ALL NECESSARY DRILLING OF WALL STUDS, CEILING JOISTS, PLATES, FINISHES, ETC. TO ACCOMMODATE ROUTING AND INSTALLATION OF ALL PIPING, DUCT, ETC.
 HVAC EQUIPMENT, METHODS AND MATERIALS

18. DUCTWORK GENERAL:
 DUCT SIZES SHOWN ON THE DRAWINGS ARE INSIDE DIMENSIONS AND DO NOT TAKE INTO ACCOUNT LINING THICKNESS. DUCTWORK SHALL BE GALVANIZED SHEET METAL WITH GAUGES, CONSTRUCTION DETAILS AND INSTALLATION ACCORDING TO N.F.P.A. STANDARD 90A, ASHRAE, AND SMACNA DUCT CONSTRUCTION MANUALS AND REQUIREMENTS.
 PROVIDE FLEXIBLE CONNECTIONS AT AIR HANDLING UNITS AND FANS. PROVIDE SINGLE THICKNESS TURNING VANES IN ELBOWS.
 PAINT DUCTS, SLEEVES, PLENUMS, ETC., INTERIORS VISIBLE THROUGH AIR DEVICES WITH A MINIMUM OF ONE COAT OF PROPER TYPE RUST PREVENTATIVE PRIMER, SUITABLE FOR GALVANIZED STEEL, AND TWO FINISH COATS OF FLAT BLACK PAINT.

19. DUCT CONSTRUCTION MATERIALS:
 RECTANGULAR SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST: LINED GALVANIZED SHEET METAL. ROUND DUCT AND RUN-OUTS: EXTERNALLY INSULATED GALVANIZED SHEET METAL DUCTS WITH SPIRAL LOCK SEAMS.
 FLEXIBLE DUCT: PRE-INSULATED FLEXIBLE DUCT. NO FLEXIBLE DUCT RUNS LONGER THAN 5 FEET. PROVIDE DRYER VENT PIPING INSTALLED AS REQUIRED BY THE MANUFACTURER AND PER CODE USING 4 INCH ROUND GALVANIZED STEEL, SEALED AND SUPPORTED. THE USE OF FLEXIBLE DRYER VENT PIPE IS PROHIBITED.

20. FABRICATION, ERECTION, AND SUPPORT:
 ALL DUCTWORK SHALL BE FABRICATED, ERECTED, BRACED, AND SUPPORTED IN STRICT ACCORDANCE WITH THE LATEST EDITIONS OF SMACNA AND ASHRAE REQUIREMENTS.

21. ACOUSTIC LINED DUCTWORK:
 ACOUSTICALLY AND THERMALLY LINE 10' OF RECTANGULAR SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCT AND PLENUMS WITH 1" THICK, 1 1/2 PCF FIBERGLASS DUCT LINER, APPLIED PER THE MANUFACTURER'S AND NAIMA REQUIREMENTS. DUCT LINER SHALL MEET AND/OR EXCEED ASHRAE'S I.A.Q. STANDARD 62. USE WELDED STICK CLIPS, IN LIEU OF ADHESIVE TYPE FASTENERS AND FULL COVERAGE ADHESIVE. PROVIDE EDGE NOSINGS WHERE REQUIRED. COAT ALL EXPOSED FIBERGLASS WITH HARDCAST "LAG-GRIP 671".

22. JOINT SEALING:
 SEAL ALL DUCT JOINTS AND SEAMS (LONGITUDINAL AND TRANSVERSE) WITH HIGH PRESSURE DUCT SEALER, HARDCAST "IRON-GRIP 601" OR APPROVED EQUIVALENT. REINFORCED FOIL BACKED TAPES, CLOTH OR PLASTIC BACKED TAPES (DUCT TAPE) ARE NOT ACCEPTABLE.

23. FLEXIBLE AIR DUCT:
 DUCT SHALL BE UL LISTED UL-181, CLASS I AIR DUCT MATERIAL AND SHALL COMPLY WITH N.F.P.A 90A AND 90B AND ALL LOCAL REQUIREMENTS. DUCT SHALL HAVE AN OPERATING AIR PRESSURE OF 6 INCHES WG POSITIVE AND 4 INCHES WG NEGATIVE, ACOUSTICAL DOUBLE LAMINATED INNER FABRIC BONDED TO A STEEL HELIX WIRE. OUTER JACKET FIRE RETARDANT REINFORCED ALUMINUM MYLAR WITH FIBERGLASS INSULATION. FLEXMASTER TYPE "8M" ACOUSTICAL INSULATED OR EQUIVALENT.
 MAKE ALL FLEXIBLE DUCT CONNECTIONS TO HARD DUCT USING STAINLESS STEEL SCREW CLAMPING BANDS AND SEALED AIR TIGHT WITH HIGH PRESSURE DUCT SEALER. PLASTIC BANDS ARE NOT ACCEPTABLE.
 SEAL FLEXIBLE DUCT VAPOR BARRIER TO HARD DUCT AND/OR ADJACENT INSULATION. NO EXPOSED FIBERGLASS SHALL BE VISIBLE.

24. AIR DISTRIBUTION DEVICES:
 COORDINATE THE EXACT LOCATIONS OF ALL AIR DEVICE NEEDS WITH THE ARCHITECTURAL DRAWINGS PRIOR TO INSTALLATION. COORDINATE THE EXACT LOCATION OF EACH OUTLET WITH THE ARCHITECT WITH REGARD TO CEILING AND WALL SPACING, CENTERING ALONG SOFFITS, WALLS, ETC.
 FURNISH AND INSTALL WHERE SHOWN ON THE DRAWINGS ALL DIFFUSERS, GRILLES, AND REGISTERS OF THE SIZE, TYPE, AND CAPACITY AS INDICATED IN THE AIR DEVICE SCHEDULE. ELBOWS:
 25. TURNING VANES AND SMOOTH RADIUS ELBOW (WITHOUT VANES):
 AT ALL DUCT TURNS OF 45 DEGREES OR MORE, PROVIDE SINGLE THICKNESS TURNING VANES PER SMACNA REQUIREMENTS. ALTERNATIVELY, USE SMOOTH RADIUS ELBOW (R/W = 1.5).
 26. BRANCH TAKEOFF FITTINGS:
 AT ALL MAIN TO BRANCH DUCT TAPS, TAKEOFFS, OR RUN-OUTS, PROVIDE 45 DEGREE ENTRANCE TAPS, AS DETAILED BY SMACNA STANDARDS.

DATE:	04 MAR 2025
COMM No:	25-02
DRAWN BY:	JNB
CHECKED BY:	
STATE PROJECT No:	

MECHANICAL SPECIFICATIONS

MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DESCRIPTION	DATE	No.			
			<	<	<	<

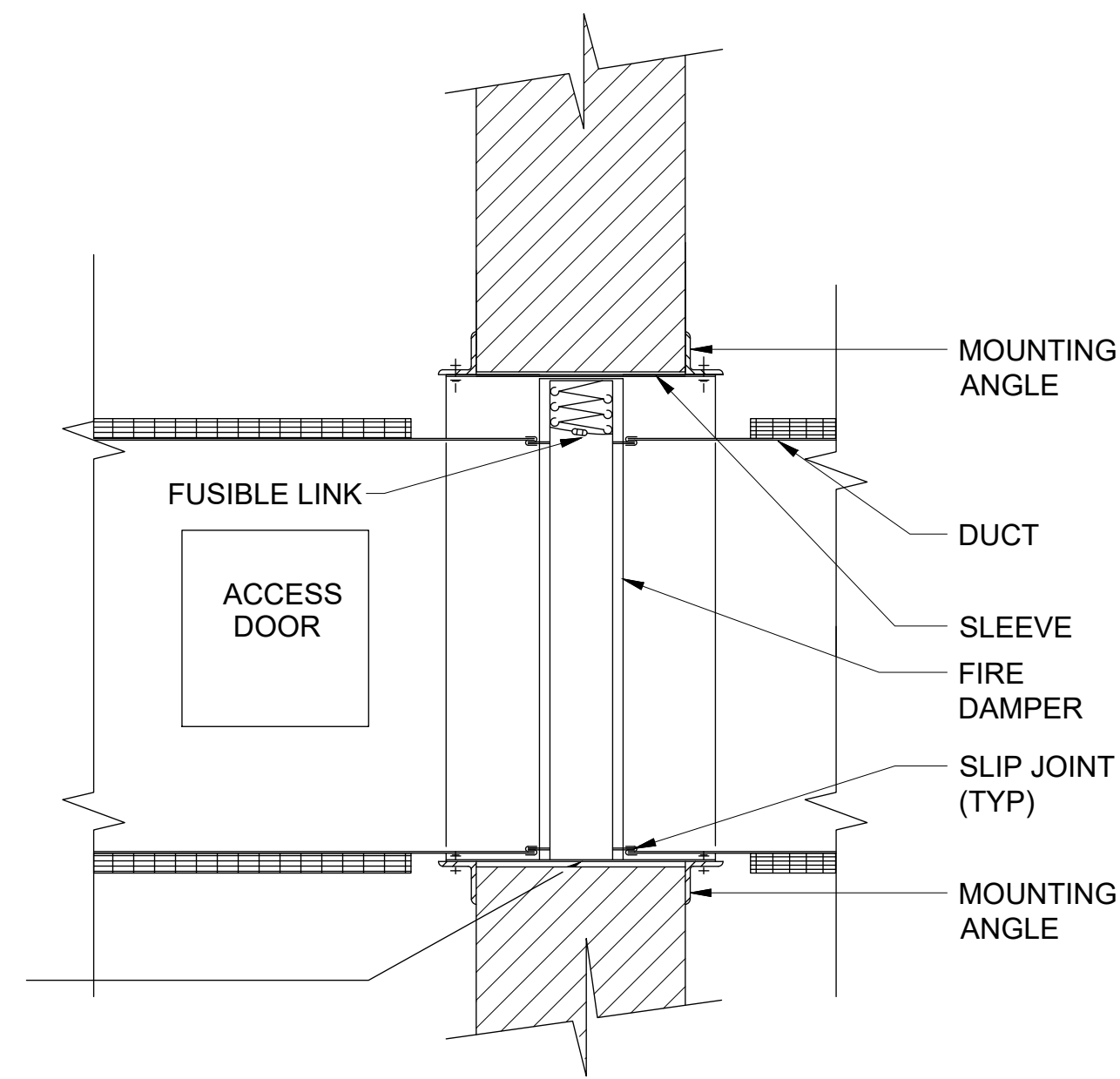
STOTTSBERG ENGINEERING
 www.stottsbereg.com
 Project #25002

M004

27. DUCT MOUNTED ACCESS PANELS:
 INSTALL ACCESS PANELS AS FOLLOWS:
 AT INLET OF EACH DUCT MOUNTED FIRE AND MOTORIZED DAMPER.
 FOR DUCT MOUNTED CONTROLS.
 AS REQUIRED AND DIRECTED BY THE TEST AND BALANCE CONTRACTOR.
 WHERE REQUIRED FOR DUCT INSPECTION, MAINTENANCE, AND CLEANING.
 ACCESS PANELS SHALL BE 18 INCHES X 18 INCHES OR LARGEST DUCT WILL ALLOW. NORMALLY
 CENTER THE ACCESS PANEL IN THE BOTTOM OF THE DUCT AS CLOSE AS POSSIBLE TO THE DUCT
 MOUNTED DEVICE. ACCESS PANELS MAY BE INSTALLED ON THE SIDE OF THE DUCT, WHERE
 NECESSARY.
 ACCESS PANELS SHALL BE DOUBLE WALL INSULATED HINGED WITH NEOPRENE GASKETS AND
 CAM LOCKS ON EACH UNHINGED SIDE. WHERE REQUIRED BECAUSE OF PANEL OPENING
 CLEARANCE, SUBSTITUTE UNHINGED ACCESS PANELS WITH CAM LOCKS ON EACH SIDE AND
 CAPTIVE CHAIN. ACCESS PANELS SHALL BE FLEXMASTER "TBSM-TAB DOOR" GREENHECK MODEL
 "HAD-10", OR EQUIVALENT.
 28. REFRIGERANT PIPING:
 REFRIGERANT PIPING SHALL CONFORM TO THE REQUIREMENTS OF THE SAFETY CODES FOR
 MECHANICAL REFRIGERATION AND REFRIGERANT PIPING AND THE MANUFACTURER
 REQUIREMENTS.
 RUN ALL PIPING SQUARE TO BUILDING LINES WHEREVER POSSIBLE. FIELD ROUTE PIPING IN
 ORDER TO PROVIDE FOR EASE OF ACCESS TO VALVES AND OTHER APPURTENANCES.
 SUPPORT INTERIOR PIPING FROM THE BUILDING STRUCTURE USING COPPER OR PVC COATED
 HANGERS. SUPPORT REFRIGERANT PIPING 4 FOOT ON CENTER AND AT EACH CHANGE OF
 DIRECTION. PROVIDE 4" WIDE INSULATION SADDLES.
 SUBMIT REFRIGERANT PIPING LAYOUT SHOP DRAWINGS FOR EACH UNIQUE SYSTEM, REVIEWED
 AND APPROVED BY THE MANUFACTURER, IN WRITING. SHOW ALL FILTERS, DRIERS,
 SIGHT-GLASSES, VALVES, ETC. AS REQUIRED BY THE MANUFACTURER.
 USE REFRIGERANT GRADE, TYPE "K" HARD DRAWN COPPER PIPE WITH LONG RADIUS ELBOWS.
 NO CAST FITTINGS ARE ACCEPTABLE.
 INSTALL FILTER DRIER EQUIVALENT TO SPORLAN CATCH-ALL.
 INSTALL SIGHT GLASSES WITH MOISTURE INDICATORS COVERED BY A PROTECTIVE CAP. LOCATE
 THE SIGHT GLASSES INSIDE THE BUILDINGS, CLOSE TO THE FAN COIL IN THEIR RESPECTIVE
 MECHANICAL CLOSETS.
 PROVIDE EXTERNAL FRONT SEATED BRASS SERVICE VALVES WITH SWEAT CONNECTIONS, WITH
 SERVICE PORTS FOR CHECKING OPERATING REFRIGERANT PRESSURES.
 COPPER SHALL BE CLEANED AND SHINED BEFORE BRAZING. BRAZE USING J.W. HARRIS
 "DYNAFLOW" 6% SILVER BRAZING ALLOY.
 PIPING SHALL BE PURGED WITH DRY NITROGEN WHILE BRAZING TO PREVENT OXIDATION. UPON
 COMPLETION OF A WELD, THE WELD SHALL BE WIPED WITH A DAMP RAG TO REMOVE FLUX
 WHILE STILL HOT.
 ALL PIPING SHALL BE TESTED FOR 24 HOURS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE
 AND PROVEN TIGHT:
 DISCHARGE AND LIQUID REFRIGERANT PIPING--300 PSIG, NITROGEN.
 SUCTION REFRIGERANT PIPING--150 PSIG NITROGEN.
 REFRIGERANT PIPING, AFTER PROVEN TIGHT, SHALL BE EVACUATED BY MEANS OF AN APPROVED
 VACUUM PUMP TO A VACUUM OF 2.5 MM HG ABSOLUTE. SYSTEMS SHALL STAND UNDER
 VACUUM WITH VACUUM PUMP OFF FOR A MINIMUM OF 12 HOURS. SYSTEMS MAY BE CHARGED
 WITH PROPER REFRIGERANT AFTER ARCHITECT'S APPROVAL OF VACUUM TEST. A DEHYDRATOR
 SHALL BE USED IN CHARGING HOSE DURING CHARGING OF SYSTEMS WITH REFRIGERANT.
 29. GENERAL
 THIS SECTION APPLIES TO ALL MECHANICAL WORK.
 ALL INSULATION SHALL BE IN STRICT ACCORDANCE WITH ASHRAE STANDARDS AND ALL LOCAL
 AND STATE ENERGY CODES.
 THE INSULATION WORK SHALL BE PERFORMED BY A FIRM REGULARLY ENGAGED IN THIS TYPE
 WORK USING MECHANICS SKILLED IN THE TRADE.
 INSTALL ALL MATERIALS AS RECOMMENDED BY THE MANUFACTURER FOR THE SERVICE
 INTENDED. ALL INSULATION MATERIAL, INCLUDING SEALER MATERIAL, ADHESIVES, COVERING
 MATERIAL, FINISH, ETC. SHALL HAVE A U.L. LISTED FLAME SPREAD RATING NOT OVER 24
 WITHOUT EVIDENCE OF CONTINUED PROGRESSIVE COMBUSTION AND WITH A SMOKE
 DEVELOPED RATING NOT HIGHER THAN 50. ALL COATINGS AND COVERINGS FOR HOT SERVICE
 SHALL BE BREATHER TYPE AND VAPOR BARRIER TYPE FOR COLD SERVICE.
 HVAC PIPING:
 INSULATE REFRIGERANT SUCTION LINES AND ALL CONDENSATE DRAIN LINES WITH 1" THICK
 CLOSE CELLED ELASTOMERIC INSULATION INSTALLED PER THE MANUFACTURERS REQUIREMENTS.
 PAINT EXTERIOR INSULATION WITH TWO COATS OF PAINT AS REQUIRED BY THE INSULATION
 MANUFACTURER.
 EXTERNALLY INSULATED DUCTS:
 EXTERNALLY INSULATE ALL ROUND SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK
 WITH 1 1/2" THICK (3/4 LBS/CU. FT. DENSITY) DUCT WRAP WITH ALUMINUM ALL SERVICE JACKET,
 VAPOR BARRIER, EXCEPT PRE-INSULATED FLEXIBLE DUCT.
 30. EQUIPMENT:
 CAPACITY, PERFORMANCE AND CHARACTERISTICS OF EQUIPMENT SHALL BE AS INDICATED ON
 THE DRAWINGS AND AS SPECIFIED OR IMPLIED HEREIN. CONTRACTOR SHALL BE RESPONSIBLE
 FOR ANY INCREASED COST TO HIMSELF OR OTHERS FOR EQUIPMENT WHICH DEVIATES FROM
 THAT SCHEDULED OR IMPLIED HEREIN. REGARDLESS OF COST AFFECT, THE ARCHITECT MUST
 APPROVE ANY DEVIATION FROM THE DRAWINGS AND THE SPECIFICATION.
 31. MOTORS AND STARTERS:
 ALL ELECTRIC MOTORS SHALL BE HIGH EFFICIENCY TYPE WITH MAXIMUM OF 1750 RPM WITH
 OPEN DRIP PROOF OR TEFC ENCLOSURES, UNLESS OTHERWISE NOTED. MOTORS LOCATED ON
 AIR HANDLING UNITS SHALL BE MOUNTED IN RUBBER SUPPORTS OR THE FAN SHALL BE
 INDEPENDENTLY SUPPORTED ON SPRING ISOLATORS. MOTORS LOCATED IN THE CONDITIONED
 SPACE SHALL BE SELECTED FOR QUIET OPERATION AND SHALL NOT PRODUCE AN OBJECTIONABLE
 "MOTOR NOISE" IN THE SPACE.
 ELECTRICAL CHARACTERISTICS SHALL BE VERIFIED FROM THE ELECTRICAL DRAWINGS, PRIOR TO
 BIDDING, AND VERIFIED ON THE JOB WITH THE ELECTRICAL SUB-CONTRACTOR. IF A CONFLICT
 ARISES, THE ELECTRICAL DRAWINGS SHALL BE THE AUTHORITY.
 PROVIDE MOTOR STARTERS AND PROPER HEATER ELEMENTS SIZED IN ACCORDANCE WITH NFPA
 70. STARTERS SHALL BE SQUARE-D OR EQUIVALENT WITH OVERLOAD TRIP ELEMENT IN EACH
 PHASE. LARGER MOTORS AND THEIR STARTERS SHALL MEET THE REQUIREMENTS OF THE UTILITY
 COMPANY AS TO INRUSH ALLOWABLE AND THE TYPE OF STARTING PERMITTED.
 SHOULD ANY MECHANICAL EQUIPMENT REQUIRE EXTRA WORK BY OTHER TRADES, FOR PROPER
 INSTALLATION, THIS CONTRACTOR SHALL BEAR ALL COSTS, SUCH AS INCREASED ELECTRICAL,
 STRUCTURAL, ROOFING, ETC.

32. SYSTEMS TEST AND BALANCE:
 THE REQUIRED TEST & BALANCE OF THE HVAC SYSTEM SHALL BE PERFORMED BY
 AN APPROVED INDEPENDENT TESTING AGENCY AS SPECIFIED BELOW.
 AGENCY QUALIFICATIONS:
 TEST & BALANCE AGENCY (TBA) SHALL BE PERFORMED BY AN INDEPENDENT
 AGENCY ENGAGED SOLELY IN TEST AND BALANCE WORK. AGENCY SHALL BE A
 MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) AND NATIONAL
 ENVIRONMENTAL BALANCING BUREAU, (NEBB).
 SUBMIT A WRITTEN REPORT WITHIN 30 DAYS OF COMMENCING WORK, WITH ANY
 RECOMMENDED CHANGES TO INSURE BALANCING CAPABILITY.
 SUBMIT A DETAILED TEST PLAN TO THE ARCHITECT ILLUSTRATING ALL FORMATS,
 DRAWINGS, AND TEST PROCEDURE TO BE USED FOR TESTING THE COMPLETED
 SYSTEM. THE APPROVED PLAN WILL BE USED FOR TESTING THE SYSTEMS.
 PROCEDURES SHALL INCLUDE REQUIREMENTS LISTED IN AABC/NEBB STANDARDS,
 LATEST EDITION AND ANY SPECIAL REQUIREMENTS FOR THIS PROJECT.
 MAKE PROJECT VISITS AS REQUIRED DURING CONSTRUCTION PERIOD
 INSPECTING FOR PROPER INSTALLATION OF THE SYSTEM AND RELATED
 BALANCING DEVICES. PROJECT VISIT REPORTS SHALL BE MADE TO THE
 ARCHITECT IN WRITING.
 CONTRACTORS REQUIREMENTS PRIOR TO TEST & BALANCE:
 THE CONTRACTOR SHALL PERFORM ALL REQUIRED PRELIMINARY TESTS AND
 OTHER PREPARATORY WORK, INCLUDING BUT NOT LIMITED TO:
 MAKE SURE ALL FANS ARE OPERATING. CHECK ROTATION, RPM, AND AMPS.
 CHECK ALL DAMPERS FOR OPERATION.
 PUT ALL HVAC EQUIPMENT IN FULL OPERATION INCLUDING AIR UNITS, ACCU'S AND
 FANS. MAKE SURE ALL HVAC CONTROLS ARE INSTALLED AND FULLY
 OPERATIONAL. CLEAN/REPLACE FILTERS JUST PRIOR TO TESTING.
 PROVIDE ALL BALANCING DEVICES AND DRIVE CHANGES THAT ARE DEEMED
 NECESSARY BY T&B AGENCY FOR BALANCE AT NO ADDITIONAL COST TO THE
 OWNER.
 TEST & BALANCE AGENCY SHALL BALANCE ALL AIR SYSTEMS FOR OPERATION
 WITHIN DESIGN CRITERIA. PRIME MOVERS SHALL BE WITHIN 5% OF DESIGN AND
 TERMINALS WITHIN 10% OF DESIGN.
 AIR SYSTEMS SHALL BE BALANCED AS DESCRIBED HEREIN.
 TEST REPORT:
 THE TBA SHALL PREPARE FIVE (5) COPIES OF A FINAL COMPREHENSIVE TEST
 REPORT IN THE FOLLOWING FORMAT.
 REPORT SHALL BE BOUND 8-1/2 X 11" WITH SUBSTANTIAL COVERS USING
 APPROVED FORMS. TYPED OR COMPUTER GENERATED REPORTS ARE
 ACCEPTABLE.
 REPORT SHALL BE INDEXED.
 TABLE OF CONTENTS SHALL LIST ALL REPORTS.
 ALL AIR OUTLETS SHALL BE LOCATED ON CODED DRAWINGS PREPARED BY THE
 T&B AGENCY. AIR OUTLETS FORMS SHALL BE PREPARED AND CORRELATED TO
 THE CODED DRAWINGS.
 TEST SUMMARY SHALL DESCRIBE FINAL TEST PROCEDURES AND SPECIAL
 CONDITIONS DURING TESTS (SUCH AS THERMOSTAT OUTSIDE/RETURN AIR
 RELATIONSHIP), AND DUCT STATIC PRESSURE.
 DESCRIBE OTHER DATA THAT MAY ASSIST OPERATING PERSONNEL IN THE
 CONTINUING OPERATION OF THE SYSTEM.
 T&B CONTRACTOR SHALL TAKE AND RECORD ALL NECESSARY READINGS AT THE
 FINAL BALANCE POINTS, SUCH AS BUT NOT LIMITED TO: AIR QUANTITIES,
 PRESSURES, SETPOINTS, ENTERING AND LEAVING COIL TEMPERATURES, SPACE
 INDOOR AND OUTSIDE WET AND DRY BULB TEMPERATURES, OUTDOOR WEATHER
 CONDITIONS, ELECTRICAL READINGS OF ALL NEW AND EXISTING MOTORS,
 COMPRESSORS, ETC.
 TEST REPORT SHALL CONTAIN TBA CERTIFICATION OF TEST DATA AND SYSTEM
 CONDITIONS. SUBMIT THE TEST REPORTS, FOR REVIEW, BEFORE SUBSTANTIAL
 COMPLETION.
 32. CONTROLS:
 ALL CONTROLS FOR THE NEW MECHANICAL SYSTEMS WILL BE PROVIDED BY THE
 OWNER UNDER A SEPARATE CONTRACT. ALL CONTROL INSTALLATION AND
 WIRING SHALL BE PROVIDED BY CONTRACTOR PER OWNERS SPECIFICATIONS
 (TYPICAL).

END OF MECHANICAL SPECIFICATIONS.



FIRE DAMPER DETAIL

NO
SCALE

DATE:	04 MAR 2025
COMM No:	25-02
DRAWN BY:	JNB
CHECKED BY:	
STATE PROJECT No:	

MECHANICAL SPECIFICATIONS

MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

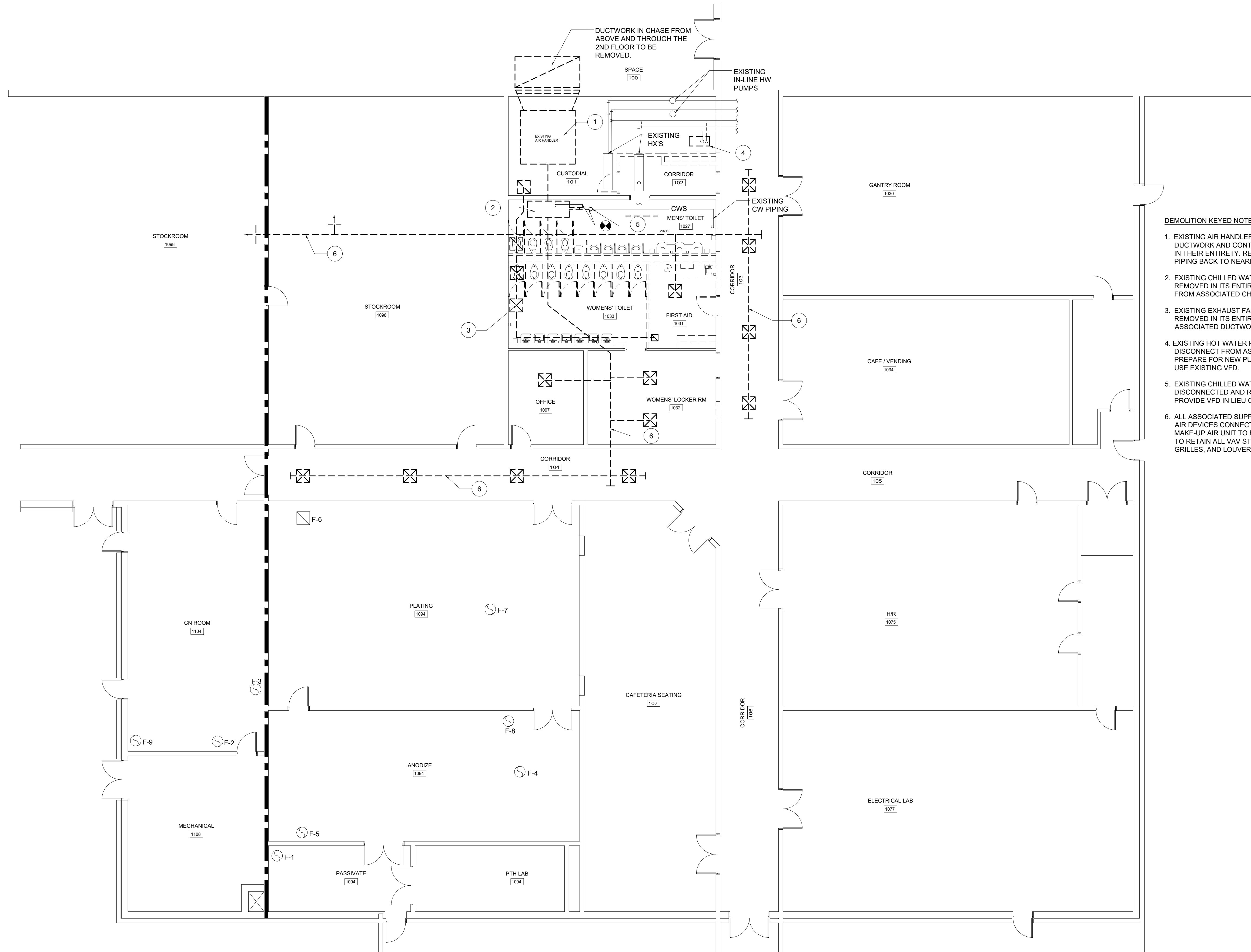
REVISIONS	DATE			
	DESCRIPTION			
No:	<	<	<	<



**STOTTSBERG
 ENGINEERING**

www.stottsbergeng.com
 Project #25002

M005



- DEMOLITION KEYED NOTES:**
1. EXISTING AIR HANDLER AND ASSOCIATED DUCTWORK AND CONTROLS TO BE REMOVED IN THEIR ENTIRETY. REMOVE ALL STEAM PIPING BACK TO NEAREST MAIN AND CAP.
 2. EXISTING CHILLED WATER COIL TO BE REMOVED IN ITS ENTIRETY. DISCONNECT FROM ASSOCIATED CHILLED WATER PIPING.
 3. EXISTING EXHAUST FAN ON ROOF TO BE REMOVED IN ITS ENTIRETY ALONG WITH ASSOCIATED DUCTWORK AND AIR DEVICES.
 4. EXISTING HOT WATER PUMP TO BE REMOVED. DISCONNECT FROM ASSOCIATED PIPING AND PREPARE FOR NEW PUMP. NEW PUMP SHALL USE EXISTING VFD.
 5. EXISTING CHILLED WATER PUMP TO BE DISCONNECTED AND RE-USED. OWNER SHALL PROVIDE VFD IN LIEU OF STARTER.
 6. ALL ASSOCIATED SUPPLY AIR DUCTWORK AND AIR DEVICES CONNECTED TO EXISTING MAKE-UP AIR UNIT TO BE REMOVED. OWNER TO RETAIN ALL VAV STYLE DIFFUSERS, GRILLES, AND LOUVERS.

PARTIAL PLAN OF DEMOLITION

1/8" = 1'-0"
 1/8" = 1'-0"

STOTTSBERG ENGINEERING
 www.stottsbergeng.com
 Project #25002

DATE: 04 MAR 2025
 COMM No: 25-02
 DRAWN BY: JNB
 CHECKED BY:
 STATE PROJECT No:

**MECHANICAL DEMOLITION
 PARTIAL FIRST FLOOR PLAN**

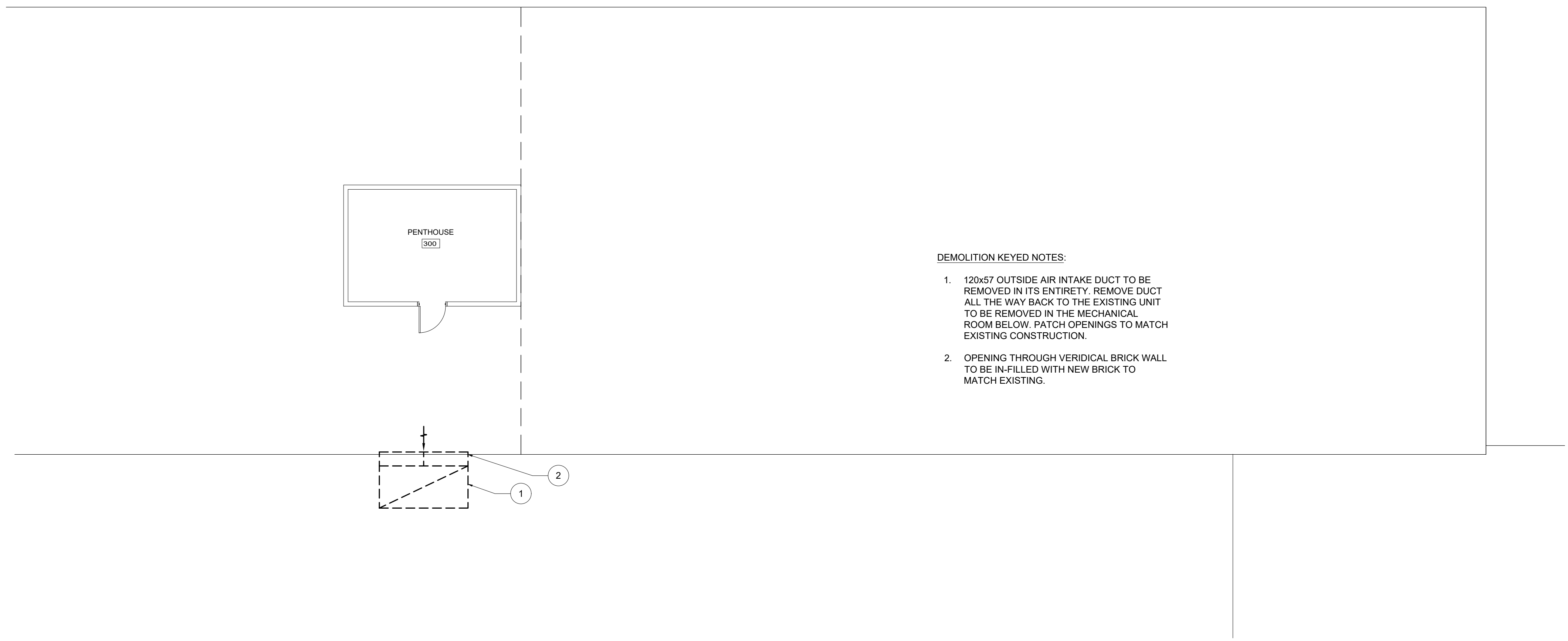
MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DESCRIPTION	DATE
No.	<	<
	<	<
	<	<

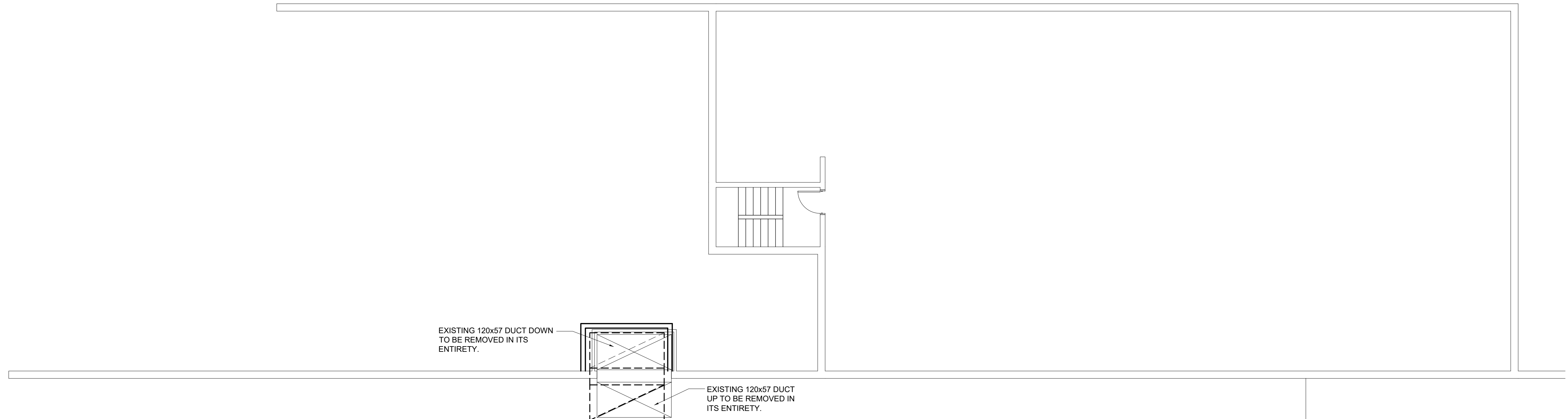
M100



- DEMOLITION KEYED NOTES:
- 120x57 OUTSIDE AIR INTAKE DUCT TO BE REMOVED IN ITS ENTIRETY. REMOVE DUCT ALL THE WAY BACK TO THE EXISTING UNIT TO BE REMOVED IN THE MECHANICAL ROOM BELOW. PATCH OPENINGS TO MATCH EXISTING CONSTRUCTION.
 - OPENING THROUGH VERIDICAL BRICK WALL TO BE IN-FILLED WITH NEW BRICK TO MATCH EXISTING.

PARTIAL MECHANICAL ROOF / 3RD FLOOR DEMOLITION PLAN

1/8" = 1'-0"
 1/8" = 1'-0"



PARTIAL MECHANICAL ROOF / 2ND FLOOR DEMOLITION PLAN

1/8" = 1'-0"
 1/8" = 1'-0"

STOTTSBERG ENGINEERING
 www.stottsbergeng.com
 Project #25002

DATE: 04 MAR 2025
 COMM No: 25-02
 DRAWN BY: JNB
 CHECKED BY:
 STATE PROJECT No:

**MECHANICAL DEMOLITION
 PARTIAL ROOF PLAN**

MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DESCRIPTION	DATE
No.	<	<
	<	<
	<	<

M101

**MECHANICAL NEW WORK
 PARTIAL FIRST FLOOR PLAN**

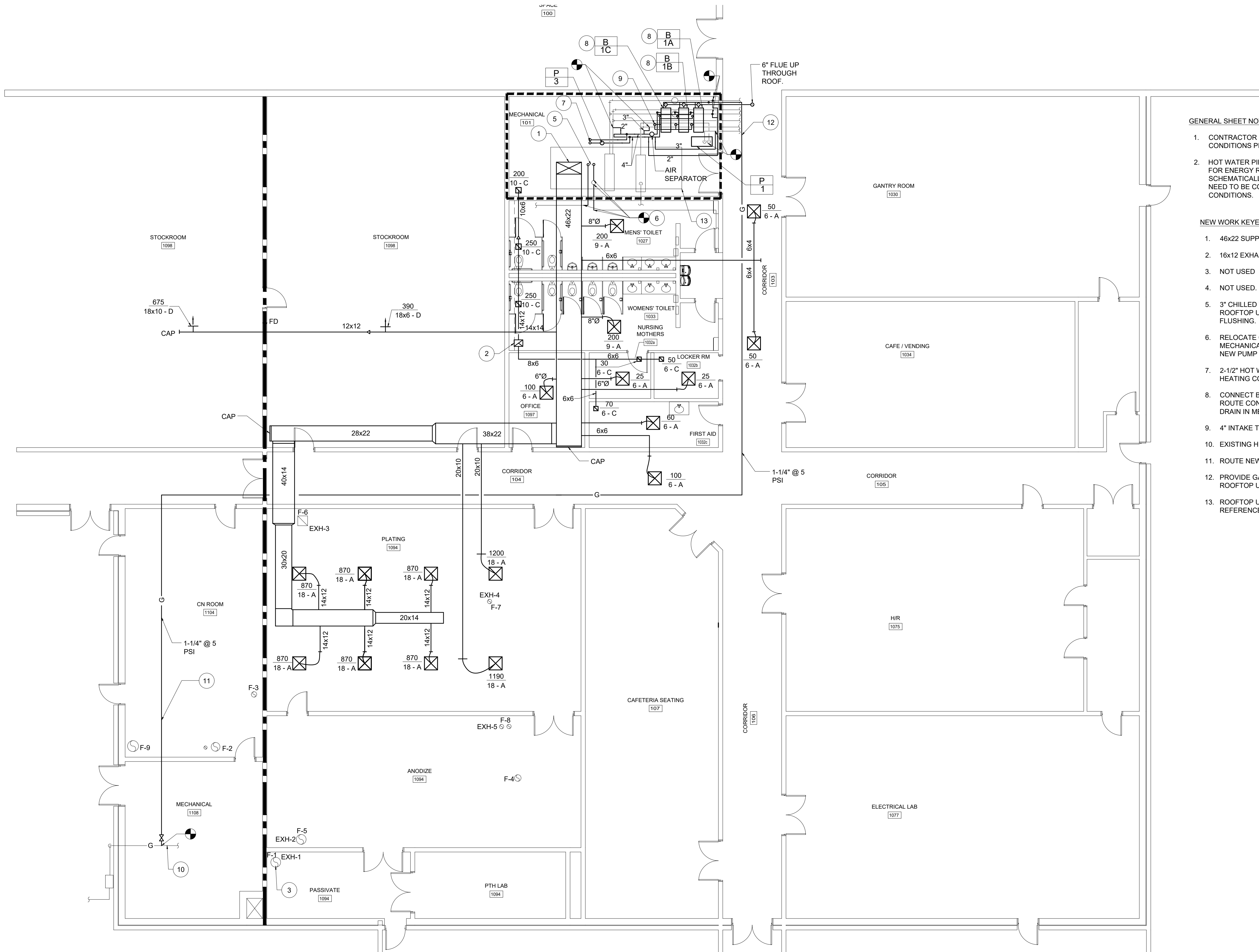
MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DATE
No. <<<	<<<

M200



GENERAL SHEET NOTES:

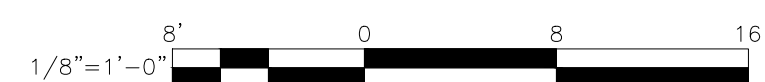
- CONTRACTOR SHALL COORDINATE/VERIFY EXISTING CONDITIONS PRIOR TO BIDDING.
- HOT WATER PIPING, CHILLED WATER PIPING, AND PIPING FOR ENERGY RECOVERY LOOP IS SHOWN SCHEMATICALLY. EXACT PIPING LENGTHS AND PATHS WILL NEED TO BE CONFIRMED BY CONTRACTOR PER FIELD CONDITIONS.

NEW WORK KEYED NOTES:

- 46x22 SUPPLY DUCT FROM ERU-1 ON ROOF ABOVE.
- 16x12 EXHAUST DUCT UP TO F-1 ON ROOF.
- NOT USED.
- NOT USED.
- 3" CHILLED WATER PIPING UP TO COOLING COIL IN ROOFTOP UNIT ON ROOF ABOVE. PROVIDE BYPASS FOR FLUSHING.
- RELOCATE CHILLED WATER PUMP TO INSIDE THE MECHANICAL ROOM. EXTEND CHILLED WATER PIPING TO NEW PUMP LOCATION.
- 2-1/2" HOT WATER SUPPLY AND RETURN PIPING UP TO HEATING COIL IN ROOFTOP UNIT ON ROOF ABOVE.
- CONNECT BOILERS TO EXISTING HOT WATER LOOPS. ROUTE CONDENSATE DRAIN FROM BOILERS TO FLOOR DRAIN IN MECHANICAL ROOM.
- 4" INTAKE THRU ROOF.
- EXISTING HIGH PRESSURE GAS MAIN.
- ROUTE NEW GAS PIPING ABOVE CEILING OR ON ROOF.
- PROVIDE GAS REGULATOR & VENT TO ROOF AWAY FROM ROOFTOP UNIT OUTSIDE AIR INLET.
- ROOFTOP UNIT RTU-1 ON ROOF ABOVE SHOWN FOR REFERENCE. SEE ROOF PLAN ON SHEET M201.

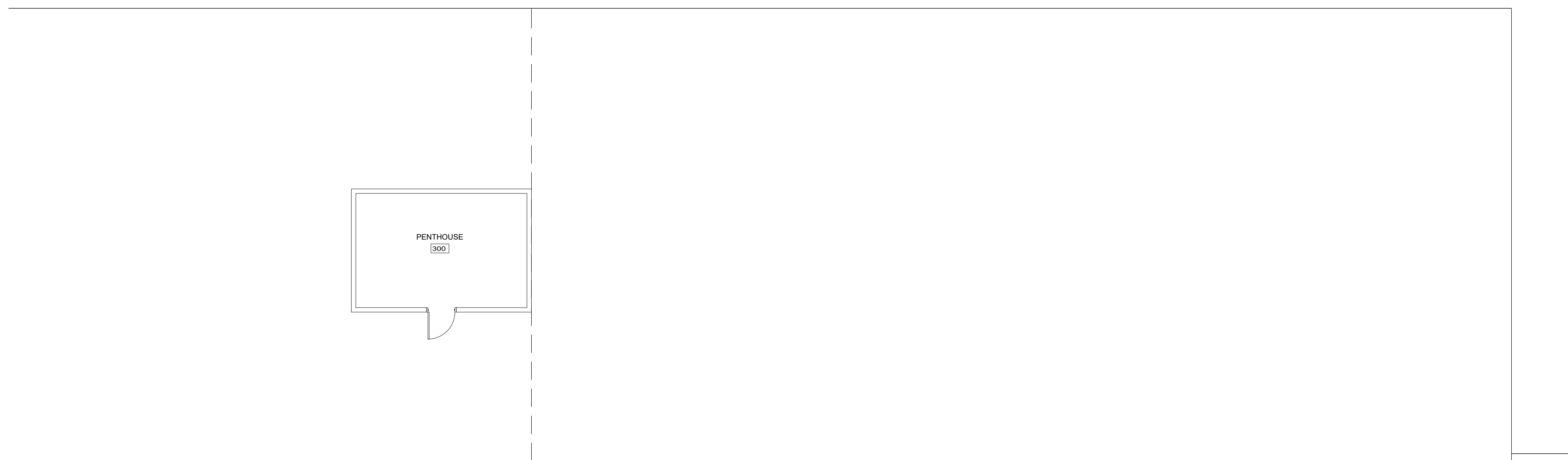
PARTIAL PLAN OF NEW WORK

1/8" = 1'-0"

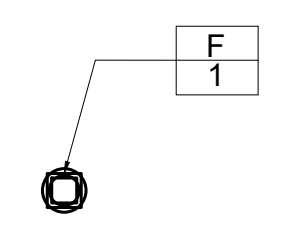


**STOTTSBERG
 ENGINEERING**

www.stottsbergeng.com
 Project #25002

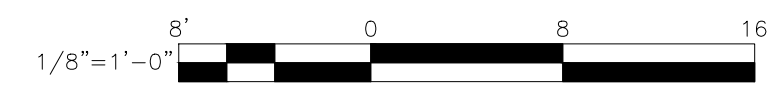


NEW WORK KEYED NOTES:
 1. ROUTE CONDENSATE DRAIN FROM UNIT DRAIN TO NEAREST ROOF DRAIN.



PARTIAL MECHANICAL ROOF PLAN

1/8" = 1'-0"



STOTTSBERG ENGINEERING
 www.stottsbergeng.com
 Project #25002

DATE: 04 MAR 2025
 COMM No: 25-02
 DRAWN BY: JNB
 CHECKED BY:
 STATE PROJECT No:

**MECHANICAL NEW WORK
 PARTIAL ROOF PLAN**

MOOG, INC FACILITY AT 1213 NORTH MAIN STREET BLACKSBURG, VA 24060
 MECHANICAL AND RESTROOM RENOVATIONS



5 Design, LLC
 P.O. Box 320
 Riner, VA 24149
 540-230-2619
 www.5designarchitecture.com

REVISIONS	DESCRIPTION	DATE
No.	<	<
	<	<
	<	<

M201