

STANDARD DETAILING SYMBOLS

CALLOUT
 PLAN / DETAIL REF. 1 SIM A101 SHEET REF.
 AREA TO BE ENLARGED

BUILDING/WALL SECTION
 SECTION REF. 1 SIM A101 SHEET REF.

VIEW TITLE
 VIEW NAME View Name
 VIEW DESIGNATION 1/A101
 Scale: 1/8" = 1'-0"

LEVEL LINE
 LEVEL NAME FIRST FLOOR
 LEVEL ELEVATION 100'-0"

GRID LINE
 GRID NUMBER OR LETTER A

NORTH INDICATOR
 INDICATES PLAN NORTH
 INDICATES TRUE NORTH

ROOM TAG
 ROOM NUMBER 101 Room Name

REVISION TAG
 REVISION NUMBER
 REVISION CLOUD

KEYNOTE TAG
 PER SHEET KEYNOTE NUMBER

SPOT ELEVATION SYMBOL
 ELEVATION AT POINT INDICATED 1'-0"

CONNECT NEW TO EXISTING
POINT OF DISCONNECTION

LINE TYPE INDICATES BACKGROUND
LINE TYPE INDICATES EXISTING
LINE TYPE INDICATES DEMOLITION
LINE TYPE INDICATES NEW
LINE TYPE INDICATES FUTURE
LINE TYPE INDICATES HIDDEN/UNDER OBSTRUCTION

HVAC SYMBOLS

SYMBOL	DESCRIPTION
GRILLES	
	CEILING MTD
	WALL MTD
	SUPPLY AIR DEVICE
	RETURN AIR DEVICE
	EXHAUST AIR DEVICE
	LINEAR SLOT AIR DEVICE
	LINEAR SLOT AIR DEVICE WITH INACTIVE SECTIONS LENGTH AS INDICATED ON PLANS
	AIR DEVICE TAG "TYPE" / "CFM" (SEE SCHEDULE)
	ECCENTRIC TRANSITION
	CONCENTRIC TRANSITION
	RADIUS OFFSET (IN THE VERTICAL)
	MITERED OFFSET (IN THE VERTICAL)
	RADIUS ELBOW
	MITERED ELBOW WITH TURNING VANES
	SUPPLY DUCT
	RETURN AIR DUCT
	EXHAUST AIR DUCT
	FLEX DUCT
	DEMOLITION DUCTWORK OR EQUIPMENT.
	EXISTING DUCTWORK OR EQUIPMENT.
	NEW OR FUTURE DUCTWORK OR EQUIPMENT
	ROUND DUCT RISE/DROP
	OVAL DUCT RISE/DROP
	RECTANGULAR TAKE-OFF
	ROUND TAKE-OFF
	ACCESS DOORS

HVAC SYMBOLS CONTINUED

SYMBOL	DESCRIPTION
DAMPERS	
	FIRE DAMPER
	FIRE/SMOKE DAMPER
	SMOKE DAMPER
	MANUAL DAMPER
	GRAVITY BACKDRAFT DAMPER
	MOTORIZED PARALLEL BLADE DAMPER
	MOTORIZED OPPOSED BLADE DAMPER
	POINT OF CHANGE IN DUCT CONSTRUCTION CLASS (NUMBERS INDICATE PRESSURE CLASS)
CONTROLS	
	THERMOSTAT
	SPECIAL SENSOR
	TEMPERATURE SENSOR
	HUMIDITY SENSOR
	NITROGEN DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	CARBON DIOXIDE SENSOR
	OXYGEN SENSOR
	DUCT MOUNTED SMOKE DETECTOR
	DUCT MOUNTED TEMPERATURE/HUMIDITY SENSOR
	TEMPERATURE SENSOR
	HUMIDITY SENSOR
	FREEZE STAT
	AVERAGING TEMPERATURE SENSOR IN AIR DUCT
	OCCUPANCY SENSOR
	EMERGENCY POWER OFF SWITCH (E-STOP)
	MANUAL MOTOR STARTER, FRACTIONAL HORSEPOWER (SEE STARTER SCHEDULE FOR SIZE, ETC.)

MECHANICAL GENERAL DEMOLITION WORK NOTES

- VERIFY PROJECT SITE EXISTING CONDITIONS PRIOR TO BID. EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE APPROXIMATE AND DO NOT INCLUDE EVERY COMPONENT.
- RECORD EXISTING CONDITIONS PRIOR TO THE START OF WORK. REPAIR DAMAGES RESULTING FROM PROJECT WORK.
- COORDINATE MATERIALS TO BE RETAINED BY THE OWNER PRIOR TO THE START OF DEMOLITION WORK. RETAINED MATERIALS SHALL BE DELIVERED TO A POINT DESIGNATED BY THE OWNER WITHIN A 10-MILE RADIUS OF THE PROJECT SITE. PROPERLY DISPOSE OF ALL REMAINING DEMOLITION MATERIALS. COMPLY WITH MATERIAL RECYCLING REQUIREMENTS. DO NOT ABANDON IN PLACE ANY ITEMS IDENTIFIED TO BE REMOVED UNLESS OTHERWISE NOTED.
- THE SCOPE OF DEMOLITION FOR ITEMS TO BE REMOVED INCLUDES ASSOCIATED SUPPORTS, POWER CONNECTIONS, CONTROLS, ETC.
- PERFORM ALL DEMOLITION INDICATED INCLUDING THAT REQUIRED TO INSTALL NEW WORK. REMOVE AND REINSTALL MATERIALS TO REMAIN AS NEEDED WHERE REQUIRED TO PERFORM DEMOLITION OR TO INSTALL NEW WORK. REPAIR DAMAGED SURFACES TO MATCH EXISTING ADJACENT SURFACES.
- REMOVE DUCT, PIPING AND CONDUIT BACK TO POINTS INDICATED. PREPARE OPEN ENDS FOR CONNECTION TO NEW WORK INDICATED OR CAP.
- REPAIR DAMAGE TO ANY OPENINGS IN LIFE-SAFETY RATED ASSEMBLIES CREATED BY THE DEMOLITION WORK PER APPROVED UL-LISTED DETAIL IN ACCORDANCE WITH THE BUILDING CODE.
- DURING RENOVATION OF OCCUPIED AREAS MAINTAIN OPERATION OF EXISTING CONTROL SYSTEM. AT EACH PHASE RE-VERIFY OPERATION OF REMAINING CONTROLLED DEVICES AFTER REMOVAL WORK IS COMPLETE.
- EXISTING SYSTEMS SERVING AREAS OCCUPIED DURING CONSTRUCTION SHALL BE KEPT IN OPERATION BY TEMPORARY MEANS. TEMPORARY MEANS INCLUDES TEMPORARY BYPASSES OR CONNECTIONS TO BUILDING SYSTEMS AND / OR CONNECTIONS TO TEMPORARY EQUIPMENT. ALL TEMPORARY MEANS, MATERIALS AND EQUIPMENT SHALL BE INCLUDED IN THE CONTRACT UNLESS OTHERWISE NOTED.

ABBREVIATIONS - MECHANICAL

(D)	DEMOLISH
(E)	EXISTING
AC	AIR CONDITIONING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AF	AIRFLOW
AFF	ABOVE FINISHED FLOOR
AI	ANALOG INPUT
AO	ANALOG OUTPUT
ARCH	ARCHITECTURAL
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR-CONDITIONING ENGINEERS
BAS	BUILDING AUTOMATION SYSTEM
BHP	BRAKE HORSEPOWER
BI	BINARY INPUT
BO	BINARY OUTPUT
BTUH	BRITISH THERMAL UNIT PER HOUR
CFM	CUBIC FEET PER MINUTE
CONT	CONTROLS, CONTINUED
DB	DRY BULB
DBL	DOUBLE
DEG	DEGREE
DI	DIGITAL INPUT
DIA	DIAMETER
DN	DOWN
DO	DIGITAL OUTPUT
DWG	DRAWING
EA	EXHAUST AIR
ECM	ELECTRONICALLY COMMUTATED MOTOR
EF	EXHAUST FAN
ELEC	ELECTRICAL
ESP	EXTERNAL STATIC PRESSURE
ETC	ETCETERA
F	DEGREES FAHRENHEIT
FD	FIRE DAMPER OR FLOOR DRAIN
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FT	FOOT/FEET
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
H	HUMIDIFIER OR HEIGHT
H2O	WATER
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AND AIR-CONDITIONING
IN	INCH
KW	KILOWATT
L	LOUVER
LBS	POUNDS
LF	LINEAR FEET
M	MOTOR OR MOTORIZED DAMPER OR METER
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTURER
MOCPP	MAXIMUM OVERCURRENT PROTECTION
NC	NORMALLY CLOSED OR NOISE CRITERIA
NO	NORMALLY OPEN OR NUMBER
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OD	OUTSIDE DIAMETER
OS	OCCUPANCY SENSOR
P	PRESSURE OR PRESSURE SENSOR
PD	PRESSURE DROP
QTY	QUANTITY
R	RADIUS, RISE, OR REMOVE
RCP	REFLECTED CEILING PLAN
RH	RELATIVE HUMIDITY, REHEAT
RPM	REVOLUTIONS PER MINUTE
SCH	SCHEDULE
SEC	SECONDS
SF	SUPPLY FAN OR SQUARE FOOT
SP	STATIC PRESSURE
T, TEMP	TEMPERATURE
T-STAT	THERMOSTAT
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
V, VOLT	VOLTAGE
VEL	VELOCITY
VF	VENTILATION FAN
VFD	VARIABLE FREQUENCY DRIVE
W	WIDTH OR WATTS
WI	WITH
WC	WATER COLUMN
WG	WATER GAUGE

MECHANICAL GENERAL NEW WORK NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, VIRGINIA AND LOCAL CODES AND REGULATIONS. MECHANICAL EQUIPMENT SHALL BE SELECTED TO MEET OR EXCEED THE REQUIREMENTS OF THE ENERGY CONSERVATION CODE. MECHANICAL WORK SHALL COMPLY WITH PROJECT SPECIFICATIONS.
- FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES REQUIRED TO MAKE THE MECHANICAL WORK COMPLETE AND OPERATIONAL.
- THESE DRAWINGS ARE DIAGRAMMATIC. EXACT EQUIPMENT LOCATIONS AND DUCT AND PIPING ROUTING SHALL BE COORDINATED WITH THE BUILDING AND SITE CONDITIONS. THE ACTUAL EQUIPMENT AND MINIMUM CLEARANCE DIMENSIONS SHALL BE VERIFIED WITH THE SUPPLIERS. FITTINGS NOT SHOWN ON THE DRAWINGS MIGHT BE REQUIRED.
- EQUIPMENT, DUCTWORK, PIPING AND CONDUIT LAYOUT SHALL BE COORDINATED WITH BUILDING COMPONENTS AND OTHER TRADES PRIOR TO INSTALLATION. THE SYSTEM SHALL BE NEATLY ARRANGED TO MAXIMIZE SPACE ABOVE CEILINGS AND WITHIN CHASES. MAINTAIN MINIMUM EQUIPMENT AND DEVICE MAINTENANCE CLEARANCES. DEVICES SHALL BE READILY MAINTAINABLE.
- DUCT OFFSETS SHALL BE MADE AT 15 OR 30-DEGREE ANGLES WHERE POSSIBLE BUT AT NEVER MORE THAN 45-DEGREES.
- CEILING-MOUNTED EQUIPMENT EXACT LOCATIONS SHALL BE COORDINATED WITH THE REFLECTED CEILING PLANS AND THE EXISTING CONDITIONS. AIR OUTLETS AND SMOKE DETECTORS SHALL BE COORDINATED TO BE NO LESS THAN 36-INCHES APART.
- PROVIDE A DUCT ACCESS DOOR FOR EACH DUCT-MOUNTED DEVICE REQUIRING MAINTENANCE OR INSPECTION. REFER TO SECTION 23 33 00 FOR DOOR SIZING REQUIREMENTS. COORDINATE CEILING AND WALL ACCESS DOORS WITH DUCT ACCESS DOORS.
- DUCT BRANCH FROM MAIN TAKEOFF TO AIR INLET OR OUTLET SHALL MATCH SCHEDULED NECK SIZE UNLESS OTHERWISE NOTED.
- SCHEDULE ALL SERVICE DISRUPTIONS AND SHUTDOWNS WITH THE OWNER NO LESS THAN 1 WEEK PRIOR.

AGENCY APPROVAL



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DEI Project No: 50168644

CONSULTANT



REVISIONS	DATE
1 UBO COMMENTS	04/26/2024
2 REDESIGN PER VT DIRECTION	02/20/2026

MECHANICAL SYMBOLS & NOTES

Virginia Tech

McBryde Hall Restroom Renovations

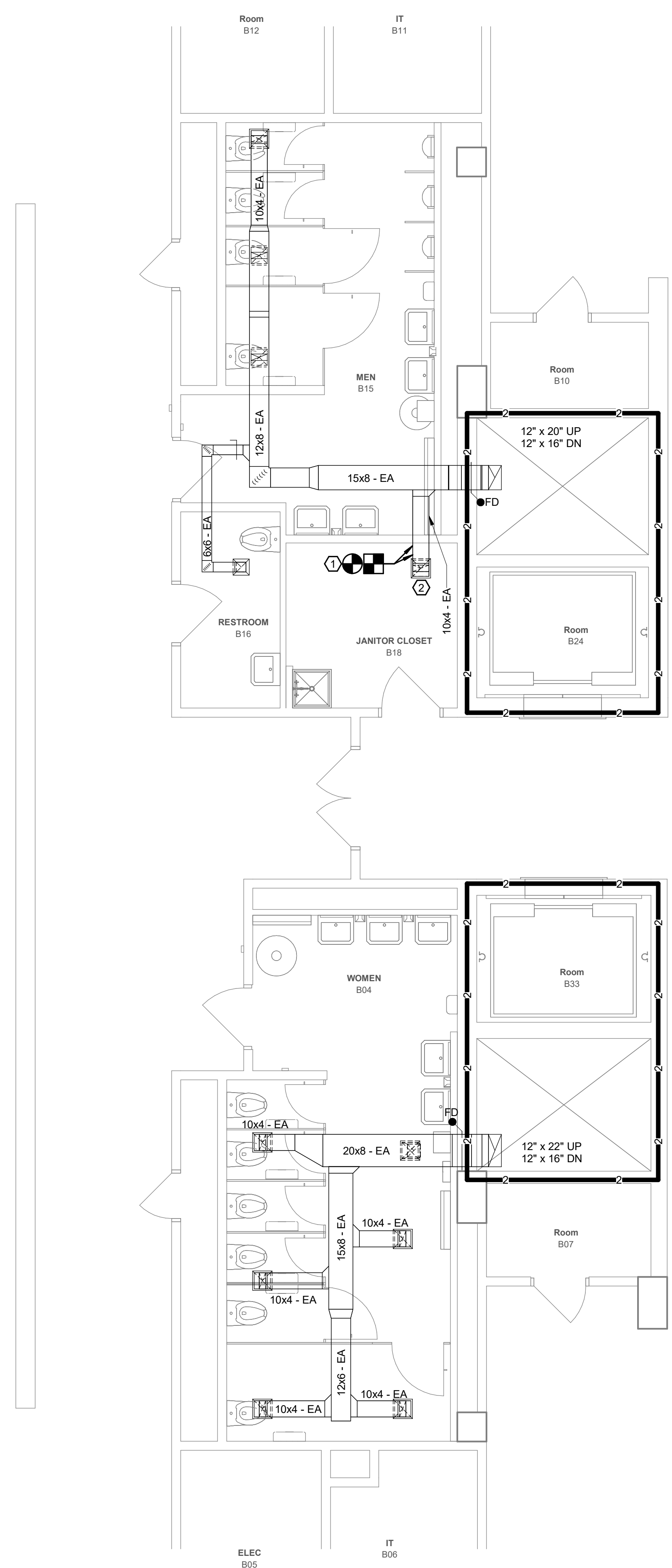


DRAWING LIST - MECHANICAL

M-001	MECHANICAL SYMBOLS & NOTES
M-111	FIRST FLOOR MECHANICAL PLANS NORTH
M-112	FIRST FLOOR MECHANICAL PLANS SOUTH
M-121	SECOND FLOOR MECHANICAL PLANS
M-501	DETAILS
M-601	SCHEDULES
TOTAL:	6

DATE	03/08/2024
SCALE	As indicated
DRAWN	BAD
JOB	2325
IFB #	TBD
PROJECT CODE	23-568216
SHEET	

M-001



1 SECOND FLOOR MECHANICAL PLAN
 Scale: 1/4" = 1'-0"
 0' 2' 4' 8'

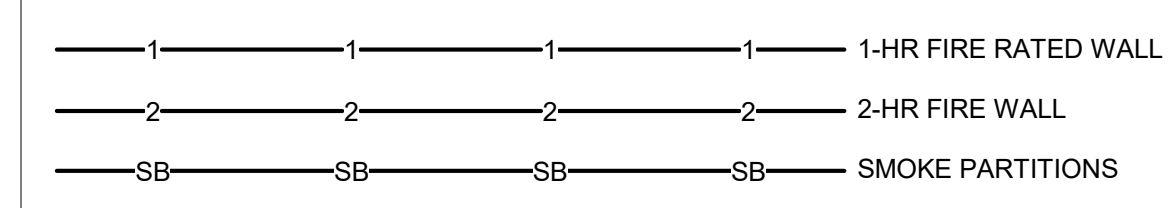
GENERAL NOTES:

- TESTING AND BALANCING OF EXHAUST GRILLES IN RESTROOMS ON THIS SHEET IS NOT INCLUDED IN PROJECT SCOPE. ALL BALANCING DAMPERS FOR EXHAUST GRILLES ARE TO REMAIN IN THEIR CURRENT POSITIONS.

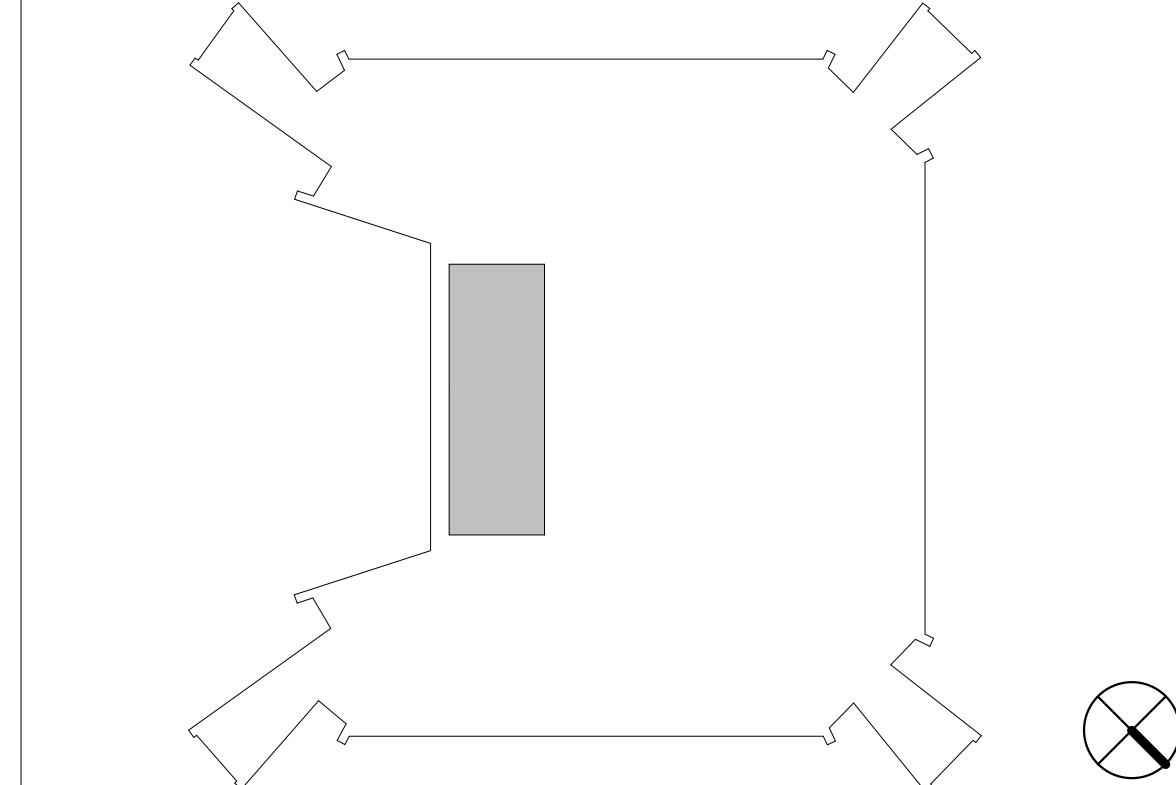
KEYNOTES:

- EXTEND DUCTWORK TO ALLOW REINSTALLATION OF EXISTING EXHAUST GRILLE IN NEW LOCATION. REBALANCE TO 100 CFM.
- CLEAN AND REPAINT EXHAUST GRILLE. REMOVE DURING DEMOLITION AND REINSTALL IN NEW LOCATION SHOWN. COORDINATE INSTALLATION WITH NEW CEILING.

WALL RATING LEGEND:



KEYPLAN:



AGENCY APPROVAL

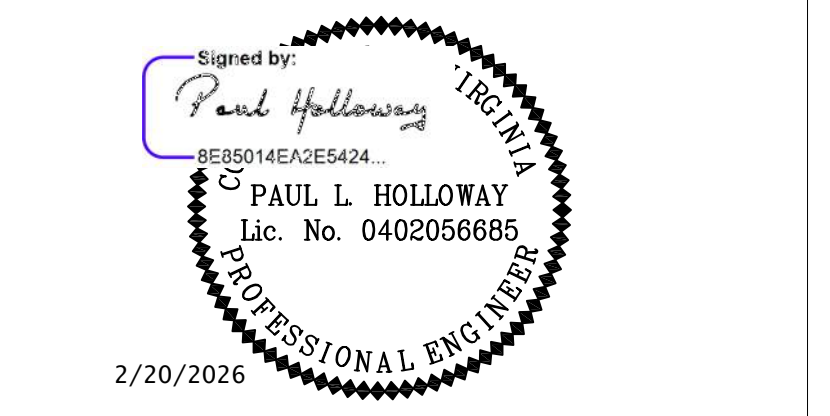


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SECOND FLOOR MECHANICAL PLANS

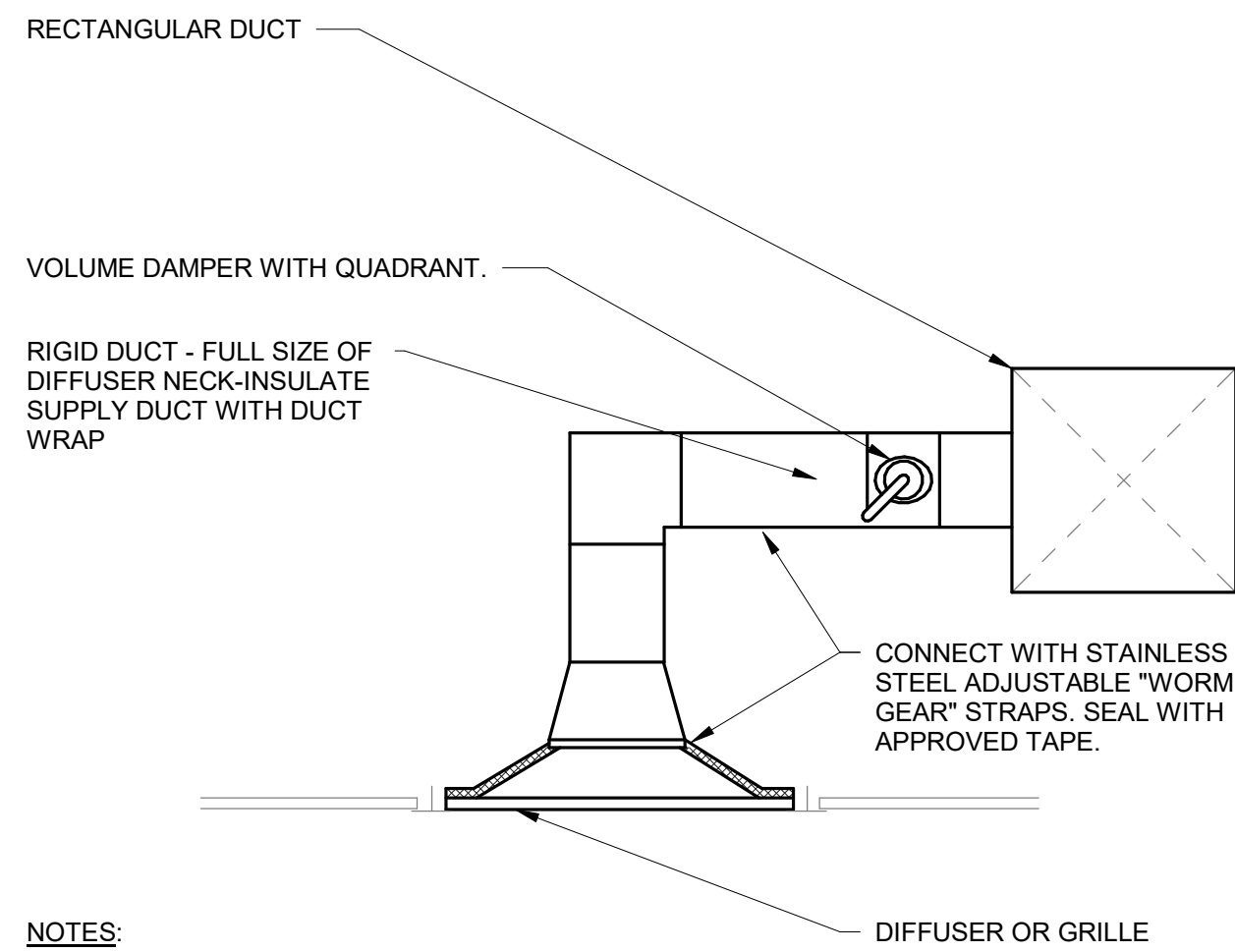
Virginia Tech

McBryde Hall Restroom Renovations



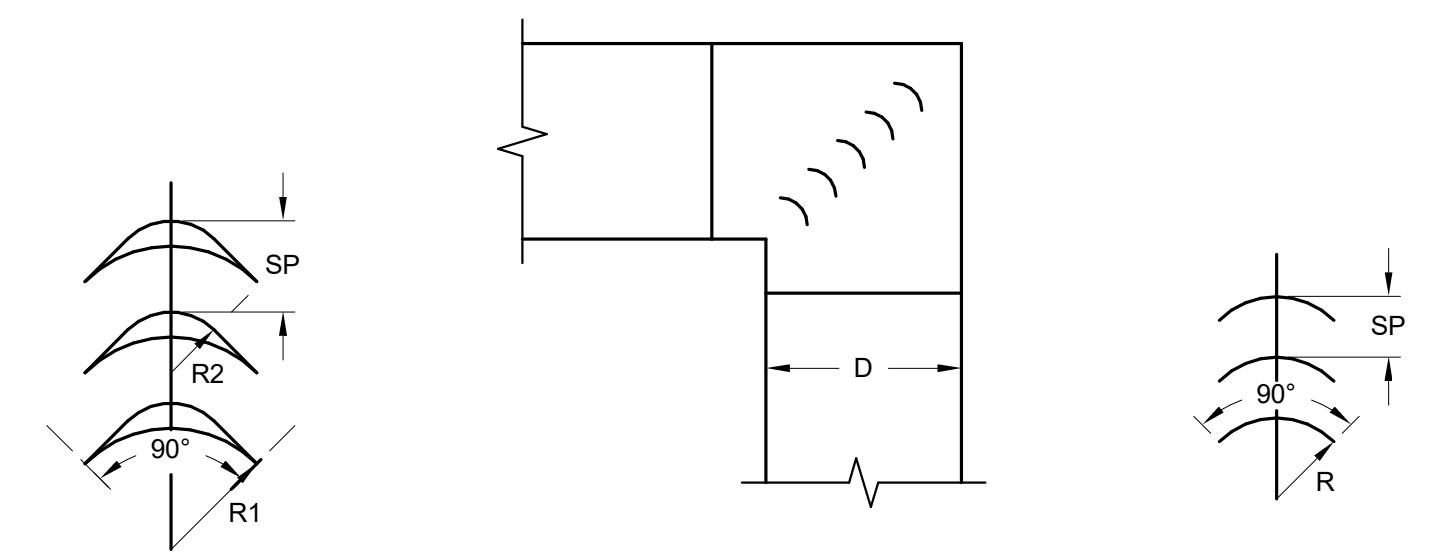
DATE	03/08/2024
SCALE	As indicated
DRAWN	BAD
JOB	2325
IFB #	TBD
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SHEET	

M-121



- NOTES:**
1. PROVIDE VOLUME DAMPERS ON RUNOUTS TO ALL DIFFUSERS AND GRILLES.
 2. LOCATE DAMPER WHERE ACCESSIBLE.
 3. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.

1 GRILLE AND DIFFUSER ASSEMBLY
Scale: N.T.S.



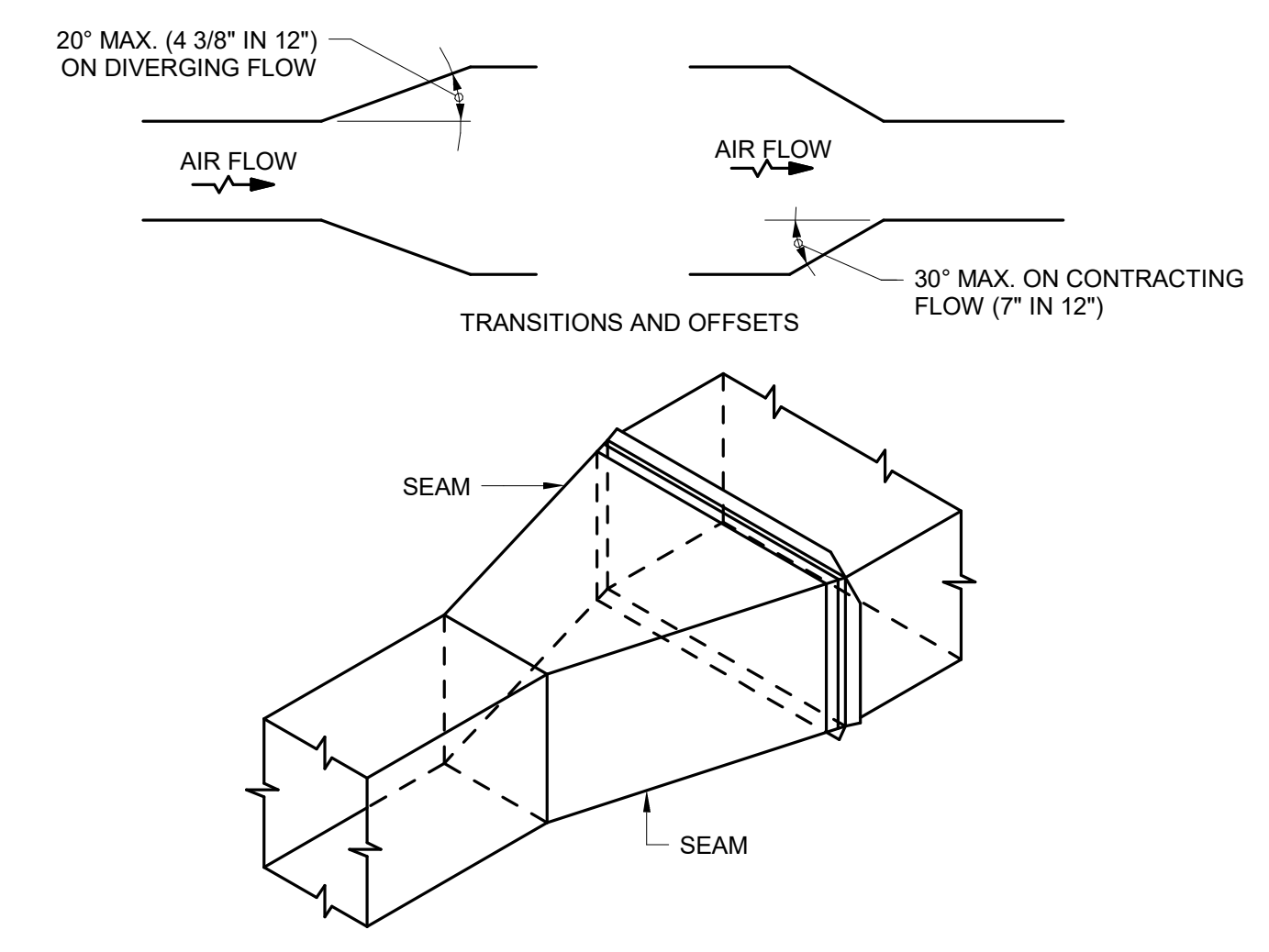
DOUBLE VANE SCHEDULE						
LARGE	D	H	R1	R2	SP	GA
	>18"	>18"	4-1/2"	2-1/4"	3-1/4"	24

SINGLE VANE SCHEDULE					
SMALL	D	H	R	SP	GA
	<18"	<18"	2"	1-1/2"	24

MAXIMUM UNSUPPORTED VANE LENGTH LARGE DOUBLE VANE 72"

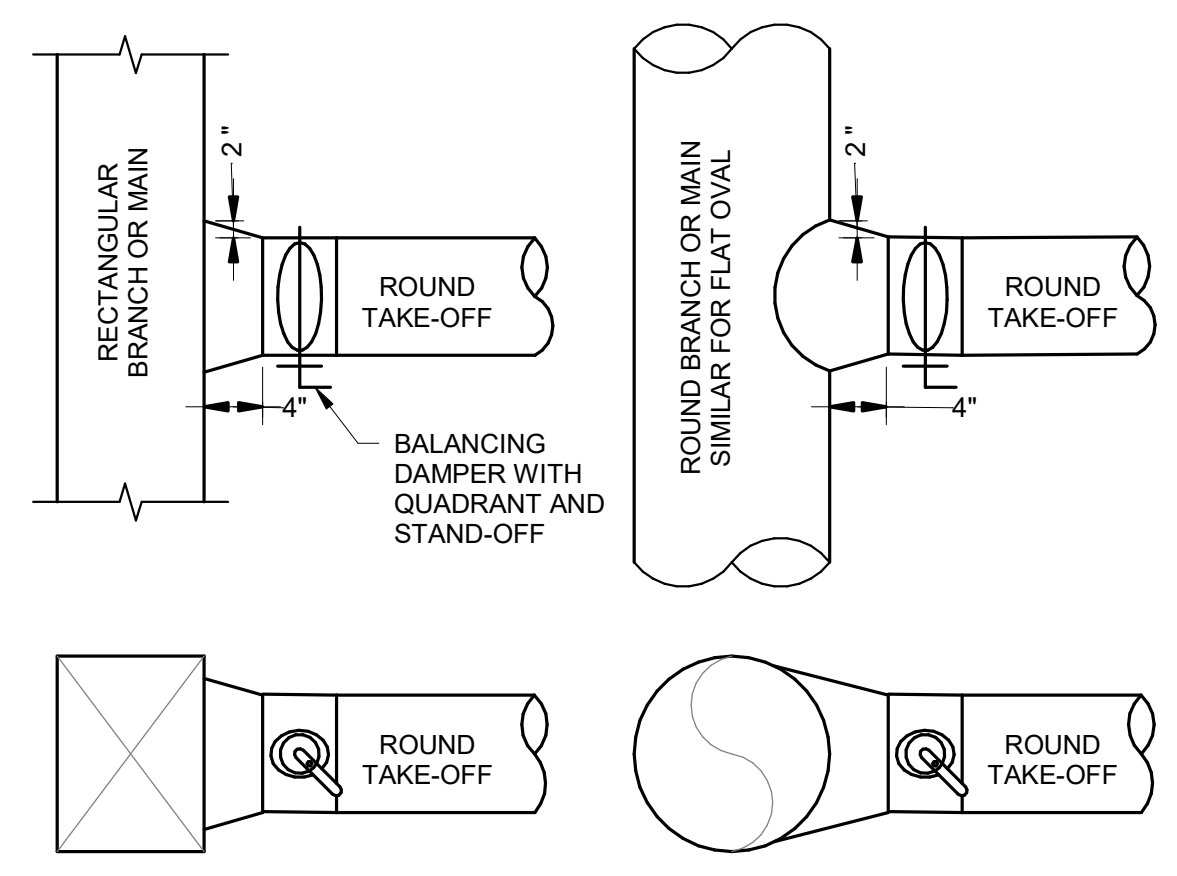
- NOTES:**
1. SINGLE VANES ALLOWED IN ELBOWS LESS THAN OR EQUAL TO 18" X 18".
 2. TURNING VANES NOT REQUIRED IN ELBOWS SMALLER THAN 12" X 12"

2 DUCT MITERED 90 ELBOW
Scale: N.T.S.



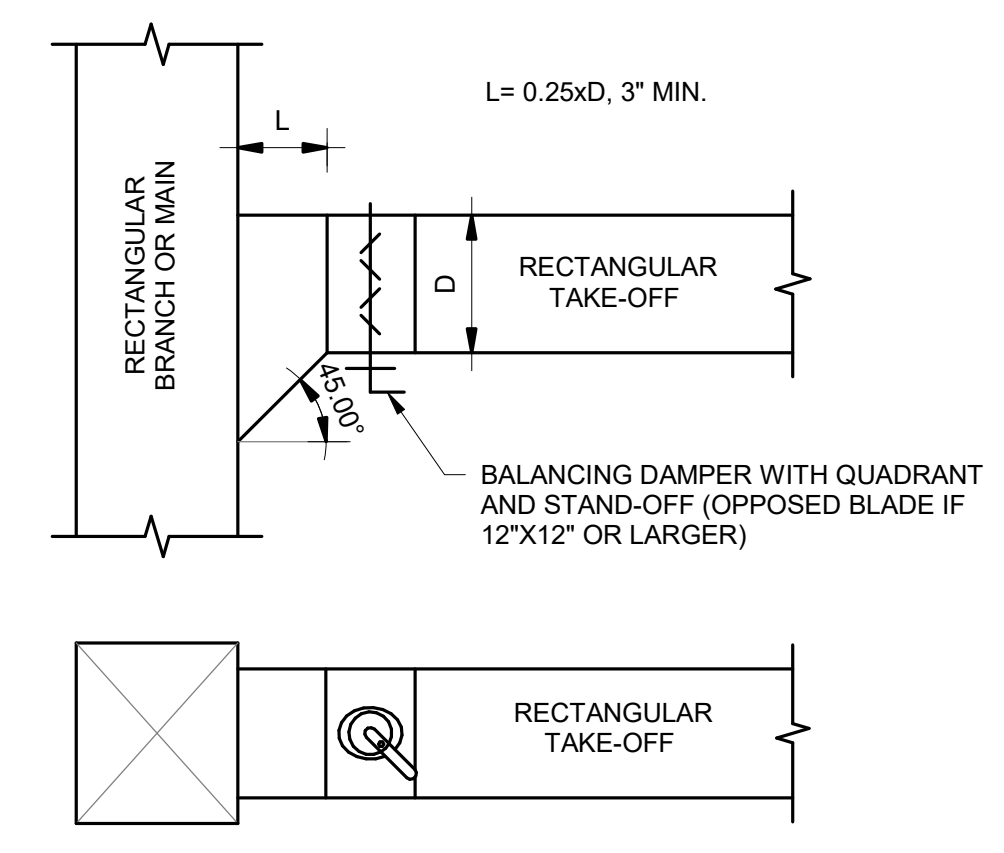
LARGEST DIMENSION GOVERNS CONSTRUCTION
CROSS BREAK OR BEAD FOR DUCT PAGE 1-36
(SMACNA LOW PRESSURE STAND. 5th ED.)

3 DUCT TRANSITION
Scale: N.T.S.



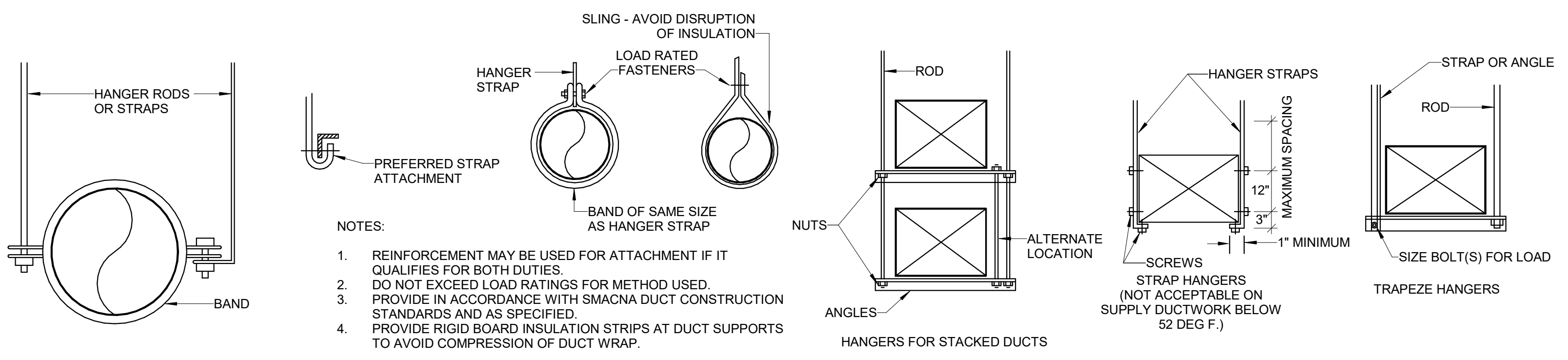
- NOTES:**
1. PROVIDE 45° LATERAL WYE TAKE-OFFS.
 2. WHEN SPACE DOES NOT ALLOW 45° LATERAL WYE TAKE-OFF, USE 90° CONICAL TEE CONNECTIONS.
 3. STRAIGHT IN FACTORY BUILT CONNECTIONS ARE PERMITTED FOR:
 - A. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS FOR EXHAUST OR RETURN AIR APPLICATIONS.
 - B. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS ON THE LOW PRESSURE SIDE OF TERMINAL BOXES.
 4. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.

4 DUCT CONICAL TAKE-OFF
Scale: N.T.S.



- NOTES:**
1. PROVIDE 45° LATERAL WYE TAKE-OFFS.
 2. WHEN SPACE DOES NOT ALLOW 45° LATERAL WYE TAKE-OFF, USE 90° CONICAL TEE CONNECTIONS.
 3. STRAIGHT IN FACTORY BUILT CONNECTIONS ARE PERMITTED FOR:
 - A. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS FOR EXHAUST OR RETURN AIR APPLICATIONS.
 - B. SINGLE DIFFUSER, GRILLE OR REGISTER RUNOUTS ON THE LOW PRESSURE SIDE OF TERMINAL BOXES.
 4. STANDOFF REQUIRED FOR DAMPER HANDLE ON ALL INSULATED DUCT.

5 DUCT 45 DEG. LATERAL TAKE-OFF
Scale: 12" = 1'-0"



- NOTES:**
1. REINFORCEMENT MAY BE USED FOR ATTACHMENT IF IT QUALIFIES FOR BOTH DUTIES.
 2. DO NOT EXCEED LOAD RATINGS FOR METHOD USED.
 3. PROVIDE IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS AND AS SPECIFIED.
 4. PROVIDE RIGID BOARD INSULATION STRIPS AT DUCT SUPPORTS TO AVOID COMPRESSION OF DUCT WRAP.

6 TYPICAL DUCT HANGERS
Scale: N.T.S.

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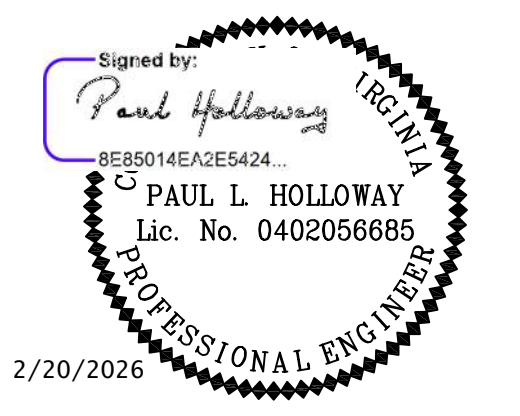
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DETAILS

Virginia Tech

McBryde Hall Restroom Renovations



DATE	03/08/2024
SCALE	
DRAWN	BAD
JOB	2325
IFB #	TBD
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SHEET	

M-501

AIR DISTRIBUTION SCHEDULE												
MARK	SERVICE	TYPE	MANUFACTURER / SERIES	MATERIAL	COLOR	PATTERN	MAX. AIR FLOW (CFM)	FACE SIZE (IN x IN)	NECK SIZE (IN x IN)	MAX. APD (IN WG)	MAX. SOUND (NC)	NOTES
E1	EXHAUST	SQUARE PERFORATED FACE	TITUS PAR	ALUMINUM	WHITE	360-DEG.	190	24 x 24	8	0.10	20	1,2,3,4,5

- NOTES:
- REFER TO SECTION 233713 FOR ADDITIONAL REQUIREMENTS.
 - SOUND LEVELS SHALL BE BASED ON ASHRAE 70.
 - VERIFY MOUNTING FRAME STYLE WITH ARCHITECTURAL REFLECTED CEILING PLANS, FINISH SCHEDULES AND EXISTING CEILINGS.
 - DUCT BRANCH FROM MAIN TAKEOFF TO AIR INLET / OUTLET SHALL MATCH SCHEDULED NECK SIZE UNLESS OTHERWISE NOTED.
 - PROVIDE INTEGRAL DAMPERS ADJUSTABLE AT THE DEVICE FACE ONLY AT LOCATIONS NOTED ON PLANS.

FAN SCHEDULE								
MARK	SERVICE	TYPE	AIR FLOW (CFM)	EC MOTOR (Y or N)	DRIVE TYPE	DAMPER TYPE	STARTER/ DSCNCT MEANS	NOTES
EF-1	NORTH RESTROOMS	DOWNBLAST DOME	3,345	NO	BELT	GRAVITY	MS/D	1
EF-2	SOUTH RESTROOMS	DOWNBLAST DOME	3,850	NO	BELT	GRAVITY	MS/D	1

- NOTES:
- FANS ARE EXISTING TO REMAIN, INFORMATION PROVIDED FOR REFERENCE ONLY.

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SCHEDULES

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M-601