

## AIR GRILLE SCHEDULE

MARK	NECK SIZE	FRAME SIZE	FRAME NUMBER	MAKE MODEL	FINISH TYPE	REMARKS
1 CFW	6"x6"	24"x24"	3	TITUS PCS-AA	1	ALUMINUM, PERFORATED SUPPLY AIR DIFFUSER FOR LAY-IN CEILING INSTALLATION.
2 CFW	8"x8"	24"x24"	3	TITUS PCS-AA	1	ALUMINUM, PERFORATED SUPPLY AIR DIFFUSER FOR LAY-IN CEILING INSTALLATION.
3 CFW	8"x8"	24"x24"	1	TITUS PCS-AA	1	ALUMINUM, PERFORATED SUPPLY AIR DIFFUSER FOR SURFACE MOUNTED INSTALLATION.
1	22"x22"	24"x24"	3	TITUS PAR-AA	1	ALUMINUM, PERFORATED FACE RETURN AIR GRILLE FOR LAY-IN CEILING INSTALLATION.
2	22"x22"	24"x24"	1	TITUS PAR-AA	1	ALUMINUM, PERFORATED FACE RETURN AIR GRILLE FOR SURFACE MOUNTED INSTALLATION.

### NOTES

- PROVIDE SQUARE-TO-ROUND ADAPTERS. SEE FLEX DUCT SCHEDULE FOR SIZES.
- PROVIDE ALL ALUMINUM CONSTRUCTION FOR ALL GRILLES UNLESS OTHERWISE NOTED.
- PROVIDE ALL MOUNTING AND FINISH ACCESSORIES FOR A COMPLETE INSTALLATION.

FINISH TYPE: 1. BAKED OFF-WHITE ENAMEL EXTERIOR, FLAT BLACK INTERIOR.  
2. FLAT BLACK.  
3. ALUMINUM

## MECHANICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— CHS —	CHILLED WATER SUPPLY	(E)	EXISTING ITEM
— CHR —	CHILLED WATER RETURN	(N)	NEW ITEM
— HWS —	HOT WATER SUPPLY	(R)	RELOCATED LOCATION
— HWR —	HOT WATER RETURN	(OL)	OLD LOCATION
— D —	DRAIN	(T)	THERMOSTAT
⊘	STOP VALVE	⊘	(N) PIPE SHOWN HEAVY
⊠	NEW/RELOCATED SUPPLY AIR DIFFUSER SHOWN HEAVY	⊠	(E) PIPE TO BE REMOVED SHOWN DASHED
⊠	(E) SUPPLY AIR DIFFUSER TO REMAIN SHOWN LIGHTLY	⊠	(E) PIPE TO REMAIN SHOWN LIGHTLY
⊠	NEW/RELOCATED RETURN AIR GRILLE SHOWN HEAVY	⊠	(N) DUCT SHOWN HEAVY
⊠	(E) RETURN AIR GRILLE TO REMAIN SHOWN LIGHTLY	⊠	(E) DUCT TO BE REMOVED SHOWN DASHED
⊠	NEW/RELOCATED LIGHT AIR TROFFER SHOWN HEAVY	⊠	(E) DUCT TO REMAIN SHOWN LIGHTLY
⊠	(E) LIGHT AIR TROFFER TO REMAIN SHOWN LIGHTLY	⊠	(N) FLEX DUCT SHOWN HEAVY (6"-0" RUNOUT MAX.)
⊠	SUPPLY AIR GRILLE SHOWN DASHED TO BE REMOVED	⊠	(E) FLEX DUCT TO BE REMOVED SHOWN DASHED
⊠	RETURN AIR GRILLE SHOWN DASHED TO BE REMOVED	⊠	(E) FLEX DUCT TO REMAIN SHOWN LIGHTLY
⊠	(E) SLOT DIFFUSER TO BE REMOVED SHOWN DASHED	⊠	NEW/RELOCATED SLOT DIFFUSER SHOWN HEAVY
⊠	RETURN AIR SOUND BOOT (12" x 12" SHOWN)	⊠	(E) SLOT DIFFUSER TO REMAIN SHOWN LIGHTLY
⊠	CONNECT (N) PIPE TO (E)	⊠	NEW MECHANICAL EQUIPMENT
⊠	FIRE/SMOKE DAMPER	⊠	EXISTING EQUIPMENT SHOWN LIGHTLY
⊠	SMOKE DETECTOR (SEE DIVISION 16)	⊠	REMOVED EQUIPMENT SHOWN DASHED
⊠	FIRE DAMPER	⊠	FUTURE EQUIPMENT SHOWN DASHED AND HEAVY
⊠	ACCESS PANEL	⊠	AUTOMATIC MOTORIZED DAMPER
⊠	MANUAL DAMPER	⊠	HUMIDISTAT
⊠	RETURN AIR	⊠	RETURN AIR
⊠	ROUND SPIN-IN WITH RIGID DUCT OR FLEX DUCT TO CEILING AIR DEVICE	⊠	RECTANGULAR TO ROUND TRANSITION TO RIGID OR FLEX DUCT

NOTE: NOT ALL SYMBOLS USED.

## FLEX DUCT SCHEDULE

SIZE	CFM RANGE
6"ø	0 - 120
8"ø	121 - 220
10"ø	221 - 350
12"ø	351 - 500
14"ø	501 - 750

NOTE: FOR LOW PRESSURE DUCTS ONLY.

## DESIGN CONDITIONS

AIR TEMPERATURES		
	OUTSIDE	INSIDE
SUMMER	96°D.B./80°W.B.	74°D.B./50°R.H.
WINTER	20°	74°
WATER TEMPERATURES		
	ENTERING	LEAVING
CHILLED	xx°	xx°
HEATING	—	—

## SPECIFICATIONS

### DUCTWORK

SHEET METAL DUCTWORK - SIZES SHOWN ON PLANS ARE SHEET METAL DIMENSIONS. (UNLESS OTHERWISE NOTED)

FABRICATE AND INSTALL ALL SHEET METAL DUCTWORK IN ACCORDANCE WITH CURRENT S.M.A.C.N.A. STANDARDS.

	SHEET METAL DUCT CONSTRUCTION	CONSTRUCTION PRESSURE	RATING
A	AIR HANDLING UNIT MULTIZONE DOWNSTREAM	2" W.G.	LOW
B	RETURN AIR SOUND BOOT	2" W.G.	LOW

EXTERNALLY INSULATE ALL SUPPLY AIR SHEET METAL DUCTWORK WITH 2" THICK 1½LB. DENSITY INSULATION WITH A MINIMUM INSTALLED "R" VALUE OF 6.0. PERM RATING OF VAPOR BARRIER SHALL NOT EXCEED 0.5 PERM.

ALL RIGID ROUND DUCTWORK SHALL BE SHEET METAL. INSULATE ROUND RIGID SUPPLY AIR DUCTWORK WITH 2" THICK FOIL-BACKED FIBERGLASS DUCT INSULATION WITH MINIMUM INSTALLED R-VALUE OF 6.0.

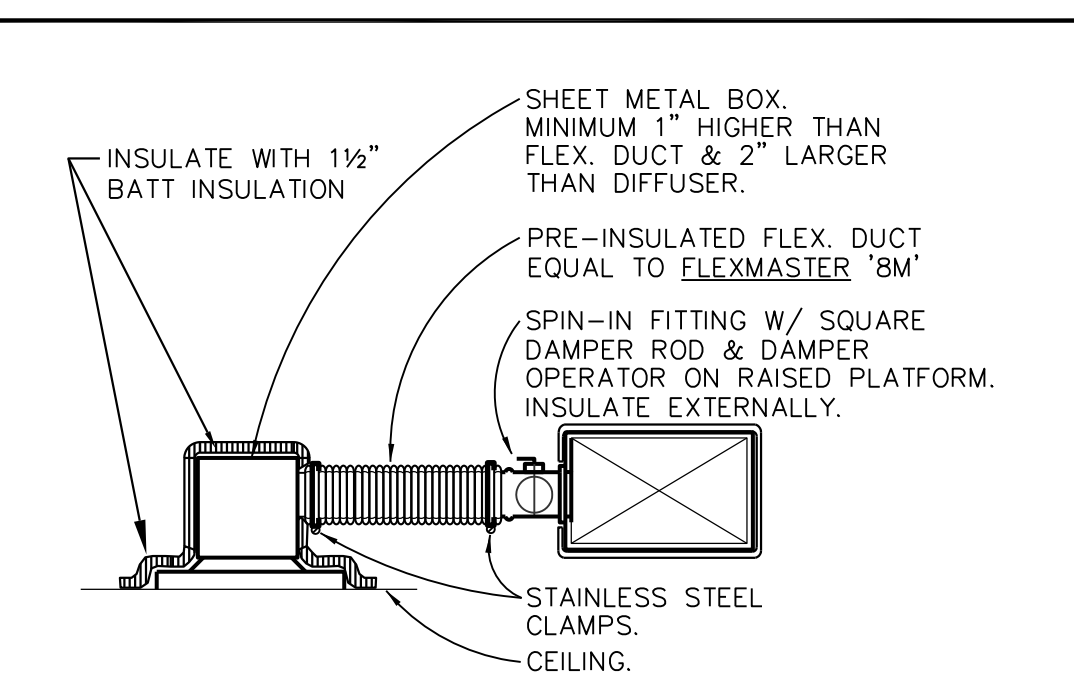
ALL BRANCH DUCTS SHALL HAVE SPIN-IN FITTINGS WITH VOLUME DAMPERS. USE STAINLESS STEEL STRAP CLAMPS ON ALL FLEX DUCT CONNECTIONS. FLEX DUCT RUNOUTS SHALL NOT EXCEED 6"-0" IN LENGTH.

### FLEXIBLE DUCTWORK

FLEXIBLE DUCTWORK SHALL BE PRE-INSULATED FLEXMASTER TYPE 8M WITH A MINIMUM INSTALLED R-VALUE OF 6.0. PERM RATING OF VAPOR BARRIER SHALL NOT EXCEED 0.5 PERM.

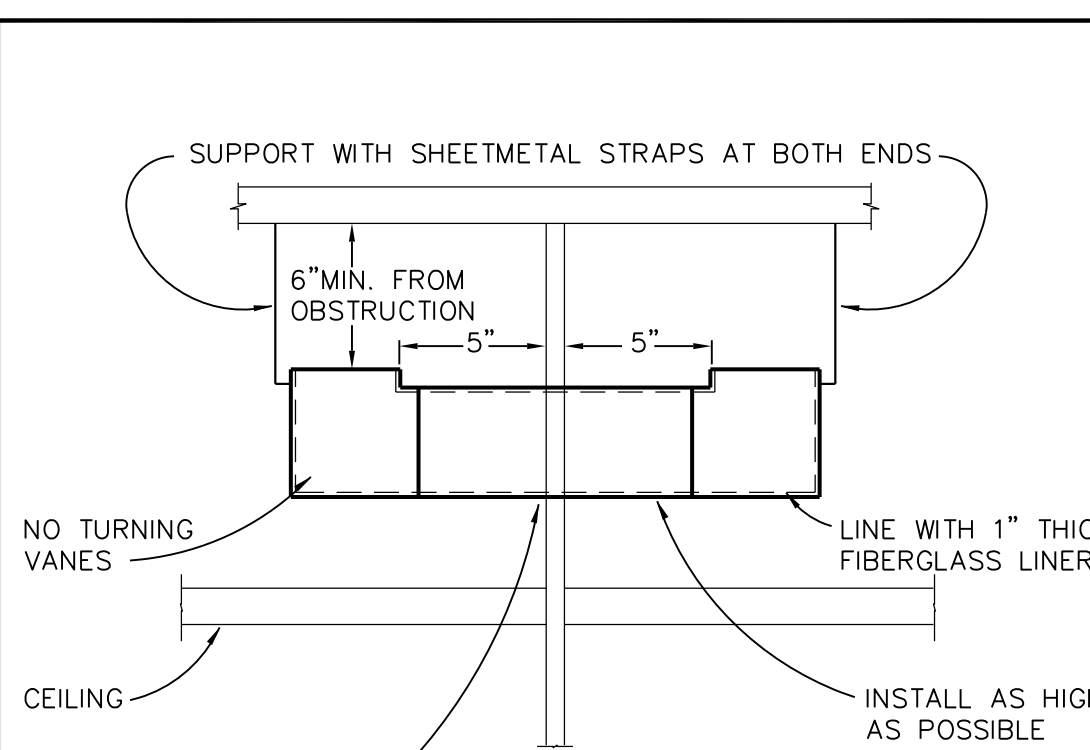
## GENERAL NOTES

- EQUIPMENT, PIPING AND DUCTWORK LOCATIONS ARE APPROXIMATE. VERIFY ALL DIMENSIONS FROM ARCHITECTURAL AND STRUCTURAL PLANS AND AT THE JOB SITE. REPORT ALL ANOMALIES TO THE PROJECT REPRESENTATIVES FOR REVIEW. CONTRACTOR SHALL VISIT JOB SITE AND VERIFY SIZE AND LOCATION OF ALL EXISTING ITEMS AND CONDITIONS.
- EXACT LOCATION OF ALL AIR DEVICES, THERMOSTATS, REGULATORS AND ANY OTHER ITEMS EXPOSED TO VIEW ON FINISHED WALLS, FLOORS OR CEILINGS SHALL BE APPROVED BY THE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
- ALL DUCT CONNECTIONS TO MOVING AIR EQUIPMENT SHALL BE MADE WITH FLEX CONNECTIONS.
- PROVIDE FIRE/SMOKE DAMPER IN ALL RETURN AIR OPENINGS, EXHAUST DUCTS, RETURN AIR DUCTS AND SUPPLY AIR DUCTS WHERE THEY PENETRATE FIRE PARTITIONS, FLOOR SLABS (EXCEPT IN RATED CHASES) AND AS REQUIRED BY CODE.
- VOLUME DAMPERS LOCATED ABOVE INACCESSIBLE CEILINGS SHALL HAVE OPERATORS EXTENDED TO THE CEILING AND FITTED WITH FLUSH TYPE OPERATORS. LOCATIONS SHALL BE APPROVED BY THE ARCHITECT.
- FURNISH ALL STEEL MEMBERS AND OTHER SUPPORTS REQUIRED FOR PIPING, DUCTWORK, EQUIPMENT, ETC. ITEMS EXPOSED TO THE OUTDOORS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
- BEFORE ANY DEMOLITION BEGINS, ALL AIR HANDLING EQUIPMENT (INCLUDING FAN POWERED BOXES, FAN POWERED VAV BOXES, AIR HANDLING UNITS, FAN COIL UNITS, MINI-MATE UNITS, ETC.) SHALL BE FITTED WITH CONSTRUCTION FILTERS OF AT LEAST 20% EFFICIENCY TO PREVENT DEMOLITION DUST FROM ENTERING DUCTWORK OR COILS OF ANY KIND. THESE SHALL BE MONITORED AND SUPPLIED BY THE GENERAL CONTRACTOR AND REPLACED ON AN AS NEEDED BASIS TO PREVENT CLOGGING AND OR REDUCTION OF AIR FLOW.
- SHUTDOWN OF THE EXISTING SYSTEMS SHALL BE SCHEDULED WITH THE BUILDING MANAGEMENT OR OWNER AND WORK SHALL BE PERFORMED IN A MANNER TO MINIMIZE DISRUPTION.
- ALL EXISTING FACILITIES SHALL BE PROTECTED DURING THE CONSTRUCTION ACTIVITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE AND STORE ITEMS WHICH ARE SUBJECT TO BREAKAGE.
- REFER TO ARCHITECTURAL PLANS AND COORDINATE WITH BUILDING MANAGEMENT OR OWNER FOR PHASING OF CONSTRUCTION, AREAS TO REMAIN IN USE, AND ARCHITECTURAL SPECIFICATIONS FOR SUPPLEMENTARY AND GENERAL CONDITIONS WHICH MAY BE APPLICABLE TO THIS WORK. ALL WORK SHALL BE COORDINATED WITH OTHER DIVISIONS.
- ALL WORK SHALL BE DONE ACCORDING TO BASE BUILDING STANDARDS AND SPECIFICATIONS.
- OBTAIN ALL NECESSARY PERMITS, PAY LEGAL FEES, AND CONFORM TO ALL LOCAL, STATE AND NATIONAL CODES AND ORDINANCES RELATING TO BUILDING AND PUBLIC SAFETY.
- UPON COMPLETION OF THE MECHANICAL WORK, THE CONTRACTOR SHALL DEMONSTRATE TO THE BUILDING CHIEF ENGINEER OR OWNER THAT ALL NEW AND RELOCATED THERMOSTATS FUNCTION CORRECTLY AND ARE MAPPED BACK TO EXISTING BUILDING AUTOMATION SYSTEM.
- ALL NEW EQUIPMENT SHALL BE BUILDING STANDARD OR APPROVED BY THE OWNER, BUILDING MANAGEMENT, OR CHIEF BUILDING ENGINEER.
- REUSE EXISTING EQUIPMENT AND SPIN-IN TAPS WHERE POSSIBLE AND PROVIDE NEW WHERE REQUIRED. REMOVE ALL UNUSED SPIN-INS. PATCH DUCTS PER S.M.A.C.N.A. STANDARDS AND SEAL AIR TIGHT WITH HARDCAST DT TAPE AND FTA-20 ADHESIVE.
- THE CONTRACTOR SHALL BALANCE ALL NEW AND EXISTING AIR DEVICES TO INDICATED CFM. BALANCE ALL AIR UNITS AND ZONES AFFECTED BY CONSTRUCTION TO TOTAL CFM OF NEW AND EXISTING AIR DEVICES. PROVIDE NEW SHEAVES AND BELTS AS REQUIRED TO DELIVER REQUIRED CFM. AT COMPLETION OF CONSTRUCTION, SUBMIT A COMPLETE AIR BALANCE REPORT TO BUILDING CHIEF ENGINEER, ARCHITECT, AND BDMI. REFER TO AIR BALANCE NOTES ON PLANS.
- ALL PLENUM AREAS SHALL BE INSPECTED AND CLEANED OF ALL DEBRIS AND TRASH PRIOR TO BEING REPLACED.
- A CERTIFIED INDEPENDENT AIR BALANCE REPORT SHALL BE PROVIDED TO THE CHIEF ENGINEER, ARCHITECT AND BDMI FOR REVIEW. REPORT SHALL INCLUDE CERTIFICATES OF CALIBRATION FOR ALL EQUIPMENT USED AT THE JOB SITE FOR DETERMINING AIR FLOW.
- DUCT BOARD STYLE DUCTWORK IS NOT ALLOWED.
- ALL AIR FLOW READINGS WHEN COMPARED TO DESIGN DRAWINGS OF THE MOST RECENTLY REVISED PRINTS SHALL NOT EXCEED + OR - 10% OF THE DESIGN READINGS SHOWN ON PRINTS.
- ANY ADHESIVES, PAINTING, VARNISH OR FINISH APPLICATIONS OR USE OF ANY ODOR PRODUCING MATERIALS SHALL NOT BE DONE WITHOUT PRIOR APPROVAL BY THE MANAGEMENT. MANAGEMENT RESERVES THE RIGHT TO STOP THESE TYPES OF APPLICATION AT ANY TIME.
- CONTRACTOR TO REUSE EXISTING AIR DEVICES SHOWN ON PLAN WHEREVER POSSIBLE. ALL EXISTING AIR DEVICES SHALL BE CLEANED, PAINTED, AND REFURBISHED TO LIKE NEW CONDITION WHERE POSSIBLE AND PROVIDE NEW GRILLES AS REQUIRED.
- REMOVE EXISTING CEILING TILES AS REQUIRED TO INSTALL NEW WORK. REINSTALL TILES AFTER INSTALLATION OF NEW WORK. ANY TILES DAMAGED BY CONTRACTOR SHALL BE REPLACED WITH NEW TILES. NEW TILES TO MATCH EXISTING TILES.
- ALL NEW THERMOSTATS OR ROOM TEMPERATURE SENSORS SHALL MATCH BASE BUILDING TYPES (UNLESS NOTED OTHERWISE). CALIBRATE ALL THERMOSTATS AND REPLACE DAMAGED OR MISSING THERMOSTATS.
- CONTROLS ARE DDC AND ARE TO BE TIED INTO THE EXISTING "CARRIER" BUILDING AUTOMATION SYSTEM.
- APPROVAL OF THE ARCHITECT IS REQUIRED PRIOR TO CORE DRILLING EXISTING STRUCTURE. REFER TO STRUCTURAL DRAWINGS.
- ALL SYSTEMS SHALL BE COMPLETE AND WORKING AT COMPLETION OF CONSTRUCTION. BUILDING FIRE SAFETY SYSTEM SHALL BE FULLY OPERATIONAL THROUGHOUT CONSTRUCTION.
- REMOVE ALL EXCESS MATERIAL AND DEBRIS AND CLEAN ALL EQUIPMENT UPON COMPLETION OF WORK. TOUCH UP WITH PAINT WHERE REQUIRED.
- ALL DDC CONTROLLED ITEMS AND ZONES THAT ARE TIED INTO THE BUILDING AUTOMATION SYSTEM SHALL HAVE ALL ASSOCIATED SYSTEM GRAPHICS UPDATED TO REFLECT AS-BUILT CONDITIONS.
- GUARANTEE ALL WORK AND MATERIALS FURNISHED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
- CONTRACTOR SHALL CONFORM TO BUILDING MANAGEMENT AND OWNER'S CONSTRUCTION POLICIES AND PROCEDURES WHILE PERFORMING THIS WORK. CARE SHOULD BE TAKEN TO CONTAIN ALL CONSTRUCTION DUST WITHIN THE REMODELED AREA SO THAT IT DOES NOT TRAVEL TO OTHER AREAS AND INTO THE BUILDING'S HVAC SYSTEM. PROVIDE NEGATIVE AIR MACHINE AS REQUIRED TO ACCOMPLISH THIS.



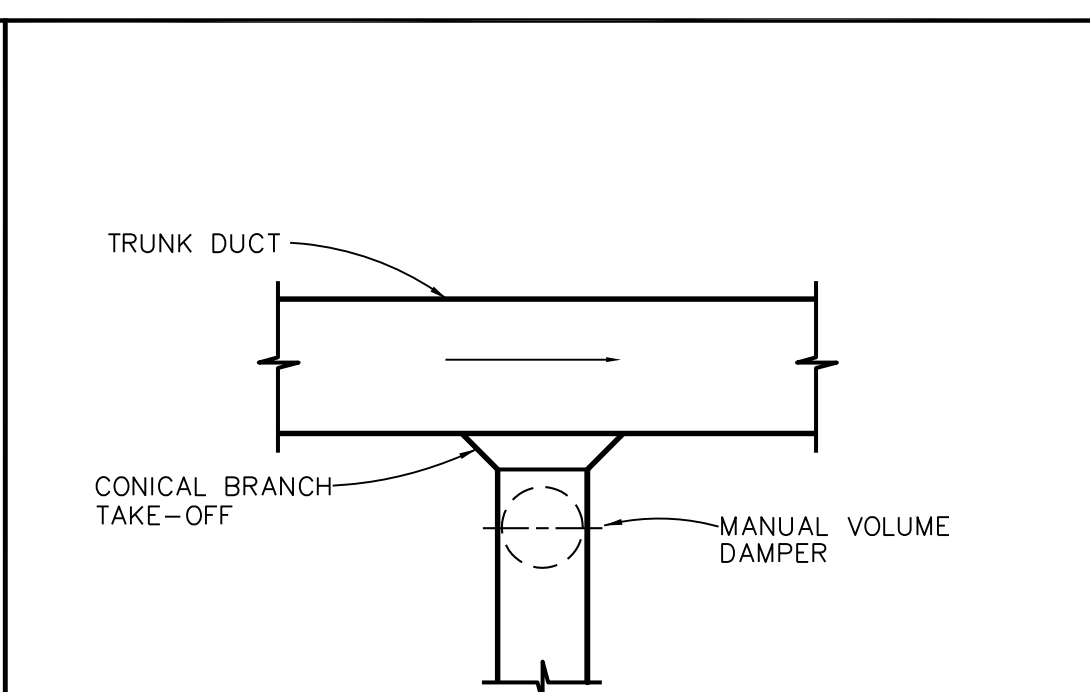
- NOTES:
- MAXIMUM LENGTH OF FLEX. DUCT IS 6'-0". IF THE DISTANCE FROM THE MAIN DUCT TO A SLOT OR CEILING DIFFUSER IS GREATER THAN 6'-0", INSTALL EXTERNALLY INSULATED RIGID ROUND DUCT FOR THE ADDITIONAL LENGTH. RIGID ROUND DUCT SHALL BE THE SAME SIZE AS THE FLEX DUCT.
  - IN LIEU OF SHEET METAL BOX, CONTRACTOR MAY SUBSTITUTE FLEX. CONNECTION WHERE CLEARANCE ALLOWS FOR FULL 1½" RADIUS ELBOW.

1 FLEX DUCT/CEILING DIFFUSER CONNECTION DETAIL  
NOT TO SCALE

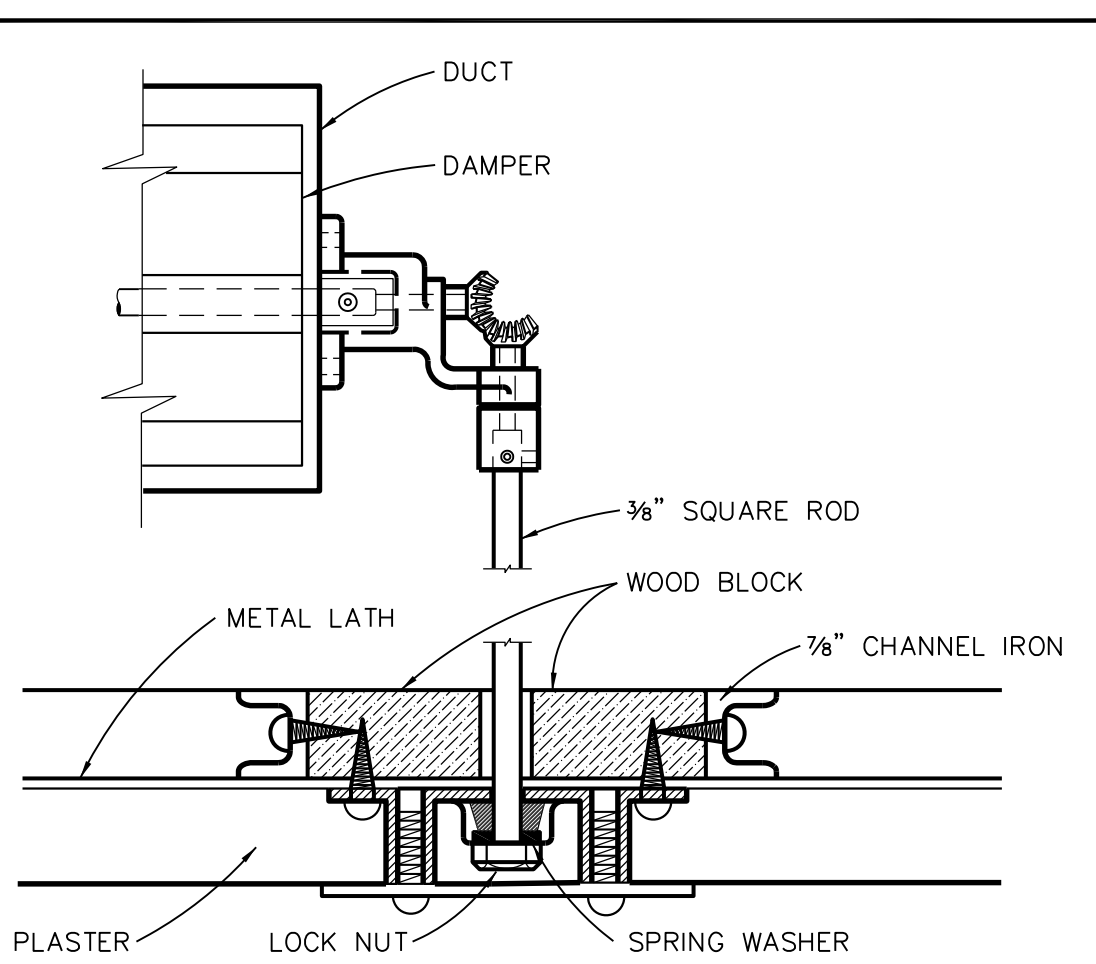


- NO TURNING VANES
- CEILING
- LINE WITH 1" THICK FIBERGLASS LINER
- INSTALL AS HIGH AS POSSIBLE
- TAPE AND FLOAT GYP. BD. TO SOUND BAFFLE

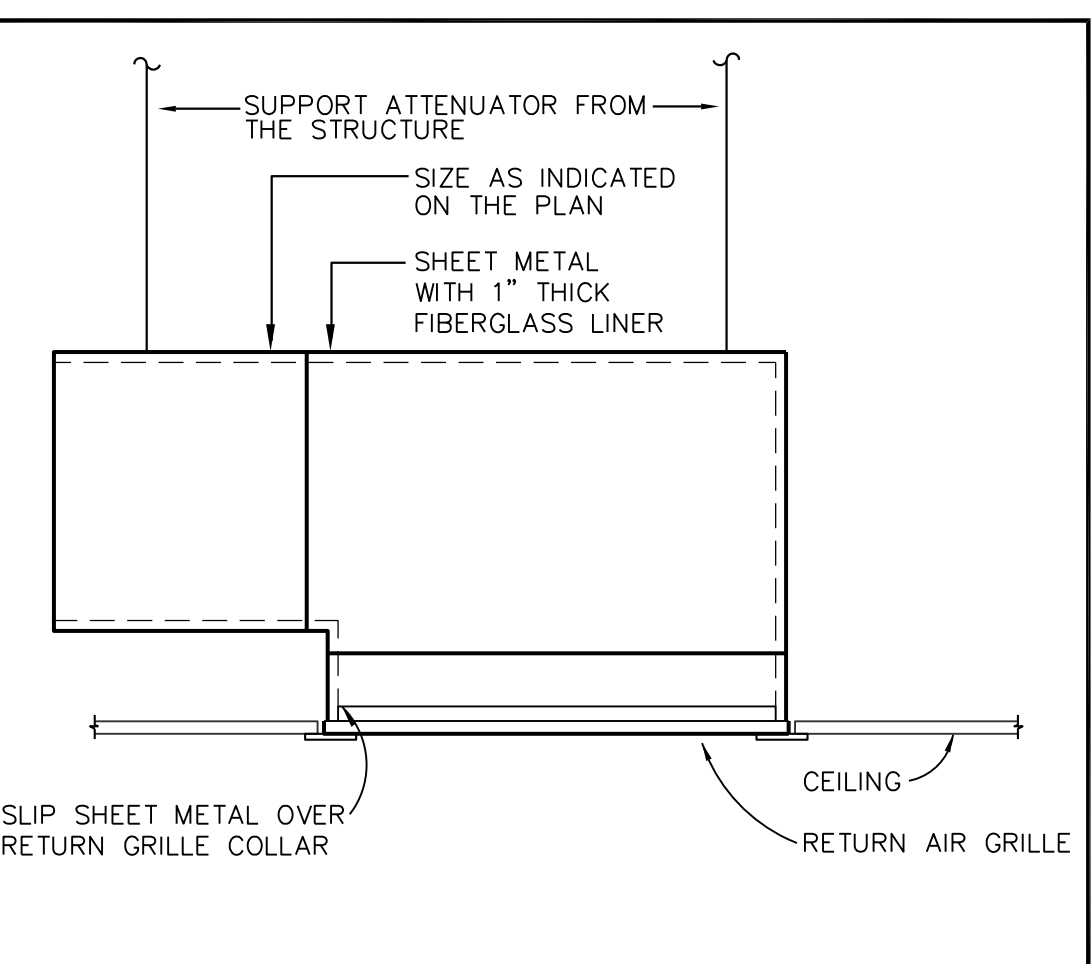
2 R.A. SOUND BOOT INSTALLATION  
NOT TO SCALE



3 BRANCH DUCT DETAIL  
NOT TO SCALE



4 CONCEALED DAMPER REGULATOR DETAIL  
NOT TO SCALE

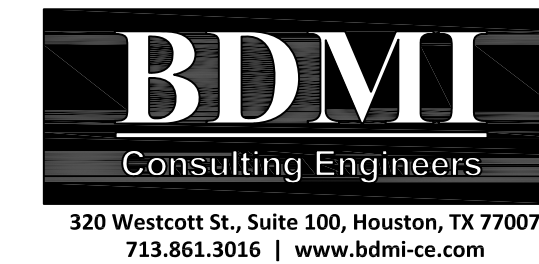


5 RETURN GRILLE SOUND BOOT DETAIL  
NOT TO SCALE

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ASSOCIATE ARCHITECT

STRUCTURAL ENGINEER



M.E.P. ENGINEER

CIVIL ENGINEER

LANDSCAPE ARCHITECT

FIRE PROTECTION

06.17.15 ISSUED FOR PRICING AND PERMIT

NO. DATE DESCRIPTION



Burns, Deloitte & McCoy, Inc.  
Texas Registered Engineering Firm  
E-685

KEY PLAN

OWNER

**THE HARRIS-GALVESTON  
SUBSIDENCE DISTRICT  
OFFICE RENOVATIONS**

1660 WEST BAY AREA BLVD. HOUSTON, TEXAS 77546

PROJECT

**Mechanical Schedules,  
Details, and Notes**

DRAWING TITLE

SCALE AS NOTED DATE 05/13/15

SBP JOB NUMBER 04815.000 14007

SBP JOB NUMBER 084059.00

ISSUED FOR PRICING & PERMIT

SUBMISSION

**M2.00**

DRAWING NUMBER