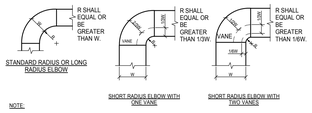
NOTE:

1. ALL VANE ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.
2. WHEN W1 DOES NOT EQUAL W2, VANE SHALL BE SINGLE THICKNESS VANE TYPE REGARDLESS OF W DIMENSION.
3. ALL SINGLE THICKNESS VANES SHALL HAVE A 2" [50mm] RADIUS, 1 1/2" [40mm] MAXIMUM SPACE BETWEEN VANES AND A 3/4" [20mm] TRAILING EDGE.
4. WHEN W EQUALS W2 AND W1 IS GREATER THAN 20" [500mm] VANES SHALL BE DOUBLE VANE TYPE.

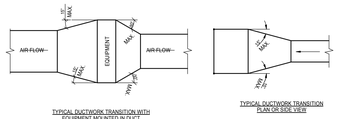
1A DUCTWORK SQUARE VANE ELBOWS
NTS



NOTE:

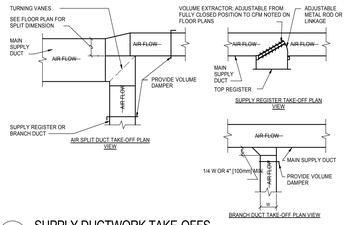
1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS CAN BE SUBSTITUTED WITH SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

2A DUCTWORK RADIUS ELBOWS
NTS



NOTE:
UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

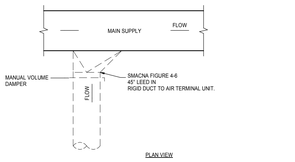
4A DUCTWORK TRANSITIONS (WITH EQUIPMENT MOUNTED IN DUCT)
NTS



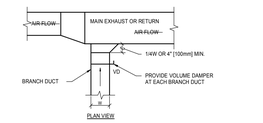
5A SUPPLY DUCTWORK TAKE-OFFS
NTS

DESIGNER'S NOTES:

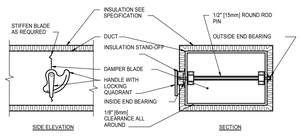
1. THE SUPPLY REGISTER TAKE-OFF MAY BE USED FOR UP UP TO 25% OF THE MAIN DUCT CFM. THE BRANCH DUCT TAKE-OFF MAY BE USED FOR UP TO 10% OF THE MAIN DUCT CFM ANYTIME AND UP TO 40% WHEN THE MAIN DUCT VELOCITY IS 1000 FPM [5.1 M/S] OR LESS. THE AIR SPLIT DUCT TAKE-OFF SHALL BE USED IN ALL OTHER CASES AND MAY BE USED AT ANYTIME.
2. SHOW ALL VOLUME DAMPERS ON FLOOR PLANS.



7A ALTERNATE SUPPLY DUCT TAKEOFF - AIR TERMINAL UNITS
NTS



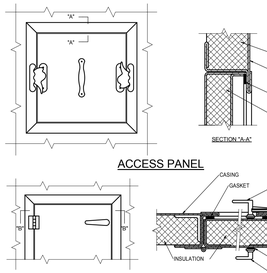
9A EXHAUST OR RETURN BRANCH DUCTWORK
NTS



NOTE:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

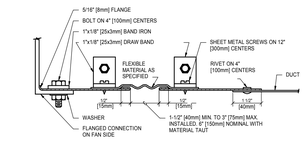
1C VOLUME DAMPER DETAIL
NTS



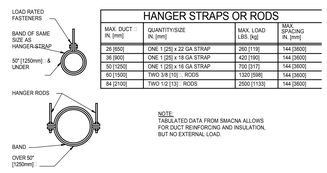
NOTES:

1. LATCHES SHALL BE OF THE WEDGE TYPE TO CLOSE DOORS TIGHTLY.
2. HINGES ON THE ACCESS DOORS SHALL HAVE NON-CORROSIVE PINS.
3. SEE SMACNA 2005, FIGURE 9-15

2C ACCESS PANEL AND DOOR DETAIL
NTS



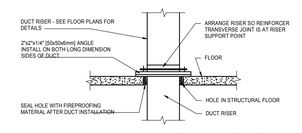
4C FLEXIBLE DUCT CONNECTIONS
NTS



HANGER STRAPS OR RODS			
MAX. DUCT IN. [mm]	QUANTITY:SIZE IN. [mm]	MAX. LOAD LBS. [kg]	MAX. SPACING IN. [mm]
25 [650]	ONE 1 [25] x 22 GA STRAP	280 [119]	144 [3600]
36 [900]	ONE 1 [25] x 18 GA STRAP	420 [190]	144 [3600]
50 [1250]	ONE 1 [25] x 16 GA STRAP	700 [317]	144 [3600]
60 [1500]	TWO 3/8 [10] ... RODS	1320 [598]	144 [3600]
84 [2100]	TWO 1/2 [13] RODS	2500 [1133]	144 [3600]

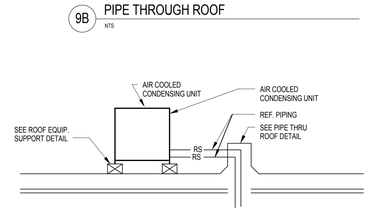
NOTE:
TABULATED DATA FROM SMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

5C ROUND DUCT HANGERS
NTS

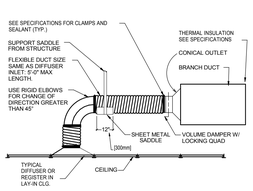


NOTE:
ALL DUCT WORK RISERS WHICH ARE RUN EXPOSED, SUCH AS THRU ATTIC FLOORS AND FAN ROOM FLOORS SHALL BE PROVIDED WITH A 3" [75mm] HIGH CONCRETE CURB AROUND OPENING FOR DUCT.

7C DUCT RISER SUPPORTS
NTS

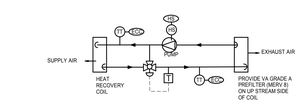


9C V-199 CONDENSER ON ROOF
1/8" = 1'-0"



NOTE:
THE USE OF FLEXIBLE AIR DUCT CONNECTORS ARE NOT PERMITTED FOR THE DEDICATED AHU SERVING THE SURGICAL SUITE.

1E FLEXIBLE AIR DUCT CONNECTOR
NTS



NOTE:

1. SECURE CURB CAP TO WOOD NAILING STRIP WITH 3/8" [10mm] CADMIUM PLATED LAG BOLTS NOT OVER 12" [300mm] ON CENTER.
2. SECURE ROOF CURB, DUCTWORK AND DAMPER TO ROOF WITH EXPANSION BOLTS (CONCRETE ROOF) OR RUST RESISTANT BOLTS (METAL DECK AND BAR JOIST ROOF).

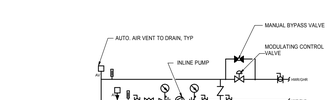
RUN ELECTRICAL LINES THROUGH CLEARANCE HOLE PROVIDED IN GRAVITY DAMPER, THEN THROUGH VENTILATOR ELECTRICAL CONDUIT GUIDE.

2E POWER ROOF VENTILATOR
NTS

DESIGNERS NOTES:
1.PROVIDE A MOTORIZED DAMPER, IF APPLICABLE.

2.PROVIDE DIRECT DRIVE FANS FOR LOCATIONS NOT EASILY ACCESSIBLE. AS ATTIC OR PIPE BASEMENT AND LESS THAN 2 HP.

3.MINIMUM CURB HEIGHT SHALL BE 12 INCHES [300 mm] INCREASE HEIGHT, IF REQUIRED, TO OVERCOME SNOW DRIFT.

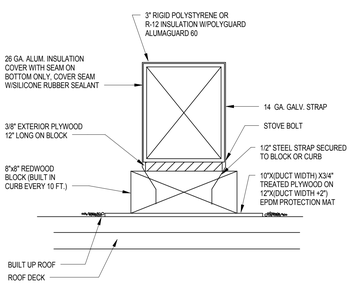


NOTES:
1.TO PREVENT ICING ON EXHAUST COIL MAINTAIN TEMPERATURE OF SOLUTION ENTERING EXHAUST AIR COIL ± 35° F BY MODULATING 3 WAY VALVE.

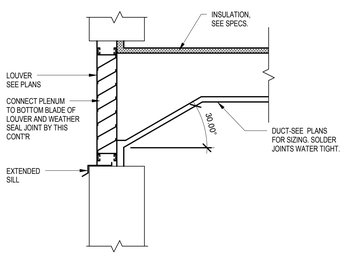
2.DISCONTINUE HEAT RECOVERY IF OUTSIDE AIR TEMPERATURE ± BETWEEN 60 TO 80° F (ADJUSTABLE)

3.FOR SYSTEMS WITH WINTER DESIGN CONDITIONS ± 32° F, PROVIDE APPROPRIATE PROPYLENE GLYCOL SOLUTION.

4E RUN AROUND HEAT RECOVERY COIL DETAIL
NTS



7E V-198 ROOF DUCT SUPPORT & OUTDOOR DUCT DETAIL
1/8" = 1'-0"



9E V-208 LOUVER
1/8" = 1'-0"

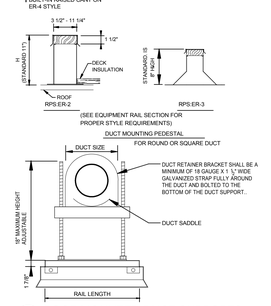
THE SIZES AND LOCATION OF ROOF-MOUNTED DUCT SUPPORTS ARE SHOWN ON THE MECHANICAL DRAWINGS. PROVIDE ROOF DUCT SUPPORTS A MAXIMUM OF 8'-0" ON CENTER AND AT EVERY ELBOW OR BRANCH.

DUCT MOUNTING CURBS OR RAILS

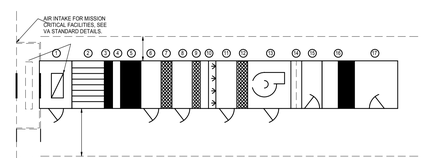
STANDARD CONSTRUCTION:
- 18 GAUGE GALVANIZED STEEL
- UNITIZED CONSTRUCTION WITH INTEGRAL BASE PLATE
- WELDED CONSTRUCTION
- WOOD NAILER FLUSH STYLE
- GALVANIZED COUNTERFLASHING WITH LAG SCREWS INTERNALLY REINFORCED
- BUILT-IN RAISED CANT ON ER-4 STYLE

SIZE CHART	
DUCT SIZE	SUPPORT RAIL LENGTH
UP TO 12"	2'-0"
12" TO 24"	3'-0"
24" TO 36"	4'-0"
36" TO 48"	5'-0"
48" TO 60"	6'-0"
60" TO 72"	7'-0"
72" TO 84"	8'-0"

NOTE: WHEN DUCT IS INSULATED, TOTAL OUTSIDE DIMENSIONS OF DUCT & COVERING SHOULD BE USED TO DETERMINE SIZE OF SLIDE ASSEMBLY



9F ROOF MOUNTED DUCT SUPPORTS
SCALE: NONE



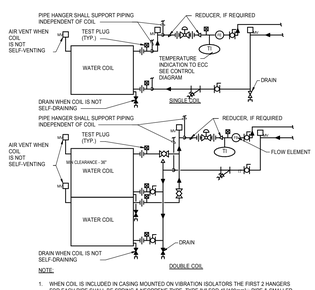
	AIR HANDLING UNIT	ITEM	MINIMUM OUTSIDE AIR TWO BEDS OF FILTERS VAV	MINIMUM OUTSIDE AIR THREE BEDS OF FILTERS CV	100% OUTSIDE AIR TWO BEDS OF FILTERS CV	100% OUTSIDE AIR THREE BEDS OF FILTERS CV
*	MIXING BOX	1	YES	YES	NO	NO
*	BLENDER SECTION	2	YES	YES	NO	NO
*	PRE-FILTERS (SIDE ACCESS)	3	YES	YES	YES	YES
*	INSPECTION SECTION, SMALL	4	YES	YES	YES	YES
*	AFTER FILTER (SIDE ACCESS)	5	YES	YES	YES	YES
*	ACCESS SECTION, MED-LARGE	6	YES	YES	YES	YES
*	HEAT RECOVERY COIL	7	NO	YES	YES	YES
*	ACCESS SECTION, MED-LARGE	8	NO	YES	YES	YES
*	PRE-HEAT COIL	9	YES	YES	YES	YES
*	INSPECTION SECTION,SMALL	10	YES	YES	YES	YES
	HUMIDIFIER	11	YES	YES	YES	YES
	COOLING COIL	12	YES	YES	YES	YES
	FAN	13	YES	YES	YES	YES
*	DIFFUSER PLATE	14	NO	NO	NO	YES
*	ACCESS SECTION,MED-LARGE	15	NO	YES	YES	YES
*	HEPA FILTER	16	NO	YES	NO	YES
*	DISCHARGE PLENUM (VERTICAL)	17	YES	YES	YES	YES

* AS REQUIRED

NOTE:

1. ACCESS DOORS SHALL BE GASKETED AND HINGED TO OPEN AGAINST FAN OPERATING PRESSURE TO PREVENT AIR LEAKAGE.
2. MINIMUM ACCESS DOOR WIDTH SHALL BE 24" [600mm].
3. ACCESS DOOR HEIGHT SHALL BE DETERMINED BY UNIT CASING BUT NOT TO EXCEED 6'-0" [1800mm].
4. ACCESS DOORS ON FAN SUCTION SHALL OPEN OUTWARD.
5. ACCESS DOORS ON FAN DISCHARGE SIZE SHALL OPEN INWARD.

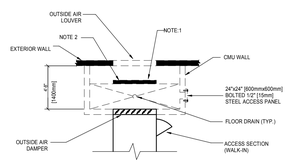
1F ACCESS DOOR SWING DETAIL FOR AIR HANDLING UNITS
NTS



NOTE:

1. WHEN COIL IS INCLUDED IN CASING MOUNTED ON VIBRATION ISOLATORS THE FIRST 2 HANGERS FOR EACH PIPE SHALL BE SPRING & NEOPRENE TYPE. TYPE "H" FOR 4" [100mm] - PIPE & SMALLER. TYPE "H-P" FOR 5" [125mm] - PIPE & LARGER.
2. PIPING SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS; NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALES, OR EQUIPMENT.
3. THE FLOW ELEMENT MAY BE INSTALLED IN THE SUPPLY PIPING IF THE REQUIRED MINIMUM UPSTREAM AND DOWNSTREAM DIMENSIONS CANNOT BE OBTAINED IN THE RETURN PIPING.

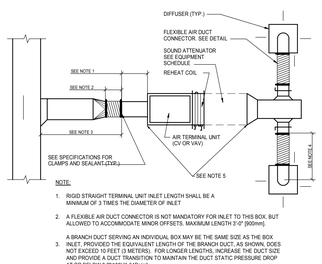
2F WATER COILS - PIPING CONNECTIONS
NTS



DETAIL KEYNOTES:

1. THE DESIGN AND SUPPORTING DOCUMENTATION FOR THE BLAST RESISTANT CONCRETE WALL SHALL BE COORDINATED AND APPROVED BY A REGISTERED PROFESSIONAL STRUCTURAL ENGINEER SPECIALIZING IN BLAST RESISTANT CONSTRUCTION.
2. LIMIT AIR VELOCITY TO 800 FPM [4.0 m/s] THRU PLENUM.

4F OUTSIDE AIR INTAKE FOR AIR HANDLER UNIT FOR MISSION CRITICAL FACILITY
NTS



NOTE:

1. RIGID STRAIGHT TERMINAL UNIT INLET LENGTH SHALL BE A MINIMUM OF 3 TIMES THE DIAMETER OF INLET
2. A FLEXIBLE AIR DUCT CONNECTOR IS NOT MANDATORY FOR INLET TO THIS BOX, BUT ALLOWED TO ACCOMMODATE MINOR OFFSETS. MAXIMUM LENGTH 3'-0" [900mm].

A BRANCH DUCT SERVING AN INDIVIDUAL BOX MAY BE THE SAME SIZE AS THE BOX INLET, PROVIDED THE EQUIVALENT LENGTH OF THE BRANCH DUCT, AS SHOWN, DOES NOT EXCEED 10 FEET (3 METERS). FOR LONGER LENGTHS, INCREASE THE DUCT SIZE AND PROVIDE A DUCT TRANSITION TO MAINTAIN THE DUCT STATIC PRESSURE DROP AT OR BELOW 0.27/100' [1.64Pa/m].

FLEXIBLE AIR DUCT CONNECTORS: WHEN USED FROM TERMINAL UNIT SUPPLY AIR DUCT TO DIFFUSER, SHALL NOT EXCEED 5'-0" [1500mm]. USE RIGID ELBOWS FOR

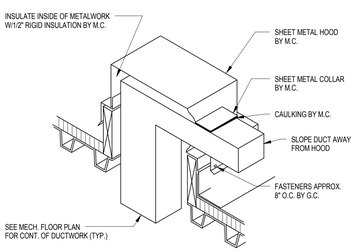
3. CHANGE OF DIRECTION GREATER THAN 45°.

COMPONENT ARRANGEMENT MAY VARY BY MANUFACTURER. PROVIDE INSULATION W/VAPOR BARRIER FOR CONNECTING DUCT SECTIONS.

5. USE OF THE FLEXIBLE AIR DUCT CONNECTORS ARE NOT PERMITTED FOR THE DEDICATED AHU SERVING THE SURGICAL SUITE.
6.

5F DUCT CONNECTIONS - AIR TERMINAL UNITS
NTS

DESIGNER'S NOTE: 1.INDICATE SOUND ATTENUATOR AS REQUIRED BY ACOUSTICAL ANALYSIS



7F V-207 DUCT THRU ROOF
1/8" = 1'-0"

FULLY SPRINKLERED
100% CONSTRUCTION DOCUMENTS

MARK	REVISION DESCRIPTION	DATE

CONSULTANTS:

REGISTERED PROFESSIONAL ENGINEER — REG. NO. 9098 — BRIAN S. WEBSTER — SOUTH DAKOTA — 8/06/2012

ARCHITECTS/ ENGINEERS:

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Drawing Title: MECHANICAL DETAILS	Project Title: Sioux Falls VA Health Care System Acute Inpatient Medical Unit Addition and Renovation	Project Number: 04100857	Office of Construction and Facilities Management
Approved: Project Director	Location: VA Medical Center, 2501 W. 22nd Street, PO Box 5046, Sioux Falls, SD 57117-5046	Building Number: 5	
	Date: 08/08/2012 / Checked: BSW / Drawn: JTC	Drawing Number: 5-MH502 Dwg. 94 of 123	Department of Veterans Affairs

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