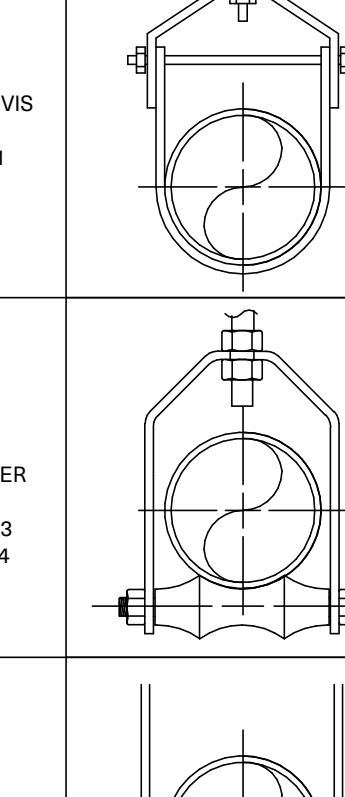
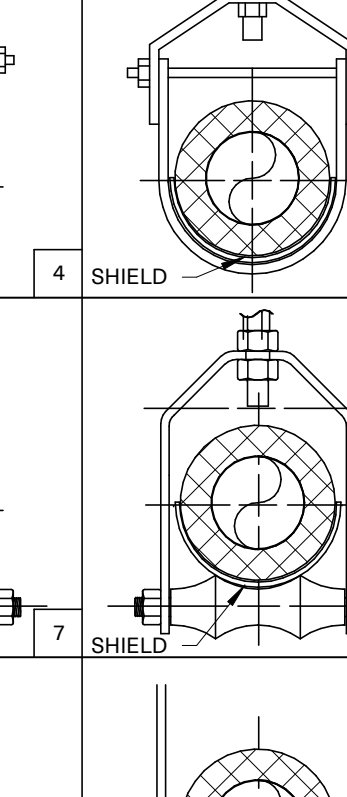
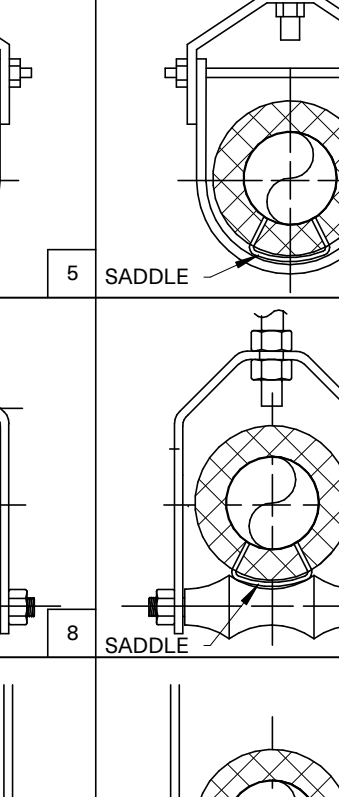
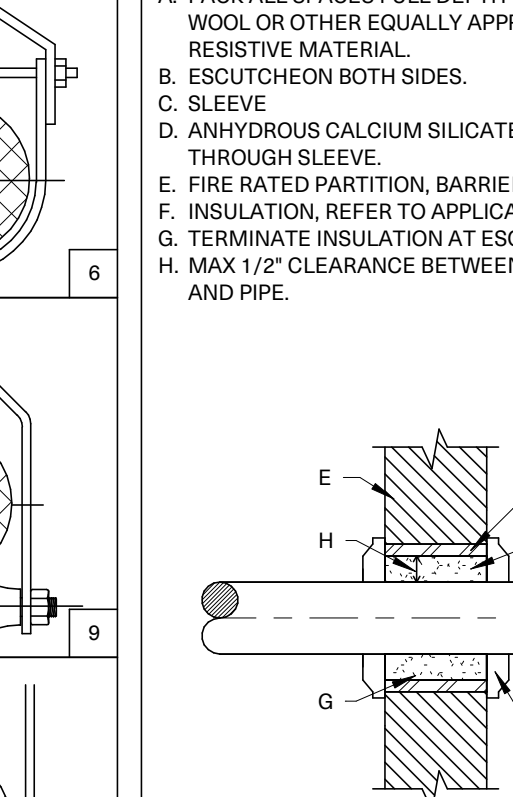
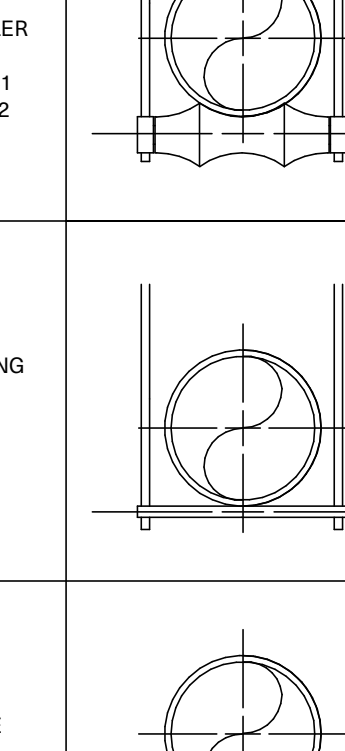
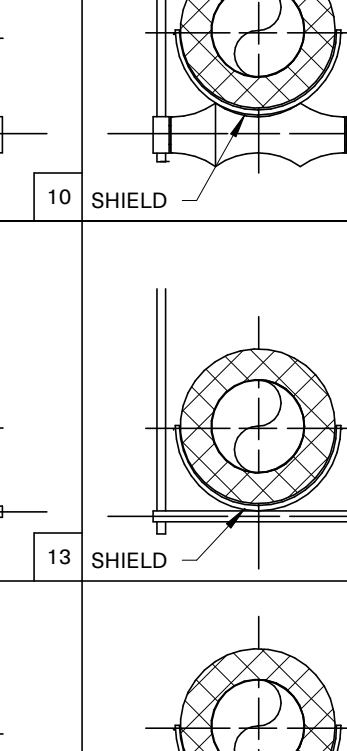
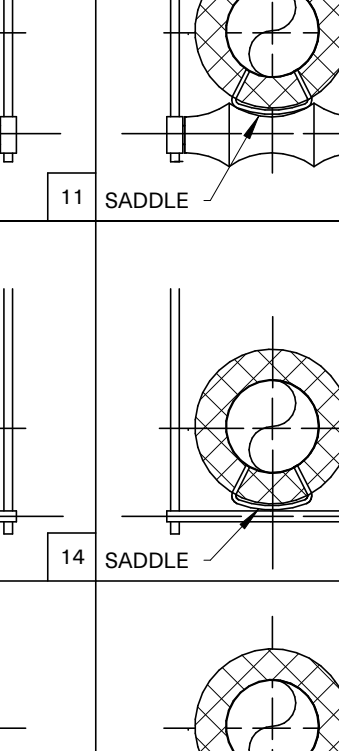
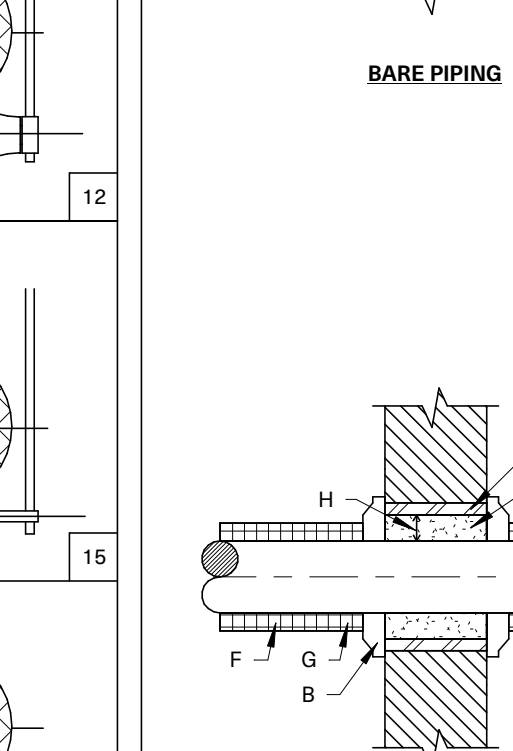
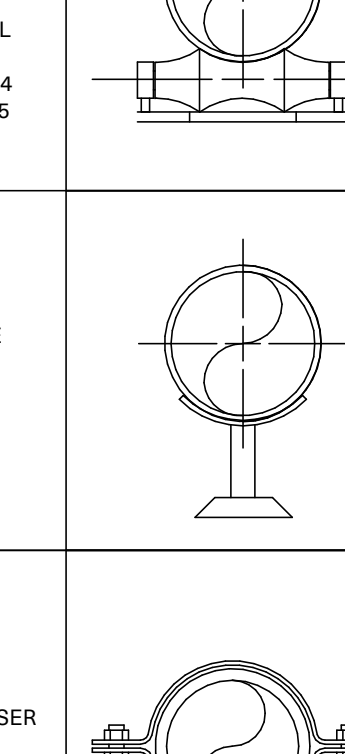
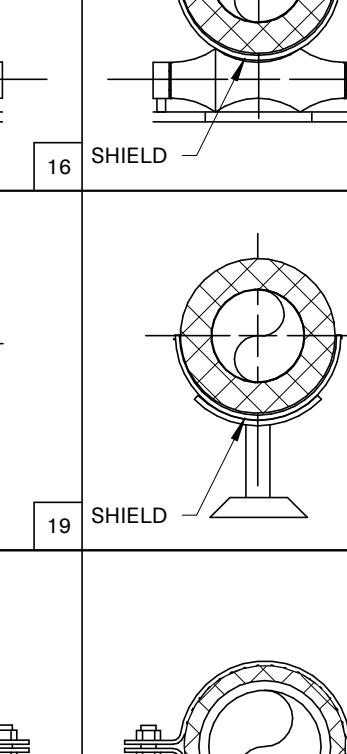
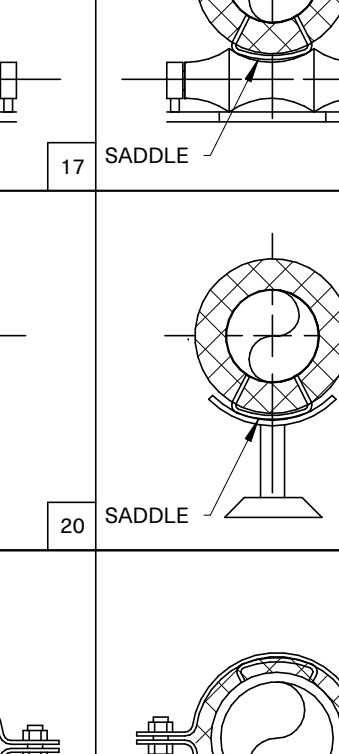
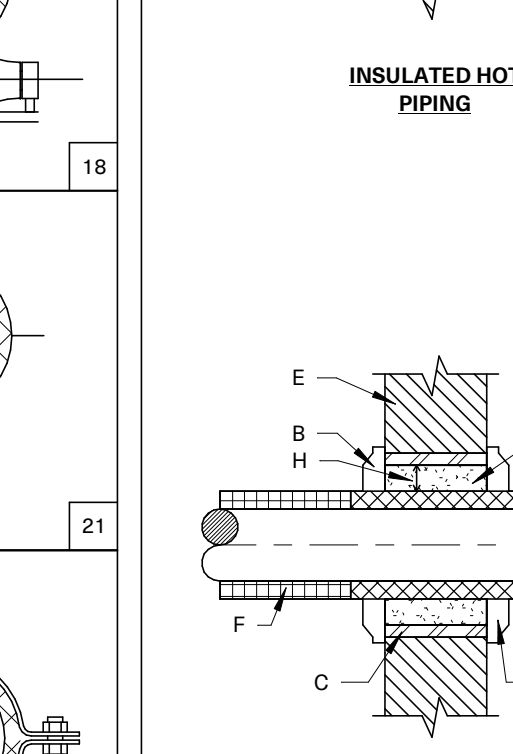
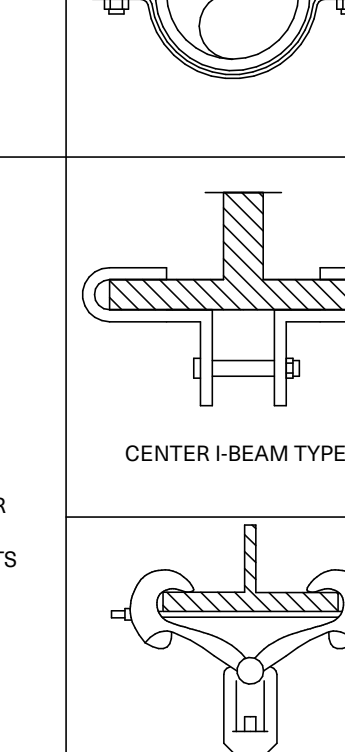
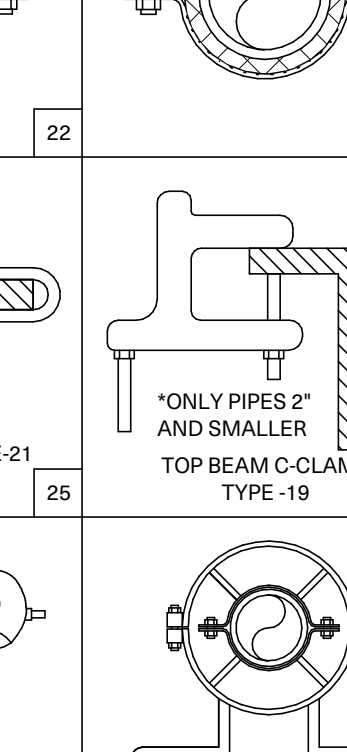
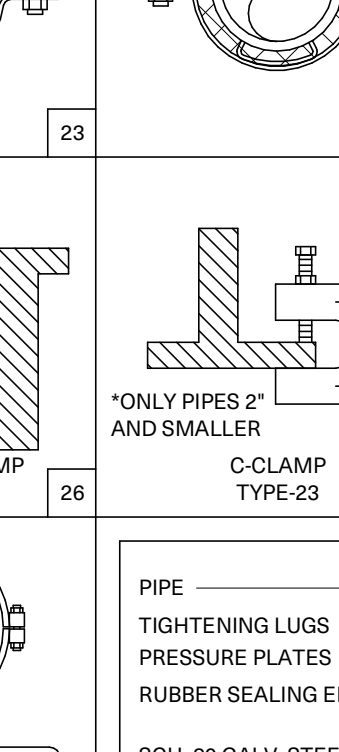
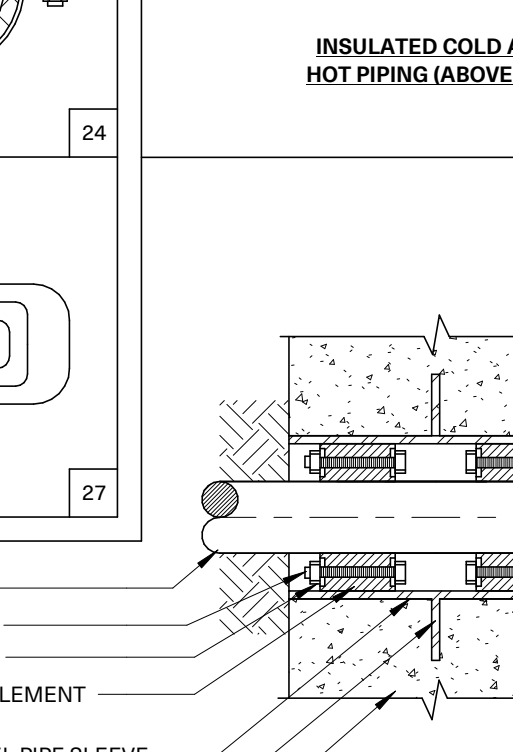
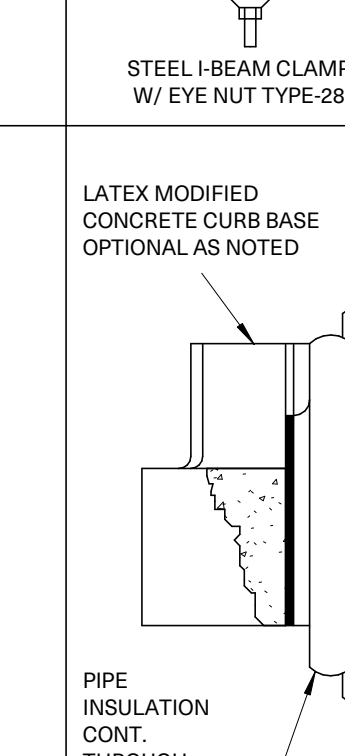
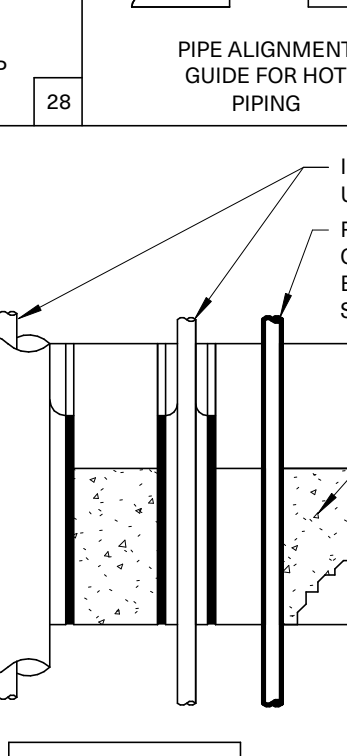
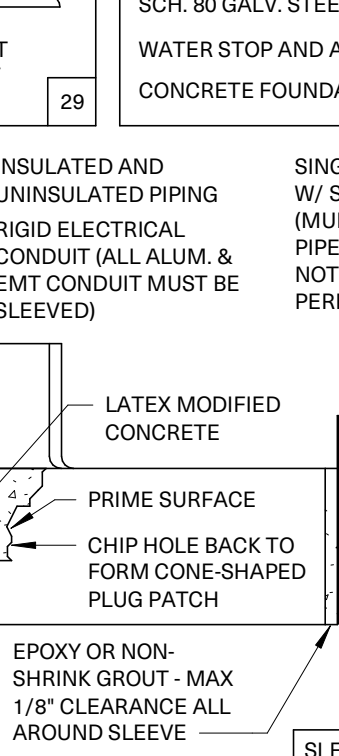
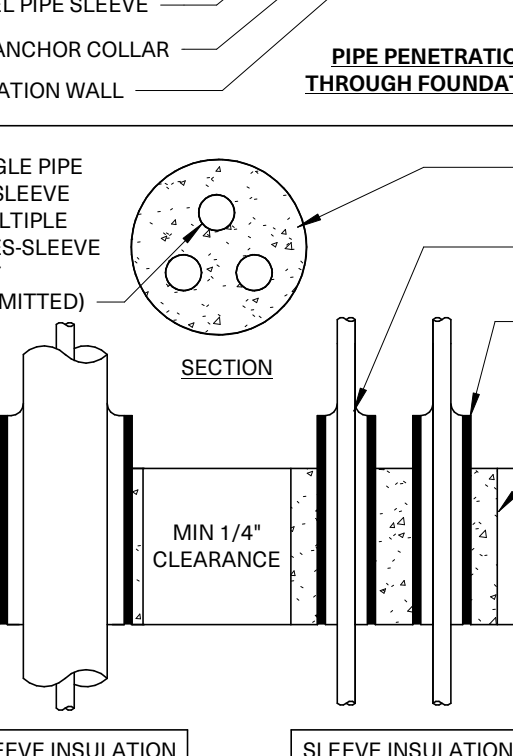
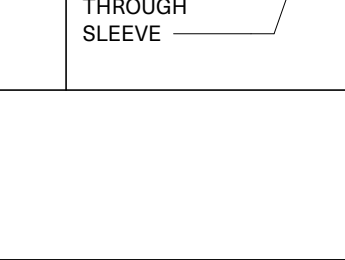
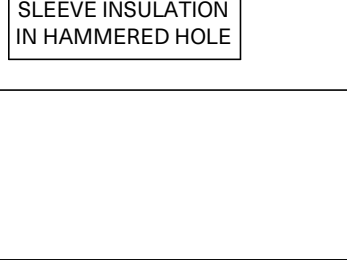
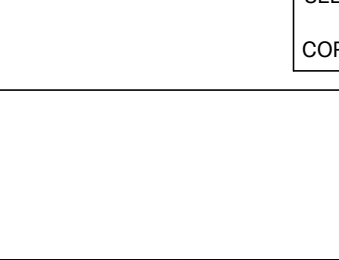
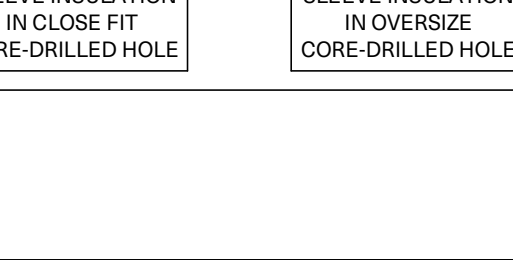


SWIVEL LOOP HANGER HEAVY DUTY MSS-SP-69 #10 WW-H-171 #10 	SWIVEL LOOP HANGER WITH INSULATION SHIELD 	TRAPEZOID PIPING HANGER SYSTEM MSS-SP-69 OR STRUCTURAL SHAPE W/ MSS-SP-68 HANGER 	STEEL THREADED ROD MOUNTED TO STRUCTURE ABOVE 
STANDARD CLEVIS HANGER MSS-SP-69 #1 WW-H-171 #1 	SHIELD 	SADDLE 	FIRE RATED PIPE PENETRATION DETAILS (BELOW) 
ONE ROD ROLLER HANGER MSS-SP-69 #43 WW-H-171 #44 	SHIELD 	SADDLE 	BARE PIPING 
TWO ROD ROLLER HANGER MSS-SP-69 #41 WW-H-171 #42 	SHIELD 	SADDLE 	INSULATED HOT PIPING 
METAL FRAMING HANGER 	SHIELD 	SADDLE 	INSULATED COLD AND HOT PIPING (ABOVE 160) 
ADJUSTABLE PIPE ROLL STAND (STEEL FRAME) MSS-SP-69 #44 WW-H-171 #45 	SHIELD 	SADDLE 	PIPE PENETRATION THROUGH FOUNDATION 
ADJUSTABLE STANCHION SUPPORTS	SHIELD	SADDLE	PIPE PENETRATION THROUGH FOUNDATION
SINGLE BOLT RISER CLAMPS TYPE-8	SHIELD	SADDLE	PIPE PENETRATION THROUGH FOUNDATION
PIPE HANGER STRUCTURE ATTACHMENTS	SHIELD	SADDLE	PIPE PENETRATION THROUGH FOUNDATION
CENTER I-BEAM TYPE-21	SHIELD	SADDLE	PIPE PENETRATION THROUGH FOUNDATION
STEEL I-BEAM CLAMP W/ EYE NUT TYPE-28	SHIELD	SADDLE	PIPE PENETRATION THROUGH FOUNDATION
PIPE ALIGNMENT GUIDE FOR HOT PIPING	SHIELD	SADDLE	PIPE PENETRATION THROUGH FOUNDATION
INSULATED AND UNINSULATED PIPING RIGID ELECTRICAL CONDUIT (ALL ALUM. & EMT CONDUIT MUST BE SLEEVED)	SHIELD	SADDLE	PIPE PENETRATION THROUGH FOUNDATION

[illegible]

GENERAL NOTES:

1. EACH ACCEPTABLE MATERIAL IS INDICATED WITH AN "X". IF MORE THAN ONE IS SELECTED, THE CONTRACTOR HAS THE OPTION TO CHOOSE BETWEEN SELECTED MATERIALS.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. EQUIPMENT CONNECTIONS SHALL BE EITHER GROOVED OR FLANGED OR USE UNIONS.
4. EQUIPMENT DRAINS, RELIEF VALVES, AND VENTS SHALL BE THE SAME MATERIAL AS PIPING SYSTEM.
5. DISSIMILAR METAL PIPING JOINTS SHALL USE DIELECTRIC FITTINGS COMPATIBLE WITH BOTH MATERIALS.
6. INSULATING MATERIALS: THICKNESS AND THERMAL RESISTANCE SHALL COMPLY WITH THE INTERNATIONAL ENERGY CONSERVATION CODE 2015 OR ASHRAE STANDARD 90.1-2013.
7. INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVE BODIES, AND BALANCE VALVES ASSOCIATED WITH PIPING 1 INCH AND SMALLER.
8. INSULATION IS NOT REQUIRED FOR PIPING CONVEYING FLUIDS OPERATING BETWEEN 60°F AND 105°F AND DIRECT BURIED PIPING CONVEYING FLUIDS AT OR BELOW 60°F.
9. PIPE HANGER SPACING IS BASED ON WORST CASE ALLOWED MATERIAL. HANGER SPACING FOR SELECTED MATERIAL SHALL COMPLY WITH CURRENT PLUMBING AND MECHANICAL CODE OR APPROVED BY AHA.

KEYED NOTES:

- A. GROVED FITTINGS SHALL ONLY BE USED IN ACCESSIBLE SPACE(S) (I.E. MECHANICAL ROOMS OR ABOVE LAY-IN CEILINGS).
B. FUEL GAS PIPING LOCATED WITHIN RETURN AIR PLENUM SHALL BE WELDED. VALVES, FLANGES, AND UNIONS ARE PROHIBITED.
C. NO JOINTS ALLOWED UNDERGROUND.
D. PLASTIC PIPE SHALL NOT BE USED IN RETURN AIR PLENUMS. CONTRACTOR SHALL PROVIDE FIRE RATED INSULATION OR GYPSUM ENCLOSURE WHEN ROUTED THROUGH A PLENUM SPACE.
E. PROVIDE INSULATION JACKETS FOR ALL AREAS SUSCEPTABLE FOR DAMAGE INCLUDING BUT NOT LIMITED TO MECHANICAL ROOMS, EQUIPMENT ROOMS, JANITOR CLOSET, RECEIVING. JACKETS SHALL BE INSTALLED UP TO 10 FEET ABOVE FINISHED FLOOR.
F. THE MAXIMUM HORIZONTAL SPACING OF PIPE HANGERS SHALL BE INCREASED TO 10 FEET WHERE 10 FOOT LENGTHS ARE INSTALLED.
G. WASTE PIPING RECEIVING WATER ABOVE 120 DEG SHALL BE METAL.
H. PROVIDE PROTECTIVE COATING FOR INSULATION LOCATED OUTDOORS.
I. INSULATE EXTERIOR PIPE & PROVIDE ALUMINUM JACKET.

LOW PRESSURE DUCTWORK JOINT AND SUPPORT SCHEDULE

RECTANGULAR JOINT CONSTRUCTION										RECTANGULAR HANGERS AND SUPPORTS								ROUND HANGERS AND SUPPORTS				
STEEL GAUGE	MINIMUM DUCT SIZE	MAXIMUM DUCT SIZE	PLAIN 'S' SLIP	DRIVE SLIP	HEMME D 'S' SLIP	FLANGED WITH GASKET	STANDING DRIVE SLIP	STANDI NG S	STANDING S (BAR REINFORCED)	STANDING S (ANGLE REINFORCED)	MAXIMUM HALF OF DUCT PERIMETER	GALVANIZED SHEET STEEL STRAPS	LOAD RATED CABLE	GALVANIZED THREADED STEEL ROD	MAXIMUM SPACING FT	WIRE/ ROD DIAMETER	STRAP WIDTH AND GAUGE	DIAMETE R	MAXIMUM SPACING FT	WIRE DIAMETE R	ROD DIAMETE R	STRAP WIDTH AND GAUGE
24	4	12	X	X	X		X	X		P/2=30"	X		X	X	10	10	3/8"	1' x 22 G	12	12 ga	1/4"	1' x 22 ga
24	13	15	X	X	X		X	X		P/2=25"	X		X	X	10	3/8"	1' x 16 G	1' x 18	12	12 ga	1/4"	1' x 22 ga
24	19	30	X	X	X		X	X		P/2=196"	X		X	X	10	3/8"	1' x 16 G	19-24	12	(2) 10 ga	1/4"	1' x 22 ga
22	31	42				X	X		X	X	1/2"	1/2"	1 1/2" x 16 ga	26-36	12	(2) 8 ga	3/8"	(2) 12 ga	3/8"	(2) 1" x 18 ga		
22	43	64				X	X	X	X	X	P/2=168"	X	X	X	10	1/2"	1 1/2" x 16 G	37-50	12	-	(2) 3/8"	(2) 1" x 20 ga
20	55	80				X	X	X	X	X	P/2=192"	X	X	X	10	1/2"	-	51-60	12	-	(2) 3/8"	(2) 1" x 18 ga

GENERAL NOTES:

1. JOINT CONSTRUCTION SHALL COMPLY WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND NAIMA FIBROUS GLASS DUCT CONSTRUCTION STANDARDS.
2. "X" NOTES ALLOWED JOINT CONSTRUCTION AND SUPPORT TYPE.
3. HANGERS AND SUPPORTS SHALL COMPLY WITH CHAPTER 5 SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND LOCAL CODE AUTHORITY HAVING JURISDICTION.
4. REFER TO SMACNA FOR JOINT GAUGE, BRACING, TRANSVERSE REINFORCEMENT, AND JOINT REINFORCEMENT REQUIREMENTS.
5. ROUND METALLIC DUCTS SHALL BE MECHANICALLY FASTENED WITH A MINIMUM OF THREE (3) SHEET METAL SCREWS OR RIVETS EQUALLY SPACED.

DUCT APPLICATION SCHEDULE

	AIR SYSTEMS	DUCT MATERIAL										DUCT LOCATION										INSULATION MATERIAL/THICKNESS (INCH)				FIELD APPLIED JACKET						
		GRS GALV. SHEET METAL	ALUMINUM	TYPE 304 STAINLESS STEEL	FABRIC	DOUBLE WALL LINED GRS GALV. W/ SOLID INNER	DOUBLE WALL LINED GRS GALV. W/ PERF. INNER	14 GAUGE CARBON STEEL	PVC COATED GRS GALV SHEET METAL	UL 1978 PRE-FAB ZERO-C LEAKAGE GREGG DUCT	RIGID PHENOLIC PRE-INSULATED DUCT	MAXIMUM AIR VELOCITY, FPM	MAX FRICTION LOSS (IN WG.)	DESIGN PRESSURE CLASS (IN WG.)	MAXIMUM ALLOWABLE LEAKAGE (IN)	SEAL CLASS	EXPOSED (GENUINE SPACE)	EXPOSED (NOT SERVING SPACE)	ABOVE CEILING/ CONCEALED/ OUTSIDE THE SPACE SERVED	MECHANICAL ROOM	MAINTENANCE/ HIGH HUMIDITY	BURIED/ AT-IC	FIBERGLASS BLANKET	FIBERGLASS BOARD	FLEXIBLE ELASTOMERIC			ASTM E2382 2-HOUR FIRE BLANKET	2-HOUR FIRE BLANKET	MINIMUM THERMAL RESISTANCE R-VALUE	ALUMINUM	SELF-ADHERED CLADDING
	LOW PRESSURE SUPPLY	X			X						1000	0.1	+2	5	A	X																
	LOW PRESSURE SUPPLY	X									1000	0.1	+2	5	A	X																
	LOW PRESSURE SUPPLY	X									1000	0.1	+2	5	A			X	X				1.5	1.5				4.7				
	LOW PRESSURE SUPPLY	X									1000	0.1	+2	5	A				X	X		X	3	3	2			8	X	X	X	PROVIDE PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC INSULATION
	LOW PRESSURE EXHAUST	X									1000	0.1	-2	5	A	X		X	X		X											
	LOW PRESSURE RETURN	X	X			X					1000	0.1	-2	5	A	X	X															
	LOW PRESSURE RETURN	X									1000	0.1	-2	5	A	X	X	X														RETURN AIR PLENUM; PROVIDE LINED DUCTWORK FOR THE FIRST 15 FEET FROM AHU
	LOW PRESSURE RETURN	X									1000	0.1	-2	5	A	X					X	3	3	2			8	X	X	X	PROVIDE PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC INSULATION	
	LOW PRESSURE RETURN	X									1000	0.1	-2	5	A	X	X	X				1.5	1.5				4.7					DUCTED RETURN; PROVIDE LINED DUCTWORK FOR THE FIRST 15 FEET FROM AHU
	AIR TRANSFER DUCT	X	X								500	0.05	+2	5	A	X	X	X														
	LOW PRESSURE OUTSIDE AIR AND MIXED AIR	X									1000	0.1	-2	5	A	X	X	X				1.5	1.5				4.7					
	LOW PRESSURE PLENUMS ADJACENT TO EXTERIOR	X				X					1000	0.1	+1/2	5	A	X	X	X				1.5	1.5				4.7					
	LOW PRESSURE EXHAUST (DAMPER TO EXTERIOR)	X				X					1000	0.1	+1/2	5	A	X	X	X				1.5	1.5				4.7					
	LAUNDRY/ DRYER EXHAUST	X									1000	0.1	+1/2	5	A	X	X	X		X												NO SHEET METAL SCREWS, DAMPERS, OR PROJECTIONS INSIDE DUCT