CHS School of Public Health Seismic Correction - UCLA

HVAC

SUBMITTAL DATA

GENERAL CONTRACTOR:
2H Construction Inc.
2561 Walnut Ave.,
Signal Hill, CA 90755
Tel. 562-424-5567

HVAC (SUB) CONTRACTOR
Cooland, Inc.
20950 S. Normandie Ave #O
Torrance, CA 90502
Tel. 310-320-3660

August 15, 2012

[X] NO EXCEPTIONS TAKEN
[ ] MAKE CORRECTIONS NOTED
[ ] REJECTED
[ ] REVISE AND RESUBMIT
[ ] SUBMIT SPECIFIED ITEM
[ ] REVIEWED FOR GENERAL CONFORMANCE ONLY
[ ] RETURNED WITHOUT REVIEW

This review is for general conformance with the design concepts of the project and general compliance with the information given in the contract documents. Any comments made during this review do not relieve the contractor from compliance with the requirements of the contract documents. Review of the product data shall not include the review of an assembly of which the item is a component. Contractor is responsible for quantities and dimensions, which shall be confirmed and correlated at the job site; fabrication processes and techniques of the construction; coordination of his work with that of all other trades and satisfactory performance of his work.

M-E ENGINEERS

DATE: 10/31/12 NAME: Marlon Ramirez

Table of Contents

No.	Description	Make/Model	Specification
1	**Duct Work**	Omni Duct, Cooland	15890
2	Flexible Duct	Thermaflex	15890
3	Duct Sealant	CCWI-181	15890
4	Duct Support System		15890

HVAC
SUBMITTAL DATA

MATERIAL: Duct Work **SPECIFICATION**: 15890
MODEL/MAKE: Omni Duct Systems / T. 714-704-1387
Heating and Cooling Supply / T. 562-426-1338

PROJECT : CHS- School of Public Health Seismic Correction

ARCHITECT:
Barton Phelps & Associates
5514 Wilshire Blvd., 10th Floor
Los Angeles, CA 90036-3829
Tel. 323-934-8615

ENGINEER:
M-E Engineers, Inc.
10113 Jefferson Blvd.,
Culver City, CA 90232
Tel. 310-842-8700

GENERAL CONTRACTOR:
2H Construction Inc.
2561 Walnut Ave.,
Signal Hill, CA 90755
Tel. 562-424-5567

HVAC (SUB) CONTRACTOR
Cooland, Inc.
20950 S. Normandie Ave., #O
Torrance, CA 90502
Tel. 310-320-3660

REVIEW COMMENTS/APPROVAL:

OMNI DUCT SYSTEMS

Submittal

Rectangular Duct

⇒ Omni Rectangular Duct & Fittings meet ASTM-A653-96 standards

⇒ Reference SMACNA tables 1" - 10" W.G. for construction standards and reinforcement schedule

Omni Rectangular Duct & Fittings are fabricated from galvanized steel & is in accordance with the latest edition of SMACNA Duct construction standards.

Coil Line Finish Lengths		
Connectors	**60"**	**48"**
TDC/TDC	56 1/4	44 1/4
TDC/S&D	57 5/8	45 5/8
TDC/DM 35	58 1/8	46 1/8
TDC/RAW	58 1/8	46 1/8
TDC/CAPS	57 1/2	45 1/2
TDC/CAPL	57 1/4	45 1/4
TDC/NOTCH	57 1/8	45 1/8
S&D/S&D	59	47
S&D/DM 35	59 1/2	47 1/2
S&D/RAW	59 1/2	47 1/2
S&D/CAPS	58 7/8	46 7/8
S&D/CAPL	58 5/8	46 5/8
S&D NOTCH	58 1/2	46 1/2
RAW/RAW	60	48
CAPS/RAW	59 3/8	47 3/8
CAPL/RAW	59 1/8	47 1/8
CAPS/CAPS	58 3/4	46 3/4
CAPL/CAPL	58 1/4	46 1/4
DM 35/DM 35	60	48

***Note: Check to indicate variations from standard construction methods**

Alternative Joint Connectors*

- ☐ TDC
- ☑ Ductmate

Seam Construction*

- ☑ Pittsburg
- ☐ Snap-Lock

Reinforcement Options*

- ☐ External Angle Iron
- ☐ Internal Tie Rods

Seam Sealant Available*

- ☐ Yes
- ☐ No

www.omniduct.com

Job Name: _____ **Location:** _____

Mechanical Contractor: _____ **Job No:** _____

Manufacturer : Omni Duct Systems, Toll Free (888) 444-DUCT (3828) **Date:** _____

OMNI DUCT SYSTEMS

Submittal

Round Spiral Duct & Fittings

- ⇒ Omni Round Spiral Duct & Fittings meet ASTM A653-96 standards.
- ⇒ Joint connection, unless otherwise specified, will be furnished with coupling slip-joint connections.
- ⇒ All fitting ends will insert a minimum of 2" inside the mating duct.
- ⇒ ~~Seam construction, unless otherwise specified, will be spot-welded on 1" centers .~~
- ⇒ ~~If specified, a protective seam sealer formulated for bonding metal to metal will be applied.~~
- ⇒ ~~Standard (Type S) - A smooth, high-strength duct. Provides a combination of high strength and economy, plus the lowest friction loss available.~~
- ⇒ ~~Semi-Ribbed (Type SR) - Offers a reinforcing corrugation for added strength.~~
- ⇒ Omni Spiral Duct is made with air-tight spiral 4-ply lock seam construction, available in galvanized steel, cold roll steel, stainless steel and aluminum & is in accordance with the latest edition of SMACNA Duct construction standards.

Spiral Duct Construction
Maximum +2 W.G. / Static Pressure

Duct Dia. Inches	Spiral Seam Gauge	Longitudinal Seam Gauge
3-8	28	28
9-14	28	26
15-26	26	24
27-36	24	22
37-50	22	20
51-60	20	18
61-84	18	16

Spiral Duct Construction
Maximum +4 W.G. Static Pressure

Duct Dia. Inches	Spiral Seam Gauge	Longitudinal Seam Gauge
3-8	26	24
9-14	26	24
15-26	24	22
27-36	22	20
37-50	20	20
51-60	18	18
61-84	18	16

Spiral Duct Construction
Maximum +10 W.G. Static Pressure

Duct Dia. Inches	Spiral Seam Gauge	Longitudinal Seam Gauge
3-8	28	24
9-14	28	24
15-26	24	22
27-36	22	20
37-50	20	18
51-60	18	16
61-84	16	14

***Note: Check to indicate variations from standard construction methods**

Alternative Joint Connectors*

☐ Dura Flange ☐ Angle Rings

☐ Spiralmate ☐ _____

Alternative Seam Construction* (Fittings)

☐ Seam Welded

☐ _____

Seam Sealant Available* (Fittings)

☐ Seal Outside

☐ Seal Inside

www.omniduct.com

Job Name: _____ **Location:** _____

Mechanical Contractor: _____ **Job No:** _____

Manufacturer : Omni Duct Systems, Toll Free (888) 444-DUCT (3828) **Date:** _____

2 in. wg Static Pos. or Neg. Duct Dimension	No Reinforcement Required	Reinforcement Code for Duct Gage Number							
		Reinforcement Spacing Options							
		10 ft	8 ft	6 ft	5 ft	4 ft	3 ft	2½ ft	2 ft
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
10 in. and under	26 ga.	Not Required							
11 – 12 in.	26 ga.								
13 – 14 in.	24 ga.		B-26	B-26	B-26	B-26	B-26	B-26	B-26
15 – 16 in.	24 ga.		C-26	C-26	C-26	C-26	C-26	B-26	B-26
17 – 18 in.	22 ga.		C-26	C-26	C-26	C-26	C-26	C-26	B-26
19 – 20 in.	20 ga.	C-22	C-24	C-26	C-26	C-26	C-26	C-26	C-26
21 – 22 in.	18 ga.	D-22	D-24	D-26	D-26	C-26	C-26	C-26	C-26
23 – 24 in.	18 ga.	E-22	E-24	D-26	D-26	D-26	C-26	C-26	C-26
25 – 26 in.	18 ga.	E-22	E-22	E-24	D-26	D-26	C-26	C-26	C-26
27 – 28 in.	18 ga.	F-20	E-20	E-22	E-24	D-26	D-26	C-26	C-26
29 – 30 in.	18 ga.	F-20	F-20	E-22	E-24	E-26	D-26	D-26	C-26
31 – 36 in.	16 ga.	G-18	G-20	F-22	F-24	E-24	E-26	D-26	D-26
37 – 42 in.	Not Designed	H-16	H-18	G-20	G-22	F-24	E-24	E-26	E-26
43 – 48 in.			I-18	H-20	H-22	G-22	F-24	F-24	E-24
49 – 54 in.			I-16G	I-18G	H-20G	H-20G	G-24	F-24	F-24
55 – 60 in.				I-18G	I-20G	H-20G	G-22	G-24	F-24
61 – 72 in.				J-16H	J-18H	I-20G	H-22G	H-22G	H-24
73 – 84 in.					J-16H	I-20G	I-20G	I-22G	I-22G
85 – 96 in.						J-18H	I-18H	I-20H	I-22H
97 – 108 in.						K-16I	K-18H	J-18H	I-18H
109 – 120 in.							K-16I	K-18I	J-18I

Table 2–3 Rectangular Duct Reinforcement

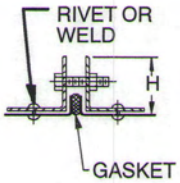
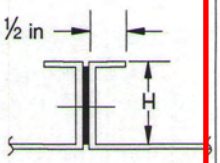
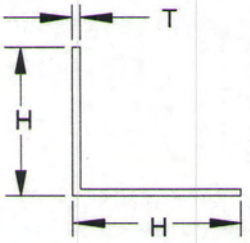
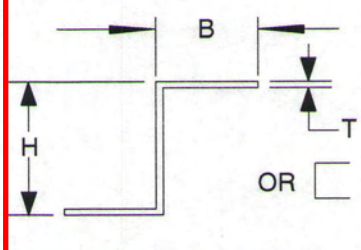
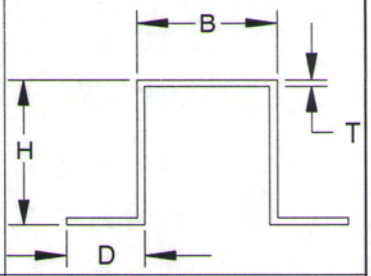
Reinf. Class										
		T-22 Companion Angles		T-24 Flanged		T-24a Flanged		T-25a Flanged T-25b Flanged		Slip-On Flange
	EI*	H × T	WT LF	T (Nom.)	WT LF	H × T (Nom.)	WT LF	H × T (Nom.)	WT LF	
B	1.0	Use E		Use D		Use D		Use D		Consult manufacturers for ratings established by performance documented to functional criteria in Chapter 11. *See* text S1.18 on page 2.4.
C	1.9	Use E		Use D		Use D		Use D		
D	2.7	Use E		26 ga	0.5	1 × 22 ga	0.4	26 ga	0.5	
E	6.5	C 1 × ⅛	1.7	24 ga	0.6	Use F		24 ga	0.6	
F	12.8	H 1 × ⅛	1.7	22 ga	0.7	1½ × 20 ga	0.6	22 ga	0.7	
G	15.8	1¼ × ⅛	2.1	22 ga (R) 20 G	1.0	1½ × 18 ga	0.8	22 ga (R) 20 ga	1.0	
H	26.4	C 1½ × ⅛ (+) H 1½ × ⅛	2.6	18 ga	1.1	SEE TIE ROD TEXT		18 ga	1.1	
I	69	1½ × ¼	3.7	20 ga (R)	1.0			20 ga (R)	1.0	
J	80	1½ × ¼ (+) 2 × ⅛	4.7	18 ga (R)	1.1			18 ga (R)	1.1	
K	103	2 × 3⁄16	5	18 ga (R)	1.1			18 ga (R)	1.1	
L	207	H 2 × ¼	6.5	18 ga (R)	1.1			18 ga (R)	1.1	

Table 2–32 Transverse Joint Reinforcement

See Section 2.1.4. *Effective EI is number listed times 10^5 before adjustment for bending moment capacity. For T-22, see tie rod downsize options in Tables 2-1 to 2-7; one rod for two angles. (R) means Tie Rodded. Accepted Pressure Mode for T-24a is (+) or (-) 2 in. wg maximum. *See* Figures 2-5 and 2-6 and tie rod text. (+) indicates positive pressure use only.







Reinf. Class		Angle		Channel or Zee		Hat Section	
	E1*	H × T (MIN)	WT LF	H × B × T (MIN)	WT LF	H × B × D × T (MIN)	WT LF
A	0.43	Use C		Use B		Use F	
B	1.0	Use C		¾ × ½ × 20 ga	0.24	Use F	
C	1.9	C 1 × 16 ga C ¾ × ⅛	0.40 0.57	¾ × ½ × 18 ga 1 × ¾ × 20 ga	0.31	Use F	
D	2.7	H ¾ × ⅛ C 1 × ⅛	0.57 0.80	1 × ¾ × 18 ga	0.45	Use F	
E	6.5	C 1 ¼ × 12 ga H 1 × ⅛	0.90	2 × 1 ⅛ × 20 ga	0.60	Use F	
F	12.8	H 1 ¼ × ⅛	1.02	1 ½ × ¾ × 18 ga	0.54	1 ½ × ¾ × ⅝ × 18 ga 1 ½ × 1 ½ × ¾ × 20 ga	0.90 0.83
G	15.8	1 ½ × ⅛	1.23	1 ½ × ¾ × 16 ga	0.66	1 ½ × ¾ × ⅝ × 18 ga	0.80
H	26.4	1 ½ × 3⁄16 2 × ⅛	1.78 1.65	1 ½ × ¾ × ⅛	1.31	1 ½ × 1 ½ × ¾ × 18 ga 2 × 1 × ¾ × 20 ga	1.08 0.90
I	69	C 2 × 3⁄16 2 ½ × ⅛	2.44 2.10	2 × 1 ⅛ × 12 ga 3 × 1 ⅛ × 16 ga	1.60 1.05	2 × 1 × ¾ × 16 ga	1.44
J	80	H 2 × 3⁄16 C 2 × ¼ 2 ½ × ⅛ (+)	2.44 3.20 2.10	2 × 1 ⅛ × ⅛	1.85	2 × 1 × ¾ × 12 ga 2 ½ × 2 × ¾ × 18 ga	2.45 1.53
K	103	2 ½ × 3⁄16	3.10	3 × 1 ⅛ × 12 ga	2.00	2 ½ × 2 × ¾ × 16 ga 3 × 1 ½ × ¾ × 16 ga	1.88 2.00
L	207	H 2 ½ × ¼	4.10	3 × 1 ⅛ × ⅛	2.29	2 ½ × 2 × ¾ × ⅛ 3 × 1 ½ × ¾ × 12 ga	3.70 3.40

Table 2–29 Intermediate Reinforcement

See Section 2.1.4. *Effective EI is number listed times 10^5 before adjustment for bending moment capacity. C and H denote cold formed and hot rolled ratings; when neither is listed, either may be used. *See* tie rod options elsewhere.

NOTES:

a. (+) indicates positive pressure use only.

b. Hat Section Dimension "B" may be equal to 2 times Dimension "H" with the same reinforcement class rating.

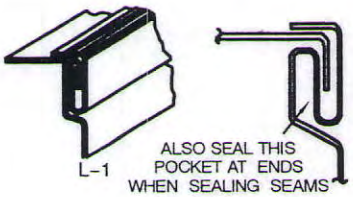
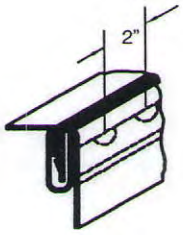
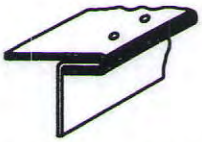
 PITTSBURGH LOCK	• Pocket depth from ¼ in. to ⅝ in. • Use on straight duct and fittings • To ± 10 in. wg
 L–2 BUTTON PUNCH SNAP LOCK	• ⅝ in. pocket depth for 20, 22, and 24 ga • ½ in. pocket depth for 24 and 26 ga • To ± 4 in. wg • Screws must be added at the ends of all duct of 4 in. wg and at the ends of 3 in. wg when the duct is over 48 in. width
 L–3 GROOVED SEAM ALSO CALLED FLAT LOCK AND PIPE LOCK	• To ± 10 in. wg
 SEE FIG. 2–7 ALSO L–4 STANDING SEAM	• To ± 10 in. wg • 1 in. seam up to duct width of 42 in. • 1 ½ in. seam for larger ducts • May be used on duct interiors • Fasten at 2 in. maximum from ends and at 8 in. maximum intervals
 L–5 SINGLE CORNER SEAM	• To ± 10 in. wg • Fasten as per L-4
 FLANGED (WITH GASKET) T–25a  FLANGED (WITH GASKET) T–25b	• Assemble per Figure 2-17 • Ratings may be adjusted with EI-rated bar stock or members from Tables 2-29 and 2-30 • Supplemental members may be attached to the duct wall on both sides of the joint • Single members may be used if they are fastened through both mating flanges • Gasket to be located to form an effective seal

FIGURE 2–2 RECTANGULAR DUCT/LONGITUDINAL SEAMS

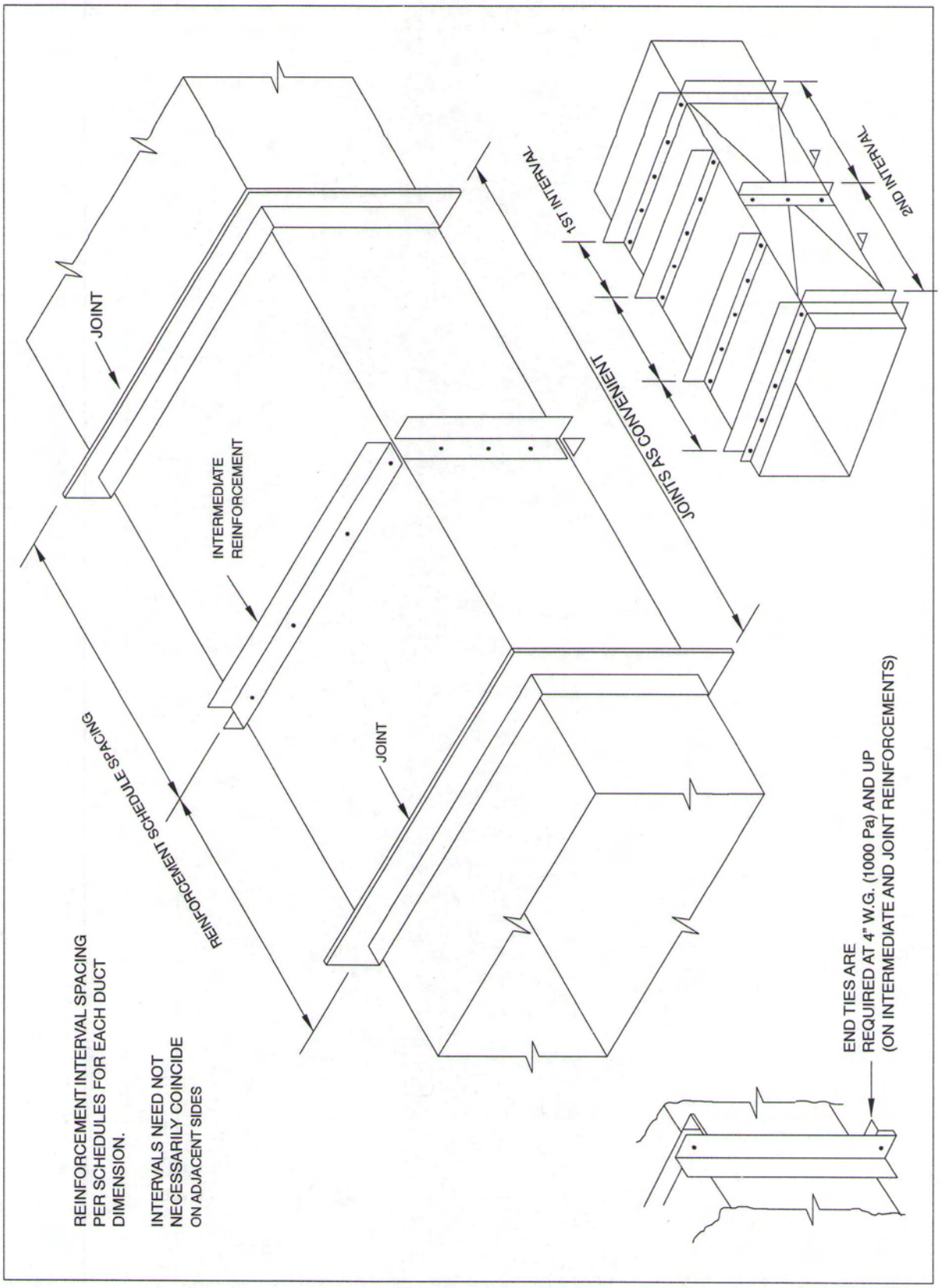


FIGURE 2–11 DUCT REINFORCED ON ALL SIDES

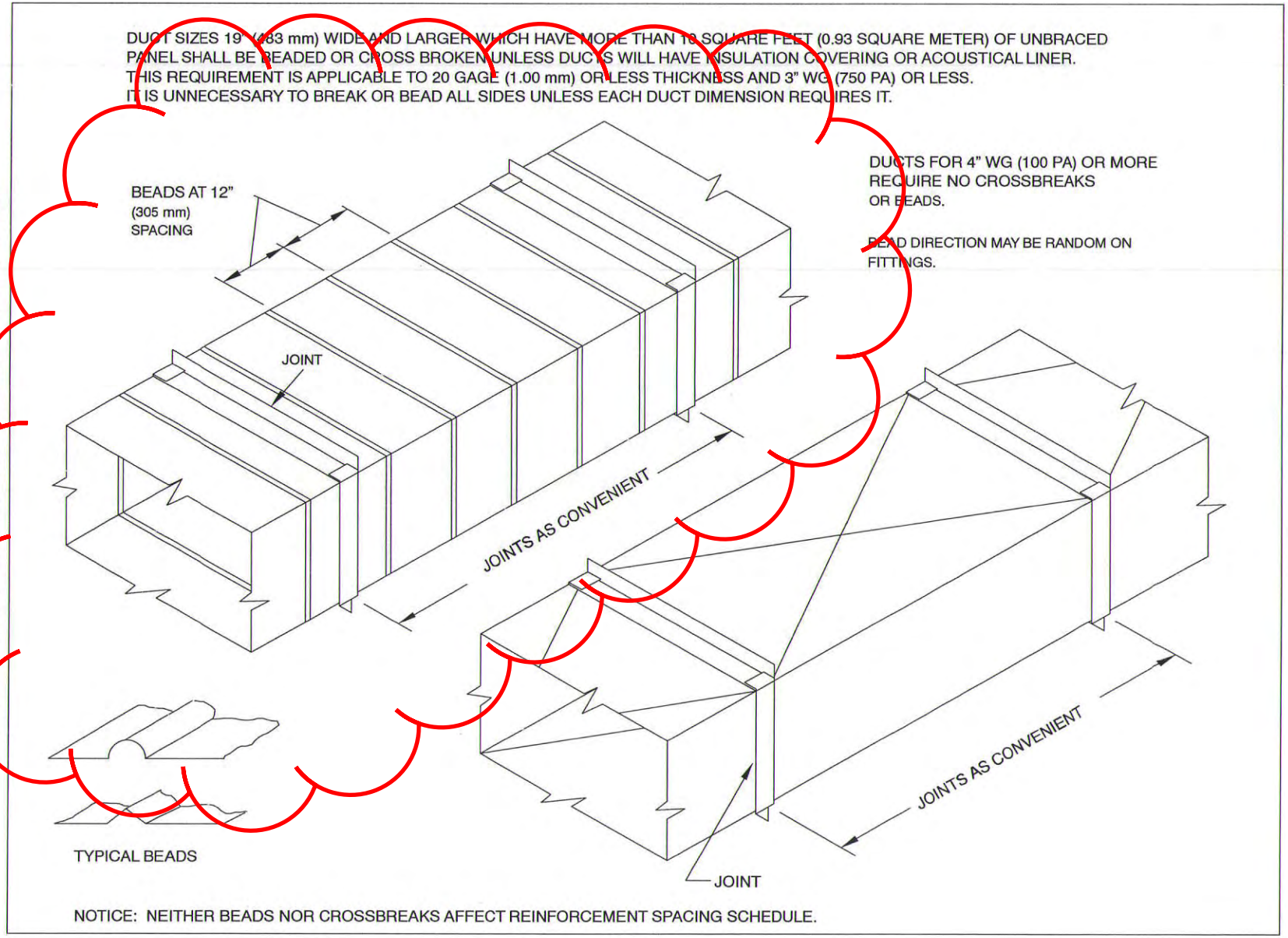
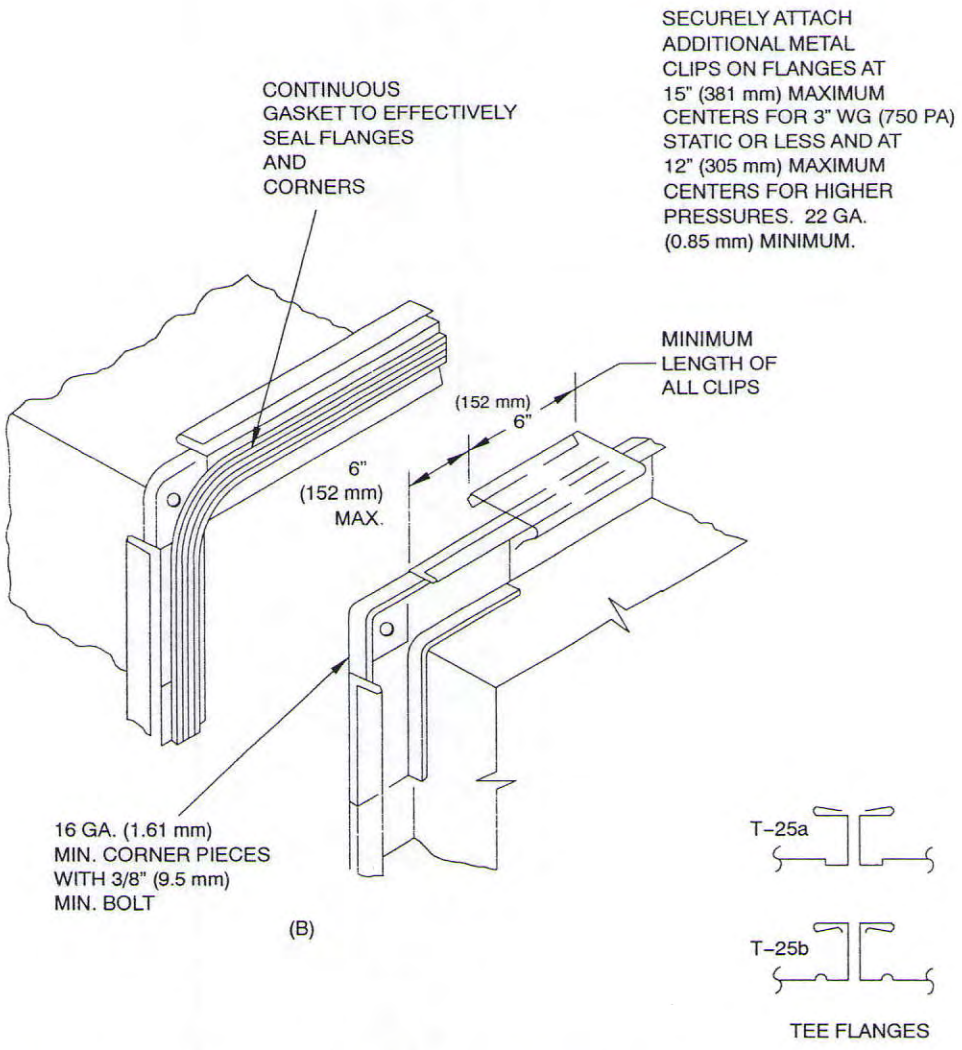


FIGURE 2-9 CROSSBROKEN AND BEADED DUCT



SCREWS MAY BE USED IN LIEU OF METAL CLIPS. INSTALL 1" (25MM) MAX. FROM END OF CORNER PIECE AND AT 6" (152 MM) MAX. INTERVALS.

EQUIVALENT FIXATION OF JOINTS MAY BE USED. CONTINUOUS CLEATS MAY BE USED.

FIGURE 2-17 CORNER CLOSURES - FLANGES

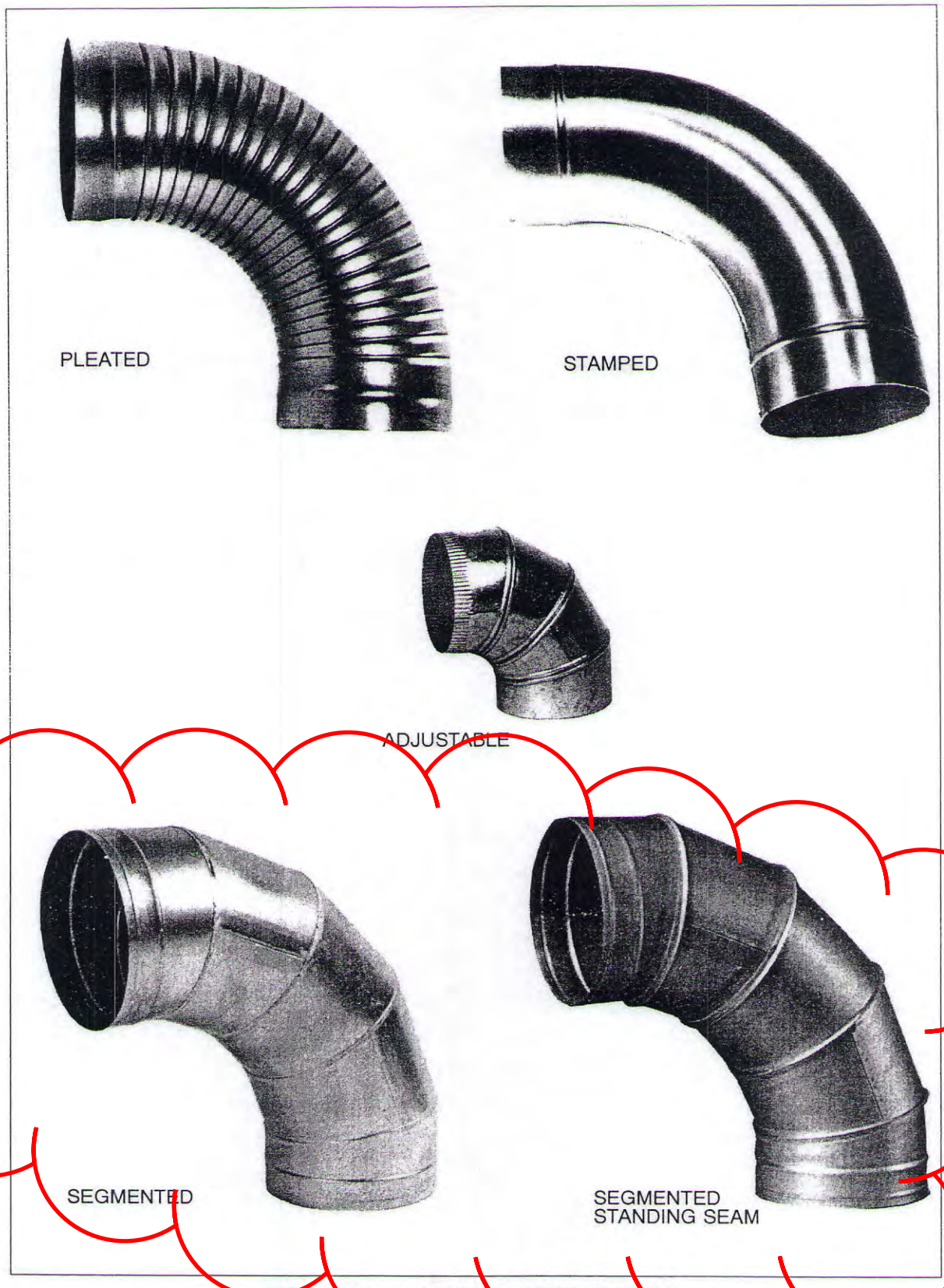


FIGURE 3–4 ROUND DUCT ELBOWS

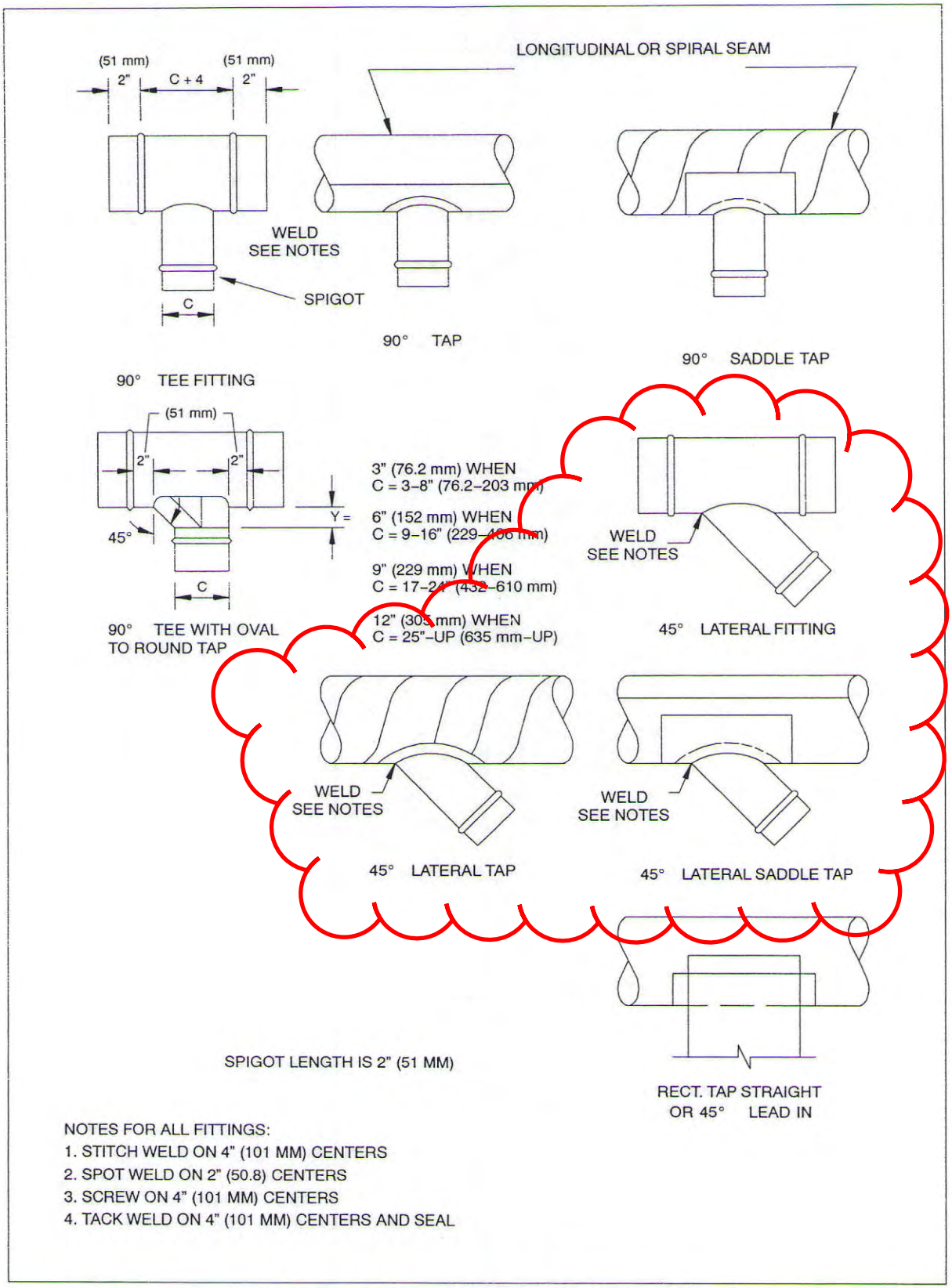
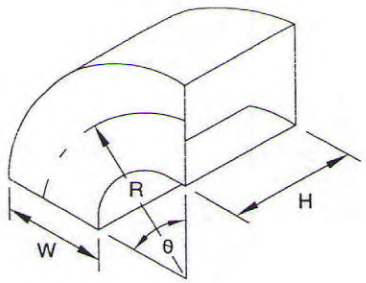


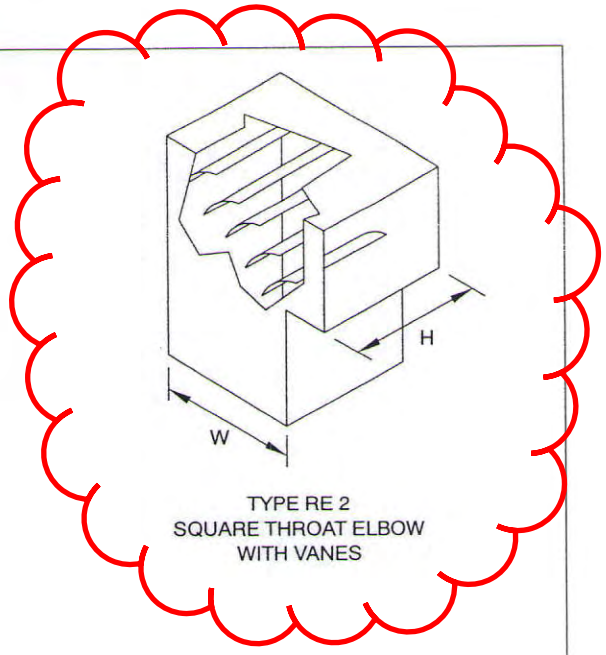
FIGURE 3–5 90° TEES AND LATERALS



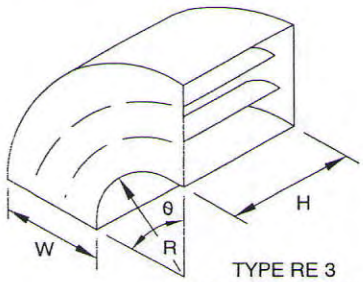
TYPE RE 1
RADIUS ELBOW

CENTERLINE R = $\frac{3W}{2}$ UNLESS OTHERWISE SPECIFIED – IS NOT RESTRICTED TO 90°

SQUARE THROAT, $\frac{R}{W}$ = 0.5, MAY BE USED, UP TO 1000 FPM (5 mps).



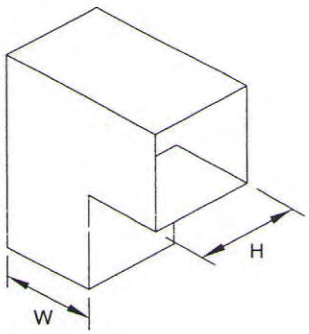
TYPE RE 2
SQUARE THROAT ELBOW
WITH VANES



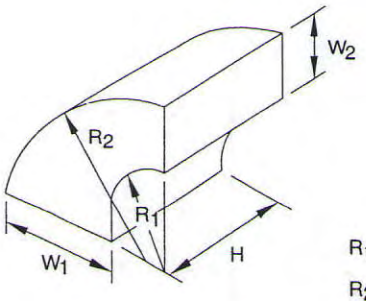
TYPE RE 3
RADIUS ELBOW
WITH VANES

NOTE:

FOR RE 3 *SEE* SPLITTER VANES IN SMACNA *HVAC SYSTEMS DUCT DESIGN*



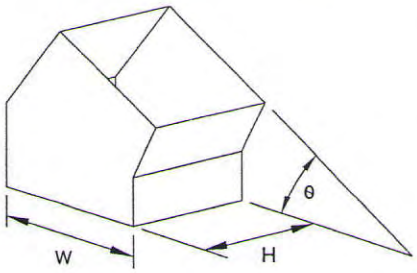
TYPE RE 4
SQUARE THROAT ELBOW
WITHOUT VANES
(1000 FPM (5 mps) MAXIMUM VELOCITY)



$R_1 = 3/4 \quad W_1$

$R_2 = R_1 + W_2$

TYPE RE 5
DUAL RADIUS ELBOW



TYPE RE 6
MITERED ELBOW

BEAD, CROSSBREAK AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT

PAGE 1 OF 2

FIGURE 4–2 RECTANGULAR ELBOWS

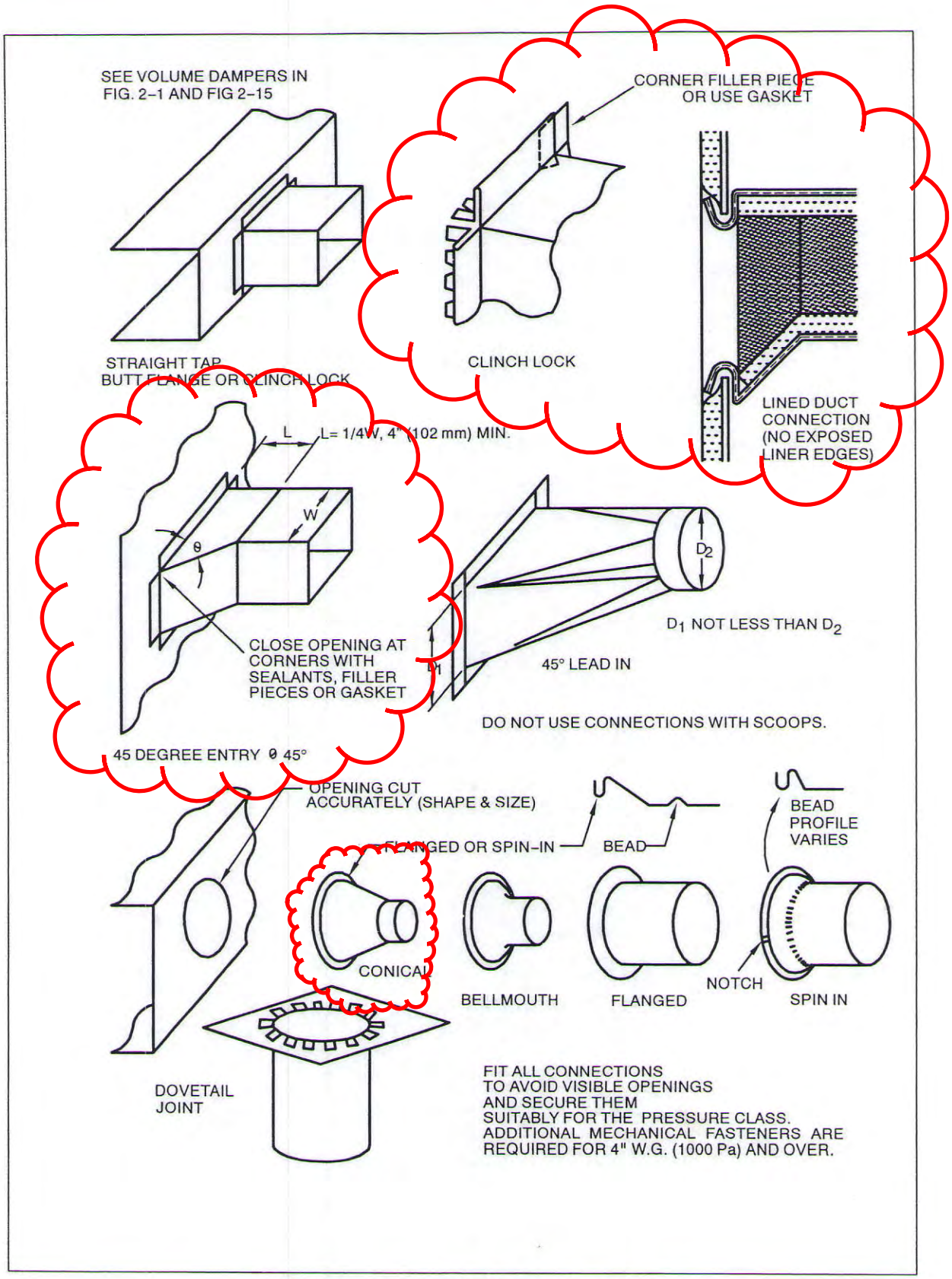


FIGURE 4–6 BRANCH CONNECTION

Thermaflex®

M-KE

ACOUSTICAL FLEXIBLE AIR DUCT

M-KE Features and Benefits:

- Underwriters Laboratories UL 181 listed, and complies with NFPA Standards 90A and 90B.
- Core material will not support mold and mildew growth.
- Fully lined for efficient air delivery.
- Large diameter, heavy, spring steel wire helix assures dimensional stability, resists mechanical abuse and provides more efficient air delivery.
- Bi-Directional reinforced metallized jacket resists tearing—reduces chance for damage to vapor barrier.
- Acoustically rated CPE core assures quiet performance.
- Uniquely constructed core will not unravel when cut.
- All components are self-extinguishing and will not support flame (see oxygen index figures under application and engineering data).
- "Outward Cast" of heavy spring steel helix keeps duct core from shrinking up inside insulation and jacket, resulting in less waste.
- CPE core material will stretch over fittings providing a "snug" fit and reducing labor costs associated with a poor fit.
- CPE core will not "blow-out" and eliminates costly call-backs.
- Labor savings and reduced waste result in lower installed costs.
- Available through broad national distribution.

APPLICATIONS:

Thermaflex® M-KE air duct is a thermally insulated, fully lined, flexible air duct designed for use in all medium pressure cooling and heating systems. It is used in either supply or return sections: for branch ducts and branch connections to or between mixing units, induction units, control or terminal units and diffusion devices, including light troffers. Thermaflex M-KE air duct provides economical means for handling mis-alignment between system components and ducting around obstacles where fabricated and fitted ducts are difficult and costly to install. Thermaflex air duct is equally suitable for new jobs or refit work and is especially useful when making system extensions or for changing conditioned zones, now or in the future. Compliance with NFPA Standards lets you install lengths longer than the limitation applying to connectors. Thermaflex M-KE is a highly efficient duct because the liner, in combination with the reinforced, metallized vapor barrier, provides a double air seal.

GreenGuard Certified for Superior Indoor Air Quality

GREENGUARD Indoor Air Quality Certified

www.thermaflex.net

National Sales Headquarters
P.O. Box 888 (528 Carwellyn Rd.)
Abbeville, SC 29620
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Fax 800-459-3828

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5230 Orbitor Dr.
Mississauga, Ontario L4W 5G7
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Fax 905-602-9665

HARDI UL ADC c UL

A division of Flex-Tek Group, Inc., a subsidiary of Smiths Group, plc.

M-KE

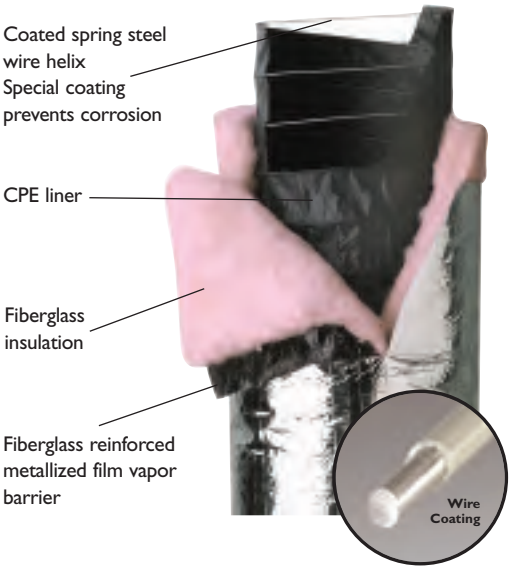
Insulated Acoustical Flexible
Air Duct for All Pressure Systems

APPLICATIONS and ENGINEERING DATA:

Nominal Inside Diameter (inches):	4	5	6	7	8	9	10	12	14	16	18	20	
Length (feet):	25	25	25	25	25	25	25	25	25	25	25	25	
Inside Bend Radius (inches):	4	5	6	7	8	9	10	12	14	16	18	20	
Operating Pressure (inches water column):	Positive = 10 inches (4-12 in. ID) 6 inches (14-16 in. ID) 4 inches (18-20 in. ID)												
	Negative = 1 inch (4-12 in. ID) 1/2 inch (14-20 in. ID)												
Operating Temperature Range (°F):	Minimum = -20								Maximum = 250				
Velocity (feet per minute):	5000												
R-Value:	4.2, 6.0, 8.0												
Surface Burning Characteristics:	Max. Flame Spread = 25								Max. Smoke Developed = 50				
Oxygen Index Ratings:	CPE Core = 3.13								Metallized Jacket = 45.7				
Vapor Transmission Rating (U.S. Perm):	0.05												

Construction and Materials:

CPE duct liner is permanently bonded to a coated spring steel wire helix, also supporting a blanket of fiberglass insulation. Vapor barrier is an outer jacket of fiberglass reinforced metallized film laminate.



Suggested Specification:

Flexible duct for connections between _____ and _____ shall be Thermaflex M-KE air duct Listed by Underwriters Laboratories, Inc., under UL Standard 181 as a Class 1 flexible air duct and complying with NFPA Standards 90A and 90B. Duct shall be factory made and composed of: a CPE liner duct permanently bonded to a coated spring steel wire helix and supporting a fiberglass insulating blanket. Low permeability outer vapor barrier of fiberglass reinforced film laminate shall complete the composite.

10 Year Warranty:

Thermaflex warrants that all insulated and non-insulated products will be free from defects in materials and factory workmanship for a period of ten years from the date of manufacture. This warranty covers the flexible duct, materials and labor. This warranty applies only to ducts properly installed in accordance to Thermaflex's written installation instructions and under conditions specified in published performance data. Thermaflex shall not be liable to buyer or any third party for any special, secondary, incidental or consequential damages however arising.

Bulletin M-KE 7/05 Printed in U.S.A.

CCWI-181

CCWI-181

Indoor/Outdoor Water Based Duct Sealant

A versatile, **all purpose duct sealant** for use on all types of metal duct, glass fiber duct board, and flex duct, as well as duct fabric and flexible tubing runouts. CCWI 181 incorporates a built-in **polyester reinforcement** for **exceptional strength,** with UV inhibitors for outdoor use. UL 181A-M listed / UL 181B-M listed.

TECHNICAL DATA

Color	White
Consistency	Heavy textured
Base	Synthetic latex
Solvent	Water
Weight per Gallon	11.6 lbs. (+/- 0.2)
Solids Content	70% (+/- 2)
Viscosity	Thixotropic
Coverage (UL 181 A-M)	Apply 18 mil, scrim and 18 mil over scrim.
(UL 181 B-M)	Approximately 214 to 320 lin. ft. per gal. at 30 to 35 mil wet film thickness at 3" width.
Shore A Hardness	>20
Flexibility	Passes 1/4 inch mandrel bend
Time to Test	48 hours*
Service Temperature	-20°F to 200°F
Mildew Resistance	Mold & Mildew resistant
VOC	45 g/l (less water)
Pressure Classes	*SMACNA* 1/2, 1, 2, 3, 4, 6 and 10 inches w.g.
Seal Classes	*SMACNA* A, B, C
Packaging	1, 2 & 5 gal. pails; 10.3 oz. cart.
Freeze/Thaw Stability	Passed 5 Cycles
Specification Compliance	Passes ASTM C-731, ASTM D-2202. USDA, EPA and FDA Approved

*May vary according to temperature and humidity

Underwriters Laboratories Inc.®
LISTED
17NF
UL 181A-M
FOR USE WITH U.L. LISTED RIGID FIBERGLASS AIR DUCTS OR CONNECTORS.
UL 181B-M
FOR USE WITH U.L. LISTED FLEXIBLE AIR DUCTS OR CONNECTORS.

City of Los Angeles Approval RR#8069

- INDOOR/OUTDOOR
- POLY REINFORCEMENT
- *NO-SAG* FORMULATION
- PROVEN RELIABILITY

APPLICATION

Apply to entire surface of duct joint

Temperature	35°F to 110°F (1.7°C to 44°C)
Method	Brush, putty knife, caulk gun, pump
Preparation	Surface must be dry, dirt, oil, and grease free.
Rate (UL 181 A-M):	Apply 18 mil, scrim and 18 mil over scrim.
(UL 181 B-M):	Approx. 214 to 320 lin. ft. per gal. at 30 to 35 mil wet film thickness at 3" width.
Clean Up Wet	Soap and water
Clean Up Dry	UNN-GRIP™ 798-ES or Solvent (Use safe handling practices.)
Painting	Only latex or epoxy paints
Ductboard	Scrim required for UL 181A-M

STORAGE
DO NOT FREEZE

Temperature	35°F to 110°F (1.7°C to 44°C)
Shelf Life	One year (unopened)
Flammability	Non-flammable

PRECAUTIONS

Surface must be clean and free of moisture, contamination and foreign matter. Do not allow this product to freeze. Do not apply when rain or freezing temperatures will occur within 36 hours. Do not apply this product where temperatures will exceed 200°F. Keep out of the reach of children. Review MSDS for complete safety information prior to use. DO NOT use where acidic or alkaline chemicals are present (ie., lab fume hood, vents, etc.)

For Industrial Professional Use Only.

For additional information contact:

HARDCAST
CARLISLE
Carlisle Coatings & Waterproofing Incorporated
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Wylie, Texas 75098
Phone: (800) 527-7092 FAX: (972) 442-0076
WWW.HARDCAST.COM

Printed in U.S.A 012/03

Maximum Half of Duct Perimeter	Pair at 10 ft Spacing		Pair at 8 ft Spacing		Pair at 5 ft Spacing		Pair at 4 ft Spacing	
	Strap	Wire/ Rod	Strap	Wire/ Rod	Strap	Wire/ Rod	Strap	Wire/ Rod
P/2 = 30"	1" × 22 ga	10 ga (.135")	1" × 22 ga	10 ga (.135")	1" × 22 ga	12 ga (.106")	1" × 22 ga	12 ga (.106")
P/2 = 72"	1" × 18 ga	⅜"	1" × 20 ga	¼"	1" × 22 ga	¼"	1" × 22 ga	¼"
P/2 = 96"	1" × 16 ga	⅜"	1" × 18 ga	⅜"	1" × 20 ga	⅜"	1" × 22 ga	¼"
P/2 = 120"	1½" × 16 ga	½"	1" × 16 ga	⅜"	1" × 18 ga	⅜"	1" × 20 ga	¼"
P/2 = 168"	1½" × 16 ga	½"	1½" × 16 ga	½"	1" × 16 ga	⅜"	1" × 18 ga	⅜"
P/2 = 192"	Not Given	½"	1 ½ " × 16 ga	½"	1" × 16 ga	⅜"	1" × 16 ga	⅜"
P/2 = 193" up	Special Analysis Required							

When Straps are Lap Joined Use These Minimum Fasteners:	Single Hanger Maximum Allowable Load	
	Strap	Wire or Rod (Dia.)
1" × 18, 20, 22 ga -two #10 or one ¼" bolt 1" × 16 ga -two ¼" dia. 1½" × 16 ga -two ⅜" dia Place fasteners in series, not side by side.	1" × 22 ga - 260 lbs. 1" × 20 ga - 320 lbs. 1" × 18 ga - 420 lbs. 1" × 16 ga - 700 lbs. 1½" × 16 ga - 1100 lbs.	0.106" - 80 lbs. 0.135" - 120 lbs. 0.162" - 160 lbs. ¼" - 270 lbs. ⅜" - 680 lbs. ½" - 1250 lbs. ⅝" - 2000 lbs. ¾" - 3000 lbs.

Table 5–1 Rectangular Duct Hangers Minimum Size

NOTES:

a. Dimensions other than gage are in inches.

b. Tables allow for duct weight, 1 lb./sf insulation weight and normal reinforcement and trapeze weight, but no external loads!

c. For custom design of hangers, designers may consult SMACNA's *Rectangular Industrial Duct Construction Standards,* the AISI *Cold Formed Steel Design Manual* and the AISC Steel *Construction Manual.*

d. Straps are galvanized steel; other materials are uncoated steel.

e. Allowable loads for P/2 assume that ducts are 16 ga maximum, except that when maximum duct dimension (w) is over 60 in. then P/2 maximum is 1.25 w.

f. For upper attachments *see* Figs. 5-2, 5-3 and 5-4.

g. For lower attachments *see* Fig. 5-5.

h. For trapeze sizes *see* Table 5-3 and Fig. 5-6.

i. 12, 10, or 8 ga wire is steel of black annealed, bright basic, or galvanized type.

j. Cable hanging systems with adjustable mechanical device.

Dia.	Maximum Spacing	Wire Dia.	Rod	Strap
10 in. dn 250 mm dn	12 ft 3.7 m	One 12 ga One 2.75 mm	¼ in. 6.4 mm	1 in. × 22 ga 25.4 x 0.85 mm
11-18 in. 460 mm	12 ft 3.7 m	Two 12 ga or One 8 ga One 4.27 mm	¼ in. 6.4 mm	1 in. × 22 ga 25.4 × 0.85 mm
19-24 in. 610 mm	12 ft 3.7 m	Two 10 ga Two 3.51 mm	¼ in. 6.4 mm	1 in. × 22 ga 25.4 × 0.85 mm
25-36 in. 900 mm	12 ft 3.7 m	Two 8 ga Two 2.7 mm	⅜ in. 9.5 mm	1 in. × 20 ga 25.4 × 1.00 mm
37-50 in. 1270 mm	12 ft 3.7 m	→	Two ⅜ in. Two 9.5 mm	Two 1 in. × 20 ga (2) 25.4 × 1.00 mm
51-60 in. 1520 mm	12 ft 3.7 m	→	Two ⅜ in. Two 9.5 mm	Two 1 in. × 18 ga (2) 25.4 × 1.31 mm
61-84 in. 2130 mm	12 ft 3.7 m	→	Two ⅜ in. Two 9.5 mm	Two 1 in. × 16 ga (2) 25.4 × 1.61 mm
85-96 in. 2400 mm	12 ft 3.7 m	→	Two ½ in. Two 12 mm	Two 1½ in. × 16 ga (2) 38 × 1.61 mm

Table 5–2 Minimum Hanger Sizes for Round Duct

NOTES:

a. Straps are galvanized steel; rods are uncoated or galvanized steel; wire is black annealed, bright basic or galvanized steel. All are alternatives.

b. *See* Figure 5-5 for lower supports.

c. *See* Figs. 5-2, 5-3 and 5-4 for upper attachments.

d. Table allows for conventional wall thickness, and joint systems plus one lb./sf (4.89 Kg/m^2) insulation weight. If heavier ducts are to be installed, adjust hanger sizes to be within their load limits; see allowable loads with Table 5-1. Hanger spacing may be adjusted by special analysis.

e. Designers: For industrial grade supports, including saddles, single point trapeze loads, longer spans and flanged joint loads, *see* SMACNA's *Round Industrial Duct Construction Standards.*

f. *See* Figs. 3-9 and 3-10 for flexible duct supports.

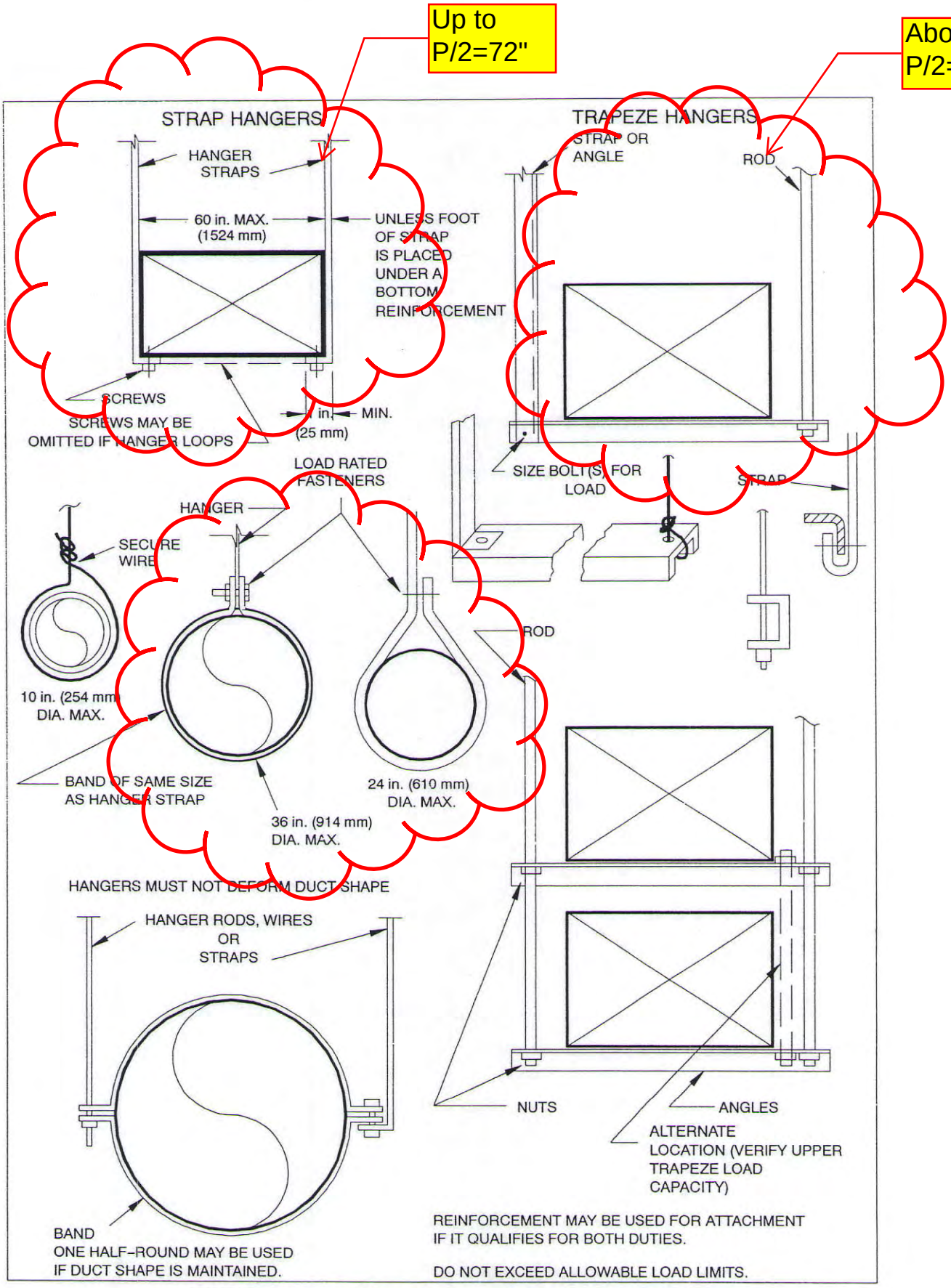

FIGURE 5–5 LOWER HANGER ATTACHMENTS