Quality People. Building Solutions.

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Date: 10/18/2024
Return Request: 11/1/2024
Project: UAMS (CAMID)
Supplier: Middleton
Manufacturer: Middleton
Submittal: Ductwork
Submittal Number: 23 31 13-01
Drawing # and Installation: Mechanical Drawings

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HVAC SUBMITTALS
10-17-24

PROJECT: UAMS Center for Animal Models of Infection & Disease
CONTRACTOR: Comfort Systems

PREPARED BY: David Singleton – **Middleton, Inc.**

CONTENTS

FURNISHED BY: **MIDDLETON, INC.**

Submittal Items : 233113 – Ductwork
Metal Duct Construction
Single Wall Spiral
Sigle Wall Stainless Long Seam

HVAC DUCT CONSTRUCTION SUBMITTALS

MIDDLETON SHEET METAL DUCT FABRICATION SUBMITTALS

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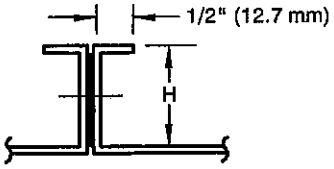
GRIPPLE SUBMITTALS ARE ATTACHED AND SMACNA APPROVED

ALL DUCT CONSTRUCTION TO MEET CURRENT SMACNA STANDARDS

FLANGED
(WITH GASKET)
T–24

- Assemble per Figure 2-16
- Close corners with minimum 16 ga corner pieces and ⅜ in. bolts min.
- Lock flanges together with 6 in. long clips located within 6 in. of each corner
- Clips spaced at 15 in. maximum for 3 in. wg pressure class or lower
- Clips spaced at 12 in. maximum for 4, 6 and 10 in. wg
- Gasket to be located to form an effective seal

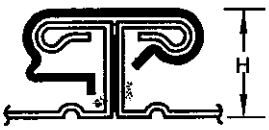


FLANGED
(WITH GASKET)
T–24A

- Bolt, rivet 1 in. maximum from ends and at 6 in. maximum intervals
- Limited to 2 in. wg pressure class
- *See* Figure 2-16
- Gasket to be located to form an effective seal

TDC FLANGED WITH GASKET

FLANGED
(WITH GASKET)
T–25a



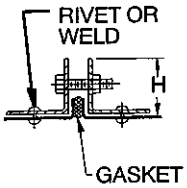
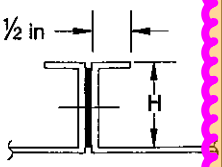
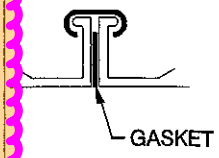
FLANGED
(WITH GASKET)
T–25b

- 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

SLIP–ON
FLANGE

- Consult manufacturers for ratings established by performance documented to functional criteria in Chapter 11.

FIGURE 2–1 RECTANGULAR DUCT/TRANSVERSE JOINTS (CONTINUED)

Reinf. Class		T-22 Companion Angles		T-24 Flanged		T-24a Flanged		T-25b Flanged		Slip-On Flange
				 H = 1⅜ in. (WITH GASKET)		 (WITH GASKET)		 T-25a Flanged 		
	E1*	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		
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	

Consult manufacturers for ratings established by performance documented to functional criteria in Chapter 11. *See* text S1.18 on page 2.4.

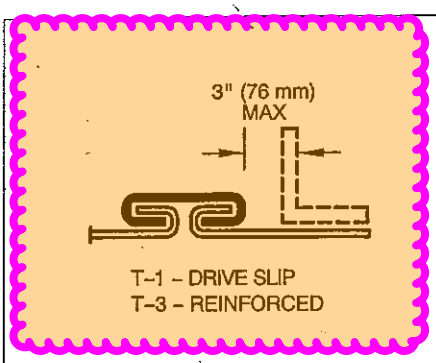
Table 2–32 Transverse Joint Reinforcement

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.

2 in. wg Static Pos. or Neg. / Duct Dimension	5 ft Joints			5 ft Joints w/2 ½ ft Reinf. Spacing				
				Joints/Reinf.			Int. Reinf.	
	Min ga	Joint Reinf.	Alt. Joint Reinf.	Min ga	Joint Reinf.	Alt. Joint Reinf.	Tie Rod	Alt. Reinf.
10 in. and under	24 GA ONLY	N/R	N/R	Use 5 ft Joints				
11 – 12 in.		N/R	N/R					
13 – 14 in.		N/R	N/R					
15 – 16 in.		N/R	N/R					
17 – 18 in.		N/R	N/R					
19 – 20 in.		N/R	N/R					
21 – 22 in.		N/R	N/R					
23 – 24 in.		N/R	N/R					
25 – 26 in.		N/R	N/R					
27 – 28 in.	24	N/R	N/R	26	N/R	N/R	MPT	C
29 – 30 in.	24	N/R	N/R	26	N/R	N/R	MPT	D
31 – 36 in.	22	N/R	N/R	26	N/R	N/R	MPT	D
37 – 42 in.	22	JTR	(2) C	24	N/R	N/R	MPT	E
	20	N/R	N/A					
43 – 48 in.	20	JTR	(2) E	22	N/R	N/R	MPT	F
	18	N/R	N/A					
49 – 54 in.	20	JTR	(2) E	22	N/R	N/R	MPT	F
	18	N/R	N/A					
55 – 60 in.	20	JTR	(2) H	22	JTR	(2) C	MPT	G
61 – 72 in.	18	JTR	(2) H	20	JTR	(2) E	MPT	H
73 – 84 in.	16	JTR	(2) H	20	JTR	(2) I	(2) MPT	I
85 – 96 in.	Not Designed			20	JTR	(2) I	(2) MPT	I
97 – 108 in.				18	JTR	(2) I		J
109 – 120 in.				18	JTR	(2) I		K

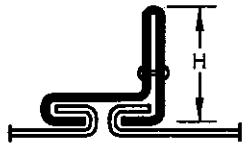
Table 2–17 5 ft Coil/Sheet Stock/T25a/T25b (TDC/TDF) Duct Reinforcement

N/R - Not Required
N/A - Not Applicable
JTR - Joint Tie Rod
MPT - Mid Panel Tie Rod(s)
(2) (X) - Indicates 2 external reinforcements of class (X) to be used in lieu of Joint Tie Rods



T–1 – DRIVE SLIP
T–3 – REINFORCED

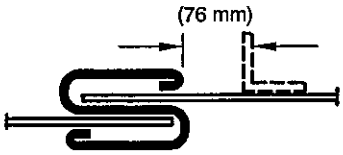
- Gage no less than two gages less than duct gage
- 24 ga minimum
- Qualification as reinforcement per Table 2-48
- T-3 – Slip Gage as per T-1
  - Any length at 2 in. wg
  - 36 in. maximum length at 3 in. wg
  - 30 in. maximum length at 4 in. wg
  - Not allowed above 4 in. wg



STANDING DRIVE SLIP
T–2

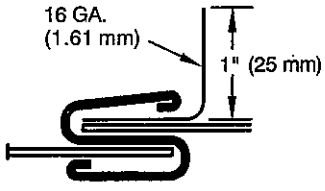
- Fasten standing portions within 2 in. of each end and elsewhere at 8 in. spacing or less
- Any length at 2 in. wg
- 36 in. maximum length at 3 in. wg
- 30 in. maximum length at 4 in. wg
- Not allowed above 4 in. wg

PLAIN "S" SLIP
T–5



T–6 HEMMED "S" SLIP
(T–6a REINFORCED)

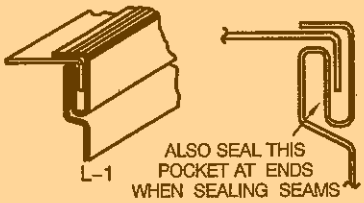
- Not less than two gages less than duct gage
- 24 ga minimum
- When used on all 4 sides, fasten within 2 in. of the corners and at 12 in. maximum intervals
- 2 in. wg maximum pressure



REINFORCED "S" SLIP
T–7

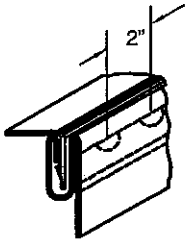
- Use slips conforming to T-6
- Use 16 ga angle of 1 in. height into slip pocket
- Fasten with screws at ends
- Angle used only for A, B, or C rigidity class
- 2 in. wg maximum pressure

FIGURE 2–1 RECTANGULAR DUCT/TRANSVERSE JOINTS



PITTSBURGH LOCK

- Pocket depth from ¼ in. to ⅝ in.
- Use on straight duct and fittings
- To ± 10 in. wg

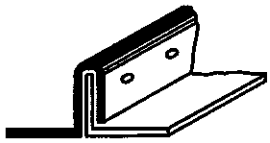


L–2
BUTTON PUNCH SNAP LOCK

- 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

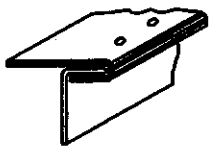
- To ± 10 in. wg



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

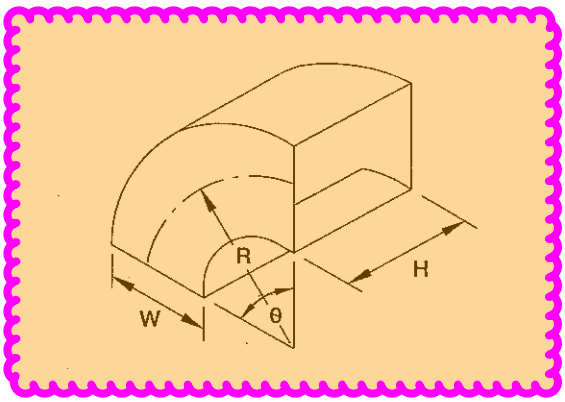
FLANGED
(WITH GASKET)
T–25a

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

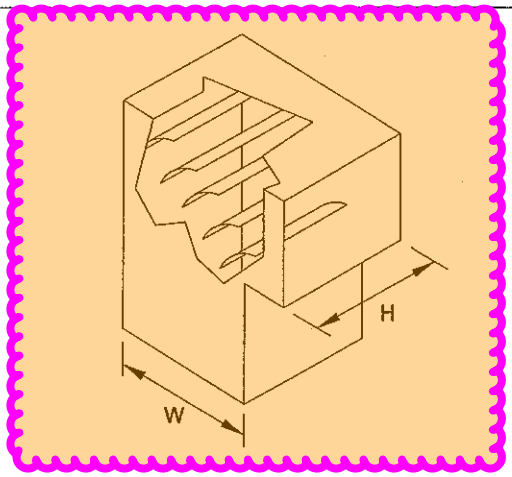
FITTING TYPE IS DETERMINED BY DRAWINGS AND SPECS



TYPE RE 1
RADIUS ELBOW

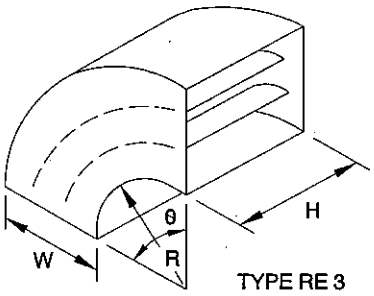
CENTERLINE R = $\frac{3W}{2}$ UNLESS OTHERWISE SPECIFIED – IS NOT RESTRICTED TO 90°

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



TYPE RE 2
SQUARE THROAT ELBOW
WITH VANES

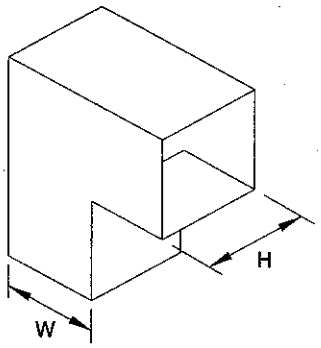
No Square Throated 90s without the approval from Engineer of record



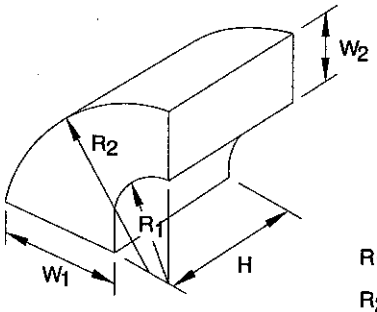
TYPE RE 3
RADIUS ELBOW
WITH VANES

NOTE:

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



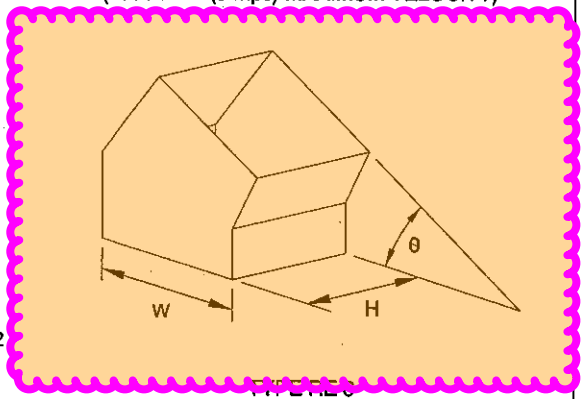
TYPE RE 4
SQUARE THROAT ELBOW
WITHOUT VANES
(1000 FPM (5 mps) MAXIMUM VELOCITY)



TYPE RE 5
DUAL RADIUS ELBOW

$R_1 = 3/4 \quad W_1$

$R_2 = R_1 + W_2$

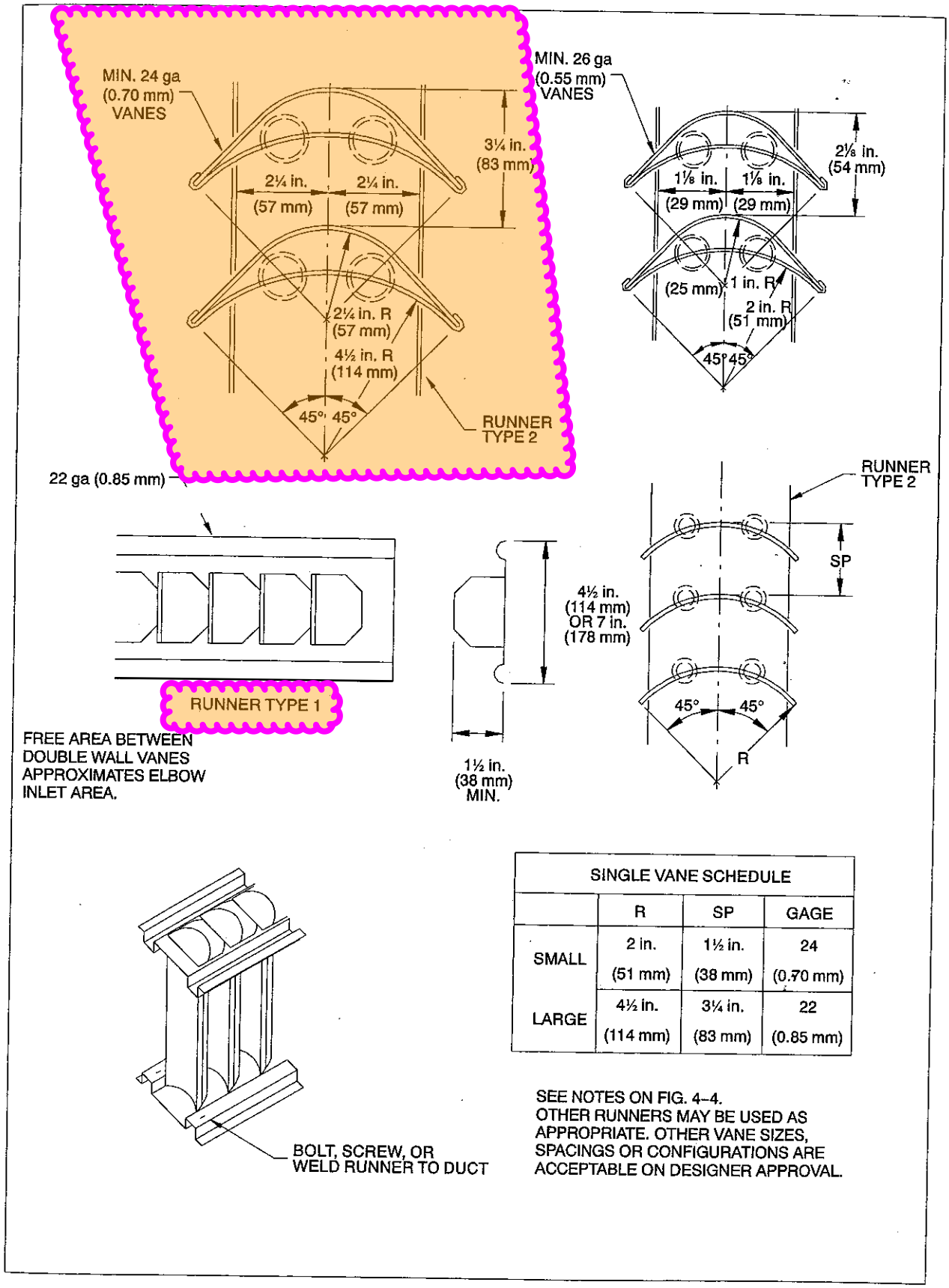


MITERED ELBOW

BEAD, CROSSBREAK AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT

PAGE 1 OF 2

FIGURE 4–2 RECTANGULAR ELBOWS



SINGLE VANE SCHEDULE			
	R	SP	GAGE
SMALL	2 in. (51 mm)	1½ in. (38 mm)	24 (0.70 mm)
LARGE	4½ in. (114 mm)	3¼ in. (83 mm)	22 (0.85 mm)

SEE NOTES ON FIG. 4–4.
OTHER RUNNERS MAY BE USED AS APPROPRIATE. OTHER VANE SIZES, SPACINGS OR CONFIGURATIONS ARE ACCEPTABLE ON DESIGNER APPROVAL.

FIGURE 4–3 VANES AND VANE RUNNERS

FITTING TYPE IS DETERMINED BY DRAWINGS AND SPECS

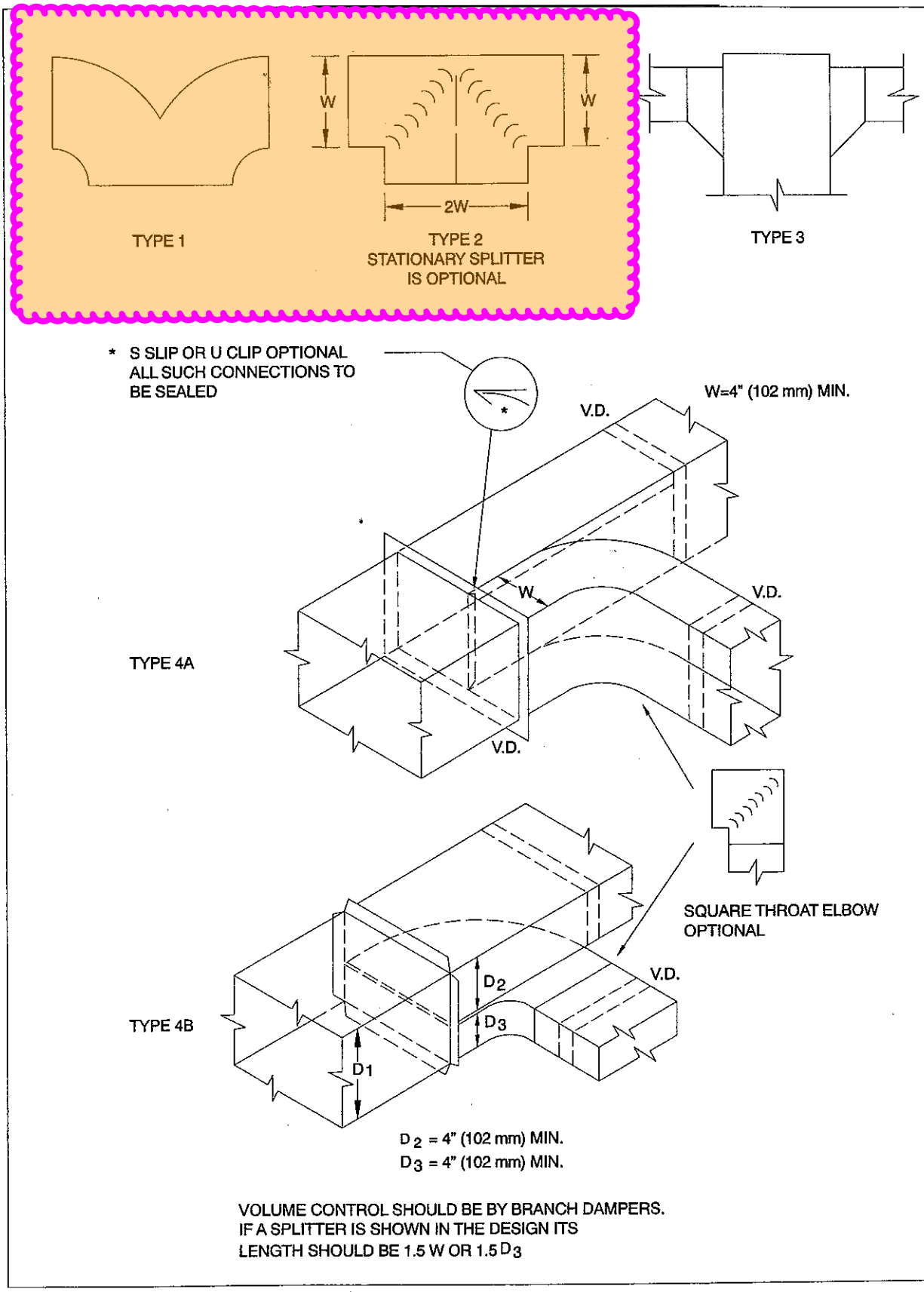
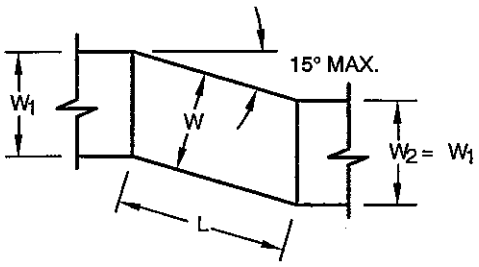


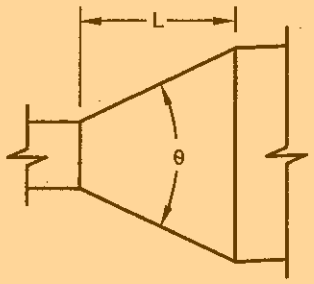
FIGURE 4–5 DIVIDED FLOW BRANCHES

FITTING TYPE IS DETERMINED BY DRAWINGS AND SPECS

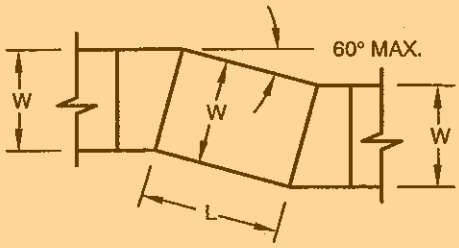
OFFSETS 2 AND 3 AND TRANSITIONS MAY HAVE EQUAL OR UNEQUAL INLET AND OUTLET AREAS. TRANSITIONS MAY CONVERT DUCT PROFILES TO ANY COMBINATION FOR RECTANGULAR, ROUND OR FLAT OVAL SHAPES.



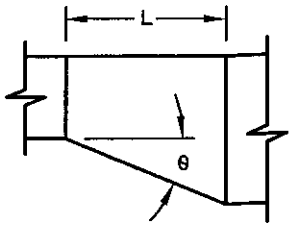
OFFSET TYPE 1
(ANGLED)



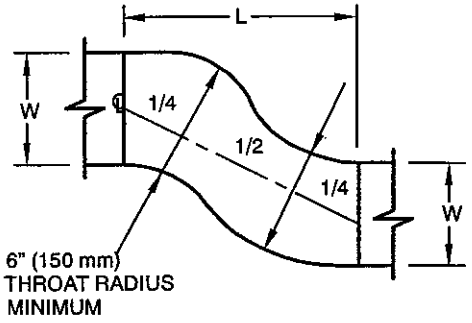
CONCENTRIC TRANSITION
θ MAX. 45° DIVERGING, 60° CONVERGING



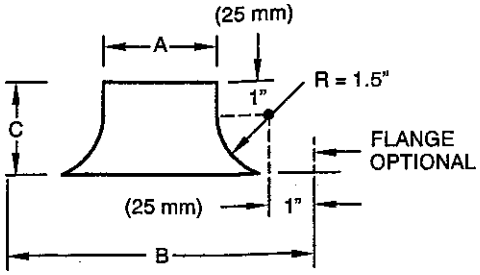
OFFSET TYPE 2
(MITERED)



ECCENTRIC TRANSITION
θ MAX. 30°
(EXCEPT 45° IS PERMITTED
AT ROUND TO FLAT OVAL)

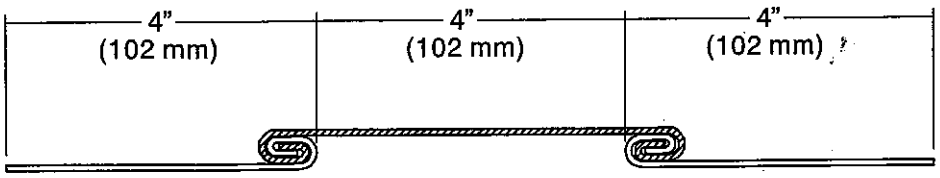


OFFSET TYPE 3
(RADIUSSED
OR OGEE)

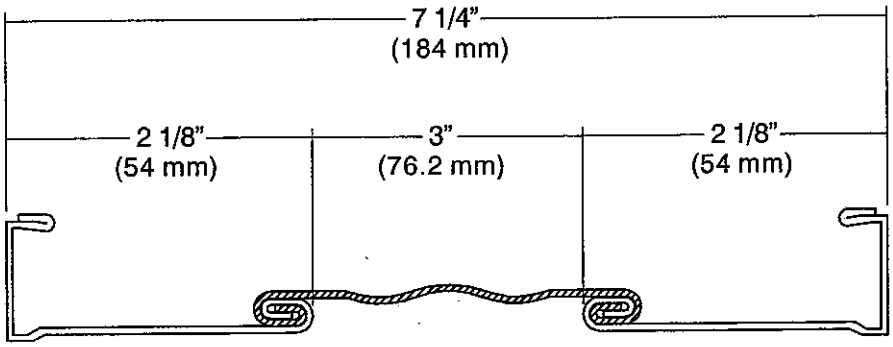


STANDARD BELLMOUTH
(ON SHORT PATTERN BELL
C = 3" (76 mm)
B = A + 4" (102 mm))

FIGURE 4–7 OFFSETS AND TRANSITIONS



4/4/4 FLEX CONNECTION



T–25 a FLANGES
ON A 4/4/4 FLEX CONNECTION

FIGURE 7–9 ALTERNATIVE FLEX CONNECTOR DETAILS

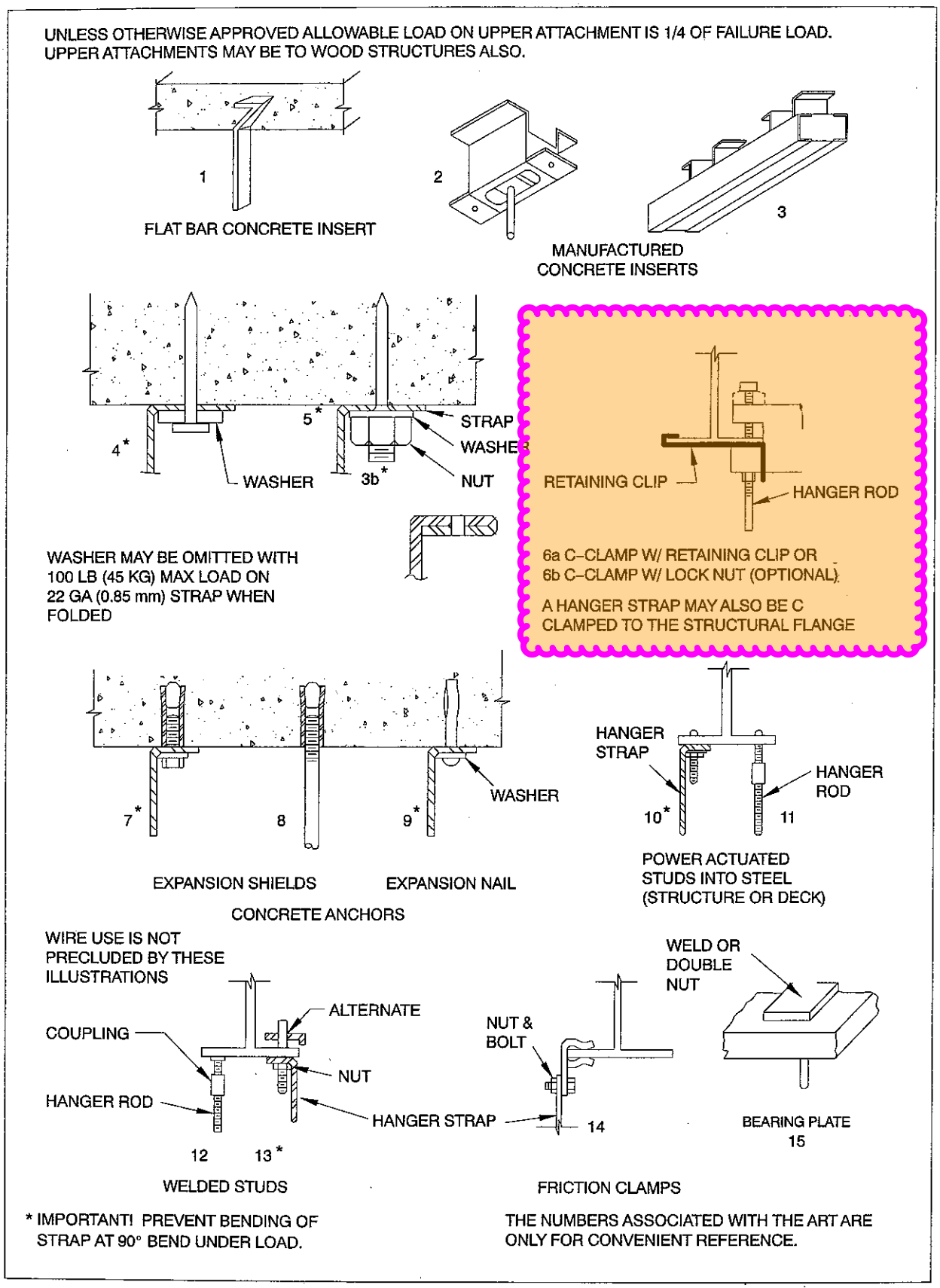


FIGURE 5–2 UPPER ATTACHMENT DEVICES – TYPICAL

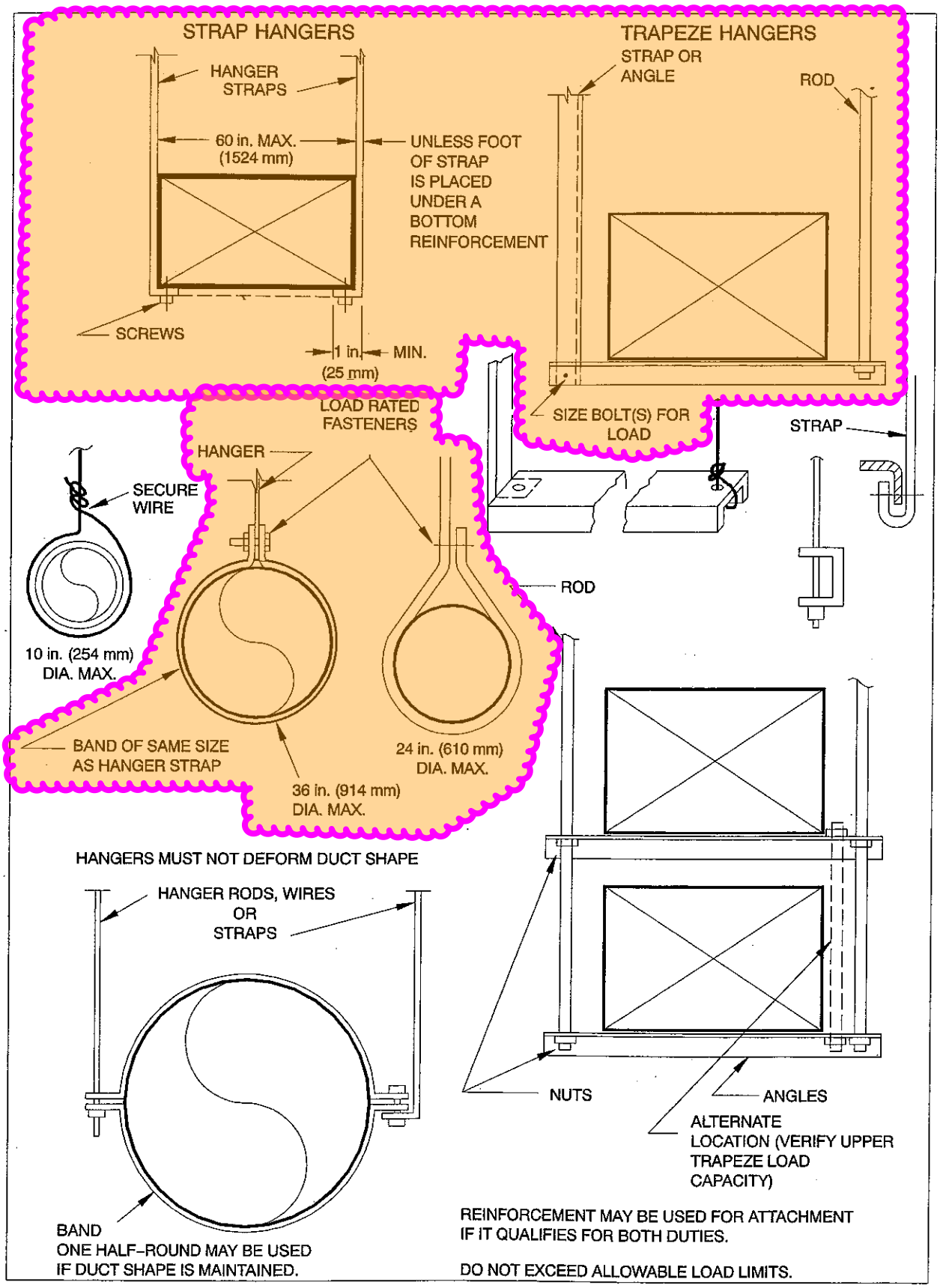


FIGURE 5–5 LOWER HANGER ATTACHMENTS

FRAMING CHANNEL (STRUT) MAY BE USED AS AN ALTERNATIVE TO THE TRAPEZE ANGLES SHOWN IN TABLE 5–3 AS FOLLOWS:

Channel (Strut)			Section Modulus (Z)	Moment of Inertia (I)	Trapeze
H	W	GA	$in.^3$	$in.^4$	Table 5-3
1 in.	1 5/8 in.	12	0.0923	0.0533	A, B, C
1 3/8 in.	1 5/8 in.	12	0.1559	0.1209	D, E
1 5/8 in.	1 5/8 in.	12	0.2042	0.1850	F, G
2 7/16 in.	1 5/8 in.	12	0.3927	0.5203	H, I
3 1/4 in.	1 5/8 in.	12	0.5772	0.9379	J, K

Channel (Strut)			Section Modulus (Z)	Moment of Inertia (I)	Trapeze
H (mm)	W (mm)	MM	mm^3	mm^4	Table 5-3M
25.4	41.3	2.45	1500	22,200	A, B, C
34.9	41.3	2.45	2600	50,300	D, E
41.3	41.3	2.45	3300	77,000	F, G
61.9	41.3	2.45	6400	216,000	H, I
82.6	41.3	2.45	10,300	454,000	J, K

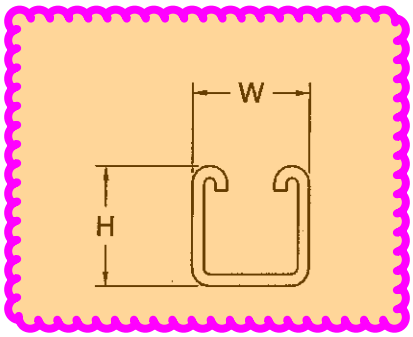
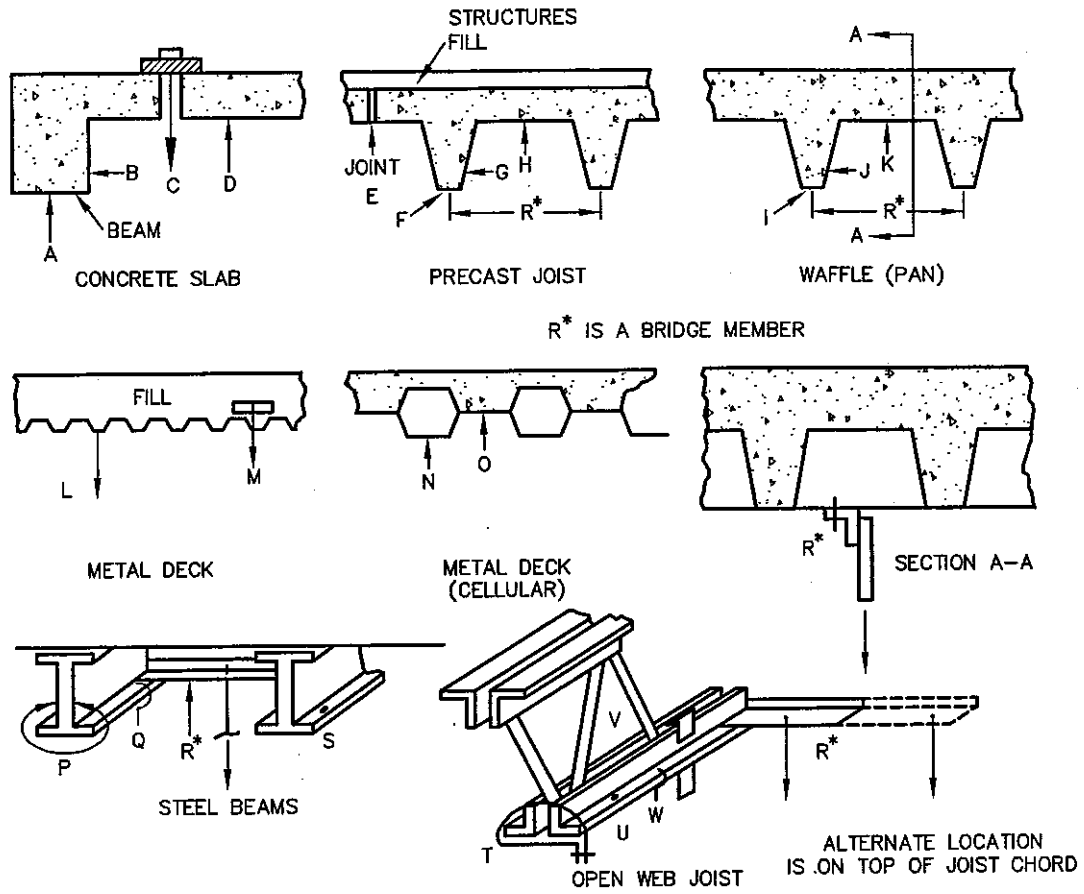


Table 5–4 Channel (Strut) Used as Trapeze

ALPHABET LETTER ONLY INDICATES AN ALTERNATIVE LOCATION OR SITUATION THAT MAY BE PERMITTED OR RESTRICTED BY DESIGN DOCUMENTS. ILLUSTRATIONS OF CONCRETE AND STEEL DO NOT PRECLUDE ATTACHMENTS TO WOOD.



CONVENTIONAL HANGER METHODS AND DEVICES

CONCRETE SCREW ANCHORS
CONCRETE INSERTS, SINGLE
CONCRETE INSERTS, SLOTTED
POWDER ACTUATED FASTENERS
GAS DRIVEN FASTENERS
"C" CLAMPS
WELDED STUDS
FRICTION CLAMPS
STRAP
ROD, THREADED, UNTHREADED
BRIDGE
BEAM CLAMP, HALF FLANGE
BEAM CLAMP, FULL FLANGE
EYE BOLT (OR ROD)
TOGGLE BOLTS
DRILLED HOLE AND BOLT
STANCHION
SELF TAPPING SCREWS PLUS STRAPS
DROP IN EXPANSION ANCHORS
KNEE BRACKET FROM WALL
LAG SCREW EXPANSION ANCHOR
NAILED PIN FASTENERS
RIVETS
SWAY BRACING
"FISH" PLATE OR WASHER AND ROD
HOOK OR LOOP
VIBRATION ISOLATOR
WIRE

NOTE: CABLE HANGING SYSTEMS WITH ADJUSTABLE MECHANICAL DEVICE SELECT HANGERS FOR TYPE OF STRUCTURE AND SUSPENSION. DO NOT EXCEED ALLOWABLE OR SPECIFIED LOAD LIMITS.

ALLOWABLE LOAD ON UPPER ATTACHMENT IS 1/4 OF FAILURE LOAD

Gripple Hangers as option to Straps

FIGURE 5–1 HANGER ATTACHMENTS TO STRUCTURES

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.

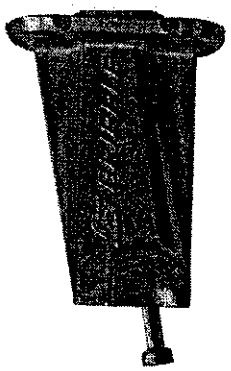
j. Cable hanging systems with adjustable mechanical device.

Gripple Trapeze Fastener System

Purpose made one-way Gripple for quick and easy suspension of pre-fabricated units in a single or multi-tiered configuration.

ADVANTAGES

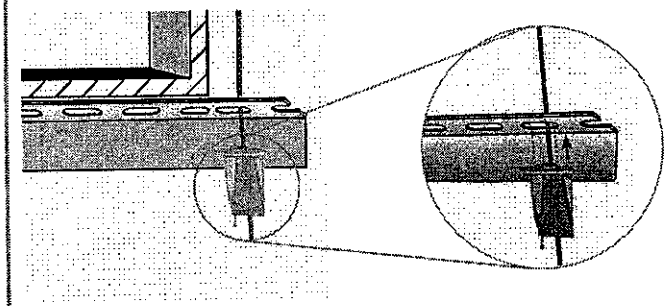
- Can be used with standard Gripple hangers for multi-tiered installations.
- Available in a kit with choice of 10 end fixings.
- Releasable pin for easy adjustment.



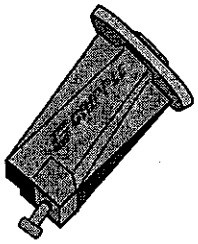
PRODUCT INFORMATION

- Suitable for low-void ceilings, allowing adjustment up to the ceiling.
- Purpose made one-way Gripple for use on Gripple Hanger size No.3.
- Load rated at 90kg SWL based on a 4:1 instant load.

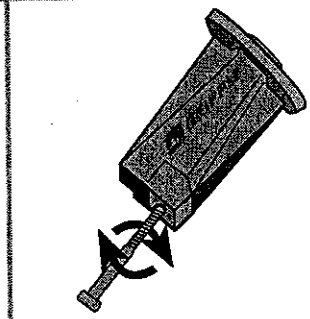
INSTALLATION



Gripple Trapeze slots into the configuration of the channel.

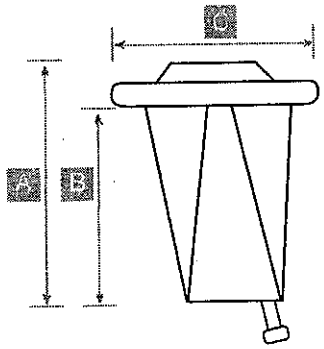


Releasable pin makes adjustment easy.



Unscrew pin and remove to complete the installation.

TRAPEZE SPECIFICATION



Size	A mm	B mm	C mm
No.3	49	44	37

Important Information

1. Construction materials and conditions vary on different sites. If it is suspected that the base material has insufficient strength to achieve a suitable fixing, contact Gripple Ltd. The responsibility for judgement of base material strength lies with the installer, and not with Gripple Ltd.

2. The information and recommendations given herein are believed to be correct at time of writing. The data has been obtained from tests done under laboratory, or other controlled conditions and it is the users responsibility to use the data given in light of conditions on site, taking account of the intended use of the products concerned.

3. Whilst Gripple Ltd can give general guidance and advice, the nature of Gripple products means that the ultimate responsibility for selecting the correct product for a particular application must lie with the customer.

4. All products must be used, handled and applied in accordance with current product instructions and manufacturers recommendations for use, published by Gripple Ltd.

5. Gripple's policy is one of continuous development and innovation. We therefore reserve the right to alter specifications, etc. without notice.

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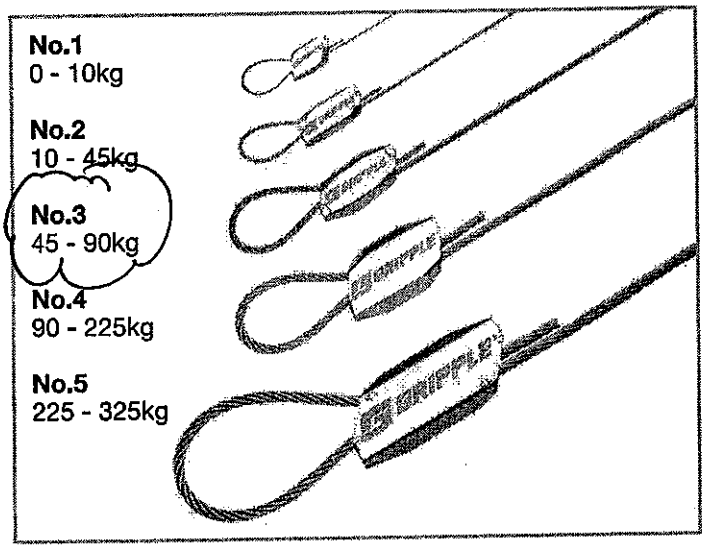
telephone: 0114 275 2255, fax: 0114 276 1155, email: info@gripple.com or visit www.gripple.com

Gripple Hangers

ADVANTAGES

- **Strong**
  5:1 load rated system.
- **Replaces threaded rod**
  No more sawing, filing or fixing nuts.
- **Faster**
  Reduces installation time by 80%.
- **Safe**
  Lightweight, making it easier to carry on site.
- **Saves time and money**
  No need for additional bracketry.



CALCULATION FORMULA

A simple formula to determine the correct hanger size is:

Weight per metre x distance between hangers

Example: 15kg load per metre → Distance between hangers is 2m
Plane: Vertical

15 x 2 = 30kg → Size will be No.2

Gripple Hangers – Do's

- Ensure that the wire rope protrudes at least 7.5cm from the Gripple housing.
- Use Gripple hangers for suspending static loads only.
- Use the hanger within it's stated load range.
- Check that the self-locking fastener is fully engaged.
- Ensure all hangers are evenly loaded.
- Keep the hanger components clean.
- Follow the manufacturers recommendations.
- Consider the effect of an angle, or forming in-line joins has on the SWL (see overleaf).
- Follow health and safety guidelines and best practice recommendations in the work place.
- Ensure appropriate PPE is worn when handling wire rope.

Gripple Hangers – Dont's

- Exceed the product's Safe Working Load.
- Use the hanger for lifting.
- Use the hanger for moving services.
- Splice together two Gripple hanger kits, or any other joining device.
- Walk on any suspended service.
- Use the self-locking fasteners on coated wire of any kind.
- Apply paints, lubricants or other coatings to the Gripple or wire rope.
- Use standard hangers in a chlorinated or humid atmosphere.
- Exceed an angle of 60°.
- Attempt to use the setting key when the suspension is under load.
- Re-use Gripple hangers, they are designed for permanent installations.

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Gripple Hangers - Best Practice Guide

HOW TO CHOOSE THE RIGHT SIZE AND MODEL

1. Choose the size where the object's weight falls within the products working range. Examples of the calculation formula are detailed overleaf.
2. Unless specified, each of our end fixings maintains the load ratings of the individual kits.
3. Each size has a specified safe working load rated at 5:1, and offers a working load range.
4. The load range should be observed; choosing a size that is lighter or heavier than necessary is counter-productive, both functionally and financially.
5. Remember to adjust your size choice if the hanger is to be used at an angle other than vertical. The table below (effect on SWL of hanging objects at an angle) shows the effect a sideways load has on a vertical installation.
6. In areas of high humidity (a paper factory) and frequent wash down (a food processing factory), stainless steel kits should be considered for extended life performance.

EFFECT ON SWL OF HANGING OBJECTS AT AN ANGLE

The load rating for a Gripple hanger is based on the suspension being hung vertically. If the wire rope is suspended at an angle, an additional sideways load is applied which reduces the capacity of the suspension. The net effect is shown on the table below:

Maximum SWL (kg) at an angle from vertical					
Gripple Hanger	0°	15°	30°	45°	60°
No.1	10.0	9.6	8.6	7.0	5.0
No.2	45.0	43.2	38.7	31.5	22.5
No.3	90.0	86.4	77.4	63.0	45.0
No.4	225.0	217.3	194.8	159.1	112.5
No.5	325.0	313.9	281.4	229.8	162.5
Load %	100	96	86	70	50

EFFECT ON SWL OF FORMING IN-LINE JOINTS

When using a Gripple as an end-stop on light duty applications, the SWL is affected by a 55% reduction in efficiency, and so the following ratings should be applied.

In order to calculate the SWL at 5:1 when forming joints, multiply the current safe working load limit 0.45 *(see table below).*

Maximum SWL (kg) at an angle from vertical		
Size	Standard	In-line join
No.1	10kg	4.5kg
No.2	45kg	20.25kg
No.3	90kg	40.5kg
No.4	225kg	101.25kg
No.5	325kg	146.25kg

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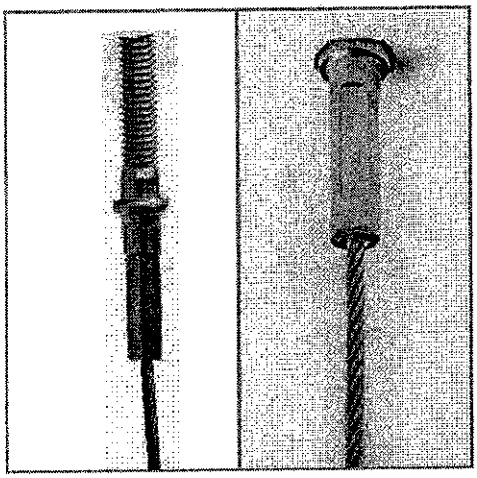
Gripple Stud Hangers

The 'stud' anchor method provides an extremely fast way of fixing a suspension to a concrete structure, or an existing metal bracket.

ADVANTAGES

- Reduces installation time by over 90%
- Threaded for ease of use, no tools required.
- Ideal for use in concrete ceilings, metal decking and pressed metal brackets.

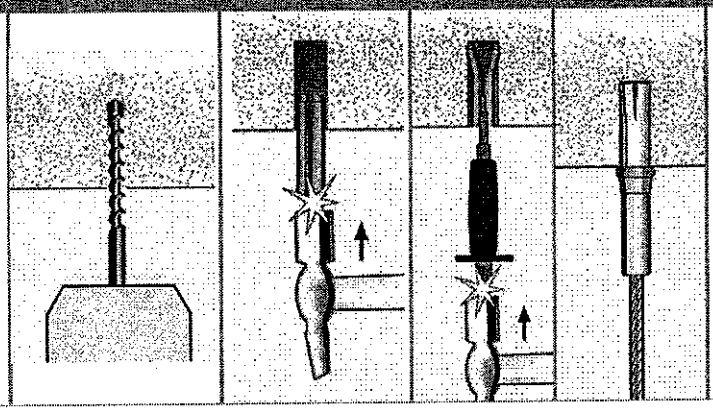


PRODUCT INFORMATION

- Supplied with drop-in anchors, free as part of the kit, or with nylock nuts (on request).
- Hollow core anchors available, specifically designed for use with Gripple Stud hangers in hollow core ceiling slabs. (note: standard hollow core anchors are not suitable)

INSTALLATION

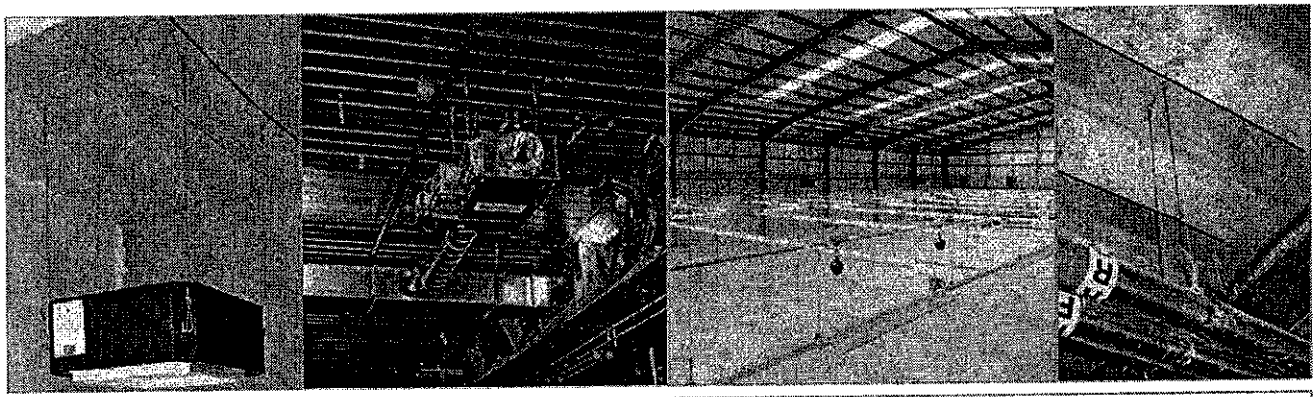
1. Drill concrete (Note: Use a wire brush to ensure drilled hole is clear).
2. Push in the drop-in anchor.
3. Use a hammer to drive in the setting punch to expand the anchor.
4. Screw in the stud.



Tips:

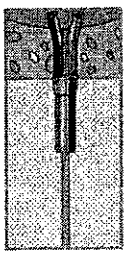
The stud is designed to be manually screwed in.

It is not essential that the stud screws up tight against the drop-in anchor.



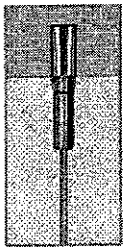
Ideal for:

- Concrete structures.
- Metal decking structures.
- Metal brackets, using nuts.



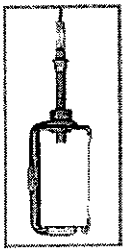
Hollow Core Ceiling

For use with M8 Fischer fixing.



Concrete Ceiling

For use with M8 drop-in anchor.



Metal bracket

For use with M8 Stud fixing and nylock nuts.

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telephone: 0114 275 2255, fax: 0114 275 1155, email: info@gripple.com or visit www.gripple.com

Stud End Fixing - Technical Information

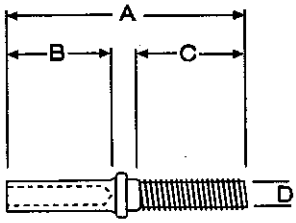
MATERIALS AND QUALITY

All Gripple studs are manufactured from mild steel, which is zinc coated for maximum anti-corrosion properties. A stainless steel version is available in the M6 and M8 size only. The stud is swaged on to one end of the wire rope by a power press. The tail end is then heat cut, fusing the individual wire filaments together, which eliminates any chance of the rope fraying. This allows the wire to be easily fed through the fastener and reduces the possibility of injury to the installer.

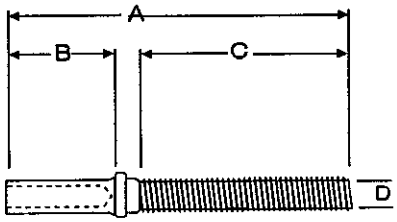
RANGE OF SIZES

Sizes	Safe Working Load Range	M6 x 20mm	M8 x 45mm	M10 x 27mm	Stainless Steel (M6 or M8)
No.1	0 - 10kg	✔			
No.2	10 - 45kg	✔	✔		✔
No.3	45 - 90kg	✔	✔		✔
No.4	90 - 225kg	✔	✔	✔	

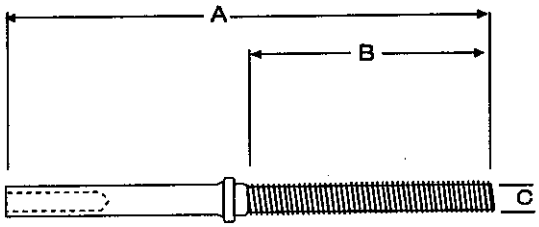
M6



M8



M10



No 1 - 3
No 3 Stainless steel

A → 47
B → 21
C → 20
D → M6

No 2 & 3

A → 70
B → 21
C → 45
D → M8

No 4

A → 100
B → 50
C → M10

mm	M6	M8	M10
SWL	330kg	330kg	510kg
Drill bit diameter	8mm	10mm	12mm
Anchorage Depth	25mm	30mm	40mm
Screwing Depth	8/11mm	10/13mm	12/16mm
Tightening Torque	4Nm	8Nm	15Nm
Clearance Hole	7mm	9mm	12mm
Min. base material thickness	100mm	100mm	100mm

Important Information

1. Construction materials and conditions vary on different sites. If it is suspected that the base material has insufficient strength to achieve a suitable fixing, contact Gripple Ltd. The responsibility for judgement of base material strength lies with the installer, and not with Gripple Ltd.

2. The information and recommendations given herein are believed to be correct at time of writing. The data has been obtained from tests done under laboratory, or other controlled conditions and it is the users responsibility to use the data given in light of conditions on site, taking account of the intended use of the products concerned.

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5. Gripple's policy is one of continuous development and innovation. We therefore reserve the right to alter specifications, etc. without notice.

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CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

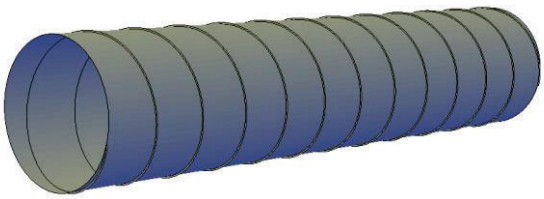
PRODUCT	Single Wall Round Spiral
MANUFACTURER	Dixie
JOB NAME	UAMS Center for Animal Models of Infection & Disease
LOCATION	Little Rock, AR
ENGINEER	James R. Beecher
CONTRACTOR	Middleton Inc.
DATE	10/16/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

963 South Bellevue
Memphis, TN 38106
(901) 774-2220
(901) 774-2174 Fax

SINGLE WALL ROUND
GALVANIZED
** LOW & MED PRESSURE **
MANUFACTURING STANDARDS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR



SPIRAL SEAM

10" Positive WG
(SMACNA 2005 Standard)

DIAMETER	Spiral Seam Pipe	Longitudinal Seam Pipe	Fitting Construction
3" -18"	26		24
18"-29"	26		24
30" - 42"	24		22
44" - 60"	22		20
62" – 80"	20		18

Construction Standards:

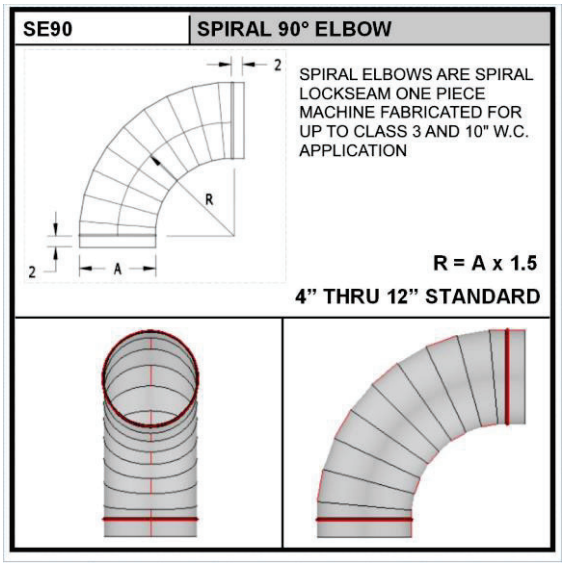
- Standard lengths of spiral pipe are 10' for spiral seam and 5' for longitudinal welded seam construction
- Class 1 air duct materials, or UL 181
- Galvanized Steel pipe will be lock-forming quality and have a zinc-coating of G-60 or greater in accordance with SMACNA 2005 Duct Construction Standards and ASTM A653 (formerly ASTM A525/A527)
- Spiral Seam construction will be RL-1 to 10" W.G. +/- pressure. Longitudinal seam will be RL-4 to 10" W.G. +/- in accordance with SMACNA
- Fabrication in accordance with SMACNA HVAC Duct Construction Standards - Metal & Flexible (2005) except as indicated and Spiral Pipe Manufacturers Association (SPIDA) standards.

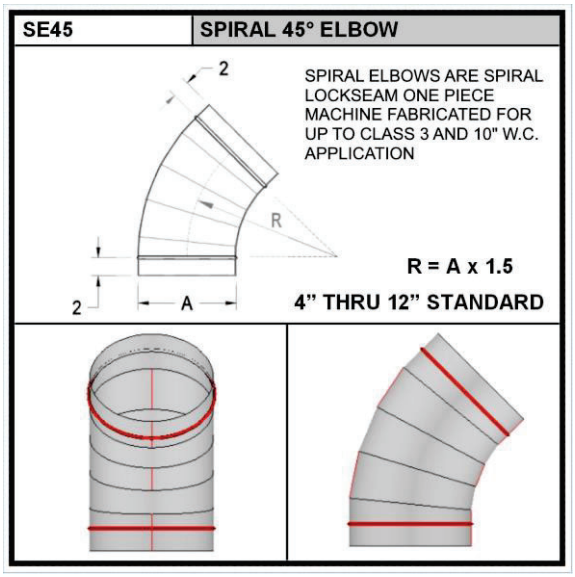
Submittal By:	Dale Turner
Submittal Date:	9/20/24

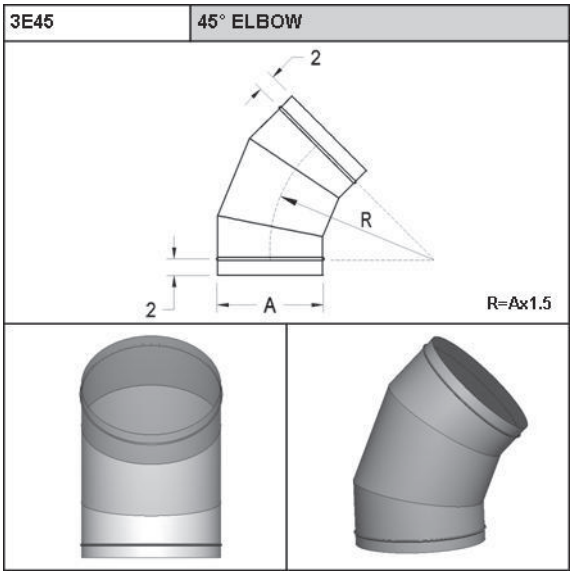
963 South Bellevue
Memphis, TN 38106
(901) 774-2220
(901) 774-2174 Fax

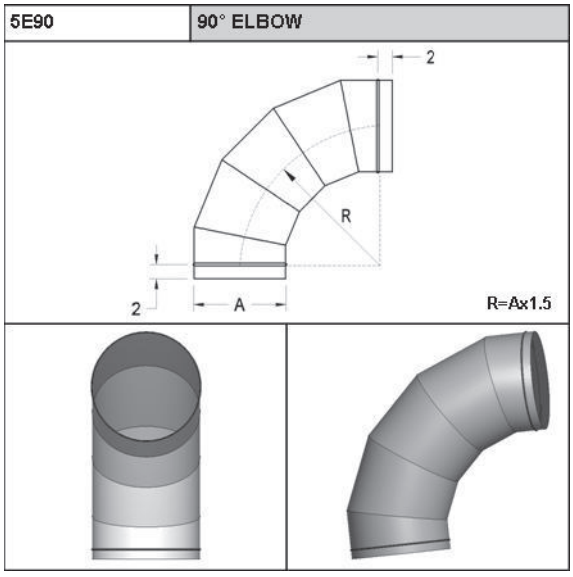
SINGLE WALL ROUND FITTINGS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant









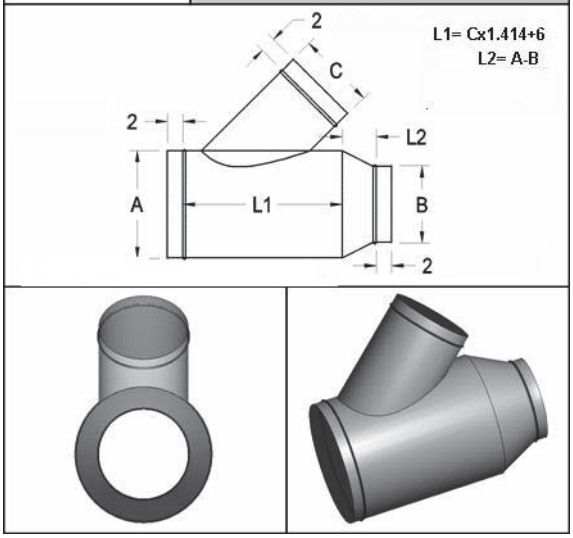
Submitted By:	Dale Turner
Submittal Date:	9/20/24

963 South Bellevue
Memphis, TN 38106
(901) 774-2220
(901) 774-2174 Fax

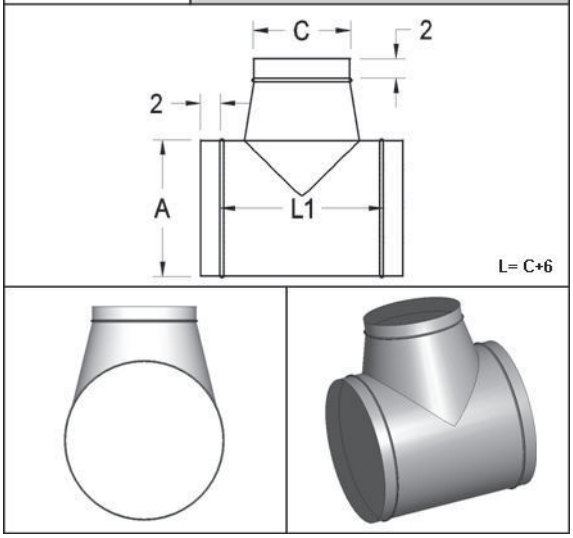
SINGLE WALL ROUND FITTINGS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant

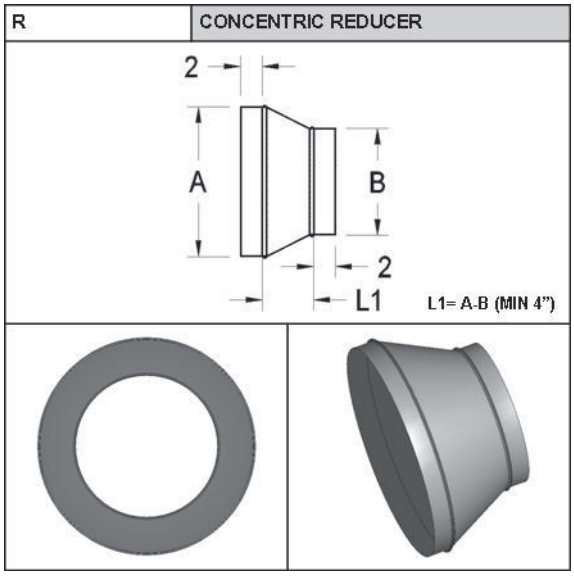
LR | LATERAL REDUCING



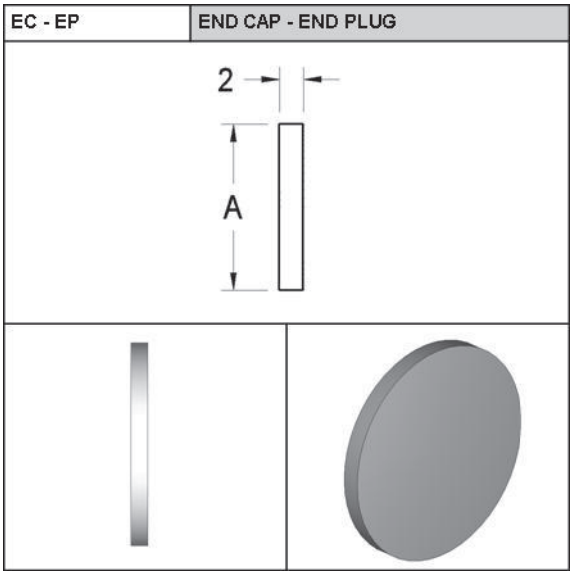
CT | CONICAL TEE



R | CONCENTRIC REDUCER



EC - EP | END CAP - END PLUG



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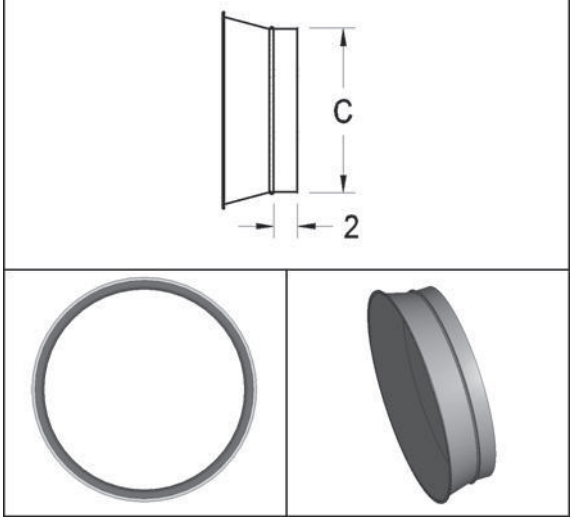
SINGLE WALL ROUND FITTINGS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant

CTF	CONICAL TAP ON FLAT



Conical Taps will be used for medium pressure applications only.

Submitted By:	Dale Turner
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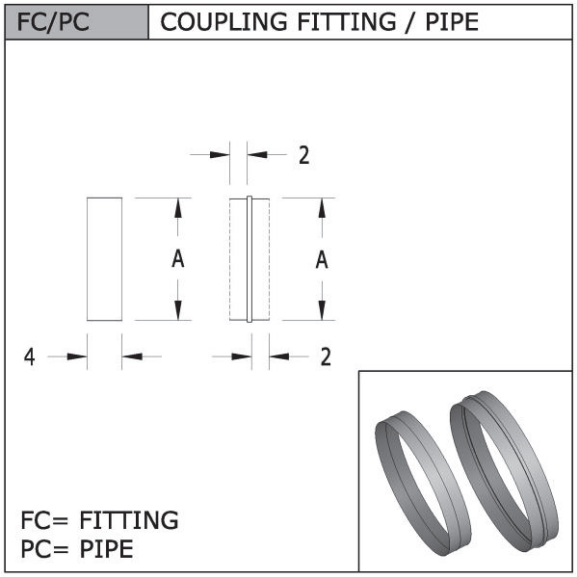
SLIP COUPLING
TRANSVERSE DUCT CONNECTION

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Sizes:	All Round Single Wall
Construction:	Transverse duct connection via slip coupling for pipe/pipe or fitting/fitting connection. Coupling will be of comparable fitting gauges per duct submittal. Single Wall (SW) duct connection will be with single coupling. For field installation, coupling should be inserted into pipe/fitting until contact is made with center bead in coupling. Adjoining pipe/fitting will be slipped on remaining half of coupling until contact is made with center bead. Coupling is then screwed on 6" centers with sheet metal screws and sealed with appropriate high pressure duct sealant.

ROUND DUCT:



Submitted By:	Dale Turner'
Submittal Date:	9/20/2024

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Single Wall Stainless Long Seam Pipe
MANUFACTURER	Dixie
JOB NAME	UAMS Center for Animal Models of Infection & Disease
LOCATION	Little Rock, AR
ENGINEER	James R. Beecher
CONTRACTOR	Middleton Inc.
DATE	10/16/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

963 South Bellevue
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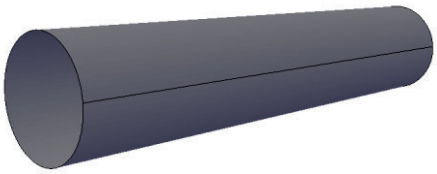
SINGLE WALL ROUND
304-2b STAINLESS STEEL
MANUFACTURING STANDARDS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR



LONG SEAM WELD

-2" Negative WG
(SMACNA 2005 Standard)

DIAMETER	Long Seam Welded	Fitting Construction
3" -20"	20**	20
21" - 36"		
37" - 50"		
50" – 54"		
56" - 80"		

** NOTE: Exceeds SMACNA standards

Construction Standards:

- **Standard lengths are 5' or 10' where applicable for longitudinal welded seam construction**
- Class 1 air duct materials, or UL 181
- Stainless Steel will be 304 2B construction as required per ASTM A167
- Continuous weld longitudinal seam will be RL-4 Butt Weld or RL-3 Stitch Welded in accordance with SMACNA 2005
- Fabrication in accordance with SMACNA HVAC Duct Construction Standards - Metal & Flexible (2005) except as indicated and Spiral Pipe Manufacturers Association (SPIDA) standards.

NOTE: All transverse joint connections to be provided with a ¼" flange out for field welding

Submittal By:	Dale Turner
Submittal Date:	9/20/24

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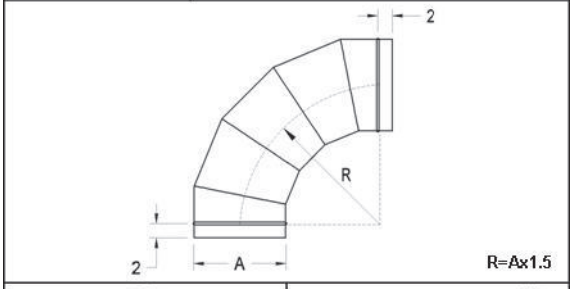
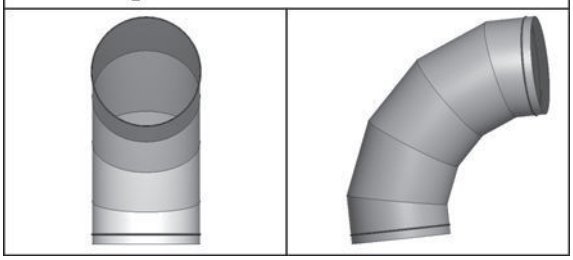
304-2b STAINLESS STEEL ROUND SUBMITTALS

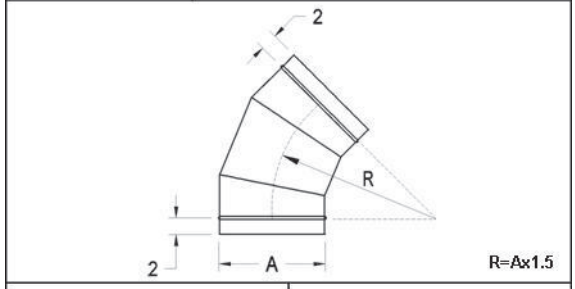
Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	304 2B Stainless Steel – Solid Welded Seam Construction

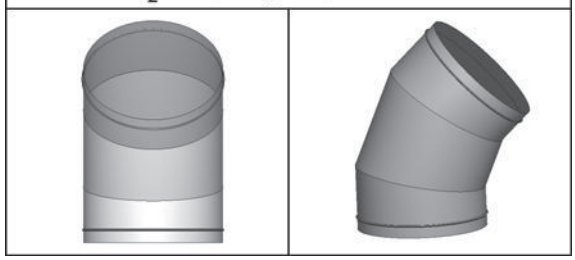
5E90	90° ELBOW



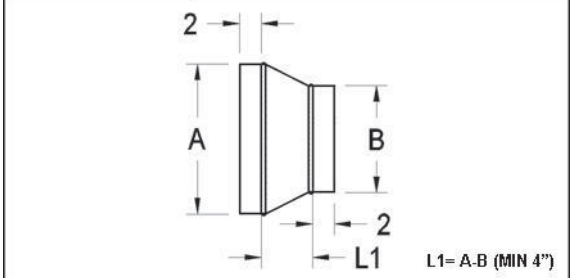


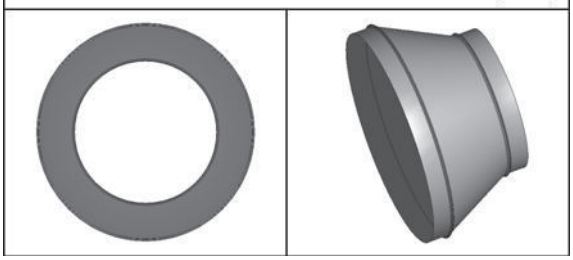
3E45	45° ELBOW



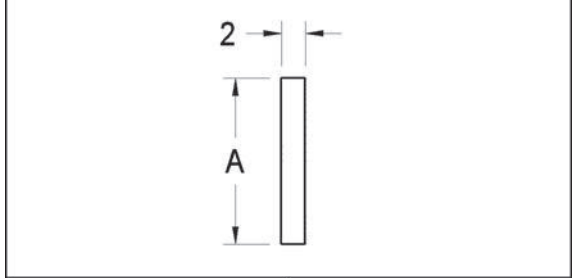


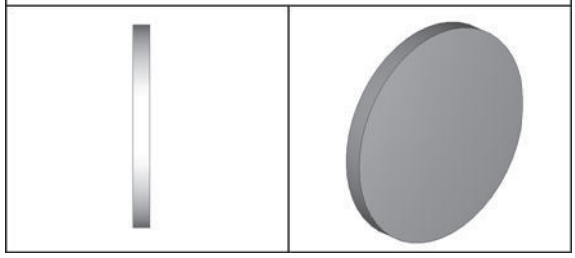
R	CONCENTRIC REDUCER





EC - EP	END CAP - END PLUG





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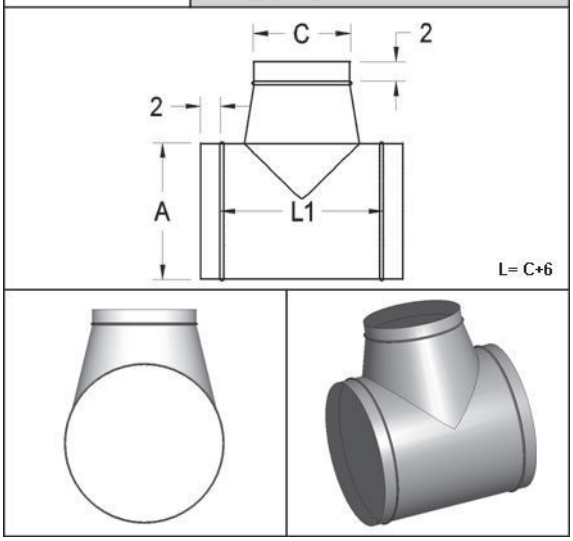
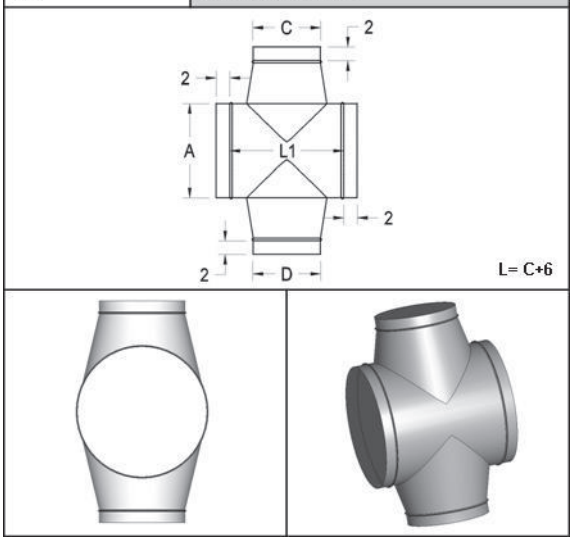
304-2b STAINLESS STEEL ROUND SUBMITTALS

Project:	UAMS-Center for Animal Models of Infection and Disease
Location:	Little Rock, AR
Construction:	304 2B Stainless Steel – Solid Welded Seam Construction

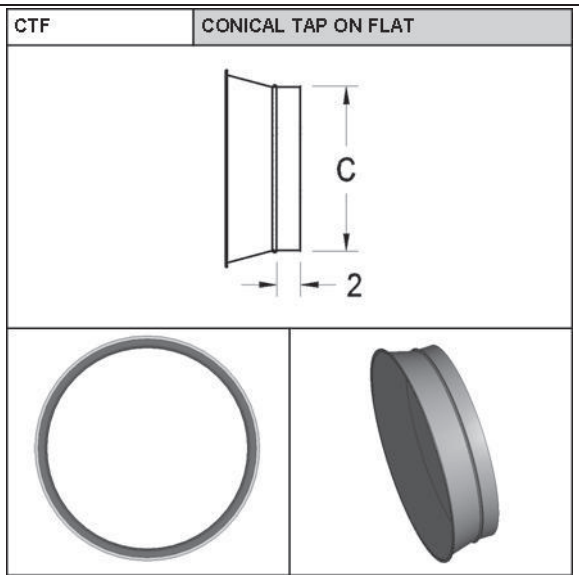
CT CONICAL TEE



CC CONICAL CROSS



CTF CONICAL TAP ON FLAT



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