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Date: 07/14/2026
Return Request: 08/11/2026
Project: Highlands Building at Pinnacle Hills
Supplier: Comfort Systems USA
Manufacturer: Various
Submittal: Duct, Casings and Take Offs
Submittal Number: 23 31 00 -01
Drawing # and Installation: Mechanical

ARCHITECT

Crafton Tull
Fayetteville, Ar

ENGINEER

IMEG

GENERAL CONTRACTOR

Clark Contractors
Rogers, Ar

MECHANICAL SUBCONTRACTOR

Comfort Systems USA (Arkansas), Inc.
116 Commercial Ave.
Lowell, AR 72745
(479) 770.8992

NOTES:

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CSUSA PROJECT NO.
26-5034

jzuber@comfortar.com

K & W

Knight & Wilson, Inc.
"Sheet Metal Contractors"
 676 East E.H. Crump Blvd. Memphis Tn 38126
 901-274-6978

SUBMITTAL

EQUIPMENT: DUCTWORK - RECTANGULAR - GALVANIZED

SPEC SECTION: 23 31 00

PROJECT: HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION: ROGERS, AR

CONTRACTOR: COMFORT SYSTEMS USA

WE CONSTRUCT ALL OUR DUCTWORK OF G-90 GALVANIZED DOMESTIC STEEL. THIS DUCT WILL BE SEALED, REINFORCED AND FABRICATED IN ACCORDANCE WITH SMACNA STANDARDS. TABLES BELOW INDICATE MINIMUM STANDARDS

Note-on 6 "SP, button-punch snaplock is NOT allowed.						ALTERNATE	
6" SP-MEDIUM PRESSURE DUCT				Reinforcement-O.C.		Tie Rods	Tie Rods
Duct Size	Gauge	Longitude Seam	Joint	Mid Point	@ Joint	Mid Point	@ Joint
0-30"	24	Pittsburg	TDF or Ward J	1-¼ x 1/8"	X	1 > 26"	1 > 26"
31-36"	22	"	TDF or Ward J	2-½ x 1/8"	X	1	1
37-43"	20	"	TDF or Ward J	2-½ x 1/8"	2-½ x 1/8"	1	1
44-72"	20	"	TDF or Ward J	2-½ x 1/8"	2-½ x 1/8"	2	1
61-84"	18	"	TDF or Ward J	2-½ x 1/8"	2-½ x 1/8"	1 (2>73")	1
85-96"	16	"	TDF or Ward J	2-½ x 1/8"	2-½ x 1/8"	2	1

Note-on 4 "SP, snaplock is allowed if screws are put thru seam at each end .						ALTERNATE	
4" SP-MEDIUM PRESSURE DUCT				Reinforcement-O.C.		Tie Rods	Tie Rods
Duct Size	Gauge	Longitude Seam	Joint	Mid Point	@ Joint	Mid Point	@ Joint
0-30"	24	Pittsburg	TDF or Ward J	X	X	X	X
31-43"	22	"	TDF or Ward J	1-1/2 x 1/8"	X	1 > 37"	1>43"
43-54"	20	"	TDF or Ward J	2-½ x 1/8"	1-1/2 x 1/8"	1	1
55-72"	20	"	TDF or Ward J	2-½ x 1/8"	1-1/2 x 1/8"	1 (2>60")	1
73-84"	18	"	TDF or Ward J	2-½ x 1/8"	1-1/2 x 1/8"	2	1
85-96"	18	"	TDF or Ward J	2-½ x 1/8"	2-½ x 1/8"	2	1

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Note-on 3 "SP, snaplock is allowed if screws are put thru seam at each end.						ALTERNATE	
3" SP-MEDIUM PRESSURE DUCT				Reinforcement-O.C.		Tie Rods	Tie Rods
Duct Size	Gauge	Longitude Seam	Joint	Mid Point	@ Joint	Mid Point	@ Joint
0-30"	24	Pittsburg (Snaplock)	TDF or Ward J	X	X	X	X
31-48"	22	"	TDF or Ward J	1-1/2 x 1/8"	X	1 > 37"	1 > 43"
49-54"	22	"	TDF or Ward J	2-1/2 x 1/8"	1-1/2 x 1/8"	1	1
55-72"	20	"	TDF or Ward J	2-1/2 x 1/8"	1-1/2 x 1/8"	1 (2 > 60")	1
73-84"	18	"	TDF or Ward J	2-1/2 x 1/8"	1-1/2 x 1/8"	2	1
85-96"	18	"	TDF or Ward J	2-1/2 x 1/8"	2-1/2 x 1/8"	2	1
ALTERNATE							
LOW PRESSURE DUCT-2" SP<				Reinforcement-O.C.		Tie Rods	Tie Rods
Duct Size	Gauge	Longitude Seam	Transverse Joint	Mid Point	@ Joint	Mid Point	@ Joint
0-12"	26	Snaplock	S'S and Drives	X	X	X	X
13-30"	24	"	S'S and Drives	X	X	X	X
31-60"	22	"	TDF or Ward J	X	X	1 > 37"	X
55-60"	20	"	TDF or Ward J	1-1/2 x 1/8"	X	1	1
61-84"	20	"	TDF or Ward J	2-1/2 x 1/8"	1-1/2 x 1/8"	1 (2-73">)	1
>85"	18	"	TDF or Ward J	2-1/2 x 1/8"	2-1/2 x 1/8"	2 or more	1

SEE TABLES 2-47 AND 2-48.
 DUCTS WITH FLAT SLIP CONNECTORS
 AND NO REINFORCEMENT
 SEE OTHER FIGURES AND TEXT
 FOR COMPLETE REQUIREMENTS
 AND LIMITATIONS

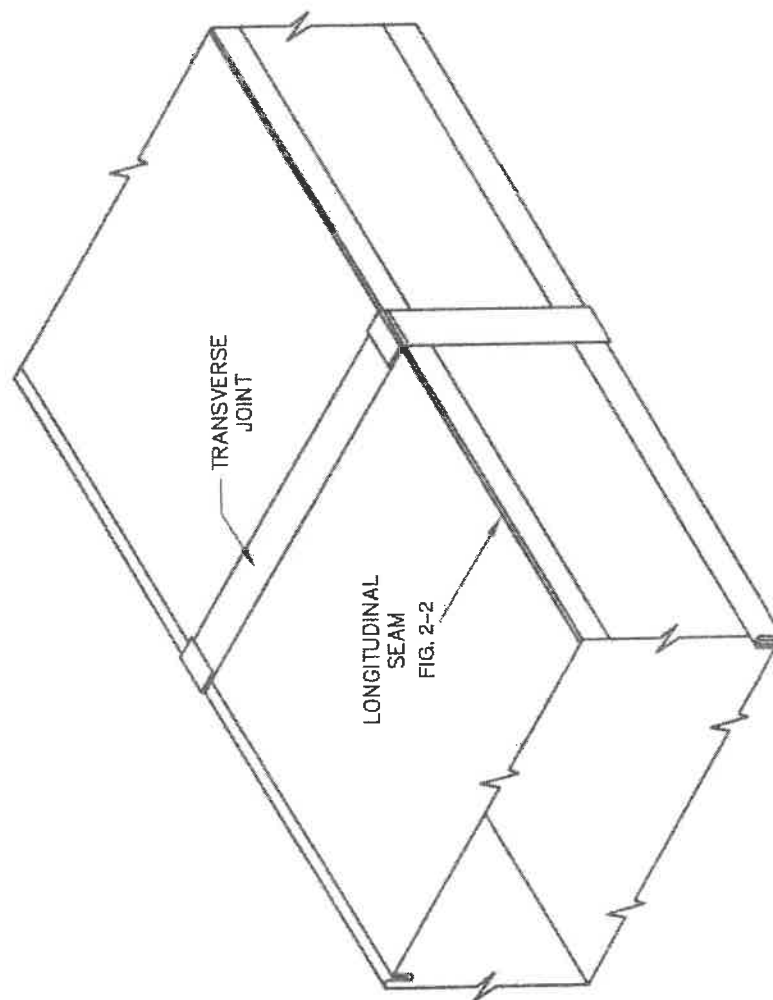
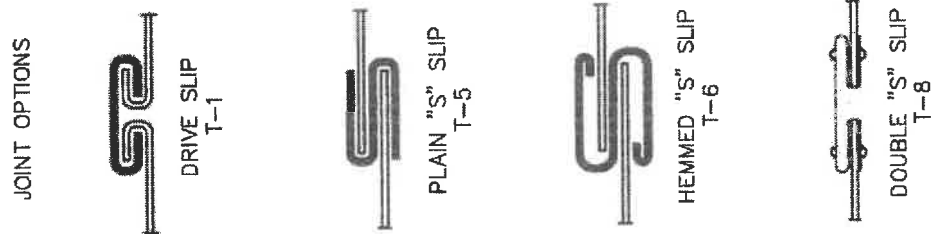
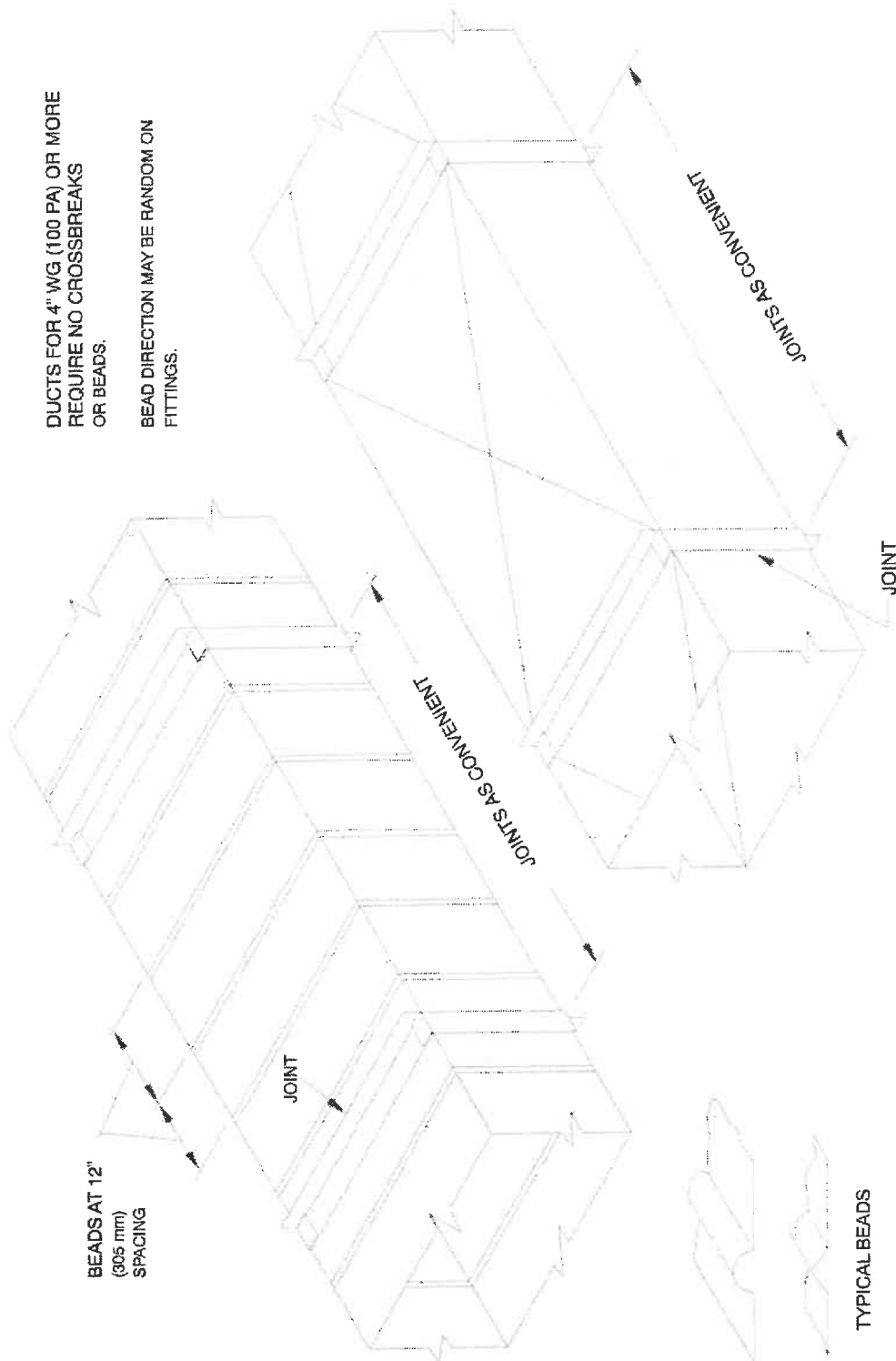


FIGURE 2-9 UNREINFORCED DUCT

DUCT SIZES 19" (483 mm) WIDE AND LARGER WHICH HAVE MORE THAN 10 SQUARE FEET (0.93 SQUARE METER) OF UNBRACED PANEL SHALL BE BEADED OR CROSS BROKEN UNLESS DUCTS WILL HAVE INSULATION COVERING OR ACOUSTICAL LINER. THIS REQUIREMENT IS APPLICABLE TO 20 GAGE (1.00 mm) OR LESS THICKNESS AND 3" WG (750 PA) OR LESS. IT IS UNNECESSARY TO BREAK OR BEAD ALL SIDES UNLESS EACH DUCT DIMENSION REQUIRES IT.

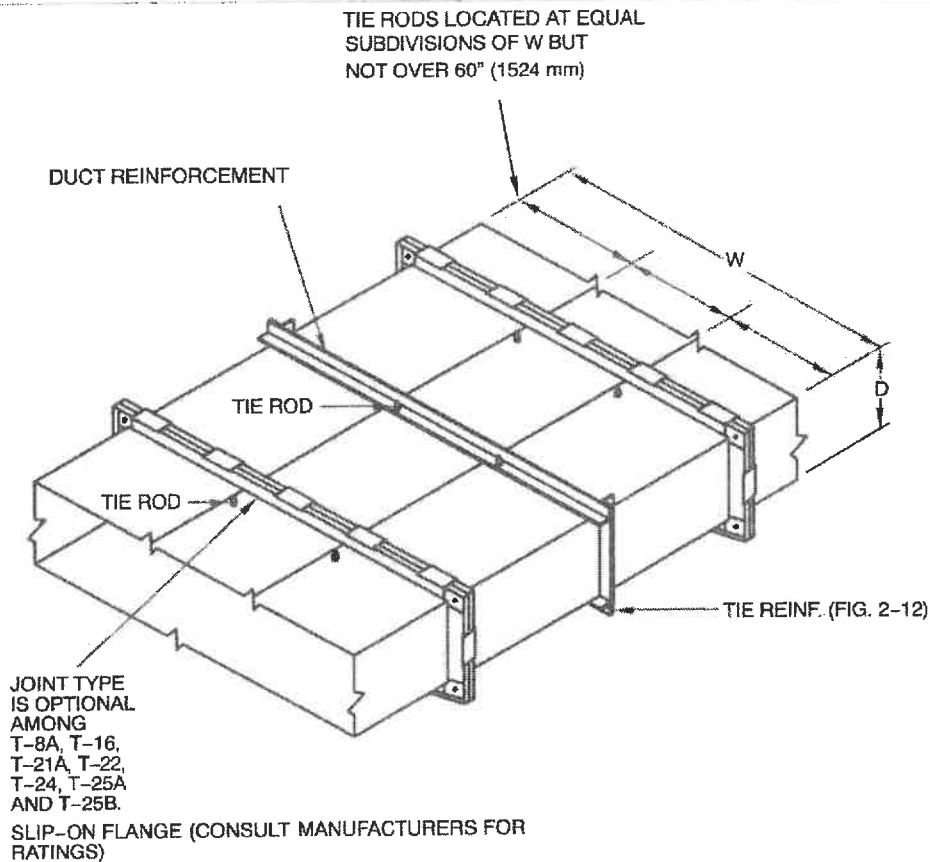
DUCTS FOR 4" WG (100 PA) OR MORE REQUIRE NO CROSSBREAKS OR BEADS.

BEAD DIRECTION MAY BE RANDOM ON FITTINGS.



NOTICE: NEITHER BEADS NOR CROSSBREAKS AFFECT REINFORCEMENT SPACING SCHEDULE.

FIGURE 2-10 CROSSBROKEN AND BEADED DUCT



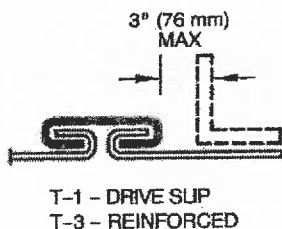
Duct Pressure Class

wg (Pa)	½ in. (125 Pa)	1 in. (250 Pa)	2 in. (500 Pa)	3 in. (750 Pa)	4 in. (1000 Pa)	6 in. (1500 Pa)	10 in. (2500 Pa)
Panel Ga (mm)	18 (1.31 mm)	18 (1.31 mm)	18 (1.31 mm)	18 (1.31 mm)	18 (1.31 mm)	18 (1.31 mm)	16 (1.61 mm)
Reinf. Size	It	It	It	It	Jt	Kt	Lt
Reinf. Spacing ft (m)	2 ½ (0.75 m)	2 ½ (0.75 m)	2 ½ (0.75 m)	2 ½ (0.75 m)	2 ½ (0.75 m)	2 (0.60 m)	2 (0.60 m)
Max. Tie Rod Spacing ft (m)	5 (1.50 m)	5 (1.50 m)	5 (1.50 m)	5 (1.50 m)	5 (1.50 m)	5 (1.50 m)	4 (1.20 m)

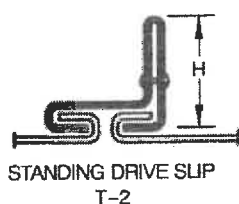
Table 2-49 Duct Over 120 in. (3000 mm) Duct Construction

- See tie rod text.
- See Reinforcement Attachment in Figure 2-13.
- See Figure 5-7 for large duct supports. Duct over 100 in. (2540 mm) width may require other internal supports for shape retention.

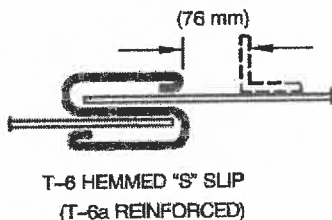
FIGURE 2-14 DUCT OVER 120 IN. (3000 MM) WIDE



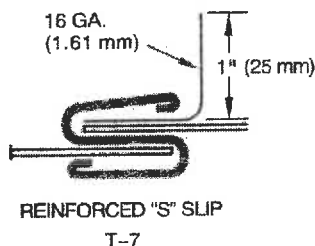
- Gage no less than two gages less than duct gage
- 24 ga minimum
- Qualification as reinforcement per Table 2-48
- T-3 - Slip Gage as per T-1
 - Any length at 2 in. wg
 - 36 in. maximum length at 3 in. wg
 - 30 in. maximum length at 4 in. wg
 - Not allowed above 4 in. wg



- 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

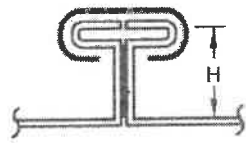


- Not less than two gages less than duct gage
- 24 ga minimum
- When used on all 4 sides, fasten within 2 in. of the corners and at 12 in. maximum intervals
- 2 in. wg maximum pressure



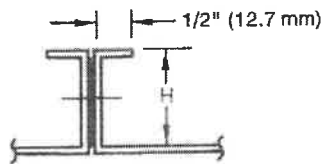
- Use slips conforming to T-6
- Use 16 ga angle of 1 in. height into slip pocket
- Fasten with screws at ends
- Angle used only for A, B, or C rigidity class
- 2 in. wg maximum pressure

FIGURE 2-1 RECTANGULAR DUCT/TRANSVERSE JOINTS



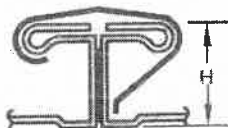
FLANGED
(WITH GASKET)
T-24

- Assemble per Figure 2-17
- Close corners with minimum 16 ga corner pieces and $\frac{3}{8}$ 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 2-17
- Gasket to be located to form an effective seal

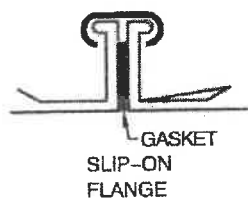


FLANGED
(WITH GASKET)
T-25a



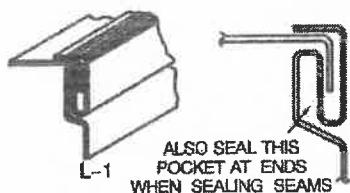
FLANGED
(WITH GASKET)
T-25b

- Assemble per Figure 2-18
- 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



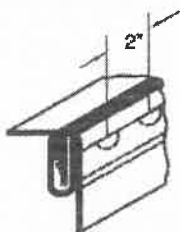
- Consult manufacturers for ratings established by performance documented to functional criteria in Chapter 11.

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



PITTSBURGH LOCK

- Pocket depth from $\frac{1}{4}$ in. to $\frac{5}{8}$ in.
- Use on straight duct and fittings
- To ± 10 in. wg



L-2
BUTTON PUNCH SNAP LOCK

- $\frac{5}{8}$ in. pocket depth for 20, 22, and 24 ga
- $\frac{1}{2}$ 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

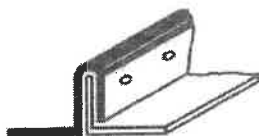


L-3
GROOVED SEAM
ALSO CALLED FLAT
LOCK AND PIPE LOCK



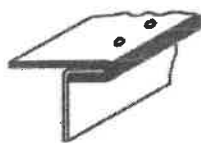
SEE L-1
SEALING
NOTE.
L-6
DOUBLE CORNER SEAM

- To ± 10 in. wg



SEE FIG. 2-8 ALSO
L-4 STANDING SEAM

- To ± 10 in. wg
- 1 in. seam minimum
- 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

- Modify for longitudinal seam application.

FIGURE 2-2 RECTANGULAR DUCT/LONGITUDINAL SEAMS



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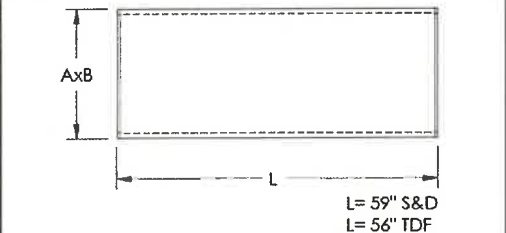
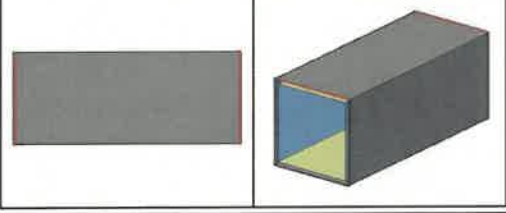
676 E. H. CRUMP BLVD.

MEMPHIS, TENNESSEE 38126

(901) 274-6978

DOUBLE WALL RECTANGULAR GALVANIZED MANUFACTURING STANDARDS

Project:	Highland Oncology Group
Location:	Rogers, AR

D (DUCT)	STANDARD DUCT														
	OUTSIDE WALL <table> <tr> <th>MAJOR AXIS</th><th>Duct Construction</th></tr> <tr> <td>3" -30"</td><td>24</td></tr> <tr> <td>30"-36"</td><td>22</td></tr> <tr> <td>37" - 48"</td><td>20</td></tr> <tr> <td>49" - 60"</td><td>18</td></tr> <tr> <td>61"-70"</td><td>16</td></tr> <tr> <td>71+"</td><td>16</td></tr> </table>	MAJOR AXIS	Duct Construction	3" -30"	24	30"-36"	22	37" - 48"	20	49" - 60"	18	61"-70"	16	71+"	16
MAJOR AXIS	Duct Construction														
3" -30"	24														
30"-36"	22														
37" - 48"	20														
49" - 60"	18														
61"-70"	16														
71+"	16														
	INSIDE WALL <table> <tr> <th>MAJOR AXIS</th><th>Duct Construction</th></tr> <tr> <td>3" - 36"</td><td>22</td></tr> <tr> <td>37" - 60"</td><td>22</td></tr> <tr> <td>60" +</td><td>20</td></tr> </table>	MAJOR AXIS	Duct Construction	3" - 36"	22	37" - 60"	22	60" +	20						
MAJOR AXIS	Duct Construction														
3" - 36"	22														
37" - 60"	22														
60" +	20														

OUTER WALL: Solid Galvanized Steel
INNER WALL: Perforated Galv Steel
INSULATION: 2" – 1.5lb Density

Construction Standards:

- Longitudinal Seams: Straight Duct = Pittsburgh Lock Seam Fittings = Pittsburgh Lock Seam
- Transverse Seams: TDC/F Seam equal to T-25 a/b
- Insulation will have a thermal conductivity factor of .26 BTU/hr/sq. ft./deg F or less.
- Fabrication in accordance with SMACNA HVAC Duct Construction Standards - Metal & Flexible (2005) except as indicated

DOUBLEWALL WILL BE PROVIDED IN THE FOLLOWING LOCATIONS:

ALL MEDIUM PRESSURE CONSTANT VOLUME AND VAV SUPPLY AIR DUCT FOR FIRST 20' FROM AIR HANDLER OR PACKAGED UNIT AND IN DUCT CHASE BETWEEN FLOORS	DOUBLE WALL WITH PERFORATED METAL LINER. MYLAR FILM IS TO COVER FIBERGLASS	FIBERGLASS EQUAL TO UNITED MCGILL ACOUSTIC - K27	1-1/2" LINER, R VALUE=6.0
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Submittal Date:	7/9/26
Submitted By:	Steve Stratton



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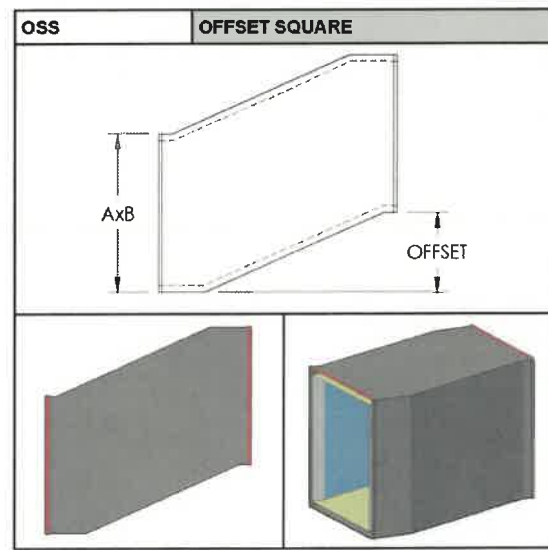
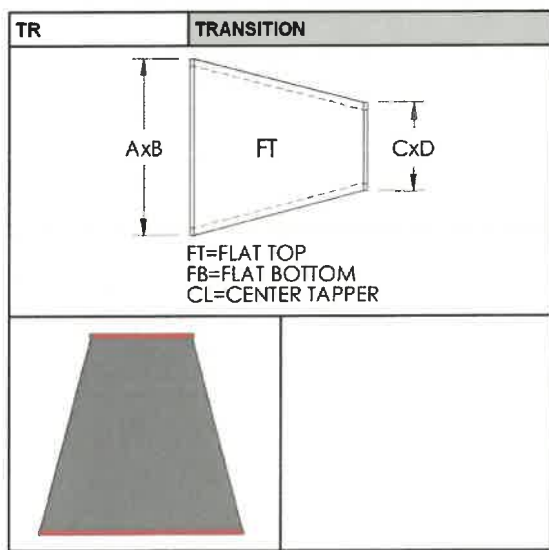
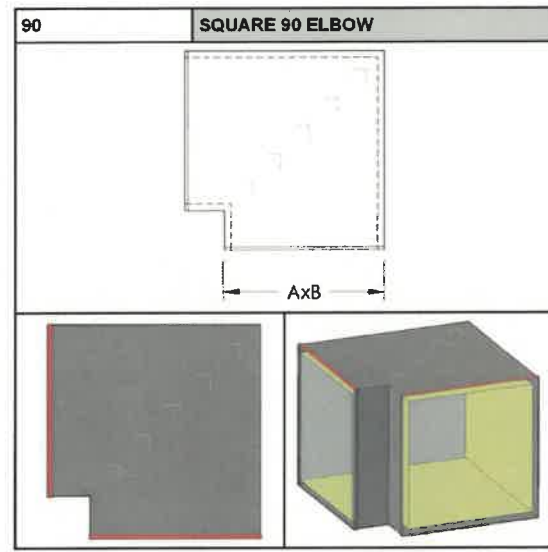
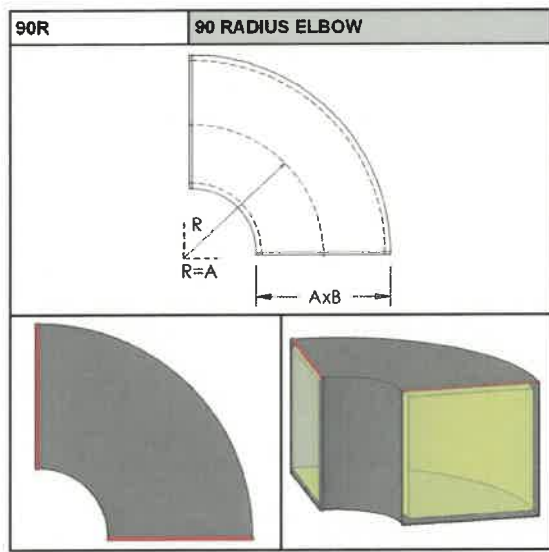
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(901) 274-6978

DOUBLE WALL RECTANGULAR FITTINGS

Project:	Highlands Oncology
Location:	Rogers, AR
Construction:	Transverse Connection – SMACNA TDF Type T-25 A/B
Fitting Walls:	OD Wall will be Solid Galvanized. ID Wall will Perforated Galvanized Steel





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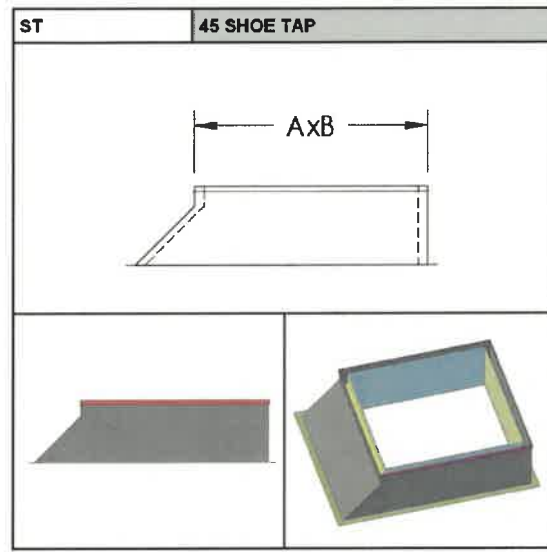
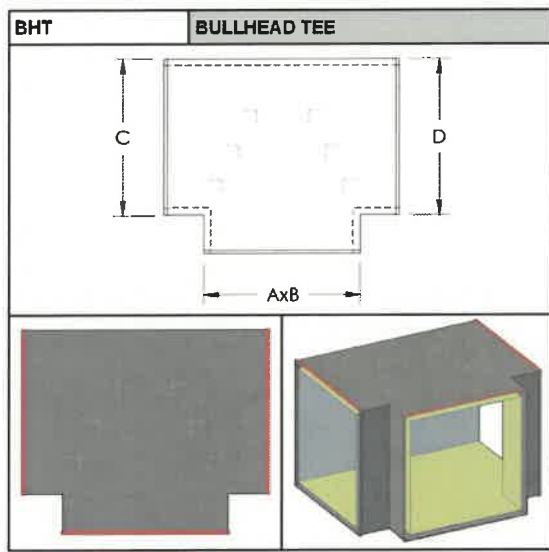
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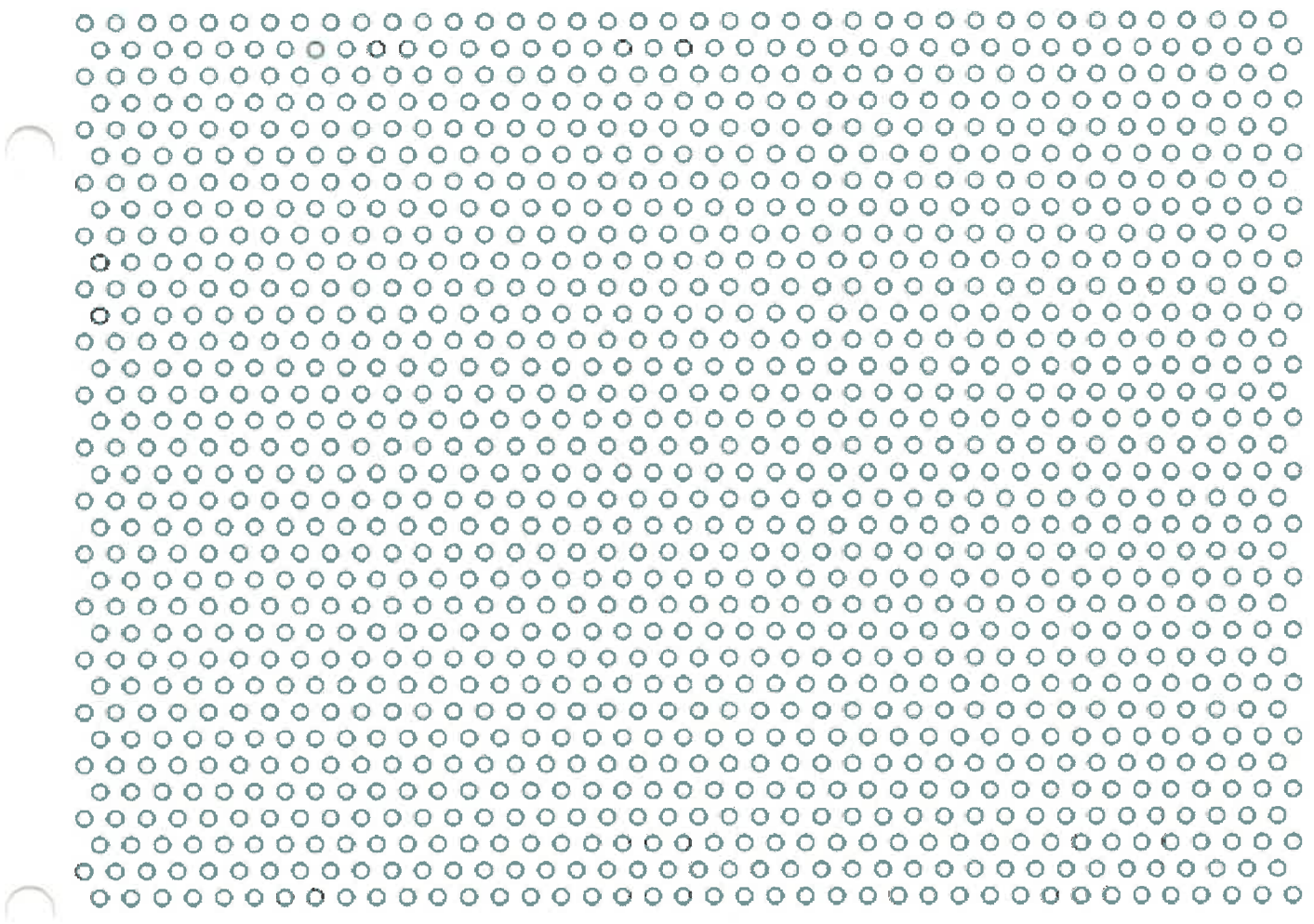
(901) 274-6978

DOUBLE WALL RECTANGULAR FITTINGS

Project:	Highlands Oncology
Location:	Rogers, AR
Construction:	Transverse Connection – SMACNA TDF Type T-25 A/B
Fitting Walls:	OD Wall will be Solid Galvanized. ID Wall will Perforated Galvanized Steel



Submitted By:	Steve Stratton
Date:	7/9/26



3/32" Diameter 3/16" Staggered Centers

Hole Type: Round
Finish Type:
Hole Size: 3/32"
Centers: 3/16"
Pattern Type: 60 Deg
Holes PSI: 32.84
Open Area: 22.67%





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K25 MAT FACE INSULATION



Description

K25 MatFace Insulation is a light yellow, medium density, flexible, resilient insulation blanket composed of glass fibers bonded with a thermosetting resin and faced with a black fabric. The product features dimensional stability and good handling properties. The black surface of our K Series insulation contains an EPA-registered antimicrobial agent.

Uses

The product is specifically designed for the heating, ventilating and air conditioning equipment market and is recommended for acoustical and thermal applications up to a surface temperature of 250°F.

FEATURES AND RELATED BENEFITS

Air Flow Erosion Resistant	With its smooth black facing this well bonded fibrous glass blanket resists the deteriorating effects of air flow erosion to 4000 FPM. Meets air erosion requirements of UL 181.
Excellent Acoustical Properties	The excellent sound absorption characteristics of K25 MatFace Insulation helps reduce equipment noise.
Ease of Installation	K25 MatFace Insulation handles well and is easy to install with adhesives and mechanical fasteners.
Non-Corrosive	Does not accelerate corrosion on copper, aluminum or steel, per ASTM C665.
Bacteria Fungi Resistance	Does not breed or promote growth of bacteria fungi, ASTM 665.

PROPERTIES

Property	Test Method	1/2" – 2"
Density	ASTM C518	1.0 lb/ft ³
Thermal Conductivity	ASTM C518	0.25 at 75 degrees Fahrenheit at mean (K value)
R Value:		
1.12"		4.48
1.63"		6.52
Air Erosion – No Erosion	UL 181	1600 fpm – 4000 fpm
Moisture Absorption	ASTM C1104	Less than 1% by volume
Sound Absorption Coefficients	ASTM C 423 (A Mounting)	

Insulation Thickness	Octave Band Center Frequencies, HZ						
	125	250	500	1000	2000	4000	NRC
1.12"	0.14	0.32	0.65	0.86	0.94	0.95	0.70
1.63"	0.15	0.46	0.86	0.99	1.06	0.99	0.85

Product Features	UL723, CAN/ULC-S102M, ASTM E84
Specification Compliance	ASTM C553, CGSB51-GP-11M, ASTM E662, ASTM E162, NFPA 90(a) & 90(b)

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901-274-6978

SUBMITTAL

EQUIPMENT:

DUCTWORK - SPIRAL-ROUND - GALVANIZED

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

WE PROPOSE TO USE "SINGLE WALL ROUND GALVANIZED SPIRAL DUCT"
AS SUPPLIED BY "DIXIE METAL PRODUCTS" PER THE ATTACHED
SUBMITTALS.

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026



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

SINGLE WALL ROUND GALVANIZED MANUFACTURING STANDARDS

Project:	Highlands Building at Pinnacle Hills
Location:	Rogers, AR

SPIRAL SEAM

10" Positive WG
(SMACNA 2005 Standard)

DIAMETER	Spiral Seam Pipe	Longitudinal Seam Pipe	Fitting Construction
3" - 18"	26		24
19" - 24"	26		24
25" - 42"	24		22
43" - 60"	22		20
61" - 66"	22		18
67" - 96"	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 ASTM A653 (formerly ASTM A525/A527)
- Spiral Seam construction will be RL-1 to 10" W.G Positive. Longitudinal seam will be RL-4 to 10" W.G. Positive 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.

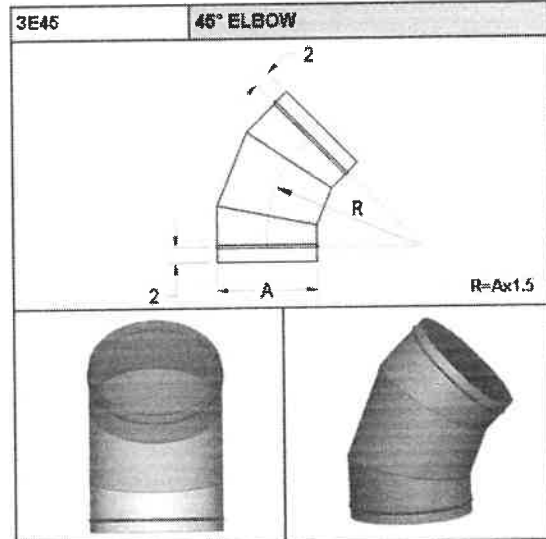
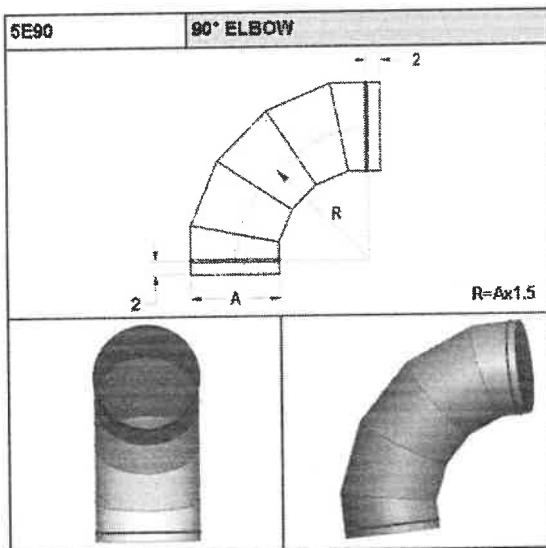
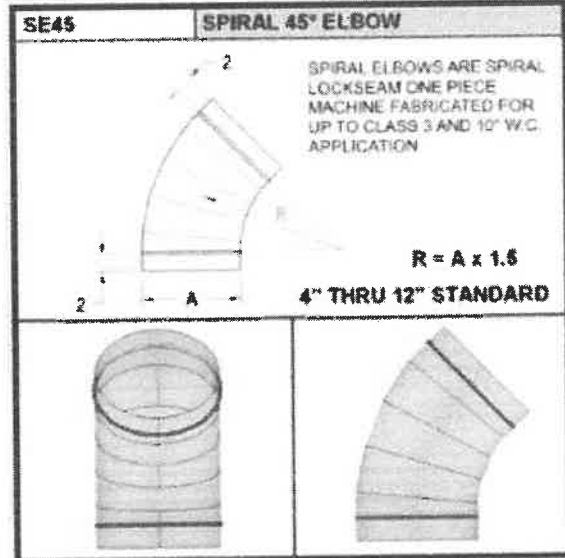
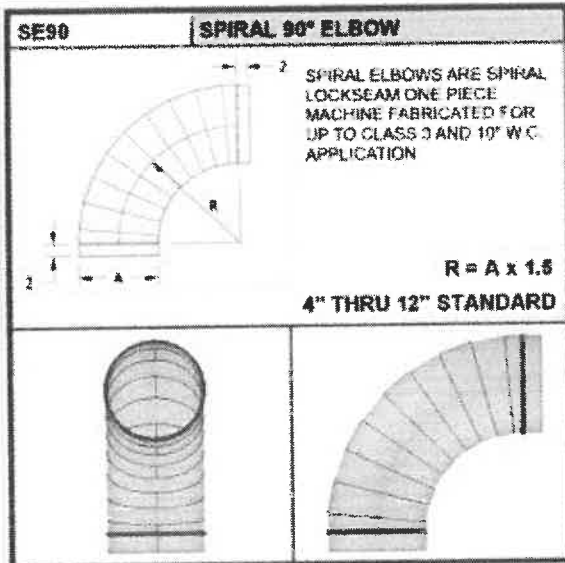
Submittal By:	Dale Turner
Submittal Date:	5/26/2026



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

SINGLE WALL ROUND FITTINGS

Project:	Highlands Building at Pinnacle Hills
Location:	Rogers, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant



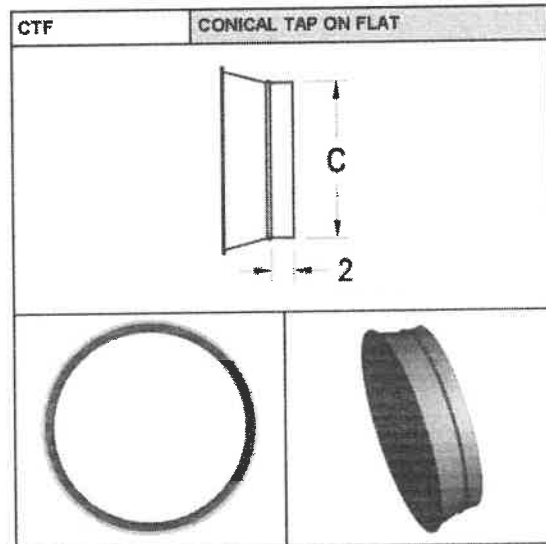
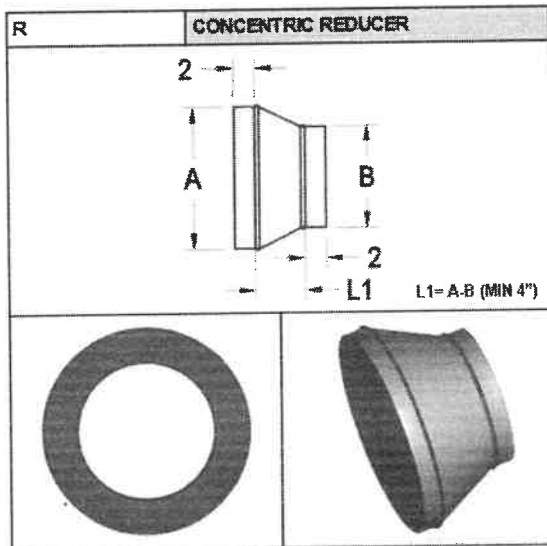
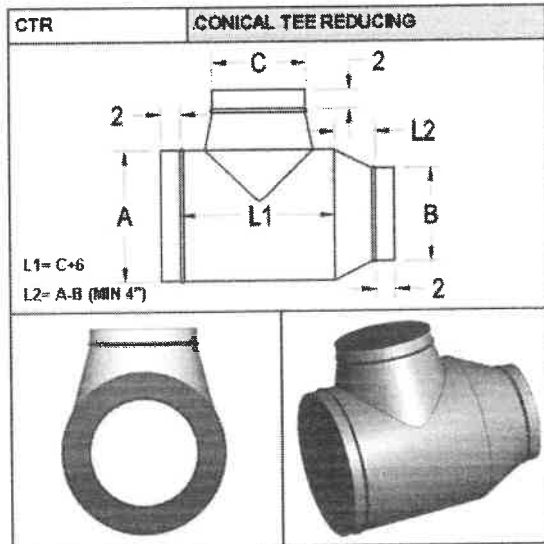
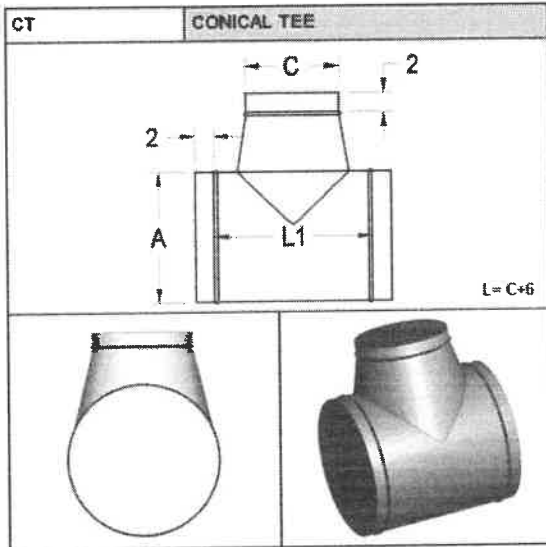
Submitted By:	Dale Turner
Submittal Date:	5/26/2026



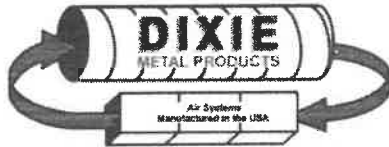
963 South Bellevue
Memphis, TN 38106
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SINGLE WALL ROUND FITTINGS

Project:	Highlands Building at Pinnacle Hills
Location:	Rogers, AR
Construction:	Tack Welded Seam or Gore Locked Standing Seam and Sealed with high pressure duct sealant



Submitted By:	Dale Turner
Submittal Date:	5/26/2026

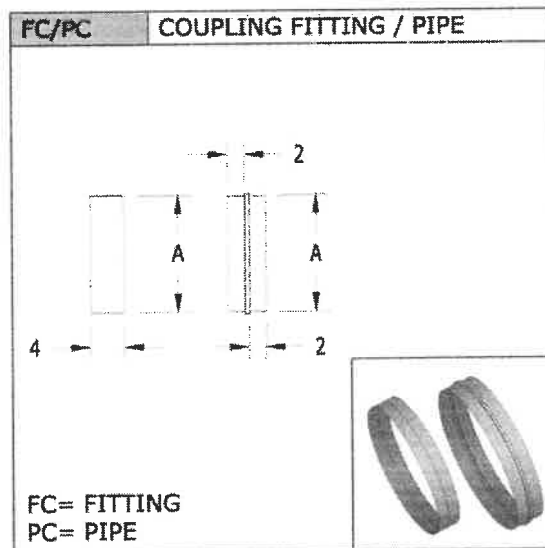


963 South Bellevue
Memphis, TN 38106
(901) 774-2220
(901) 774-2174 Fax

SLIP COUPLING TRANSVERSE DUCT CONNECTION

Project:	Highlands Building at Pinnacle Hills
Location:	Rogers, 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:	5/26/2026



Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis Tn 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

SHOWER EXHAUST DUCT - ALUMINUM

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

WE WILL CONSTRUCT & INSTALL SHOWER EXHAUST DUCT IN ACCORDANCE WITH SMACNA STANDARDS. ALL LOW PRESSURE DUCTWORK WILL BE OF **3003** GRADE ALUMINUM SHEETS. THIS ALUMINUM IS A COMMERCIAL GRADE ALUMINUM SUITABLE FOR DUCTWORK AND CORROSION RESISTANCE. MINIMUM THICKNESS IS .032

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026



Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis TN 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

FUMEHOOD EXHAUST DUCT - STAINLESS STEEL

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

ALL FUMEHOOD EXHAUST DUCT WILL BE CONSTRUCTED OF **18GA - 304** STAINLESS STEEL. ALL LONGITUDINAL AND TRANSVERSE JOINTS WILL BE WELDED AND OF A GAUGE IN ACCORDANCE WITH SMACNA 1995 EDITION.

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026



Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis TN 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

SNAPLOCK PIPE & ADJUSTABLE ELBOWS

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

**LOW PRESSURE ROUND SNAPLOCK "26ga" PIPE & "26ga"
ADJUSTABLE ELBOWS PER ATTACHED SUBMITTAL.**

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026



SOUTHWARK METAL MANUFACTURING COMPANY

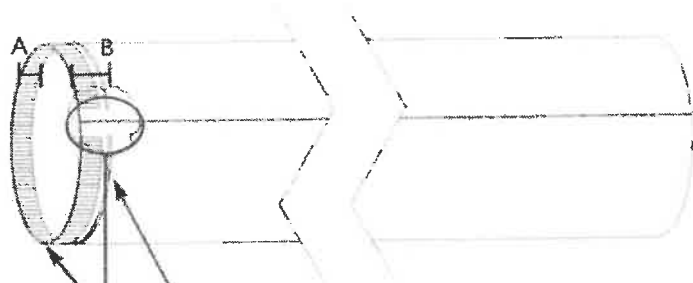
Philadelphia, PA • Greenville, SC • Indianapolis, IN • Southaven, MS • Fremont, NE • Caldwell, ID

Corporate Headquarters: 2800 Red Lion Road, Philadelphia PA 19114

tel: (800) 523-1052 • fax (800) 722-2076 • www.southwarkmetal.com

SUBMITTAL DRAWING

SNAPLOCK PIPE (MODEL NO: SL)



Measurements

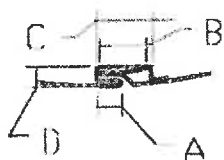
.375" width of bead

A - 1 1/2" crimp length (+/- .0625")

.25" length of tapered leading edge (+/- .0625")

B - 1 3/4" length from top of bead to bottom of tapered leading edge

Reeves Lock



Measurements

A - .23"

B - .375"

C - .4375"

D - .20"

From SMACNA HVAC
Duct Construction Standards
Metal and Flexible, 2nd Ed
(1995); 3.3 & 3.8

Product Availability

Diameter	30 Ga	28 Ga	26 Ga	24 Ga
3"	x	x	x	
4"	x	x	x	x
5"	x	x	x	x
6"	x	x	x	x
7"	x		x	x
8"	x		x	x
9"	x		x	x
10"	x		x	x
12"	x		x	x
14"			x	x
16"			x	x
18"			x	x
20"			x	x
22"			x	x
24"			x	x

SMACNA Gauge Requirements for Galvanized Steel

Duct Diameter	2" w.g. max Positive Pressure	Duct Diameter	2" w.g. max Negative Pressure
3" - 8"	28 Ga	6" - 10"	28 Ga
9" - 14"	26 Ga	12"	26 Ga
15" - 26"	24 Ga	14" - 16"	24 Ga
		18" - 20"	22 Ga
		22" - 26"	20 Ga

NOTES

- Material: Hot Dipped Galvanized Steel per ASTM A653 CS Type B
- Available in all standard gauges
- Crimp and bead male connection and straight female connection
- Meets 2" W.G. pressure

- Consult factory for available joint lengths
- Aluminum and stainless steel pipe available in certain sizes and gauges
- .0625" thickness of crimp
- RL-7 longitudinal seam

JOB NAME: _____
LOCATION: _____
ARCHITECT: _____
ENGINEER: _____
CONTRACTOR: _____

DATE: 01/03/13

SW-SLPNE

SD-0004

Snaplock Pipe
MODEL NO: SL



SOUTHWARK METAL MANUFACTURING COMPANY

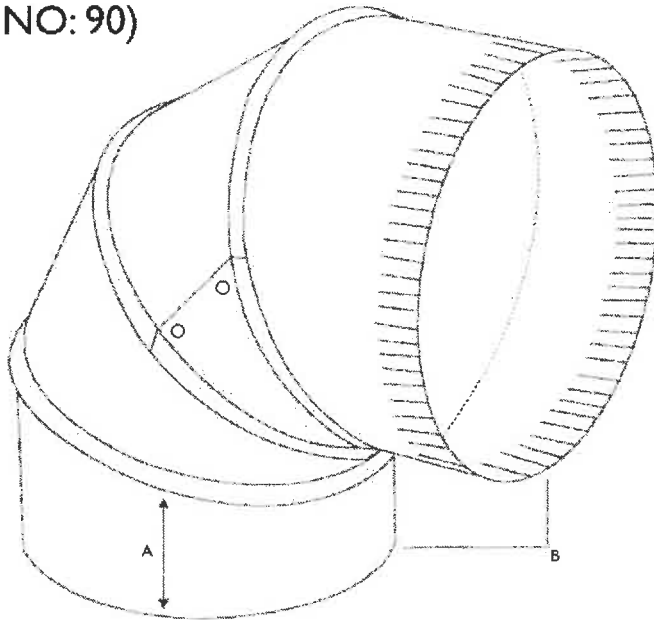
Philadelphia, PA • Greenville, SC • Indianapolis, IN • Southaven, MS • Fremont, NE • Caldwell, ID

Corporate Headquarters: 2800 Red Lion Road, Philadelphia PA 19114

tel: (800) 523-1052 • fax (800) 722-2076 • www.southwarkmetal.com

SUBMITTAL DRAWING

90° ELBOW (MODEL NO: 90)



Product Availability

Diameter	30 Ga	28 Ga	26 Ga	24 Ga
3"	x	x	x	
4"	x	x	x	x
5"	x	x	x	x
6"	x	x	x	x
7"	x		x	x
8"	x		x	x
9"	x		x	x
10"	x		x	x
12"	x		x	x
14"			x	x
16"			x	x
18"			x	x
20"			x	x
22"			x	x
24"			x	x

Diameter	A	B	Diameter	A	B
3"	1 1/4"	2 1/2"	12"	1 1/8"	3"
4"	1 1/8"	3"	14"	2 1/8"	4"
5"	1 3/4"	3"	16"	2 1/4"	3 1/2"
6"	1 1/8"	3 1/8"	18"	1 7/8"	3 1/2"
7"	2"	3 1/4"	20"	1 7/8"	4 1/2"
8"	2"	3 1/8"	22"	1 3/4"	5 1/2"
9"	2"	3 1/8"	24"	2"	6 1/8"
10"	2 1/4"	4"			

SMACNA Gauge Requirements for Galvanized Steel

Duct Diameter	2" w.g. max Positive Pressure	Duct Diameter	2" w.g. max Negative Pressure
3" - 8"	28 Ga	6" - 10"	28 Ga
9" - 14"	26 Ga	12"	26 Ga
15" - 26"	24 Ga	14" - 16"	24 Ga
		18" - 20"	22 Ga
		22" - 26"	20 Ga

From SMACNA HVAC Duct Construction Standards Metal and Flexible, 2nd Ed (1995); 3.3 & 3.8

NOTES

- Material: Hot Dipped Galvanized Steel per ASTM A653 CS Type B
- Crimp and bead male connection and straight female connection
- 1" crimp length
- Meets +/- 2" W.G. pressure overall

- 1/2" overlap for riveting using 1/8" rivets
- RL-2 rivet seam; meets +/- 4" w.g. pressure
- 3" through 20" diameters = 4 pc. assembly
- 22" through 24" diameters = 5 pc. assembly
- Aluminum and type 304 stainless steel pipe available in certain sizes and gauges

JOB NAME: _____
 LOCATION: _____
 ARCHITECT: _____
 ENGINEER: _____
 CONTRACTOR: _____

DATE: 01/03/13 SW-SLPNE SD-0004

Snaplock Pipe
 MODEL NO: SL



Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis TN 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

DUCT SEALANT

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

WE PROPOSE TO USE WATER-BASED **HARDCAST**
"CCWI-181" PER THE ATTACHED SUBMITTAL TO SEAL ALL
JOINTS AND PENETRATIONS OF DUCTWORK.

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026

PART NUMBERS

304142	1 Case w/ (25) 11 oz. Cartridges (White)
304146	1 Case w/ (25) 11 oz. Cartridges (Gray)
304144	1 Case w/ (4) 1-Gallon Pails (White)
304148	1 Case w/ (4) 1-Gallon Pails (Gray)
304143	1 - 2-Gallon Pail (White)
304147	1 - 2-Gallon Pail (Gray)
304145	1 - 5-Gallon Pail (White)

TECHNICAL DATA

Color	White & Gray
Consistency	Heavy textured
Base	Synthetic latex
Solvent	Water
Weight per Gallon	11.6 lbs.
Solids Content	73.4%
Viscosity	Thixotropic
Coverage (UL 181 A-M)	Apply 18 mil, scrim, addt. 18 mil
Coverage (UL 181 B-M)	Approximately 214 to 320 lin. ft. per gal. at 20 to 30 mil wet film thickness at 3" width
Shore A Hardness	> 20
Flexibility	Passes ¼ inch mandrel bend
Time to Test	48 hours*
Service Temperature	-20°F to 200°F
Mildew Resistance	Mold & Mildew resistant
VOC	Exempt: 0 g/l Non Exempt: 38 g/l (less water)
Surface Burning	Flame Spread - 0, Smoke Developed - 0 (When tested in accordance with ASTM E84, UL 723)
Pressure Classes	SMACNA ½, 1, 2, 3, 4, 6 and 10 inches w.g.
Seal Class	Meets Seal Class A
Packaging	11 oz. cart.; 1, 2 & 5 gal. pails
Freeze/Thaw Stability	Passed 5 Cycles

*May vary according to temperature and humidity

SPECIFICATION/STANDARDS COMPLIANCE

Property	Method	Results
Freeze Thaw & Heat Cycling	ASTM C-731	Pass
Slump Test	ASTM D-2202	Pass
VOC Limitation	SCAQMD Rule 1168	Pass
	USDA	Pass
	FDA	Pass
	EPA	Pass
	City of Los Angeles Approval RR#8427	Pass

A versatile, all purpose duct sealant for use on all types of metal duct, fiberglass duct board, duct fabric and flex duct. 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.

APPLICATION

Temperature	35°F to 110°F (1.7°C to 44°C)
Method	Brush, putty knife, caulk gun
Preparation	Surface must be dry, dirt, oil, and grease free.
Rate (UL 181 A-M)	Apply 18 mil, scrim and 18 mil over scrim.
Rate (UL 181 B-M)	Approx. 214 to 320 lin. ft. per gal. at 20 to 30 mil wet film thickness at 3" width.
Clean Up Wet	Soap and water
Clean Up Dry	UN-TACK™ or Solvent (Use safe handling practices.)
Painting	Only latex or epoxy paints
Ductboard	Scrim required for UL 181A-M

STORAGE

Temperature	35°F to 110°F (1.7°C to 44°C) DO NOT FREEZE
Shelf Life	One year (unopened)
Flammability	Non-flammable

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



PRECAUTIONS

Surface must be clean and free of moisture, contamination and foreign matter. Do not allow this product to freeze. Apply when temperatures will not fall below freezing for at least 36–48 hours, depending on temperature and humidity. 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.





Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis TN 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

DUCT FLANGE GASKETS

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

WE PROPOSE TO USE DURO-DYNE **"BTL316"** SEALING GASKET TAPE AS PER THE ATTACHED SUBMITTAL.

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026

SUBMITTAL RECORD _____
 JOB _____
 LOCATION _____
 SUBMITTED TO _____
 SUBMITTAL PREPARED BY _____
 APPROVED BY _____
 DATE _____



Submittal Form

BTL316

Butyl Gasket



DESCRIPTION

BTL316 Butyl Gasket is used in tape and bead form to seal transverse duct connection systems helping to provide a moisture and air tight seal. It is a dark gray permanently soft, non-drying tape sealant compound which contains virgin butyl polymer to enhance its sealing properties and aging characteristics. It is formulated to retain low temperature operating properties. BTL316 Butyl Gasket will not crack or separate while being applied at low end of temperature usage range, however, it is recommended that the material be stored at moderate temperature to enhance its application characteristics. When stored at warehouse conditions, it will remain usable for a prolonged period. BTL316 Butyl Gasket will adhere to most clean, dry surfaces such as steel, galvanized steel, aluminum, plastic, wood and concrete. The product is non-hazardous and non-toxic.

FEATURES

- Excellent sealant for HVAC, as well as many others industries.
- Non-irritant: No limitation to eyes or skin as listed in CFR, Title 16, "Appraisal of the safety of chemicals in food, drugs, and cosmetics".
- Remains pliable and will not crack or separate while being applied at low end of temperature usage range; when stored in warehouse conditions, it will remain useable for a prolonged period.
- Chemical Resistance: Excellent resistance to water, alcohols, mild acids and bases.

TYPICAL PROPERTIES

Base: Non-drying synthetic polymer
Fillers: Mineral fillers and inert ingredients—Non-asbestos
Specific Gravity: 1.43 to 1.47 G/CC
Cone Penetration: Modified to total moving load at 300 gm., 5 sec @ 77° F; 80-90 mm/10.
Adhesive Tensile Strength: 10 to 12 PSI
Temperature Tolerance: -40° F to +249° F
Application Temperature: Above 40° F
Weatherometer Test: Will not harden even after 1000 hour
Flame & Smoke Rating: Flame 15 Smoke 15
Shelf Life: 1 year minimum
Flexibility: No cracking at -20° F.
Paintability: Yes
Vehicle Bleedout: None
Non-Corrosive: Will not corrode Metals
Color: 21046-light gray / 13099-dark gray

ITEM#	CODE	DESCRIPTION
21046	BTL316-58LG	3/16 x 5/8 UV Resistant Butyl
13099	BTL316-58DGH	3/16 x 5/8 UV Resistant Butyl H-Style

RELATED SMACNA RECOMMENDATIONS*

1.4.1 - Duct Sealing

Ducts must be sufficiently airtight to ensure economical and quiet performance of the system. It must be recognized that airtightness in ducts cannot, and need not, be absolute (as it must be in a water piping system). Codes normally require that ducts be reasonably airtight. Concerns for energy conservation, humidity control, space temperature control, room air movement, ventilation, maintenance, etc., necessitate regulating leakage by prescriptive measures in construction standards. Leakage is largely a function of static pressure and the amount of leakage in a system is significantly related to system size. Adequate airtightness can normally be ensured by a) selecting a static pressure, construction class suitable for the operating condition, and b) sealing the ductwork properly.

The designer is responsible for determining the pressure class or classes required for duct construction and for evaluating the amount of sealing necessary to achieve system performance objectives. It is recommended that all duct constructed for the 1 in. (250 Pa) and 1/2 in. (125 Pa) pressure class meet Seal Class C. However, because designers sometimes deem leakage in unsealed ducts not to have adverse effects, the sealing of all ducts in the 1 in. (250 Pa) and 1/2 in. (125 Pa) pressure class is not required by this construction manual. Designers occasionally exempt the following from sealing requirements: small systems, residential occupancies, ducts located directly in the zones they serve, ducts that have short runs from volume control boxes to diffusers, certain return air ceiling plenum applications, etc. When Seal Class C is to apply to all 1 in. (250 Pa) and 1/2 in. (125 Pa) pressure class duct, the designer must require this in the project specification. The designer should review the *HVAC Air Duct Leakage Test Manual* for estimated and practical leakage allowances.

Seven pressure classes exist [1/2 in. (125 Pa), 1 in. (250 Pa), 2 in. (500 Pa), 3 in. (750 Pa), 4 in. (1000 Pa), 6 in. (1500 Pa), and 10 in. wg (2500 Pa)]. If the designer does not designate pressure class for duct construction on the contract drawings, the basis of compliance with the SMACNA *HVAC Duct Construction Standards* is as follows: 2 in. wg (500 Pa) for all ducts between the supply fan and variable volume control boxes and 1 in. wg (250 Pa) for all other ducts of any application.

Some sealants can adversely affect the release function of breakaway connections to fire dampers; consult the damper manufacturer for installation restrictions.

Table 1-1 Standard Duct Sealing Requirements		
Seal Class	Sealing Requirements	Applicable Static Pressure Construction Class
A	Class A: All Transverse joints, longitudinal seams, and duct wall penetrations	4 in. wg and up (1000 Pa)
B	Class B: All Transverse joints and longitudinal seams only	3 in. wg (750 Pa)
C	Class C: Transverse joints only	2 in. wg (500 Pa)
In addition to the above, any variable air volume systems duct of 1 in. (250 Pa) and 1/2 in. wg (125 Pa) construction class that is upstream of the VAV boxes shall meet Seal Class C		

*From SMACNA *HVAC Duct Construction Standards Metal and Flexible • Third Edition • 2005*

Duro Dyne Corporate Headquarters, Bay Shore, NY
 631-249-9000 • Fax: 631-249-8346

Duro Dyne Midwest • Duro Dyne West • Duro Dyne Canada
 www.durodyne.com • E-mail: durodyne@durodyne.com



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 BO050000



Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis TN 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

FLEXIBLE DUCT - INSULATED

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

WE PROPOSE TO USE FLEXMASTER TYPE **1M (R-6)** FLEXIBLE DUCT PER THE ATTACHED SUBMITTAL.

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

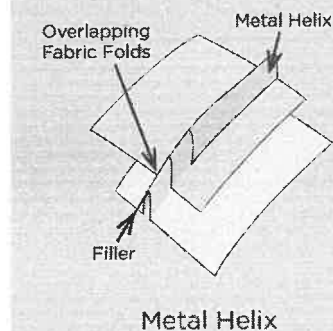
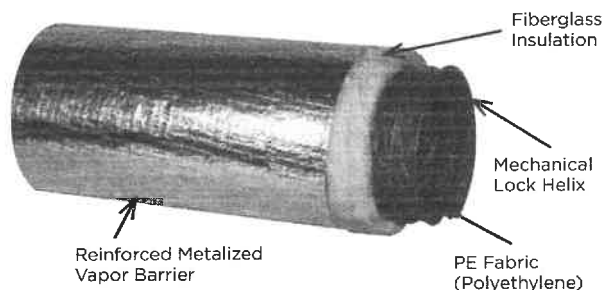
DATE:

6/29/2026

SUBMITTAL DATA

Flexmaster U.S.A.® 1M

Acoustical Flexible Duct Insulated



Technical Data

Standard Lengths (ft)	25 ft, Special lengths on request
Inside Diameter (in)	3", 4", 5", 6", 7", 8", 9", 10", 12", 14", 15", 16", 18", 20"
Air Friction Loss	See Friction Loss Chart for details
Vapor Barrier Permeance	(.05) perm A.S.T.M. E96, Procedure A
Test Standard	UL181
Tested By	Intertek/ETL
Certifications Met	Class 1 Air Duct, NFPA 90A and 90B, BOCA, SBBC, HUD/FHA, MIN Property Std.
Internal Working Pressure (w.g.)	10" w.g. positive 5" w.g. negative thru 16" dia. 1" w.g. negative, 18" & 20" dia.
Rated Velocity	5500 F.P.M.
Min Burst Pressure	2 1/2 times working pressure
Operating Temperature Range	-20° to +250°F
Flame/Smoke	25/50
Insulation Thermal Conductance	R4.2, R6, R8

Like the UL Mark, the ETL Listed Mark shows that our product has been independently tested by a Nationally Recognized Testing Laboratory (NRTL). It shows that it has met the requirements of widely accepted product safety standards and that we have agreed to periodic follow-up inspections to verify continued compliance.

Construction Features

The Flexmaster U.S.A.® Type 1M is manufactured to meet the highest quality standards in strength, permeability and fire resistance required in a flexible duct. Tested to UL standard 181, this Class 1 Air Duct is fabricated with an acoustically transparent PE inner film which allows mid-range sound energy to penetrate the duct wall.

Duct Fabric

A Polyethylene fabric, mechanically locked to the duct helix without the use of adhesives.

Duct Helix

Made from corrosive resistant galvanized steel, the duct helix is mechanically formed to attach the duct fabric without the use of adhesives.

Vapor Barrier

Fire retardant, reinforced aluminum material. Excellent strength at low temperatures. Will not age harden.

Insulation

Formaldehyde-free fiberglass insulation by Johns Manville.

Flexmaster U.S.A.® Type 1 Acoustical Performance Submittal Data

Sound Attenuation - Straight Duct

Flexmaster U.S.A.® Flexible Duct	Dia (in.)	Length (ft.)	Insertion Loss, dB					
			Octave Band Center Frequency, Hz					
			125	250	500	1,000	2,000	4,000
Type 1	6	12	9	49	>53	>52	50	36
		9	7	31	36	33	32	24
		6	5	16	18	17	16	13
		3	2.7	5.6	6.0	5.8	5.6	4.9
		1	0.93	1.48	1.55	1.51	1.49	1.36
Type 1	8	12	10	47	>50	>51	49	30
		9	8	30	33	36	31	20
		6	5	16	17	18	16	11
		3	2.8	5.4	5.8	6.0	5.6	4.6
		1	0.95	1.46	1.51	1.55	1.48	1.30
Type 1	12	12	18	>49	39	>48	38	28
		9	12	32	25	33	25	19
		6	8	17	14	18	14	11
		3	3.5	5.6	5.0	5.8	5.2	4.3
		1	1.12	1.49	1.39	1.51	1.41	1.26

Sound Attenuation - 90° Elbow

Flexmaster U.S.A.® Flexible Duct	Dia (in.)	Length (ft.)	Insertion Loss, dB					
			Octave Band Center Frequency, Hz					
			125	250	500	1K	2K	4K
Type 1	6	12	7	39	>52	>51	>50	44
		9	5	25	37	35	33	28
		6	4	14	19	18	17	15
		3	2.3	2.7	6.0	5.9	5.8	5.3
Type 1	8	12	10	47	>52	>52	49	32
		9	8	30	35	37	31	21
		6	6	16	18	19	16	12
		3	2.8	5.5	5.9	6.1	5.7	4.6
Type 1	12	12	14	>51	>52	>52	46	25
		9	10	35	33	34	29	17
		6	7	18	17	17	15	10
		3	3.2	5.9	5.8	5.8	5.4	4.1

Notes:

1. Acoustical testing was performed in accordance with ASTM E477 and ADC Test Code FD 72-RI by ETL.
2. Insertion loss values are for flow velocities less than 2,500 fpm.
3. The 63 Hz IL values were laboratory measured, but were not published due to lack of acoustical value.

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FLEXMASTER U.S.A.®
A MASTERDUCT COMPANY

041221 1M Acoustical 2 Sided



Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis TN 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

DUCT - HANGERS & SUPPORTS

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

SUSPENSION HANGER:

WE WILL INSTALL DUCT HANGERS USING SMACNA STANDARDS LISTED UNDER FIGURE 5-2 (upper), FIGURE 5-5 (lower) AND TABLE 5-4 (strut) FOR LARGE DUCTS. FOR SMALLER DUCTS, WE WILL UTILIZE METAL STRAP HANGERS AS SHOWN ON ATTACHMENTS.

ALL HANGERS WILL BE IN ACCORDANCE WITH SMACNA H.V.A.C. DUCT CONSTRUCTION STANDARDS - 4th ED.

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026

UNLESS OTHERWISE APPROVED ALLOWABLE LOAD ON UPPER ATTACHMENT IS 1/4 OF FAILURE LOAD.
UPPER ATTACHMENTS MAY BE TO WOOD STRUCTURES ALSO.

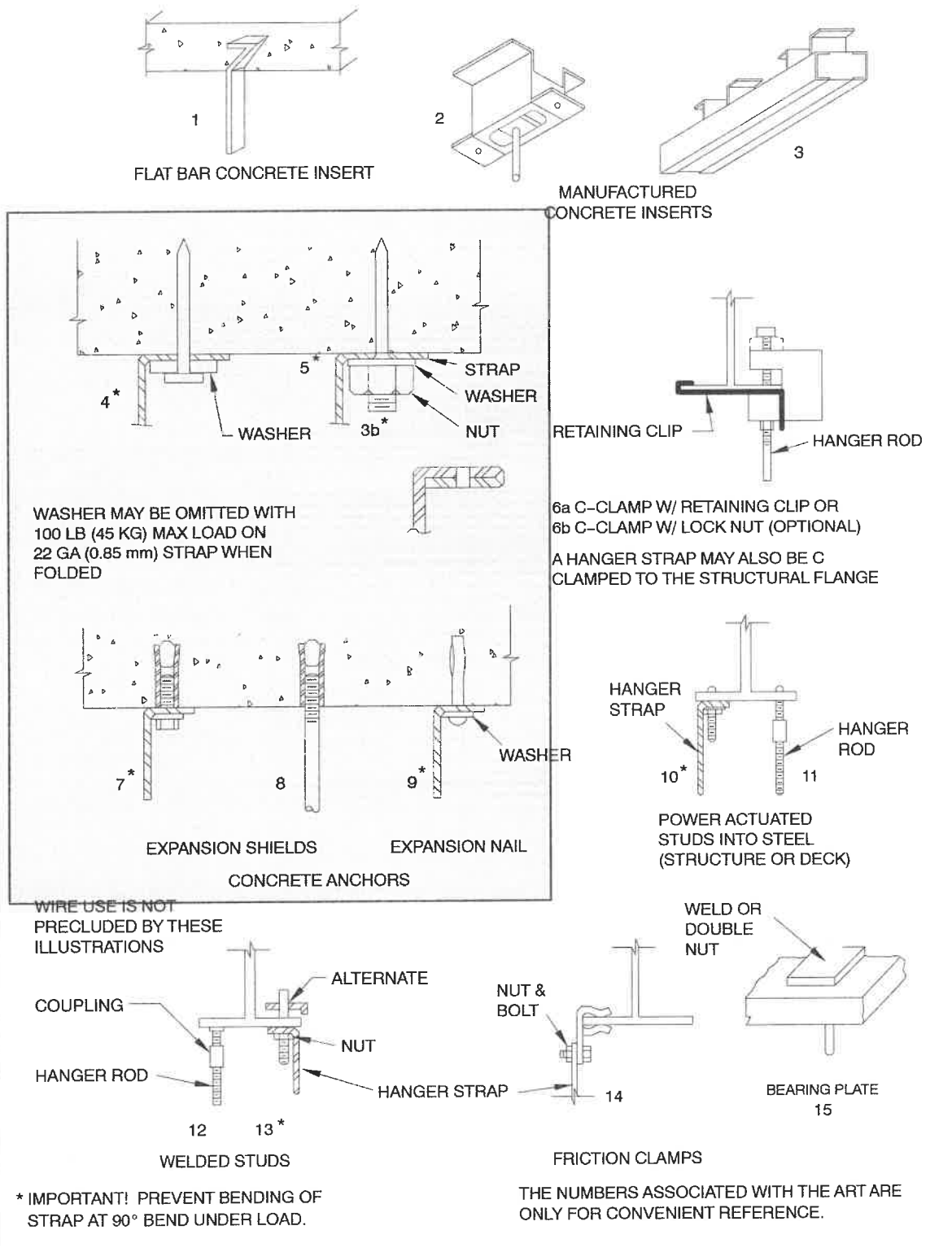


FIGURE 5-2 UPPER ATTACHMENT DEVICES – TYPICAL

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	3/8"	1" × 20 ga	1/4"	1" × 22 ga	1/4"	1" × 22 ga	1/4"
P/2 = 96"	1" × 16 ga	3/8"	1" × 18 ga	3/8"	1" × 20 ga	3/8"	1" × 22 ga	1/4"
P/2 = 120"	1 1/2" × 16 ga	1/2"	1" × 16 ga	3/8"	1" × 18 ga	3/8"	1" × 20 ga	1/4"
P/2 = 168"	1 1/2" × 16 ga	1/2"	1 1/2" × 16 ga	1/2"	1" × 16 ga	3/8"	1" × 18 ga	3/8"
P/2 = 192"	Not Given	1/2"	1 1/2" × 16 ga	1/2"	1" × 16 ga	3/8"	1" × 16 ga	3/8"
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 1/4" bolt 1" × 16 ga -two 1/4" dia. 1 1/2" × 16 ga -two 3/8" 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. 1 1/2" × 16 ga - 1100 lbs.		0.106" - 80 lbs. 0.135" - 120 lbs. 0.162" - 160 lbs. 1/4" - 270 lbs. 3/8" - 680 lbs. 1/2" - 1250 lbs. 5/8" - 2000 lbs. 3/4" - 3000 lbs.		

Table 5-1 Rectangular Duct Hangers Minimum Size

NOTES:

- Dimensions other than gage are in inches.
- Tables allow for duct weight, 1 lb./sf insulation weight and normal reinforcement and trapeze weight, but no external loads!
- 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*.
- Straps are galvanized steel; other materials are uncoated steel.
- 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.
- For upper attachments see Figs. 5-2, 5-3 and 5-4.
- For lower attachments see Fig. 5-5.
- For trapeze sizes see Table 5-3 and Fig. 5-6.
- 12, 10, or 8 ga wire is steel of black annealed, bright basic, or galvanized type.
- Cable hanging systems with adjustable mechanical device.
- Edge distance for holes in strap minimum of one hole diameter.

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 × 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 ⅝ 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 ⅝ 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 ⅝ 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:

- Straps are galvanized steel; rods are uncoated or galvanized steel; wire is black annealed, bright basic or galvanized steel. All are alternatives.
- See Figure 5-5 for lower supports.
- See Figs. 5-2, 5-3 and 5-4 for upper attachments.
- Table allows for conventional wall thickness, and joint systems plus one lb./sf (4.89 Kg/m²) 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.
- 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*.
- See Figs. 3-9 and 3-10 for flexible duct supports.

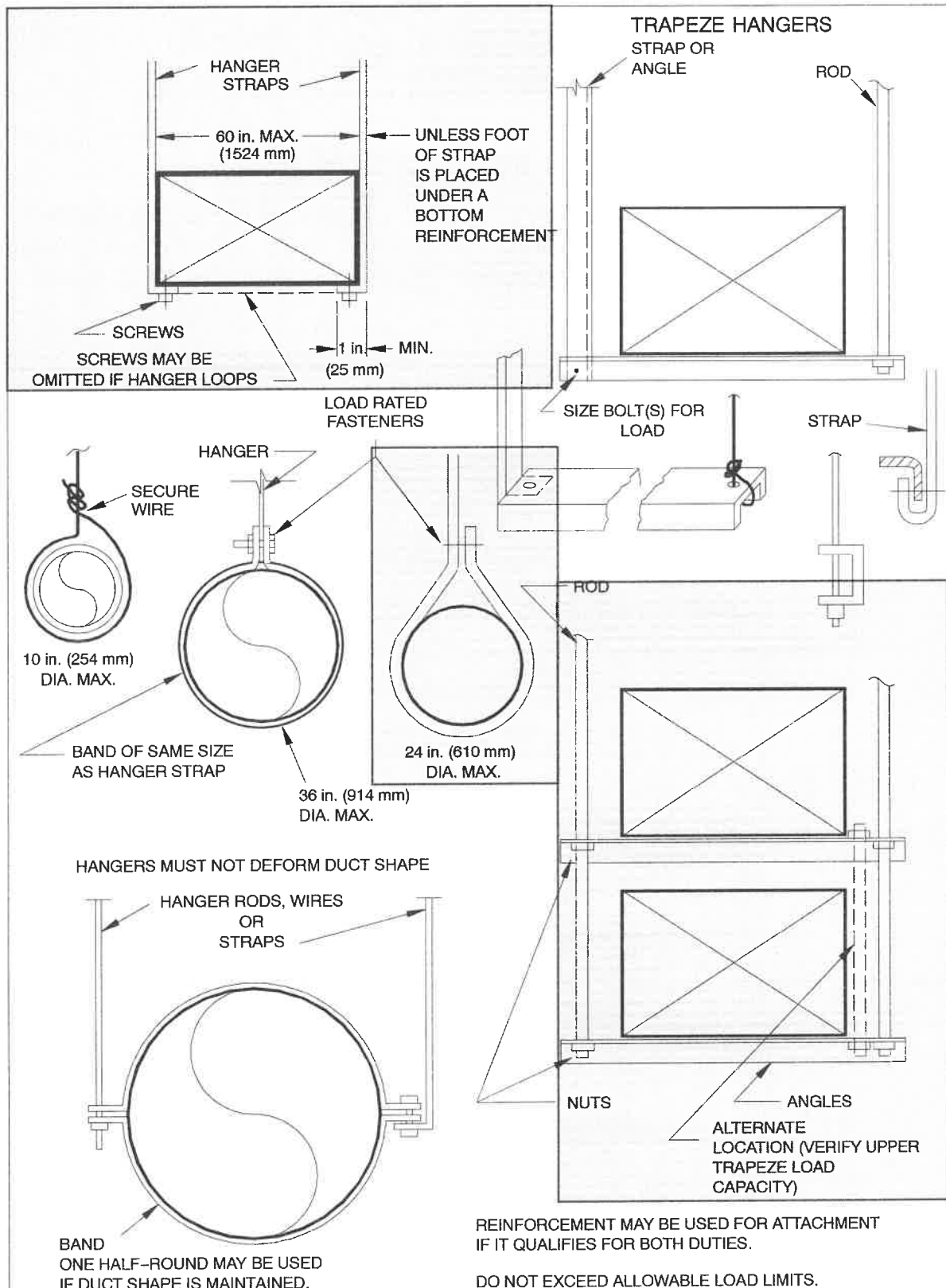


FIGURE 5-5 LOWER HANGER ATTACHMENTS

**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 7/8 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

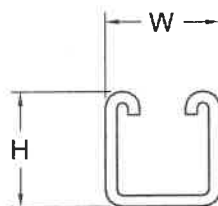


Table 5-4 Channel (Strut) Used as Trapeze



Knight & Wilson, Inc.

"Sheet Metal Contractors"

676 East E.H. Crump Blvd. Memphis TN 38126

901-274-6978

SUBMITTAL

EQUIPMENT:

DUCT END PRTOTECTION

SPEC SECTION:

23 31 00

PROJECT:

HIGHLANDS BLDG. - PINNACLE HILLS

LOCATION:

ROGERS, AR

CONTRACTOR:

COMFORT SYSTEMS USA

NOTE:

TEMPORARY CLOSURE:

DURING SHIPPING & STORAGE & AFTER INSTALLATION, IF A DUCT END IS NOT CONNECTED TO EQUIPMENT OR AIR DISTRIBUTION DEVICES, THAT END WILL BE TEMPORARILY SEALED WITH SHRINK WRAP USING DUROYNE **DYN-O-WRAP** PROTECTIVE DUCT WRAP FILM AS PER ATTACHED SUBMITTAL.

CONTACT:

MICHAEL COAD, K&W - PROJECT MGR.

DATE:

6/29/2026

SUBMITTAL RECORD _____
 JOB _____
 LOCATION _____
 SUBMITTED TO _____
 SUBMITTAL PREPARED BY _____
 APPROVED BY _____
 DATE _____



Submittal Form Dyn-O-Wrap

DESCRIPTION:

A self-adhesive film which can protect uninstalled duct sections from the intrusion of contaminants. Available in different sizes and several varieties, including Puncture Resistant Wrap and Reverse Puncture Resistant Wrap.

DYN-O-WRAP

- Excellent adhesion to ductwork, yet easily removable without leaving residue.
- Color: Lightning Blue
- Adhesive Color: Water Clear
- 2.5 mil thickness + .5mil for adhesion
- Temperature range: 60° - 80°F
- Humidity range: 30% - 70%
- Lengthy heat, moisture and direct sunlight exposure can negatively affect the product performance.
- Cohesive products should be protected from direct UV contact.
- Up to a six-month shelf life: stored in airtight (white) bags, to keep film from drying out.
- Packaged in boxes

Item #	Code	Description
13380	DW24-200	Dyn-O-Wrap 24" x 200'
13384	DW36-200	Dyn-O-Wrap 36" x 200'
13388	DW48-200	Dyn-O-Wrap 48" x 200'



Dyn-O-Wrap



PUNCTURE RESISTANT DYN-O-WRAP & REVERSE PUNCTURE RESISTANT DYN-O-WRAP

- Excellent adhesion to ductwork, yet easily removable without leaving residue.
- Water based and environmentally friendly
- Color: Blue
- Adhesive Color: Water Clear
- 1.5 mil thickness + .5mil for adhesion
- Temperature range: 50° - 90°F - For best results, keep within 60° - 90°F range. (Colder temperatures than listed will lessen the initial bond to the substrate.)
- Humidity range: 40% - 60%
- Keep away from exposure to temperature extremes, direct sunlight, water, solvent and other contaminants.
- Do not store substrates for longer than 6 months with protective masking films applied.
- Up to a six-month shelf life: stored in airtight (white) bags, to keep film from drying out.

Item #	Code	Description
13382	PRW24-200	Puncture Resistant Dyn-O-Wrap 24" x 200'
13386	PRW36-200	Puncture Resistant Dyn-O-Wrap 36" x 200'
13389	PRW48-200	Puncture Resistant Dyn-O-Wrap 48" x 200'
13344	PRW24-400	Puncture Resistant Dyn-O-Wrap 24" x 400'
13345	PRW36-400	Puncture Resistant Dyn-O-Wrap 36" x 400'
13346	PRW48-400	Puncture Resistant Dyn-O-Wrap 48" x 400'
13392	RPRW24-200	Reverse Puncture Resistant Dyn-O-Wrap 24" x 200'
13393	RPRW36-200	Reverse Puncture Resistant Dyn-O-Wrap 36" x 200'
13394	RPRW48-200	Reverse Puncture Resistant Dyn-O-Wrap 48" x 200'



**Puncture Resistant
 Dyn-O-Wrap**

Duro Dyne East Division, Bay Shore, NY
 Duro Dyne Midwest Division, Hamilton, OH
 Duro Dyne West Division, Fontana, CA
 Duro Dyne Canada, Lachine, Quebec, Canada

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 562-926-1774 Fax: 562-926-5778
 514-422-9760 Fax: 514-636-0328

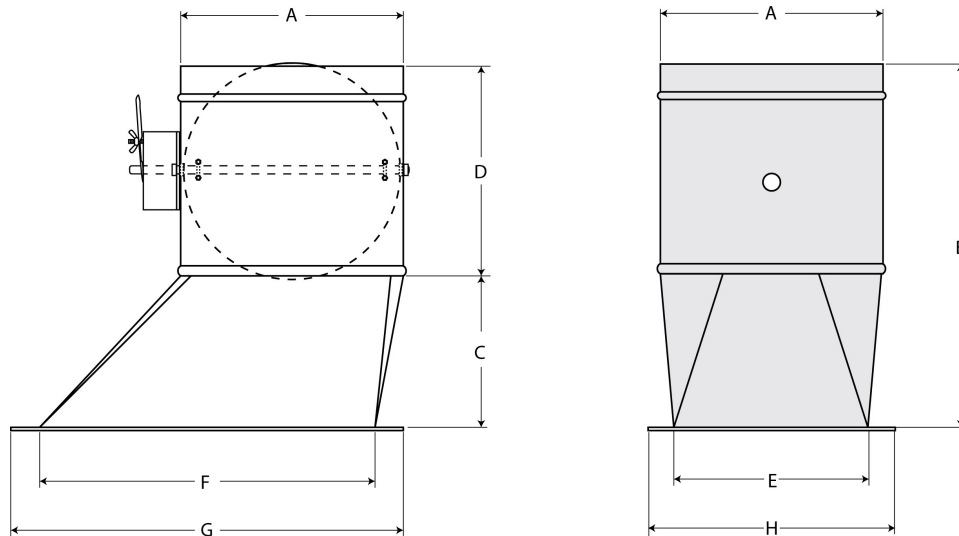


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 BO050019

Submittal

JOB NAME	Highlands Building at Pinnacle Hills Rogers
JOB NUMBER	26ADCA0017-1
PRODUCT	Takeoff Fittings & Round Manual Balancing Dampers
MANUFACTURER	Dace Manufacturing
LOCATION	Rogers, AR
DATE	June 25, 2026
SPECIFICATION	Sheet M500, Detail 1
LEAD TIME	2 Weeks
ENGINEER	IMEG
CONTRACTOR	Knight & Wilson
SUBMITTED BY	Chris Atwood

HIGH EFFICIENCY SIDE TAKEOFF FITTINGS



SIZE	A	B	C	D	E	F	G	H
5"	4 7/8	13	5 1/2	7 1/2	5	9	11	7
6"	5 7/8	13	5 1/2	7 1/2	5	9	11	7
7"	6 7/8	13	5 1/2	7 1/2	5	11	13	7
8"	7 7/8	13	5 1/2	7 1/2	6	12	14	8
9"	8 7/8	13	5 1/2	7 1/2	7	13	15	9
10"	9 7/8	13	5 1/2	7 1/2	8	14	16	10
12"	11 7/8	13	5 1/2	7 1/2	10	16	18	12
14"	13 7/8	13	5 1/2	7 1/2	12	18	20	14
16"	15 7/8	13	5 1/2	7 1/2	14	20	22	16
18"	17 7/8	13	5 1/2	7 1/2	16	22	24	18
20"	19 7/8	13	5 1/2	7 1/2	18	24	26	20

STANDARD CONSTRUCTION DETAILS

- 26 gauge G90/60 galvanized steel
- 1" flange with die formed corners & pre punched mounting holes
- entire unit is spot welded, SMACNA 3" WG minimum
- adhesive coated rubber perimeter gasket

OPTIONS IN CONSTRUCTION

- material 24 ga, 22 ga galvanized steel,
- all aluminum or all stainless steel
- optional damper—26—16 ga galvanized steel, aluminum, stainless steel
- CO3 damper control is a 2" raised locking quadrant, 3/8" sq. axle, nylon bearings fastened to the damper with U bolts.

Dace Mfg.

orders@dacemfg.co

SUBMITTAL

Feb 2015

ROUND MANUAL BALANCE DAMPER

MODEL: RMBD CO3

Purpose Description:

The round manual balancing damper is used to regulate air flow in pipe.

CONSTRUCTION:

BARREL: (B) 6" long, beaded & tapered.

ALL DIAMETERS: (A) sized 1/8" under nominal

BODY MATERIAL:

26 gauge standard

OPTIONS:

24 gauge steel

22 gauge steel

SS 304

DAMPER BLADES:

26 gauge standard

OPTIONS:

24 GA,

22 GA steel,

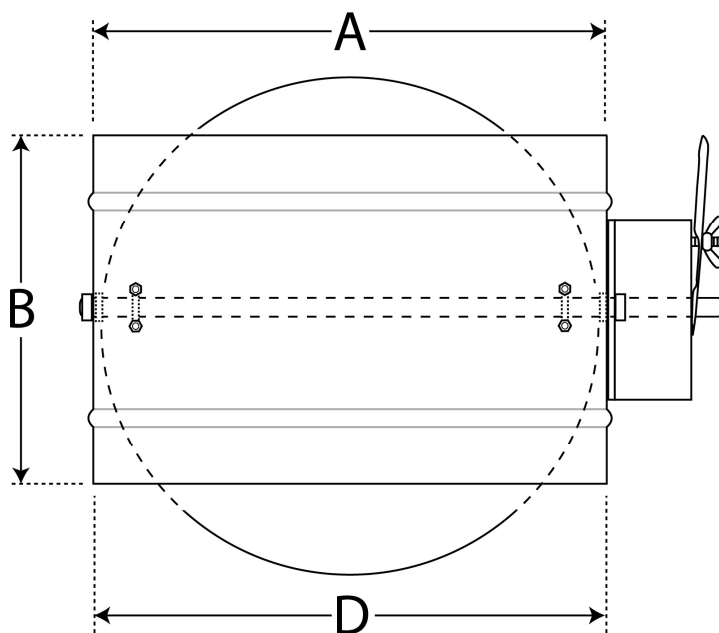
20 gauge—16 gauge steel

SS 304

DAMPER CONTROL:

CO3 - 2" raised handle, locking quadrant, 3/8" square continuous rod, 'U' bolts, nylon bearings

All stainless steel option



RMBD-CO3

