



Pipe & Duct Flip Book

Companion to the Kinetics Pipe & Duct Seismic Application Manual

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Table of Contents

NOTES	6
I1.0 Quick Start	7
I1.1 DEFINITION OF TRANSVERSE AND LONGITUDINAL SEISMIC RESTRAINTS	8
I1.2-1.3 RESTRAINT LOCATION AND RESTRAINT/ANCHORAGE KIT SYMBOLS	9
TABLE I1.1 RESTRAINT CABLE KIT VS. CODE CROSS-REFERENCE	10
TABLE I1.2 STRUCTURAL CONCRETE/STEEL ANCHORAGE KIT VS. CODE CROSS-REFERENCE	11
TABLE I1.3 STRUCTURAL WOOD/STEEL ANCHORAGE KIT VS. CODE CROSS-REFERENCE	12
TABLE I1.4 TYPICAL SEISMIC RESTRAINT SPACINGS	13
I1.4-I1.5 RESTRAINT AND ANCHORAGE LOCATION CALLOUTS FOR PIPE	14
I1.6 RESTRAINT AND ANCHORAGE LOCATION CALLOUTS FOR DUCT	15
I1.7-I1.9 TYPICAL TRANSVERSE SEISMIC CABLE RESTRAINTS.....	16
I3.0 PIPE SCHEMATICS.....	17
I3.1-I3.4 TRANSVERSE SINGLE CLEVIS SUPPORTED PIPE.....	18
I3.5-I3.7 LONGITUDINAL SINGLE CLEVIS SUPPORTED PIPE.....	20
I3.8- I3.10	22
I3.15-I3.20 TRANSVERSE TRAPEZE SUPPORTED PIPE.....	24
I3-23 TRANSVERSE & LONGITUDINAL TRAPEZE SUPPORTED PIPE	28
I4.0 DUCT SCHEMATICS	29
I4.1-I4.4 TRANSVERSE TRAPPED RECTANGULAR DUCT	30
I4.5 & I4.10 TRANSVERSE SUPPORTED RECTANGULAR DUCT	32

14.6-14.9 & 14.11 TRANSVERSE SUSPENDED RECTANGULAR DUCT	33
14.12 LONGITUDINAL RECTANGULAR DUCT	36
14.13 LONGITUDINAL TRAPPED RECTANGULAR DUCT.....	37
14.14-14.15 TRANSVERSE ONE & TWO HANGAR ROD ROUND DUCT	38
14.16-14.17 LONGITUDINAL ONE & TWO HANGAR ROD ROUND DUCT	39
14.18 TRANSVERSE & LONGITUDINAL ARRANGMENTS FOR DUCT	40
14.19 COMBINED TRANSVERSE & LONGITUDINAL ARRANGMENTS FOR DUCT	41
15.0 STRUCTURAL ATTACHMENT	42
15.2 KSUA ATTACHMENT BRACKET	43
15.3 KSUA ATTACHMENT TO STEEL	44
15.4 KSBC BEAM CLAMP & KSUA ATTACHMENT TO STRUCTURAL STEEL	45
15.5-15.6 KSUA ATTACHMENT TO CROSS-BRACED & UNBRACED OPEN WEB STEEL JOISTS	46
15.7 KSUA ATTACHMENT TO UN-BRACED OPEN WEB STEEL JOISTS- ALIGNED TO JOISTS	47
15.9 KSUA ATTACHED TO CONCRETE POURED ON CORRUGATED METAL DECKING	48
15.10 KSUA ATTACHED TO STRUT CHANNEL ANCHORED TO CONCRETE	49
15.11 KSUA THROUGH BOLT ATTACHMENT TO A SOLID CMU WALL.....	50
15.12-15.13 KSUA THROUGH BOLT & “UMBRELLA” TYPE ANCHOR ATTACHMENT TO A HOLLOW CMU WALL.....	51
15.14 KSUA WEDGE TYPE ANCHOR ATTACHMENT TO A FILLED CMU WALL	52
15-16 & 15.18 KSUA ATTACHED TO WOOD WITH LAG SCREW	53
15.17 & 15.19 KSUA ATTACHED TO WOOD USING THROUGH BOLT.....	54
15.20-15.21 KSUA ATTACHED TO WOODEN BEAM OR JOIST USING LAG SCREW & BOLT	55
15.22-15.23 KSUA ATTACHMENT BRACKET	56
15.25 KSUA WELDED TO STRUCTURAL STEEL	57
15.26 KSBC BEAM CLAMP & KSUA ATTACHMENT TO STRUCTURAL STEEL.....	58

15.28-15.29 MODEL KSCUZ2 & KSCUZ4 ATTACHMENT KIT TO CONCRETE USING KSCA.....	59
15.30-15.31 KSCUZ2 & KSCUZ4 CONCRETE ATTACHMENT KITS & DRILL TEMPLATE	60
15.32-15.33 KSCA THROUGH BOLT ATTACHMENT TO SOLID & HOLLOW CMU WALL	61
15.34-15.35 KSCA “UMBRELLA” & WEDGE TYPE ANCHOR TO CMU WALL	62
15.36 & 15.38 KSCA ATTACHED TO WOOD WITH LAG SCREW	63
15.37 & 15.39 KSCA ATTACHED TO WOOD WITH THROUGH BOLT	64
15.40-15.41 KSCA ATTACHED TO WOOD JOIST OR BEAM USING LAG SCREW OR BOLT	65
15.42-15.43 KSCUZ2 & KSCUZ4 ATTACHMENT KIT TO WOOD COLUMN WITH KSCA.....	66
15.44-15.45 KSCUZ2 & KSCUZ4 ATTACHMENT KIT TO WOOD BEAM WITH KSCA.....	67
15.47 KSCC ATTACHMENT BRACKET.....	68
15.48-15.49 KSCC WELDED TO STRUCTURAL STEEL	69
15.50 KSBC BEAM CLAMP & KSCC ATTACHMENT TO STRUCTURAL STEEL.....	70
15.51-15.52 KSCC ATTACHMENT TO CROSS-BRACED & UN-BRACED OPEN WB STEEL JOISTS.....	71
15.53 KSCC ATTACHMENT TO UN-BRACED OPEN WEB STEEL JOISTS- ALIGNED TO JOISTS	72
15.55 KSCC ATTACHED TO CONCRETE POURED ON CORRUGATED METAL DECKING	73
15.56 KSUA ATTACHED TO STRUT CHANNEL ANCHORED TO CONCRETE	74
15.57-15.58 KSCCZ2 & KSCCZ4 ATTACHMENT KIT TO CONCRETE WITH KSCC	75
15.60 KSCCZ2 & KSCCZ4 CONCRETE ATTACHMENT KITS & DRILL TEMPLATE	76
15.61-15.62 KSCC THROUGH BOLT ATTACHMENT TO SOLID & HOLLOW CMU WALL	77
15.63-15.64 KSCC “UMBRELLA” & WEDGE TYPE ANCHOR TO CMU WALL.....	78
15.65 & 15.67 KSCC ATTACHED TO WOOD WITH LAG SCREW	79
15.66 & 15.68 KSCC ATTACHED TO WOOD WITH THROUGH BOLT	80
15.69-15.70 KSCC ATTACHED TO WOOD JOIST OR BEAM USING LAG SCREW OR BOLT	81
15.71-15.72 KSCCZ2 & KSCCZ4 ATTACHMENT KIT TO WOOD COLUMN WITH KSCA	82

15.73-15.74 KSCCZ2 & KSCCZ4 ATTACHMENT KIT TO WOOD BEAM WITH KSCA	83
15.76-15.77 EXCESS CABLE COIL FOR KSCU & KSCC	84
16.0 SYSTEM ATTACHMENTS.....	85
16.2 KSUA BRACKET INSTALLATION	86
16.3-16.4 KSUA ATTACHED TO CLEVIS HANGER.....	87
16.5-16.7 KSUA ATTACHED TO CLAMP TYPE CLEVIS HANGER.....	88
16.8-16.10 KSUA ATTACHED TO KFPC CLAMP	90
16.11-16.13 KSUA ATTACHED TO ROLLED STRUCTURAL TRAPEZE BAR	92
16.14-16.16 KSUA BRACKETS ATTACHED TO STRUT CHANNEL TRAPEZE BAR.....	95
16.17 KSCA BRACKET	98
16.18 KSCA CLAMPING OPTIONS.....	99
16.19-16.20 KSCA ATTACHED TO CLEVIS HANGER	100
16.21-16.23 KSCA ATTACHED TO CLAMP TYPE CLEVIS HANGER	101
16.24-16.26 KSCA WITH ROLLED STRUCTURAL & STRUT CHANNEL TRAPEZE BAR	103
16.28-16.29 KSCC ATTACHED TO CLEVIS HANGER	106
16.30-16.32 KSCC ATTACHED TO CLAMP TYPE CLEVIS HANGER	107
16.33-16.35 KSCC ATTACHED TO KFPC CLAMP.....	109
16.36-16.38 KSCC ATTACHED TO ROLLED STRUCTURAL TRAPEZE BAR	111
16.40-16.41 EXCESS CABLE COIL FOR KSCU & KSCC	114
17.0 STRUT RESTRAINTS.....	115
17.2-17.3 KSCA & KSCC ATTACHMENT HOLES IDENTIFIED.....	116
17.4-17.5 KSCA ATTACHMENT TO STRUT CHANNEL.....	117
17.6-17.11 KSCA ATTACHMENT TO STRUT CHANNEL FOR SEISMIC RESTRAINTS.....	118

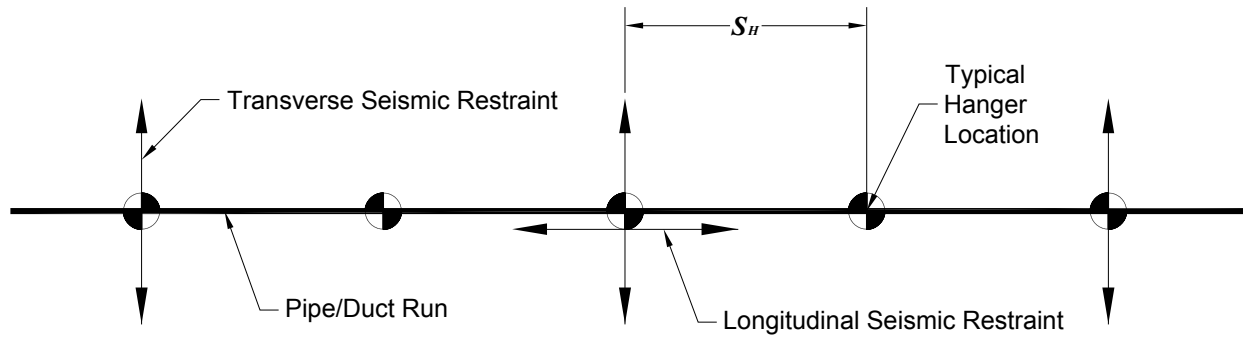
17.12-17.13 KSCC ATTACHMENT TO STRUT CHANNEL.....	121
17.14-17.19 KSCC ATTACHMENT TO STRUT CHANNEL FOR SEISMIC RESTRAINTS.....	122
17.20-17.22 KSCA ATTACHMENT TO ROLLED ANGLE	125
17.23-17.24 KSCA ATTACHMENT TO ROLLED ANGLE FOR CLEVIS & TRAPEZE BAR HANGER ROD.....	127
17.25-17.34 KSCA ATTACHMENT TO ROLLED ANGLE FOR SEISMIC RESTRAINTS	128
17.35-17.36 KSCC ATTACHMENT TO ROLLED ANGLE	133
17.37-17.44 KSCC ATTACHMENT TO ROLLED ANGLE FOR SEISMIC RESTRAINTS	134
17.45 KSCA WELD ATTACHMENT TO SCHEDULE 40 IPS PIPE.....	138
17.46-17.49 KSCA ATTACHMENT TO PIPE FOR SEISMIC RESTRAINTS	139
17.50-17.53 SINGLE CLEVIS SUPPORTED PIPE RESTRAINT SCHEMATIC.....	141
17.53-17.61 TRAPEZE SUPPORTED PIPE RESTRAINT SCHEMATIC.....	143
17.62-17.64 TRAPPED RECTANGULAR DUCT RESTRAINT SCHEMATIC	148
17.65 & 17.70 SUPPORTED RECTANGULAR DUCT RESTRAINT SCHEMATIC	150
17.66-17.69 SUSPENDED RECTANGULAR DUCT RESTRAINT SCHEMATIC.....	151
17.71-17.72 RECTANGULAR DUCT RESTRAINT SCHEMATICS	153
17.73-17.74 ROUND DUCT SUPPORTED BY TWO HANGER RODS RESTRAINT SCHEMATIC.....	154
17.75-17.76 ROUND DUCT SUPPORTED BY ONE HANGER ROD RESTRAINT SCHEMATIC.....	155
17.77-17.78 DUCT RESTRAINED WITH STRUTS RESTRAINT SCHEMATIC	156
18.0 ROD STIFFENERS	157
18.1 KHRC ROD STIFFENER CLAMPS FOR USE WITH TOLLED STRUCTURAL ANGLE.....	158
18.2 KHRC INSTALLATION	159
18.3-18.4 TYPICAL INSTALLATION FOR CLEVIS HUNG PIPE.....	160
18.5-18.6 TYPICAL INSTALLATION FOR TRAPEZE SUPPORTED PIPE & DUCT	161

NOTES

- ALL REFERENCES TO THE PIPE & DUCT MANUAL ARE FIGURES UNLESS OTHERWISE NOTED
- THIS BOOK HAS BEEN MADE FOR THE INSTALLATION OF KINETICS NOISE CONTROL PRODUCTS AND DOES NOT APPLY TO OTHER PRODUCTS NOT MADE BY KINETICS NOISE CONTROL.

I1.0 Quick Start

11.1 DEFINITION OF TRANSVERSE AND LONGITUDINAL SEISMIC RESTRAINTS



I1.2-1.3 RESTRAINT LOCATION AND RESTRAINT/ANCHORAGE KIT SYMBOLS

Restraint Location for
Single Clevis Hung
Pipe and Duct



Restraint Location for
Trapeze Supported Pipe



Restraint Type Designation:

T - Transverse Restraint

L - Longitudinal Restraint

TL - Both Transverse
& Longitudinal

TT - Two Transverse
Restrains -180° Apart &
Used Primarily For Riser
Applications

KNC Restraint Kit Code:

Restraint Capacity Required
At This Location, See Table
I1-1.

KNC Anchorage Kit Code:
Anchorage Capacity Required
At This Location, See Tables
I1-2 & I1-3.

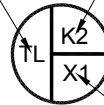


TABLE I1.1 RESTRAINT CABLE KIT VS. CODE
CROSS-REFERENCE

KNC Restraint Kit Code	Restraint Kit Description Note: Each kit contains enough components for (2) complete seismic restraint cable assemblies or (1) complete seismic restraint strut assembly with the structural member by others.
K2	KSCU-2 Cable Kit – 2 mm Cable & GRIPPLE HANGFAST No, 2 Connectors
K3	KSCU-3 Cable Kit – 3 mm Cable & GRIPPLE HANGFAST No, 3 Connectors
K4	KSCU-4 Cable Kit – 5 mm Cable & GRIPPLE HANGFAST No, 4 Connectors
K5	KSCU-5 Cable Kit – 6 mm Cable & GRIPPLE Lockable 6 mm Connectors
C1	KSCC-250 Cable Kit – 1/4" Cable & Saddle + U-bolt Connectors
C2	KSCC-375 Cable Kit – 3/8" Cable & Saddle + U-bolt Connectors
C3	KSCC-500 Cable Kit – 1/2" Cable & Saddle + U-bolt Connectors
F	Direct Mounted to Floor or Roof Using Anchor Bolts
W	Direct Mounted to Wall Using Anchor Bolts

**TABLE I1.2 STRUCTURAL CONCRETE/STEEL
ANCHORAGE KIT VS. CODE CROSS-REFERENCE**

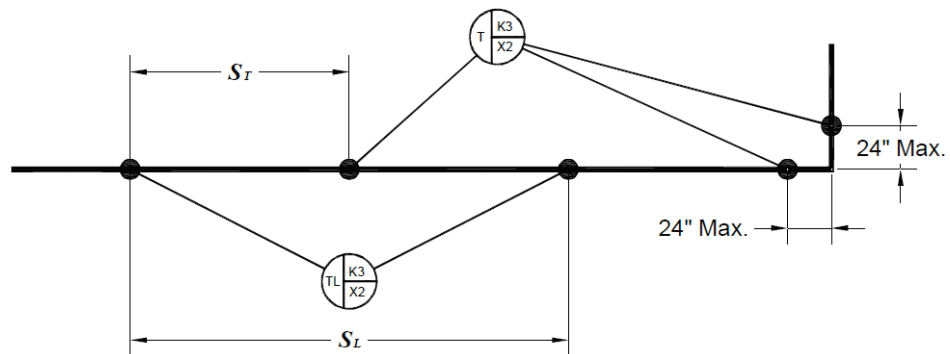
KNC Attachment Kit Code	Anchorage Kit Description per Restraint Cable Kit Note: Through bolts & nuts of the same size may be used for each kit and code shown below.
X1	(2) 1/4" Concrete Anchor (with Grommet)
X2	(2) 3/8" Concrete Anchor (with Grommet)
X3	(2) 1/2" Concrete Anchor
Y1	(2) 5/8" Concrete Anchor
Y2	(2) 3/4" Concrete Anchor
Y3	(2) 7/8" Concrete Anchor
Z1	(4) 3/8" Concrete Anchors with Oversized Base Plate
Z2	(8) 3/8" Concrete Anchors with Oversized Base Plate
Z3	(4) 1/2" Concrete Anchors with Oversized Base Plate
Z4	(8) 1/2" Concrete Anchors with Oversized Base Plate

TABLE I1.3 STRUCTURAL WOOD/STEEL
ANCHORAGE KIT VS. CODE CROSS-REFERENCE

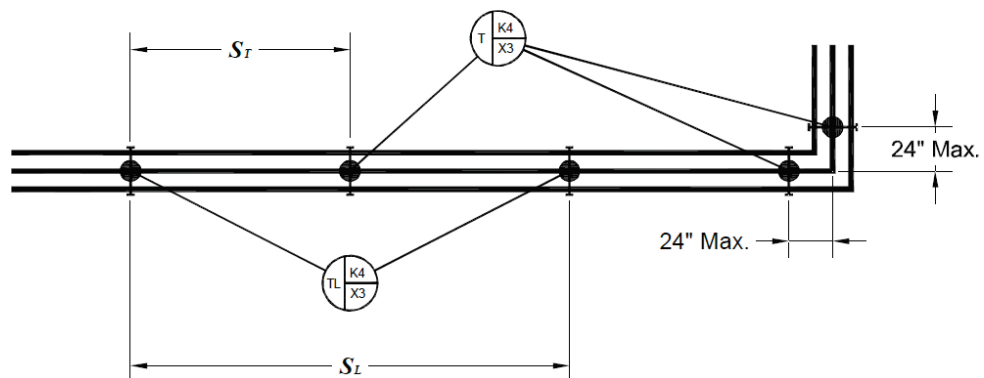
KNC Attachment Kit Code	Anchorage Kit Description per Restraint Cable Kit Note: Through bolts & nuts of the same size may be used for each kit and code shown below.
W1	(2) 1/4" Lag Screw (with Grommet)
W2	(2) 3/8" Lag Screw (with Grommet)
W3	(2) 1/2" Lag Screw
W4	(2) 5/8" Lag Screw
W5	(2) 3/4" Lag Screw
W6	(2) 7/8" Lag Screw
W7	(4) 3/8" Lag Screws with Oversized Base Plate
W8	(8) 3/8" Lag Screws with Oversized Base Plate
W9	(4) 1/2" Lag Screws with Oversized Base Plate
W10	(8) 1/2" Lag Screws with Oversized Base Plate

TABLE I1.4 TYPICAL SEISMIC
RESTRAINT SPACINGS

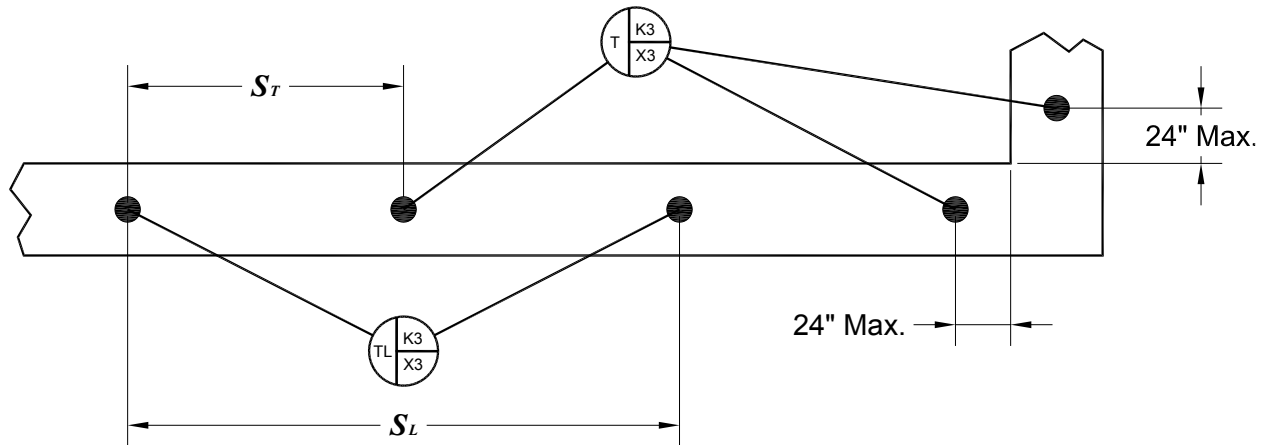
Transverse Seismic Restraint Spacing S_T (ft.)	Longitudinal Seismic Restraint Spacing S_L (ft.)	Comments on Maximum Allowable Restraint Spacings
10	10	Maximum Allowable Spacings for Low Deformability (Brittle) Piping.
10	20	Other Optional Spacings Used to Extend the Useful Range of Application for Specific Restraints.
15	30	
20	40	Maximum Allowable Restraint Spacings for Hazardous Gas Piping.
30	60	Maximum Allowable Restraint Spacings for Ductwork.
40	80	Maximum Allowable Restraint Spacings for HVAC & Plumbing Piping.

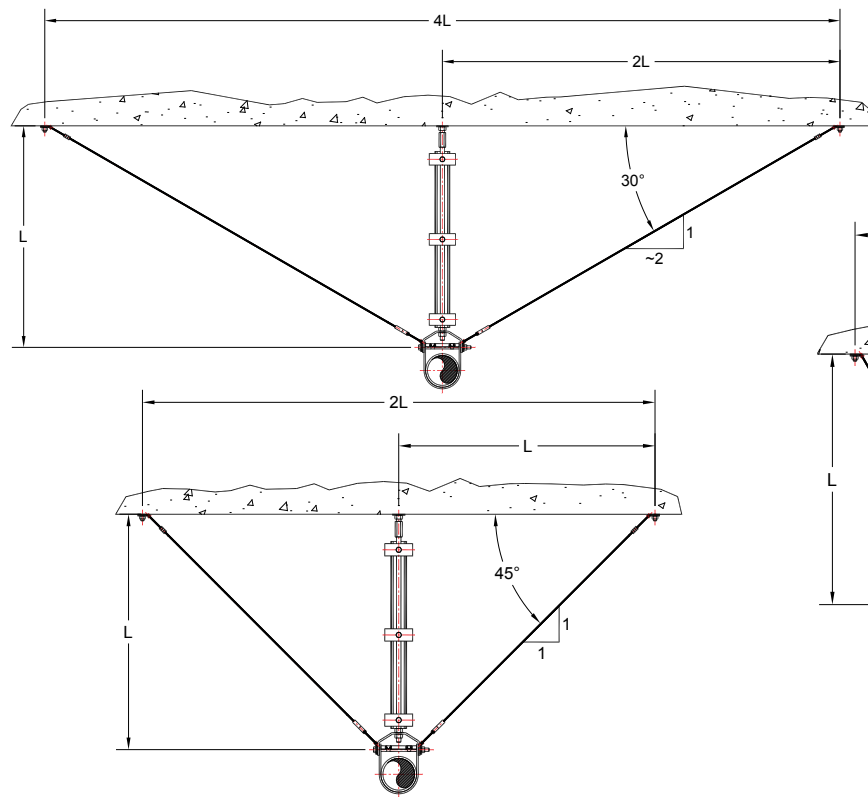


11.4-11.5 RESTRAINT
AND ANCHORAGE
LOCATION CALLOUTS
FOR PIPE

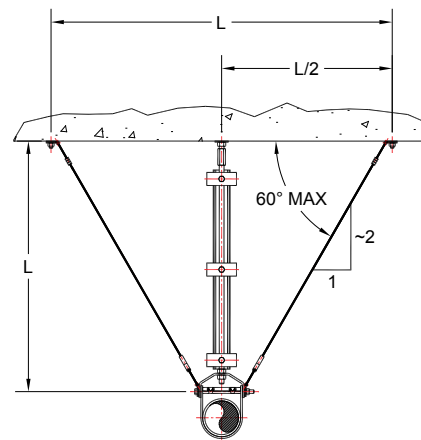


I1.6 RESTRAINT AND ANCHORAGE LOCATION CALLOUTS FOR DUCT



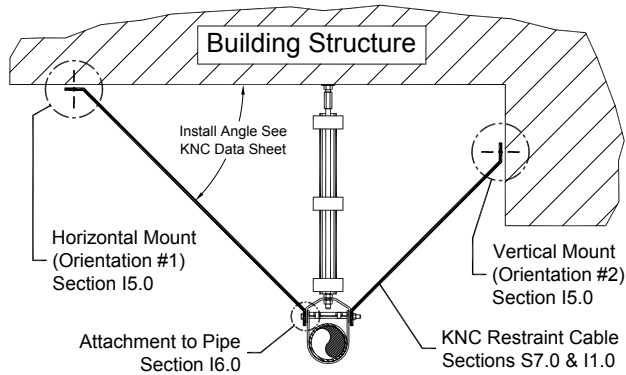


I1.7-I1.9 TYPICAL
TRANSVERSE SEISMIC CABLE
RESTRAINTS

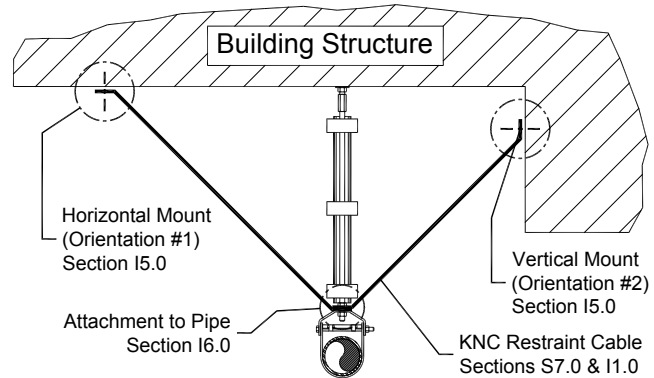


13.0 PIPE SCHEMATICS

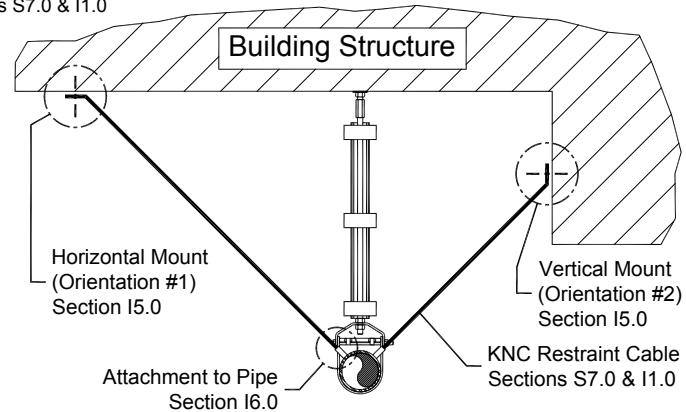
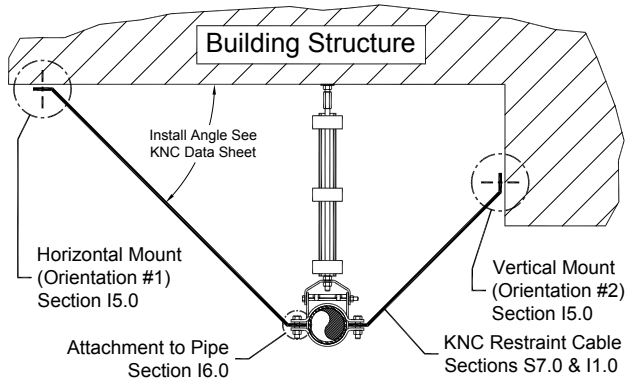
I3.1-I3.4 TRANSVERSE SINGLE CLEVIS SUPPORTED PIPE



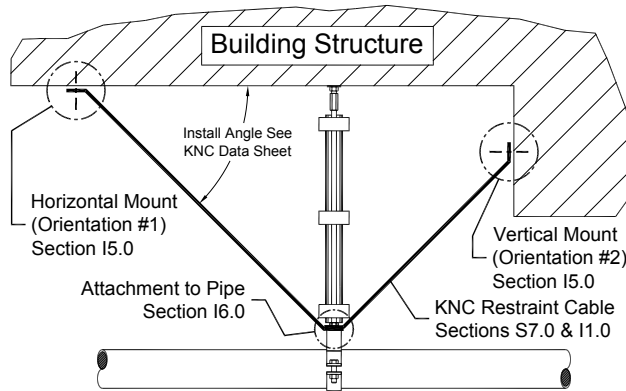
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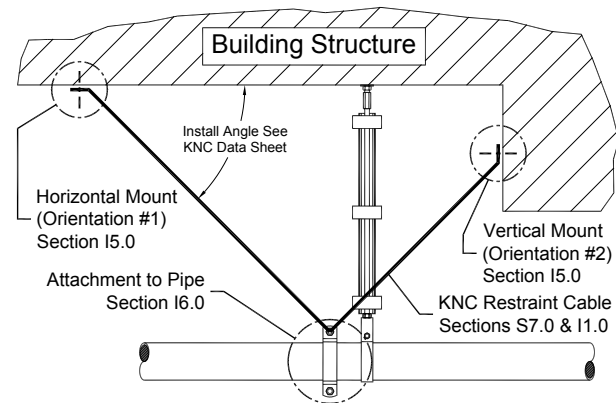
I3.1-I3.4 TRANSVERSE SINGLE CLEVIS SUPPORTED PIPE



13.5-13.7 LONGITUDINAL SINGLE CLEVIS SUPPORTED PIPE

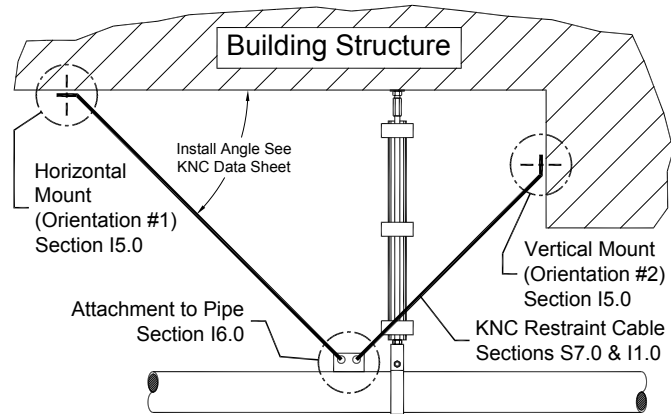


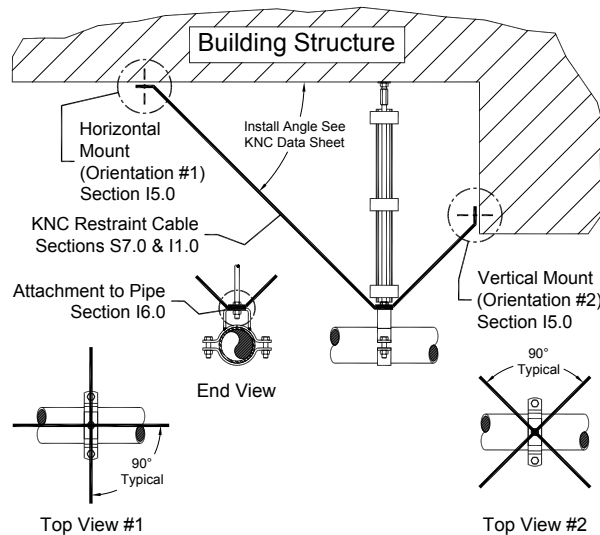
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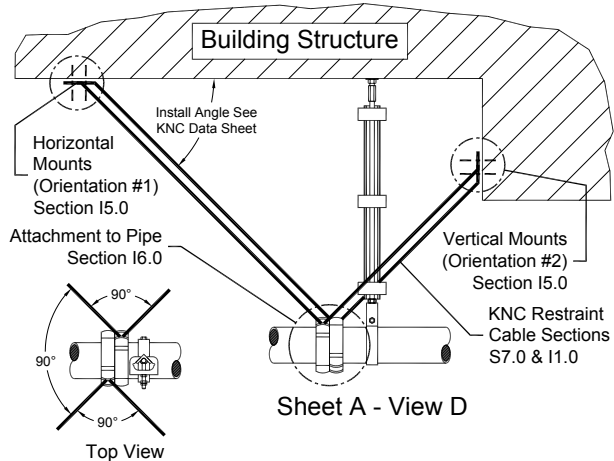
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13.5-13.7 LONGITUDINAL SINGLE CLEVIS
SUPPORTED PIPE

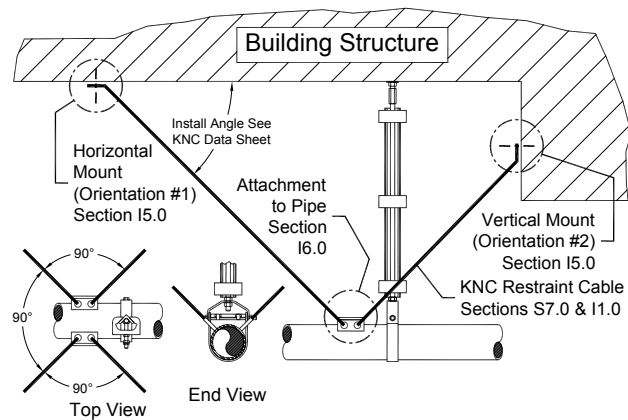




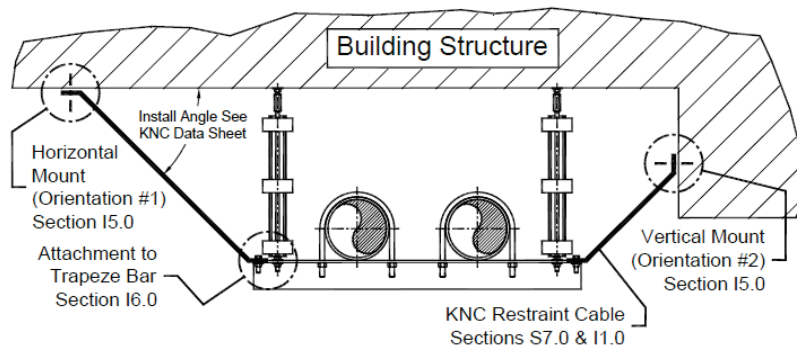
13.8- 13.10 COMBINED TRANSVERSE & LONGITUDINAL SINGLE CLEVIS SUPPORTED PIPE



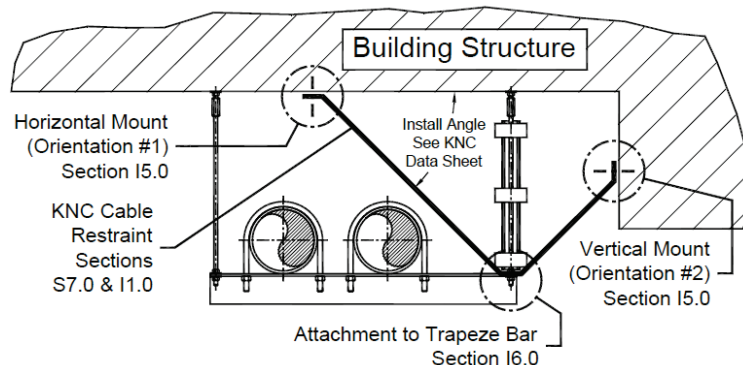
13.8- 13.10 COMBINED TRANSVERSE &
LONGITUDINAL SINGLE CLEVIS SUPPORTED
PIPE



13.15-13.20 TRANSVERSE TRAPEZE SUPPORTED PIPE

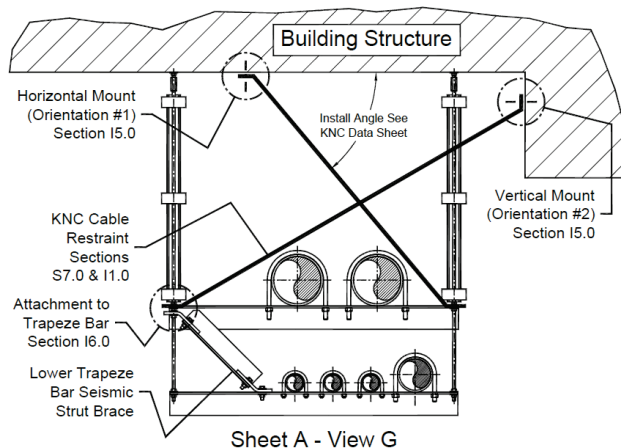
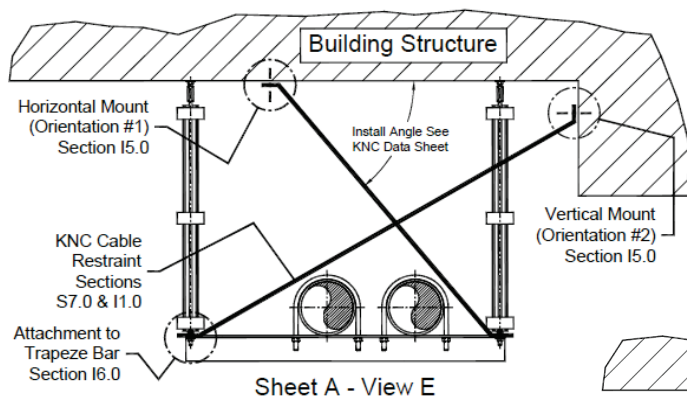


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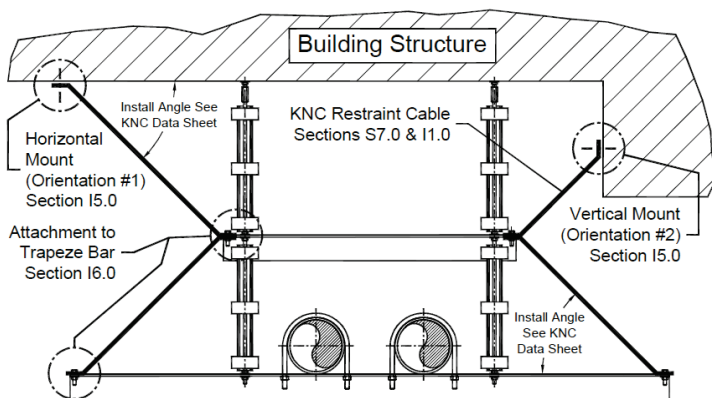


Sheet A - View H

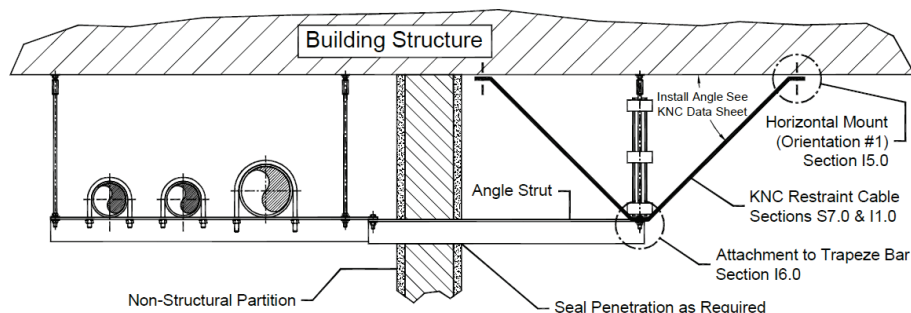
13.15-13.20 TRANSVERSE TRAPEZE SUPPORTED PIPE



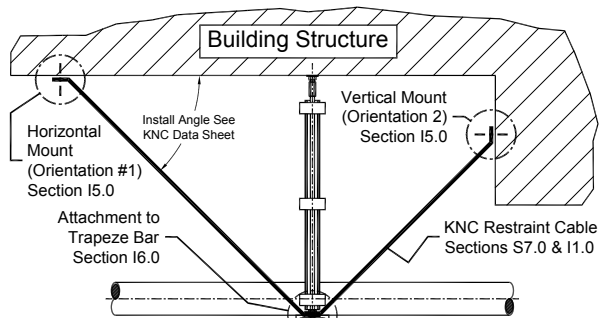
13.15-13.20 TRANSVERSE TRAPEZE SUPPORTED PIPE



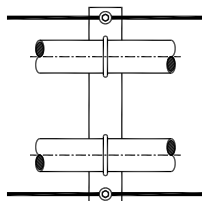
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Sheet A - View F

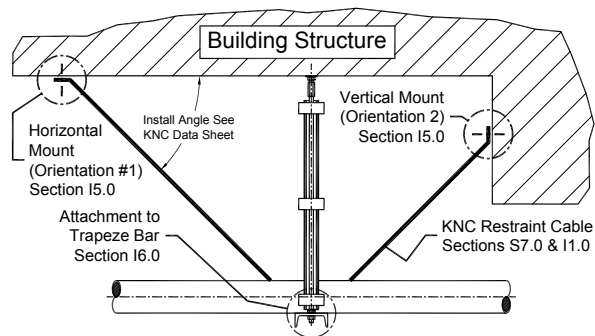


Sheet A - View M
Side View Opt. #1

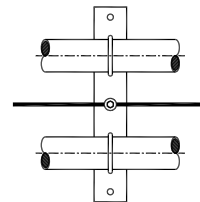


Top View Opt. #1

13.21-13.22 LONGITUDINAL TRAPEZE SUPPORTED PIPE

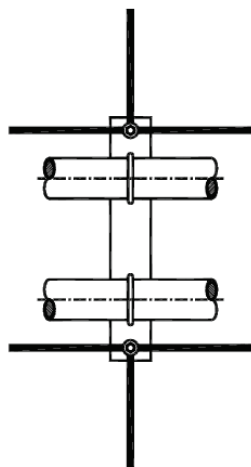


Sheet A - View M
Side View Opt. #2

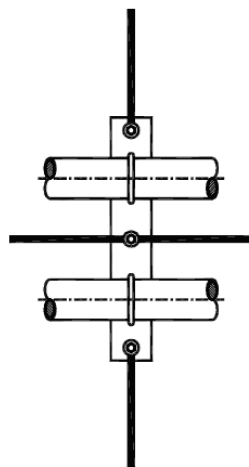


Top View Opt. #2

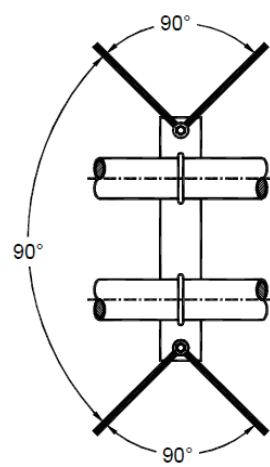
I3-23 TRANSVERSE & LONGITUDINAL TRAPEZE SUPPORTED PIPE



Transverse & Longitudinal (TL)
Restraint Option #1



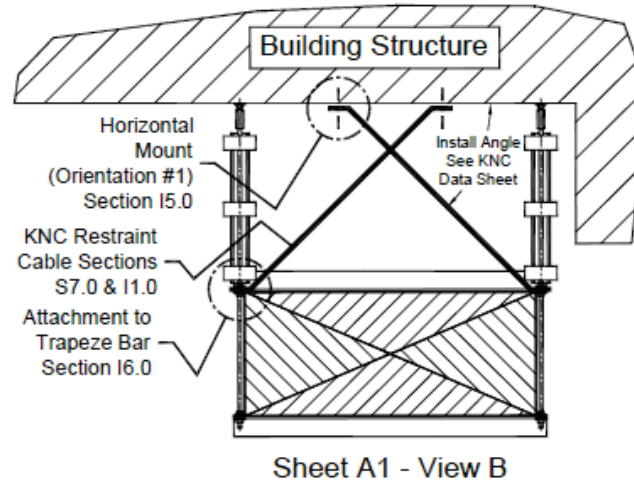
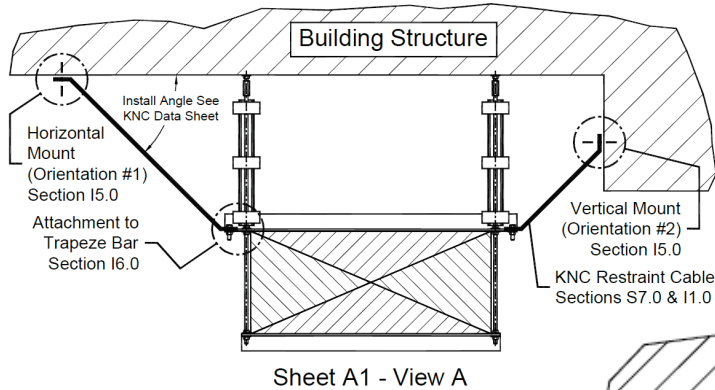
Transverse & Longitudinal (TL)
Restraint Option #2



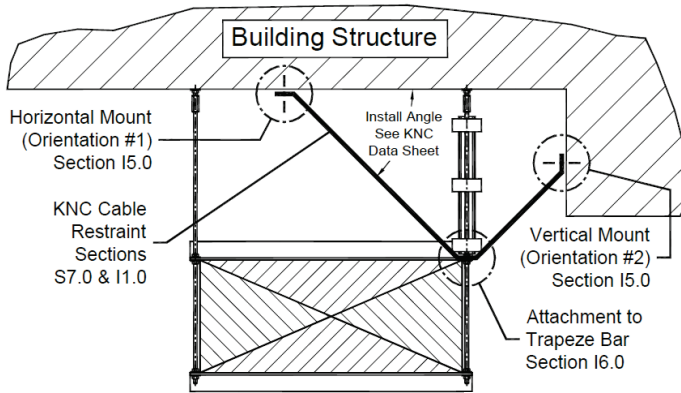
Transverse & Longitudinal (TL)
Restraint Option #3

14.0 DUCT SCHEMATICS

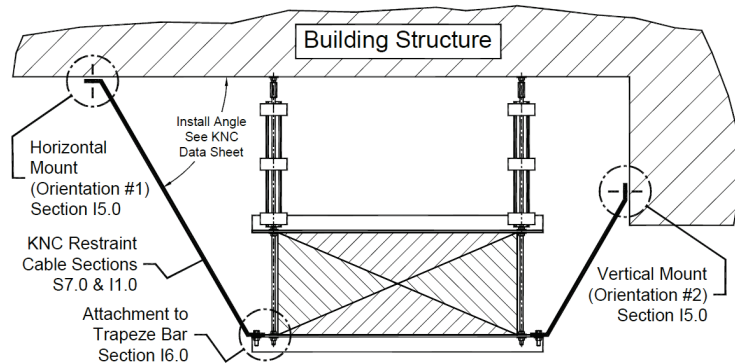
I4.1-I4.4 TRANSVERSE TRAPPED RECTANGULAR DUCT



I4.1-I4.4 TRANSVERSE TRAPPED RECTANGULAR DUCT

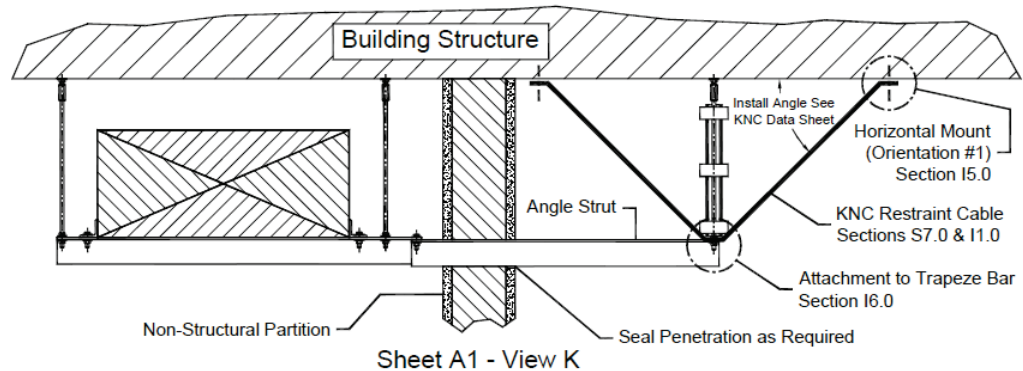
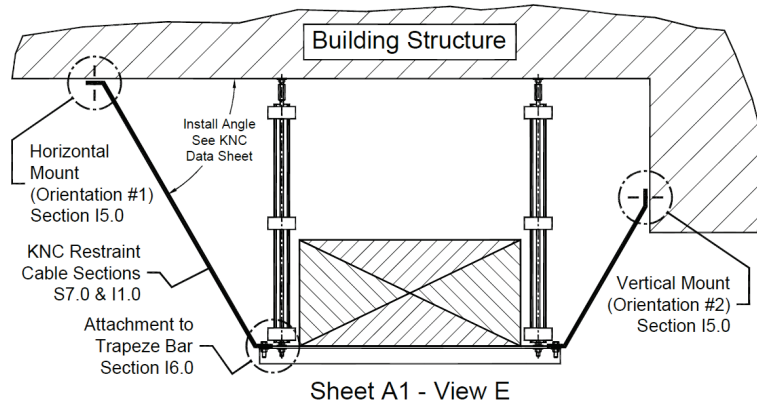


Sheet A1 - View C

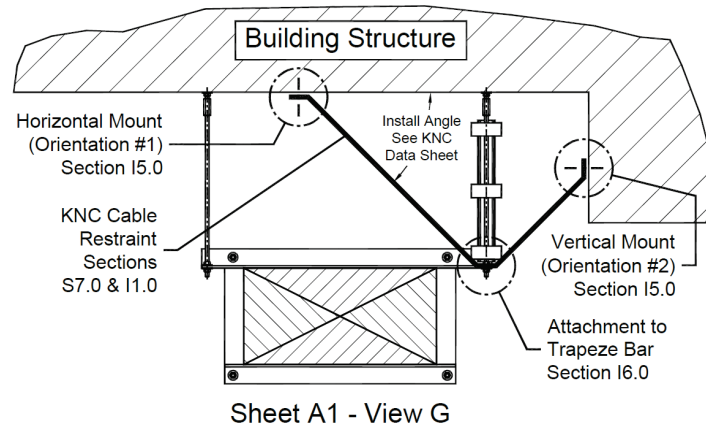
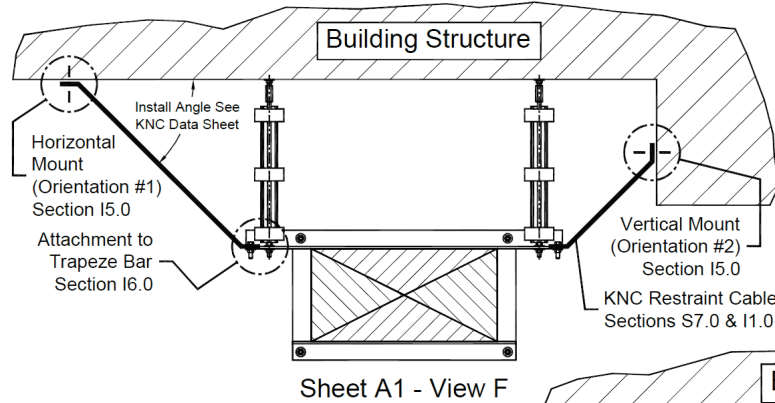


Sheet A1 - View D

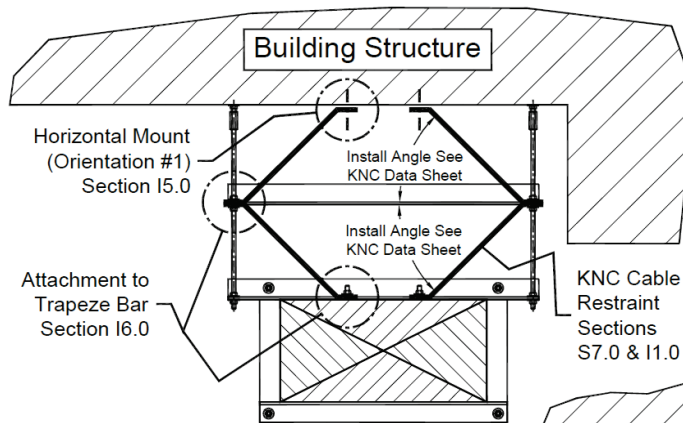
I4.5 & I4.10 TRANSVERSE SUPPORTED RECTANGULAR DUCT



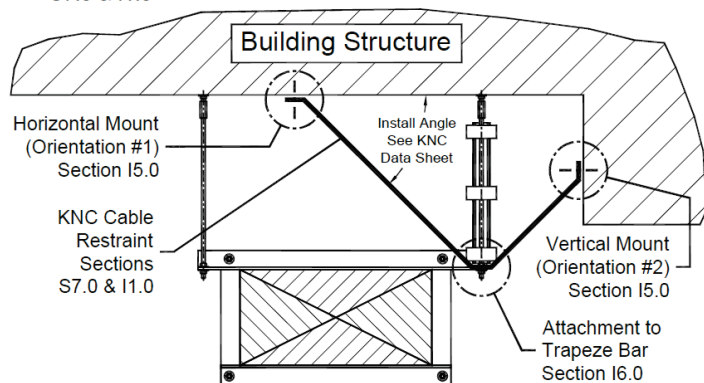
I4.6-I4.9 & I4.11 TRANSVERSE SUSPENDED RECTANGULAR DUCT



I4.6-I4.9 & I4.11 TRANSVERSE SUSPENDED RECTANGULAR DUCT

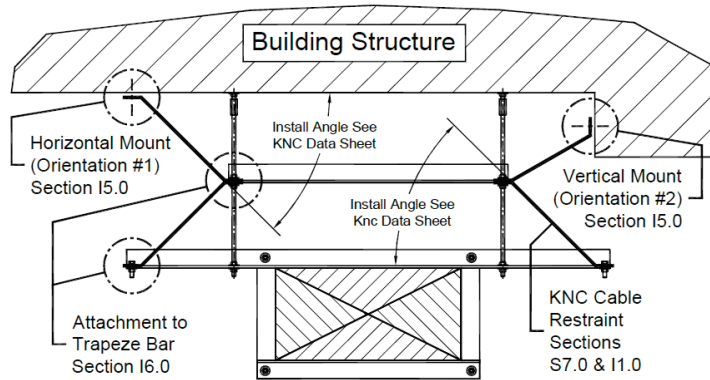


Sheet A1 - View H

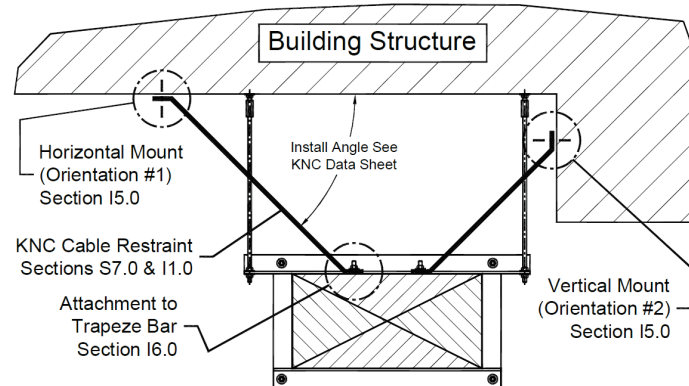


Sheet A1 - View G

I4.6-I4.9 & I4.11 TRANSVERSE SUSPENDED RECTANGULAR DUCT

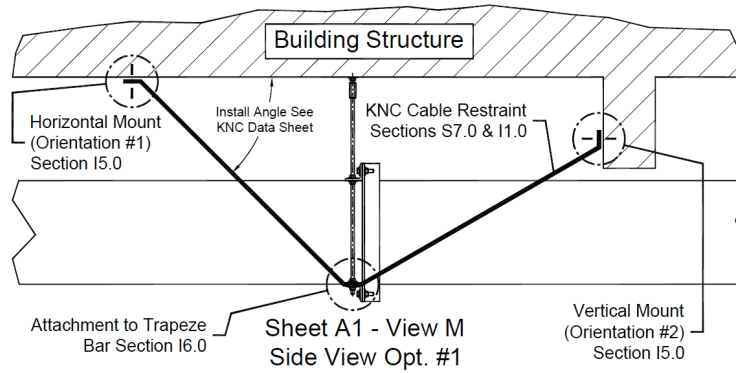


Sheet A1 - View J

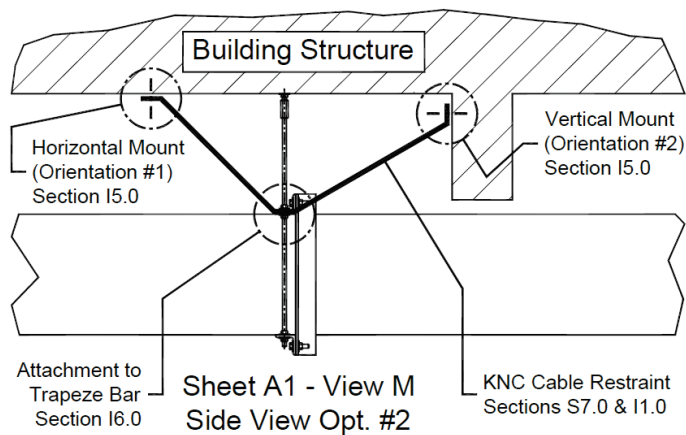


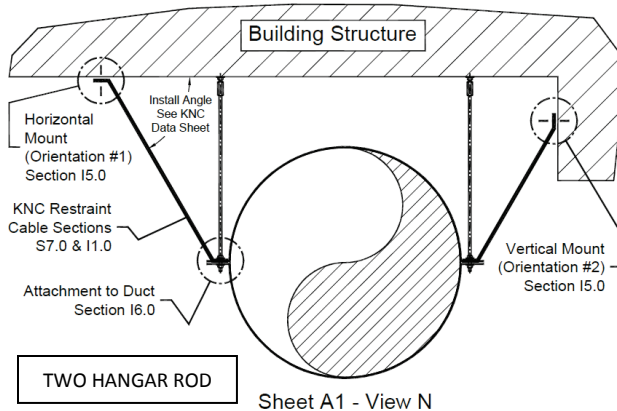
Sheet A1 - View L

I4.12 LONGITUDINAL RECTANGULAR DUCT

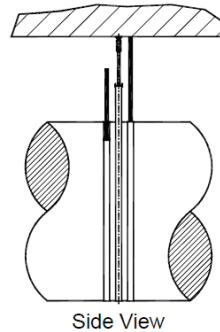


I4.13 LONGITUDINAL TRAPPED RECTANGULAR DUCT

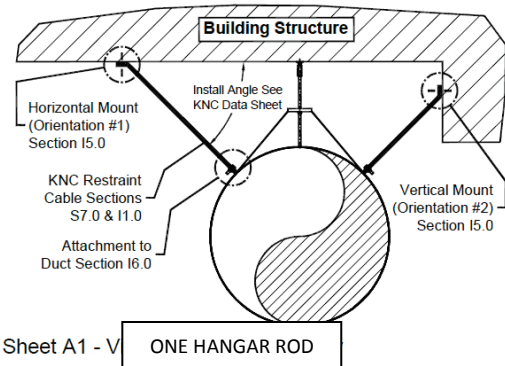




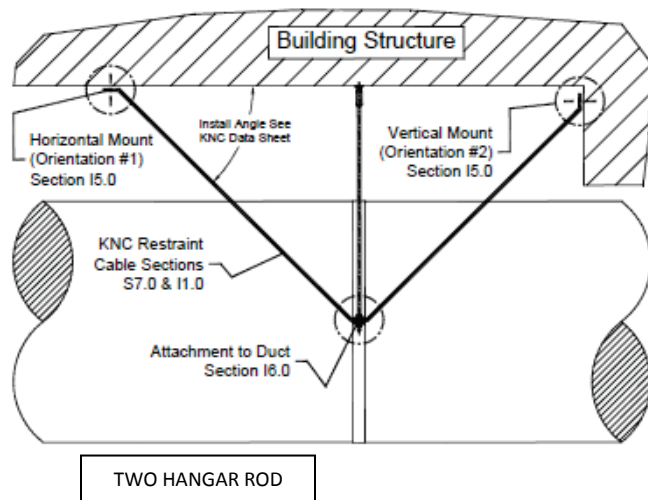
Sheet A1 - View N



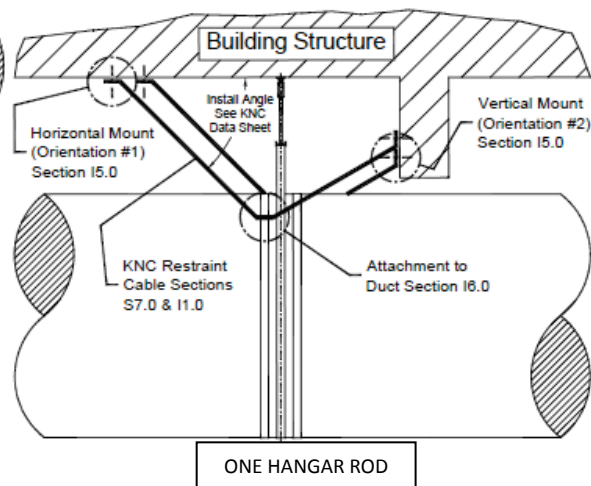
14.14-14.15 TRANSVERSE ONE & TWO HANGAR ROD ROUND DUCT



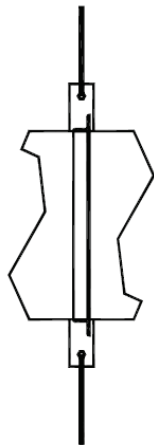
Sheet A1 - View



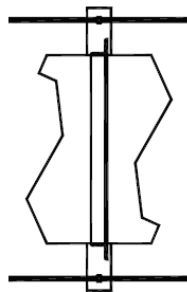
I4.16-I4.17 LONGITUDINAL ONE & TWO HANGAR ROD ROUND DUCT



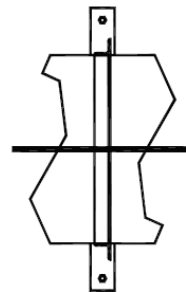
I4.18 TRANSVERSE & LONGITUDINAL ARRANGMENTS FOR DUCT



Sheet A2 - View A
Transverse (T)
Restraint
Plan View

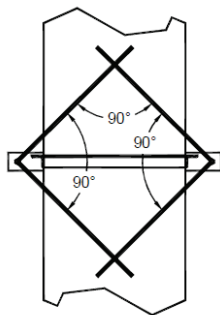


Sheet A2 - View A
Longitudinal (L)
Restraint
Plan View
Option #1

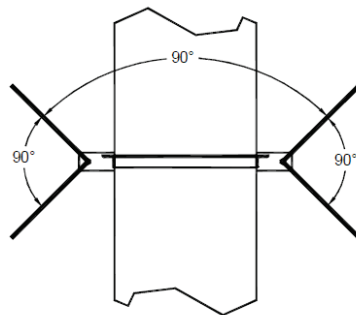


Sheet A2 - View A
Longitudinal (L)
Restraint
Plan View
Option #2

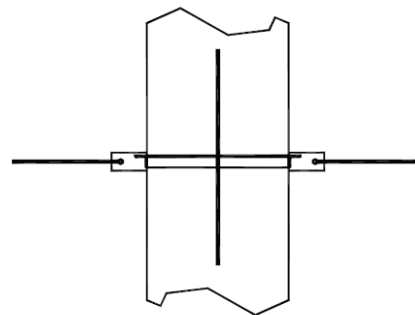
14.19 COMBINED TRANSVERSE & LONGITUDINAL ARRANGMENTS FOR DUCT



Sheet A2 - View B
Longitudinal & Transverse
(TL) Restraint
Plan View
Option #1



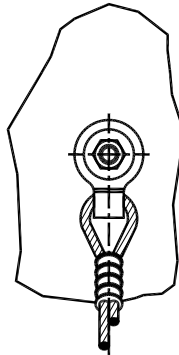
Sheet A2 - View B
Longitudinal & Transverse
(TL) Restraint
Plan View
Option #2



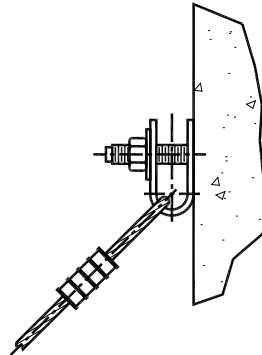
Sheet A2 - View B
Longitudinal & Transverse
(TL) Restraint
Plan View
Option #3

15.0 STRUCTURAL ATTACHMENT

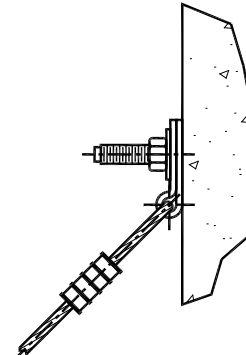
I5.2 KSUA ATTACHMENT BRACKET



View #1
Front
KSUA - Installed

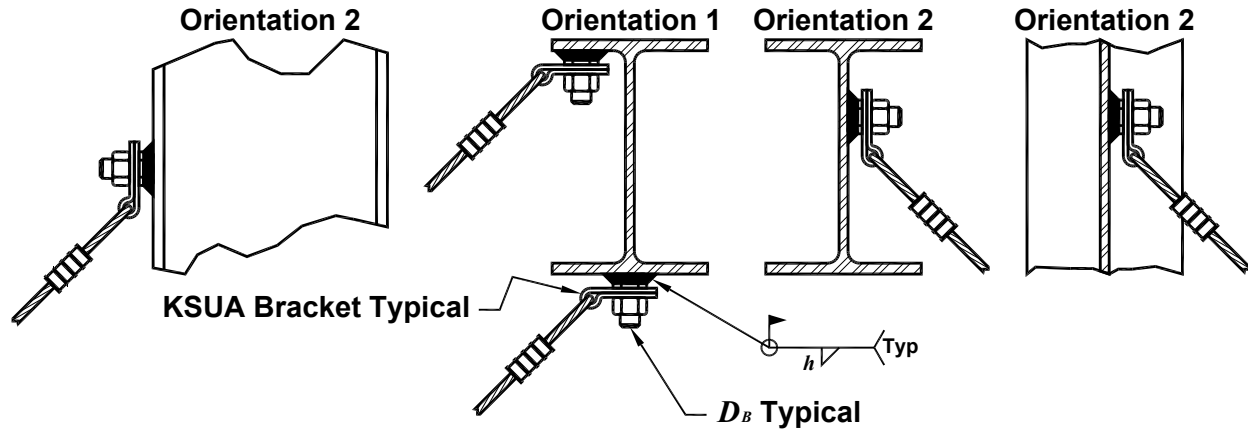


View #2
Side
KSUA - Open



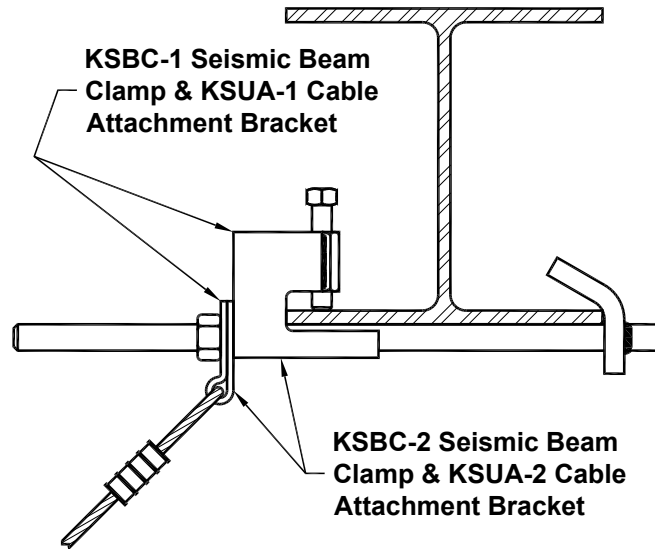
View #3
Side
KSUA - Closed

I5.3 KSUA ATTACHMENT TO STEEL

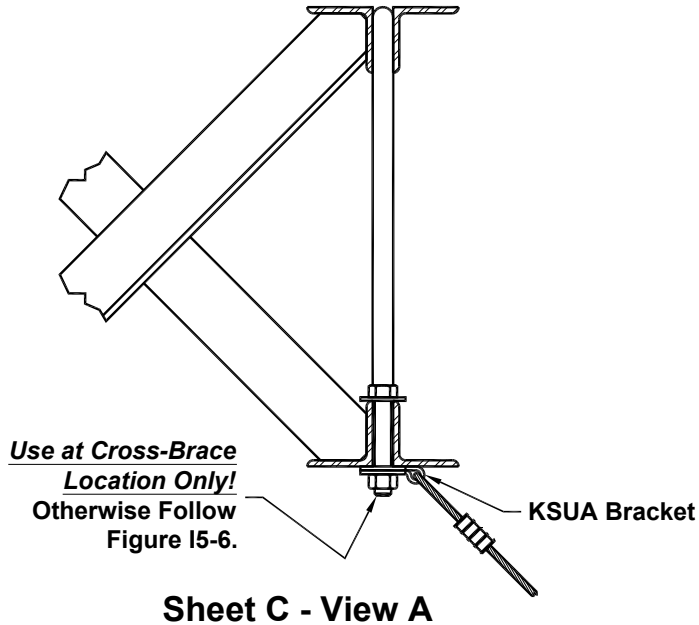


Sheet C - Views F, K, M, and N

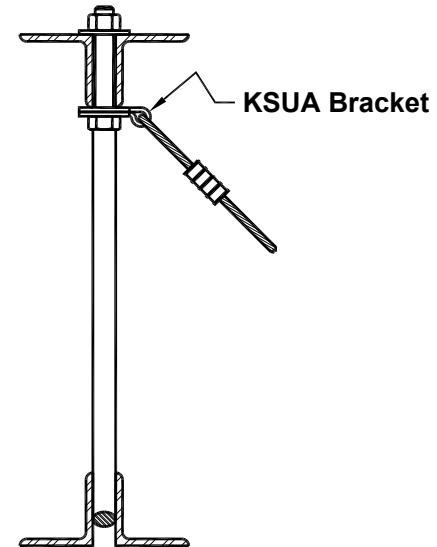
15.4 KSBC BEAM CLAMP & KSUA ATTACHMENT
TO STRUCTURAL STEEL



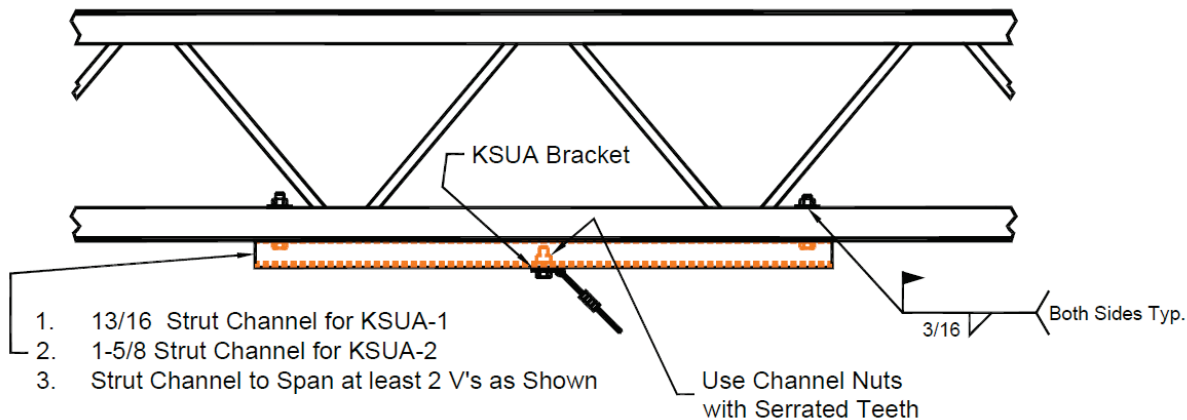
Sheet C - View J



**I5.5-I5.6 KSUA ATTACHMENT TO
CROSS-BRACED & UNBRACED OPEN
WEB STEEL JOISTS**

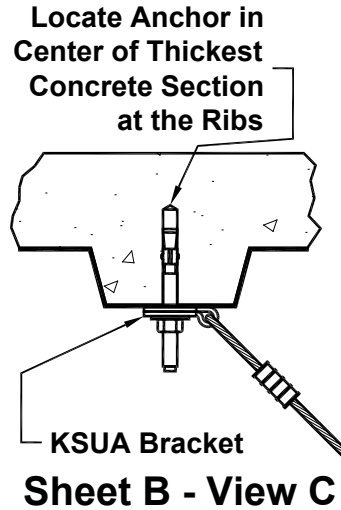


15.7 KSUA ATTACHMENT TO UN-BRACED OPEN
WEB STEEL JOISTS- ALIGNED TO JOISTS

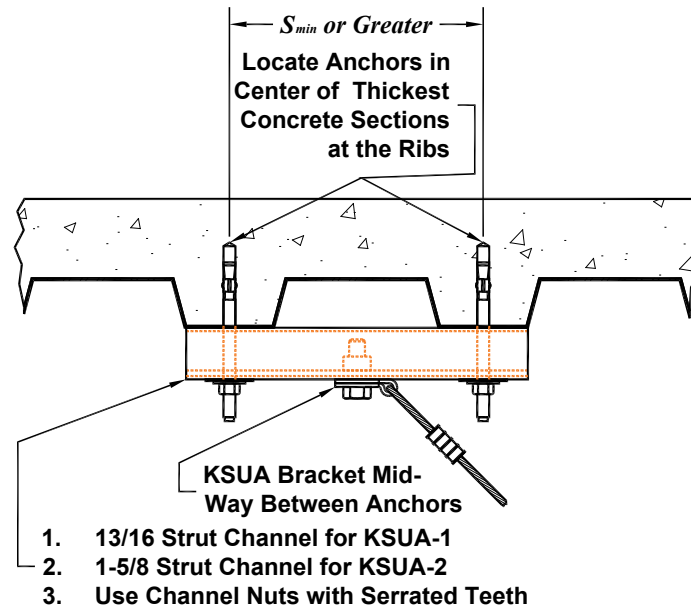


Sheet C - View B

**15.9 KSUA ATTACHED TO CONCRETE POURED ON
CORRUGATED METAL DECKING**

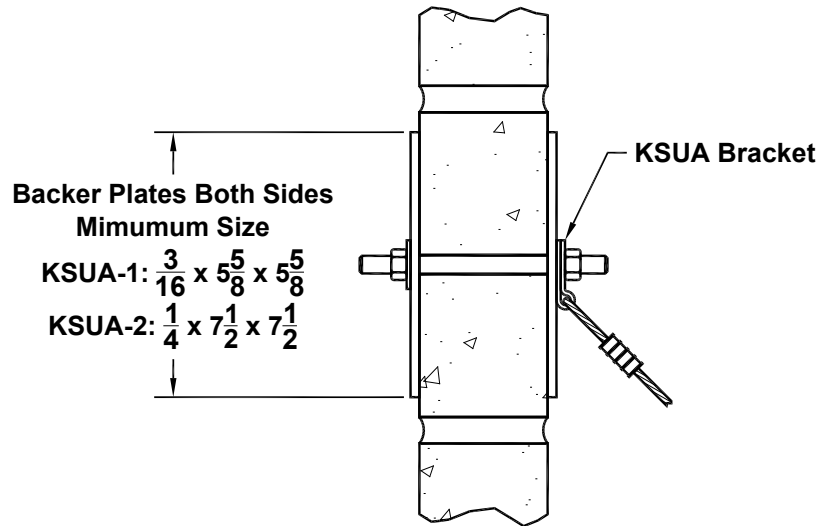


15.10 KSUA ATTACHED TO STRUT CHANNEL
ANCHORED TO CONCRETE



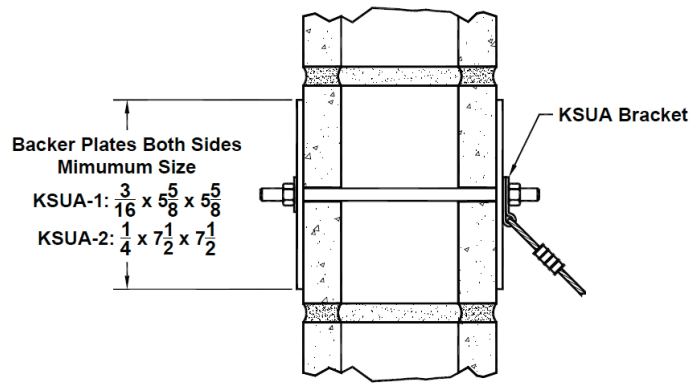
Sheet B - View G

15.11 KSUA THROUGH BOLT ATTACHMENT TO A
SOLID CMU WALL

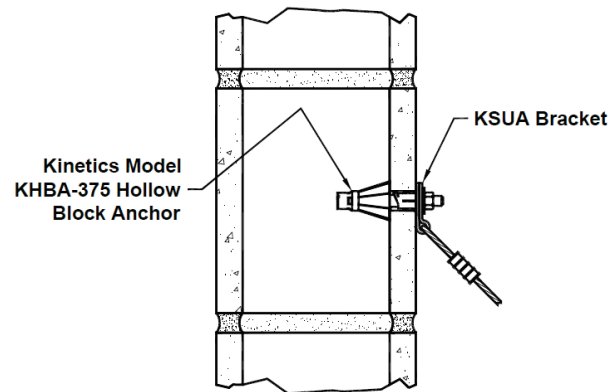


Sheet B - View F

15.12-15.13 KSUA THROUGH BOLT &
“UMBRELLA” TYPE ANCHOR
ATTACHMENT TO A HOLLOW CMU WALL

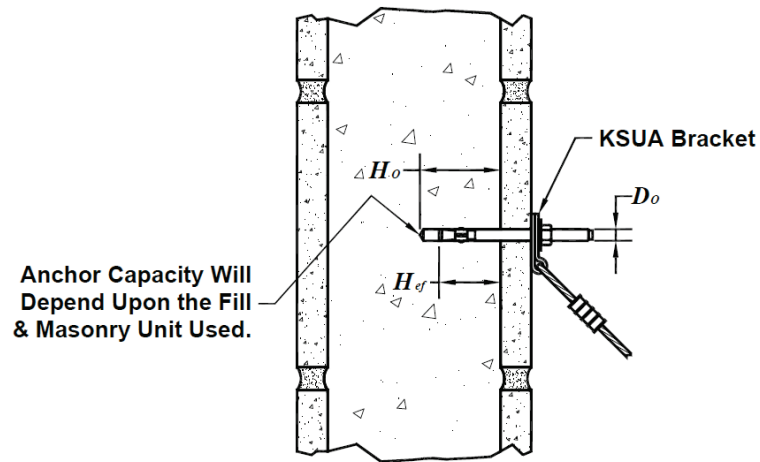


Sheet B - View M

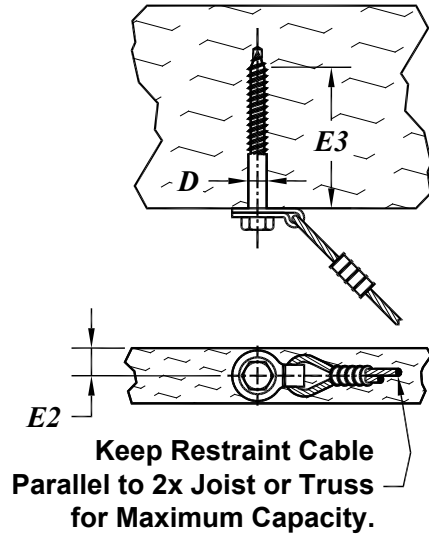


Sheet B - View J

15.14 KSUA WEDGE TYPE ANCHOR
ATTACHMENT TO A FILLED CMU WALL

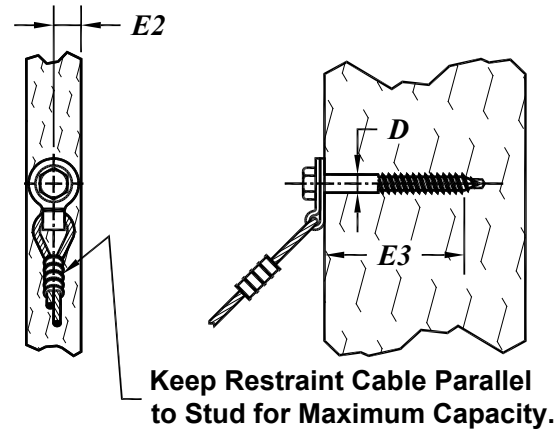


Sheet B - View P



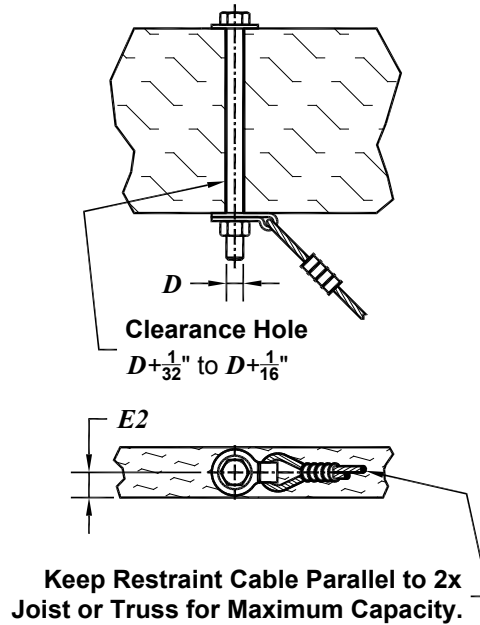
Sheet D - View A

I5-16 & I5.18 KSUA ATTACHED TO WOOD WITH LAG
SCREW

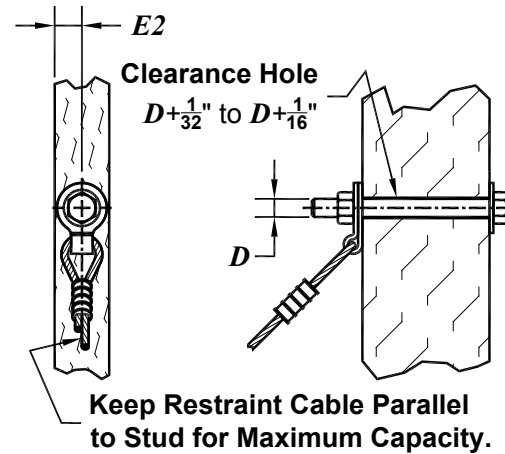


Sheet D - View K

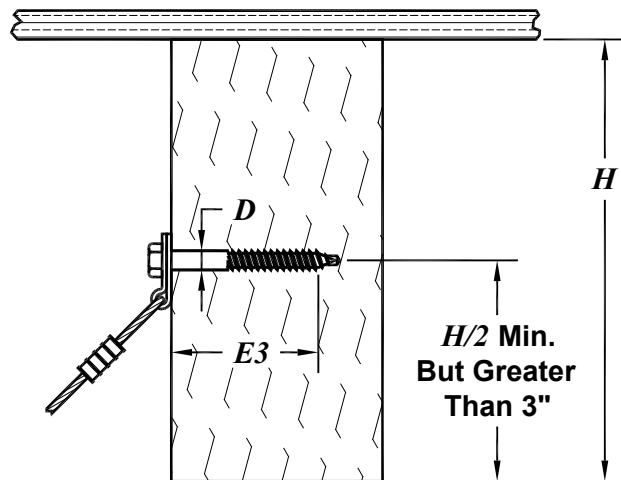
15.17 & 15.19 KSUA ATTACHED TO WOOD USING
THROUGH BOLT



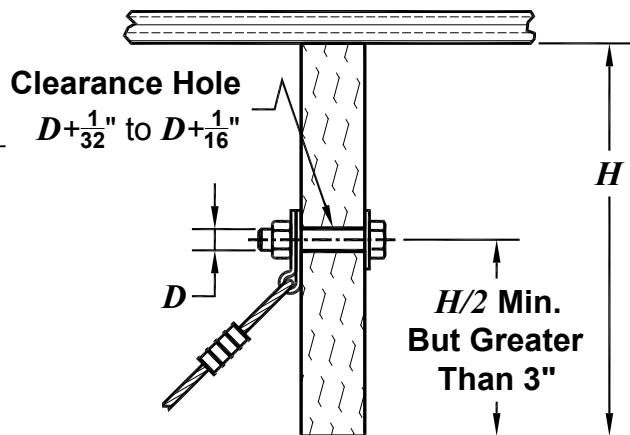
Sheet D - View A



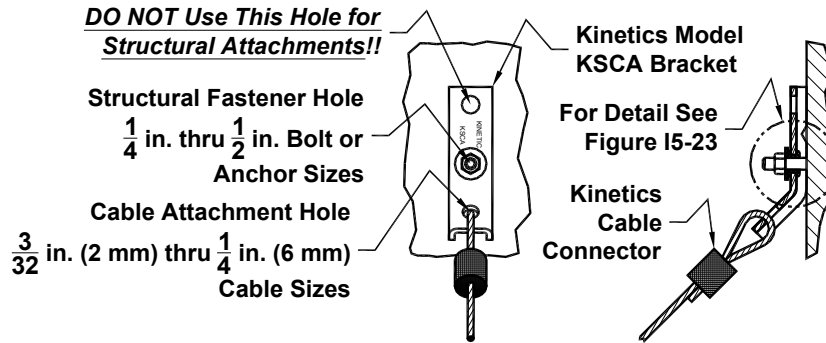
Sheet D - View K



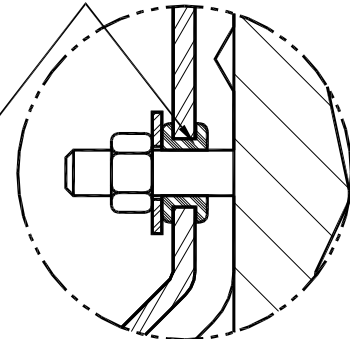
15.20-15.21 KSUA ATTACHED TO WOODEN
BEAM OR JOIST USING LAG SCREW & BOLT



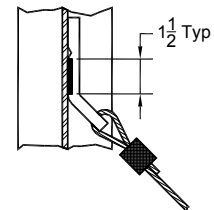
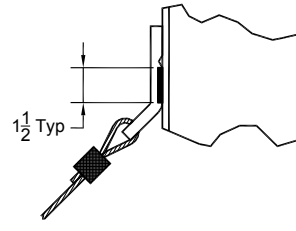
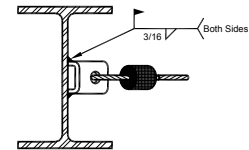
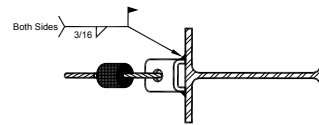
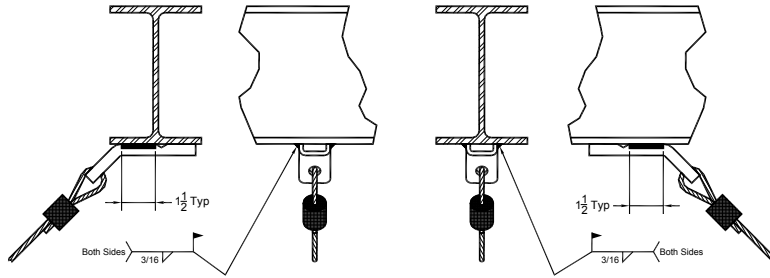
I5.22-I5.23 KSCA
ATTACHMENT BRACKET



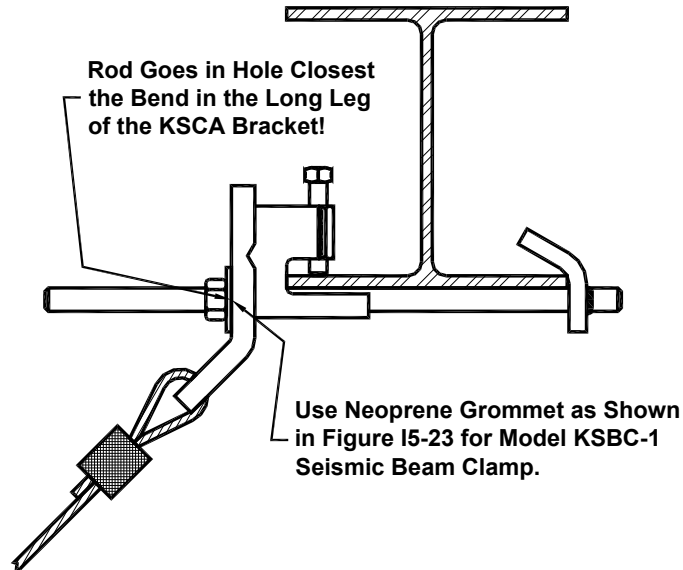
Use Neoprene
Grommet Supplied
with Attachment
Kit for $\frac{1}{4}$ in. and $\frac{3}{8}$ in.
Fasteners.



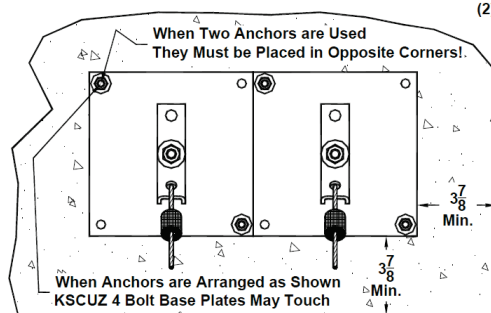
I5.25 KSCA WELDED TO STRUCTURAL STEEL



I5.26 KSBC BEAM CLAMP & KSCA ATTACHMENT TO STRUCTURAL STEEL



KSCUZ2



(2) KCCAB-38-375 Cracked Concrete Anchors

(1) KSCA Bracket

(1) 1/2-13 UNC Flat Socket Head Cap Screw

(1) 1/2-13 UNC Hex Nut

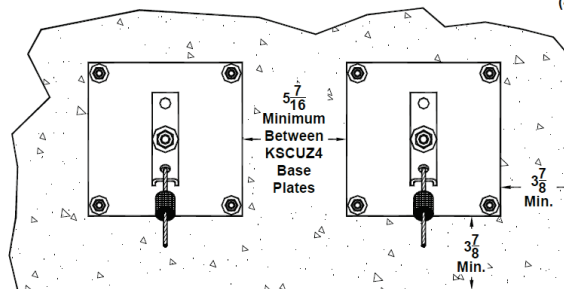
(1) 1/2 Flat Washer

KSCU Cable Kit

(1) KSCUZ 4 Bolt Base Plate

15.28-15.29 MODEL KSCUZ2 & KSCUZ4

ATTACHMENT KIT TO CONCRETE USING KSCA



(4) KCCAB-38-375 Cracked Concrete Anchors

(1) KSCA Bracket

(1) 1/2-13 UNC Flat Socket Head Cap Screw

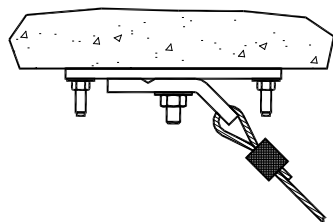
(1) 1/2-13 UNC Hex Nut

(1) 1/2 Flat Washer

KSCU Cable Kit

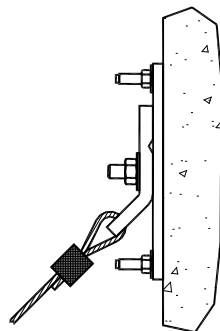
(1) KSCUZ 4 Bolt Base Plate

KSCUZ4



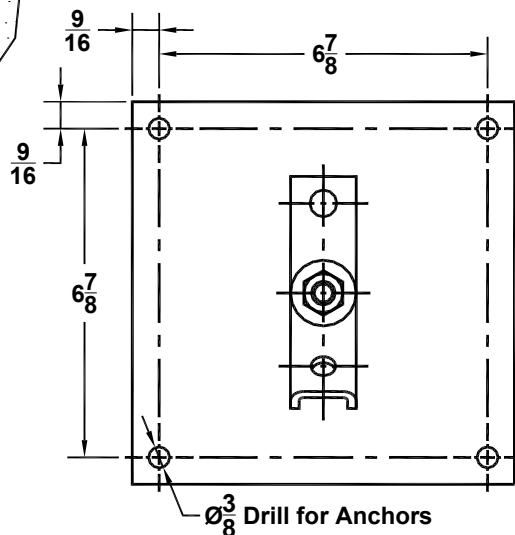
Orientation
1

Sheet B - View D

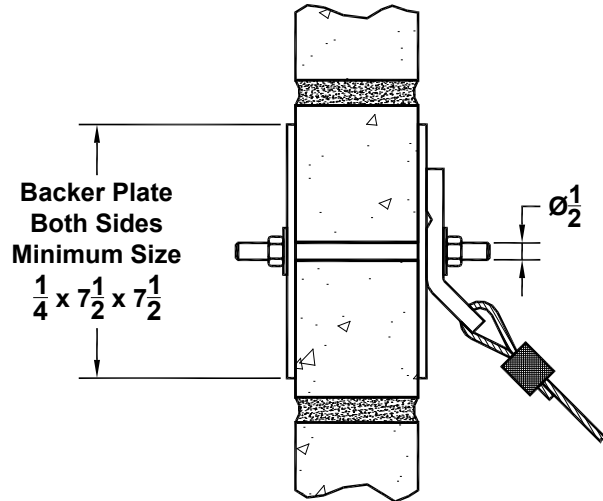


Orientation
2

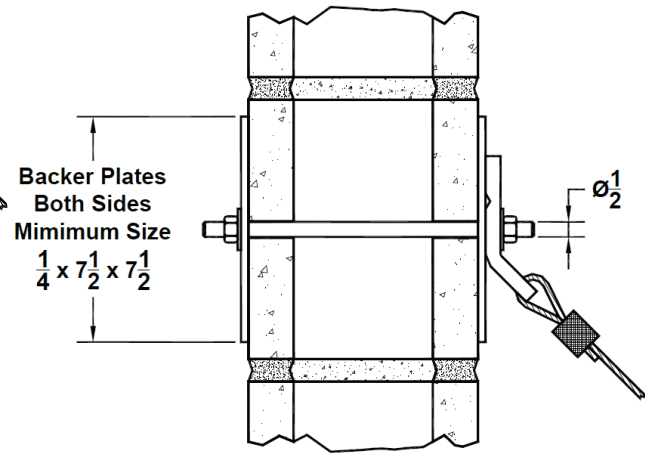
I5.30-I5.31 KSCUZ2 & KSCUZ4 CONCRETE ATTACHMENT KITS & DRILL TEMPLATE



15.32-15.33 KSCA THROUGH BOLT
ATTACHMENT TO SOLID & HOLLOW CMU
WALL

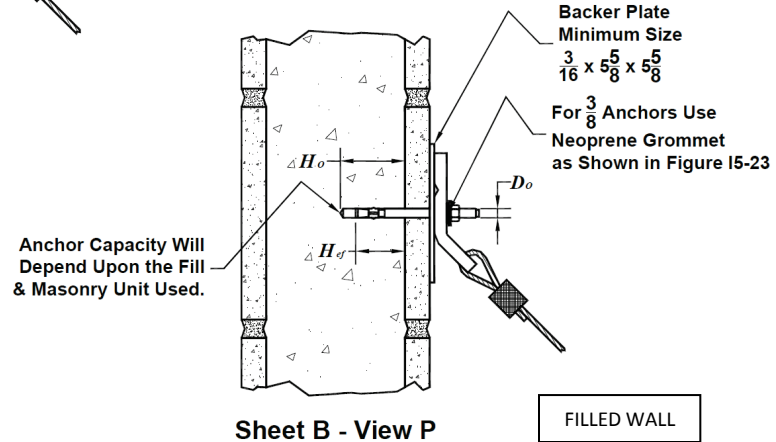
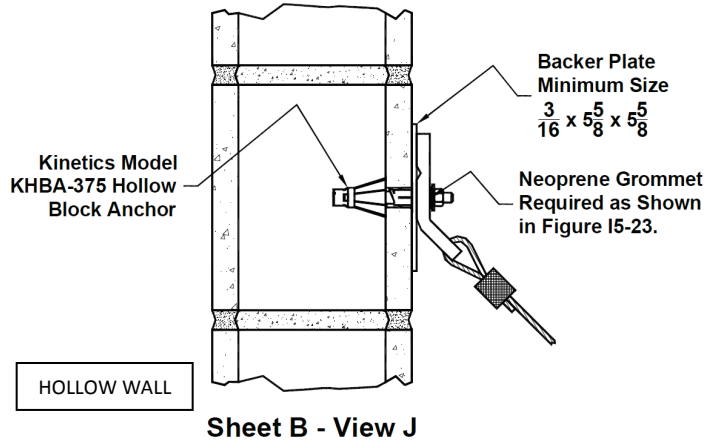


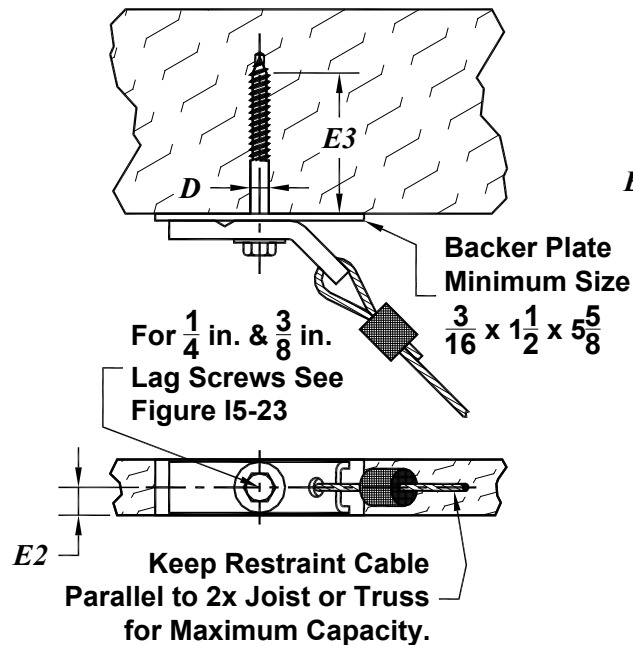
Sheet B - View F



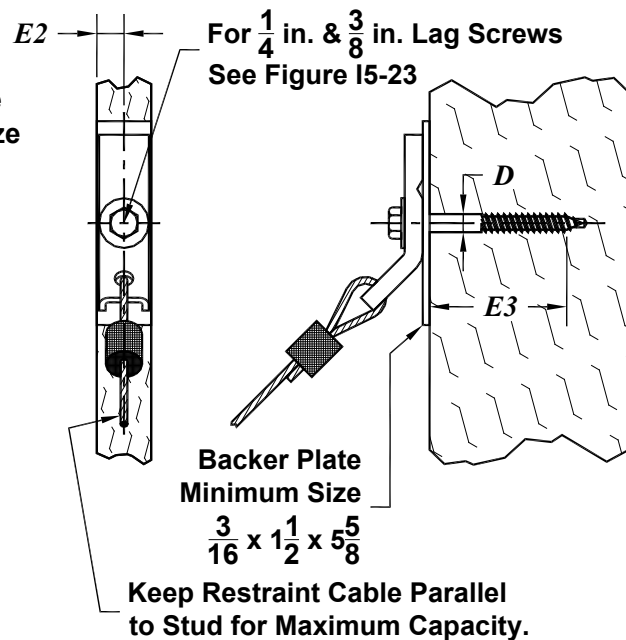
Sheet B - View M

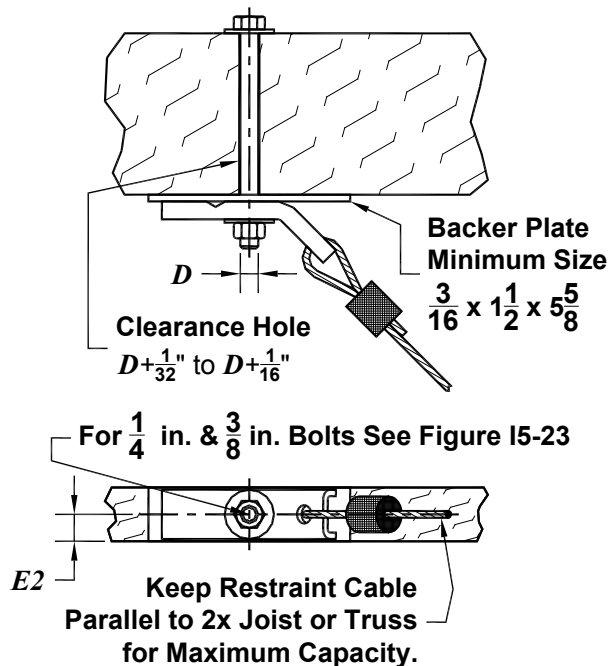
15.34-15.35 KSCA "UMBRELLA" & WEDGE TYPE ANCHOR TO CMU WALL



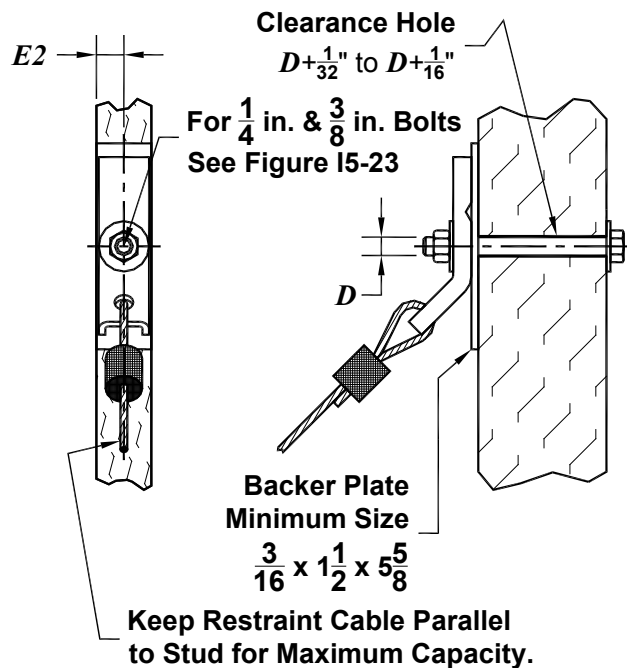


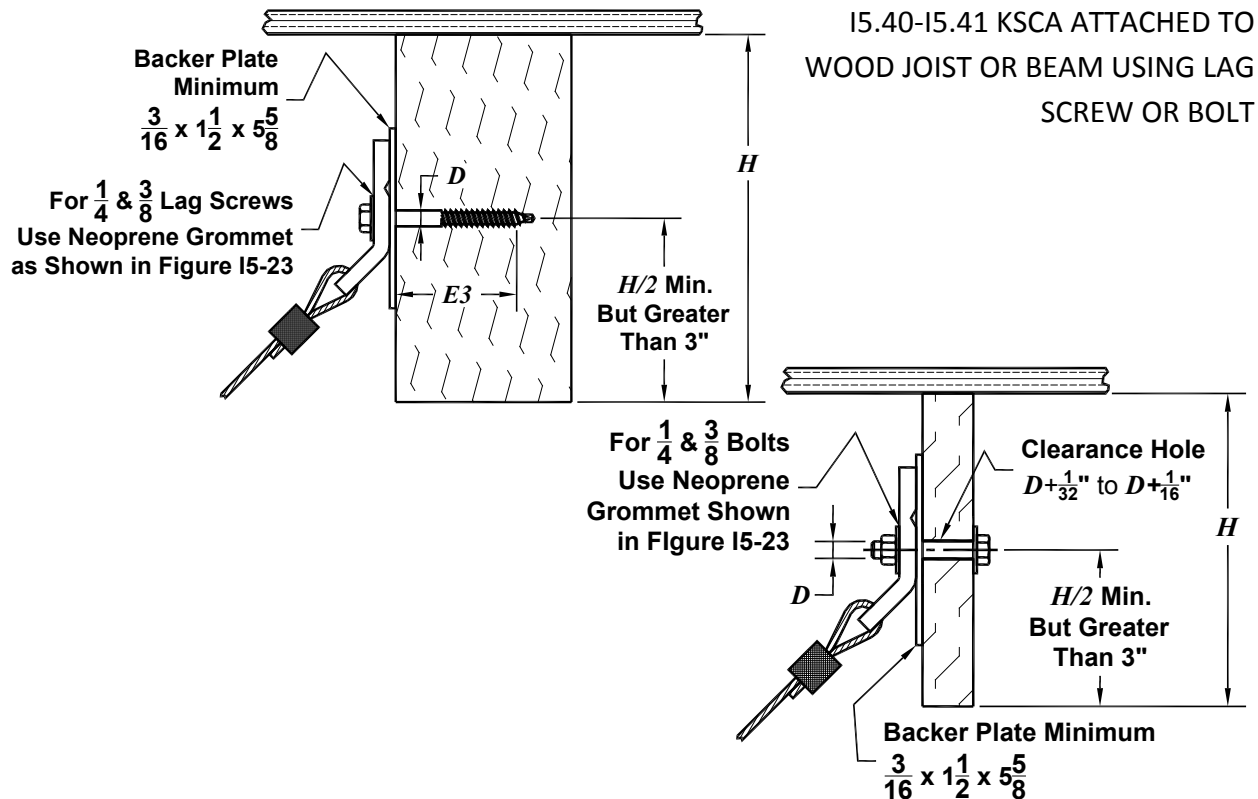
15.36 & 15.38 KSCA ATTACHED TO WOOD
WITH LAG SCREW

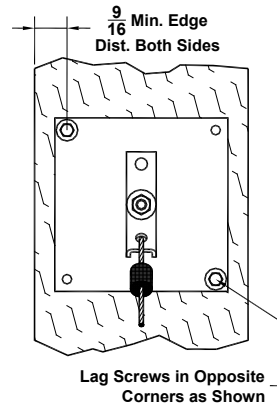




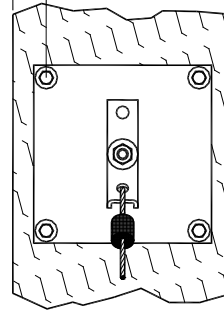
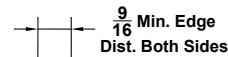
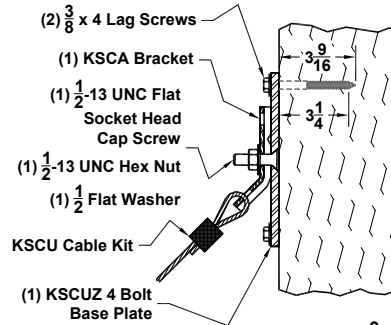
15.37 & 15.39 KSCA ATTACHED TO WOOD WITH THROUGH BOLT



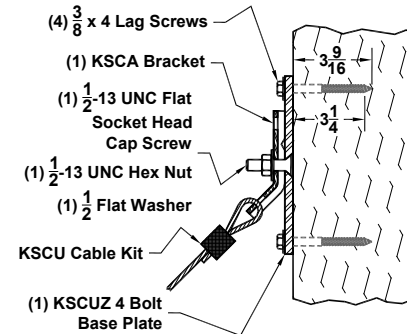




KSCUZ2



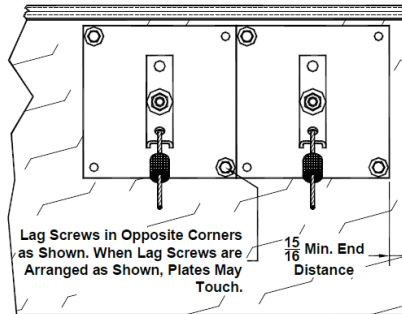
I5.42-I5.43 KSCUZ2 & KSCUZ4 ATTACHMENT KIT TO WOOD COLUMN WITH KSCA



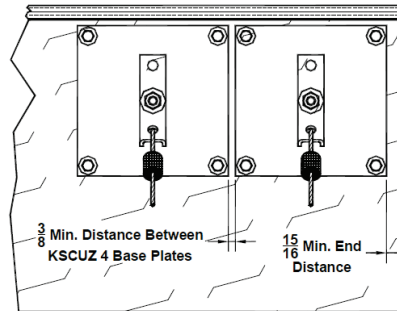
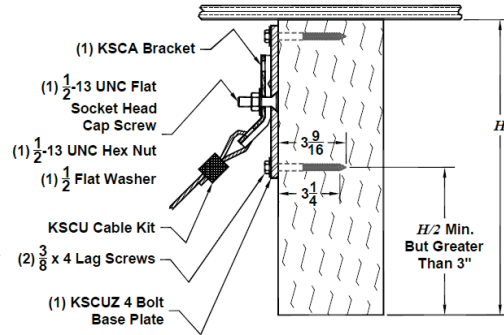
KSCUZ4

15.44-15.45 KSCUZ2 & KSCUZ4 ATTACHMENT

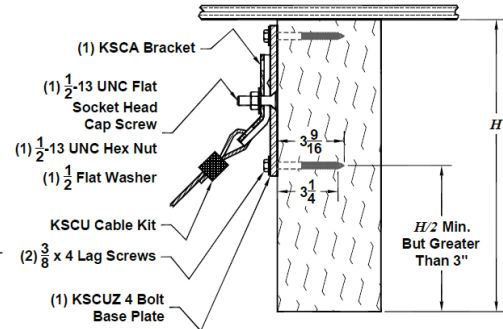
KIT TO WOOD BEAM WITH KSCA



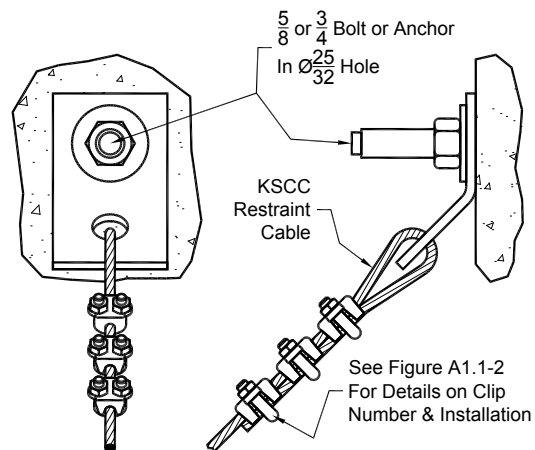
KSCUZ2



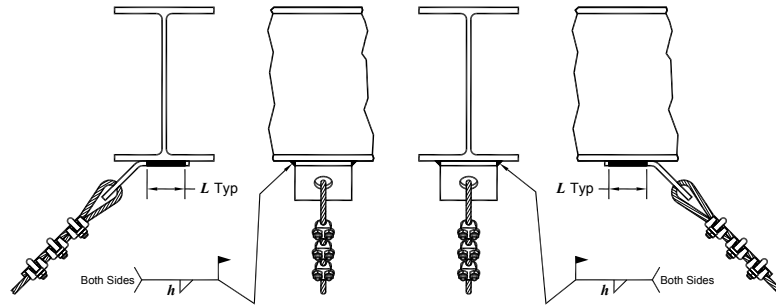
KSCUZ4



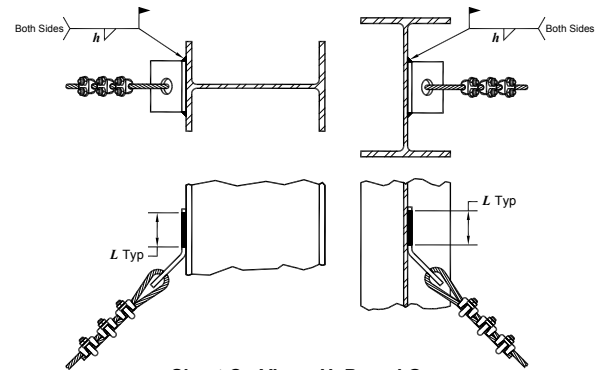
I5.47 KSCC ATTACHMENT BRACKET



15.48-15.49 KSCC WELDED TO STRUCTURAL STEEL

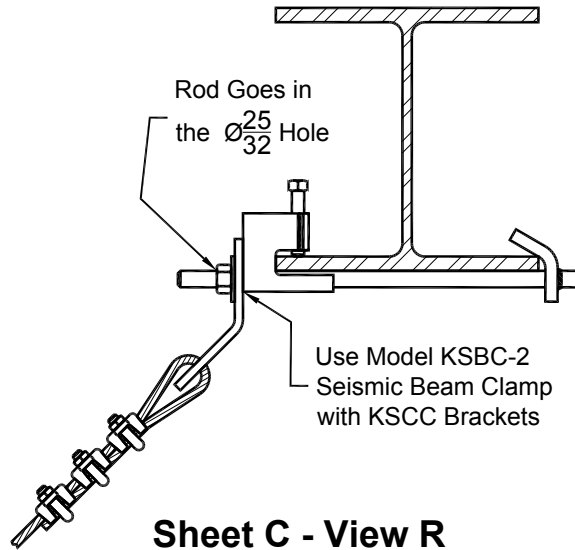


Sheet C - View E

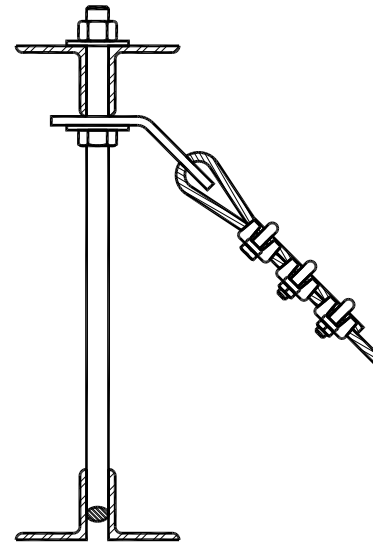
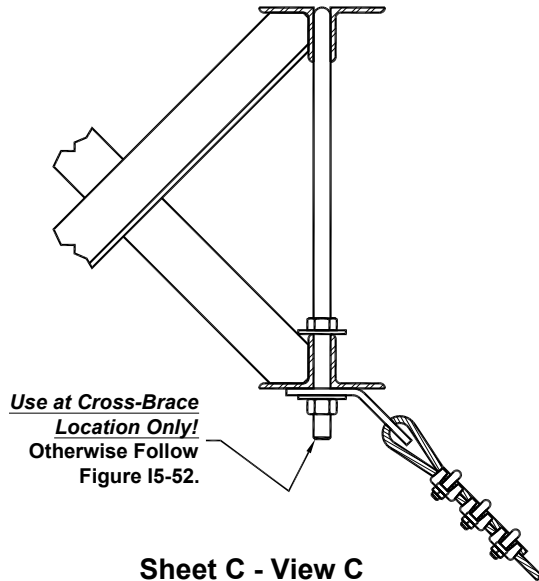


Sheet C - Views H, P, and Q

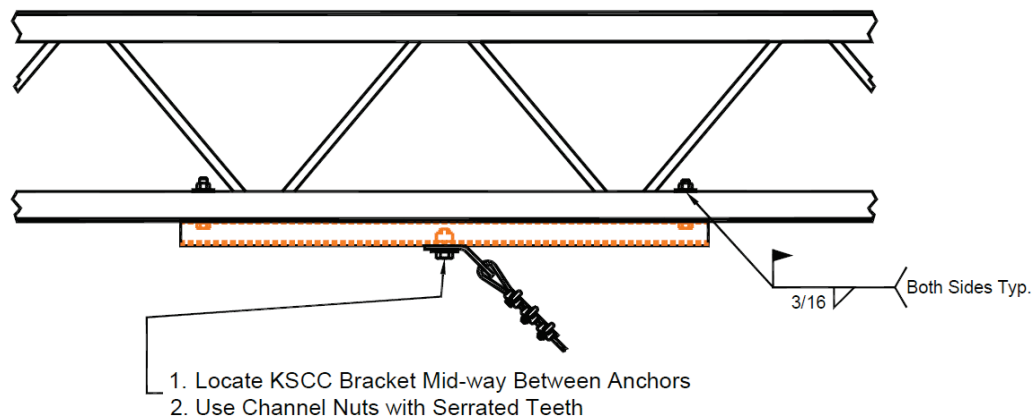
15.50 KSBC BEAM CLAMP & KSCC
ATTACHMENT TO STRUCTURAL STEEL



I5.51-I5.52 KSCC ATTACHMENT TO CROSS-
BRACED & UN-BRACED OPEN WB STEEL JOISTS

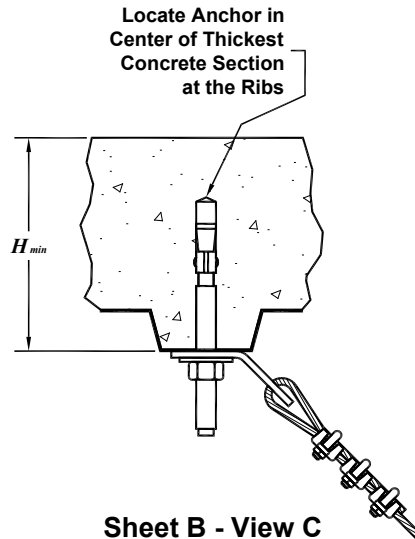


15.53 KSCC ATTACHMENT TO UN-BRACED OPEN
WEB STEEL JOISTS- ALIGNED TO JOISTS

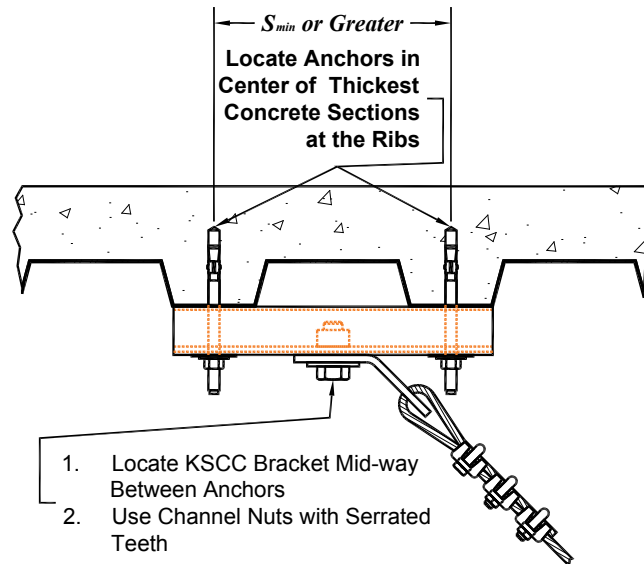


Sheet C - View B

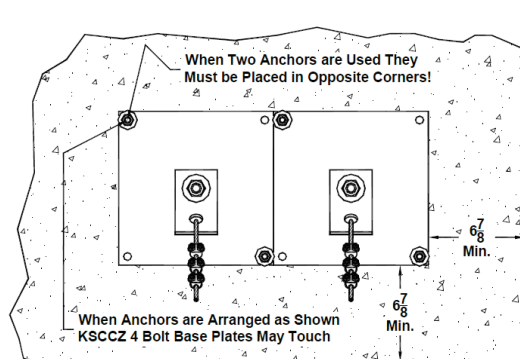
15.55 KSCC ATTACHED TO CONCRETE POURED ON
CORRUGATED METAL DECKING



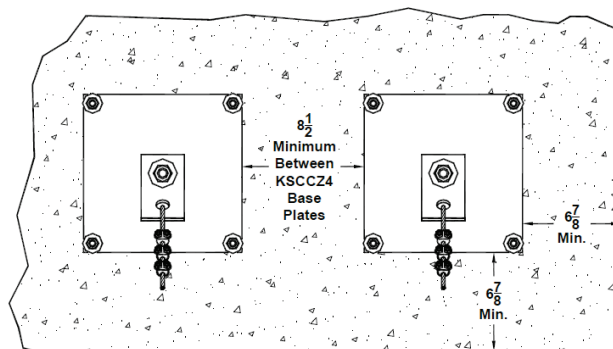
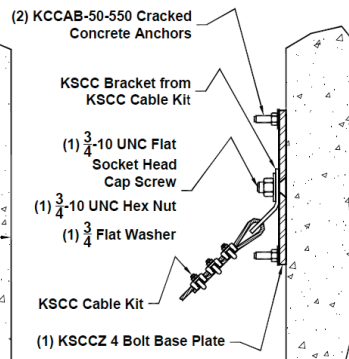
15.56 KSUA ATTACHED TO STRUT CHANNEL
ANCHORED TO CONCRETE



Sheet B - View G

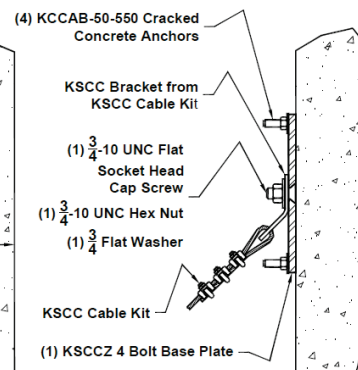


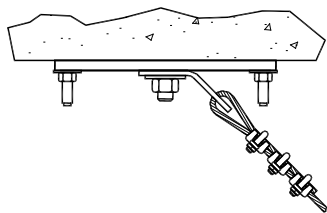
KSCCZ2



KSCCZ4

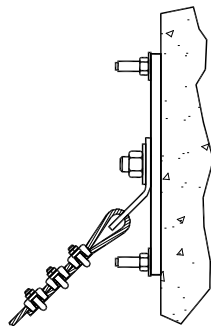
15.57-15.58 KSCCZ2 & KSCCZ4 ATTACHMENT KIT TO CONCRETE WITH KSCC





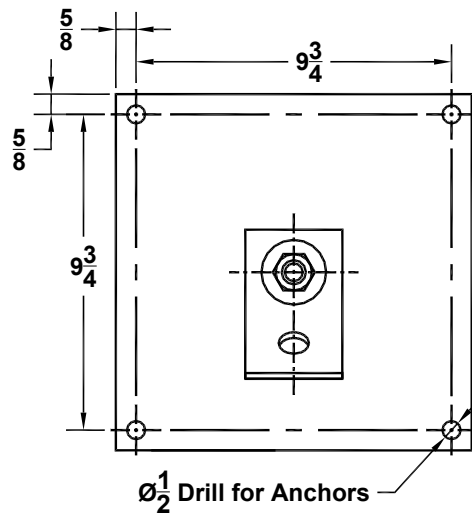
Orientation
1

Sheet B - View D

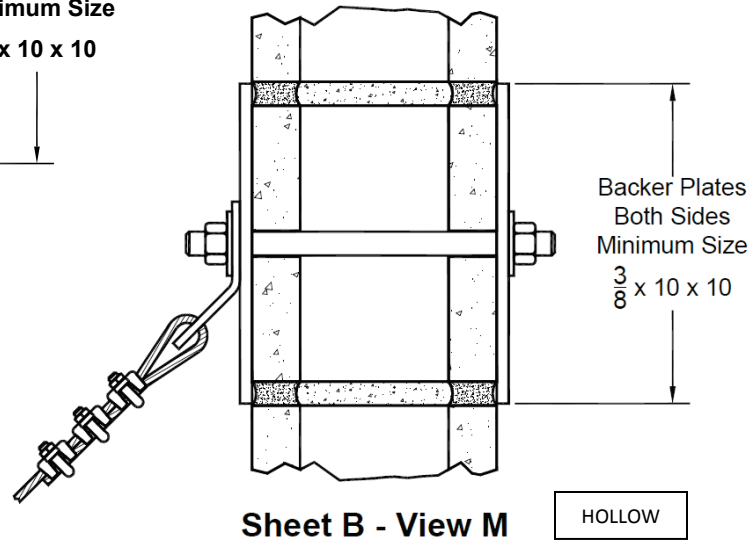
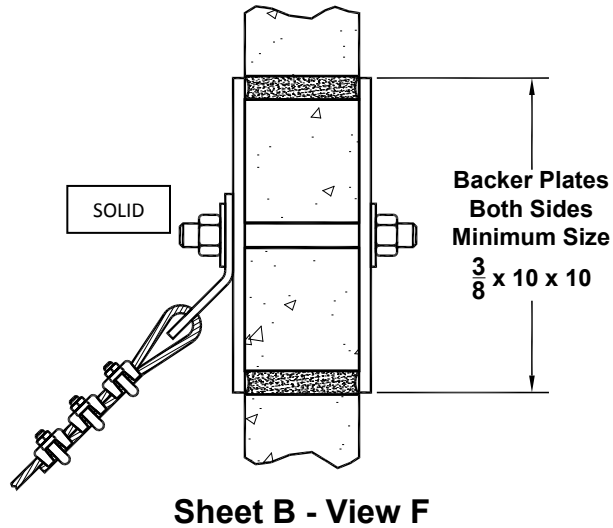


Orientation
2

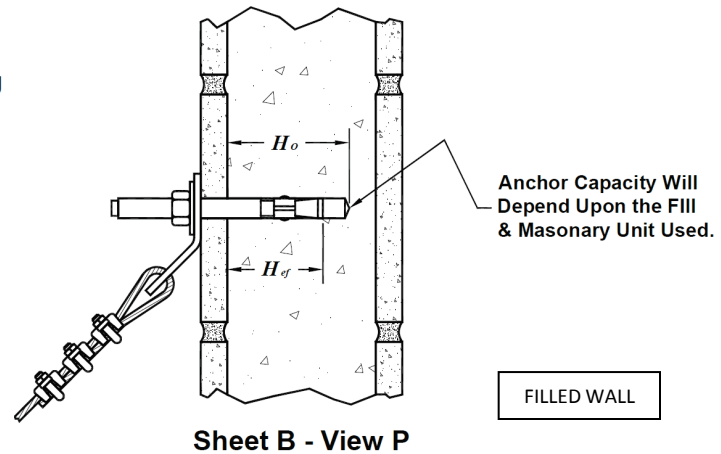
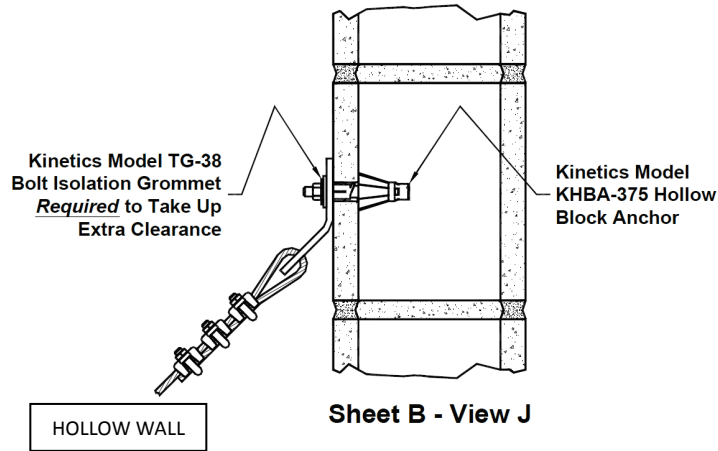
15.60 KSCCZ2 & KSCCZ4 CONCRETE ATTACHMENT KITS & DRILL TEMPLATE

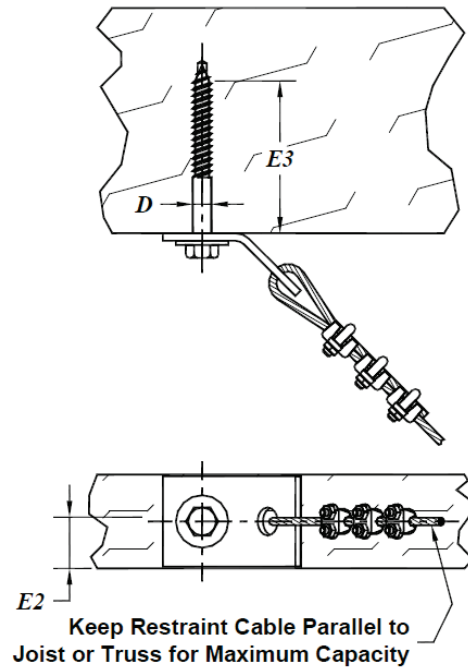


15.61-15.62 KSCC THROUGH BOLT
ATTACHMENT TO SOLID & HOLLOW CMU
WALL



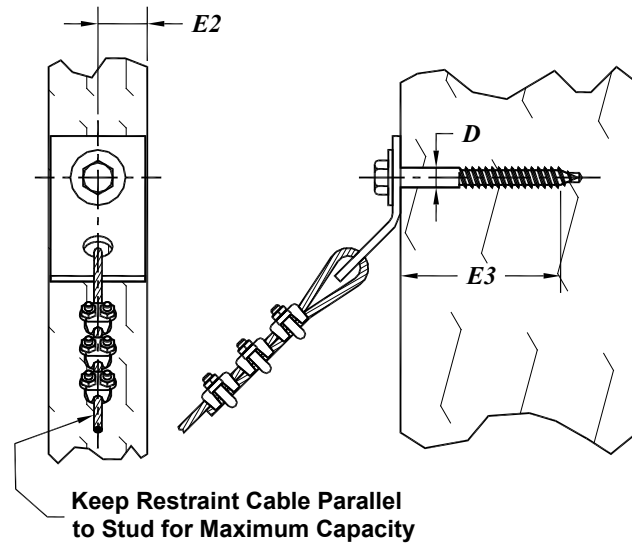
I5.63-I5.64 KSCC "UMBRELLA" &
WEDGE TYPE ANCHOR TO CMU WALL



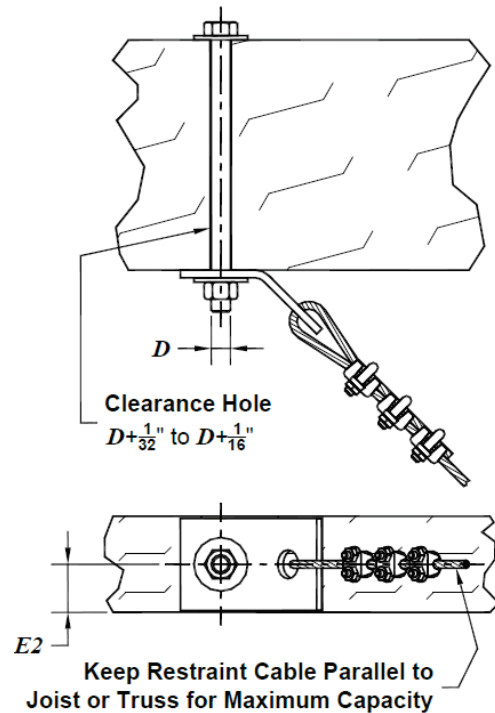


Sheet D - View D

I5.65 & I5.67 KSCC ATTACHED TO WOOD WITH LAG SCREW

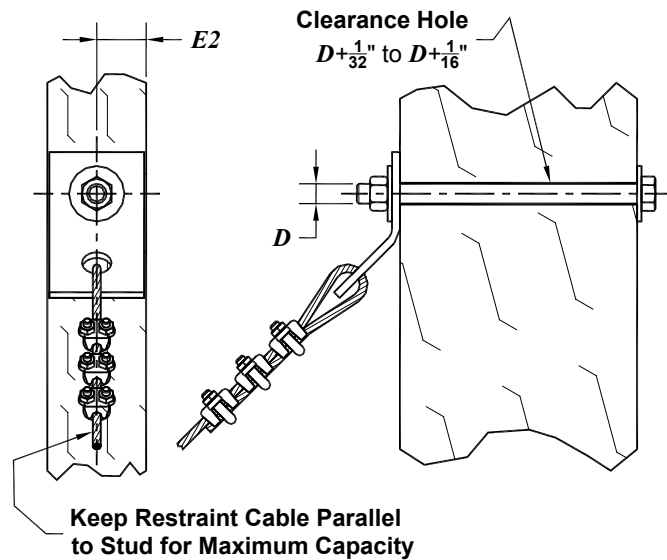


Sheet D - View J

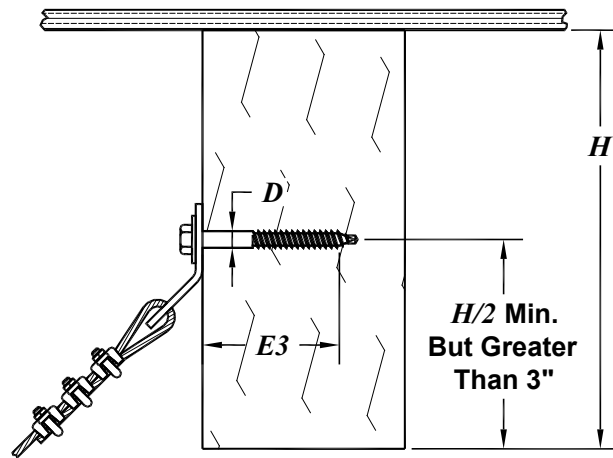


Sheet D - View D

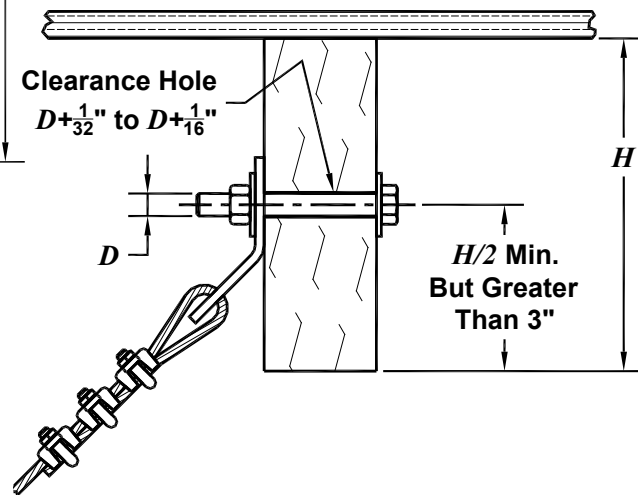
15.66 & 15.68 KSCC ATTACHED TO WOOD WITH THROUGH BOLT



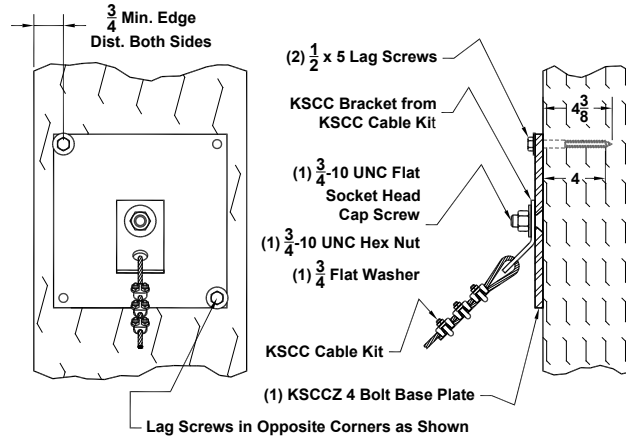
Sheet D - View J



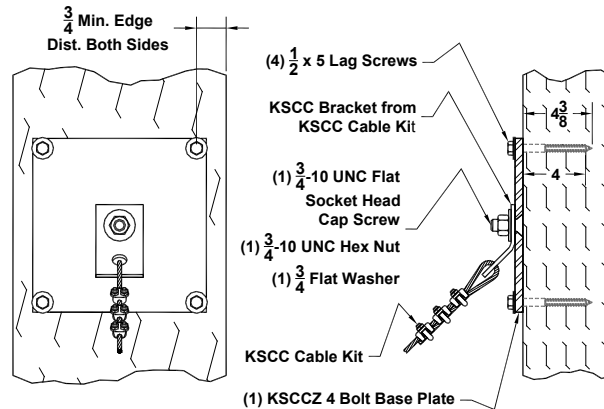
15.69-15.70 KSCC ATTACHED TO WOOD JOIST
OR BEAM USING LAG SCREW OR BOLT



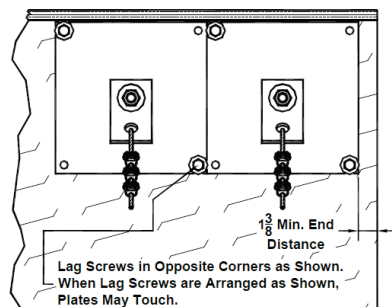
I5.71-I5.72 KSCCZ2 & KSCCZ4 ATTACHMENT KIT TO WOOD COLUMN WITH KSCA



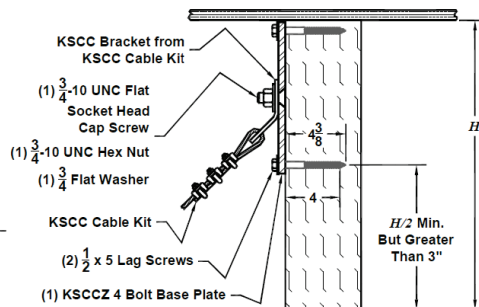
Sheet B - View G



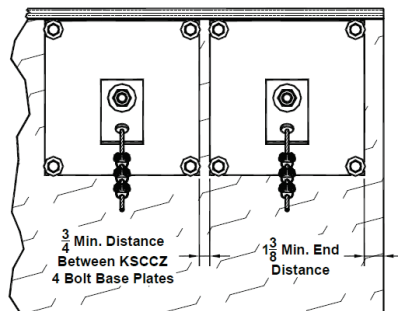
Sheet B - View G



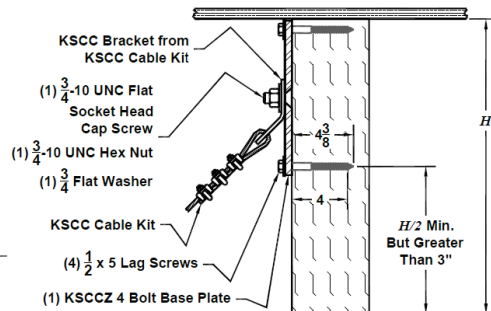
KSCUZ2



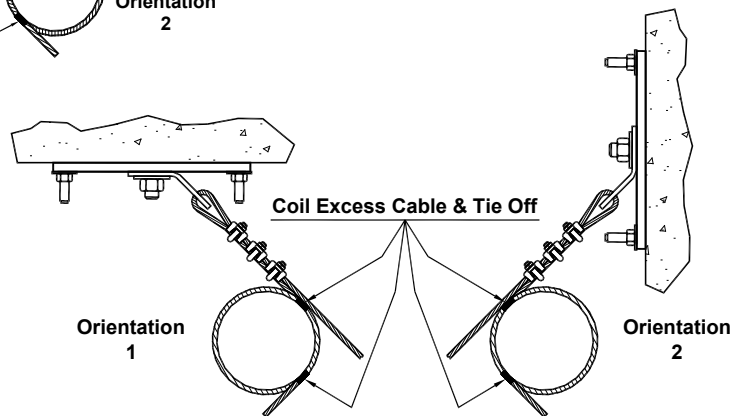
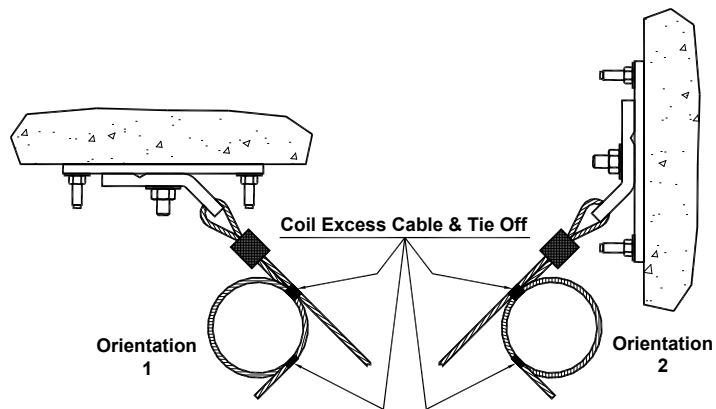
15.73-15.74 KSCCZ2 & KSCCZ4 ATTACHMENT KIT TO WOOD BEAM WITH KSCA



KSCUZ4

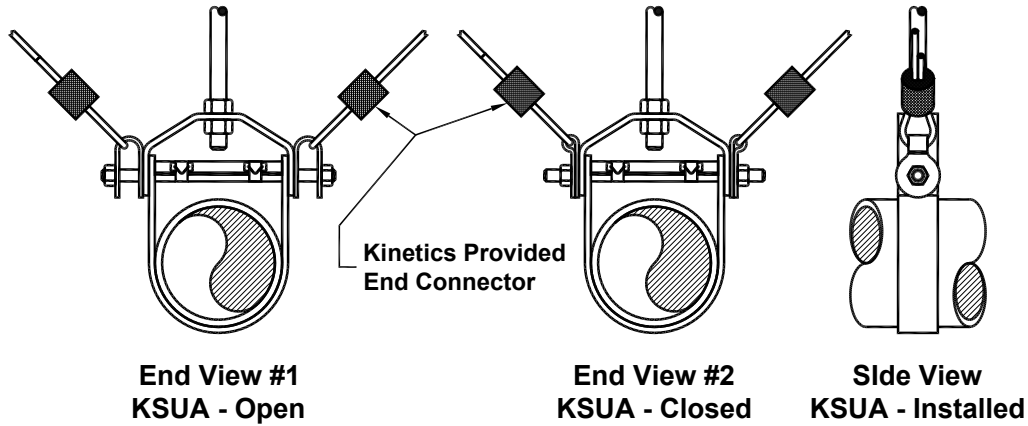


I5.76-I5.77 EXCESS CABLE COIL FOR
KSCU & KSCC

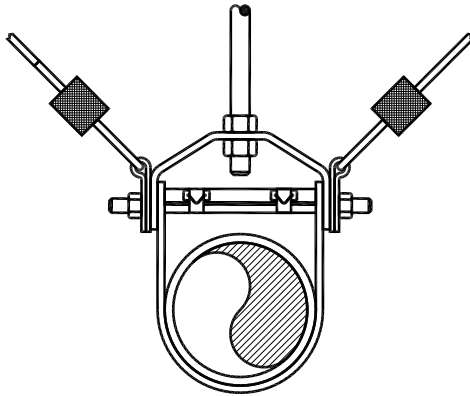


16.0 SYSTEM ATTACHMENTS

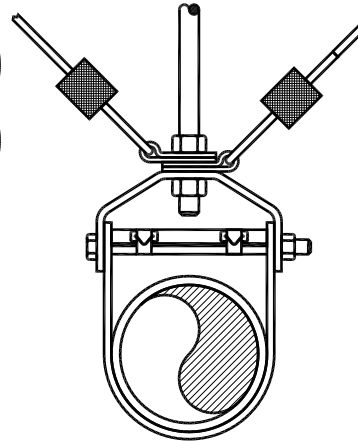
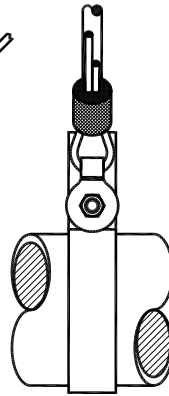
16.2 KSUA BRACKET INSTALLATION



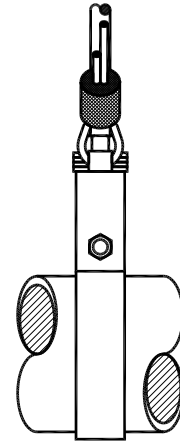
I6.3-I6.4 KSUA ATTACHED TO CLEVIS
HANGER



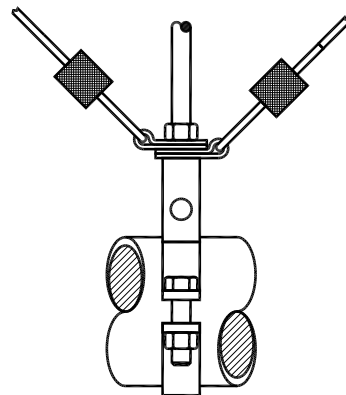
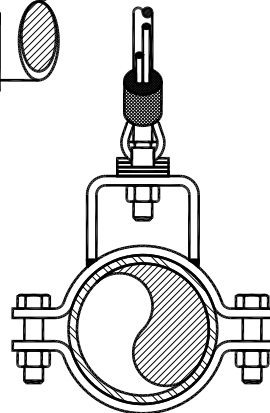
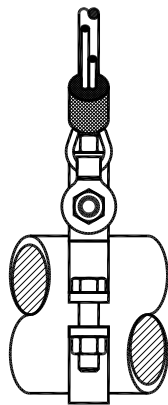
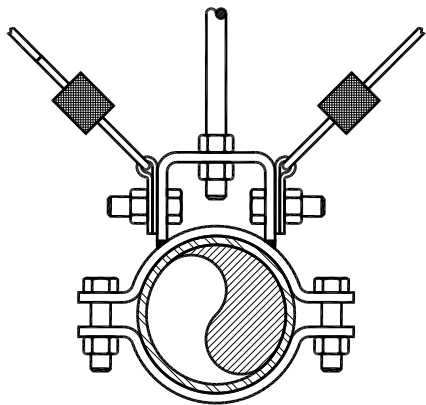
Sheet E - View B



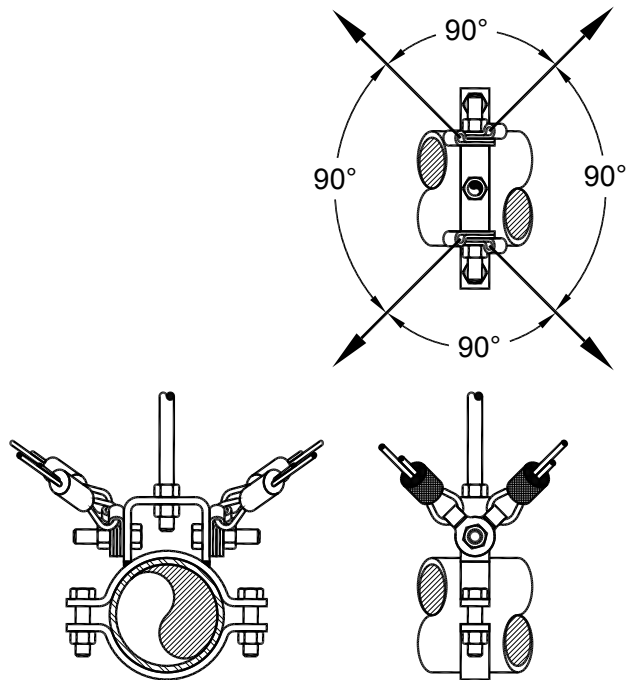
Sheet E - View C



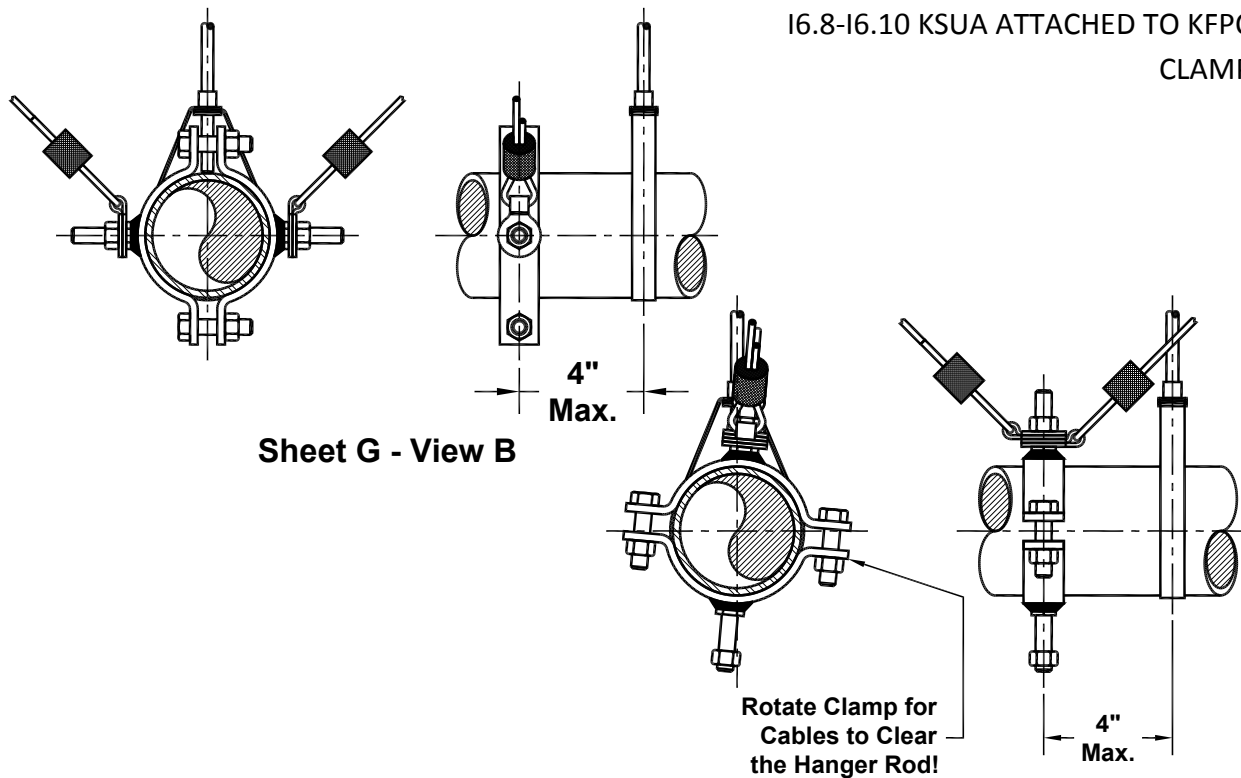
16.5-16.7 KSUA ATTACHED TO CLAMP TYPE
CLEVIS HANGER



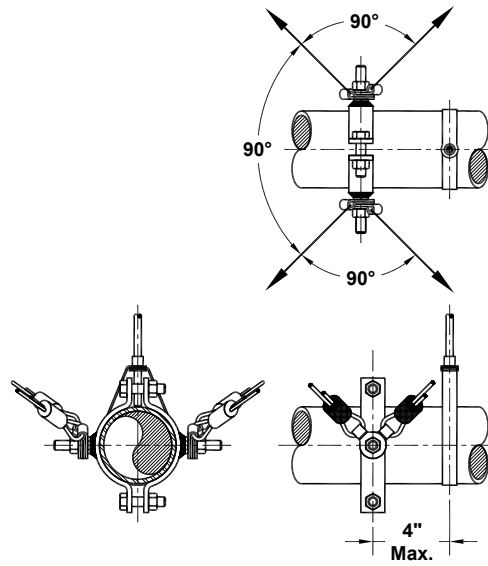
I6.5-I6.7 KSUA ATTACHED TO CLAMP TYPE CLEVIS
HANGER



16.8-16.10 KSUA ATTACHED TO KFPC
CLAMP

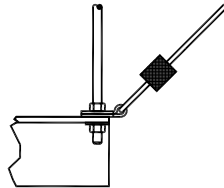


I6.8-I6.10 KSUA ATTACHED TO KFPC CLAMP

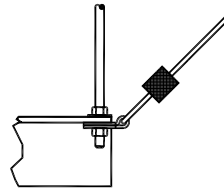


Sheet G - View A

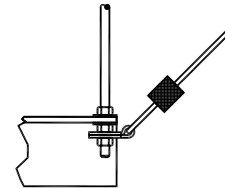
I6.11-I6.13 KSUA ATTACHED TO ROLLED
STRUCTURAL TRAPEZE BAR



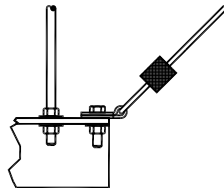
**Option #1 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



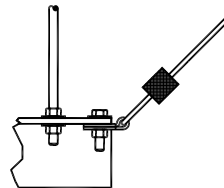
**Option #2 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



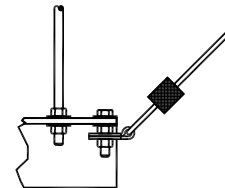
**Option #3 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



**Option #4 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



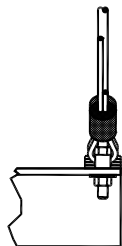
**Option #5 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



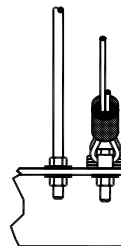
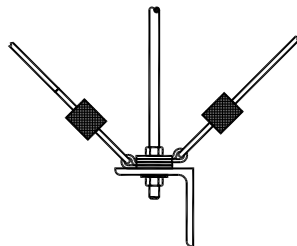
**Option #6 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**

Sheet F - Views L & M

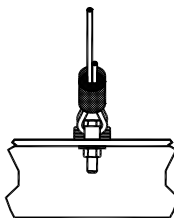
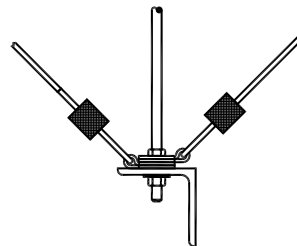
I6.11-I6.13 KSUA ATTACHED TO ROLLED
STRUCTURAL TRAPEZE BAR



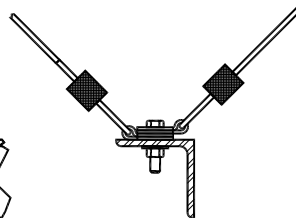
Option #1 Longitudinal Restraint (L)
Typical - Both Ends of Trapeze Bar



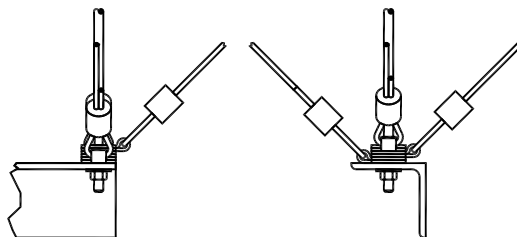
Option #2 Longitudinal Restraint (L)
Typical - Both Ends of Trapeze Bar



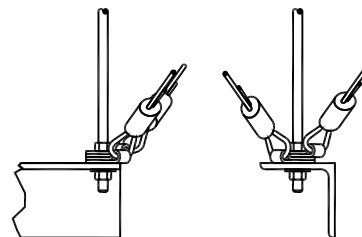
Option #3 Longitudinal Restraint (L)
At Center of Trapeze Bar



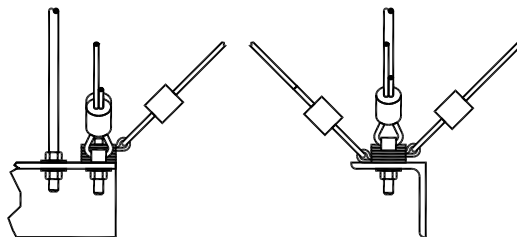
I6.11-I6.13 KSUA ATTACHED TO ROLLED
STRUCTURAL TRAPEZE BAR



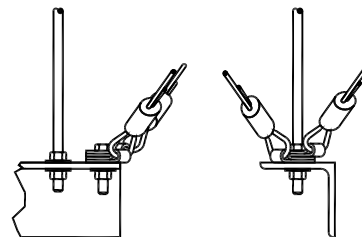
Option #1 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar



Option #2 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar

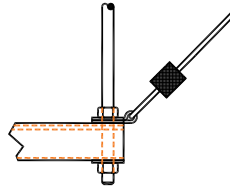


Option #3 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar

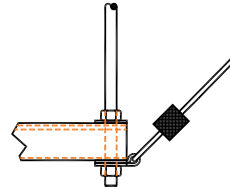


Option #4 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar

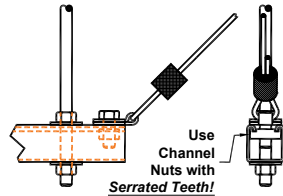
I6.14-I6.16 KSUA BRACKETS ATTACHED TO STRUT
CHANNEL TRAPEZE
BAR



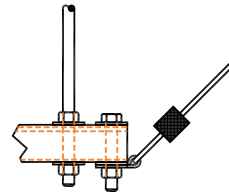
**Option #1 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



**Option #2 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



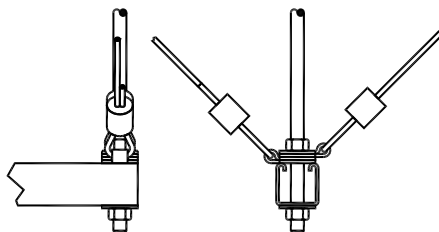
**Option #3 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**



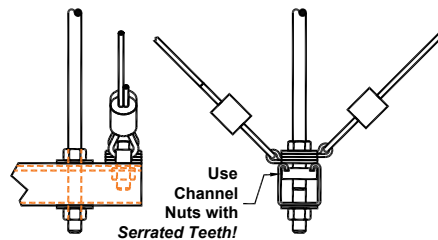
**Option #4 Transverse
Restraint (T) Typical
Both Ends of Trapeze Bar**

Sheet F - Views L & M

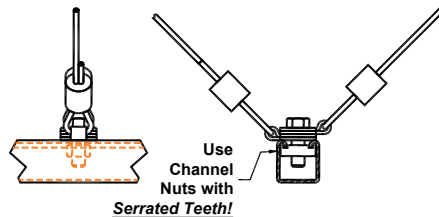
I6.14-I6.16 KSUA BRACKETS ATTACHED TO STRUT
CHANNEL TRAPEZE BAR



Option #1 Longitudinal Restraint (L)
Typical - Both Ends of Trapeze Bar

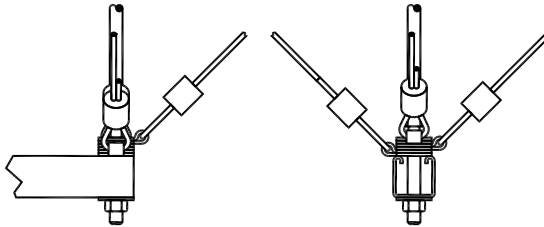


Option #2 Longitudinal Restraint (L)
Typical - Both Ends of Trapeze Bar

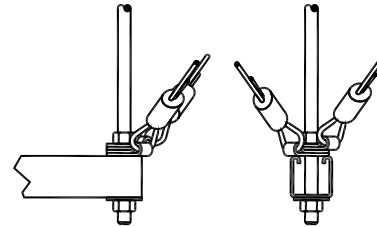


Option #3 Longitudinal Restraint (L)
At Center of Trapeze Bar

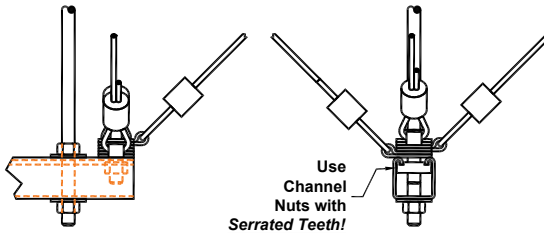
I6.14-I6.16 KSUA BRACKETS ATTACHED TO STRUT
CHANNEL TRAPEZE BAR



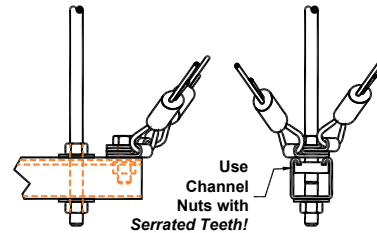
Option #1 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar



Option #2 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar

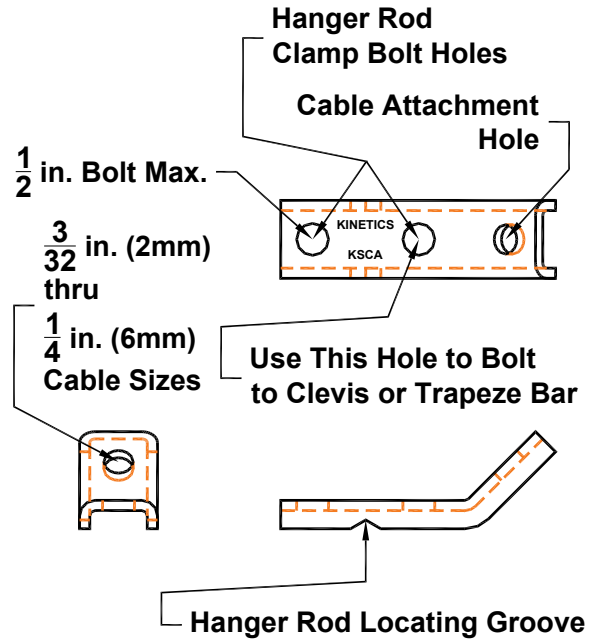


Option #3 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar

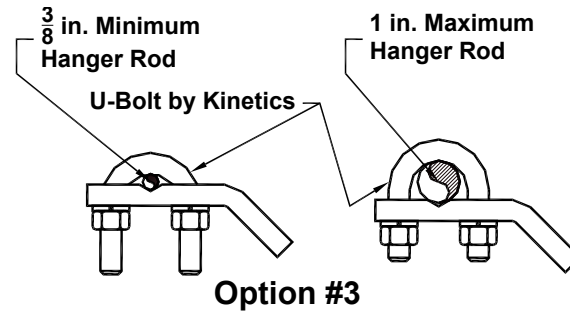
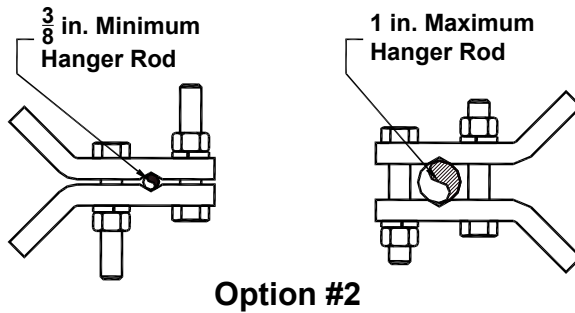
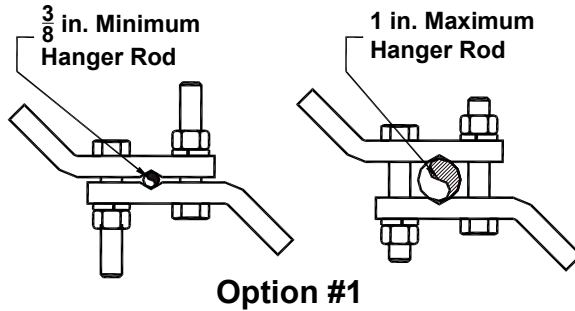


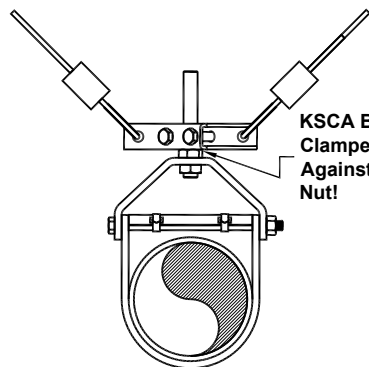
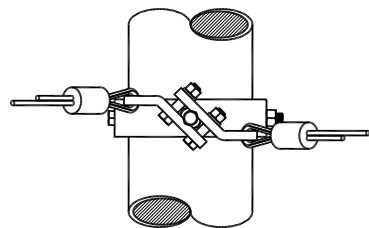
Option #4 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar

I6.17 KSCA BRACKET

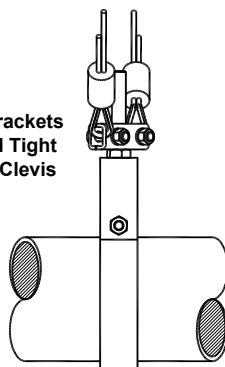


I6.18 KSCA CLAMPING OPTIONS



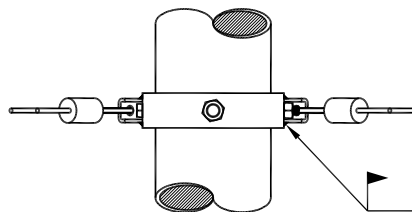


KSCA Brackets
Clamped Tight
Against Clevis
Nut!

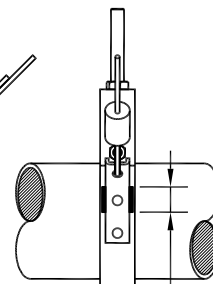
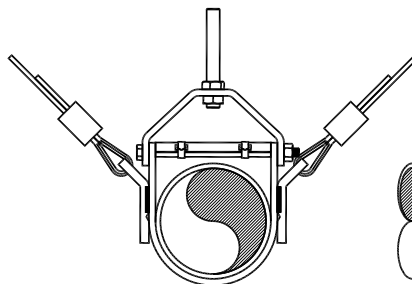


Sheet E - View A

16.19-16.20 KSCA ATTACHED TO CLEVIS HANGER



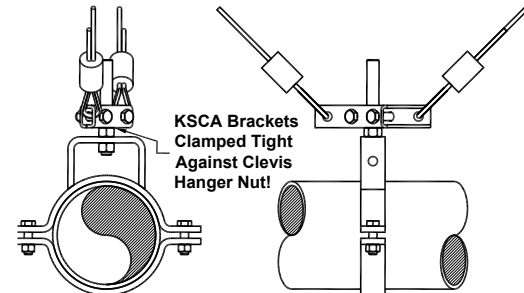
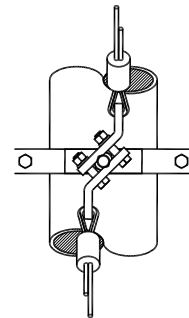
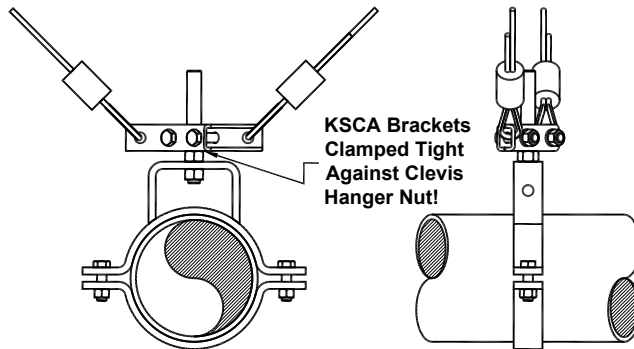
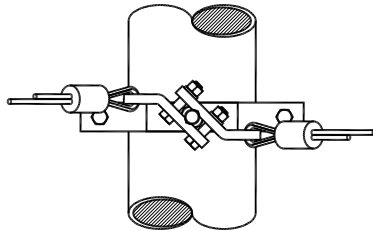
$\frac{3}{16}$ Typical



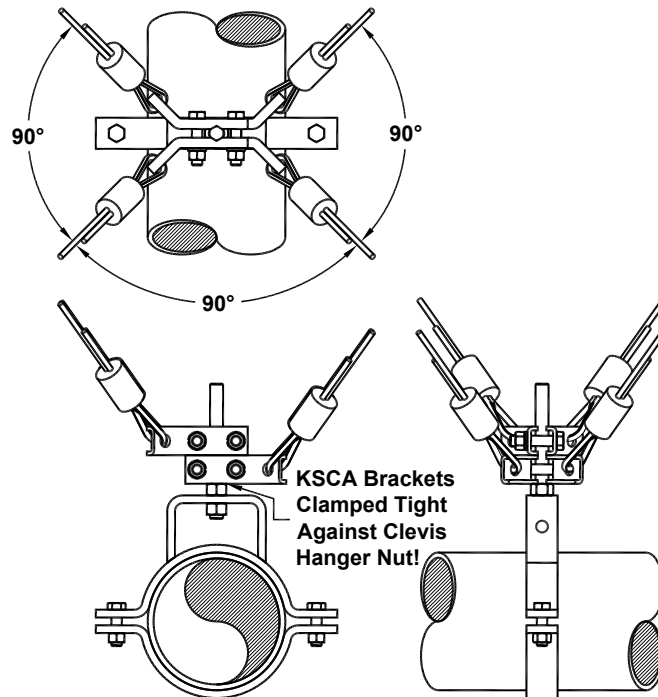
Typical $1\frac{7}{16}$ Long Weld Both Sides-Each Bracket

Sheet E - View D

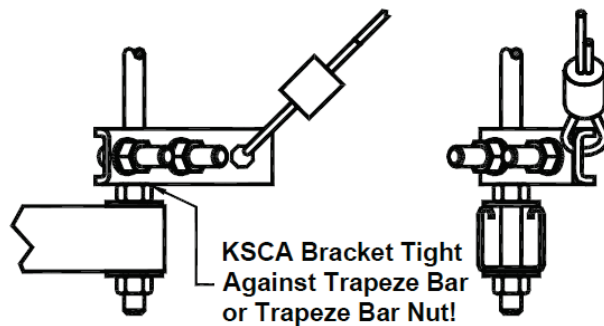
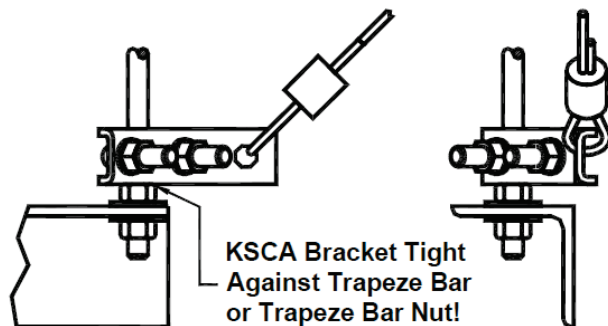
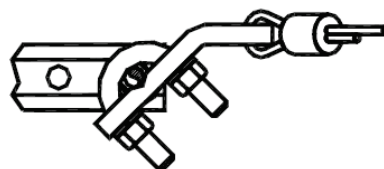
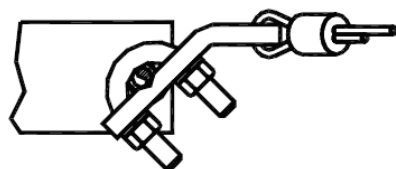
I6.21-I6.23 KSCA ATTACHED TO CLAMP TYPE
CLEVIS HANGER



I6.21-I6.23 KSCA ATTACHED TO CLAMP
TYPE CLEVIS HANGER



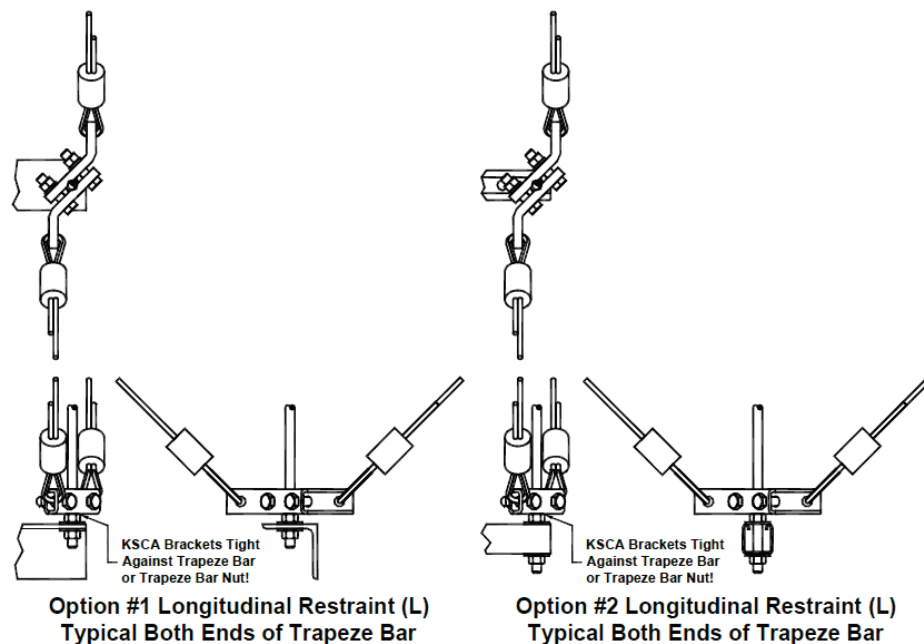
16.24-16.26 KSCA WITH ROLLED STRUCTURAL &
STRUT CHANNEL TRAPEZE BAR



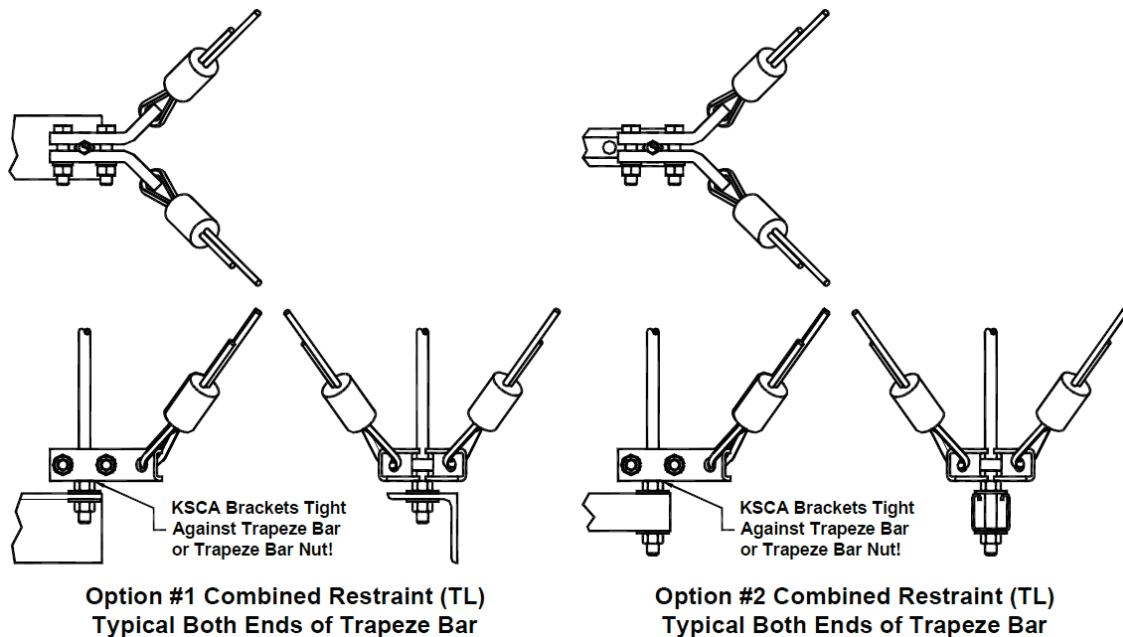
Option #1 Transverse Restraint (T)
Typical Both Ends of Trapeze Bar

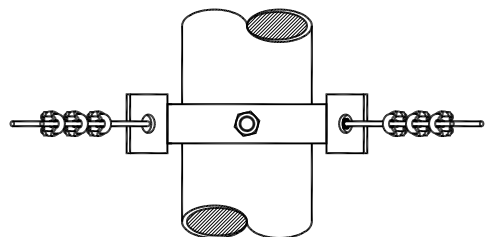
Option #2 Transverse Restraint (T)
Typical Both Ends of Trapeze Bar

16.24-16.26 KSCA WITH ROLLED STRUCTURAL & STRUT
CHANNEL TRAPEZE BAR

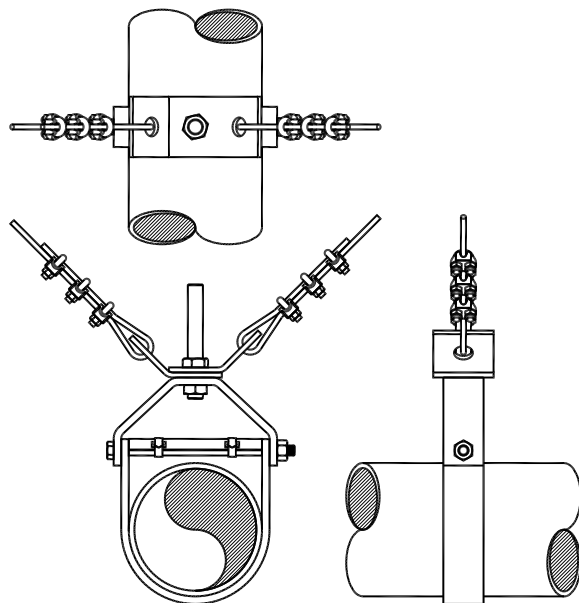
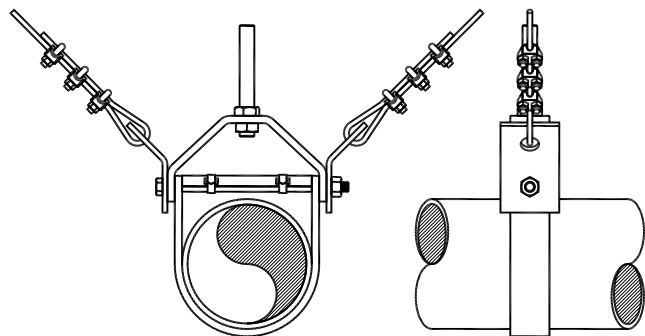


16.24-16.26 KSCA WITH ROLLED STRUCTURAL & STRUT
CHANNEL TRAPEZE BAR

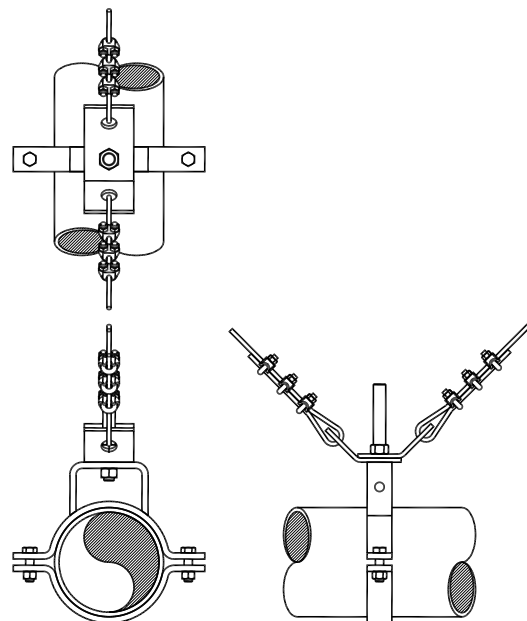
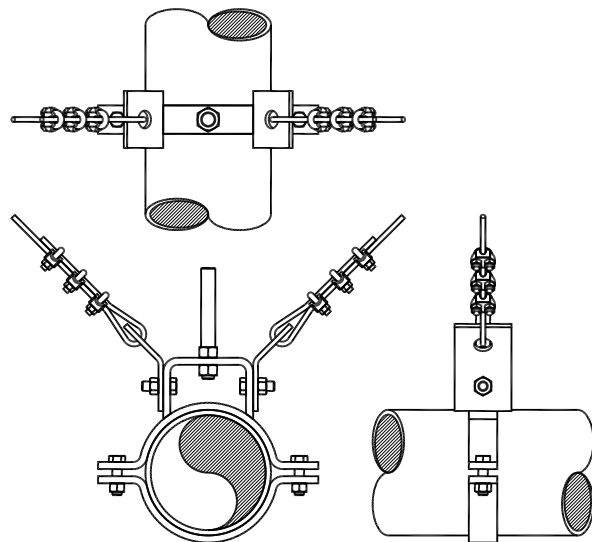




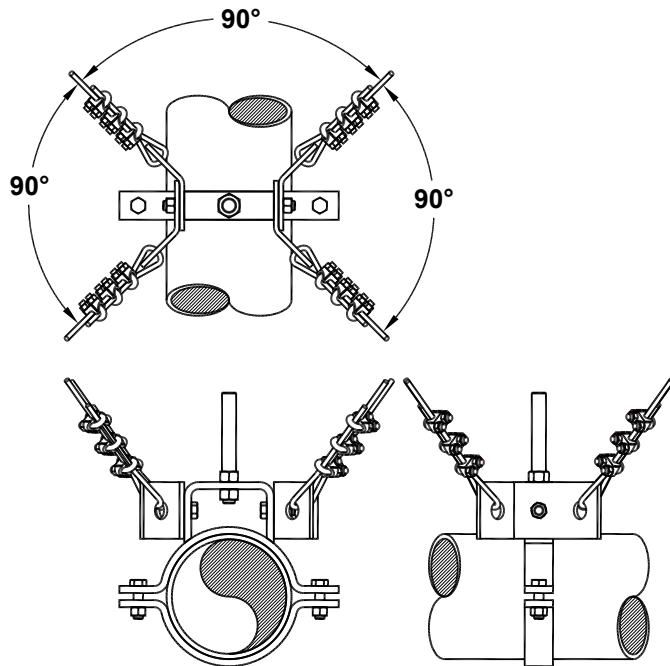
16.28-16.29 KSCC ATTACHED TO CLEVIS
HANGER

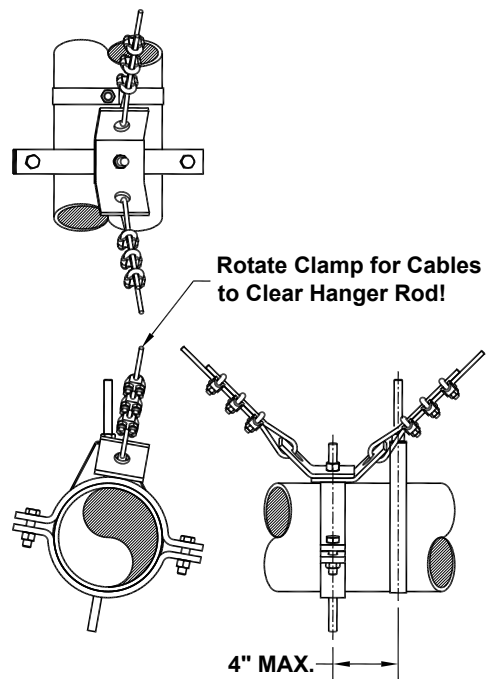


16.30-16.32 KSCC ATTACHED TO CLAMP TYPE
CLEVIS HANGER

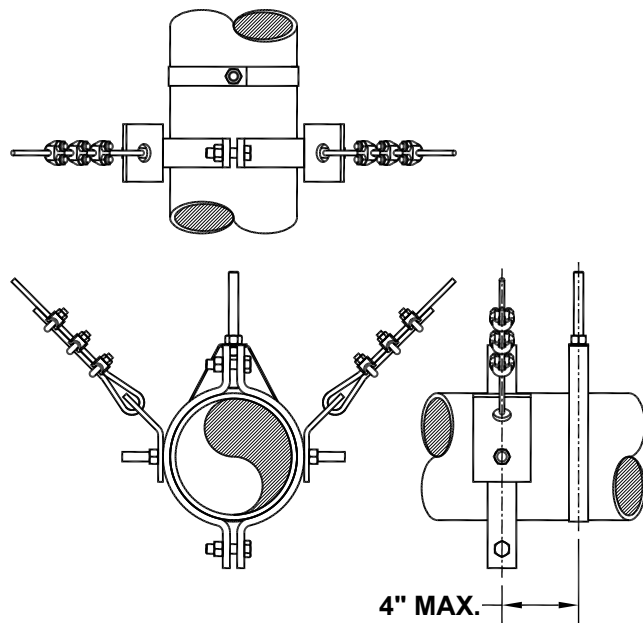


16.30-16.32 KSCC ATTACHED TO CLAMP TYPE CLEVIS
HANGER

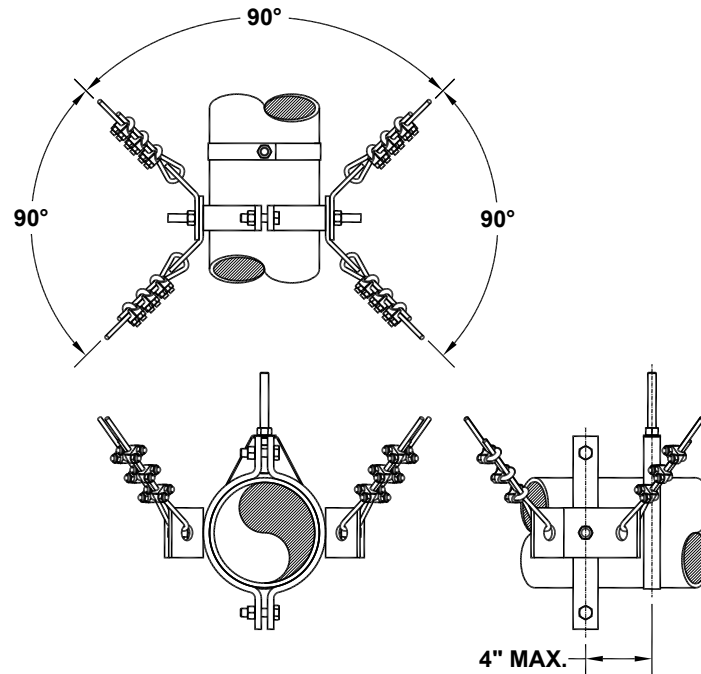




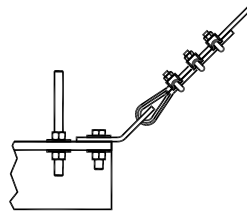
I6.33-I6.35 KSCC ATTACHED TO KFPC CLAMP



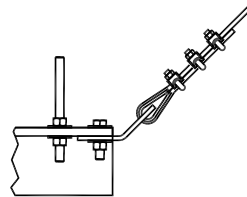
I6.33-I6.35 KSCC ATTACHED TO KFPC CLAMP



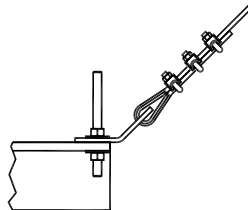
I6.36-I6.38 KSCC ATTACHED TO ROLLED
STRUCTURAL
TRAPEZE BAR



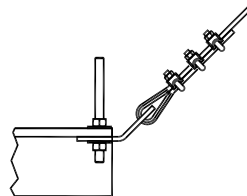
Option #1 Transverse
Restraint (T) Typical Both
Ends of Trapeze Bar



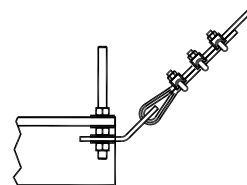
Option #2 Transverse
Restraint (T) Typical Both
Ends of Trapeze Bar



Option #3 Transverse
Restraint (T) Typical Both
Ends of Trapeze Bar



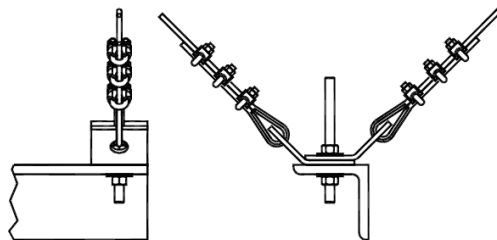
Option #4 Transverse
Restraint (T) Typical Both
Ends of Trapeze Bar



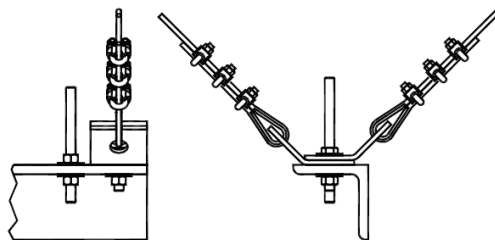
Option #5 Transverse
Restraint (T) Typical Both
Ends of Trapeze Bar

Sheet F - Views L & M

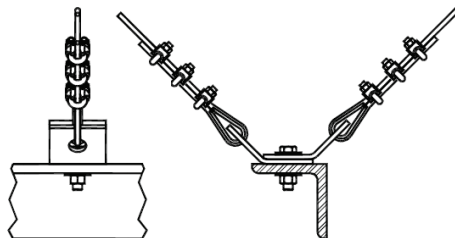
I6.36-I6.38 KSCC ATTACHED TO ROLLED STRUCTURAL
TRAPEZE BAR



Option #1 Longitudinal Restraint (L)
Typical - Both Ends of Trapeze Bar

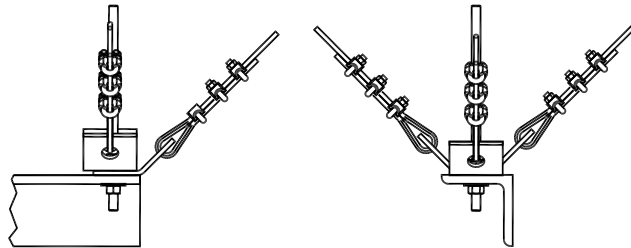


Option #2 Longitudinal Restraint (L)
Typical - Both Ends of Trapeze Bar

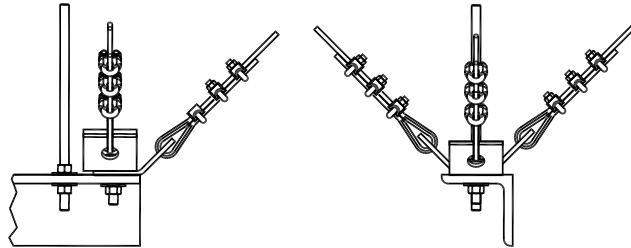


Option #3 Longitudinal Restraint (L)
At Center of Trapeze BAR

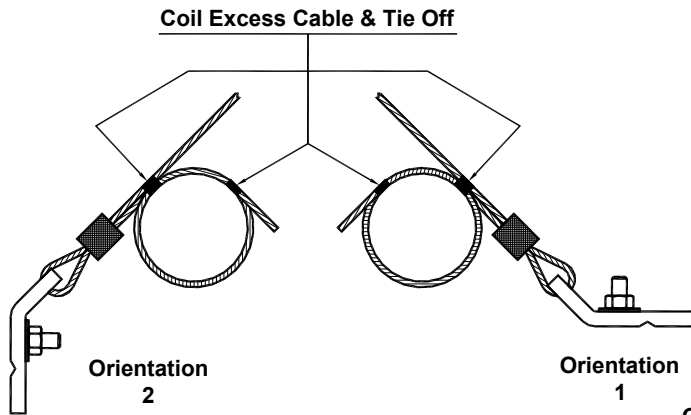
I6.36-I6.38 KSCC ATTACHED TO ROLLED STRUCTURAL
TRAPEZE BAR



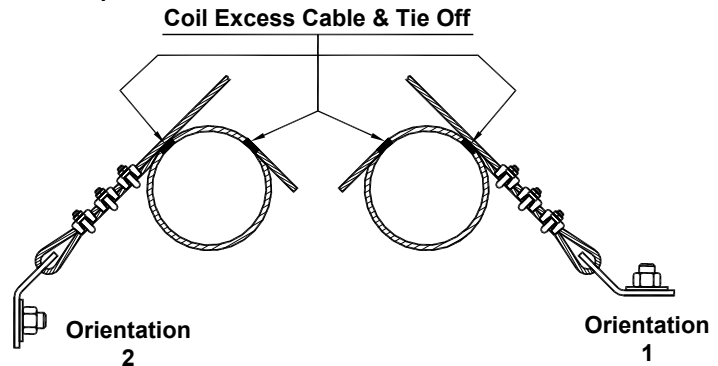
Option #1 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar



Option #2 Combined Restraint (TL)
Typical - Both Ends of Trapeze Bar

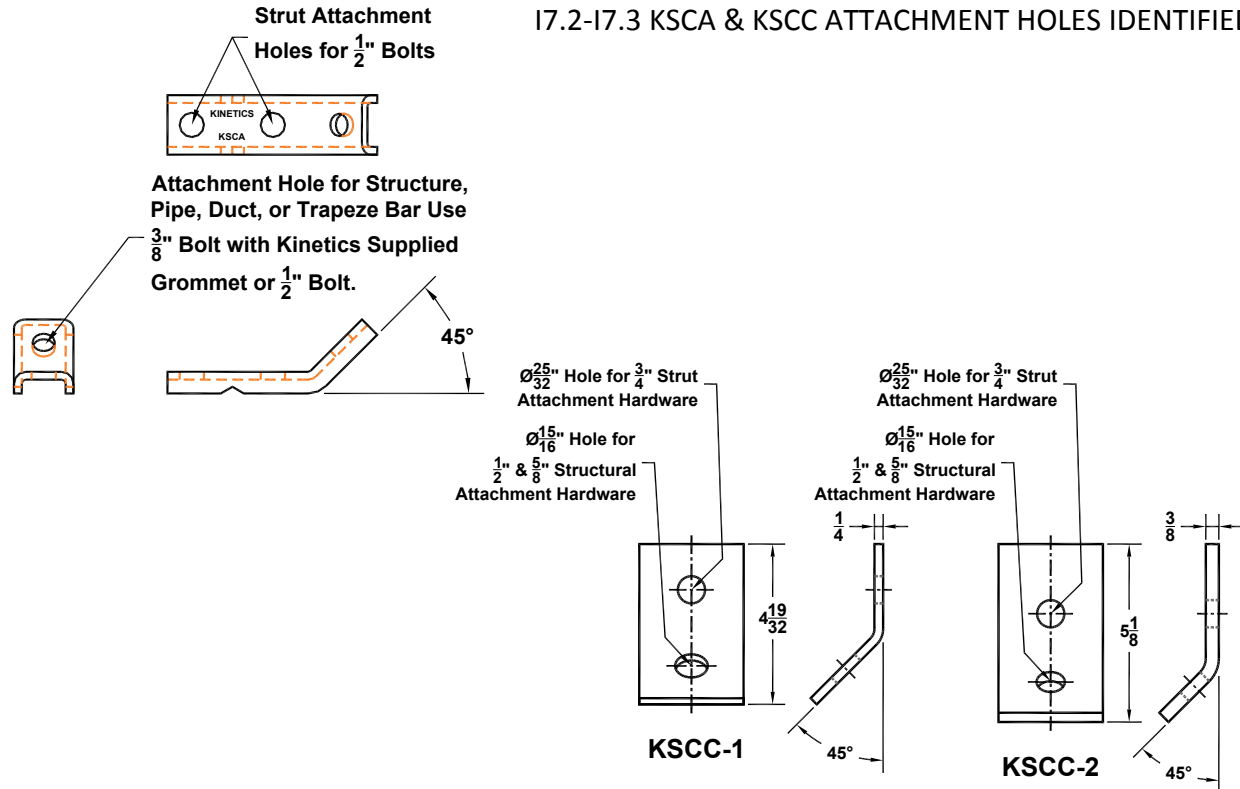


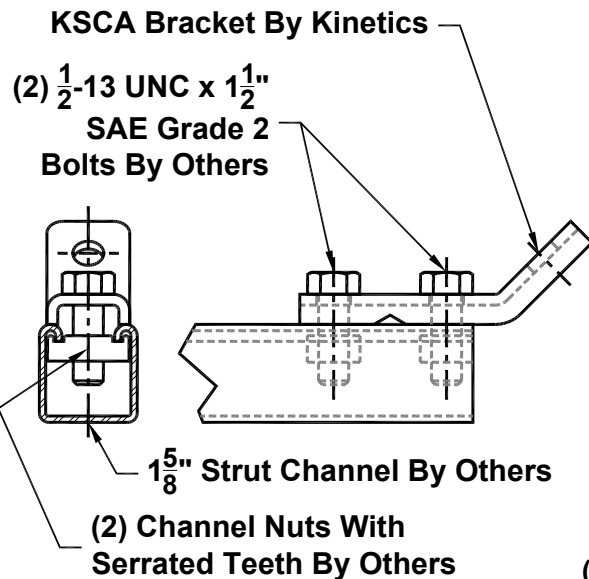
I6.40-I6.41 EXCESS CABLE COIL FOR
KSCU & KSCC



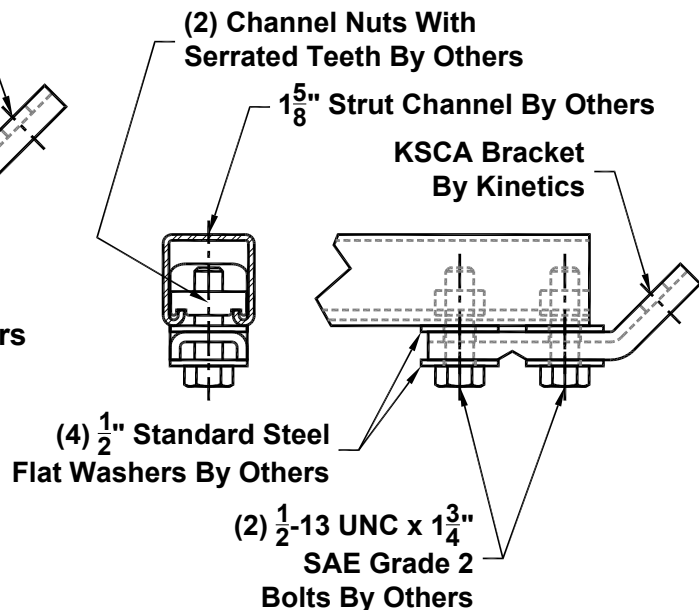
17.0 STRUT RESTRAINTS

17.2-17.3 KSCA & KSCC ATTACHMENT HOLES IDENTIFIED

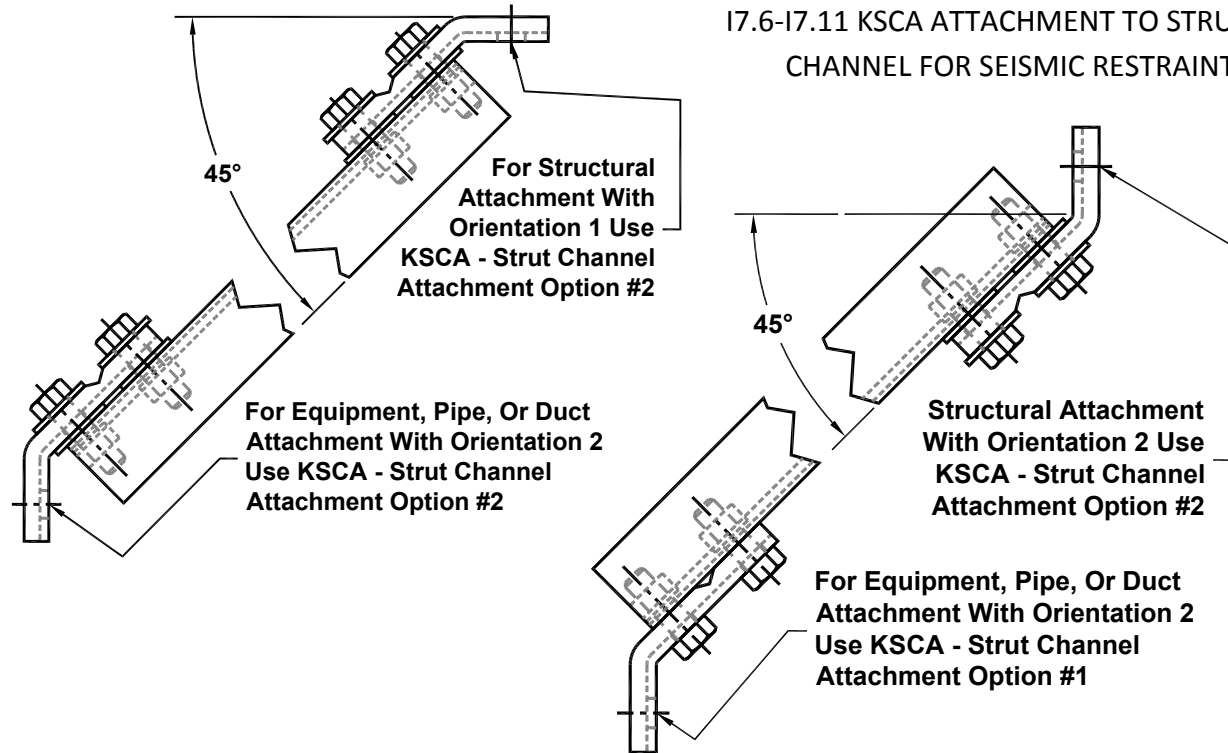




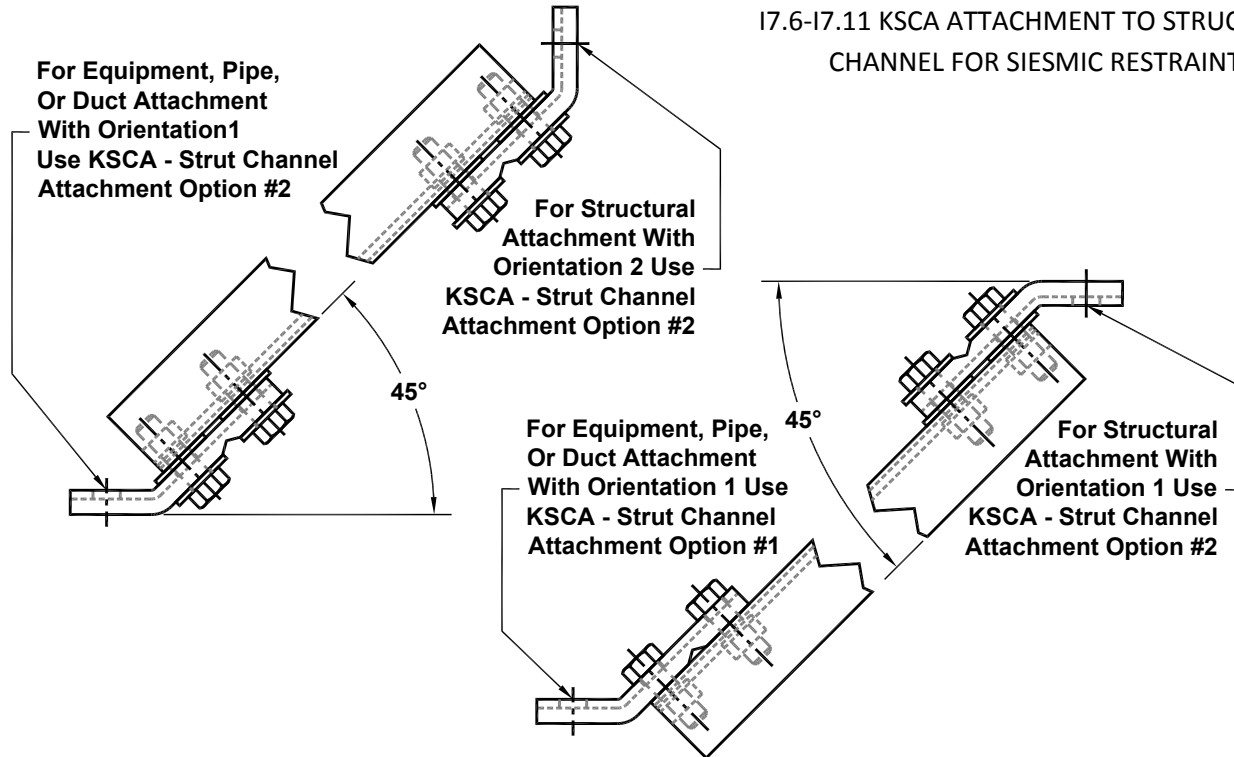
17.4-17.5 KSCA ATTACHMENT TO STRUT CHANNEL



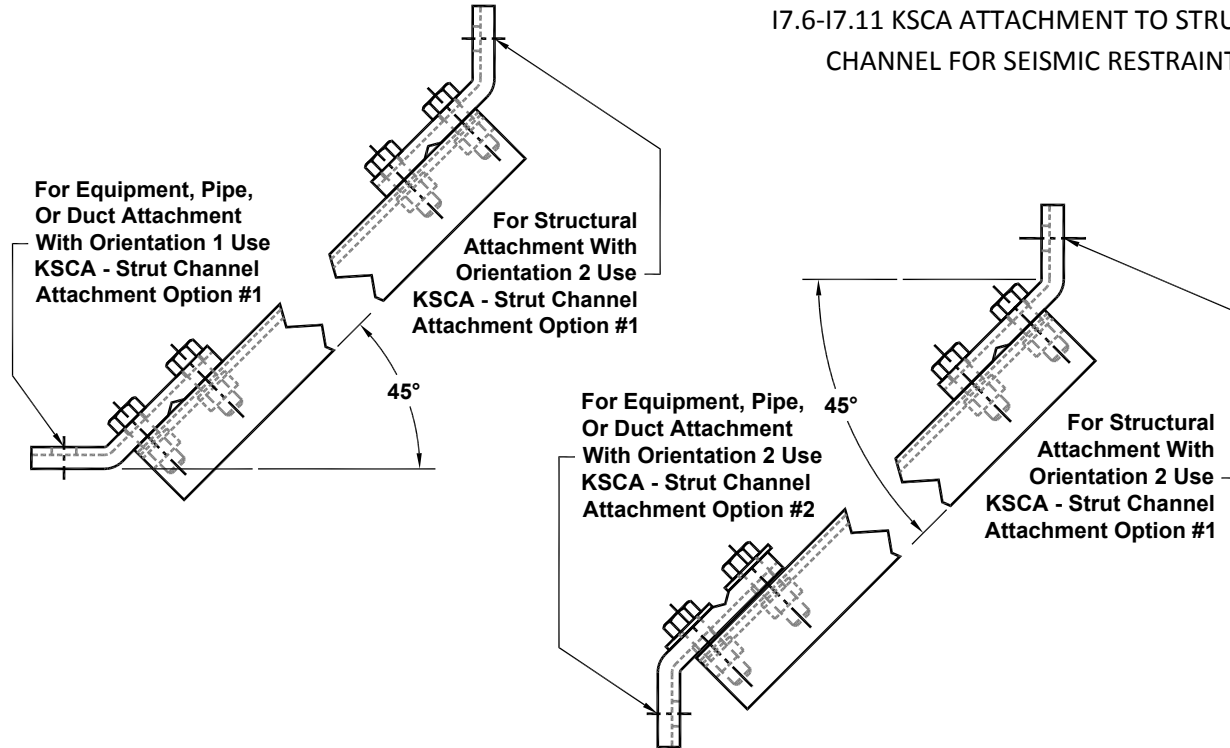
17.6-17.11 KSCA ATTACHMENT TO STRUT CHANNEL FOR SEISMIC RESTRAINTS

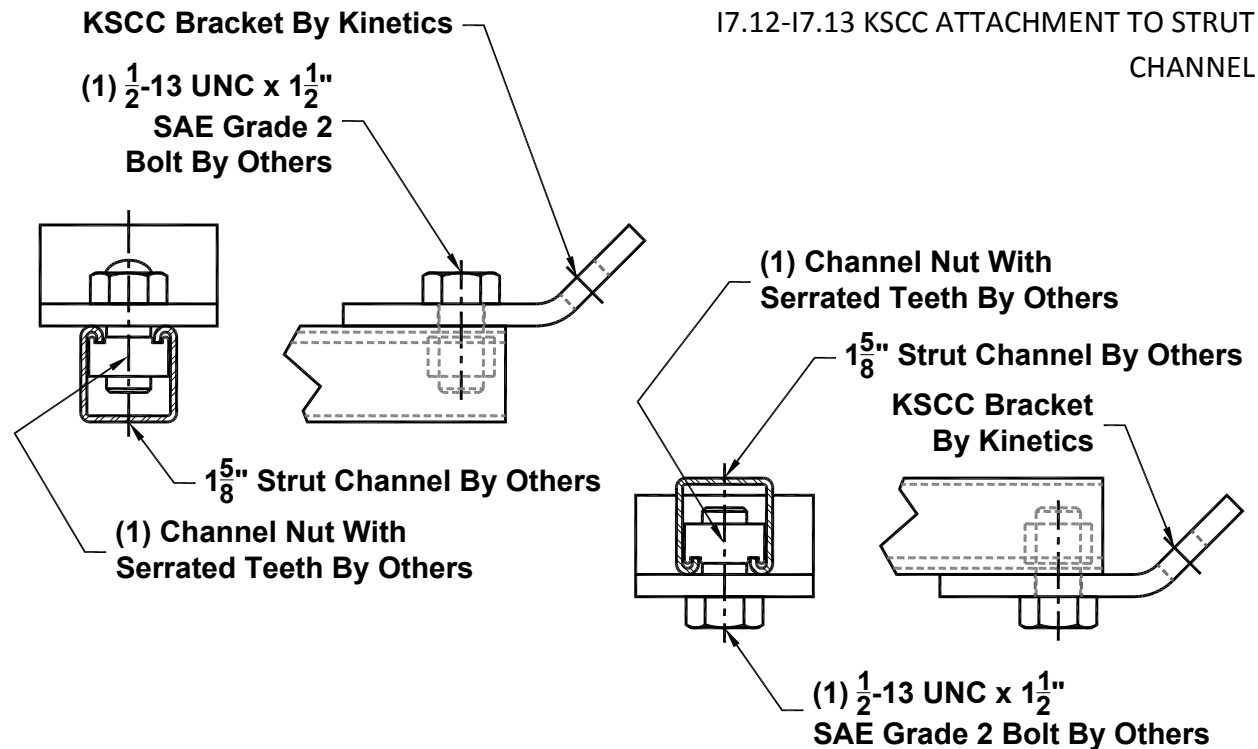


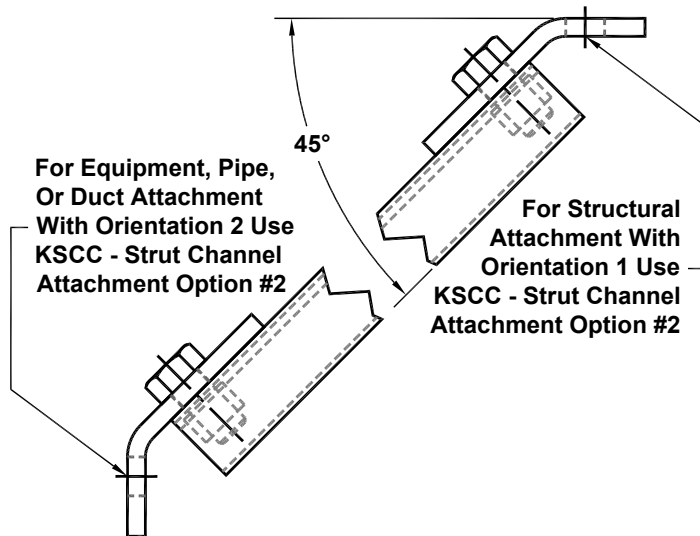
17.6-17.11 KSCA ATTACHMENT TO STRUCTURAL CHANNEL FOR SEISMIC RESTRAINTS



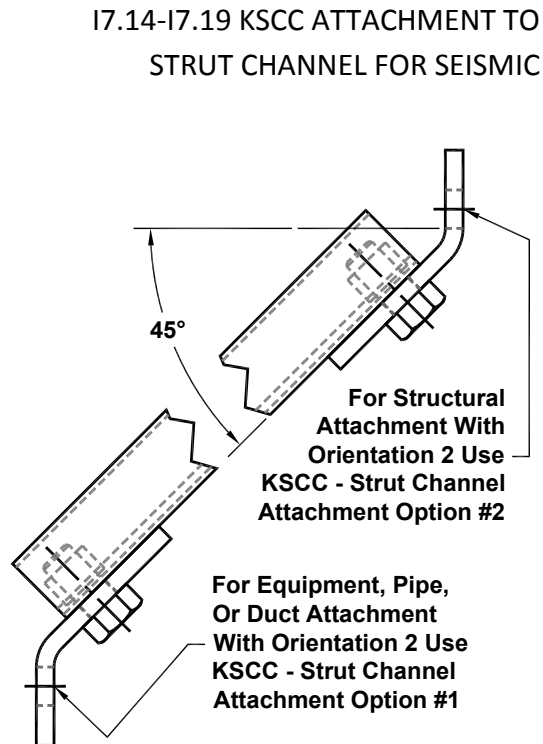
17.6-17.11 KSCA ATTACHMENT TO STRUT
CHANNEL FOR SEISMIC RESTRAINTS



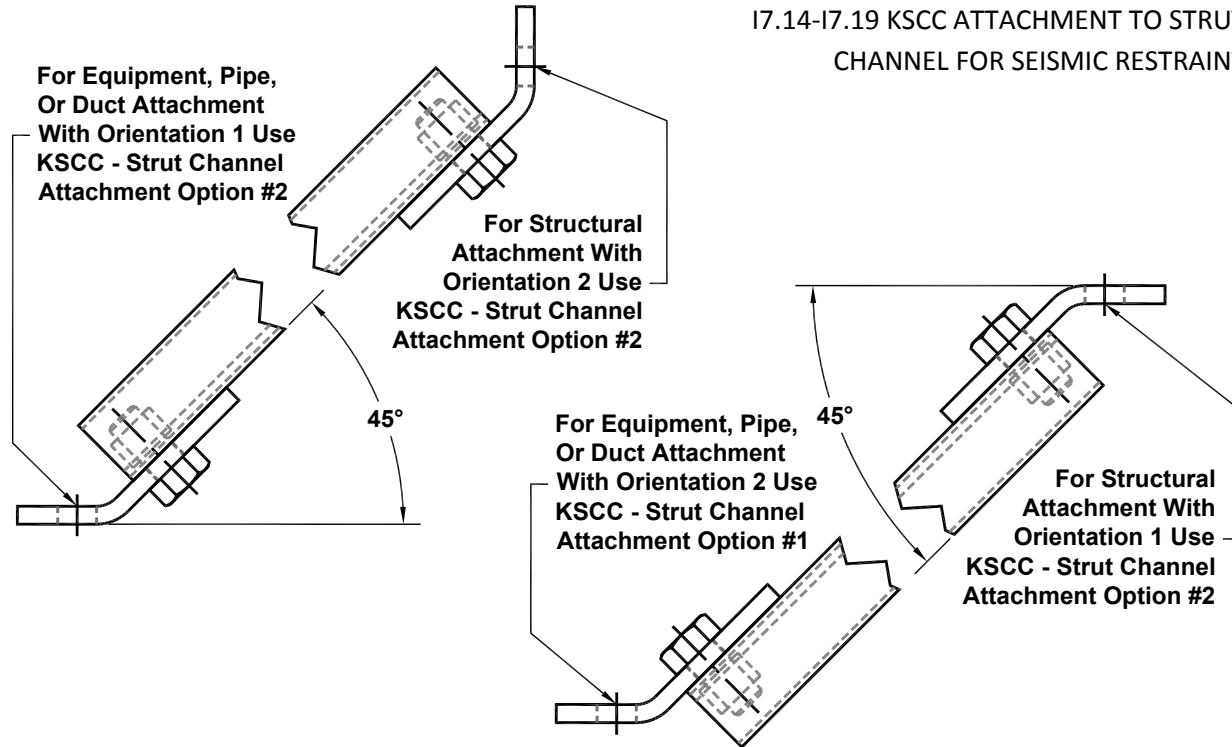




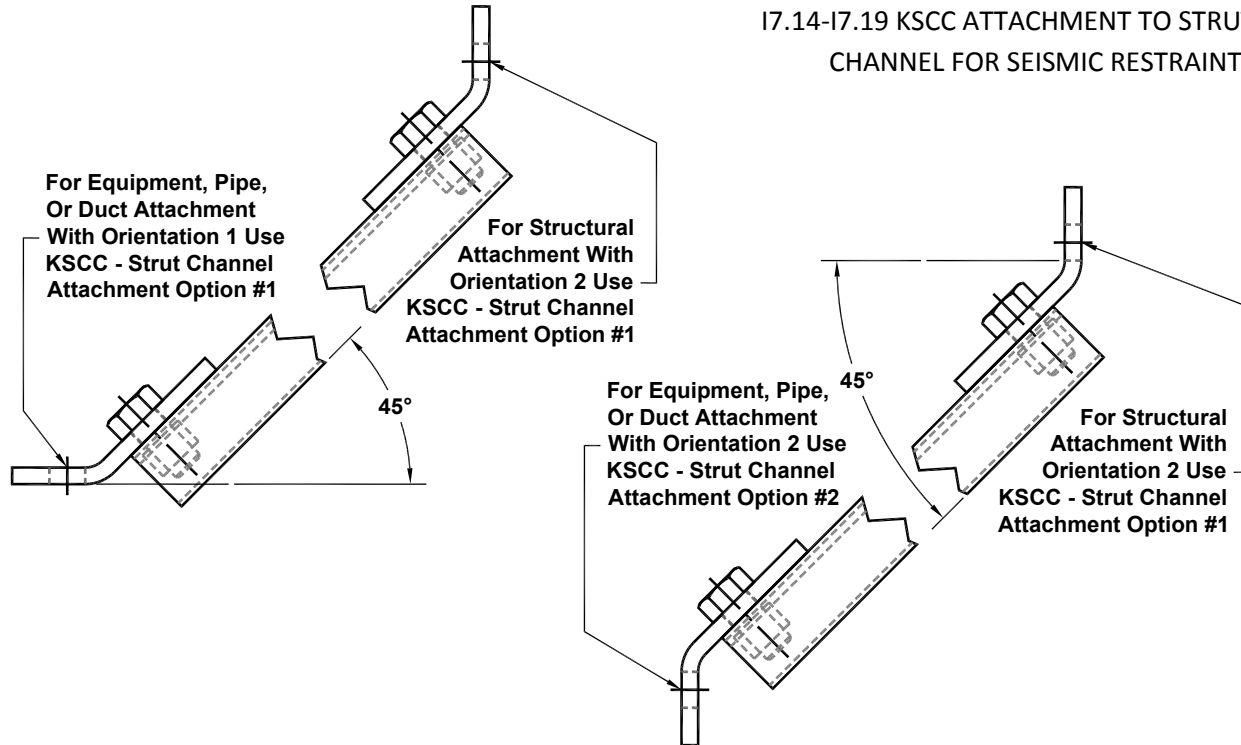
RESTRAI
NTS

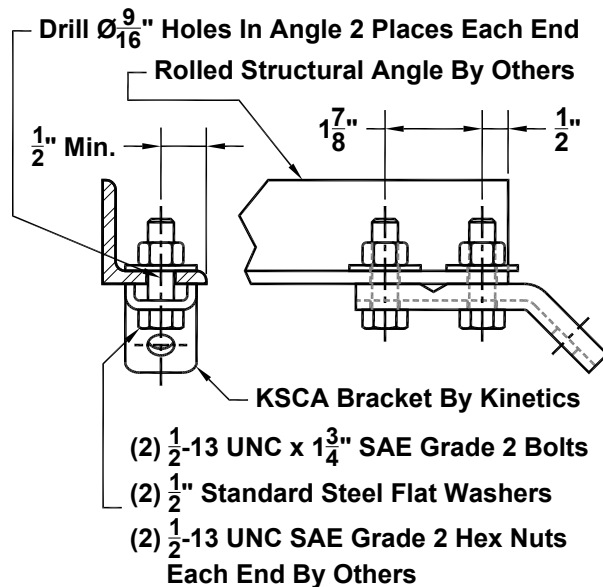


17.14-17.19 KSCC ATTACHMENT TO STRUT CHANNEL FOR SEISMIC RESTRAINT

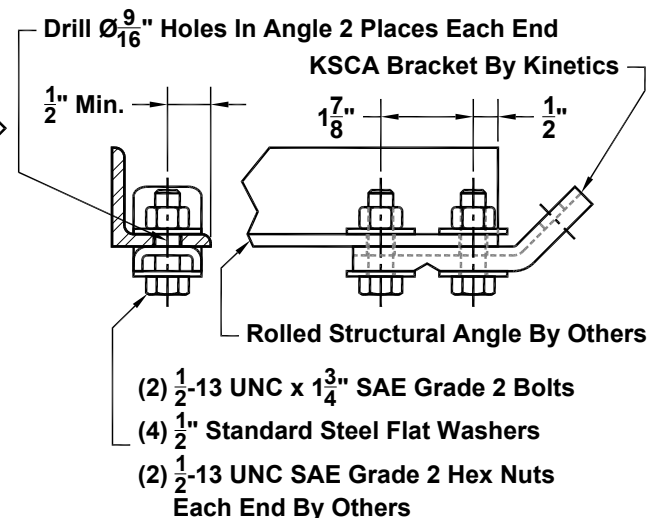


17.14-17.19 KSCC ATTACHMENT TO STRUT
CHANNEL FOR SEISMIC RESTRAINTS

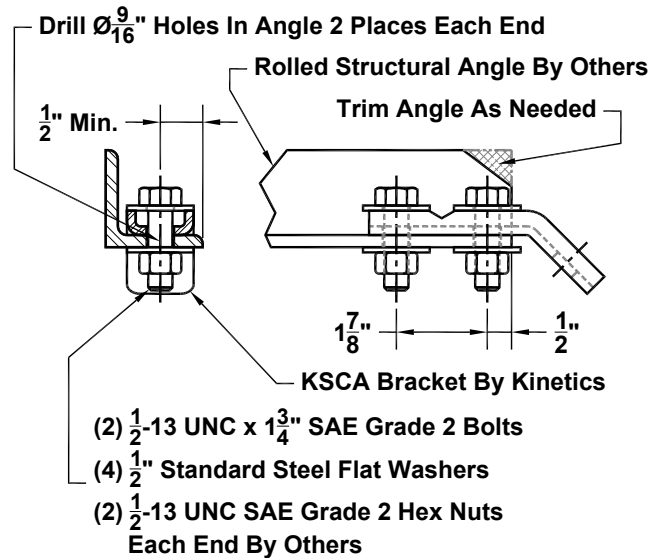


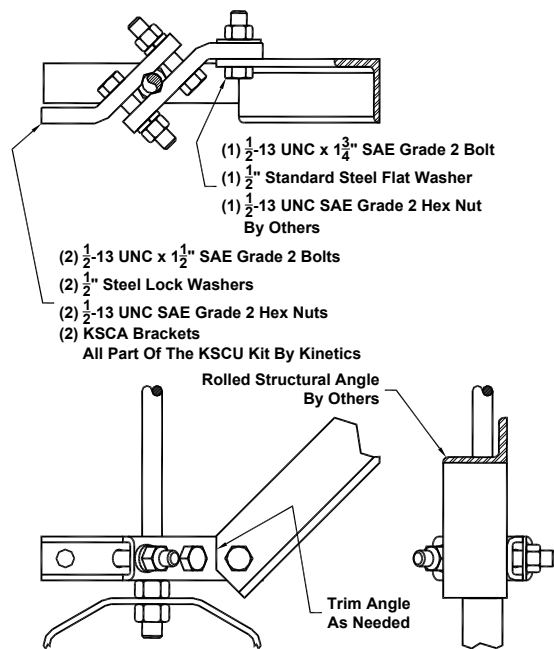


17.20-17.22 KSCA ATTACHMENT TO ROLLED ANGLE

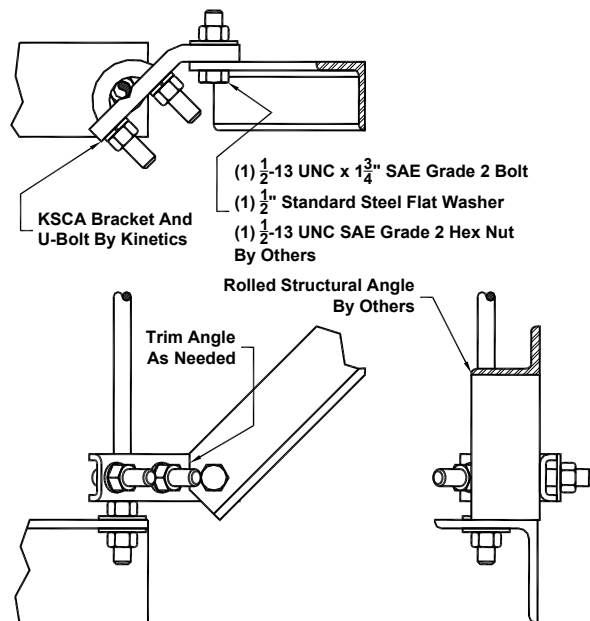


17.20-17.22 KSCA ATTACHMENT TO ROLLED ANGLE

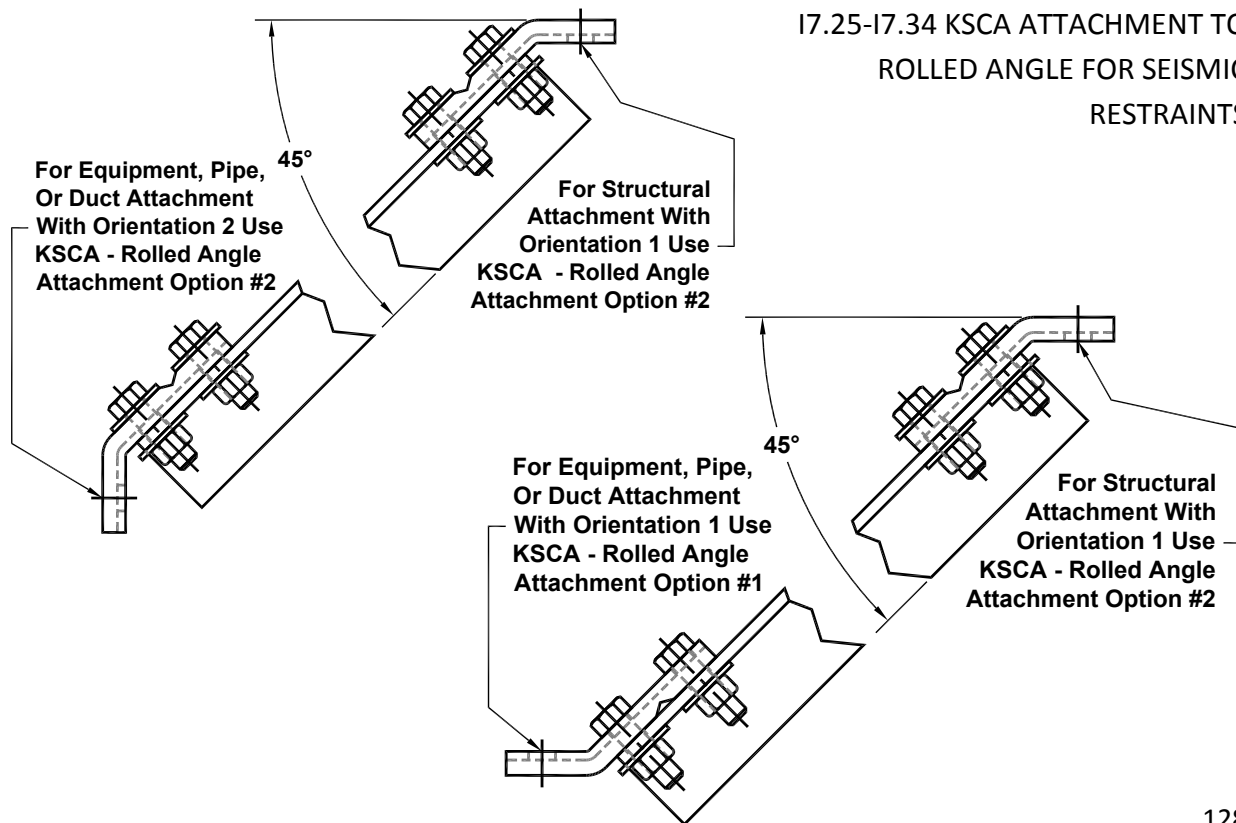




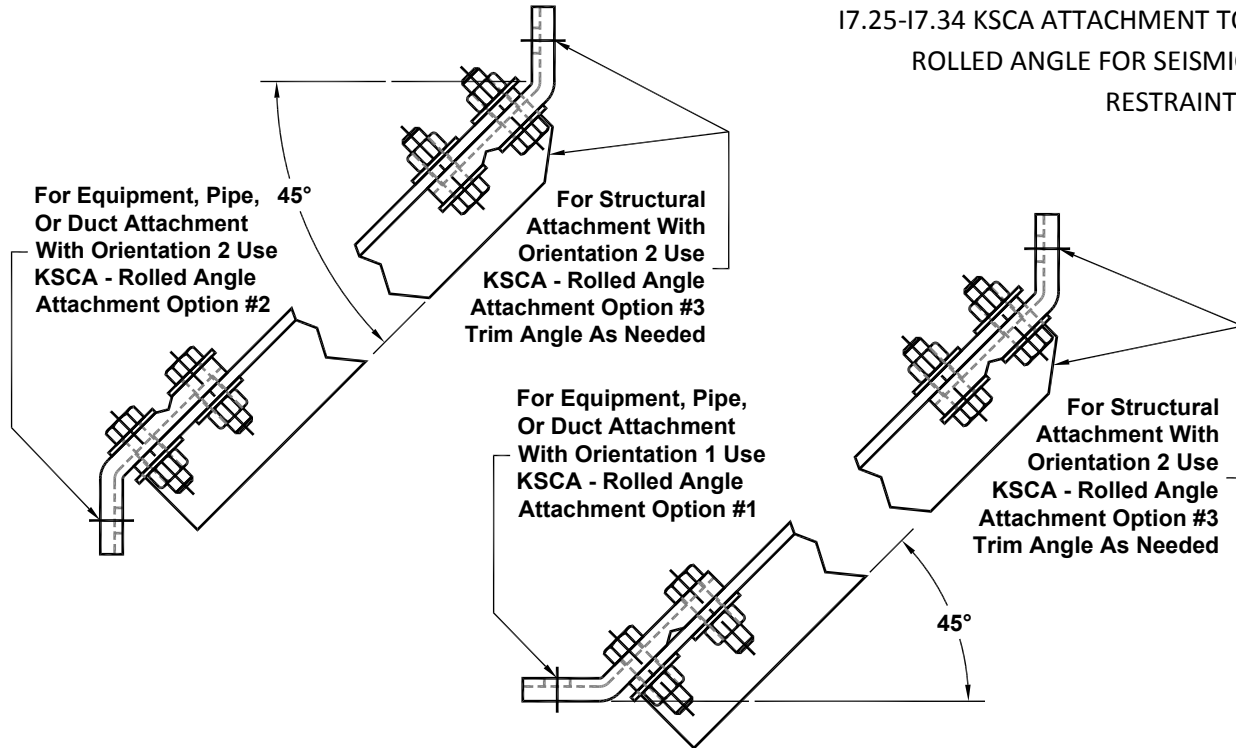
17.23-17.24 KSCA ATTACHMENT TO ROLLED ANGLE FOR CLEVIS & TRAPEZE BAR HANGER ROD



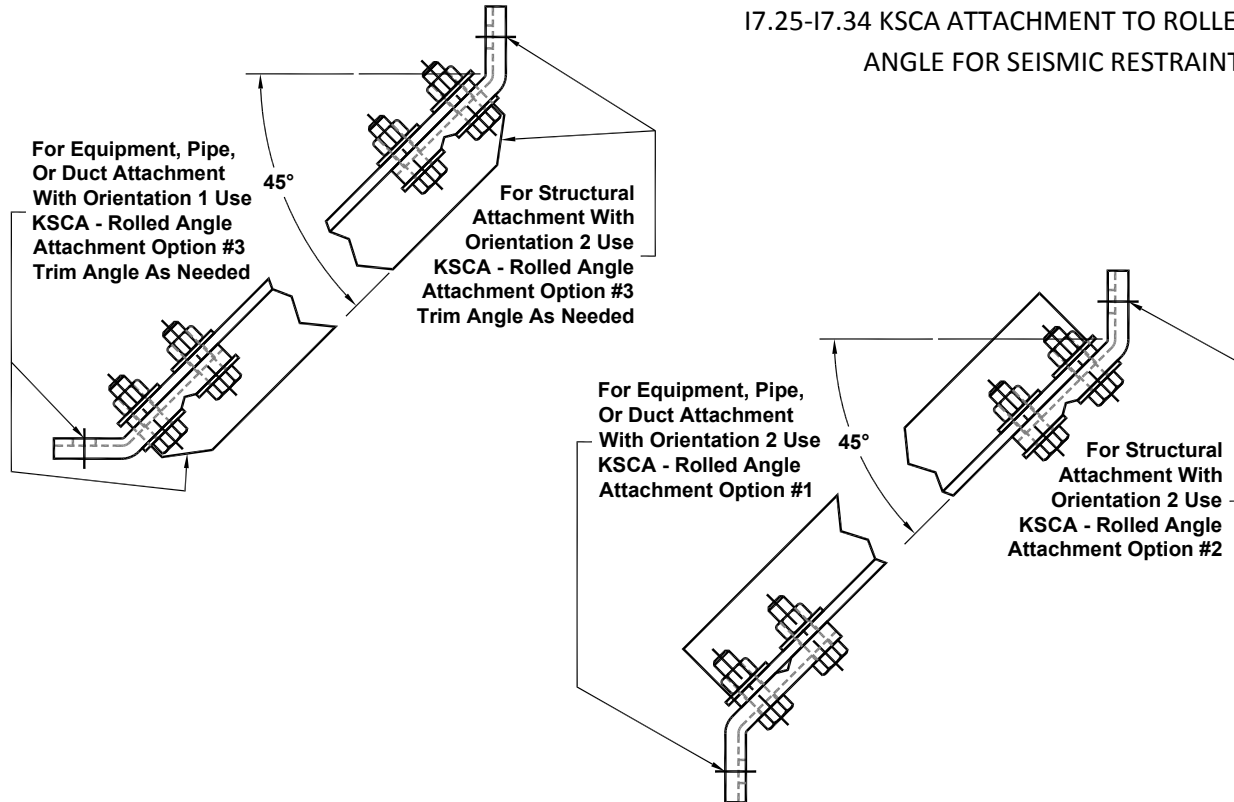
17.25-17.34 KSCA ATTACHMENT TO ROLLED ANGLE FOR SEISMIC RESTRAINTS



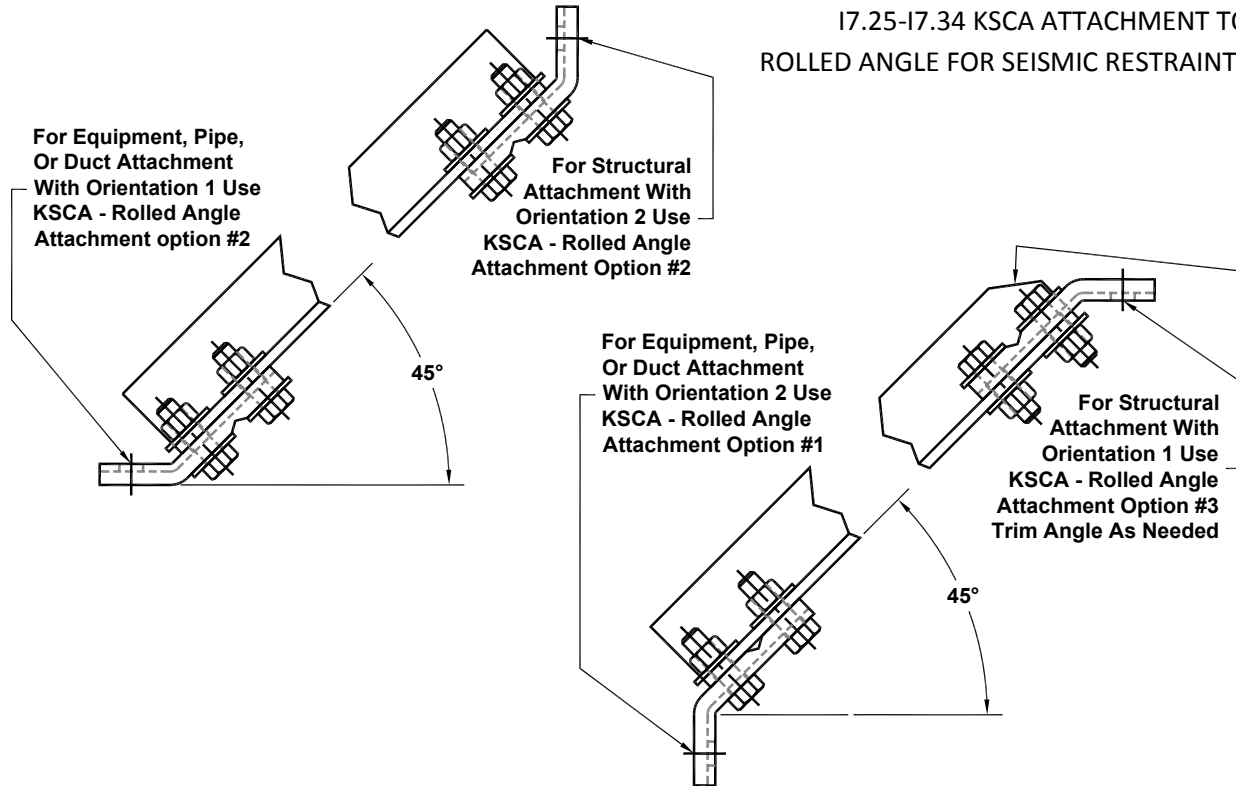
17.25-17.34 KSCA ATTACHMENT TO
ROLLED ANGLE FOR SEISMIC
RESTRAINTS



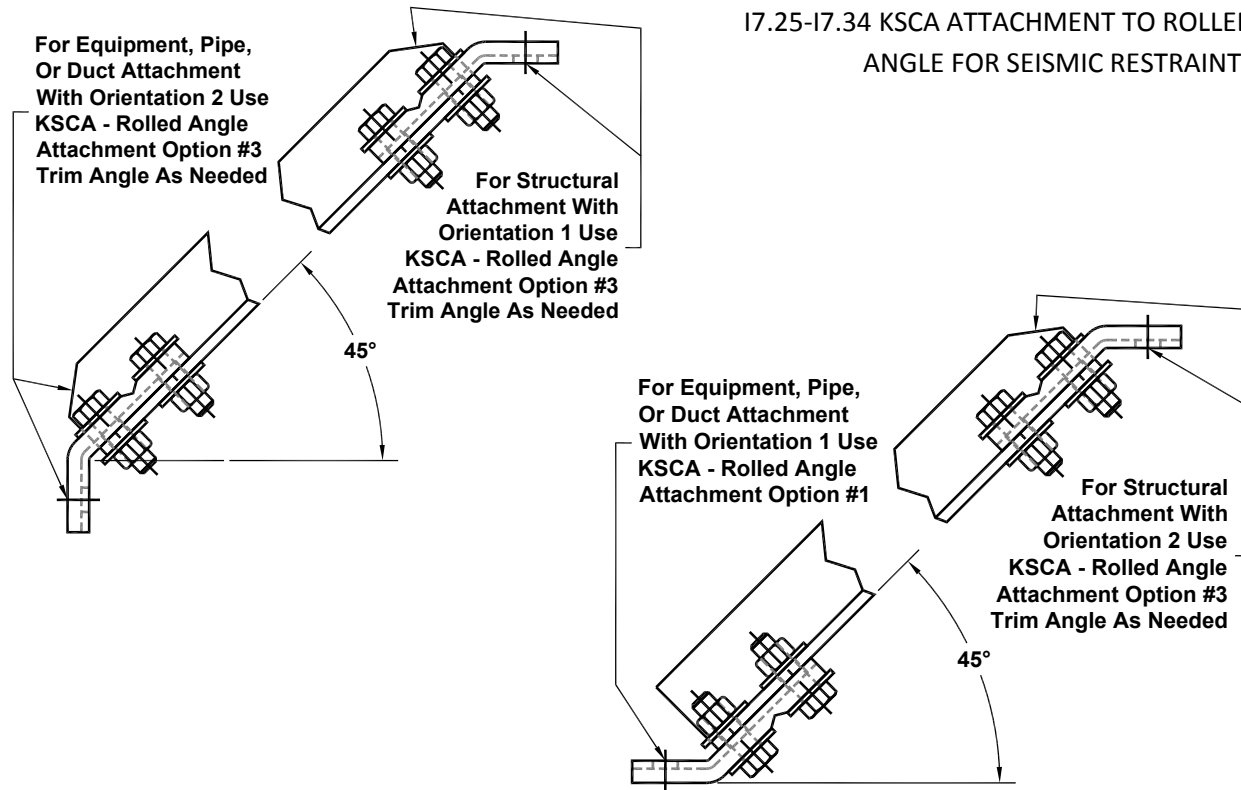
17.25-17.34 KSCA ATTACHMENT TO ROLLED ANGLE FOR SEISMIC RESTRAINTS

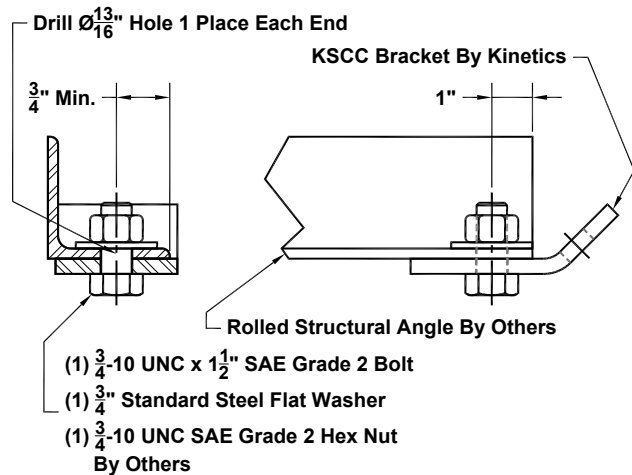


17.25-17.34 KSCA ATTACHMENT TO
ROLLED ANGLE FOR SEISMIC RESTRAINTS

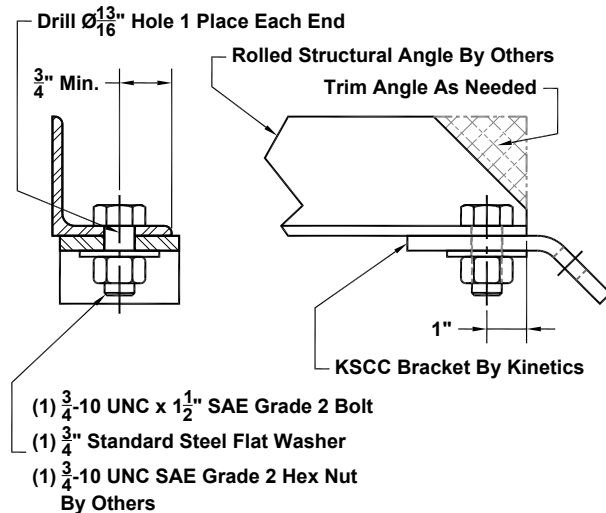


17.25-17.34 KSCA ATTACHMENT TO ROLLED ANGLE FOR SEISMIC RESTRAINTS

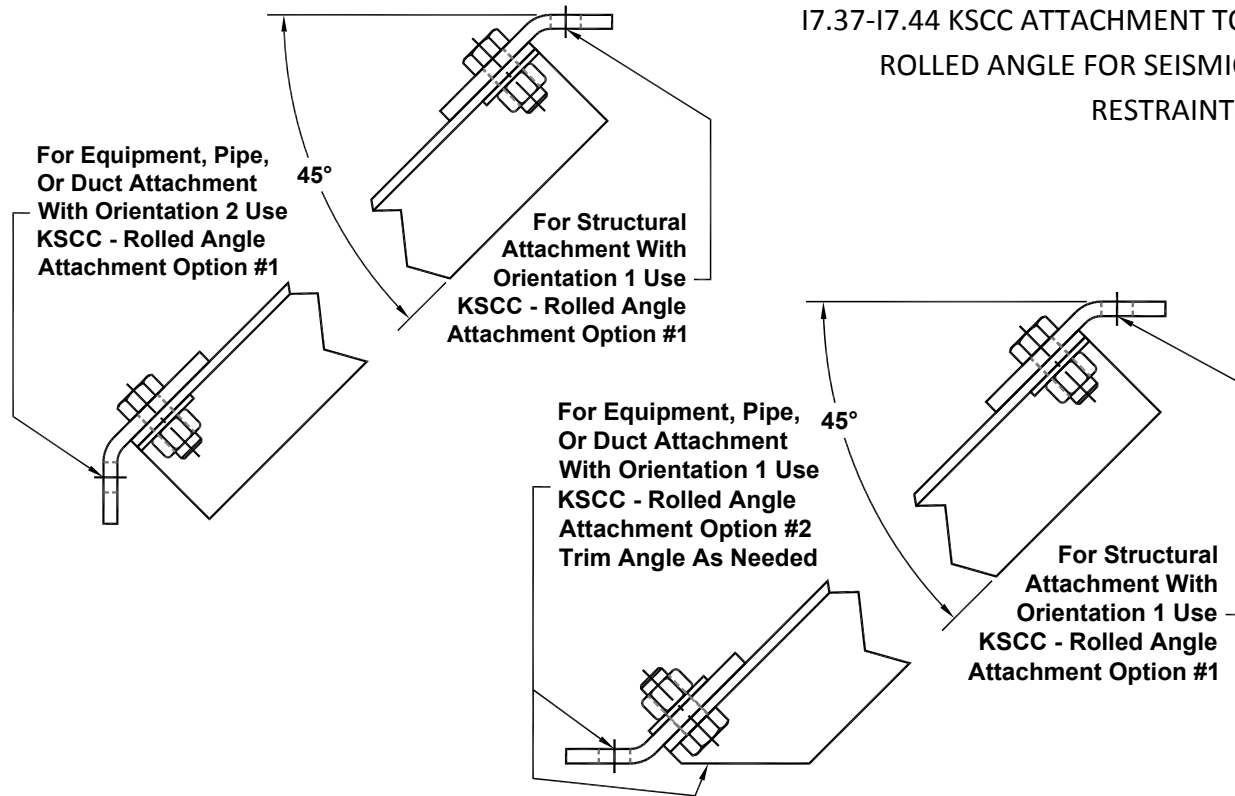




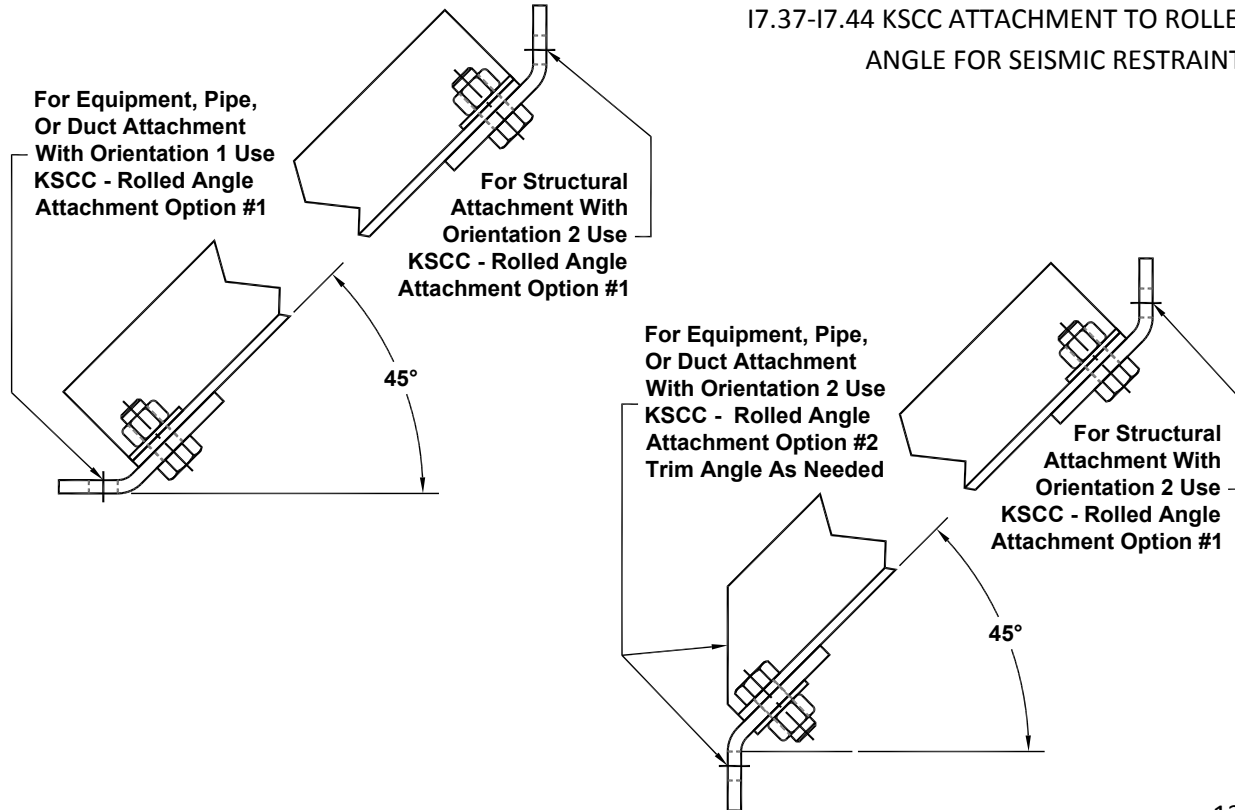
17.35-17.36 KSCC ATTACHMENT TO ROLLED ANGLE



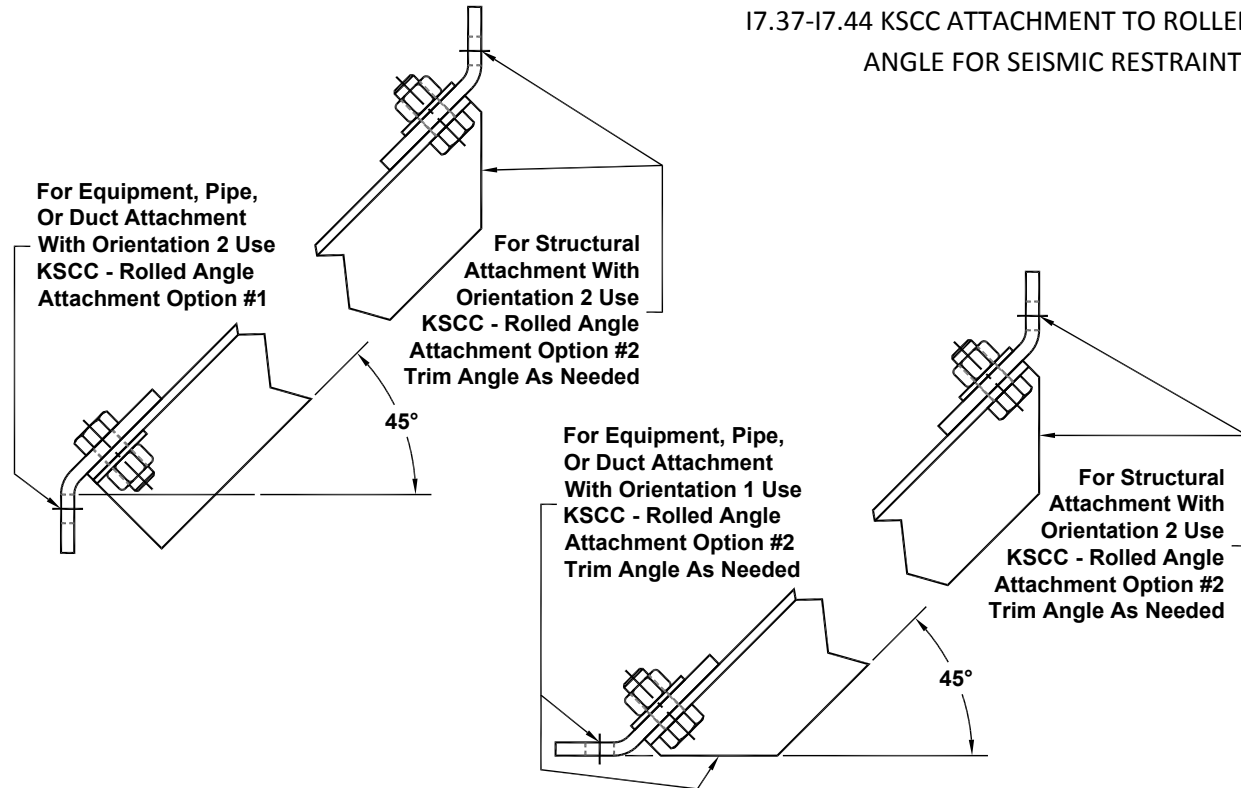
17.37-17.44 KSCC ATTACHMENT TO
ROLLED ANGLE FOR SEISMIC
RESTRAINTS



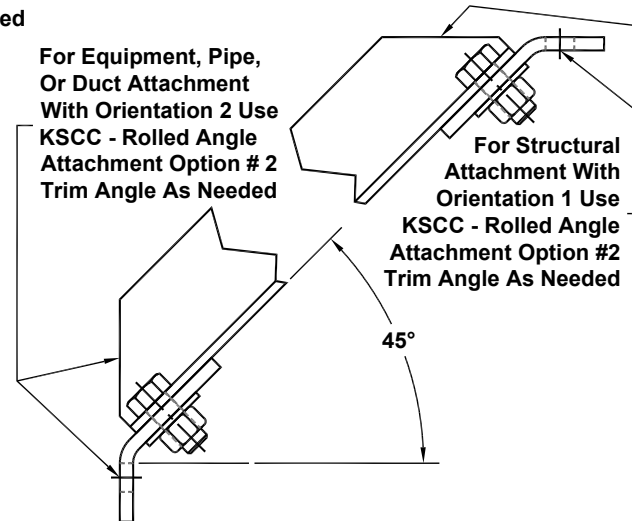
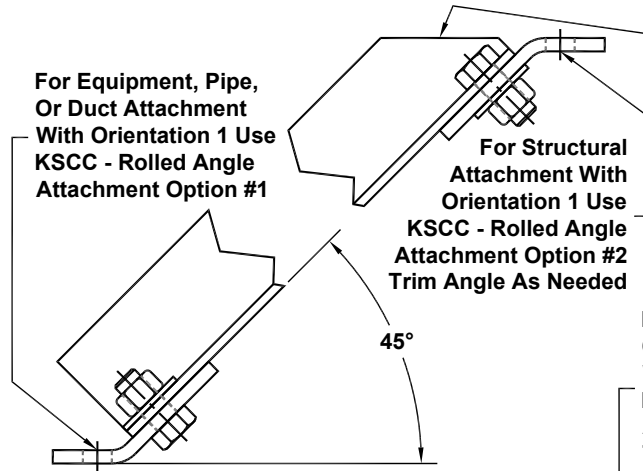
17.37-17.44 KSCC ATTACHMENT TO ROLLED
ANGLE FOR SEISMIC RESTRAINTS



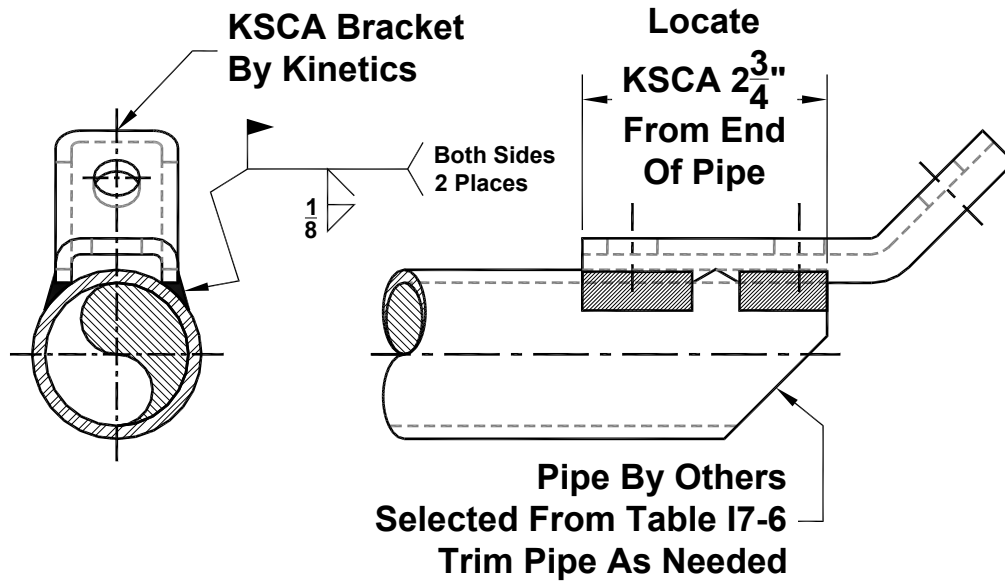
17.37-17.44 KSCC ATTACHMENT TO ROLLED
ANGLE FOR SEISMIC RESTRAINTS

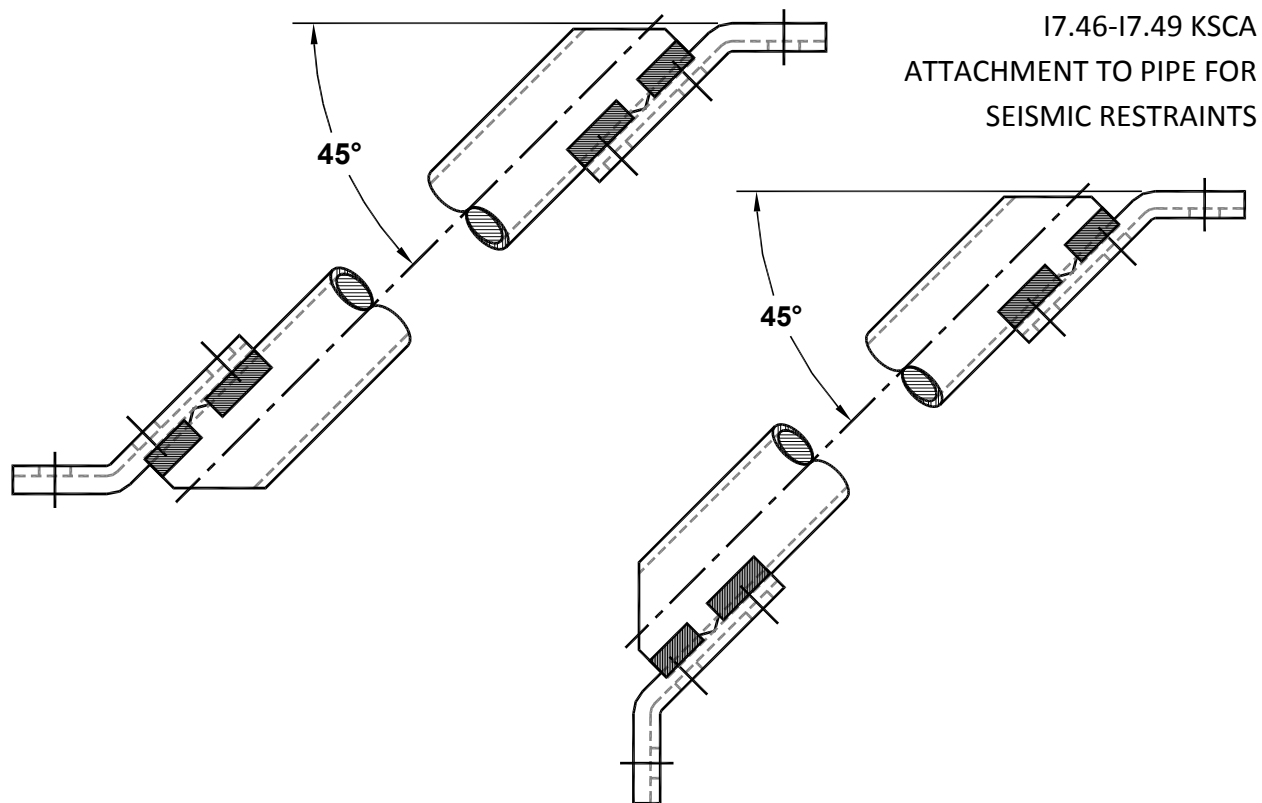


17.37-17.44 KSCC ATTACHMENT TO ROLLED ANGLE FOR SEISMIC RESTRAINTS

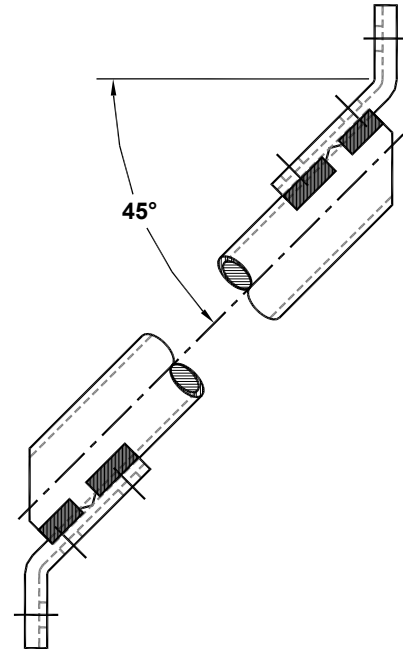
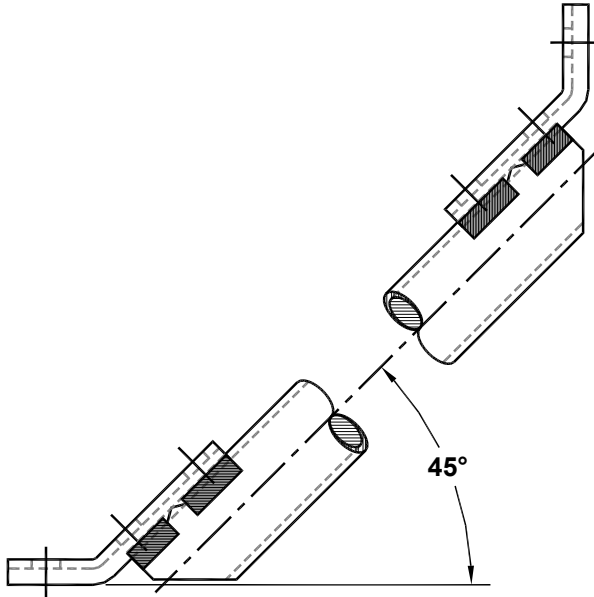


17.45 KSCA WELD ATTACHMENT TO
SCHEDULE 40 IPS PIPE

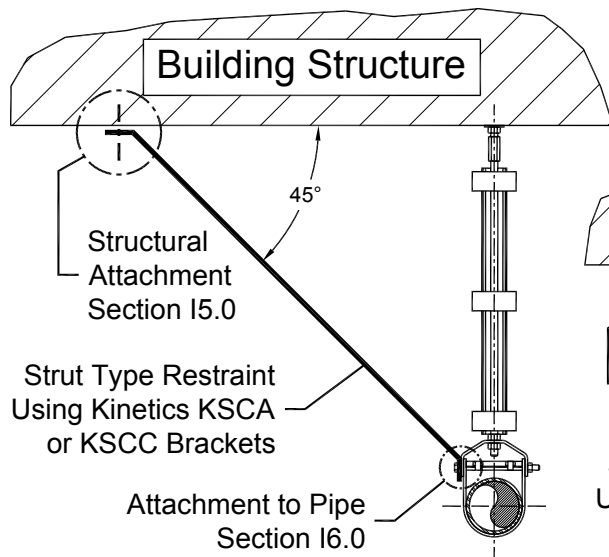




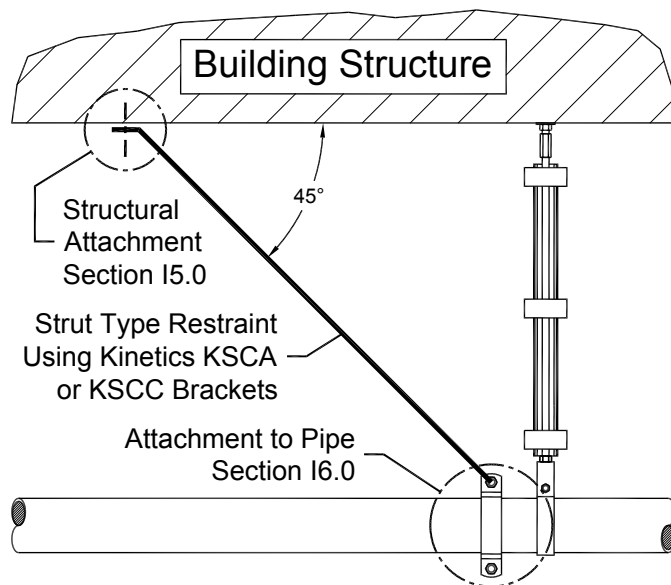
17.46-17.49 KSCA ATTACHMENT TO PIPE FOR
SEISMIC RESTRAINTS



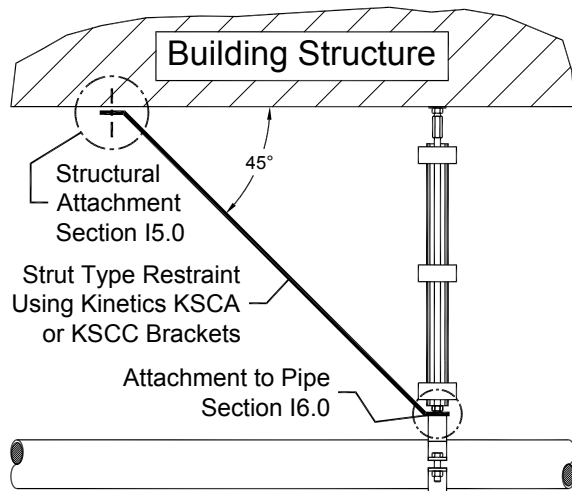
17.50-17.53 SINGLE CLEVIS SUPPORTED PIPE
RESTRAINT SCHEMATIC



Sheet H - View C

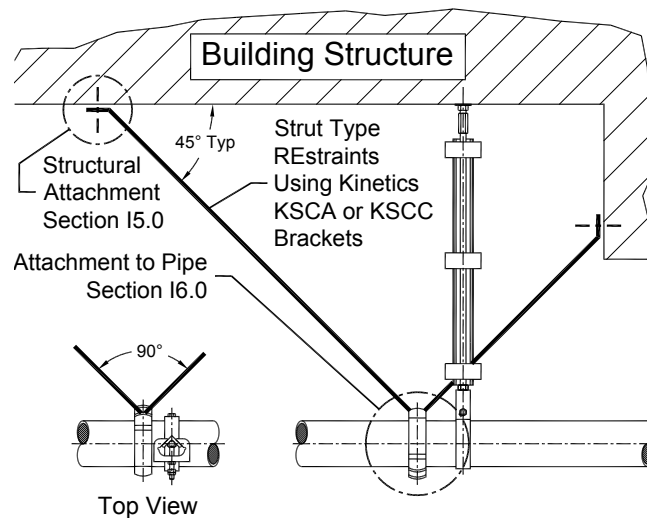


Sheet H - View B



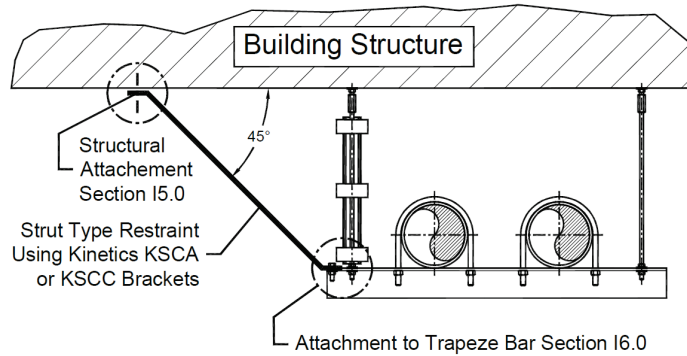
Sheet H - View A

17.50-17.53 SINGLE CLEVIS SUPPORTED PIPE RESTRAINT SCHEMATIC

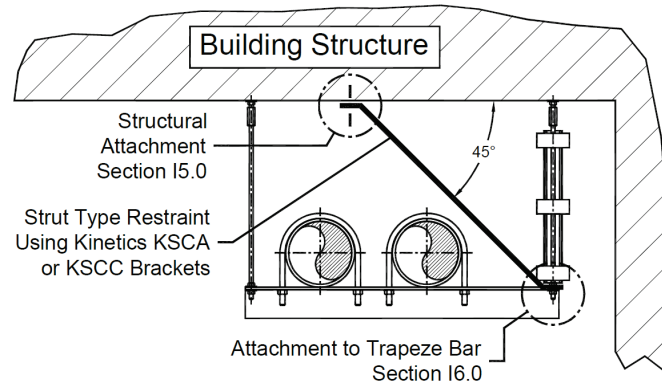


Sheet H - View D

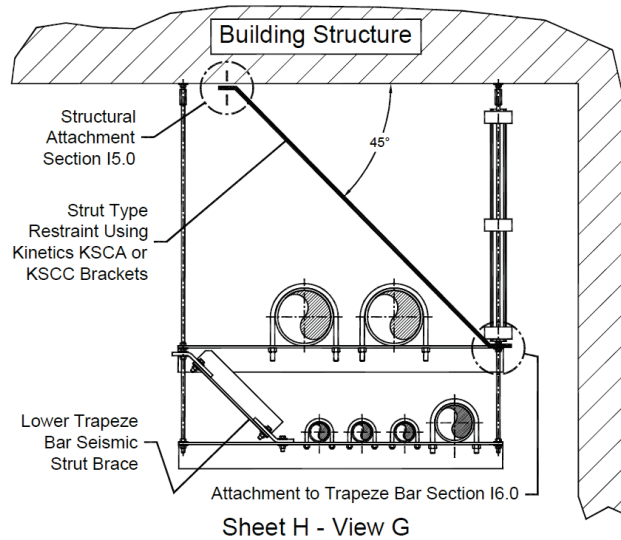
17.53-17.61 TRAPEZE SUPPORTED PIPE RESTRAINT SCHEMATIC



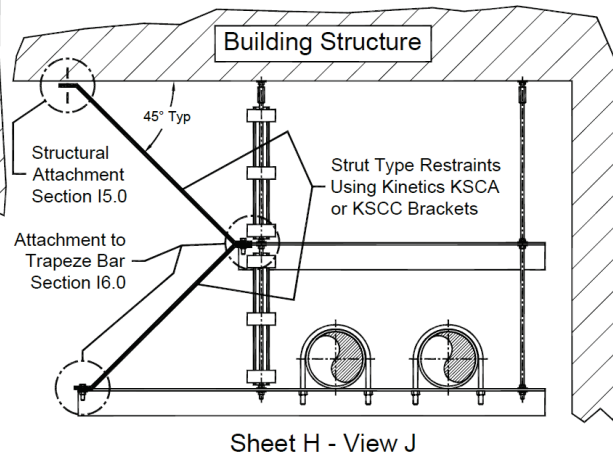
Sheet H - View H



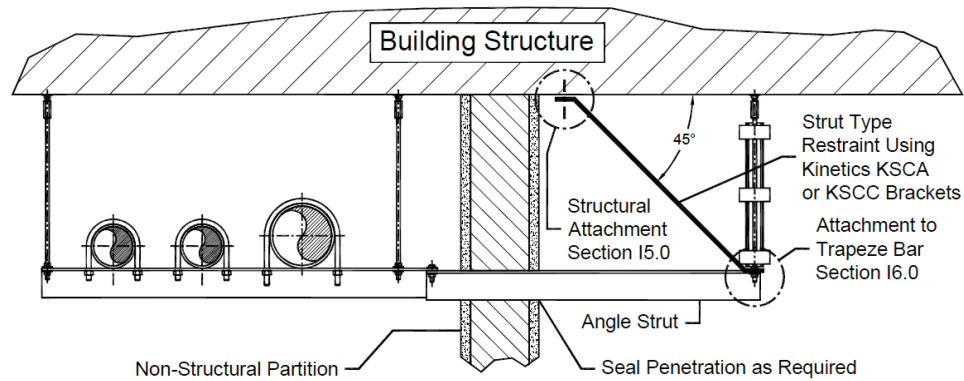
Sheet H - View E



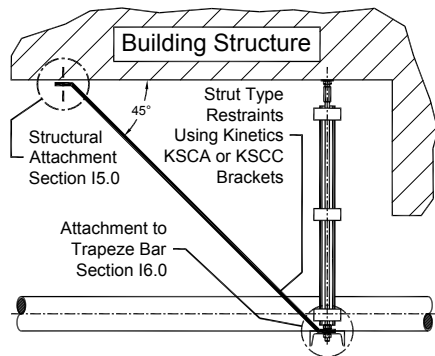
17.53-17.61 TRAPEZE SUPPORTED PIPE RESTRAINT SCHEMATIC



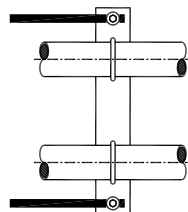
17.53-17.61 TRAPEZE SUPPORTED PIPE RESTRAINT
SCHEMATIC



Sheet H - View F

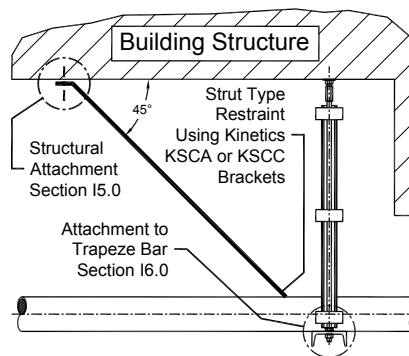


Sheet H - View K
Side View Opt. #1

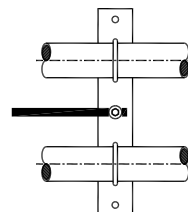


Top View Opt. #1

I7.53-I7.61 TRAPEZE SUPPORTED PIPE RESTRAINT SCHEMATIC

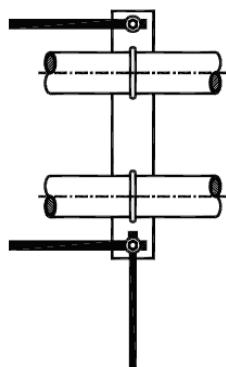


Sheet H - View K
Side View Opt. #2

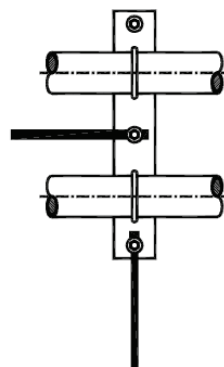


Top View Opt. #2

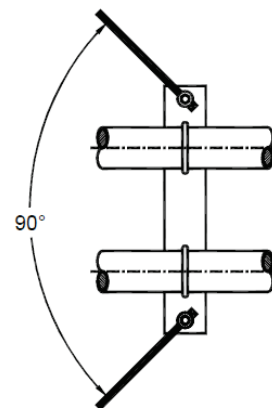
17.53-17.61 TRAPEZE SUPPORTED PIPE RESTRAINT
SCHEMATIC



Transverse & Longitudinal (TL)
Restraint Option #1

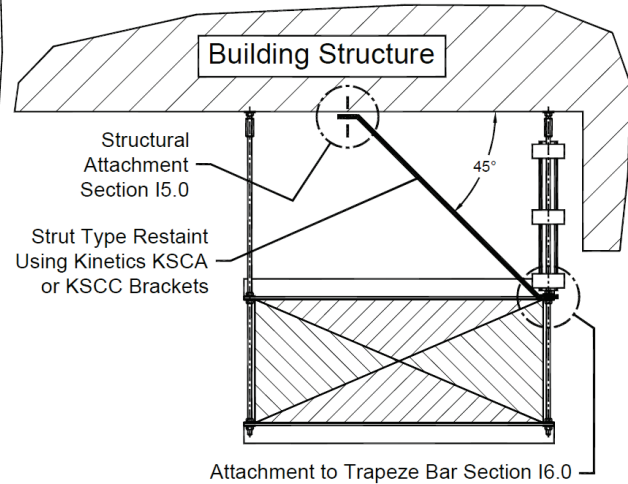
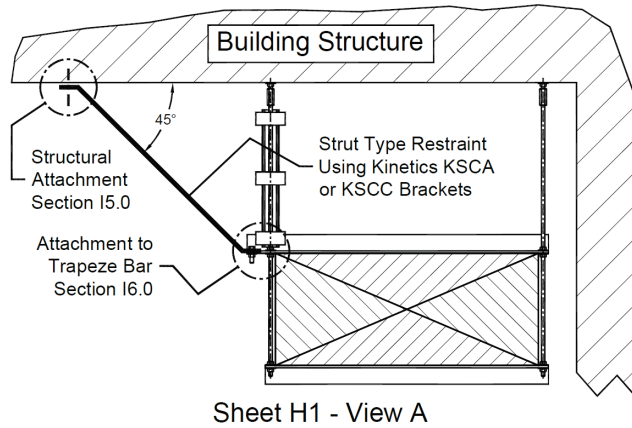


Transverse & Longitudinal (TL)
Restraint Option #2



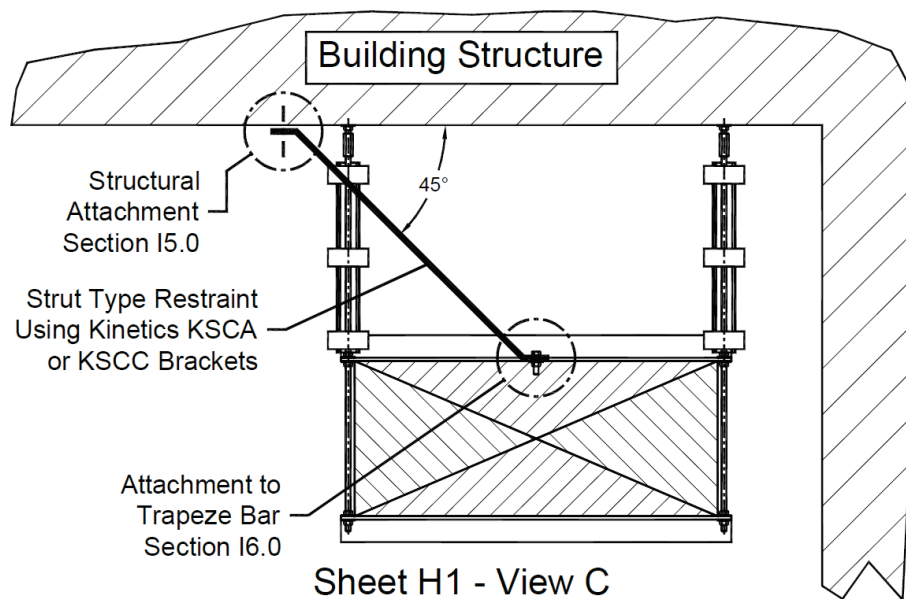
Transverse & Longitudinal (TL)
Restraint Option #3

17.62-17.64 TRAPPED RECTANGULAR DUCT RESTRAINT SCHEMATIC

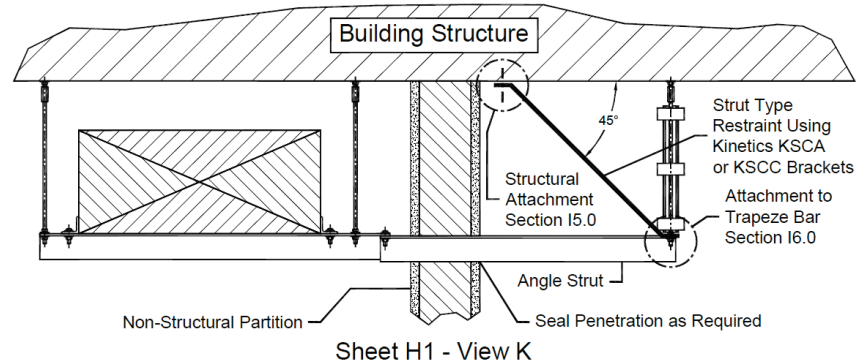
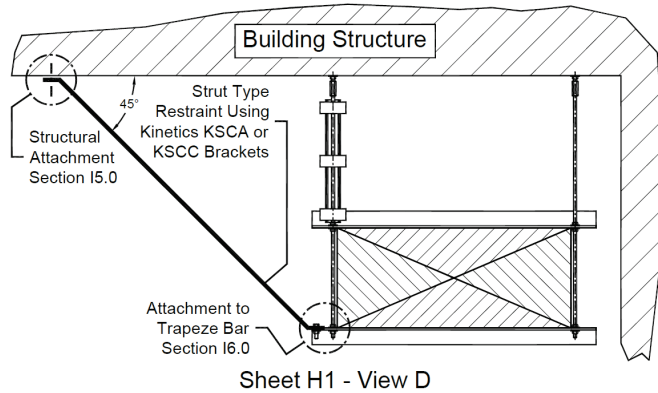


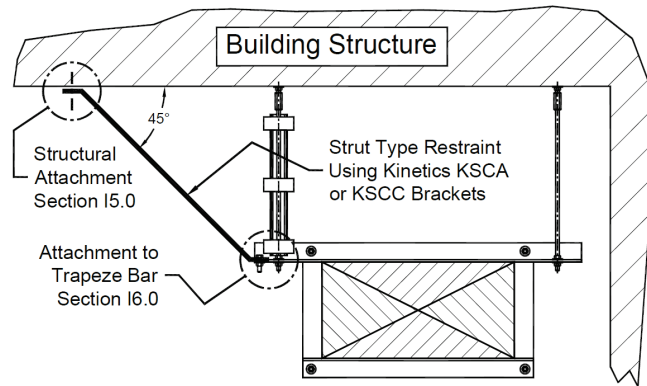
Sheet H1 - View B

17.62-17.64 TRAPPED RECTANGULAR DUCT
RESTRAINT SCHEMATIC



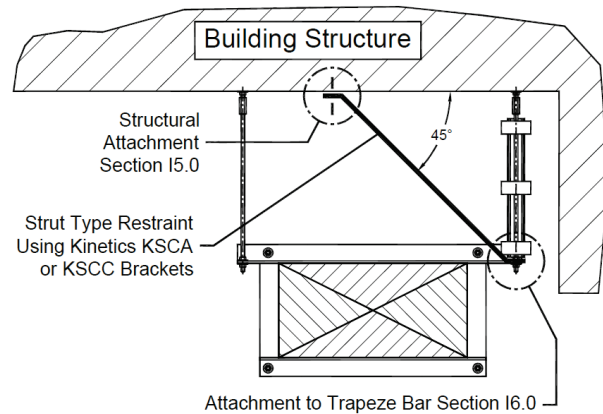
17.65 & 17.70 SUPPORTED RECTANGULAR DUCT RESTRAINT SCHEMATIC



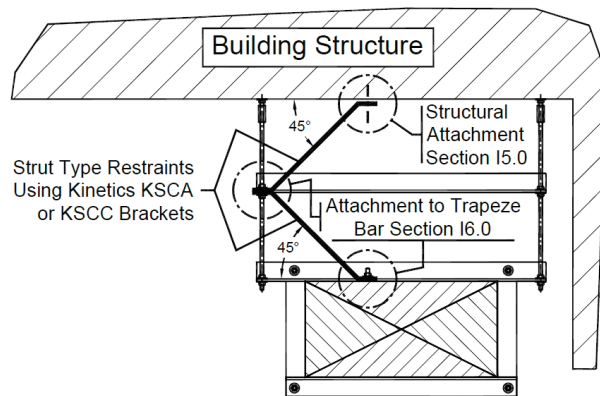


Sheet H1 - View F

17.66-17.69 SUSPENDED RECTANGULAR DUCT RESTRAINT SCHEMATIC

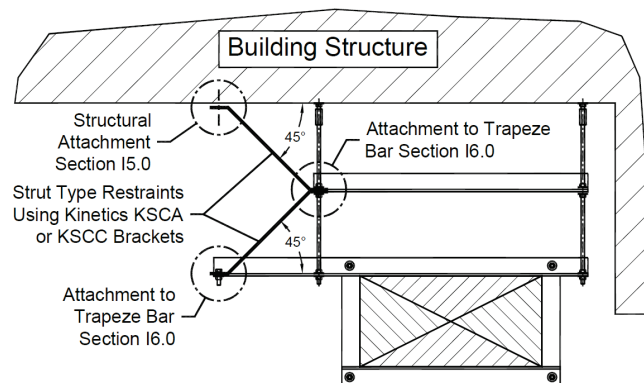


Sheet H1 - View G



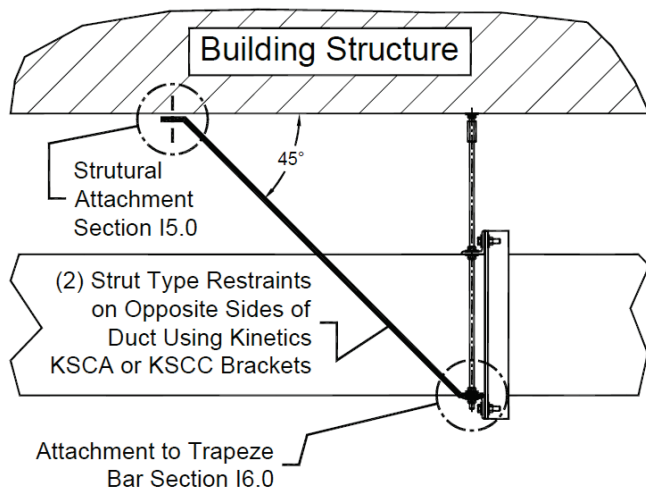
Sheet H1 - View H

SUSPENDED RECTANGULAR DUCT RESTRAINT SCHEMATIC

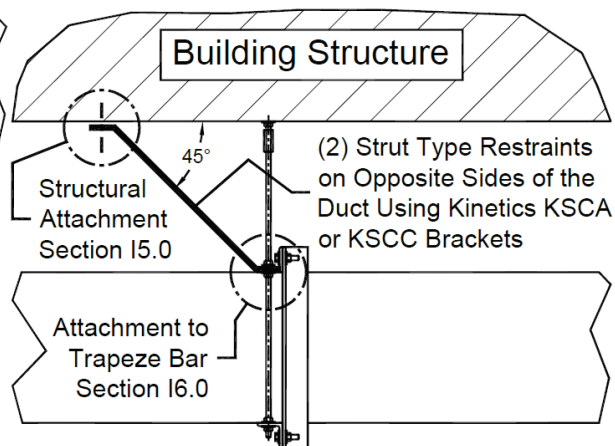


Sheet H1 - View J

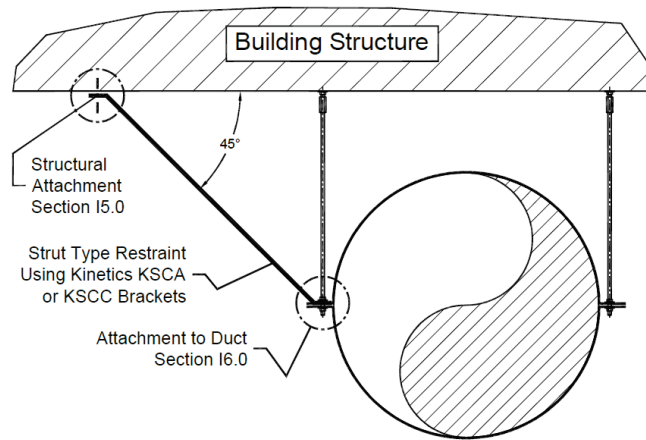
17.71-17.72 RECTANGULAR DUCT RESTRAINT SCHEMATICS



Sheet H1 - View M
Side View Opt. #1

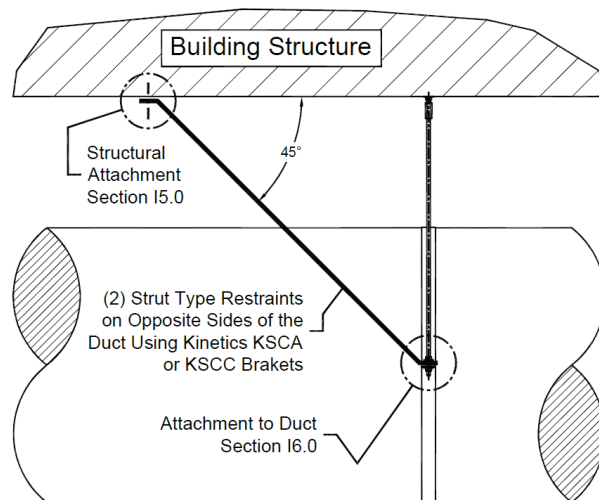


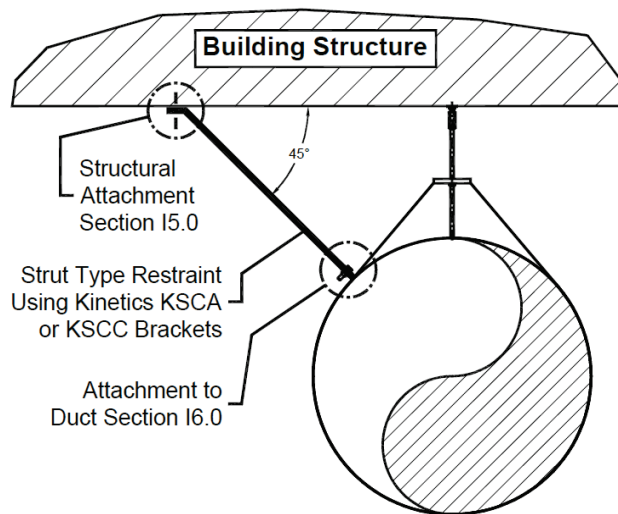
Sheet H1 - View M
Side View Opt. #2



Sheet H1 - View N

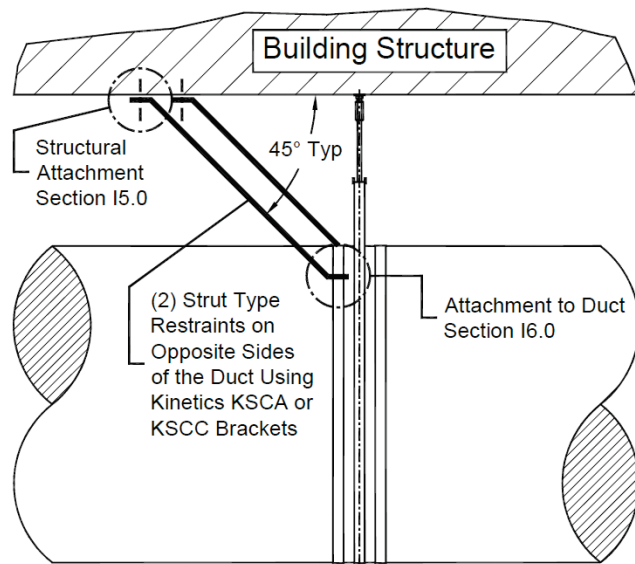
17.73-17.74 ROUND DUCT SUPPORTED BY TWO HANGER RODS RESTRAINT SCHEMATIC

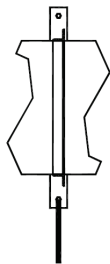




Sheet H1 - View P

17.75-17.76 ROUND DUCT SUPPORTED BY ONE HANGER ROD RESTRAINT SCHEMATIC

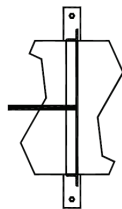




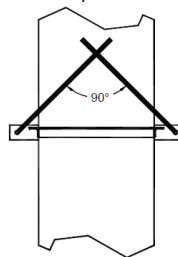
Sheet A2 - View C
Transverse (T)
Restraint
Plan View



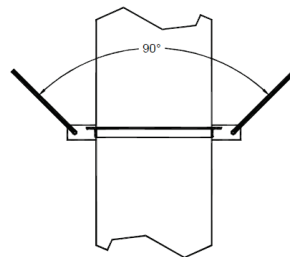
Sheet A2 - View C
Longitudinal (L)
Restraint
Plan View
Option #1



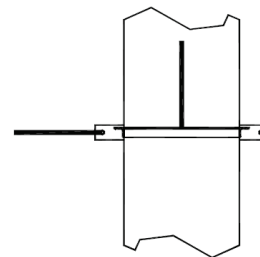
Sheet A2 - View C
Longitudinal (L)
Restraint
Plan View
Option #2



Sheet A2 - View D
Longitudinal & Transverse
(TL) Restraint
Plan View
Option #1



Sheet A2 - View D
Longitudinal & Transverse
(TL) Restraint
Plan View
Option #2

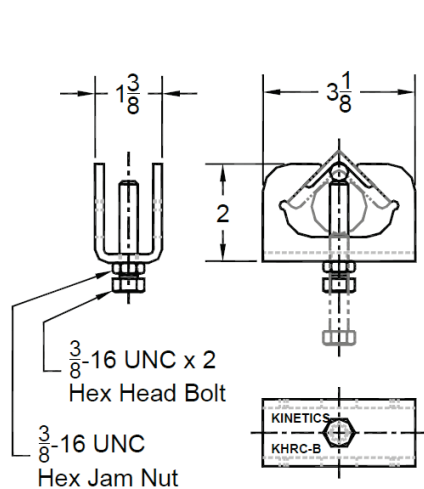


Sheet A2 - View D
Longitudinal & Transverse
(TL) Restraint
Plan View
Option #3

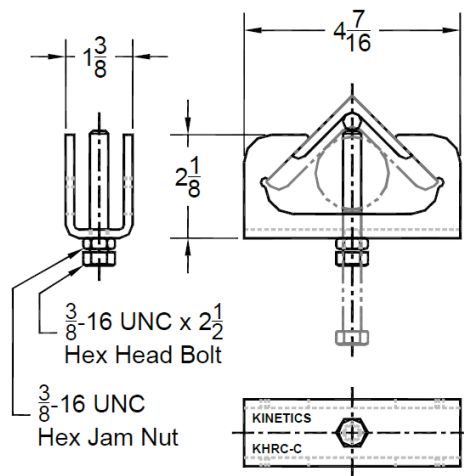
17.77-17.78 DUCT RESTRAINED WITH STRUTS RESTRAINT SCHEMATIC

18.0 ROD STIFFENERS

18.1 KHRC ROD STIFFENER CLAMPS FOR USE WITH TOLLED STRUCTURAL ANGLE

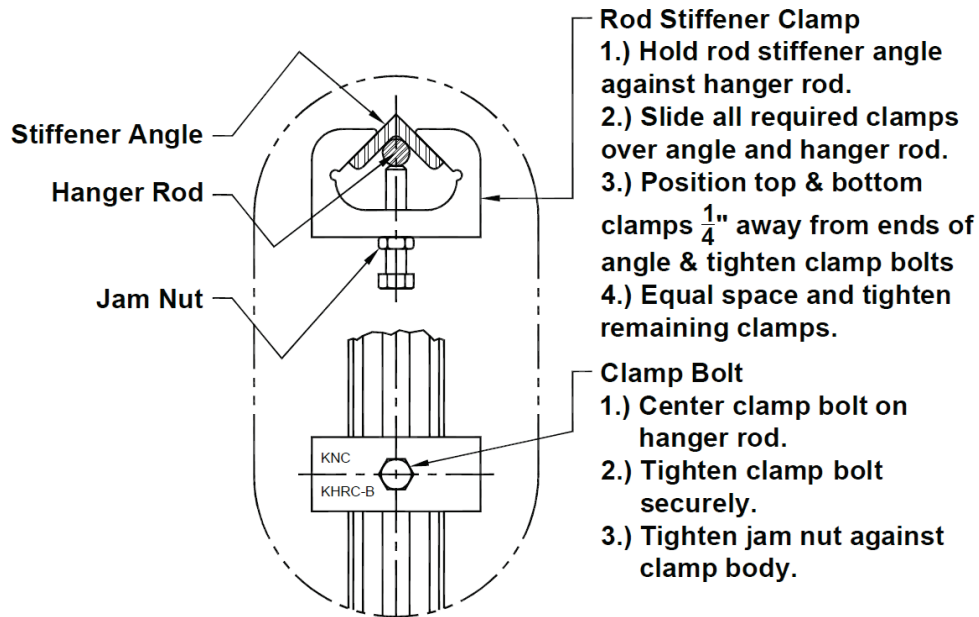


Model KHRC-B

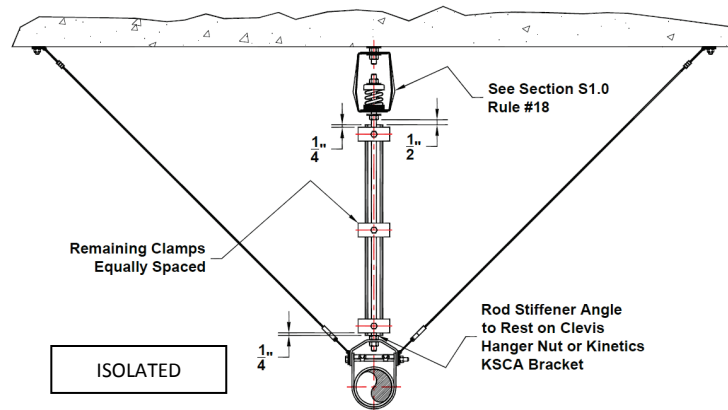
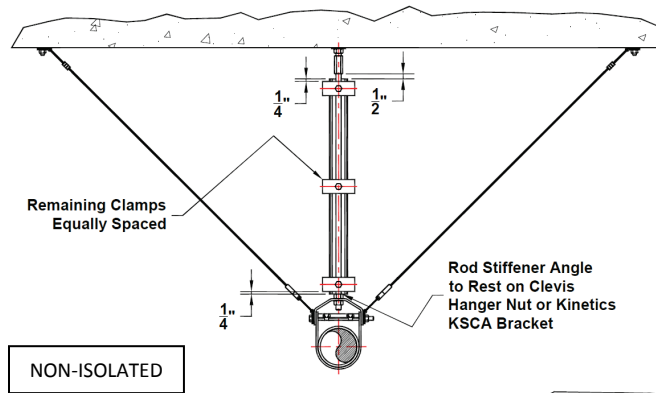


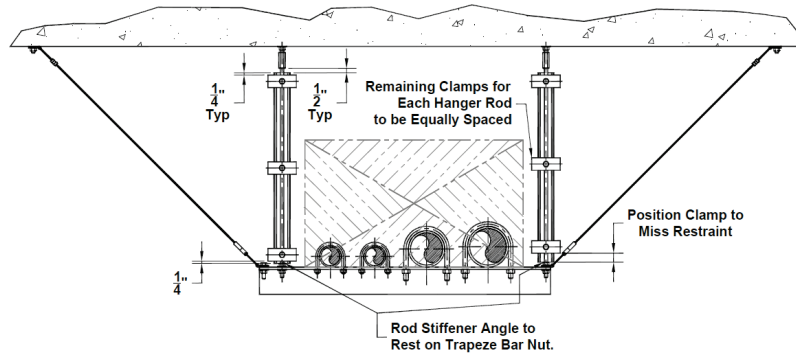
Model KHRC-C

18.2 KHRC INSTALLATION

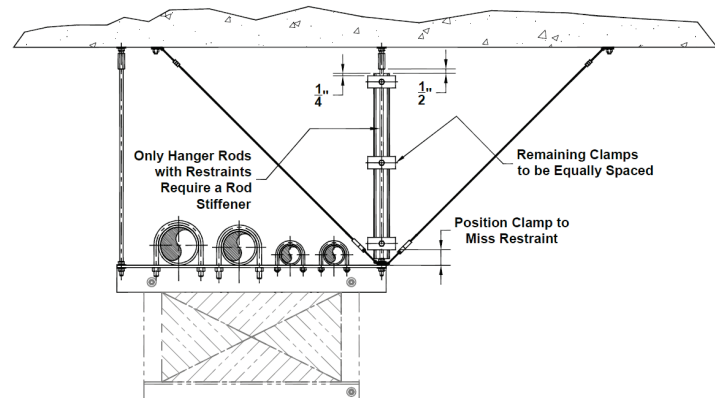


18.3-18.4 TYPICAL INSTALLATION FOR CLEVIS HUNG PIPE





18.5-18.6 TYPICAL INSTALLATION FOR TRAPEZE SUPPORTED PIPE & DUCT





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