MEP Details

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Technical Bulletin

TrusSteel® An ITW Company

Guidelines for Attachments of Mechanical Systems to TrusSteel Trusses

For many projects, mechanical systems such as sprinkler piping must be attached to TrusSteel trusses. The TS049 through TS049K Standard Detail series addresses the design of sprinkler pipe hangers, however, there are other aspects of the truss system that must be considered as well; the trusses must be loaded adequately for the mechanical system being applied, and the structural capacity of the trusses must not be diminished due to the attachment of the mechanical system. Below is a list of guidelines that must be followed when attaching mechanical systems to TrusSteel trusses to preserve the structural integrity of the trusses.

- Do not attach, hang, or support mechanical systems from any web members without prior approval from a TrusSteel engineer.
- Attachments to chord members that create holes with a diameter of 1/4" or less are acceptable anywhere in the cross section when the hole spacing is a minimum of 3 times the hole diameter.
- Attachments to chord members that create holes greater than 1/4" up to 7/16" in diameter are acceptable provided the following four requirements are met:
  1. Only one hole is allowed at any given chord cross section.
  2. Hole is to be placed in any portion of the area labeled "Acceptable Hole Location" as shown in Figure 1.
  3. Spacing of holes shall be 24"O.C. minimum along length of member.
  4. Holes cannot be located closer than 6" to a panel point.

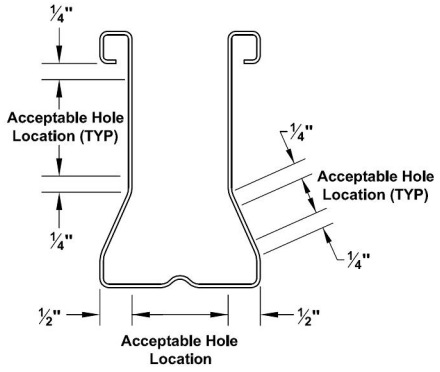


Figure 1

- Attachments to chord members that create holes larger than 7/16" in diameter are not allowed unless approved by a TrusSteel engineer.
- Connectors or hangers attached to only one side of a chord's cross section are allowed provided the supported load does not exceed 100 pounds. No more than (1) one-sided connection is allowed per panel. NOTE: One-sided connections are not to be used for sprinkler pipe supports due to the requirement that these types of connections are to support 5 times the weight of the water filled pipe plus 250 lbs.
- It is preferable to support the hanger over the top of the bottom chord, as in Standard Detail TS049, to eliminate drilling of the section and eccentric connections.
- The building designer must verify that the building design loads have accounted for the mechanical system loads.

Included Documents

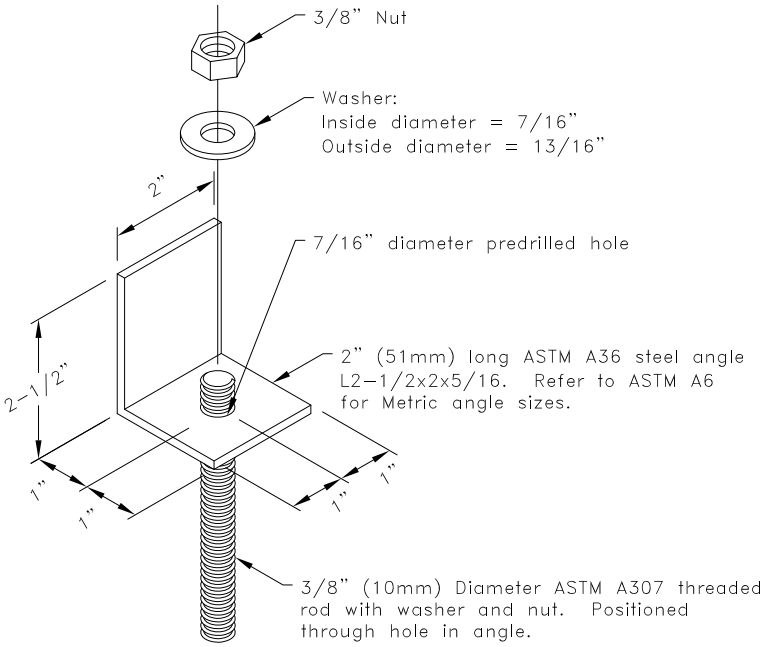
None

Revisions

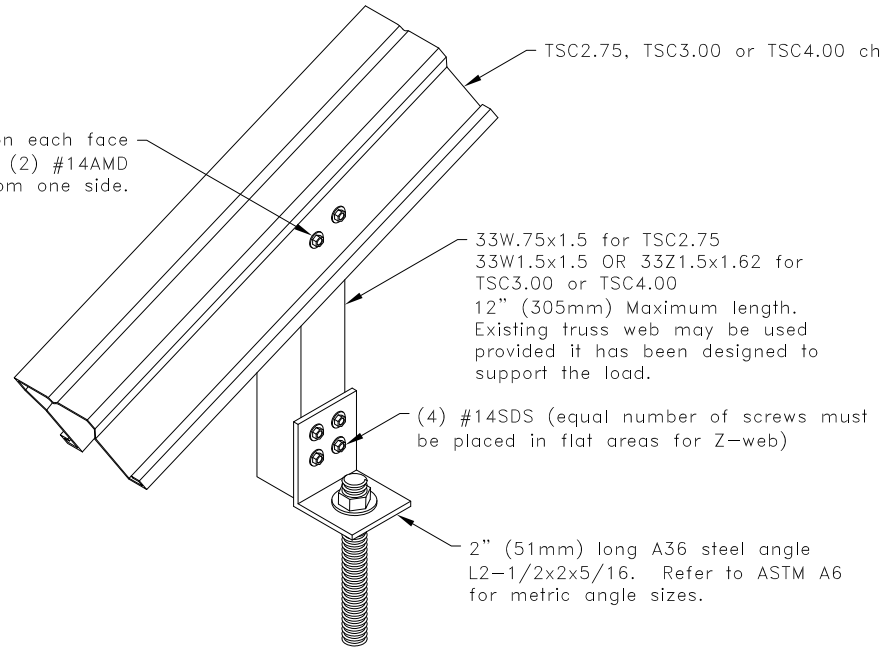
- This bulletin was created on 9/20/07.
- Revised 1/18/08 to not allow sprinklers for a one-sided connection.
- Revised 3/30/10 to change requirements for holes greater than ¼"

SPRINKLER PIPE DIAMETERS AND HANGER LOADS[A]	
Max. Sprinkler Pipe Diameter, in. (mm)	Max. Hanger Load lbs (kN)
1–1/2 (38)	520 (2.31)

(A) Values given are for maximum hanger spacing of 15' (4572 mm)



Note: Multiply above units by 25.4 for millimeters.



Sprinkler pipe support
attached to rod.

General Notes:

1. SDS = self–drilling tapping screw
2. Screw spacing and end distance is 3/4" (19mm).
3. Values shown are for the sprinkler pipe hanger only. Truss must be properly loaded for sprinkler pipe load. Refer to TrusSteel Technical Bulletin TB00.09.01, "Sprinkler Pipes – Truss Loading & Connections".
4. It is the responsibility of the architect or engineer of record to review this hanger design to verify it conforms with the overall sprinkler system support design.
5. Hanger loads were determined per NFPA13 "Standard For The Installation Of Sprinkler Systems" and assume schedule 40 steel pipe.
6. Pipe hanger spacing shall not exceed 12' (3658mm) for pipes up to and including 1–1/4" (32mm) diameter and 15' (4572mm) for pipes greater than 1–1/4" (32mm) diameter per NFPA13.
7. Nut shall be grade A, HEX conforming to ASTM A563 and Washer shall conform to ASTM F436.
8. Cold–Formed Steel Calculations are per the 2010 supplement to the AISI 2007 "North American Specifications for the Design of Cold–Formed Steel Structural Members" (S100–07/S2–10).

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Missouri: 13389 Lakefront Drive / Earth City, MO 63045 / (800) 326-4102

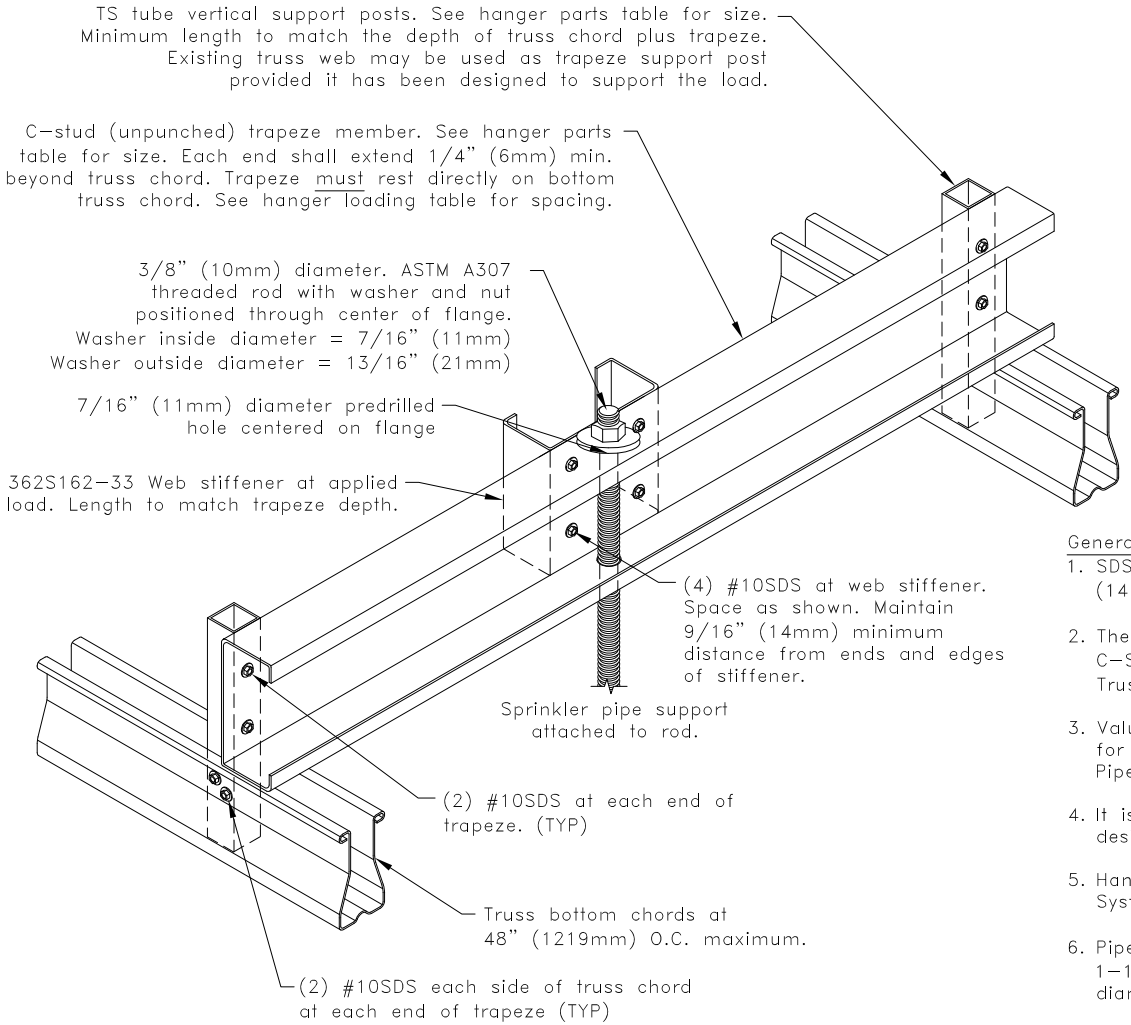
Top Chord Sprinkler Pipe Hanger For 1-1/2" (38mm) Maximum Diameter Pipe

ITW Building Components Group, Inc. shall not be responsible for any performance failure in a connection due to a deviation from this detail. Any variation from this detail shall be approved in advance by ITW Building Components Group, Inc.

Standard Detail:
TS049A

Date:
07/16/12

TrusSteel Detail Category:
Sprinkler Pipe Hangers



Note: Hanger rod assembly may be placed anywhere along the trapeze.

Hanger Parts Table			
Truss Chord Size	Trusses at 24" (610mm) O.C. Trapeze Member	Trusses at 48" (1219mm) O.C. Trapeze Member	Support Post
TSC2.75	362S162-33 min.	362S162-54 min.	33W.75x1.5
TSC2.75	600S162-33 min.	600S162-33 min.	33W.75x1.5
TSC3.00 or TSC4.00	362S162-33 min.	362S162-54 min.	33W1.5x1.5
TSC3.00 or TSC4.00	600S162-33 min.	600S162-33 min.	33W1.5x1.5

Sprinkler Pipe Diameter & Hanger Load		
Sprinkler Pipe Diameter in. (mm)	Maximum Hanger Load lbs. (kN)	Maximum Hanger Spacing ft (mm)
1 (25)	370 (1.65)	12 (3658)
1 1/4 (32)	430 (1.91)	12 (3658)
1 1/2 (38)	520 (2.31)	15 (4572)
2 (51)	630 (2.80)	15 (4572)

* Values given are based on maximum hanger spacing.

General Notes:

1. SDS = self-drilling tapping screw. Screw spacing, end and edge distance is 9/16" (14mm) min.
2. The minimum yield strengths of materials are as follows (unless otherwise noted): C-Stud Trapeze = 33ksi (228 MPa), Tube steel support posts = 45ksi (310 MPa), TrusSteel Chords = 55ksi (379 MPa).
3. Values shown are for the sprinkler pipe hanger only. Truss must be properly loaded for sprinkler pipe load. Refer to TrusSteel Technical Bulletin TB00.09.01, "Sprinkler Pipes – Truss Loading & Connections".
4. It is the responsibility of the architect or engineer of record to review this hanger design to verify it conforms with the overall sprinkler system support design.
5. Hanger loads were determined per NFPA13 "Standard For The Installation Of Sprinkler Systems" and assume schedule 40 steel pipe.
6. Pipe hanger spacing shall not exceed 12' (3658mm) for pipes up to and including 1-1/4" (32mm) diameter and 15' (4572mm) for pipes greater than 1-1/4" (32mm) diameter per NFPA13 1999.
7. Nut shall be grade A, HEX conforming to ASTM A563 and Washer shall conform to ASTM F436.
8. Cold-Formed Steel Calculations are per the 2010 supplement to the AISI 2007 "North American Specifications for the Design of Cold-Formed Steel Structural Members" (S100-07/S2-10).

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C-Stud Sprinkler Trapeze at Bottom Chord for 2" (51mm) Max. Diameter Pipe

ITW Building Components Group, Inc. shall not be responsible for any performance failure in a connection due to a deviation from this detail. Any variation from this detail shall be approved in advance by ITW Building Components Group, Inc.

Standard Detail: TS049C

Date: 07/16/12

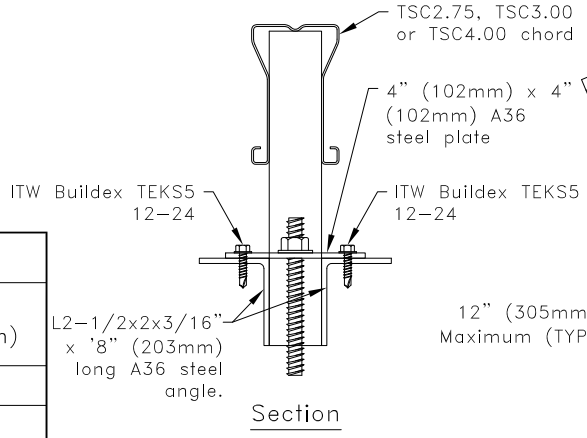
TrusSteel Detail Category: Bottom Chord Sprinkler Hanger

SPRINKLER PIPE DIAMETERS AND HANGER LOADS[A]	
Max. Sprinkler Pipe Diameter, in. (mm)	Max. Hanger Load lbs (kN)
2 (51)	640 (2.85)
4 (102)	1480 (6.58)
6 (152)	2630 (11.70)
8 (203)	4060 (18.06)

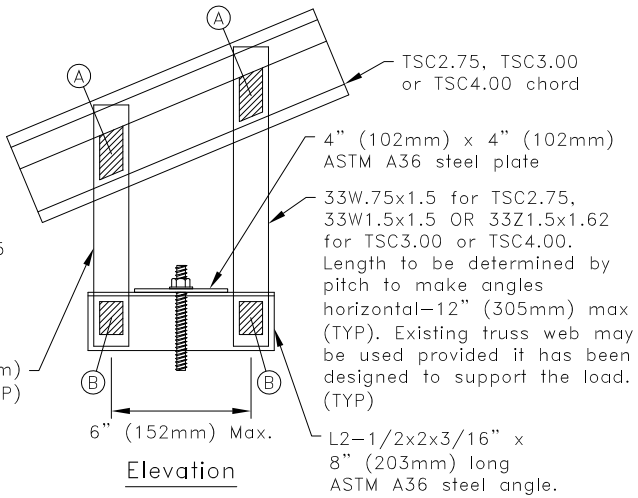
(A) Values given are for maximum hanger spacing of 15' (4572mm)

Plate Thickness Table[B]		
Max. Sprinkler Pipe Diameter, in. (mm)	Threaded Rod Diameter in. (mm)[C]	ASTM A36 Plate Thickness in. (mm)
2 (51)	3/8 (10)	3/16 (5)
4 (102)	3/8 (10)	1/4 (6)
6 (152)	1/2 (13)	5/16 (8)
8 (203)	1/2 (13)	3/8 (10)

(B) Refer to ASTM A6 for metric angle sizes.
(C) For 3/8" (10mm) diameter threaded rod / nut, washer inside diameter = 7/16" (11mm) and outside diameter = 13/16" (21mm). For 1/2" (13mm) diameter threaded rod / nut, washer inside diameter = 9/16" (14mm) and outside diameter = 1-1/16" (27mm).



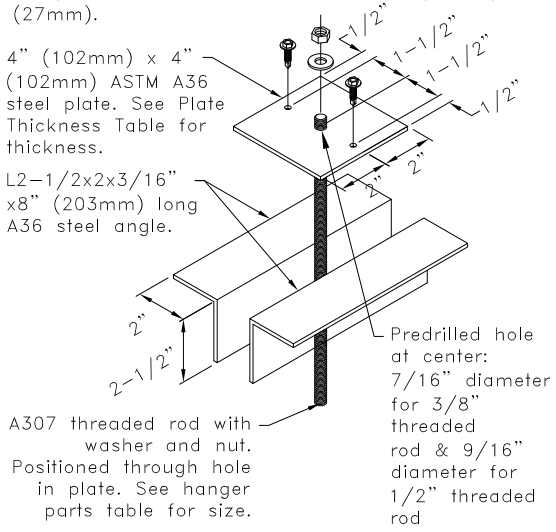
Section



Elevation

Screw Quantity Chart (#14SDS or 14AMD)		
Max. Sprinkler Pipe Diameter, in. (mm)	Screws	
	Ⓐ	Ⓑ
2 (51)	2	2
4 (102)	2	2
6 (152)	3	3
8 (203)	4	5

-Screws shall be connected to each face of chord and hanger assembly.
-Equal number of screws must be placed in flat areas for Z-web.



Note: Multiply above units by 25.4 for millimeters.

General Notes:

1. SDS = self-drilling tapping screw
2. Screw spacing and end distance is 3/4" (19mm).
3. Values shown are for the sprinkler pipe hanger only. Truss must be properly loaded for sprinkler pipe load. Refer to TrusSteel Technical Bulletin TB00.09.01, "Sprinkler Pipes - Truss Loading & Connections".
4. It is the responsibility of the architect or engineer of record to review this hanger design to verify it conforms with the overall sprinkler system support design.
5. Hanger loads were determined per NFPA13 "Standard For The Installation Of Sprinkler Systems" and assume schedule 40 steel pipe.
6. Pipe hanger spacing shall not exceed 12' (3658mm) for pipes up to and including 1-1/4" (32mm) diameter and 15' (4572mm) for pipes greater than 1-1/4" (32mm) diameter per NFPA13.
7. Nut shall be grade A, HEX conforming to ASTM A563 and Washer shall conform to ASTM F436.
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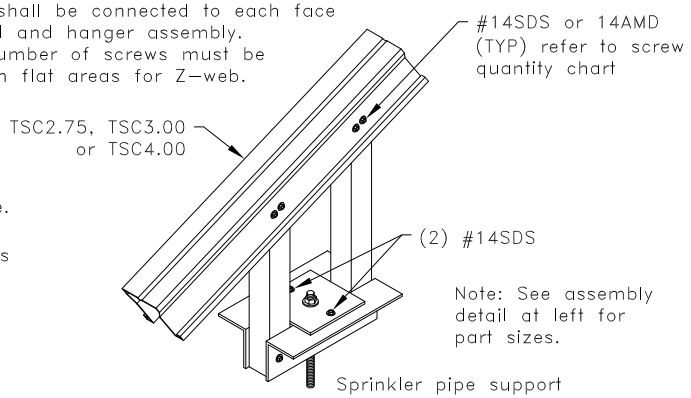

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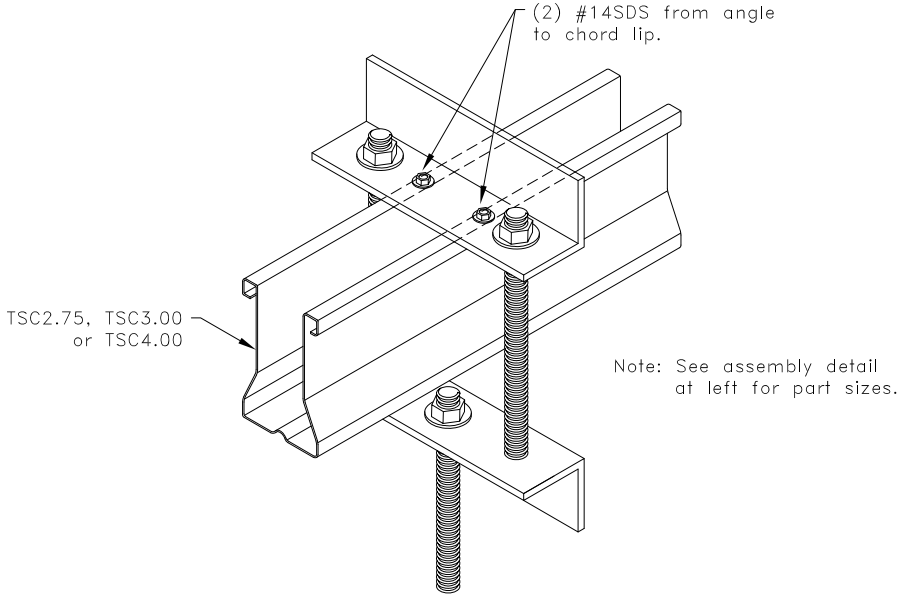
Top Chord Sprinkler Pipe Hanger For 8" (203mm) Maximum Diameter Pipe

ITW Building Components Group, Inc. shall not be responsible for any performance failure in a connection due to a deviation from this detail. Any variation from this detail shall be approved in advance by ITW Building Components Group, Inc.

Standard Detail: TS049B
Date: 07/16/12
TrusSteel Detail Category: Sprinkler Pipe Hangers

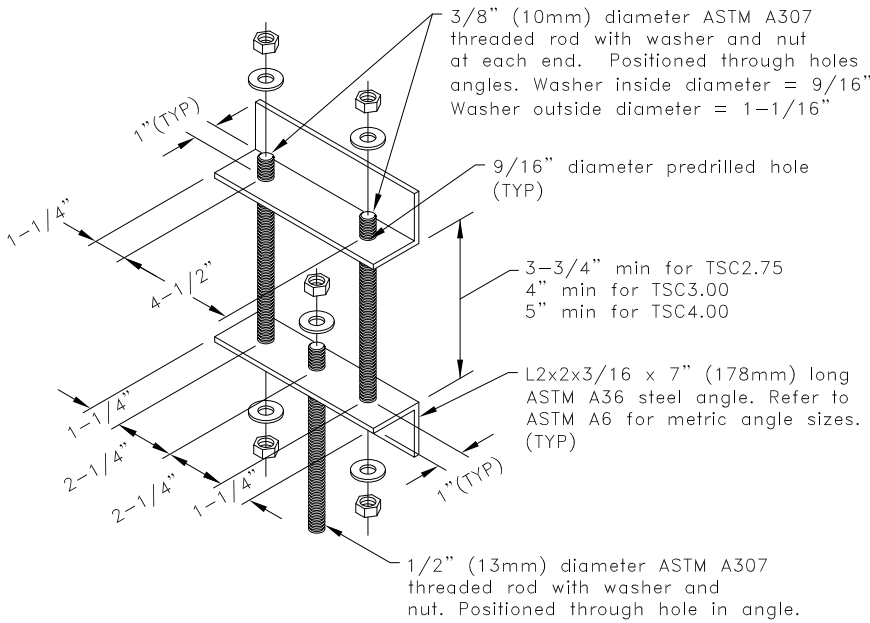
SPRINKLER PIPE DIAMETERS AND HANGER LOADS[A]	
Max. Sprinkler Pipe Diameter, in. (mm)	Max. Hanger Load lbs (kN)
4 (102)	1480 (6.58)
6 (152)	2630 (11.70)
8 (203)	4060 (18.06)

(A) Values given are for maximum hanger spacing of 15' (4572 mm)



Note: See assembly detail at left for part sizes.

Sprinkler pipe support attached to rod.



Note: Multiply above units by 25.4 for millimeters.

General Notes:

1. SDS = self-drilling tapping screw
2. Values shown are for the sprinkler pipe hanger only. Truss must be properly loaded for sprinkler pipe load. Refer to TrusSteel Technical Bulletin TB00.09.01, "Sprinkler Pipes – Truss Loading & Connections".
3. It is the responsibility of the architect or engineer of record to review this hanger design to verify it conforms with the overall sprinkler system support design.
4. Hanger loads were determined per NFPA13 "Standard For The Installation Of Sprinkler Systems" and assume schedule 40 steel pipe.
5. Pipe hanger spacing shall not exceed 12' (3658mm) for pipes up to and including 1-1/4" (32mm) diameter and 15' (4572mm) for pipes greater than 1-1/4" (32mm) diameter per NFPA13.
6. Nut shall be grade A, HEX conforming to ASTM A563 and Washer shall conform to ASTM F436.

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Bottom Chord Sprinkler Pipe Hanger for 8" (203 mm) Maximum Diameter Pipe

ITW Building Components Group, Inc. shall not be responsible for any performance failure in a connection due to a deviation from this detail. Any variation from this detail shall be approved in advance by ITW Building Components Group, Inc.

Standard Detail: TS049

Date: 07/16/12

TrusSteel Detail Category: Sprinkler Pipe Hangers