



## TECHNICAL DATA

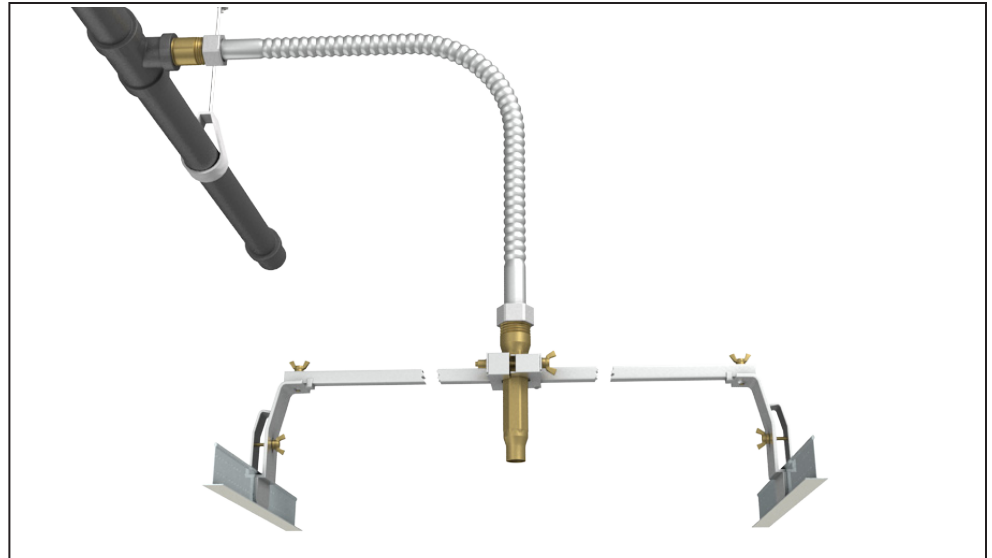
## MODEL FSC-25U UNBRAIDED FLEXIBLE SPRINKLER CONNECTION

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

### 1. DESCRIPTION

Viking Model FSC-25U Unbraided Flexible Sprinkler Connections are complete assemblies intended for installation into commercial suspended ceilings with medium to heavy support tee bars as described in ASTM C635 and C636. The hose assembly includes 25 mm diameter corrugated stainless steel flexible hose. The hose assembly includes an inlet nipple 1" NPT or BSPT for attachment to the sprinkler system branch piping, a special outlet reducer fitting with a 1/2" or 3/4" NPT or BSPT straight or 90° outlet. Also included is a support bar and brackets, which secure the complete flex sprinkler connection assembly to a medium or heavy duty commercial suspended ceiling support rail system.



Model FSC-25U Flexible Sprinkler Connection

The support bracket system (see Figure 4) locates and secures the sprinkler in the required position within the ceiling system. The mounting bracket system and special outlet fittings provide a generous amount of adjustment both laterally and vertically for flush and precise sprinkler installation.

**NOTICE** The brackets must be attached to adequately supported tee bars in accordance with ASTM C635 and C636.

The unique assembly of the Viking Flexible Sprinkler Connection to the piping system and the outlet sprinkler fitting is made with a slip nut and seal design that allows assembly after forming the flex hose to proper installation shape, and the inlet and outlet end connections are securely in place. This prevents twisting of the flex sprinkler connection during installation and provides a secure leak-tight assembly.

The Viking Model FSC-25U Unbraided Flexible Sprinkler Connection standard available assembly lengths are 39-3/8" (1000mm) and 59" (1500mm) with a straight outlet fitting and a 1/2" or 3/4" NPT sprinkler connection. Also available on special order are 90° angle outlet fittings, also available with 1/2" or 3/4" NPT sprinkler connection (refer to Table 1A). Upon special request, Viking Flexible Sprinkler Connections can be manufactured to 27-9/16" (700mm), 47-1/2" (1200mm), or 71" (1800mm) lengths. Delivery times for non standard lengths have a standard lead time of 12 weeks.

Viking Flexible Sprinkler Connections provide several installation or retrofit benefits compared to rigid sprinkler connections:

- Easy Installation
- More efficient manpower
- Improved performance and installation quality
- Precise and flush sprinkler location
- Flexible installation for seismic or vibrating applications
- Flexible installation for fast track construction projects
- Corrosion-resistant materials
- Fewer tools required for installation
- Meets NFPA, EN, and LPC guidelines
- Approved for use with suspended ceilings with medium- and heavy-duty load grids with Tee bar design per ASTM C635 and 636

### 2. LISTINGS AND APPROVALS

**cULus Listed:** Category VENF, UL Standard 2443

Refer to Design Criteria for cULus Listing requirements that must be followed.

Also refer to specific sprinkler technical data pages for sprinkler listings and other technical information.

(Removed Patent No.)



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### 3. TECHNICAL DATA

#### Specifications:

Available since 2012.

- Hose tube diameter: 25 mm outside diameter
- Standard Lengths: 39-3/8" (1000mm) & 59" (1500mm)
- Inlet 1" NPT or BSPT, male pipe threads.
- Outlet reducer straight or 90° with 1/2" or 3/4" NPT or BSPT, female thread. See Figure 5.
- Corrugated tube is annealed after forming to insure relief of all material stresses and removal of all scale.
- Limited flexibility design
- Intended use for direct connection to fire sprinklers
- Maximum Working Pressure = 200 PSI (13.8 bar)
- Approved for wet and dry systems as noted in NFPA 13
- Maximum ambient temperature: 225 °F (107 °C) EPDM seal

Viking Technical Data may be found on  
The Viking Corporation's Web site at  
<http://www.vikinggroupinc.com>.  
The Web site may include a more recent  
edition of this Technical Data Page.



**Refer to the sprinkler technical data page, as the temperature rating and maximum pressure rating of the sprinkler may be different than the Flexible Sprinkler Connection.**

- Minimum bend radius: 4" (102 mm) for cULus Listing

#### Material Standards:

Flexible Tube: UNS-S30400 Stainless Steel

Outlet Extension Nipple (Straight): SPPS Steel (ASTM A53 A) with yellow zinc plating

Inlet Nipple: SPPS Steel (ASTM A53 A) with yellow zinc plating

Seal: EPDM

Slip Nut: SS41 (ASTM A283 D) Steel with zinc plating

Support Brackets (all): SS41 (ASTM A572) Steel with zinc plating

Support Bar: SS41 (ASTM A283 D) Steel with zinc plating

Insulating Collar: Nylon 66

**Ordering Information:** (Also refer to the current Viking price list.)

The Following Model FSC-25U Flexible Sprinkler Connections are Available as Stock Assemblies:

Part No. 18356-10: 1" NPT x 1/2" NPT x 39-3/8" (1000mm) length, straight outlet, unbraided

Part No. 18357-10: 1" NPT x 3/4" NPT x 39-3/8" (1000mm) length, straight outlet, unbraided

Part No. 18356-15: 1" NPT x 1/2" NPT x 59" (1500mm) length, straight outlet, unbraided

Part No. 18357-15: 1" NPT x 3/4" NPT x 59" (1500mm) length, straight outlet, unbraided

#### NOTICE

Other flex connection assembly lengths are available upon special order. (12 week standard lead time)

Each Carton Includes (5) Complete Assemblies with the Following Components:

(5) Flexible hose assemblies, lengths 39-3/8" (1000mm) or 59" (1500mm)

(5) Outlet extension Nipple, 1/2" or 3/4" NPT or BSPT, straight as specified

(5) Inlet fittings, 1" NPT or BSPT as specified

(5) Center Bracket Assembly

(5) Center Bracket Wing Bolt, M6 X P1 X 2 3/4" (70mm)

(20) Top and Side Wing Bolts, M6 X P1 X 1" (25mm) Long

(10) Inside Brackets

(10) Outside Brackets

(5) 5/8" (16 mm) square x 23-5/64" (586 mm) long support bars (suitable for standard 600mm tiles)

(1) Set of Installation Instructions.

#### NOTICE

Hose assemblies ordered from Viking only come with straight outlet as standard. Conversion to 90° angle outlet fitting can be done by ordering the desired kit from Table 1A.

Available to Order Separately:

Optional 4" Bend Radius Gauge Tool Part No. 15450 (plastic)

Optional 4" Fixed Radius Clip Part No. 14403 (plastic)



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### 4. INSTALLATION

Viking Flexible Sprinkler Connection Assemblies are manufactured and tested to meet the latest rigid requirements of the approving agencies. They are designed and tested to be installed in accordance with the Approved and Listed installation instructions as provided with the product and the recognized installation standards. Deviations from these standards or any alterations to the support system or sprinkler after leaving the factory including, but not limited to painting, plating, coating or modification may render the sprinkler inoperative or the support system non-compliant, automatically nullifying the approvals and any guarantee made by The Viking Corporation.

#### Flexible Sprinkler Connection with Bracket System Assembly: (See figures 1 - 4)

Viking Flexible Sprinkler Connections are offered pre-assembled from the factory with the center bracket and inside/outside brackets attached to the square bar. **SKIP TO STEP TWO**, unless the standard factory assembled product is not provided.

*Step 1- Slide the square bar into the center bracket assembly. Attach the two inside brackets to the square bar with two M6 x 25mm wing bolts. Tighten the wing bolts to 30 in-lbs. (1/4 turn past hand tight). Loosely attach the two outside brackets to the inside brackets with two M6 x 20 mm wing bolts.*

**Step 2-** Install the bracket assembly onto the main tee bars of the ceiling so that the main tee is between the inside bracket and the outside bracket. Install the outlet extension nipple into the center bracket assembly. Locate the bracket assembly to the desired position of the sprinkler. Tighten the wing bolt of the center bracket to 75 in. lbs. (1/2 turn past hand tight). Tighten the wing bolts of the side brackets to 30 in-lbs. (3/4 turn past hand tight).

**Step 3-** Install the 1" inlet nipple into the sprinkler branch line pipe. Connect the flexible hose to the inlet nipple with a torque of 75 in-lbs. (1/2 turn past hand tight). Connect the flexible hose to the outlet extension nipple with a large smooth bend having a minimum radius of 4 in (101 mm). Tighten the flexible hose to the outlet extension nipple with 75 in-lbs (1/2 turn past hand tight). Multiple bends are permissible when done in accordance with Table 2.

**Step 4-** Attach the sprinkler to the outlet extension nipple. Use a wrench on the extension nipple and the proper sprinkler wrench on the sprinkler when tightening.

**Step 5-** Installation is complete, check flexible hose bends with bend radius gauge tool. See Figure 2: Bends.

The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

#### NOTICE

Keep sprinklers with protective shields or caps contained within the shields or caps during installation and testing, and any time the sprinkler is shipped or handled.

### WARNING

**Remove plastic protective sprinkler caps or bulb shields AFTER the ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.** To remove the bulb shields, simply pull the ends of the shields apart where they are snapped together. To remove caps from frame style sprinklers, turn the caps slightly and pull them off the sprinklers. **SPRINKLER CAPS OR BULB SHIELDS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!** Retain a protective cap or shield in the spare sprinkler cabinet.

For concealed style sprinklers, the cover plate assembly can now be installed onto the sprinkler.

- Remove the cover from the protective box, taking care not to damage the cover plate assembly.
- From below the ceiling, gently place the base of the cover assembly over the sprinkler protruding through the ceiling opening.
- Push the cover plate assembly onto the sprinkler until the unfinished brass flange of the cover plate base touches the ceiling.
- Available cover plate adjustment is 1/2" (12.7 mm) +/- 1/4" (6.4 mm).

For frame style sprinklers with the Model E-1 or E-2 Escutcheon, or with the Model F-1 Escutcheon, press on or thread on the outer escutcheon cup until the flanges touch the surface of the ceiling.

- With the E-1 or E-2 Escutcheon, the maximum recess is 1/2" (12.7 mm). The face of the escutcheon adapter may extend up to 11/32" (8.7 mm) beyond the edge of the escutcheon cup, resulting in 27/32" (21.4 mm) total adjustment range.

If it is necessary to remove the entire sprinkler unit, the system must be taken out of service. See section 6. INSPECTIONS, TESTS AND MAINTENANCE and follow all warnings and instructions.

### 5. OPERATION

Refer to the sprinkler technical data page for the sprinkler model used with the Flexible Sprinkler Connection Assembly.



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The Following Kits are Available for Replacement Components:

### NOTICE

These kits may be ordered in addition to the above for replacing components as required. A 49-3/16" (1,250 mm) long support bar is available when the main support beams are spaced at 4 ft. (1,219 mm). These must be ordered separate from the standard flexible Sprinkler Connection Assembly.

**TABLE 1A: KITS AVAILABLE TO CONVERT TO ANGLE OUTLET**

18311	1/2" x 25 mm hose 90° angle fitting kit (1) / package
18312	3/4" x 25 mm hose 90° angle fitting kit (1) / package

**TABLE 1B: KITS AVAILABLE FOR REPLACEMENT COMPONENTS**

18282	Square Bar for 2 Foot (600mm) Spacing
18283	Square Bar for 4 Foot (1200mm) Spacing
18469	Side Bracket Assembly (Includes Side Bracket, 18287, and 14401)
18286	Center Bracket Assembly (Includes Center Bracket, 18292, and 18293)
18287	Wing Bolt, M6 x 1" (25mm)
18288	Outlet Reducing Nipple, 1/2" NPT
18289	Outlet Reducing Nipple, 3/4" NPT
18292	Wing Bolt, M6 x 2 3/4" (70mm)
18293	Retaining O-Ring
16040	Inlet Nipple, 1" NPT

### Hose Assembly Configurations of Standard Offering Include:

1. Unbraided 25 mm flex sprinkler hose.
2. Outlet fitting, straight.
3. Outlet size 1/2" or 3/4" NPT or BSPT.
4. Inlet connection 1" NPT or BSPT.

### NOTICE

Hose assemblies ordered from Viking only come with straight outlet as standard.

### Friction Loss Data:

**TABLE 2: MODEL FSC-25U FRICTION LOSS DATA WITH 4" (102 mm) MINIMUM BEND RADIUS**

Outlet Size Straight or 90°	Hose Length with Fittings	Equivalent Length of UL 1" Schedule 40 Pipe (ft.)	Equivalent Length of UL 1" Schedule 40 Pipe (m)	Maximum Number of 90° Bends
1/2"	27-9/16"	24 ft	7.3 m	1
3/4" NPT	27-9/16"	30 ft	9.1 m	1
<b>1/2"</b>	<b>39-3/8" *</b>	<b>52 ft</b>	<b>15.8 m</b>	<b>2</b>
<b>3/4" NPT</b>	<b>39-3/8" *</b>	<b>57 ft</b>	<b>17.4 m</b>	<b>2</b>
1/2"	47-1/2"	78 ft	23.8 m	3
3/4" NPT	47-1/2"	88 ft	26.8 m	3
<b>1/2"</b>	<b>59" *</b>	<b>78 ft</b>	<b>23.8 m</b>	<b>3</b>
<b>3/4" NPT</b>	<b>59" *</b>	<b>88 ft</b>	<b>26.8 m</b>	<b>3</b>
1/2"	71"	97 ft	29.6 m	3
3/4" NPT	71"	97 ft	29.6 m	3

\* Indicates Standard Viking Offering.  
weeks.

### NOTICE

All other lengths have a standard lead time of 12



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### 6. INSPECTIONS, TESTS AND MAINTENANCE

#### NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to the latest edition of Viking technical data and the NFPA standard that describes care and maintenance of sprinkler systems. The Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

- A. Sprinklers must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. The frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the device.
- B. Sprinklers that have been field painted or mechanically damaged must be replaced immediately. Sprinklers showing signs of corrosion shall be tested and/or replaced immediately as required. Installation standards require sprinklers to be tested and, if necessary, replaced after a specified term of service. Refer to the installation standards (e.g., NFPA 25) and the Authority Having Jurisdiction for the specified period of time after which testing and/or replacement is required. Sprinklers that have operated cannot be reassembled or re-used, but must be replaced. When replacement is necessary, use only new sprinklers.
- C. The sprinkler discharge pattern is critical for proper fire protection. Therefore, nothing should be hung from, attached to, or otherwise obstruct the discharge pattern. All obstructions must be immediately removed or, if necessary, additional sprinklers installed.
- D. When replacing existing sprinklers, the system must be removed from service. Refer to the appropriate system description and/or valve instructions. Prior to removing the system from service, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.
  1. Remove the system from service, drain all water, and relieve all pressure on the piping.
  2. Using the special sprinkler wrench, remove the old sprinkler and install the new unit. Care must be taken to ensure that the replacement sprinkler is the proper model and style, with the appropriate orifice size, temperature rating, and response characteristics. A fully stocked spare sprinkler cabinet should be provided for this purpose.
  3. Place the system back in service and secure all valves. Check for and repair all leaks.
- E. Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary. Sprinklers that have been exposed to corrosive products of combustion or high ambient temperatures, but have not operated, should be replaced. Refer to the Authority Having Jurisdiction for minimum replacement requirements.

### 7. AVAILABILITY

Viking Flexible Sprinkler Connection Assemblies are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

### 8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

## DESIGN CRITERIA

#### cULus Listing Requirements:

- Approved for use in ceilings with medium and heavy load grids (ASTM C635 and C636).
- Meets NFPA 13, NFPA 13D and NFPA 13R guidelines and EN12845.
- Intended for use in wet or dry systems.
- The maximum permissible number of bends is (2) x 90° for 39-3/8" (1000mm) lengths and (3) x 90° for 59" (1500mm) lengths at the manufacturer's specified bend radius of 4" (102 mm) for cULus.
- In suspended ceilings, outlet reducer must be secured to the ceiling support system with brackets supplied.

Hydraulic calculations for NFPA systems must include the values in Table 2 using the maximum number of bends that includes the inlet and outlet fittings as indicated. Authorities Having Jurisdiction will require proper hydraulic calculations and inspect for proper bend radius and maximum quantity of bends as indicated in the table.

#### NOTICE

Refer to the specific sprinkler data page for the sprinkler model used with the Flexible Sprinkler Connection.

#### WARNING

- Minimum Inside Bend Radius: 4" (102 mm) Static cULus unbraided. See Figure 2.
- Maximum Sprinkler K-Factor: 8.0 U.S. (115.2 metric) for 1/2" and 14.0 U.S. (202 metric) for 3/4" NPT
- Maximum Number of Bends per Hose: Refer to Table 2.
- Limited Flexibility Design
- When using concealed sprinklers, they must be installed in neutral or negative pressure plenums only.

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to the appropriate sprinkler data page. Viking sprinklers and Flexible Sprinkler Connections are designed to be installed in accordance with the latest edition of Viking technical data, the latest standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards whenever applicable. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.



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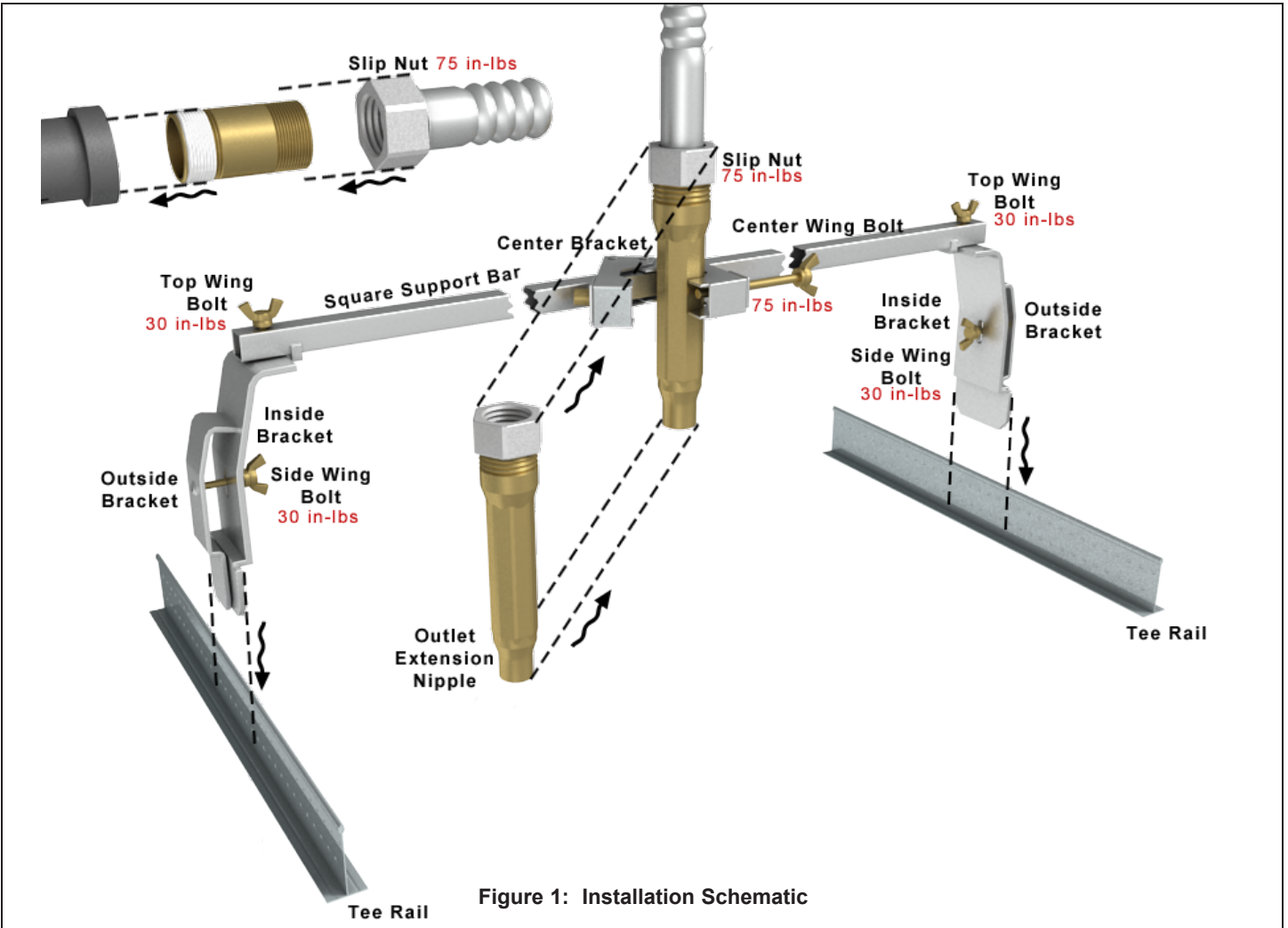


Figure 1: Installation Schematic

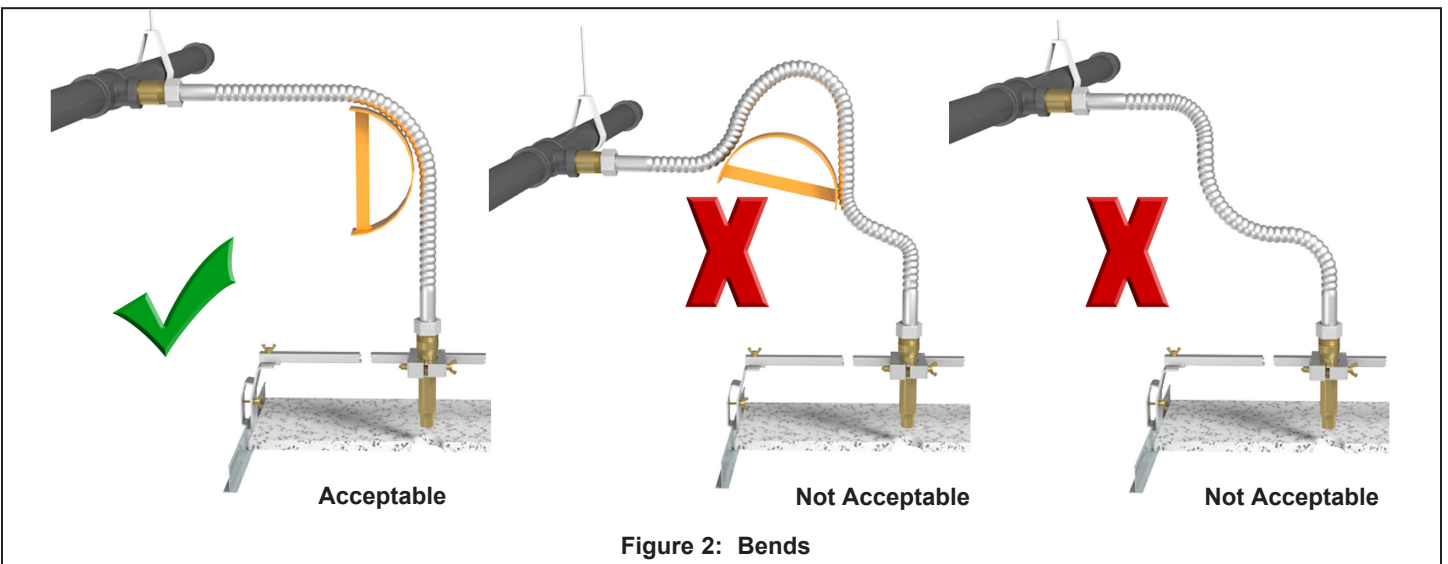


Figure 2: Bends

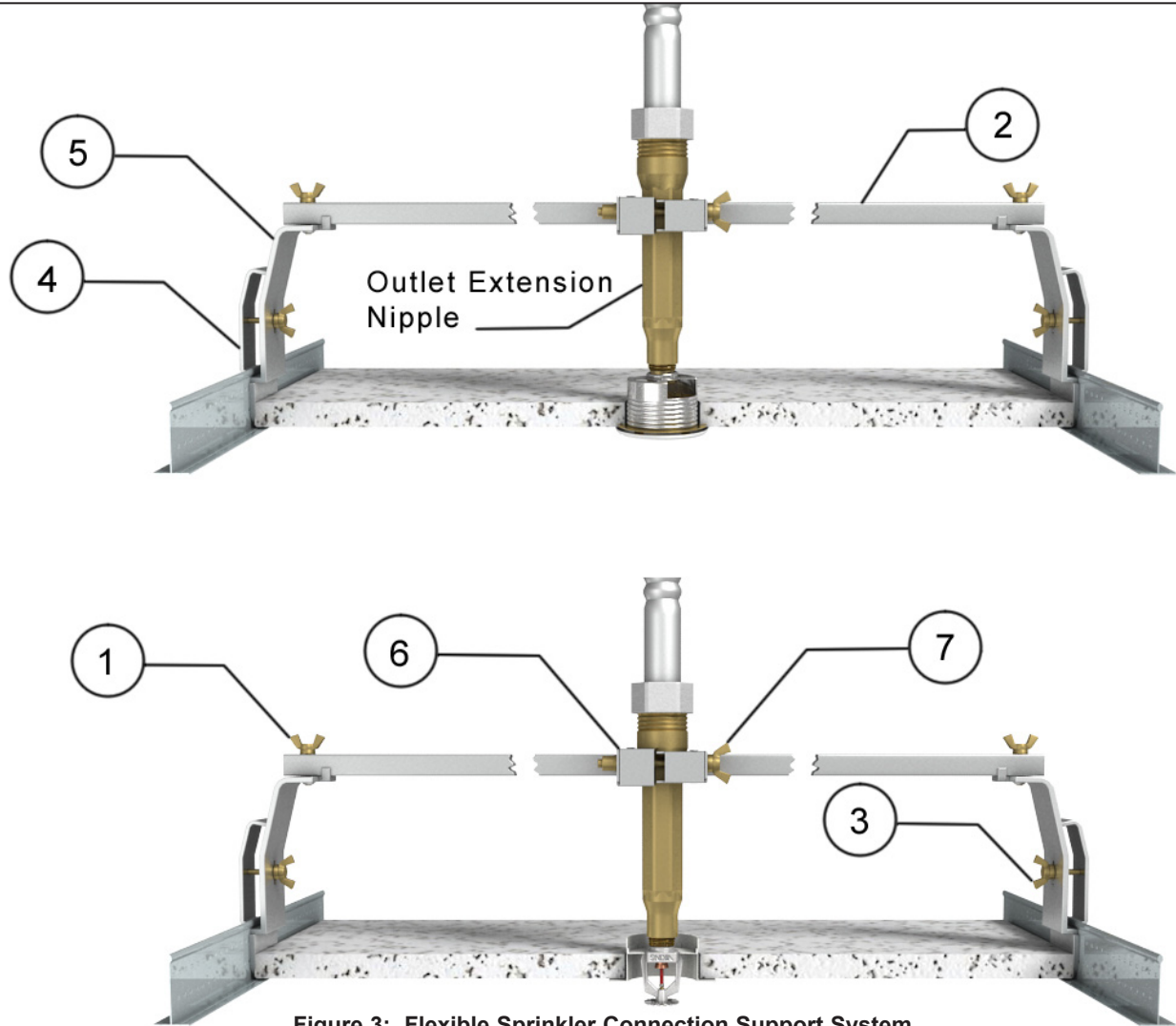


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**Figure 3: Flexible Sprinkler Connection Support System**

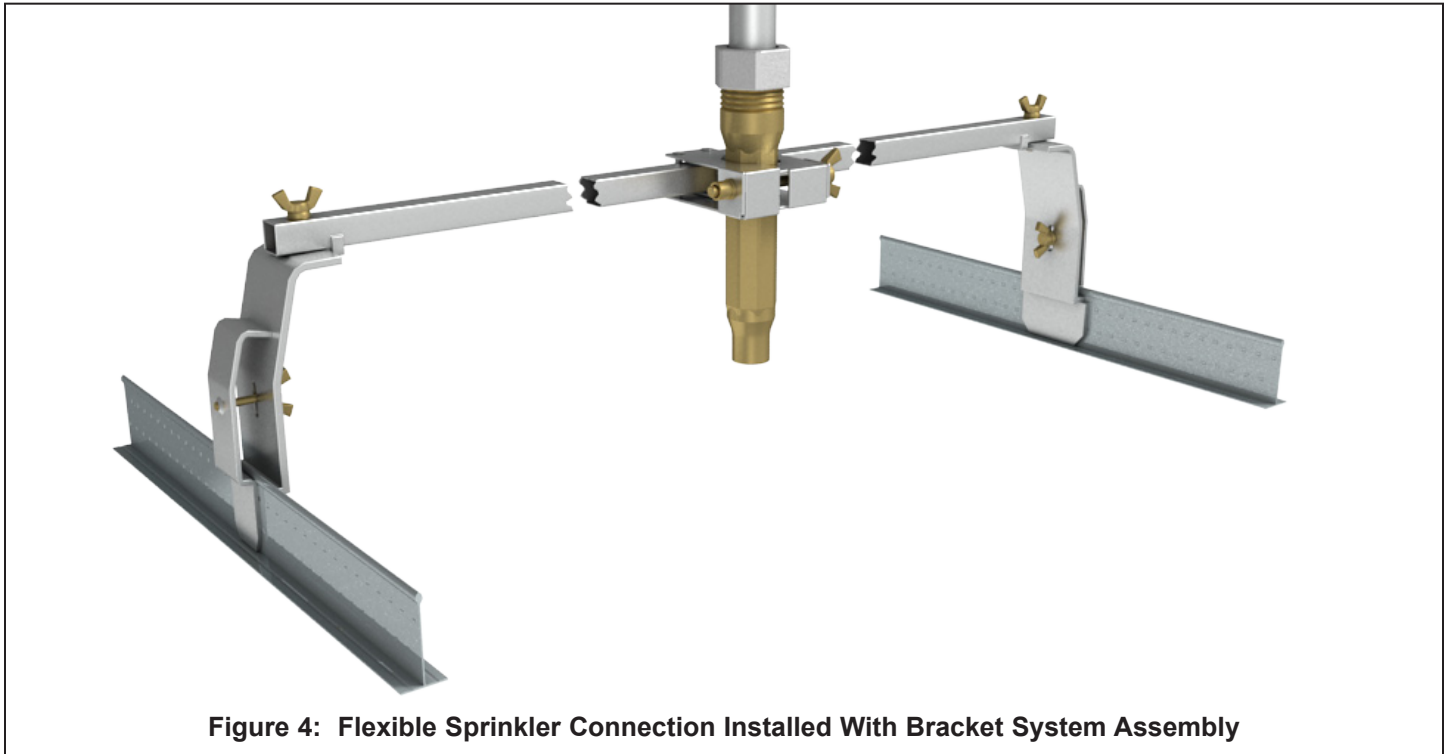
No.	Description
1	Top Wing Bolt, M6 X P1 x 1in (25mm) Long
2	Square Bar
3	Side Wing Bolt, M6 X P1 X 1in (25mm) Long
4	Outside Bracket
5	Inside Bracket
6	Center Bracket Assembly
7	Center Bracket Wing Bolt M6 X P1 X 2 3/4in (70mm) Long



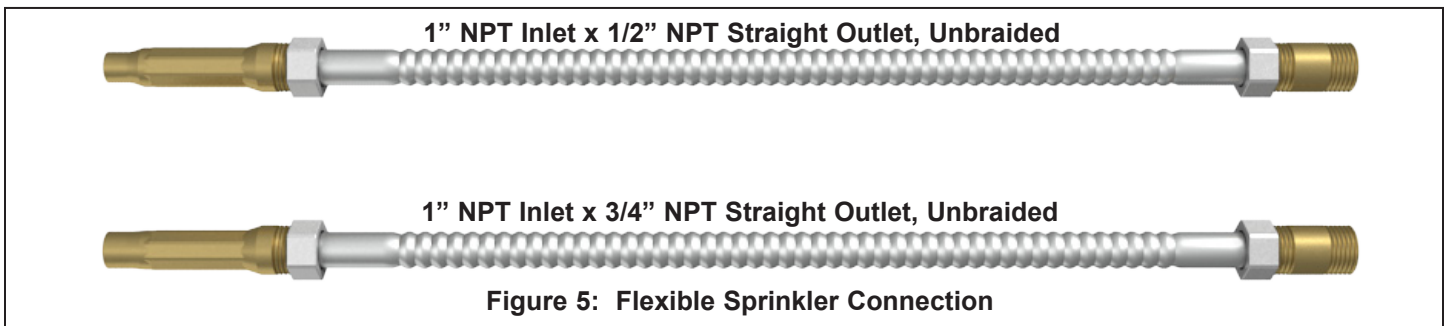
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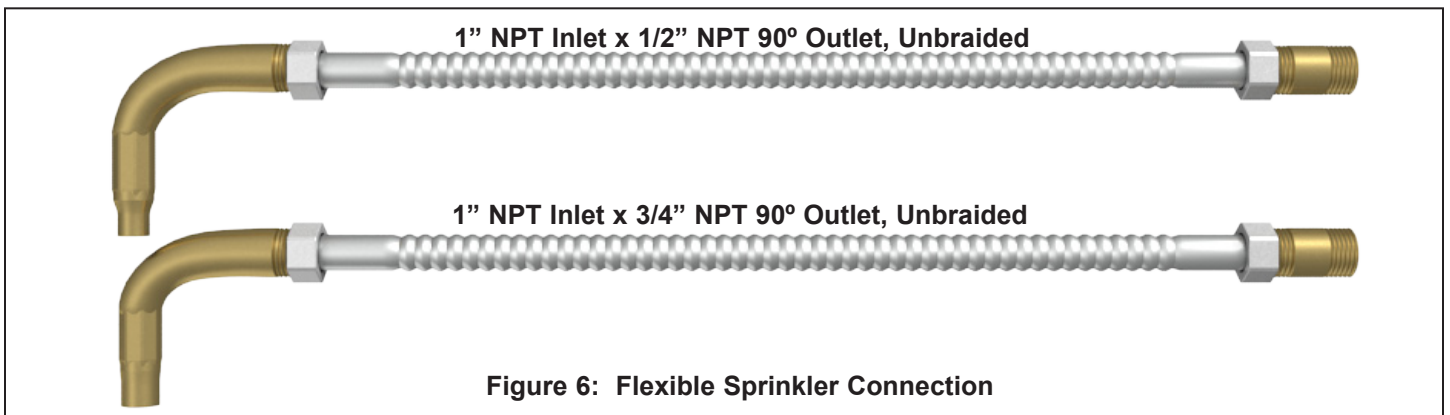
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**Figure 4: Flexible Sprinkler Connection Installed With Bracket System Assembly**



**Figure 5: Flexible Sprinkler Connection**



**Figure 6: Flexible Sprinkler Connection**