



#26090
COLA REPORT
2021 - 2022



BADGER INDUSTRIES - CITY OF LOS ANGELES COLA REPORT
— LARR 26090 —

CITY OF LOS ANGELES

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RESEARCH REPORT: RR 26090
(CSI # 13080)

REEVALUATION DUE
DATE: May 01, 2022
Issued Date: January 01, 2021
Code: 2020 LABC

GENERAL APPROVAL – Technical Modification and Renewal – Badger Industries Seismic and Vertical Components

DETAILS

The Badger Industries seismic SSC, SSC-HD and SSC-RF components are composed of ASTM A1011 CS, Grade 33 or equivalent minimum 33,000 psi yield strength carbon steel. Pivot pin is composed of (1/2") diameter ASTM A307 or equivalent carbon steel. A slotted tabbed washer sized to fit connection is provided with, and is required to be installed with each Badger Industries SSC-RF seismic bracket. Seismic brackets can be used for upper or lower brace end connections. Badger SBEMT pivot arm shall be removed when connecting cable brace member to pivot pin. The Allowable and (LRFD) capacities are listed in Attachments 1, 2 and 3.

The Badger Industries seismic SB1258 and SBRF components are composed of ASTM A1011 CS, Grade 33 or equivalent minimum 33,000 psi yield strength carbon steel. Pivot pin is composed of (3/8") diameter ASTM A307 or equivalent carbon steel. Two slotted washers sized to fit connection is provided with, and is required to be installed with each SBRF seismic bracket. Seismic brackets can be used for upper or lower brace end connections. Badger SBEMT pivot arm shall be removed when connecting cable brace member to pivot pin. The Allowable and (LRFD) capacities are listed in Attachments 4 and 5.

The Badger Industries seismic SBEMT rigid bracing component using (2)-(1/4"x1") hex washer head screws. SBEMT component is composed of minimum 33,000 psi yield strength carbon steel. The Allowable and (LRFD) capacities are listed in Attachment 6.

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Badger Industries

RE: Badger Seismic Bracing And Vertical Components

The Badger Industries seismic SWB component is composed of 0.30-inch diameter, minimum 33,000 psi yield strength carbon steel rod. The Allowable and (LRFD) capacities are listed in Attachment 7.

The Badger Industries seismic SCC-1 cable braces are composed of (1/16") diameter 7x7 galvanized steel aircraft cable with a stake-eye fitting at one end and a Badger Industries SCC-1 cable clamp bolt turn back connection at the other end. Badger Industries seismic SCC-2 cable braces are composed of (1/8") diameter 7x7 galvanized steel aircraft cable, or (3/16") diameter 7x19 galvanized steel aircraft cable with a stake-eye fitting at one end and a Badger Industries SCC-2 cable clamp bolt turn back connection at the other end. The Allowable and (LRFD) capacities are listed in Attachment 8.

The Badger Industries seismic MDH3812, MDH1258 and NDH4S-W3 components are composed of minimum 33,000 psi yield strength carbon steel bodies. Part MDH3812 and part MDH1258 include a ASTM A307 or equivalent carbon steel threaded shaft, a lock washer and an internally threaded barrel with a torque-off hex nut. Part NDH4S-W3 includes (4) carbon steel pointed set bolts with torque-off hex washer heads. The Badger Industries seismic NDH38FV-W3 component is composed of a spring steel body, an internally threaded carbon steel swivel insert nut with thread engagement inspection holes and an elastomeric grommet. The Allowable and (LRFD) capacities are listed in Attachment 9.

The Badger Industries NDH4S-W3 can be used with Badger Industries rigid or cable bracing. The Allowable and (LRFD) capacities are listed in Attachment 10.

The Badger Industries beam clamp SBC158, SBC158-C, SBC158L and SBC158L-C components are composed of ASTM A1011 CS, Grade 33 or equivalent minimum 33,000 psi yield strength carbon steel and a 1/2-13 ASTM A307 or equivalent carbon steel clamp bolt with torque-off hex head. Beam clamps can be used as an individual beam clamp or in pairs as double beam clamps. The Allowable and (LRFD) capacities are listed in Attachments 11 thru 36.

Note, attachments 13, 14, 20, 21, 32 and 33 reference detail (CMN) Cantilevered Member Notice, see Attachment 37. Attachments 16, 17, 23, 24, 30, 31, 32 and 33 note that beam clamps can be used with strut member to span from beam to beam, see Attachments 38 and 39 (BBN) Beam to Beam Notice.

The Badger Industries seismic SHCA and EMT-RSC components are composed of ASTM A1011 CS, Grade 33 or equivalent minimum 33,000 psi yield strength carbon steel. Part SHCA includes a (1/4") diameter V-bolt and (2) tamper proof torque-off hex nuts which are composed of ASTM A307 or equivalent carbon steel. Part EMT-RSC includes a (1/4") diameter carriage bolt and a tamper proof torque-off hex nut which are composed of ASTM A307 or equivalent carbon steel. The Allowable and (LRFD) capacities are listed in Attachment 40 and Attachment 41.

The Badger Industries with Anvil International LLC seismic FIG: 212 component sizes (1-1/2" and smaller) are composed of ASTM A1011 carbon steel. FIG: 212 component sizes (2" thru 4") and FIG: 212FP component sizes (5" thru 12") are composed of ASTM A36 carbon steel. Clamp

Badger Industries

RE: Badger Seismic Bracing And Vertical Components

Bolts are composed of (1/2") diameter ASTM A307 or equivalent carbon steel. Badger SBEMT pivot arm shall be removed when connecting cable brace member to clamp bolt. The Allowable and (LRFD) capacities are listed in Attachments 42, 43, 44 and 45, see Attachment 46 (TLN) Transverse as Longitudinal Notice.

The approval is subject to the following conditions:

1. This approval is limited to mechanical, electrical, ductwork, equipment, plumbing components, and fire protection components
2. Fire protection vertical hangers shall be per 2016 NFPA-13, 9.1.1.2.
3. Fire protection seismic bracing shall be per ASCE 7, Seismic Design Requirements for Non-Structural Components.
4. The use of Badger Industries components is for interior use only.
5. The tabulated allowable and/or (LRFD) loads shall not be increased for duration of loading.
6. The values listed in attachments 1-46 are for the Badger Industries components only. Calculations demonstrating the applied loads are less than the loads for each individual component within the assembly shall be submitted for plan check at the time of permit application.
7. The Badger Industries seismic components and assembly installations shall be in accordance with the manufacturer's most current instructions and the requirements herein. A copy of this report and the installation instruction shall be provided at each job site by the installing contractor.
8. Periodic Special Inspection required during installation and anchorage of piping and ductwork designed to carry hazardous material in structures in accordance with LABC 1705.12.6.

DISCUSSION

The Technical Modification is to update the code to the 2020 City of Los Angeles Building Code and to add the new and updated attachments 9 – 10 and 41 – 46.

This report is in compliance with the 2020 City of Los Angeles Building Code.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items

Badger Industries

RE: Badger Seismic Bracing And Vertical Components

approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

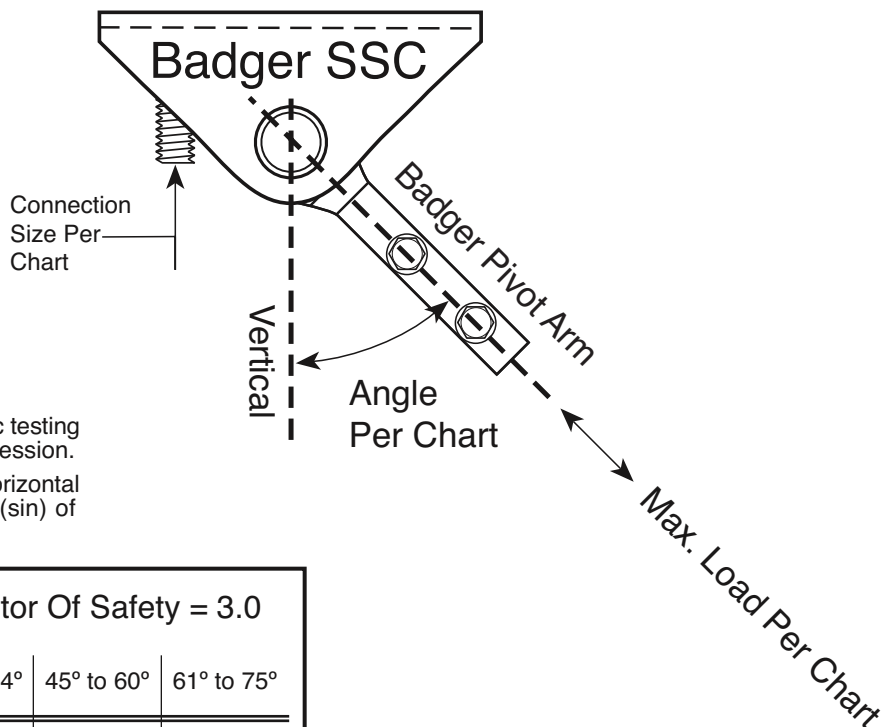
This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this Approval have been met in the project in which it is to be used.

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Attachments: Badger Industries Details (46 Pages)

DE
RR26090
R01/23/2021
TLB2100007
1705.11, 1705.12, 1705.12.6, 2210, 2211

BADGER INDUSTRIES - Part SSC



NOTES:
Capacity of bracket based on seismic testing considering both tension and compression.
To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

Allowable Load with Factor Of Safety = 3.0

| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° |
|-----------------|--------------|------------|------------|------------|
| 1/2 In. | Rigid | 1,602 lbs. | 1,602 lbs. | 1,195 lbs. |
| 5/8 In. | Rigid | 1,602 lbs. | 1,602 lbs. | 1,195 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° |
|-----------------|--------------|------------|------------|------------|
| 1/2 In. | Rigid | 2,403 lbs. | 2,403 lbs. | 1,793 lbs. |
| 5/8 In. | Rigid | 2,403 lbs. | 2,403 lbs. | 1,793 lbs. |

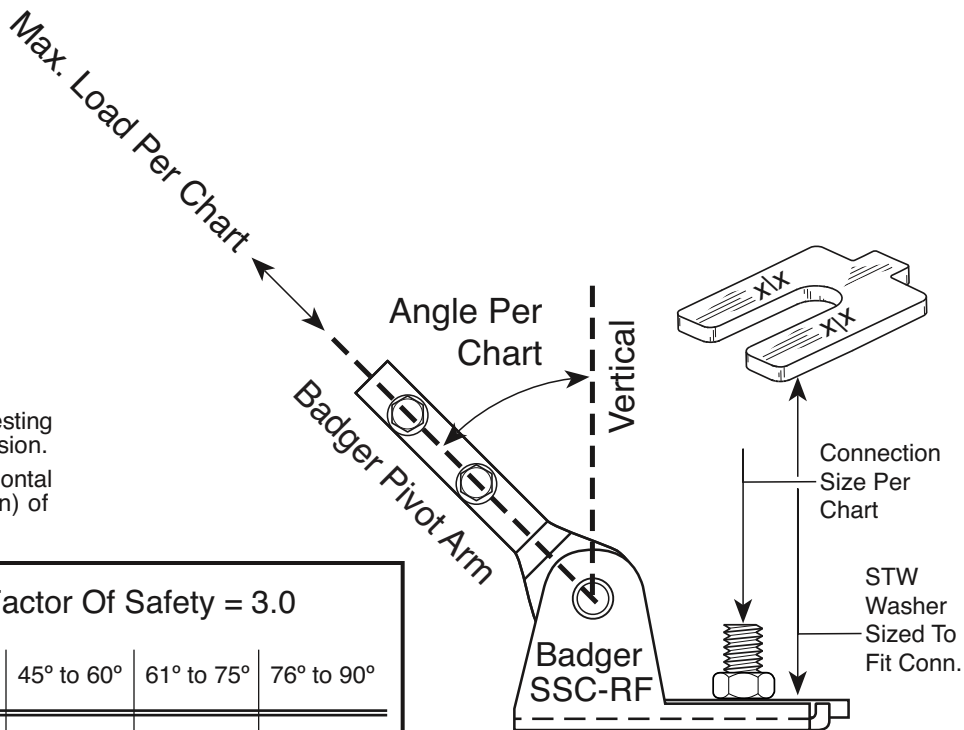


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BADGER INDUSTRIES - Part SSC-RF



NOTES:
Capacity of bracket based on seismic testing considering both tension and compression.
To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

| Allowable Load with Factor Of Safety = 3.0 | | | | | |
|--|--------------|------------|------------|------------|------------|
| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° | 76° to 90° |
| 3/8 In. | Rigid | 1,451 lbs. | 1,142 lbs. | 889 lbs. | 821 lbs. |
| 1/2 In. | Rigid | 1,451 lbs. | 1,142 lbs. | 889 lbs. | 821 lbs. |
| 5/8 In. | Rigid | 1,451 lbs. | 1,142 lbs. | 889 lbs. | 821 lbs. |
| 3/4 In. | Rigid | 1,451 lbs. | 1,142 lbs. | 889 lbs. | 821 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | | | | | |
|---|--------------|------------|------------|------------|------------|
| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° | 76° to 90° |
| 3/8 In. | Rigid | 2,176 lbs. | 1,714 lbs. | 1,333 lbs. | 1,232 lbs. |
| 1/2 In. | Rigid | 2,176 lbs. | 1,714 lbs. | 1,333 lbs. | 1,232 lbs. |
| 5/8 In. | Rigid | 2,176 lbs. | 1,714 lbs. | 1,333 lbs. | 1,232 lbs. |
| 3/4 In. | Rigid | 2,176 lbs. | 1,714 lbs. | 1,333 lbs. | 1,232 lbs. |

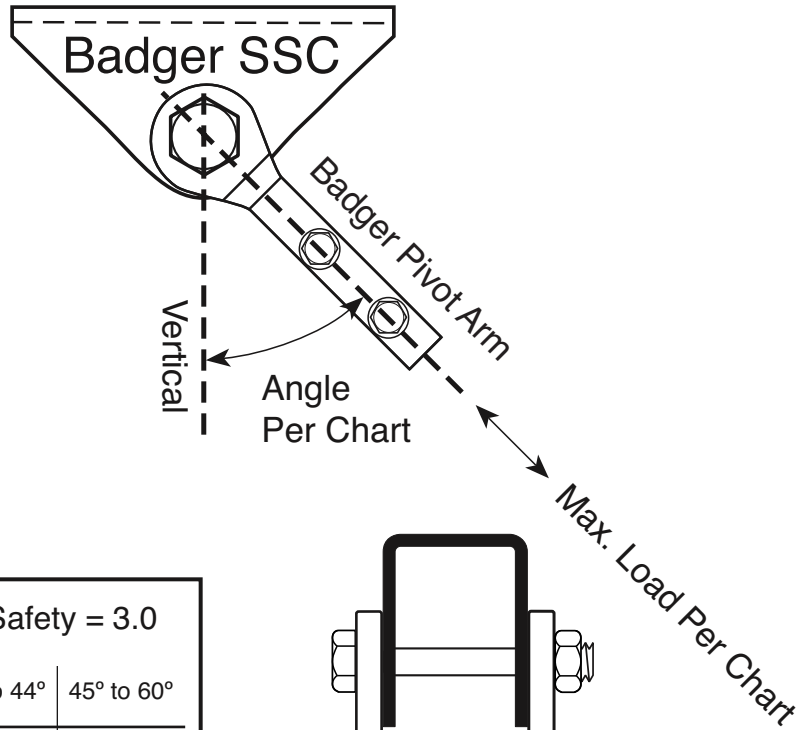


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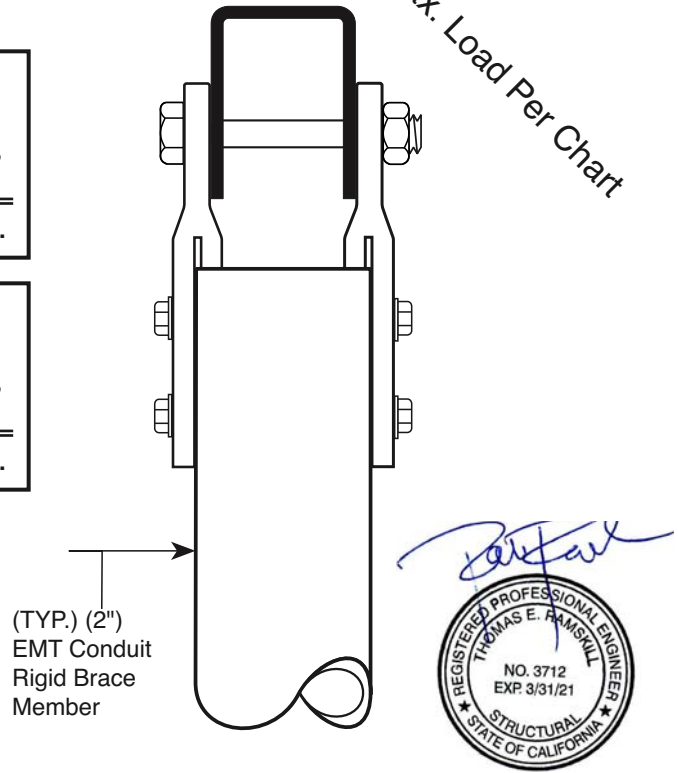
BADGER INDUSTRIES - Part SSC-HD



NOTES:
Capacity of bracket based on seismic testing considering both tension and compression.
To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

| Allowable Load with Factor Of Safety = 3.0 | | | | |
|--|--------------|------------|------------|------------|
| Connection Size | Bracing Type | 0° | 30° to 44° | 45° to 60° |
| (2) - 1/2 In. | Rigid | 2,501 lbs. | 2,501 lbs. | 2,501 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | | | | |
|---|--------------|------------|------------|------------|
| Connection Size | Bracing Type | 0° | 30° to 44° | 45° to 60° |
| (2) - 1/2 In. | Rigid | 3,752 lbs. | 3,752 lbs. | 3,752 lbs. |



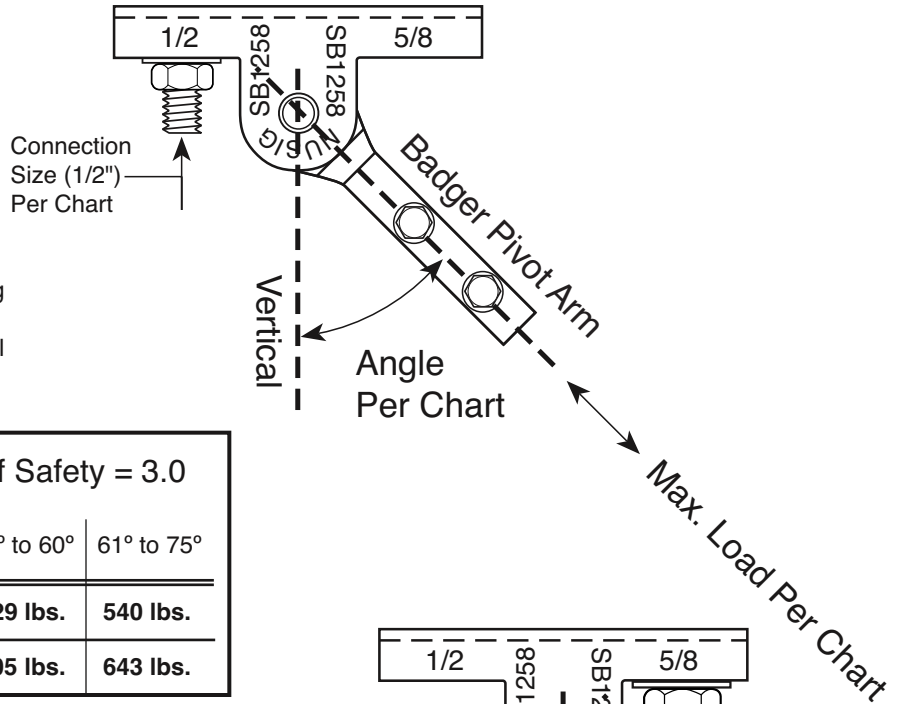
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BADGER INDUSTRIES - Part NUSIG SB1258

Patent #9,777,870



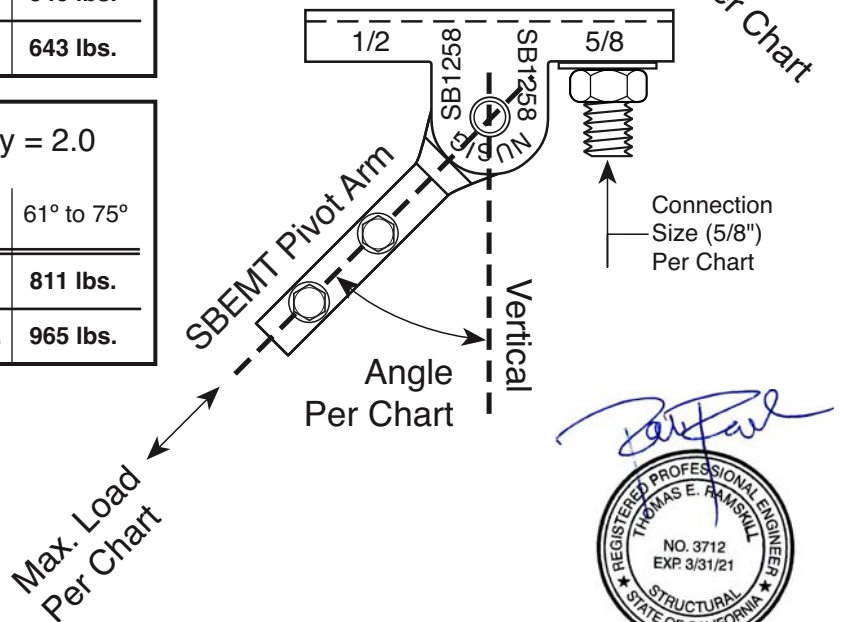
NOTES:
Capacity of bracket based on seismic testing considering both tension and compression.
To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

Allowable Load with Factor Of Safety = 3.0

| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° |
|-----------------|--------------|------------|------------|------------|
| 1/2 In. | Rigid | 962 lbs. | 629 lbs. | 540 lbs. |
| 5/8 In. | Rigid | 972 lbs. | 805 lbs. | 643 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° |
|-----------------|--------------|------------|------------|------------|
| 1/2 In. | Rigid | 1,443 lbs. | 943 lbs. | 811 lbs. |
| 5/8 In. | Rigid | 1,458 lbs. | 1,208 lbs. | 965 lbs. |



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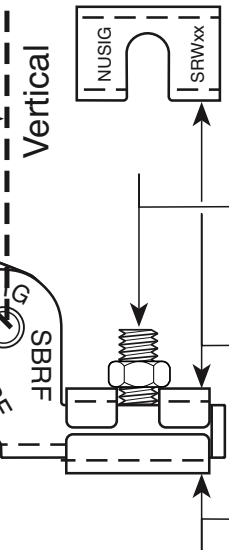
BADGER INDUSTRIES - Part NUSIG SBRF

Patent #9,777,870

Max. Load Per Chart

Angle Per Chart

Badger Pivot Arm



NOTES:
Capacity of bracket based on seismic testing considering both tension and compression.
To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

Allowable Load with Factor Of Safety = 3.0

| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° | 76° to 90° |
|-----------------|--------------|------------|------------|------------|------------|
| 3/8 In. | Rigid | 688 lbs. | 695 lbs. | 455 lbs. | 375 lbs. |
| 1/2 In. | Rigid | 688 lbs. | 695 lbs. | 455 lbs. | 375 lbs. |
| 5/8 In. | Rigid | 688 lbs. | 695 lbs. | 455 lbs. | 375 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Connection Size | Bracing Type | 30° to 44° | 45° to 60° | 61° to 75° | 76° to 90° |
|-----------------|--------------|------------|------------|------------|------------|
| 3/8 In. | Rigid | 1,033 lbs. | 1,043 lbs. | 682 lbs. | 535 lbs. |
| 1/2 In. | Rigid | 1,033 lbs. | 1,043 lbs. | 682 lbs. | 535 lbs. |
| 5/8 In. | Rigid | 1,033 lbs. | 1,043 lbs. | 682 lbs. | 535 lbs. |

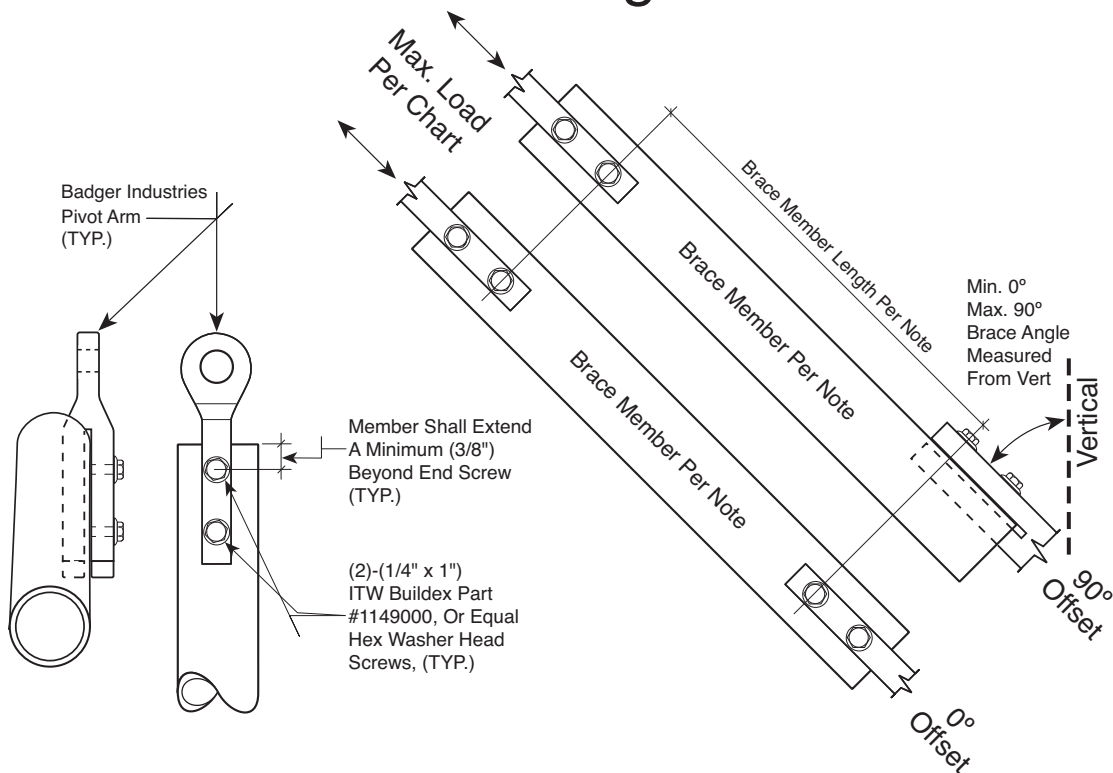


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BADGER INDUSTRIES - Rigid Brace Member



NOTES:

Capacity based on seismic testing considering both tension and compression. To convert chart listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

Capacities listed within the chart on this sheet do not account for brace length compression capacity. Thus, calculations demonstrating the applied design demand loads are less than the brace member length compression capacity shall be submitted for plan check.

Brace member shall be EMT Conduit sizes (3/4" thru 2-1/2"). Conduit shall be steel tubing constructed to UL-797 Or ANSI C-80.3. Schedule 5 or schedule 7 steel pipe with an equal or larger nominal size, and a minimum yield strength of 30,000 psi can be used in place of conduit. Brace member shall be installed as a straight, (1) piece continuous member. Screws shall not be installed into brace member weld seam. 12 gauge strut or 90° angle can be used in place of conduit.

| Allowable Load with Factor Of Safety = 3.0 | |
|--|------------|
| EMT Conduit Nominal Size | 0° to 90° |
| 3/4 in. | 618 lbs. |
| 1 in. | 973 lbs. |
| 1-1/4 in. | 1,305 lbs. |
| 1-1/2 in. | 1,177 lbs. |
| 2 in. | 1,118 lbs. |
| 2-1/2 in. | 1,119 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|------------|
| EMT Conduit Nominal Size | 0° to 90° |
| 3/4 in. | 927 lbs. |
| 1 in. | 1,459 lbs. |
| 1-1/4 in. | 1,958 lbs. |
| 1-1/2 in. | 1,765 lbs. |
| 2 in. | 1,677 lbs. |
| 2-1/2 in. | 1,678 lbs. |



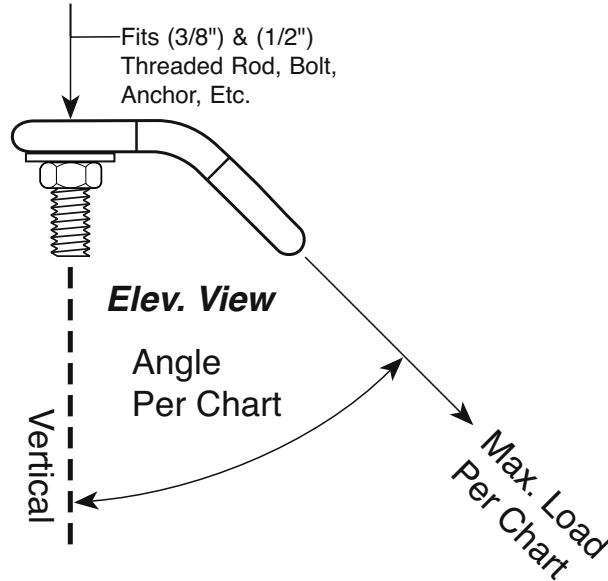
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BADGER INDUSTRIES - Part SWB

Patent Pending



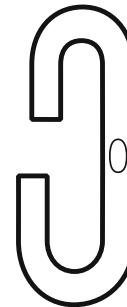
NOTES:
Capacity of bracket based on testing considering tension only.

To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

| Allowable Load with Factor Of Safety = 3.0 | | |
|--|--------------|------------|
| Connection Size | Bracing Type | 30° to 60° |
| 3/8 In. | Tension | 472 lbs. |
| 1/2 In. | Tension | 522 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | | |
|---|--------------|------------|
| Connection Size | Bracing Type | 30° to 60° |
| 3/8 In. | Tension | 708 lbs. |
| 1/2 In. | Tension | 783 lbs. |

Badger SWB



(1) End Fits
(3/8") Connection Size

Plan View

(1) End Fits
(1/2") Connection Size

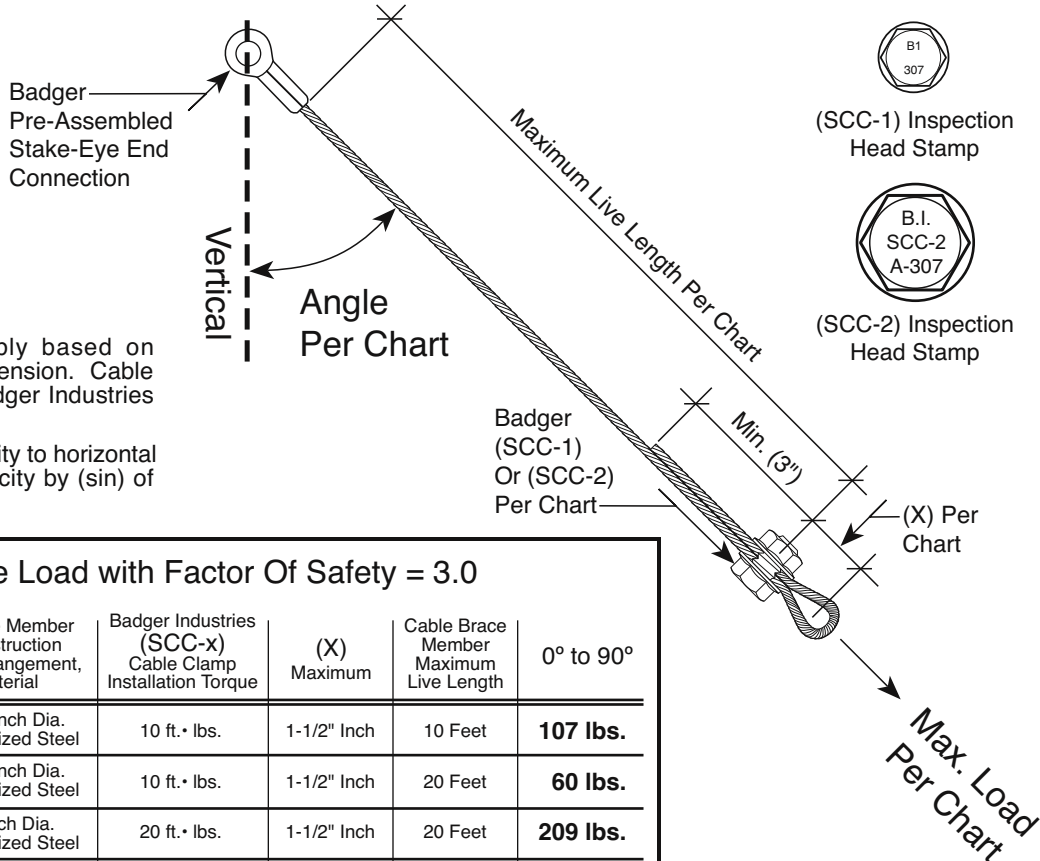


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BADGER INDUSTRIES - Cable Brace Member



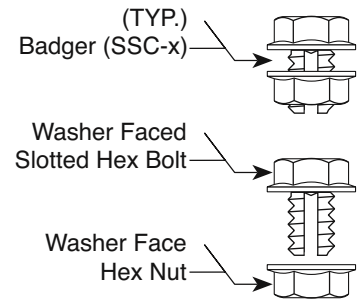
NOTES:
 Capacity of cable assembly based on seismic testing considering tension. Cable ends to be connected to Badger Industries COLA listed components.
 To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

Allowable Load with Factor Of Safety = 3.0

| Badger Industries (SCC-x) Cable Clamp Seismic Hardware Part Number | Cable Brace Member Size, Construction Strands / Arrangement, And Material | Badger Industries (SCC-x) Cable Clamp Installation Torque | (X) Maximum | Cable Brace Member Maximum Live Length | 0° to 90° |
|--|---|---|-------------|--|-----------------|
| SCC-1 | Min. (1/16") Inch Dia. (7x7) Galvanized Steel | 10 ft. • lbs. | 1-1/2" Inch | 10 Feet | 107 lbs. |
| SCC-1 | Min. (1/16") Inch Dia. (7x7) Galvanized Steel | 10 ft. • lbs. | 1-1/2" Inch | 20 Feet | 60 lbs. |
| SCC-2 | Min. (1/8") Inch Dia. (7x7) Galvanized Steel | 20 ft. • lbs. | 1-1/2" Inch | 20 Feet | 209 lbs. |
| SCC-2 | Min. (3/16") Inch Dia. (7x19) Galvanized Steel | 30 ft. • lbs. | 1-1/2" Inch | 10 Feet | 513 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

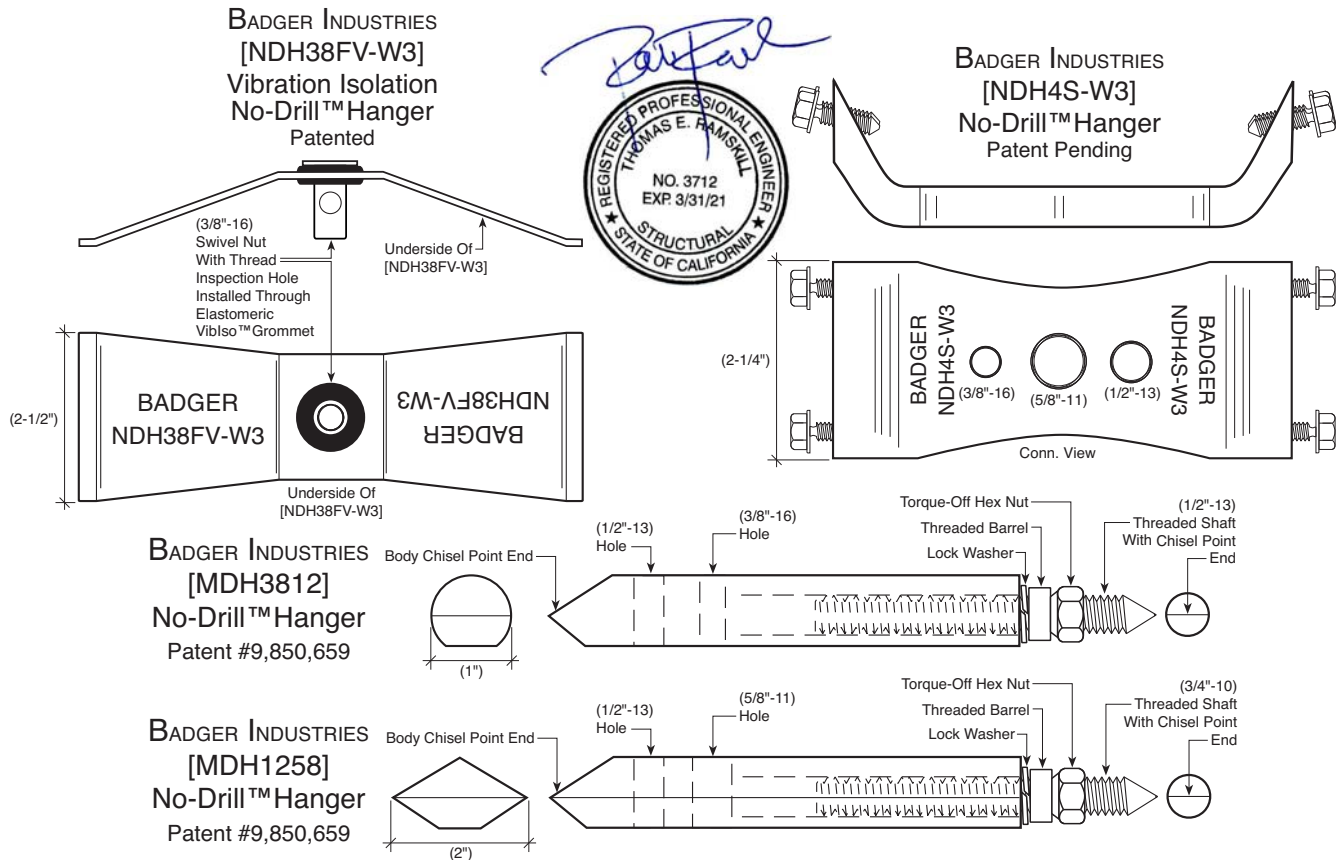
| Badger Industries (SCC-x) Cable Clamp Seismic Hardware Part Number | Cable Brace Member Size, Construction Strands / Arrangement, And Material | Badger Industries (SCC-x) Cable Clamp Installation Torque | (X) Maximum | Cable Brace Member Maximum Live Length | 0° to 90° |
|--|---|---|-------------|--|-----------------|
| SCC-1 | Min. (1/16") Inch Dia. (7x7) Galvanized Steel | 10 ft. • lbs. | 1-1/2" Inch | 10 Feet | 161 lbs. |
| SCC-1 | Min. (1/16") Inch Dia. (7x7) Galvanized Steel | 10 ft. • lbs. | 1-1/2" Inch | 20 Feet | 90 lbs. |
| SCC-2 | Min. (1/8") Inch Dia. (7x7) Galvanized Steel | 20 ft. • lbs. | 1-1/2" Inch | 20 Feet | 314 lbs. |
| SCC-2 | Min. (3/16") Inch Dia. (7x19) Galvanized Steel | 30 ft. • lbs. | 1-1/2" Inch | 10 Feet | 769 lbs. |



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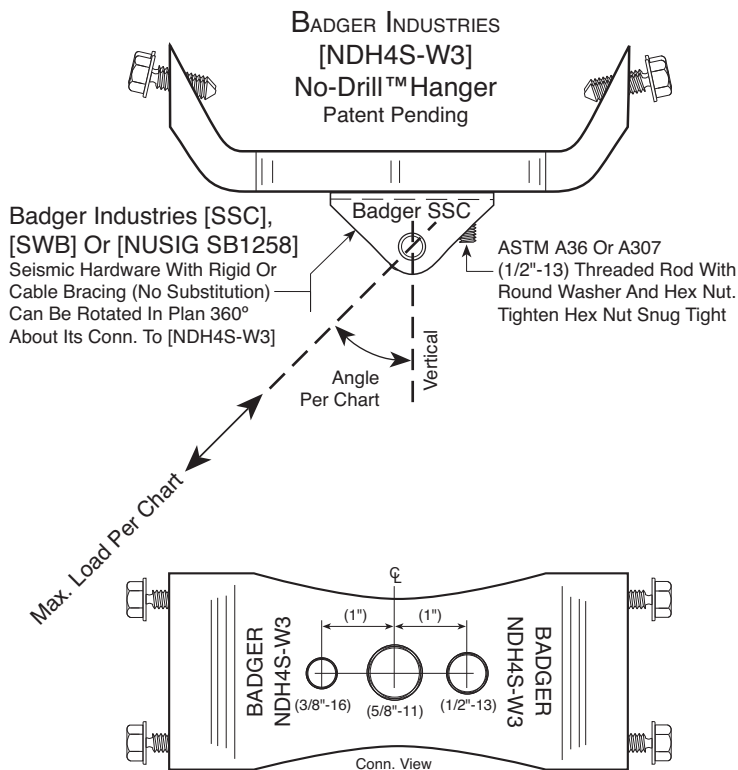


| VERTICAL HANGER INSTALLATIONS | | | | | | | |
|---------------------------------|----------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------|------------|-----------|
| Design Demand Application Usage | [NDH38FV-W3] Maximum Capacity | [MDH3812] Maximum Capacity | [MDH1258] Maximum Capacity | [NDH4S-W3] Maximum Capacity | [NDH38FV-W3] | [MDH3812] | [MDH1258] |
| Gravity (ASD) | 65 lbs. | 200 lbs. | 300 lbs. | 728 lbs. | 630 lbs. | 570 lbs. | 470 lbs. |
| Gravity + Seismic (ASD) | 130 lbs. | 255 lbs. | 537 lbs. | 970 lbs. | 840 lbs. | 760 lbs. | 626 lbs. |
| Gravity + Seismic (LRFD) | 182 lbs. | 385 lbs. | 806 lbs. | 1,456 lbs. | 1,260 lbs. | 1,140 lbs. | 940 lbs. |
| Minimum Between Spacing | 2-1/2 in. | 2 in. | 3 in. | 16 in. | 10 in. | 6 in. | 2-1/4 in. |
| Minimum Edge Distance | 6 in. | 6 in. | 6 in. | 6 in. | 6 in. | 6 in. | 6 in. |

Install and inspect per manufacturers most current instructions.
 Listed capacities do not included seismic concrete omega.
 Seismic concrete omega not required for all listed Gravity (ASD) capacities.
 Seismic concrete omega not required for all listed [NDH38FV-W3] capacities, as this component is a ductile failure performance component.
 For Gravity + Seismic Usage, the gravity design demand shall no exceed the listed Gravity (ASD) capacity.
 Use of double or quadruple Badger No-Drill™Hangers with span member shall be engineered by registered California engineer.

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**[NDH4S-W3]
SEISMIC BRACE INSTALLATIONS**

| | |
|--------------------------------|--------------------------------|
| Design Demand Application Type | 30° to 60° Maximum Capacity |
| Seismic Brace (ASD) | 767 lbs. |
| Seismic Brace (LRFD) | 1,151 lbs. |
| Minimum Between Spacing | 24 in. |
| Minimum Edge Distance | 12 in. |

Install and inspect per manufacturers most current instructions.
Listed capacities do not included seismic concrete omega.
To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.
Use of double or quadruple Badger No-Drill™Hangers with span member shall be engineered by registered California engineer.



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BADGER INDUSTRIES - Part SBC158

Patent Pending

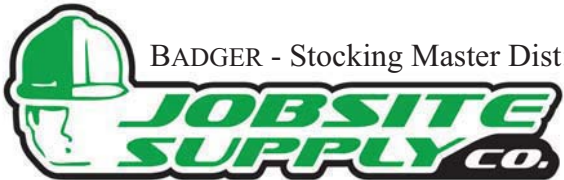
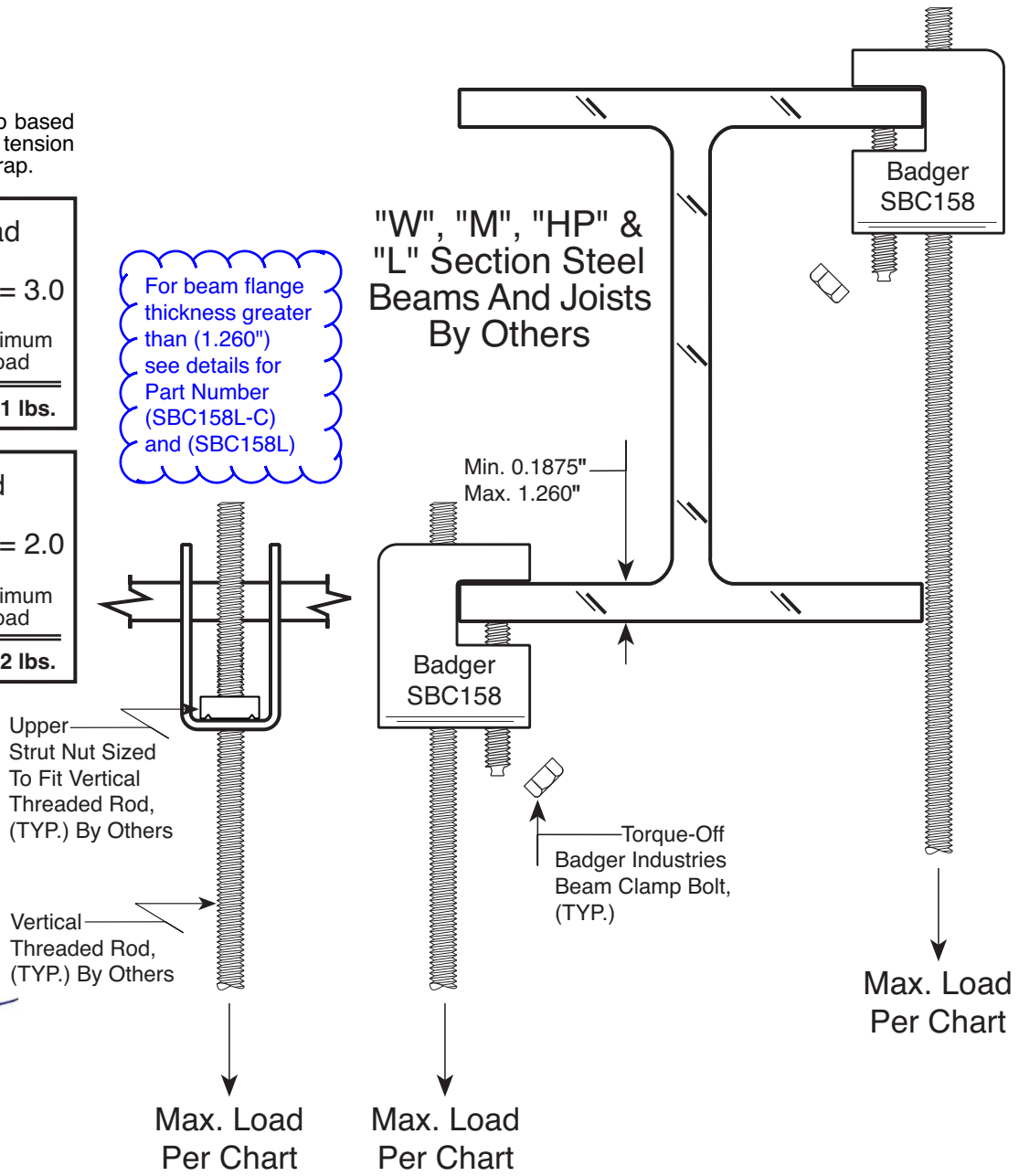
NOTES:
Capacity of beam clamp based on testing considering tension only without retaining strap.

| Allowable Load with Factor Of Safety = 3.0 | |
|--|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8", 1/2" & 5/8" | 2,581 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8", 1/2" & 5/8" | 3,872 lbs. |

For beam flange thickness greater than (1.260") see details for Part Number (SBC158L-C) and (SBC158L)

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others



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BADGER INDUSTRIES - Part SBC158

Patent Pending

NOTES:
Capacity of beam clamp based on seismic testing considering both tension and compression without retaining strap.

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8", 1/2" & 5/8" | 971 lbs. |

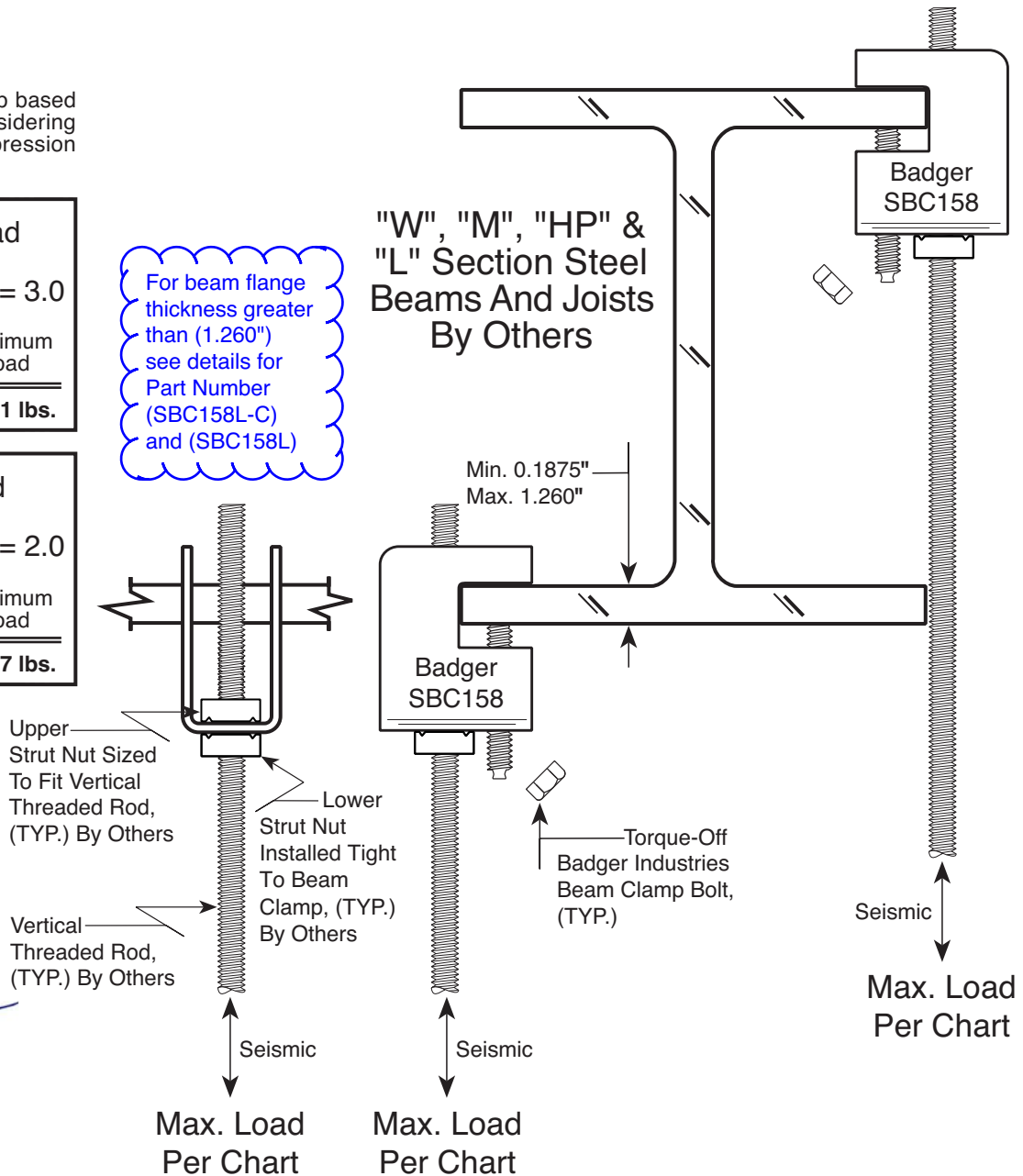
(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8", 1/2" & 5/8" | 1,457 lbs. |

For beam flange thickness greater than (1.260") see details for Part Number (SBC158L-C) and (SBC158L)

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Min. 0.1875"
Max. 1.260"



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BADGER INDUSTRIES - Part SBC158

Patent Pending

NOTES:
Capacity of beam clamp with depicted cantilevered strut member based on testing considering tension only without retaining strap. Can be installed on lower or upper flange. (CMN) considered.

For beam flange thickness greater than (1.260") see details for Part Number (SBC158L-C) and (SBC158L)

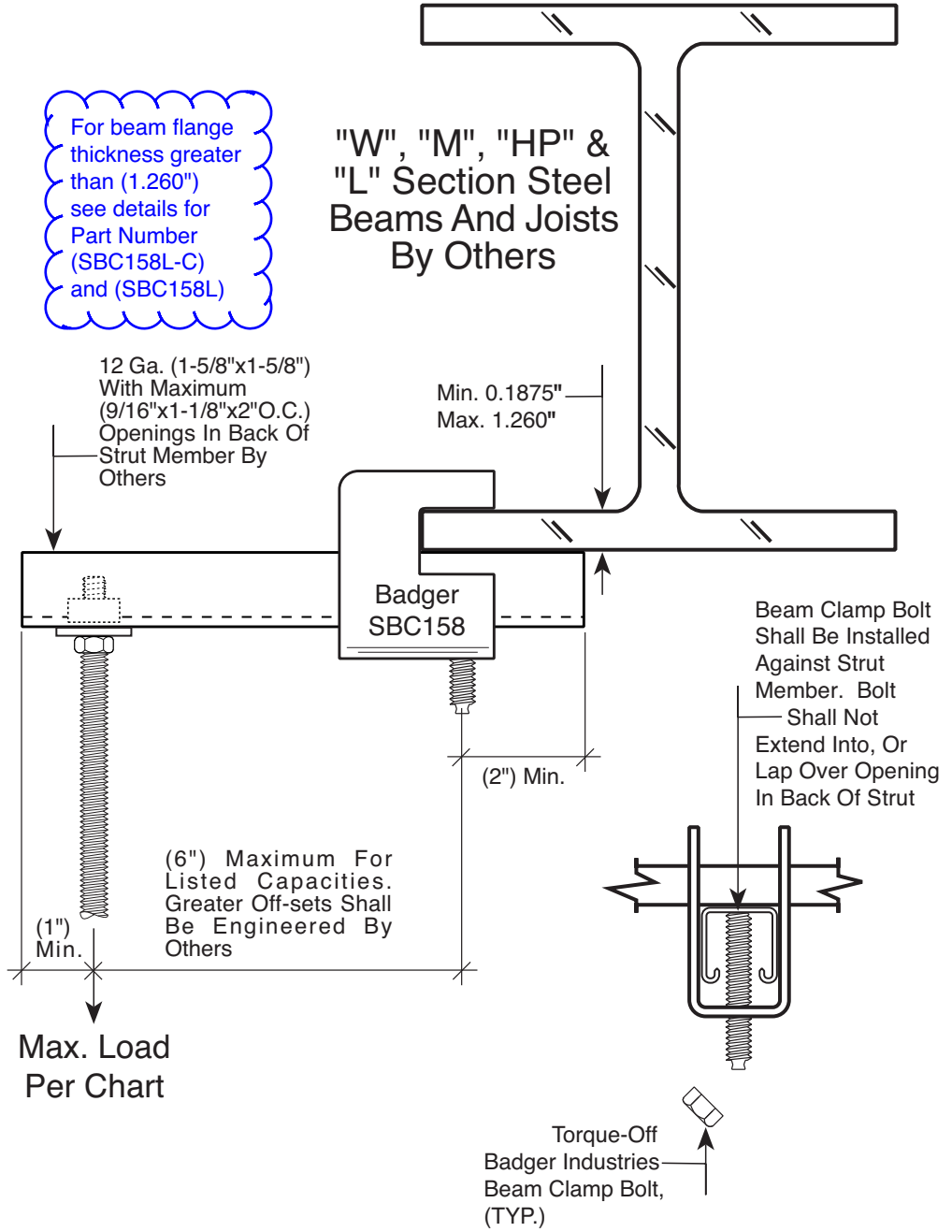
"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 304 lbs. |

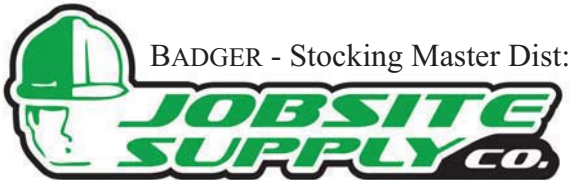
(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 364 lbs. |



Max. Load Per Chart

Torque-Off Badger Industries Beam Clamp Bolt, (TYP.)



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Patent Pending

NOTES:

Capacity of beam clamp with depicted cantilevered strut member based on seismic testing considering both tension and compression without retaining strap. Can be installed on lower or upper flange. (CMN) considered.

For beam flange thickness greater than (1.260") see details for Part Number (SBC158L-C) and (SBC158L)

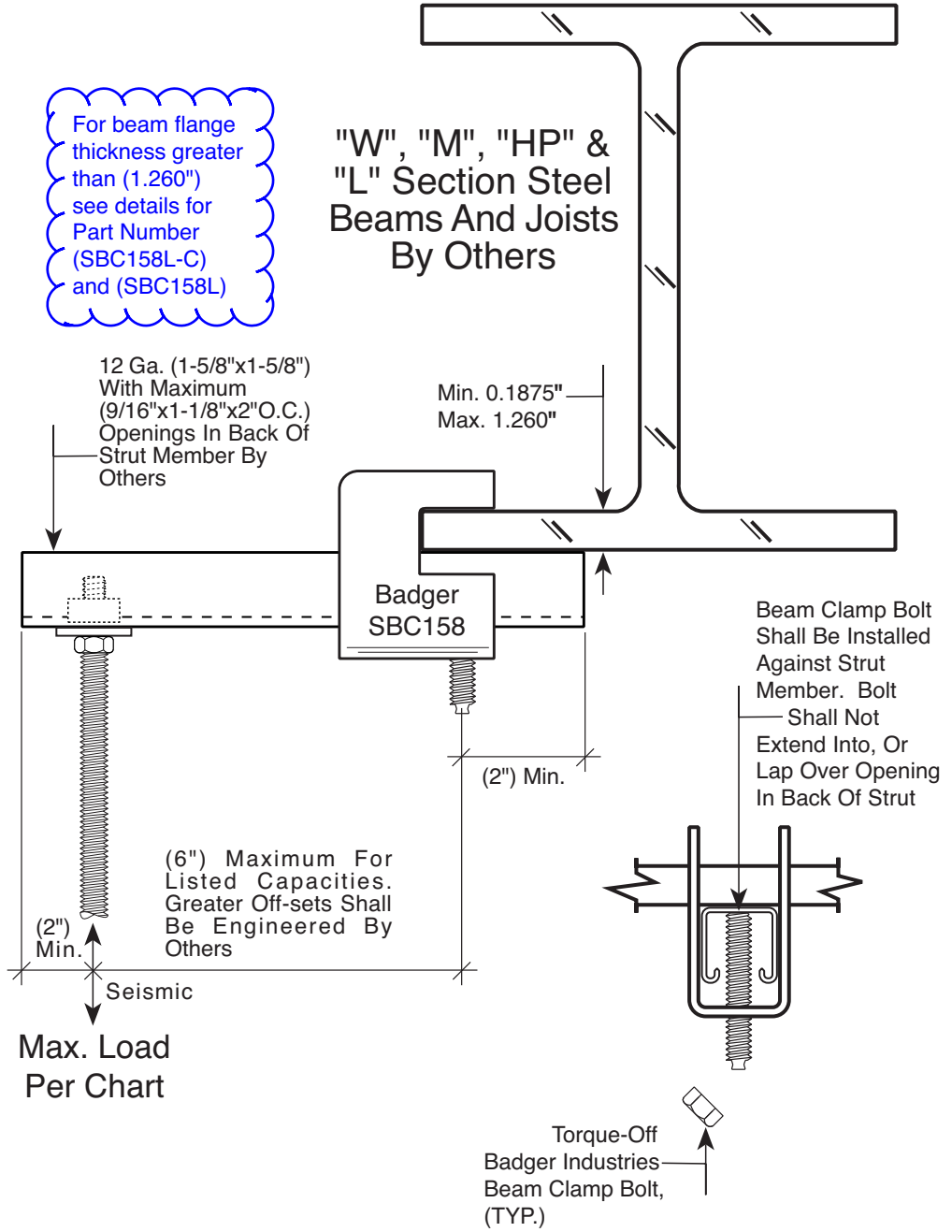
"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 149 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 224 lbs. |



Max. Load Per Chart

Torque-Off Badger Industries Beam Clamp Bolt, (TYP.)



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Patent Pending

NOTES:

Capacity of beam clamps assembled in pairs with depicted cantilevered strut member based on seismic testing considering both tension and compression only without retaining strap(s).

For beam flange thickness greater than (1.260") see details for Part Number (SBC158L-C) and (SBC158L)

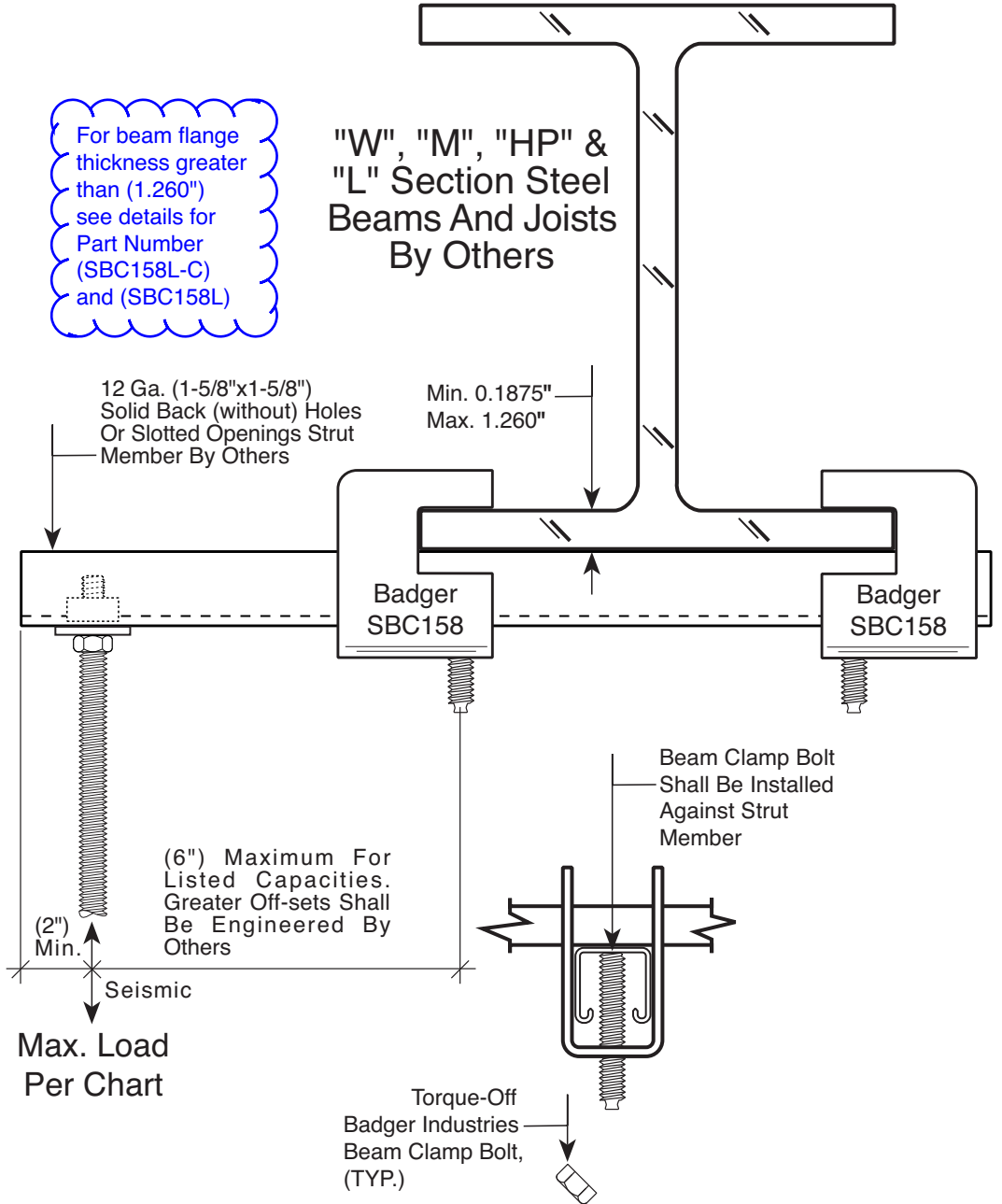
"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 677 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 1,015 lbs. |



Max. Load Per Chart



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NOTES:

Capacity of beam clamps assembled in pairs with depicted strut member based on testing considering tension only without retaining strap(s).

Double beam clamps with strut span member can be used to span from two separate beams and/or joist.

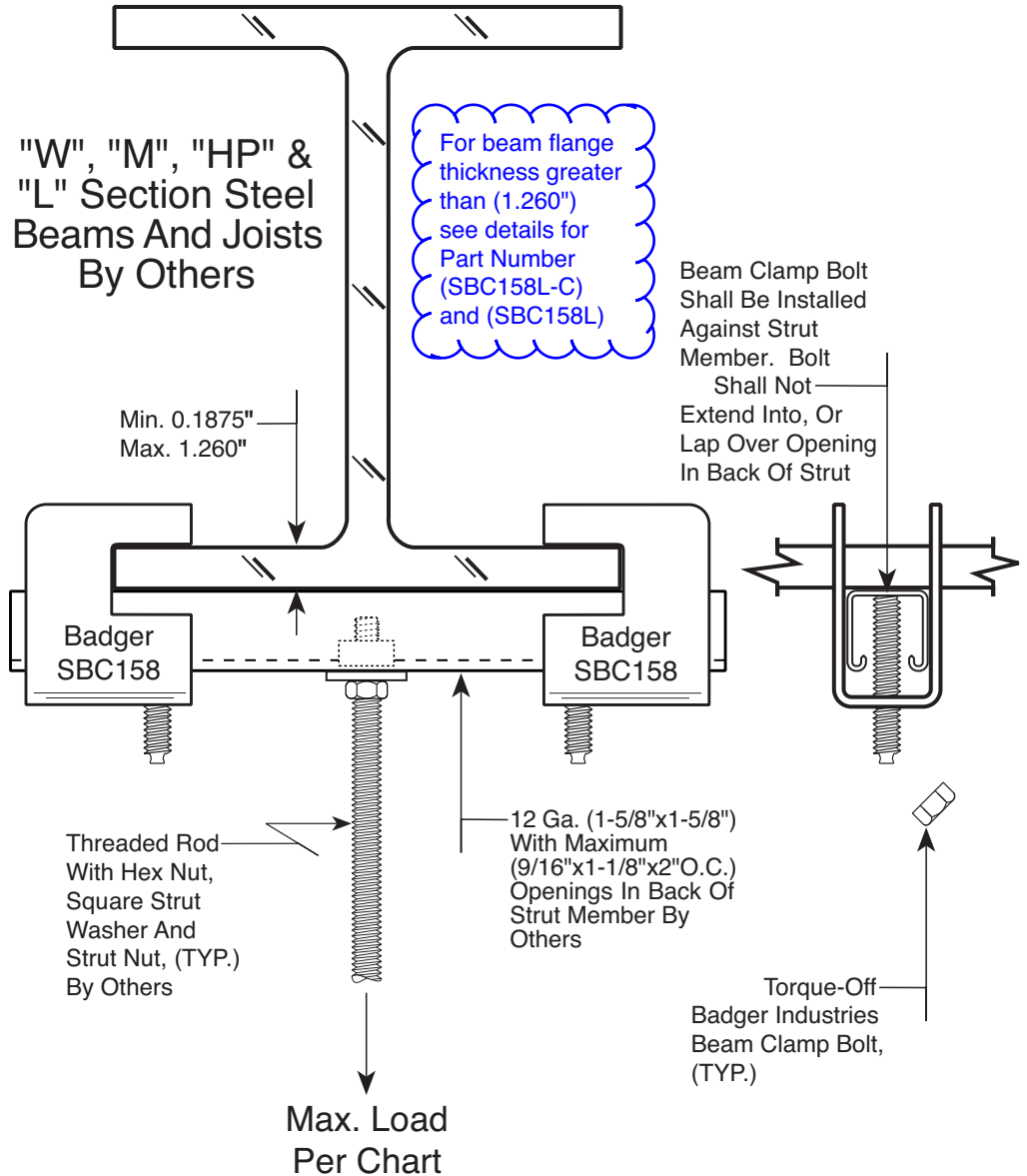
Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

For beam flange thickness greater than (1.260") see details for Part Number (SBC158L-C) and (SBC158L)

Beam Clamp Bolt Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut

Min. 0.1875"
Max. 1.260"



| Allowable Load with Factor Of Safety = 3.0 | |
|--|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 2,479 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 3,719 lbs. |



Max. Load Per Chart



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Patent Pending

NOTES:

Capacity of beam clamps assembled in pairs with depicted strut member based on seismic testing considering both tension and compression without retaining strap(s).

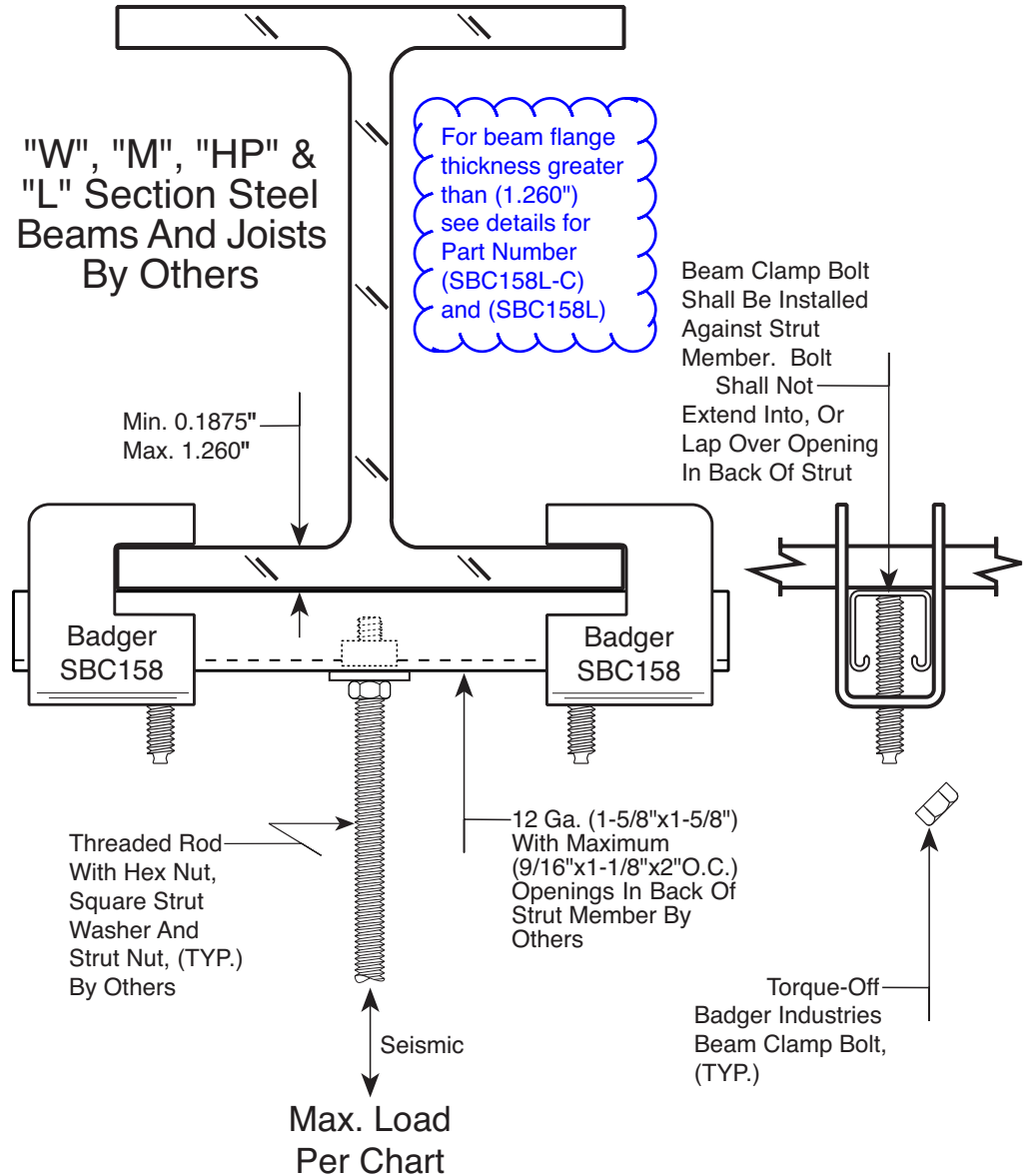
Double beam clamps with strut span member can be used to span from two separate beams and/or joist.

Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

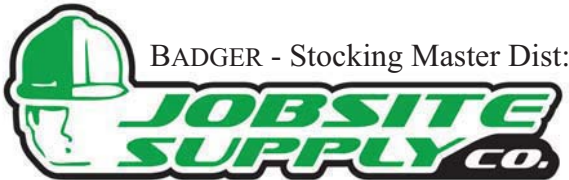
For beam flange thickness greater than (1.260") see details for Part Number (SBC158L-C) and (SBC158L)

Beam Clamp Bolt Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut



| Allowable Load with Factor Of Safety = 3.0 | |
|--|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 920 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 1,381 lbs. |



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Patent Pending

NOTES:
Capacity of beam clamp based on testing considering tension only without retaining strap.

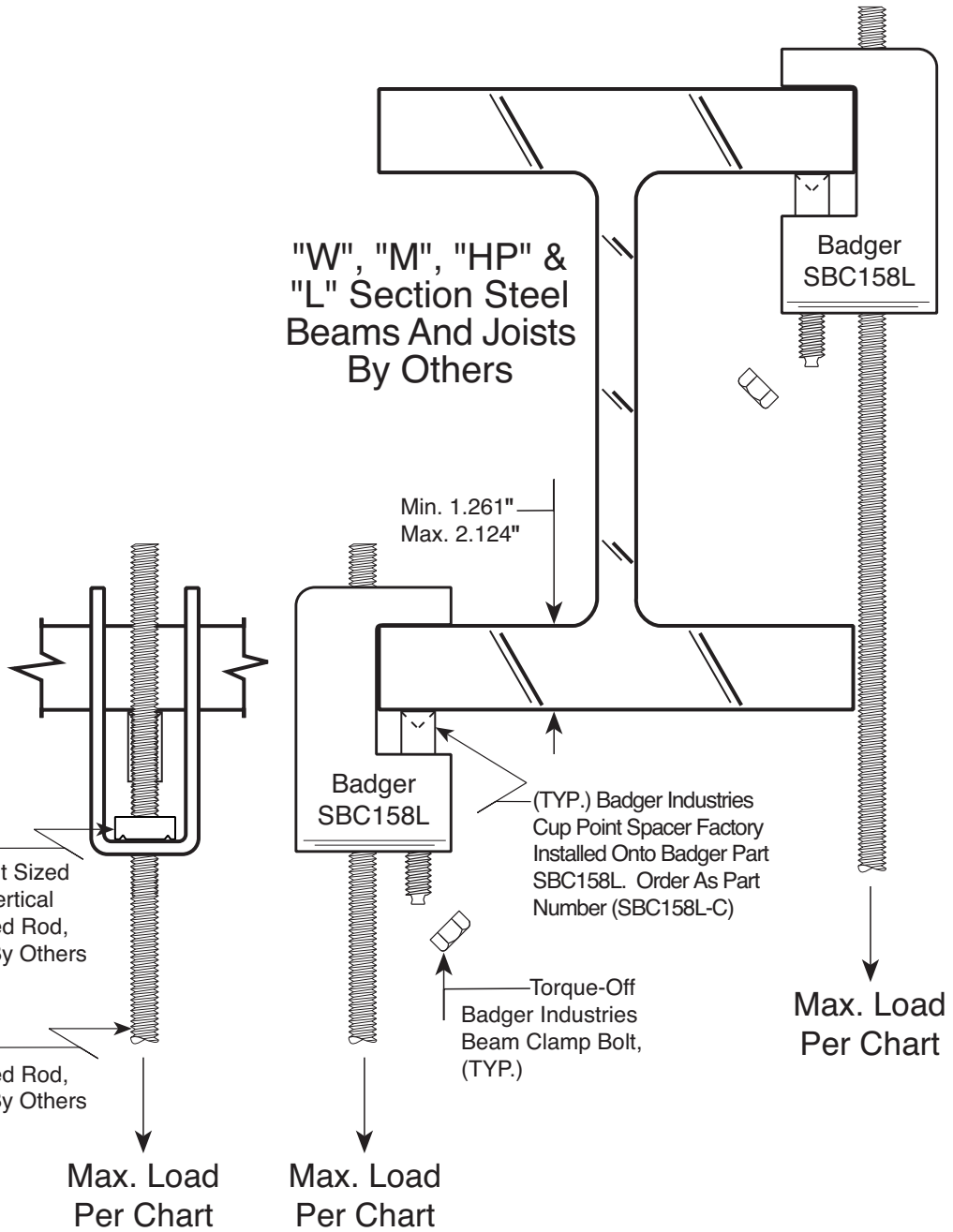
Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 3,247 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 4,871 lbs. |

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others



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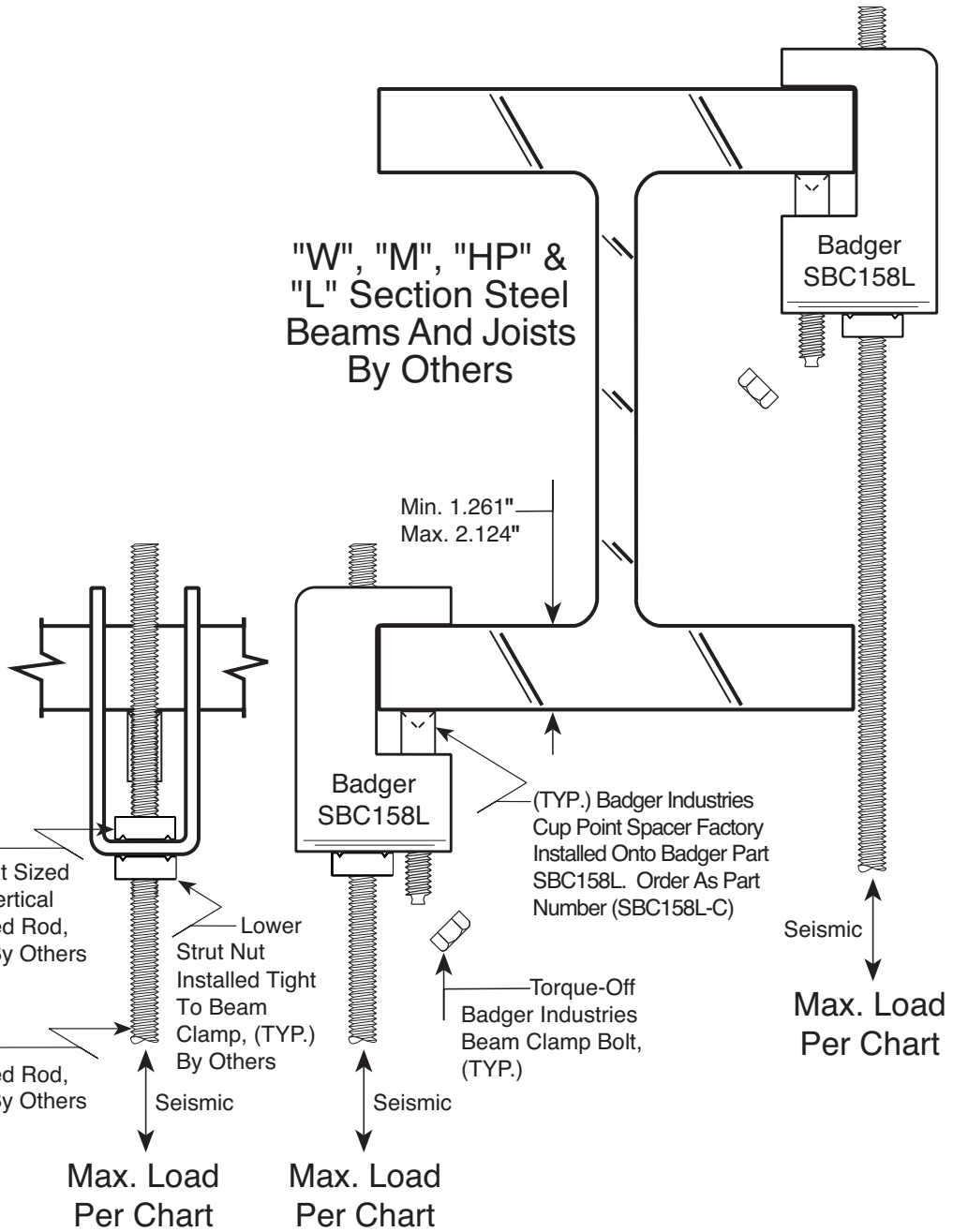
Patent Pending

NOTES:
Capacity of beam clamp based on seismic testing considering both tension and compression without retaining strap.

| Allowable Load with Factor Of Safety = 3.0 | |
|--|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 971 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 1,457 lbs. |

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Patent Pending

NOTES:
Capacity of beam clamp with depicted cantilevered strut member based on testing considering tension only without retaining strap. Can be installed on lower or upper flange. (CMN) considered.

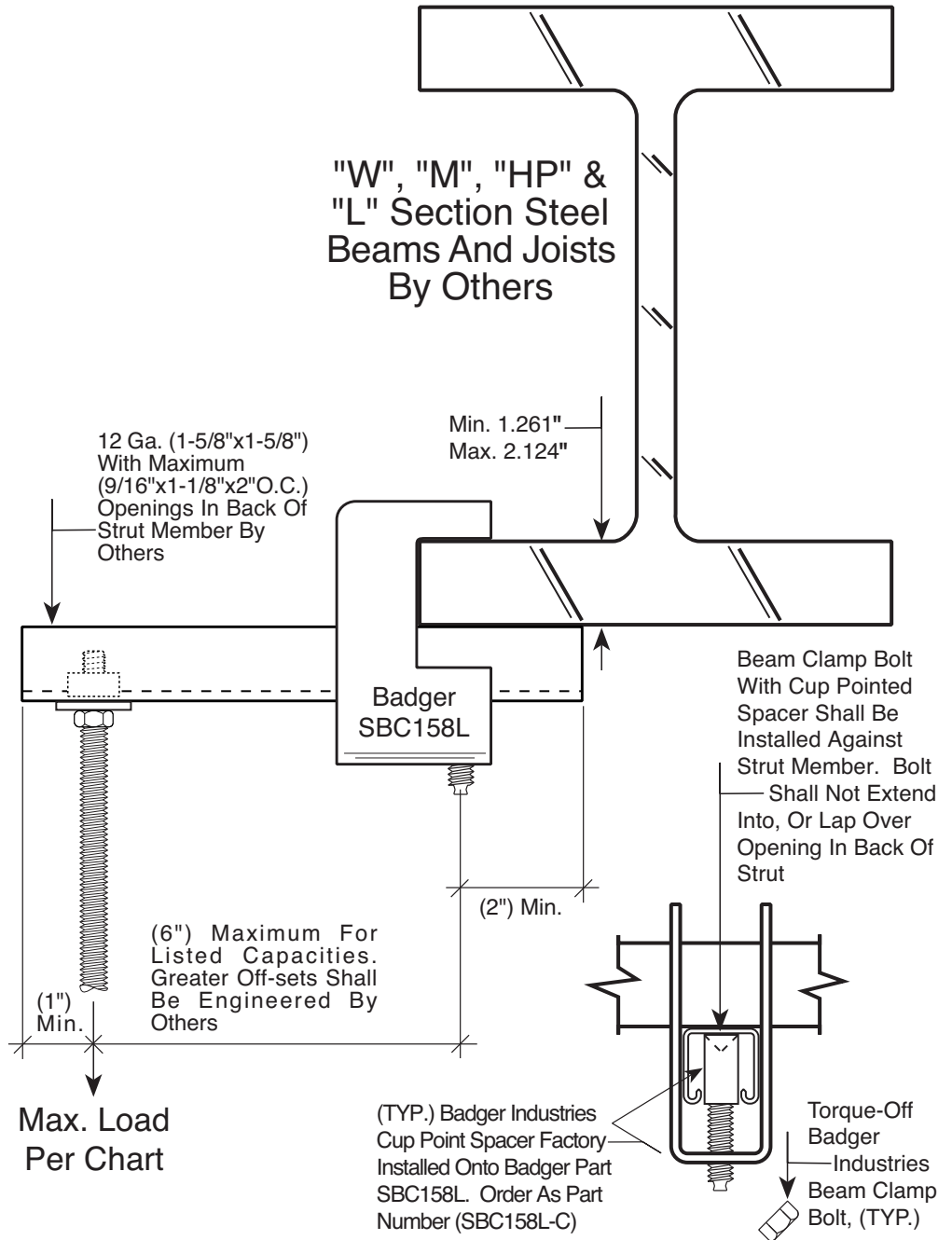
Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 304 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 364 lbs. |

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others



Max. Load Per Chart

(TYP.) Badger Industries Cup Point Spacer Factory Installed Onto Badger Part SBC158L. Order As Part Number (SBC158L-C)

Torque-Off Badger Industries Beam Clamp Bolt, (TYP.)



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BADGER INDUSTRIES - Part SBC158L-C

Patent Pending

NOTES:
Capacity of beam clamp with depicted cantilevered strut member based on seismic testing considering both tension and compression without retaining strap. Can be installed on lower or upper flange. (CMN) considered.

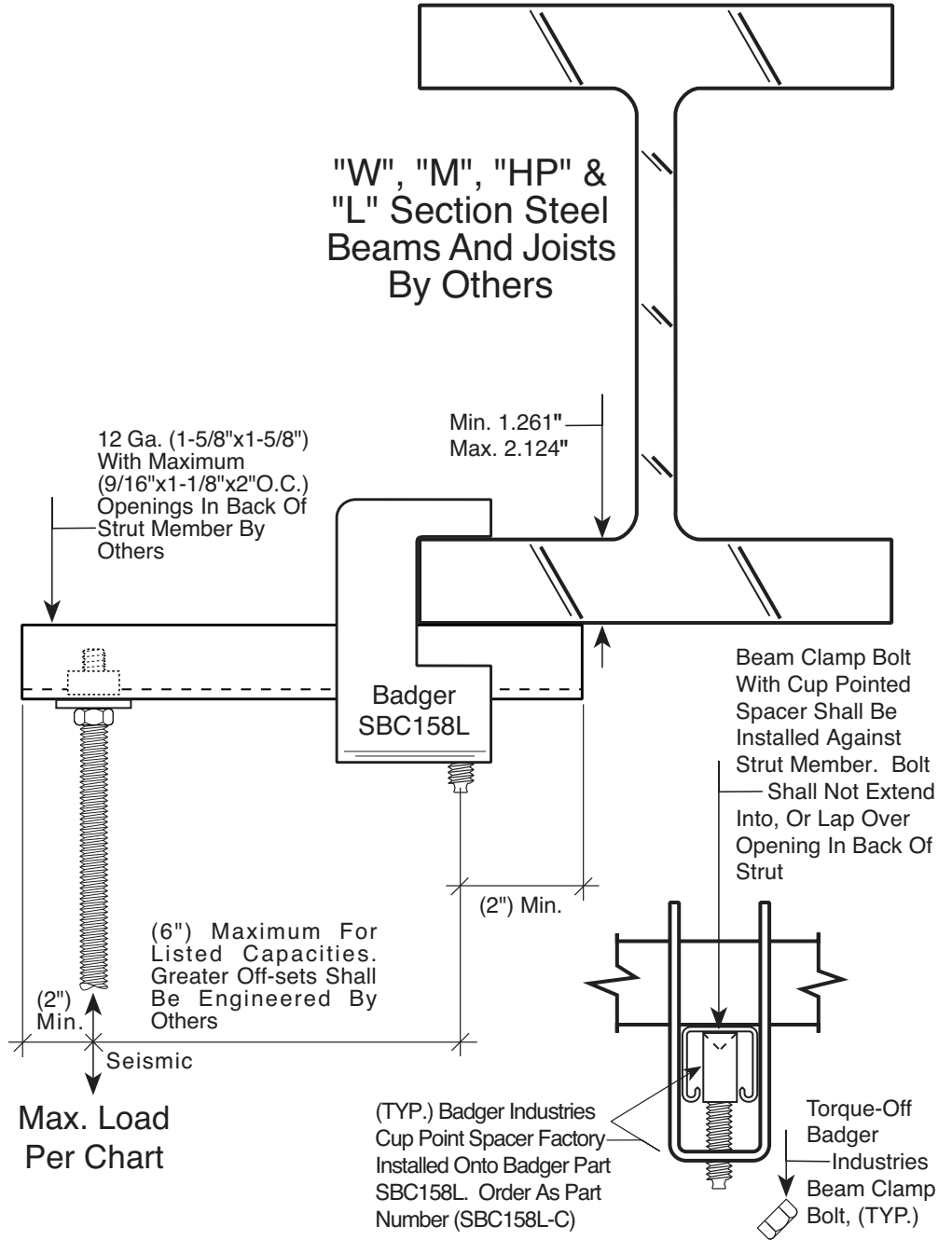
Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 149 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 224 lbs. |

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others



Max. Load Per Chart



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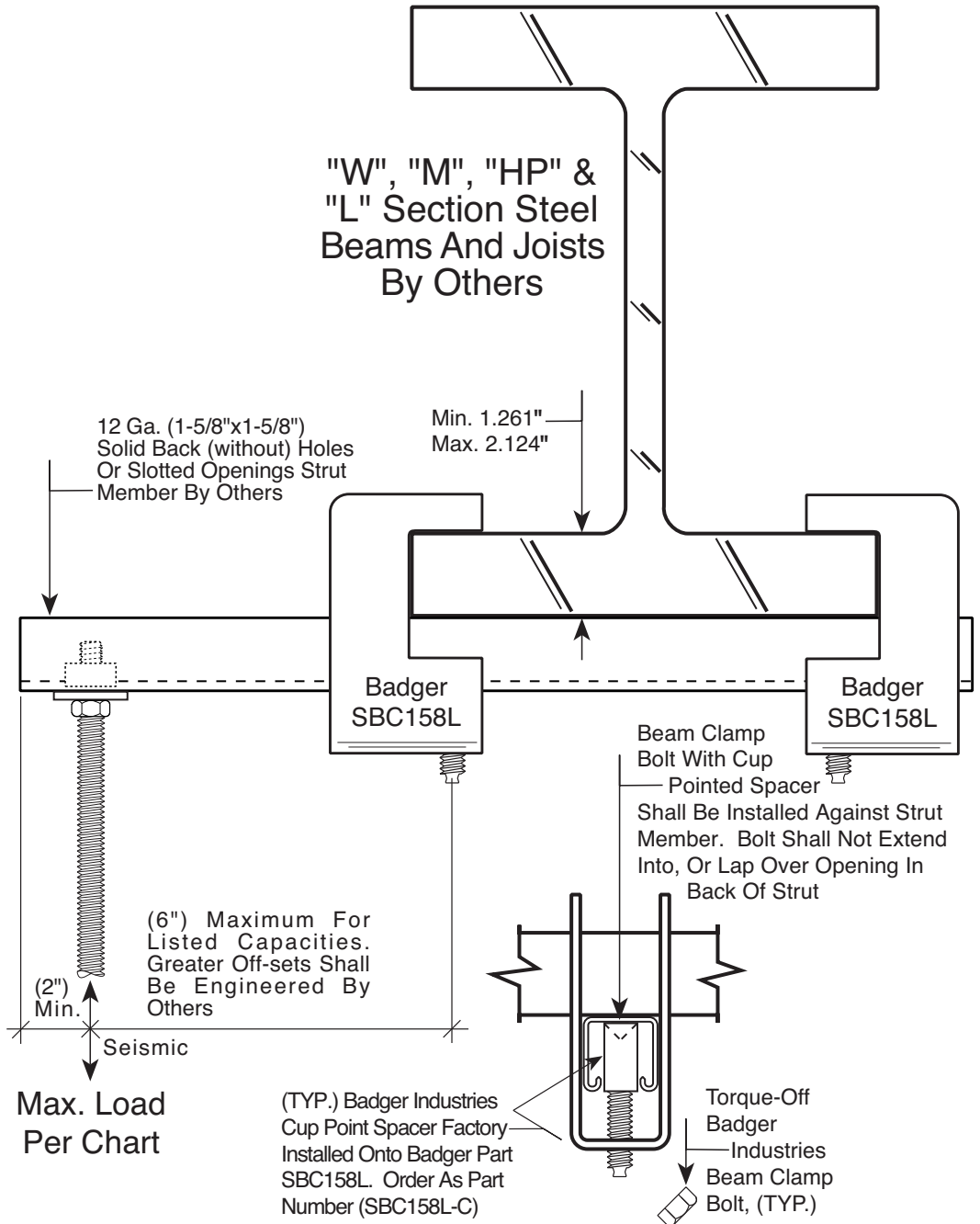
Patent Pending

NOTES:
Capacity of beam clamps assembled in pairs with depicted cantilevered strut member based on seismic testing considering both tension and compression only without retaining strap(s).

| Allowable Load with Factor Of Safety = 3.0 | |
|--|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 677 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 1,015 lbs. |

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others



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BADGER INDUSTRIES - Part SBC158L-C

Patent Pending

NOTES:

Capacity of beam clamps assembled in pairs with depicted strut member based on testing considering tension only without retaining strap(s).

Double beam clamps with strut span member can be used to span from two separate beams and/or joist.

Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

(TYP.) Badger Industries Cup Point Spacer Factory Installed Onto Badger Part SBC158L. Order As Part Number (SBC158L-C)

Beam Clamp Bolt With Cup Point Spacer Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut

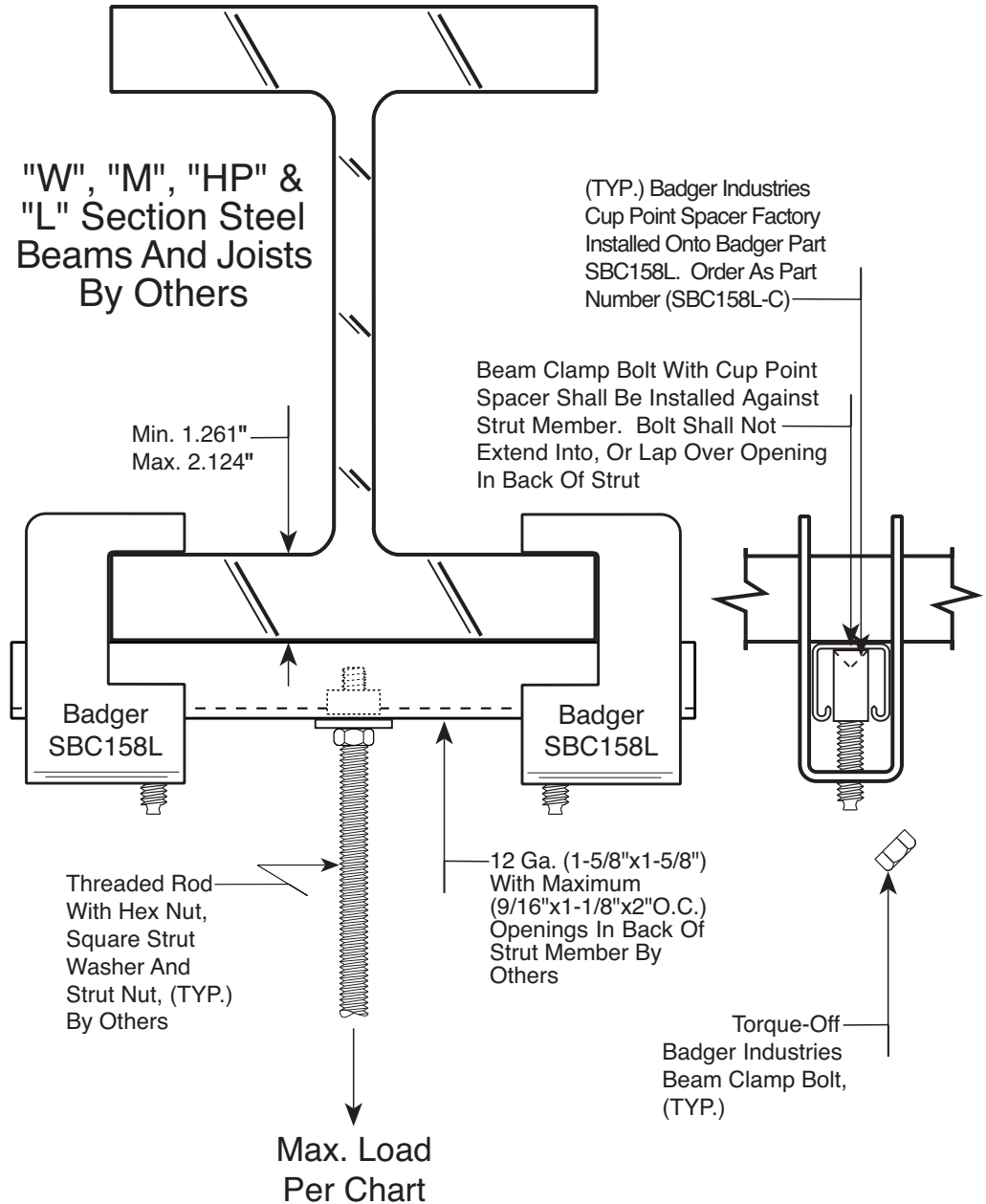
Min. 1.261"
Max. 2.124"

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 2,479 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 3,719 lbs. |



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BADGER INDUSTRIES - Part SBC158L-C

Patent Pending

NOTES:

Capacity of beam clamps assembled in pairs with depicted strut member based on seismic testing considering both tension and compression without retaining strap(s).

Double beam clamps with strut span member can be used to span from two separate beams and/or joist.

Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

(TYP.) Badger Industries Cup Point Spacer Factory Installed Onto Badger Part SBC158L. Order As Part Number (SBC158L-C)

Beam Clamp Bolt With Cup Point Spacer Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut

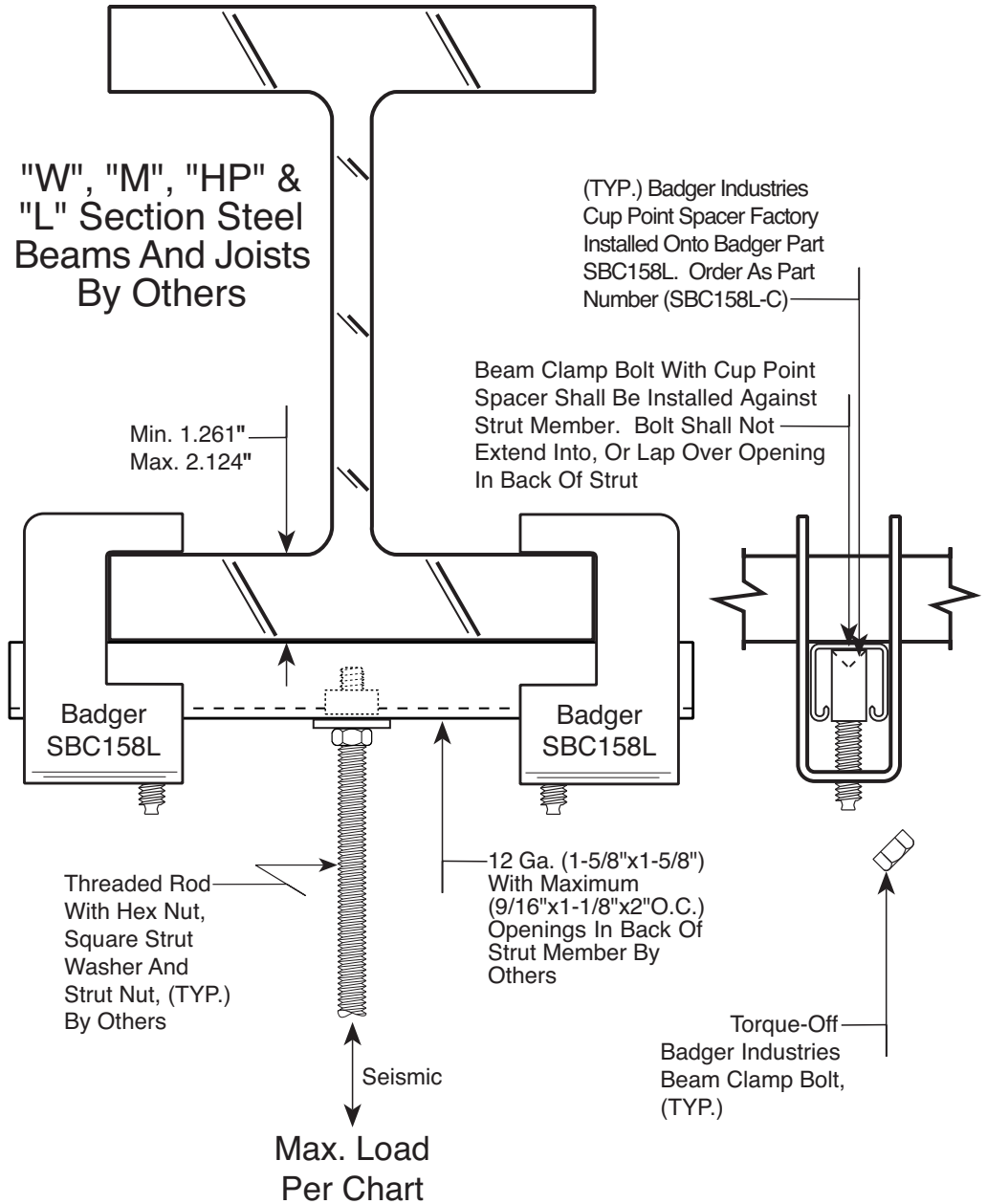
Min. 1.261"
Max. 2.124"

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 920 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 1,381 lbs. |



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BADGER INDUSTRIES - Part SBC158L

Patent Pending

NOTES:
Capacity of beam clamp based on testing considering tension only without retaining strap.

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 3,247 lbs. |

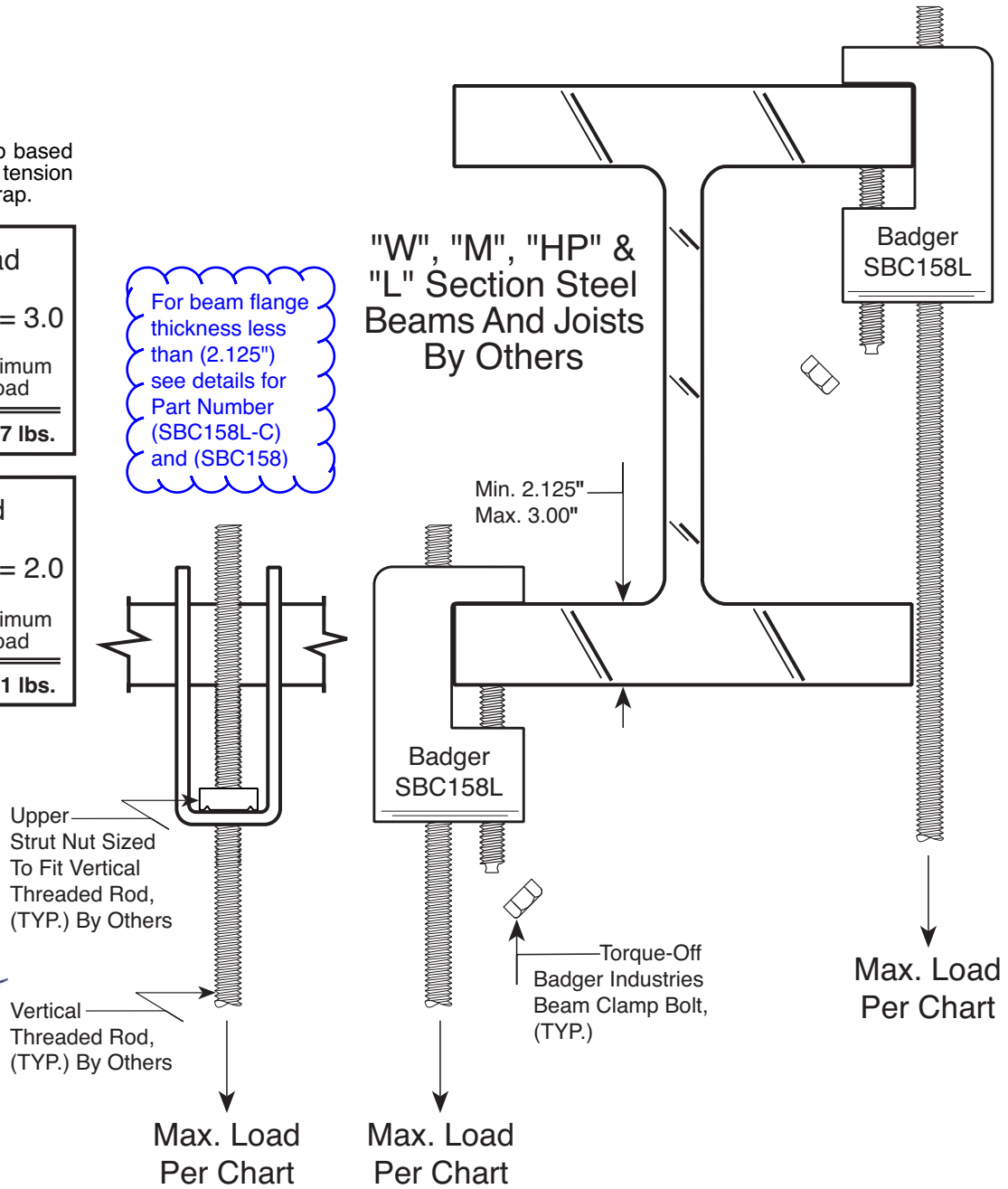
(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 4,871 lbs. |

For beam flange thickness less than (2.125") see details for Part Number (SBC158L-C) and (SBC158)

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Min. 2.125"
Max. 3.00"



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Patent Pending

NOTES:
Capacity of beam clamp based on seismic testing considering both tension and compression without retaining strap.

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 971 lbs. |

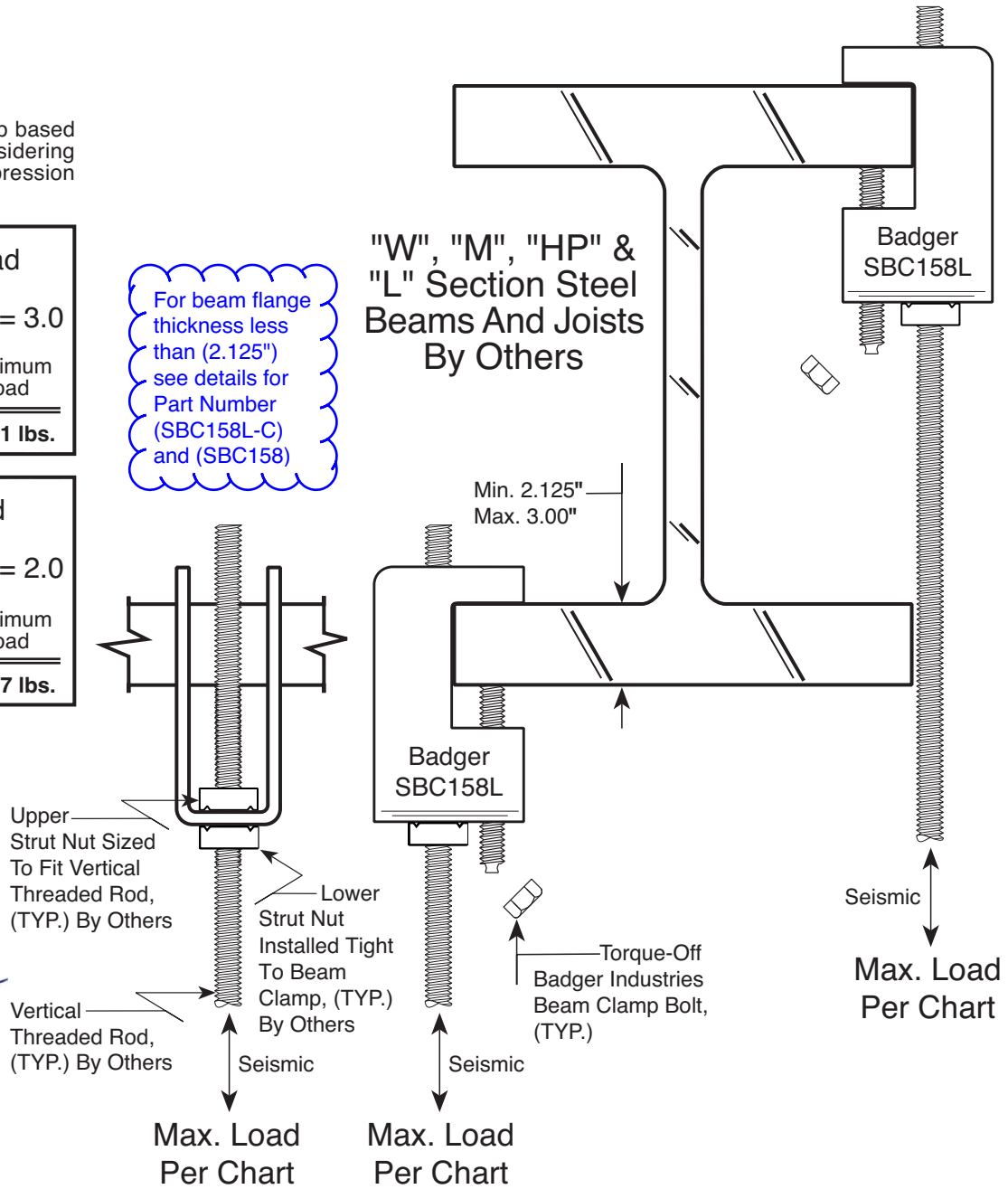
(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 1,457 lbs. |

For beam flange thickness less than (2.125") see details for Part Number (SBC158L-C) and (SBC158)

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Min. 2.125"
Max. 3.00"



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Patent Pending

NOTES:

Capacity of beam clamp with depicted cantilevered strut member based on testing considering tension only without retaining strap. Can be installed on lower or upper flange. (CMN) considered.

For beam flange thickness less than (2.125") see details for Part Number (SBC158L-C) and (SBC158)

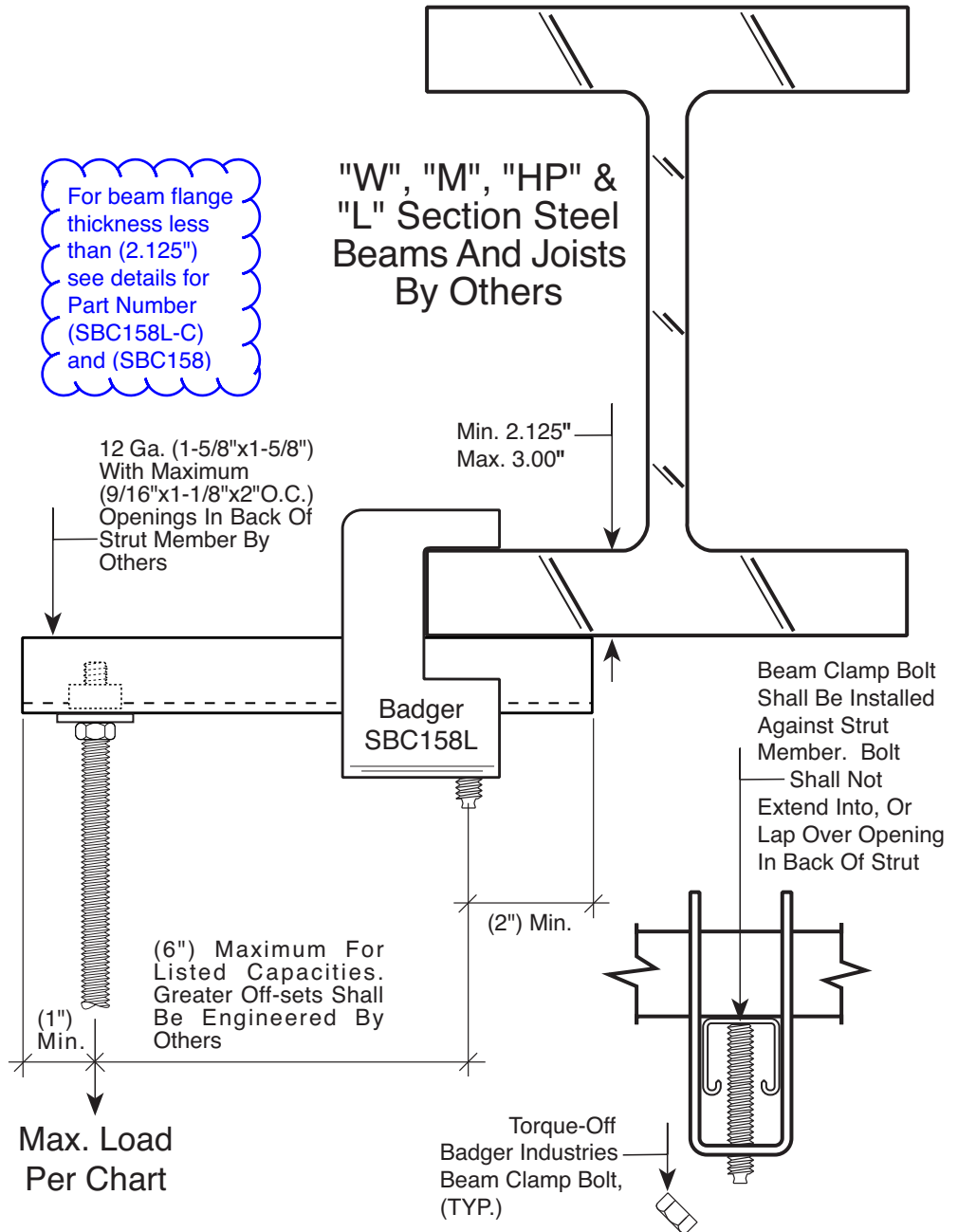
Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 304 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 364 lbs. |

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others



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Patent Pending

NOTES:
Capacity of beam clamp with depicted cantilevered strut member based on seismic testing considering both tension and compression without retaining strap. Can be installed on lower or upper flange. (CMN) considered.

For beam flange thickness less than (2.125") see details for Part Number (SBC158L-C) and (SBC158)

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Allowable Load with Factor Of Safety = 3.0

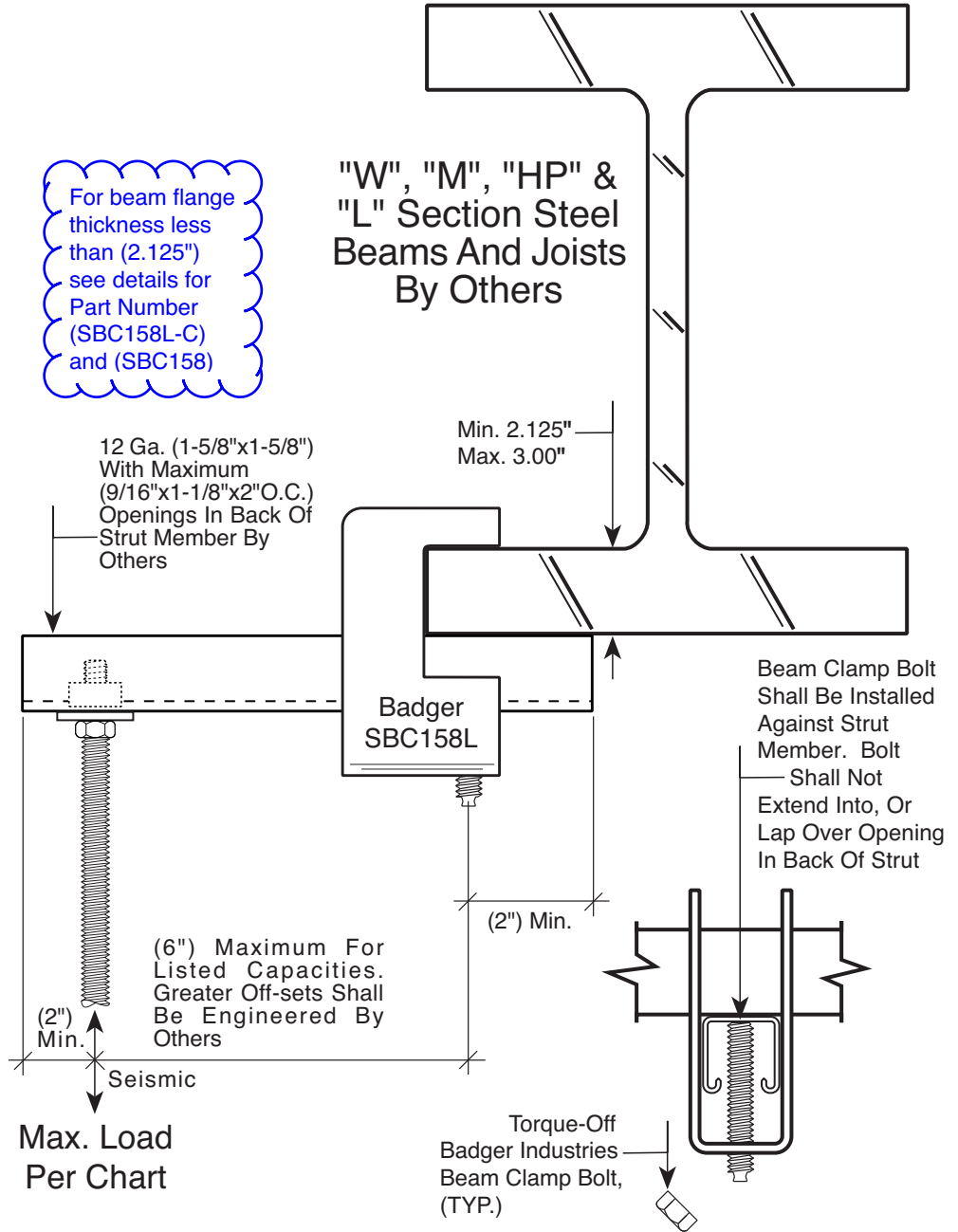
| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 149 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 224 lbs. |

12 Ga. (1-5/8"x1-5/8") With Maximum (9/16"x1-1/8"x2" O.C.) Openings In Back Of Strut Member By Others

Min. 2.125"
Max. 3.00"



Beam Clamp Bolt Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut

(6") Maximum For Listed Capacities. Greater Off-sets Shall Be Engineered By Others

Max. Load Per Chart

Torque-Off Badger Industries Beam Clamp Bolt, (TYP.)



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Patent Pending

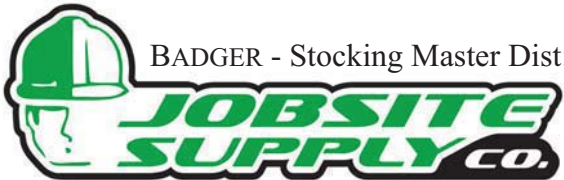
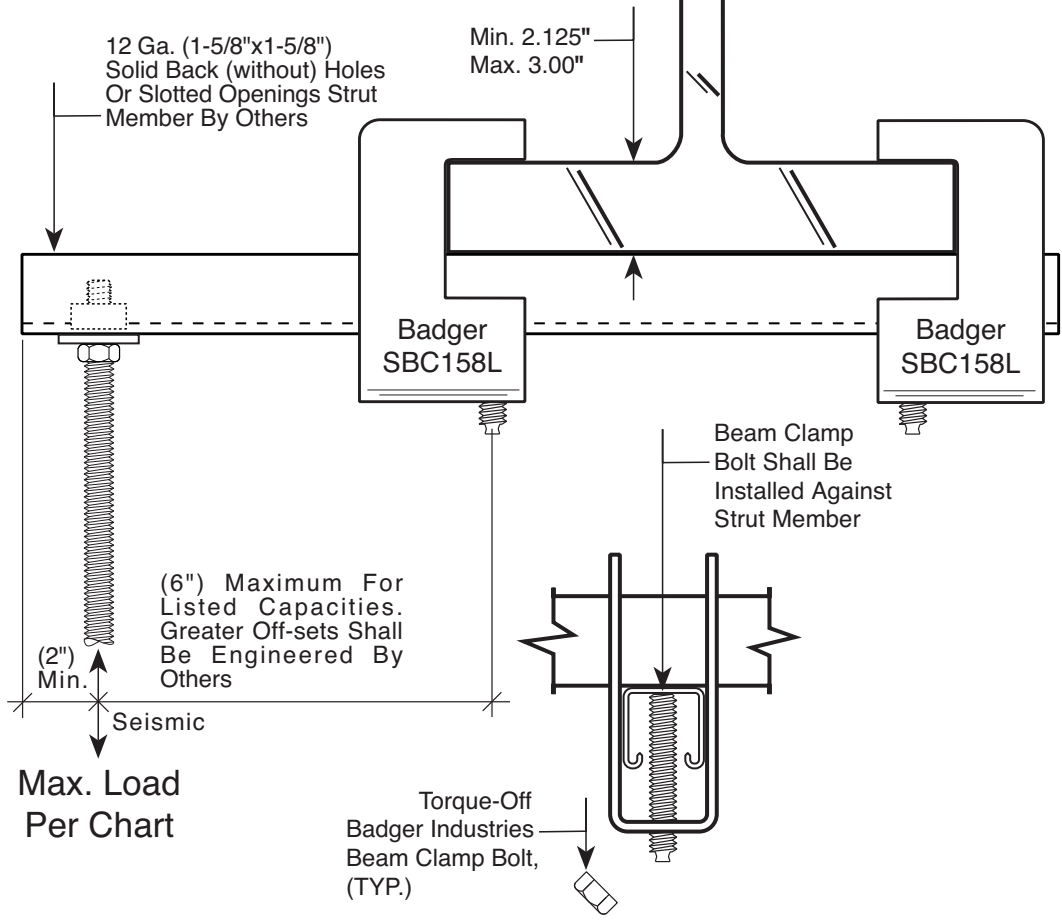
NOTES:
Capacity of beam clamps assembled in pairs with depicted cantilevered strut member based on seismic testing considering both tension and compression only without retaining strap(s).

For beam flange thickness less than (2.125") see details for Part Number (SBC158L-C) and (SBC158)

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

| Allowable Load with Factor Of Safety = 3.0 | |
|--|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 677 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 1,015 lbs. |



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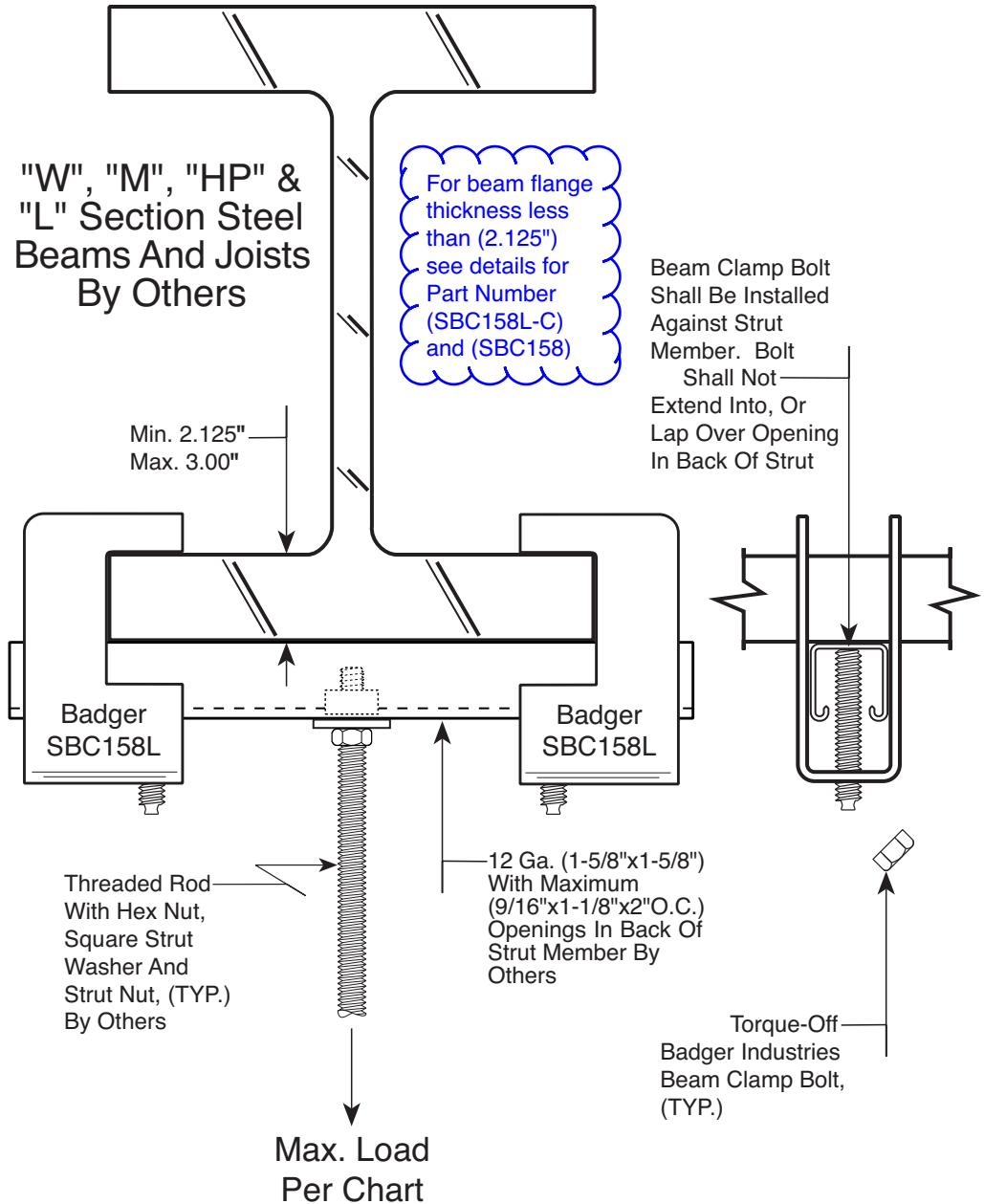
Patent Pending

NOTES:
 Capacity of beam clamps assembled in pairs with depicted strut member based on testing considering tension only without retaining strap(s).
 Double beam clamps with strut span member can be used to span from two separate beams and/or joist.
 Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

For beam flange thickness less than (2.125") see details for Part Number (SBC158L-C) and (SBC158)

Beam Clamp Bolt Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut



Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 2,479 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 3,719 lbs. |



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Patent Pending

NOTES:

Capacity of beam clamps assembled in pairs with depicted strut member based on seismic testing considering both tension and compression without retaining strap(s).

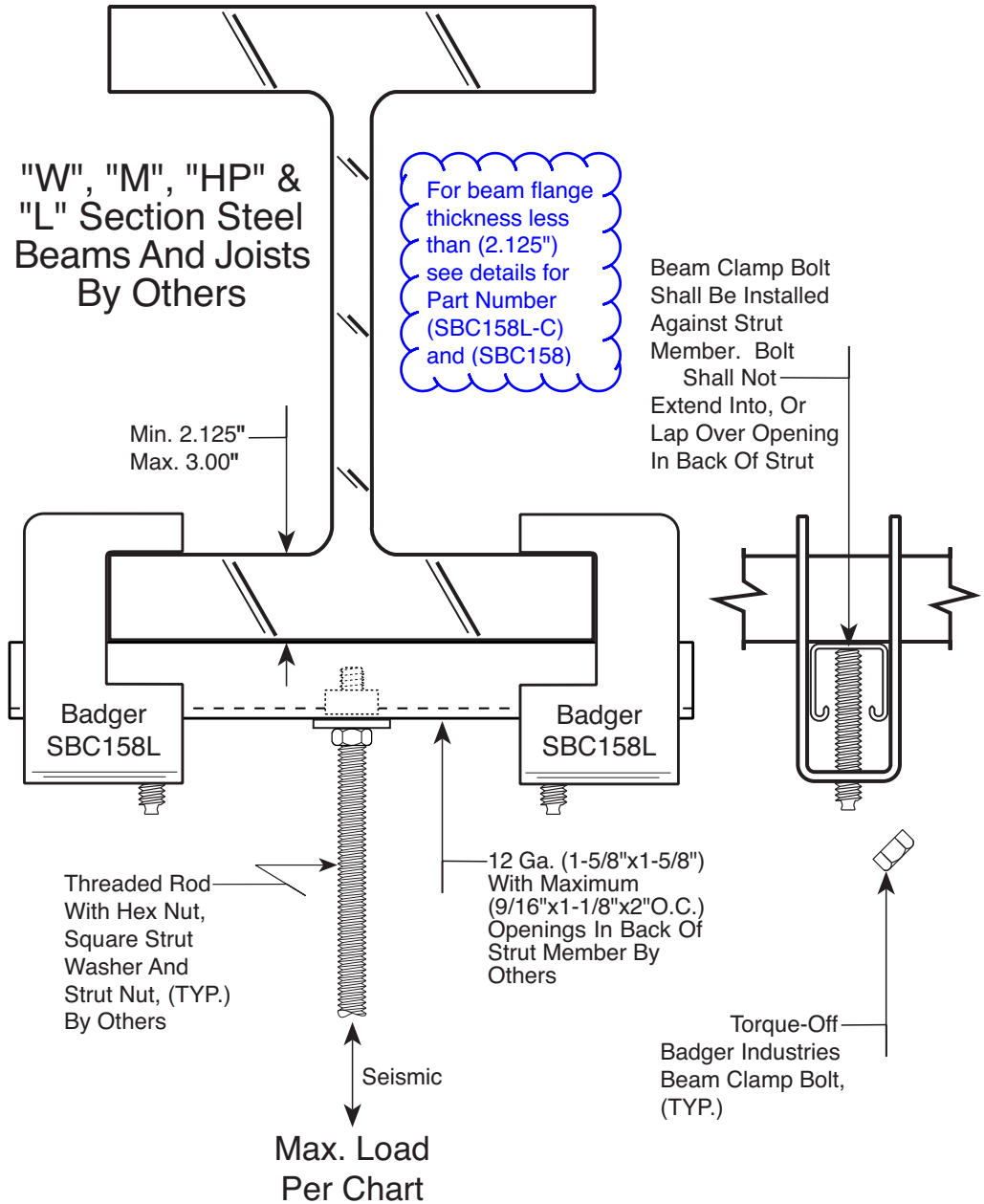
Double beam clamps with strut span member can be used to span from two separate beams and/or joist.

Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

For beam flange thickness less than (2.125") see details for Part Number (SBC158L-C) and (SBC158)

Beam Clamp Bolt Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut



| Allowable Load with Factor Of Safety = 3.0 | |
|--|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 920 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | |
|---|--------------|
| Threaded Rod Sizes | Maximum Load |
| 3/8" thru 3/4" | 1,381 lbs. |



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BADGER INDUSTRIES - Part SBC158L

Patent Pending

NOTES:

Capacity of beam clamps assembled in pairs with depicted strut member based on testing considering tension only without retaining strap(s).

Double beam clamps with strut span member can be used to span from two separate beams and/or joist.

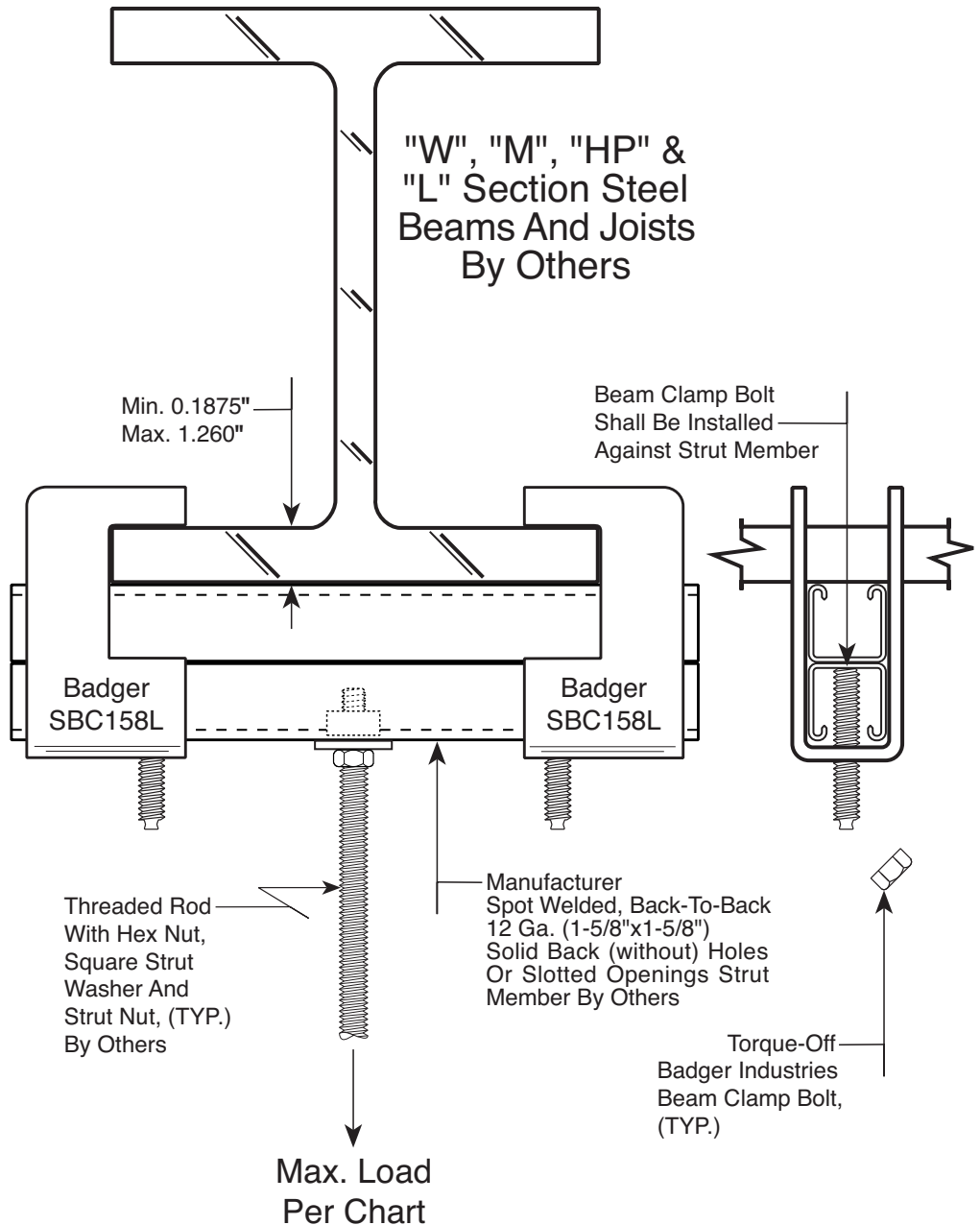
Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 3,264 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 4,896 lbs. |



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BADGER INDUSTRIES - Part SBC158L

Patent Pending

NOTES:

Capacity of beam clamps assembled in pairs with depicted strut member based on seismic testing considering both tension and compression without retaining strap(s).
 Double beam clamps with strut span member can be used to span from two separate beams and/or joist.
 Reduce listed capacities to comply with design capacity limits, including but not limited to, strut member span length, load placement(s), etc.

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Beam Clamp Bolt Shall Be Installed Against Strut Member. Bolt Shall Not Extend Into, Or Lap Over Opening In Back Of Strut

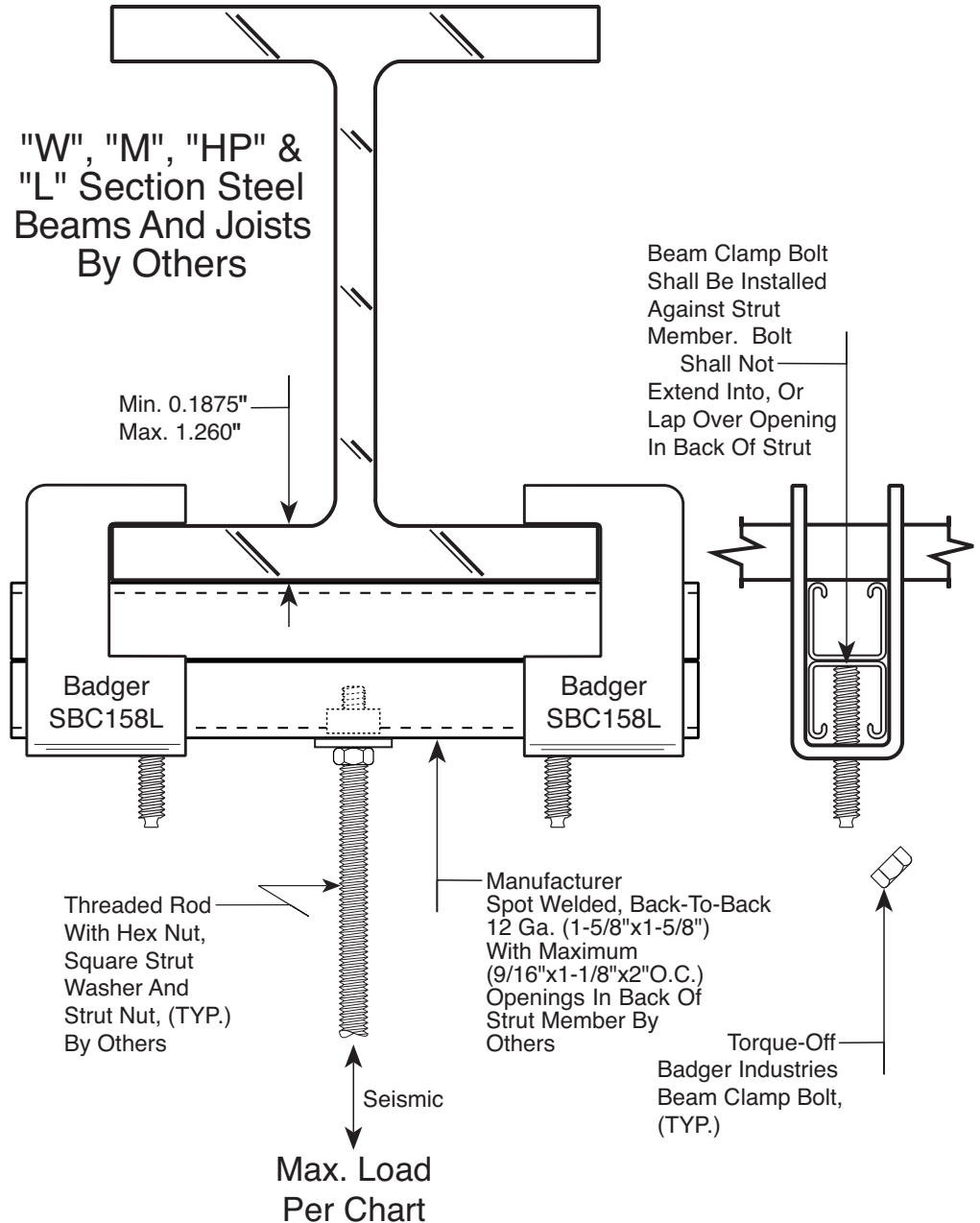
Min. 0.1875"
 Max. 1.260"

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 1,024 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 1,537 lbs. |



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BADGER INDUSTRIES - Part SBC158L

Patent Pending

NOTES:
Capacity of beam clamps assembled in pairs with depicted cantilevered strut member based on seismic testing considering both tension and compression only without retaining strap(s).

"W", "M", "HP" & "L" Section Steel Beams And Joists By Others

Manufacturer Spot Welded, Back-To-Back 12 Ga. (1-5/8"x1-5/8") Solid Back (without) Holes Or Slotted Openings Strut Member By Others

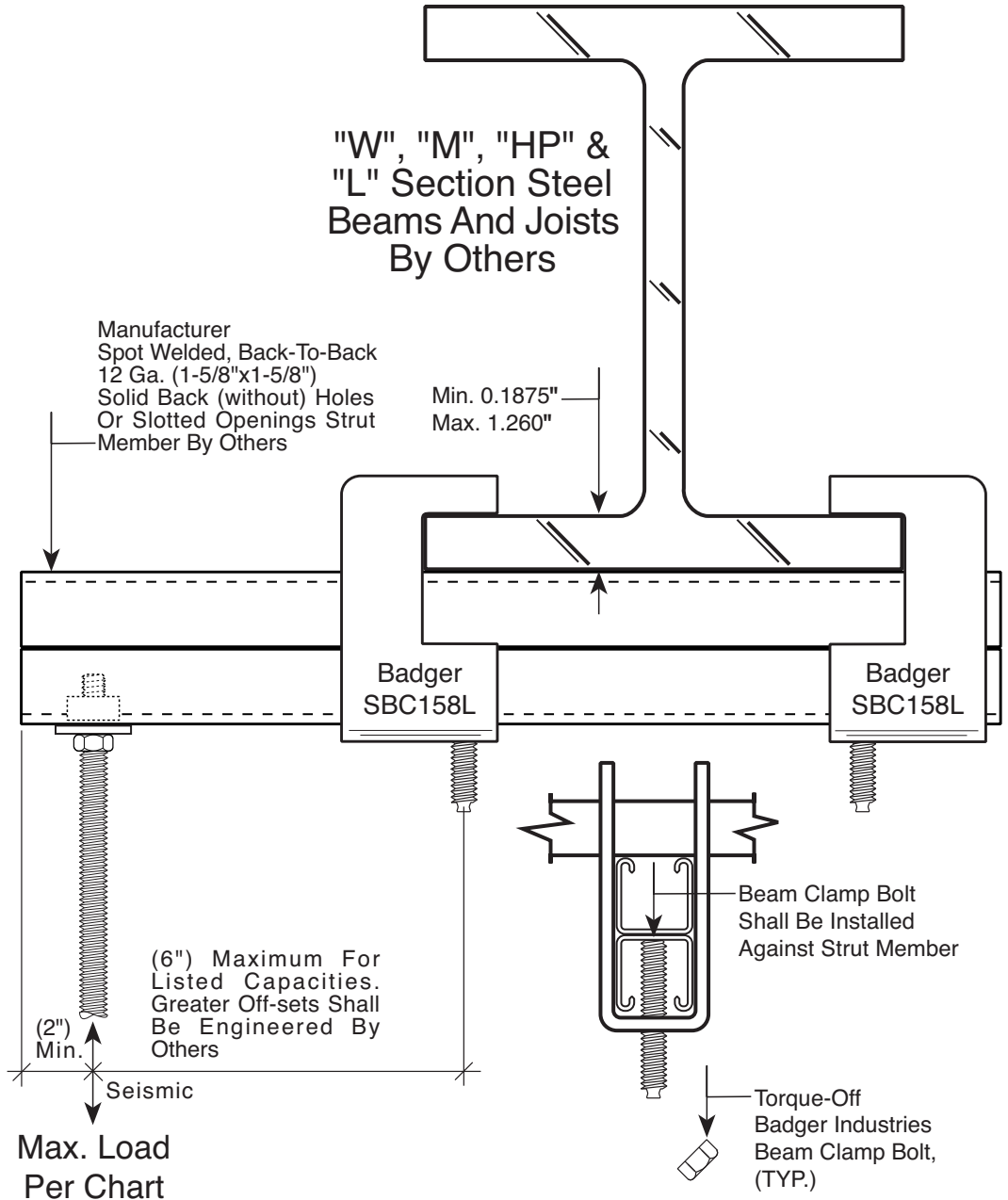
Min. 0.1875"
Max. 1.260"

Allowable Load with Factor Of Safety = 3.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 736 lbs. |

(LRFD) Load with Factor Of Safety = 2.0

| Threaded Rod Sizes | Maximum Load |
|--------------------|--------------|
| 3/8" thru 3/4" | 1,104 lbs. |



(6") Maximum For Listed Capacities. Greater Off-sets Shall Be Engineered By Others

(2") Min.

Seismic

Max. Load Per Chart



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BADGER INDUSTRIES - Part SBC158-C

Patent Pending

NOTES:

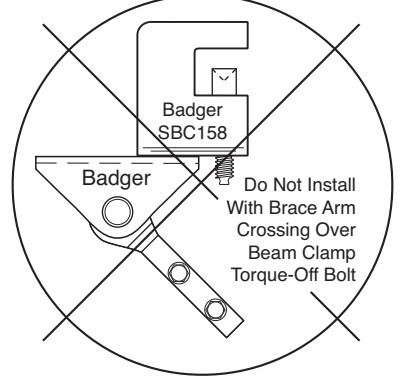
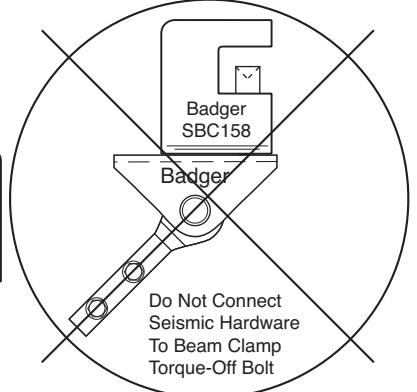
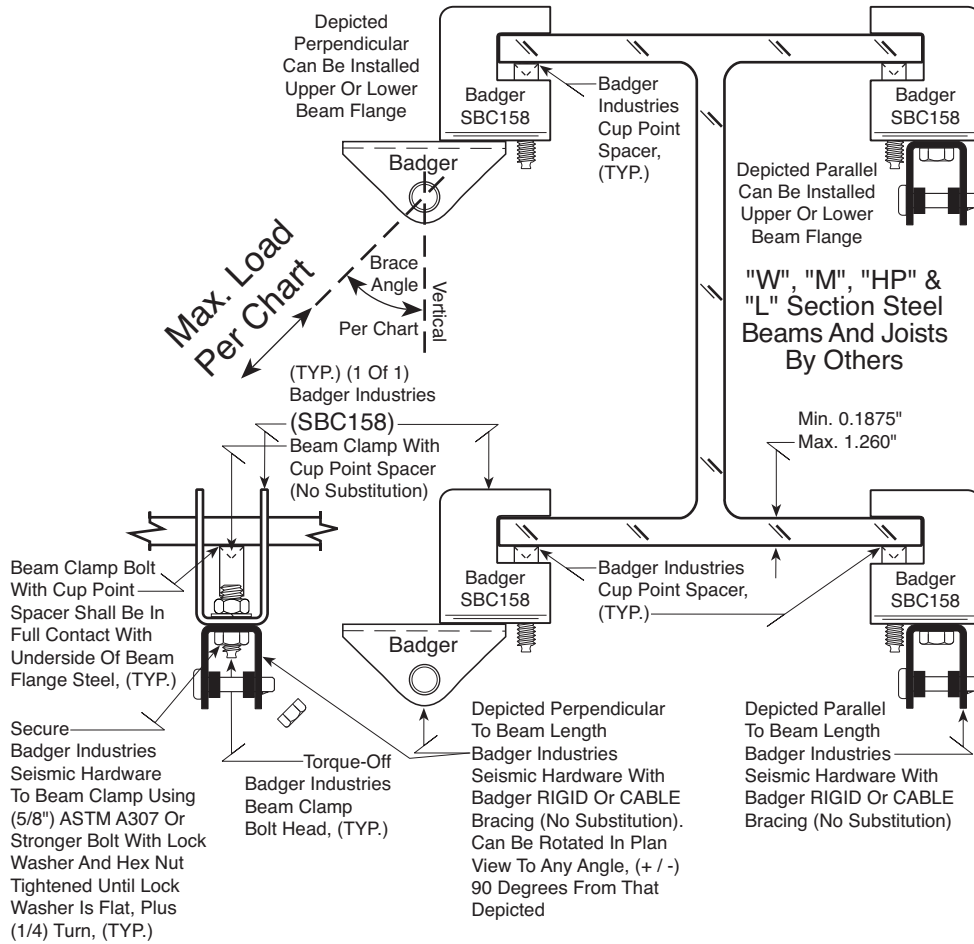
Capacity based on seismic testing considering both tension and compression without a beam clamp retaining strap.

To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle.

When ordering add a [-C] to Badger Beam Clamp Part Number (SBC158) to get beam clamp pre-assembled with required Cup Point Spacer. Thus order as Part Number (SBC158-C).

| Allowable Load with Factor Of Safety = 3.0 | | |
|--|-----------------|-----------------|
| Brace Angle | 30° to 60° | 61° to 75° |
| Maximum Load | 320 lbs. | 214 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | | |
|---|-----------------|-----------------|
| Brace Angle | 30° to 60° | 61° to 75° |
| Maximum Load | 480 lbs. | 321 lbs. |



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BADGER INDUSTRIES - Part SBC158-C

Patent Pending

NOTES:

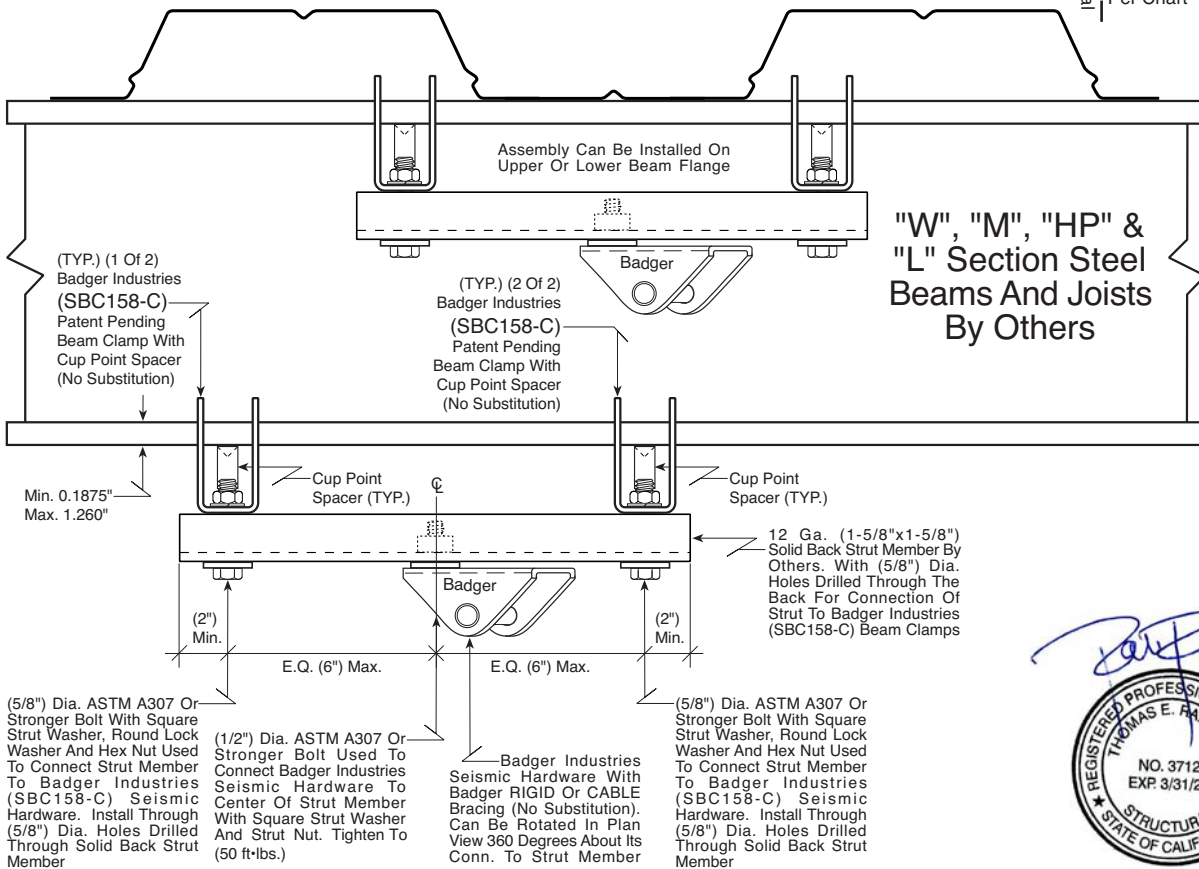
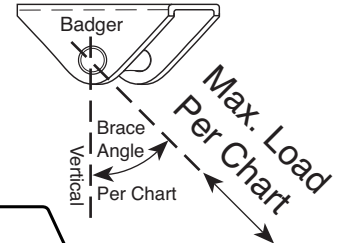
Capacity based on seismic testing considering both tension and compression without retaining strap.

To convert listed angle capacity to horizontal capacity multiply listed capacity by (sin) of the angle. If seismic hardware connection to strut member is not centered between beam clamps the listed capacities shall be engineered to qualify capacity reduction due to uneven loading of beam clamps.

When ordering add a [-C] to Badger Beam Clamp Part Number (SBC158) to get beam clamp pre-assembled with required Cup Point Spacer. Thus order as Part Number (SBC158-C).

| Allowable Load with Factor Of Safety = 3.0 | | |
|--|-----------------|-----------------|
| Brace Angle | 30° to 60° | 61° to 75° |
| Maximum Load | 638 lbs. | 426 lbs. |

| (LRFD) Load with Factor Of Safety = 2.0 | | |
|---|-----------------|-----------------|
| Brace Angle | 30° to 60° | 61° to 75° |
| Maximum Load | 956 lbs. | 640 lbs. |

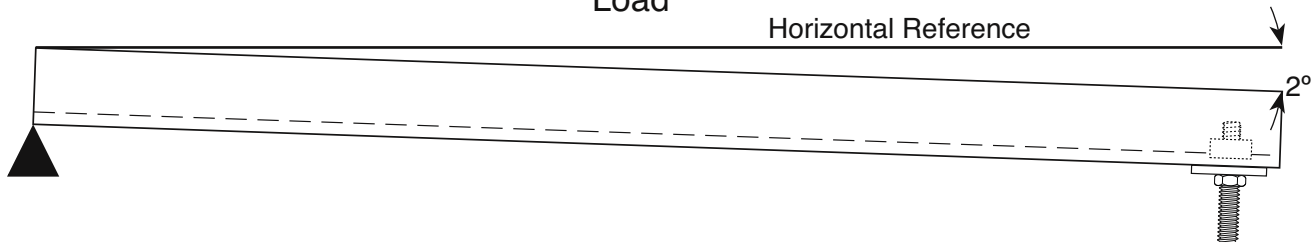
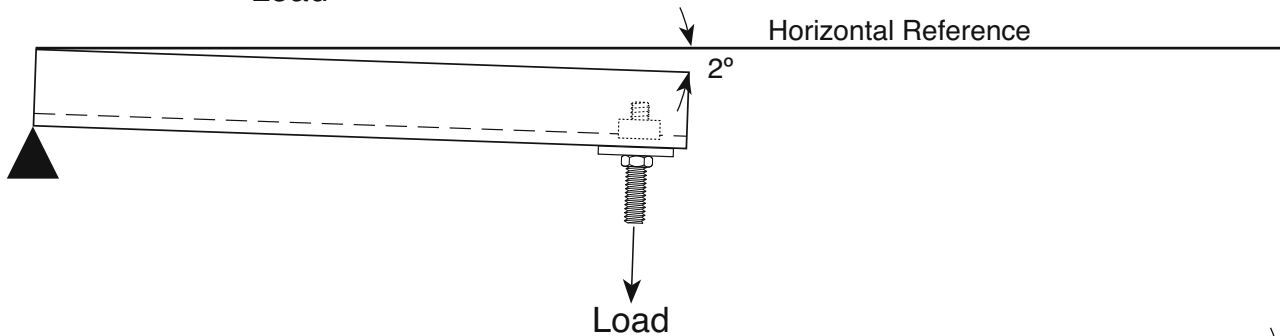


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BADGER INDUSTRIES - (CMN) Cantilevered Member Notice



Notice:
 The depictions above demonstrate how visibly noticeable two degrees (2°) of angular deflection of a cantilevered beam may be. The greater the length of the cantilever, the greater the linear offset from horizontal will become. While such deflections may be structurally sound and within code allowance, they may be visibly concerning to those unfamiliar with the code calculations and standard beam deflection principles. As such, Badger Industries Installation Details that reference this, Cantilever Member Notice Detail (CMN), have had their listed gravity capacities reduced to represent maximum allowable loads resulting in an average of one degree (1°) of angular deflection, as derived from independent lab testing. Badger Industries believes these reductions will increase system safety factors, may prevent misalignment of the trade system, and may eliminate rod bending concerns.

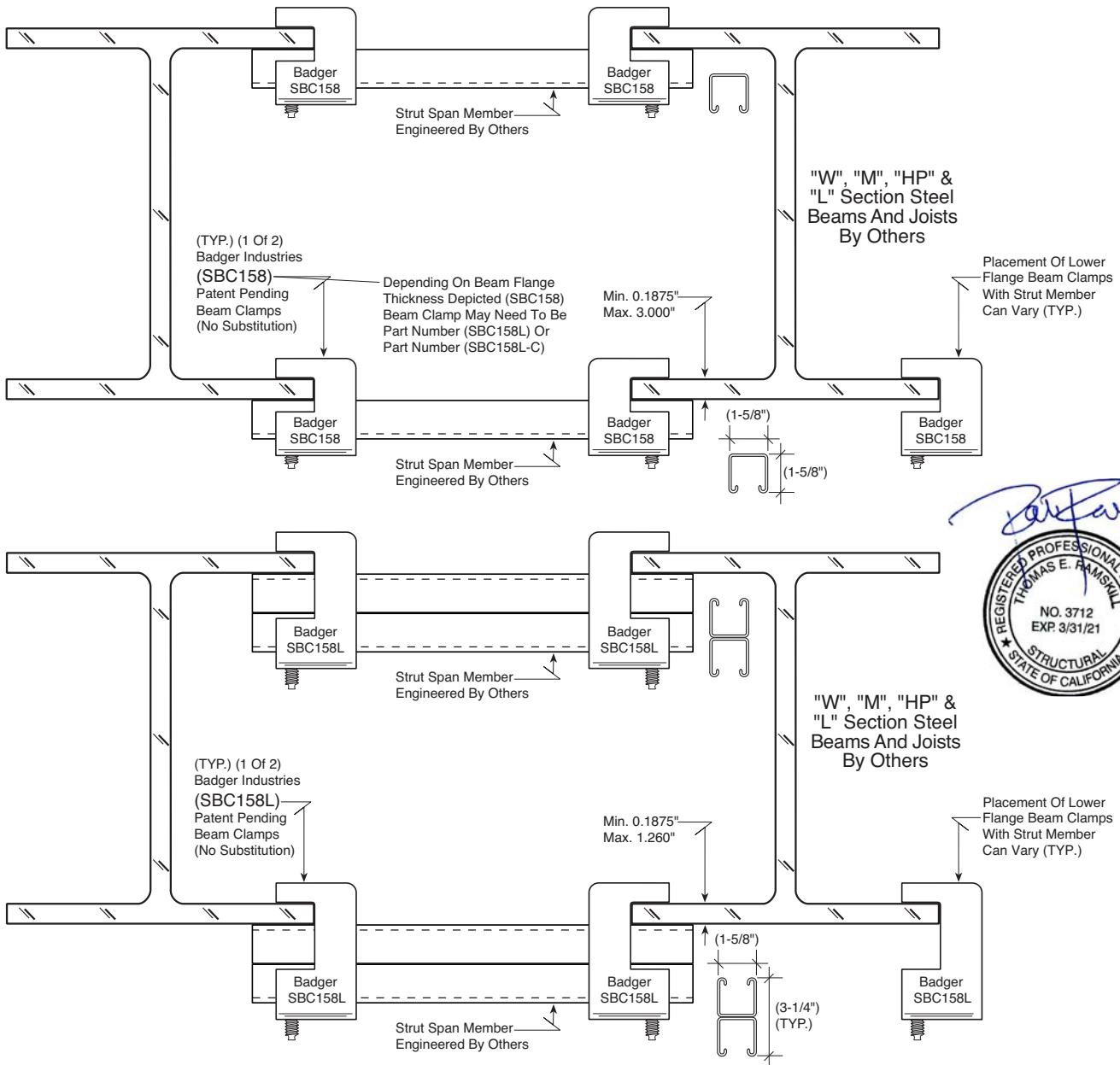


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BADGER INDUSTRIES - (BBN) Beam to Beam Notice

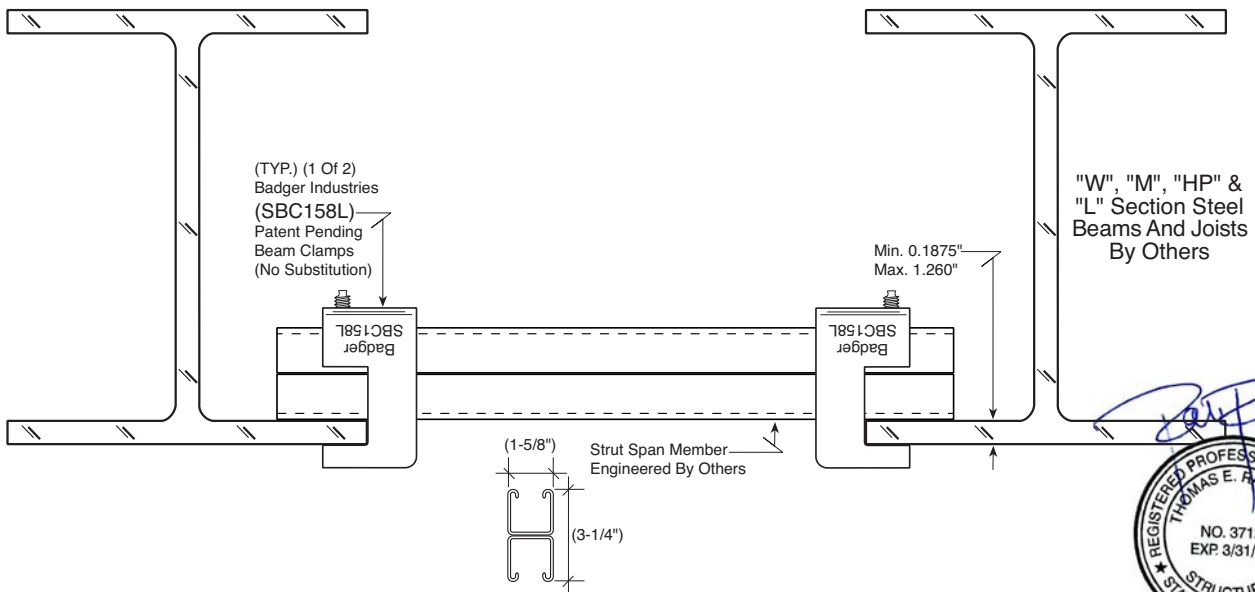
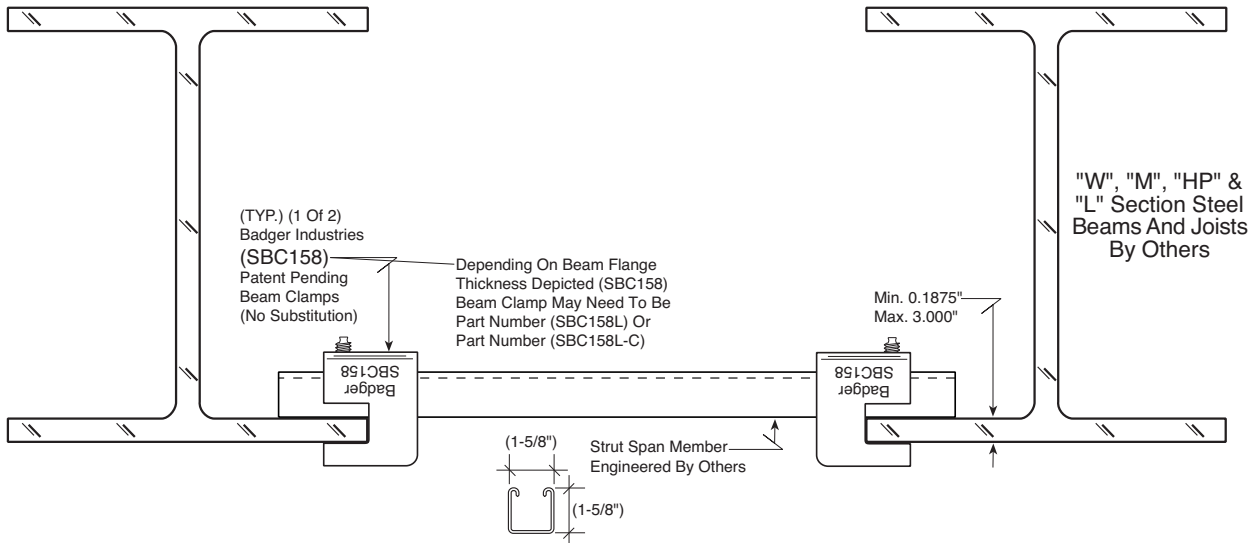


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BADGER INDUSTRIES - (BBN) Beam to Beam Notice



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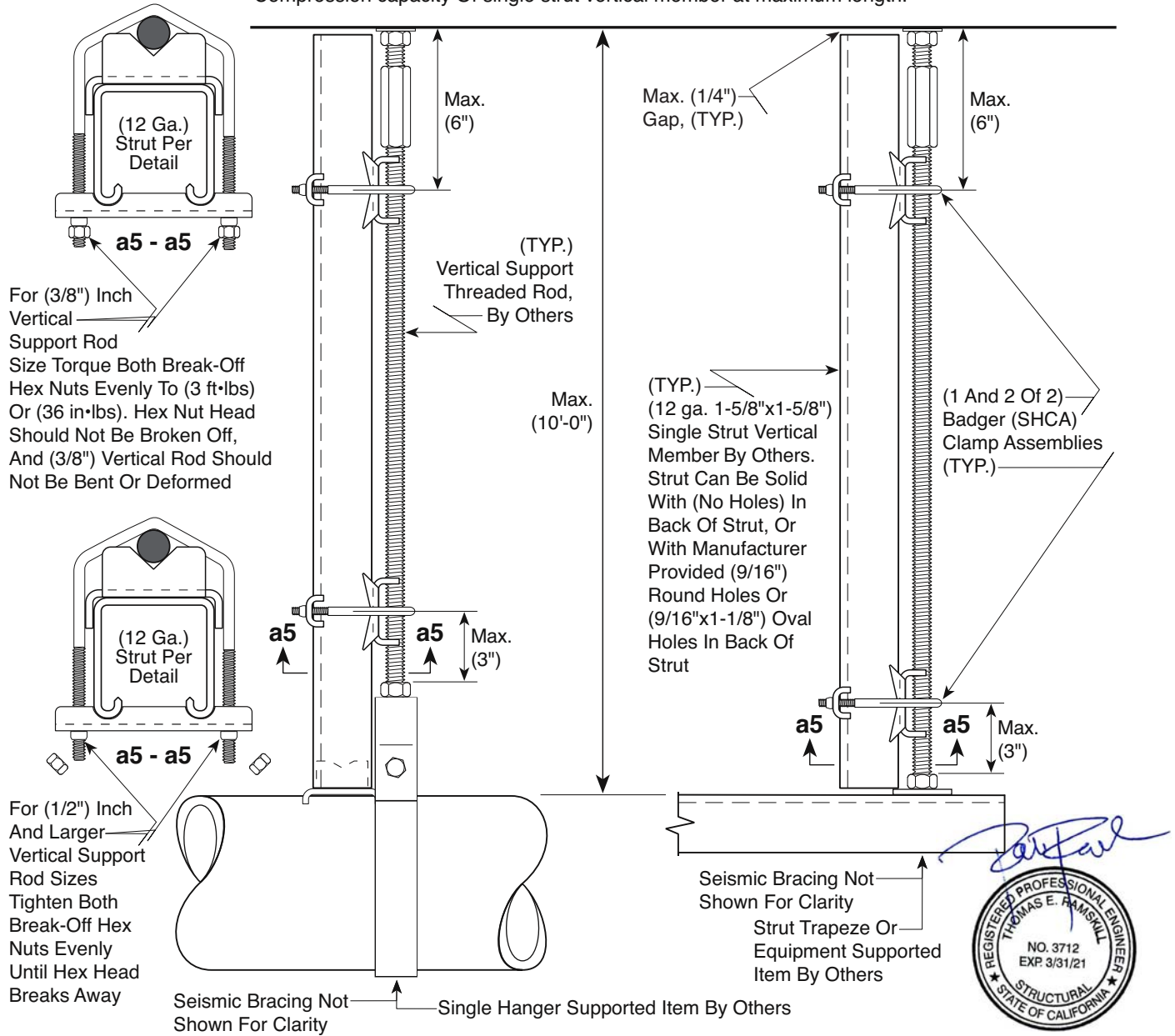
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BADGER INDUSTRIES - Part SHCA Patent #10,281,062

792 lbs Allowable Load with Factor Of Safety = 3

1,188 lbs (LRFD) Load with Factor Of Safety = 2

Compression capacity Of single strut vertical member at maximum length.

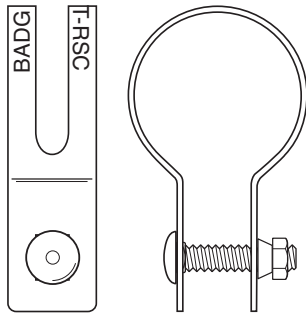


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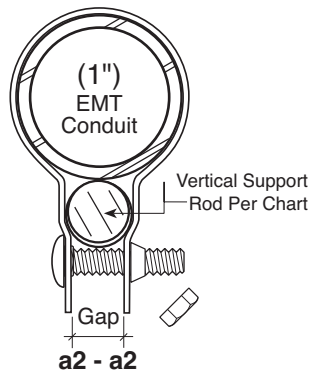
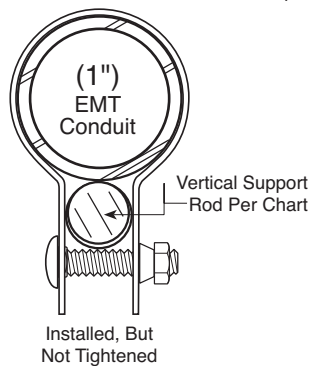
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~ BADGER INDUSTRIES ~
[EMT-RSC]



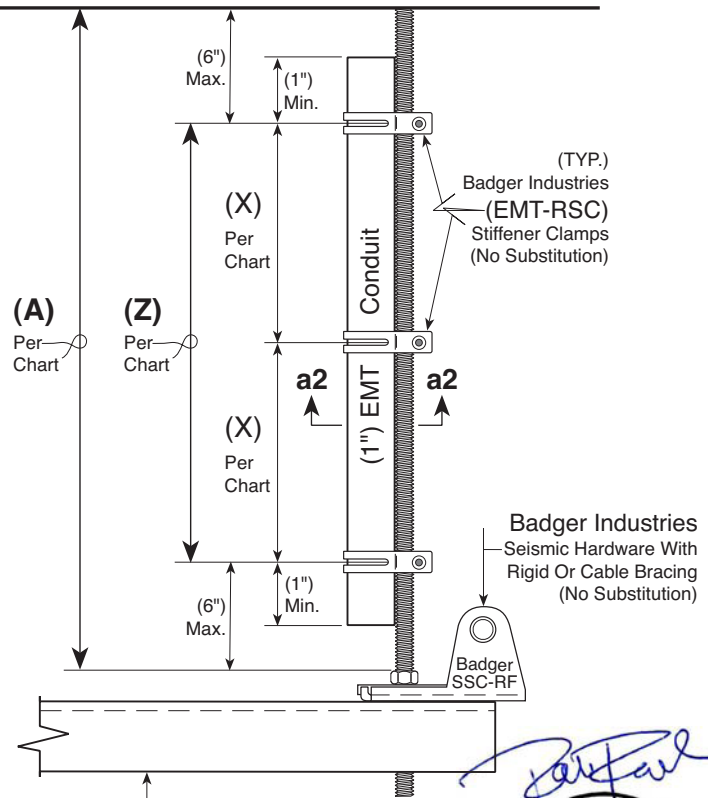
~ BADGER INDUSTRIES ~
Detail (EMT-RSC)

| Vertical Support Rod Size (Nom. Dia.) | (A) Maximum Length Without Stiffener | (Z) Maximum Length | Max. (X) Spacing Between EMT-RSC Clamps | Maximum Compression Force With Rod Stiffener (ASD) | Maximum Compression Force With Rod Stiffener (LRFD) |
|---------------------------------------|--------------------------------------|--------------------|---|--|---|
| 3/8 in. | 16 in. | 156 in. | 28 in. | 213 lbs. | 319 lbs. |
| 1/2 in. | 18 in. | 132 in. | 38 in. | 548 lbs. | 823 lbs. |
| 5/8 in. | 24 in. | 120 in. | 48 in. | 773 lbs. | 1,159 lbs. |



Tighten Torque-Off Hex Nut Until Hex Head Breaks Away. Gap And Bolt End Deformation May Vary Other Than Depicted Due To EMT Conduit Member And Vertical Support Rod Size Combinations

Structure Or Limit Stop On Spring Hanger

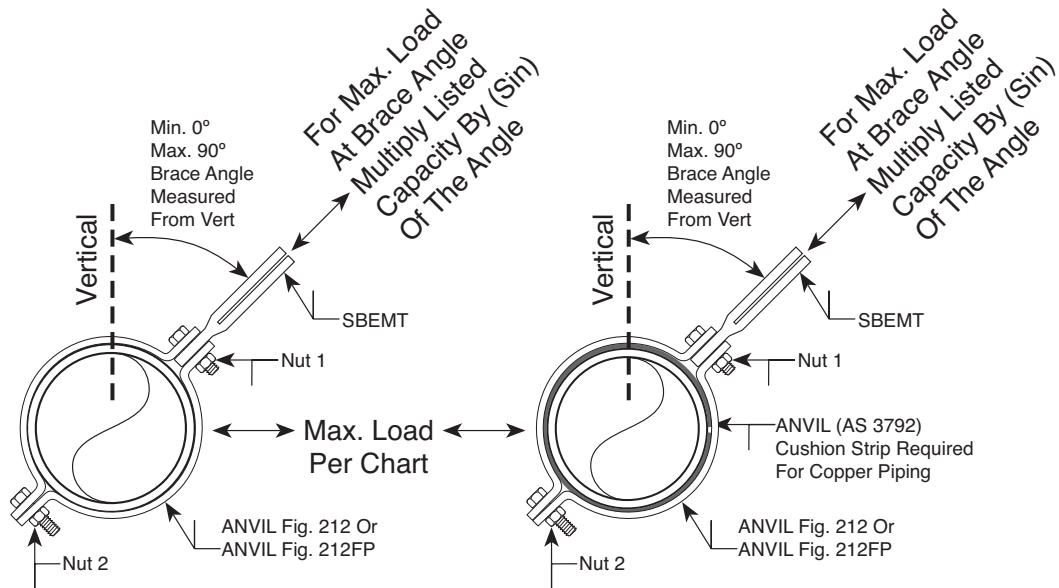


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BADGER INDUSTRIES - Anvil FIG: 212 & FIG: 212FP



NOTES:
Capacity based on seismic testing considering both tension and compression.
To convert listed horizontal capacity to angle capacity multiply listed capacity by (sin) of the angle.

Transverse Brace - Allowable Load with Factor Of Safety = 3.0

| ANVIL Fig. 212 Fig. 212FP Size | Piping Or Conduit Nominal Size | Steel Pipe, RMC Conduit | Cast-Iron Pipe | Copper Pipe | EMT Conduit | Sch 5 Steel Pipe |
|--------------------------------|--------------------------------|-------------------------|----------------|-------------|-------------|------------------|
| 1" Fig. 212 | 1 in. | 309 lbs. | | | | |
| 1-1/4" Fig. 212 | 1-1/4 in. | 386 lbs. | | | | |
| 1-1/2" Fig. 212 | 1-1/2 in. | 406 lbs. | 739 lbs. | | | |
| 2" Fig. 212 | 2 in. | 650 lbs. | 1,165 lbs. | 650 lbs. | 650 lbs. | 650 lbs. |
| 2-1/2" Fig. 212 | 2-1/2 in. | 1,469 lbs. | Size N/A | 400 lbs. | 980 lbs. | 980 lbs. |
| 3" Fig. 212 | 3 in. | 1,469 lbs. | 1,008 lbs. | 528 lbs. | 1,255 lbs. | 1,255 lbs. |
| 3-1/2" Fig. 212 | 3-1/2 in. | 1,213 lbs. | Size N/A | Not Tested | 1,213 lbs. | 1,213 lbs. |
| 4" Fig. 212 | 4 in. | 1,469 lbs. | 1,265 lbs. | 445 lbs. | 742 lbs. | 742 lbs. |
| 5" Fig. 212FP | 5 in. | 1,469 lbs. | 1,292 lbs. | 409 lbs. | | |
| 6" Fig. 212FP | 6 in. | 1,469 lbs. | 1,161 lbs. | 368 lbs. | | |
| 8" Fig. 212FP | 8 in. | 1,574 lbs. | 873 lbs. | | | |
| 10" Fig. 212FP | 10 in. | 1,545 lbs. | 900 lbs. | | | |
| 12" Fig. 212FP | 12 in. | 978 lbs. | 703 lbs. | | | |

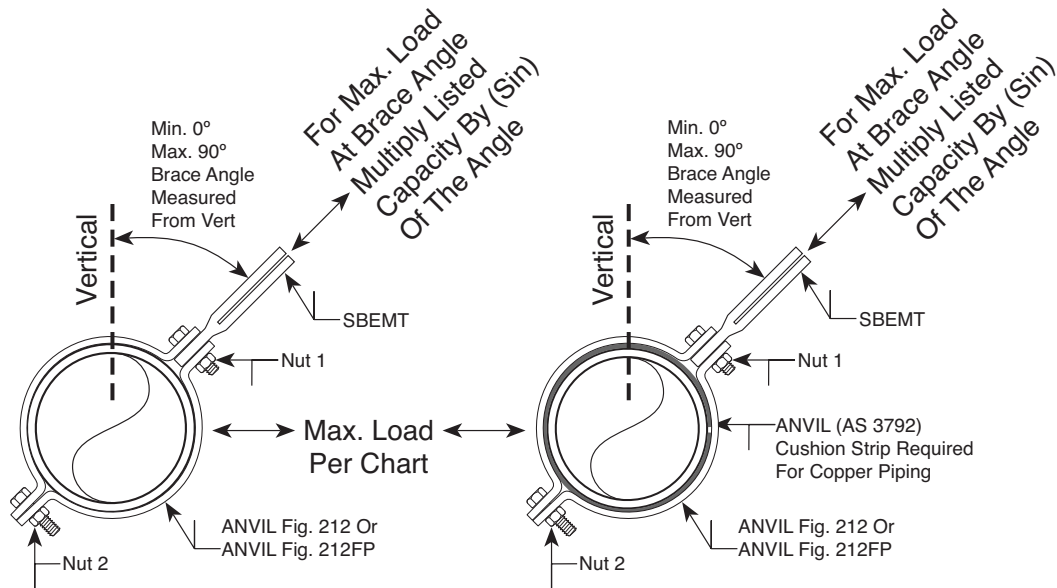


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BADGER INDUSTRIES - Anvil FIG: 212 & FIG: 212FP



NOTES:
Capacity based on seismic testing considering both tension and compression.
To convert listed horizontal capacity to angle capacity multiply listed capacity by (sin) of the angle.

Transverse Brace - (LRFD) Load with Factor Of Safety = 2.0

| ANVIL Fig. 212 Fig. 212FP Size | Piping Or Conduit Nominal Size | Steel Pipe, RMC Conduit | Cast-Iron Pipe | Copper Pipe | EMT Conduit | Sch 5 Steel Pipe |
|--------------------------------|--------------------------------|-------------------------|----------------|-------------|-------------|------------------|
| 1" Fig. 212 | 1 in. | 464 lbs. | | | | |
| 1-1/4" Fig. 212 | 1-1/4 in. | 580 lbs. | | | | |
| 1-1/2" Fig. 212 | 1-1/2 in. | 609 lbs. | 1,108 lbs. | | | |
| 2" Fig. 212 | 2 in. | 975 lbs. | 1,747 lbs. | 975 lbs. | 975 lbs. | 975 lbs. |
| 2-1/2" Fig. 212 | 2-1/2 in. | 2,204 lbs. | Size N/A | 601 lbs. | 1,470 lbs. | 1,470 lbs. |
| 3" Fig. 212 | 3 in. | 2,204 lbs. | 1,513 lbs. | 792 lbs. | 1,883 lbs. | 1,883 lbs. |
| 3-1/2" Fig. 212 | 3-1/2 in. | 1,820 lbs. | Size N/A | Not Tested | 1,820 lbs. | 1,820 lbs. |
| 4" Fig. 212 | 4 in. | 2,204 lbs. | 1,897 lbs. | 667 lbs. | 1,114 lbs. | 1,114 lbs. |
| 5" Fig. 212FP | 5 in. | 2,204 lbs. | 1,938 lbs. | 614 lbs. | | |
| 6" Fig. 212FP | 6 in. | 2,204 lbs. | 1,741 lbs. | 553 lbs. | | |
| 8" Fig. 212FP | 8 in. | 2,361 lbs. | 1,310 lbs. | | | |
| 10" Fig. 212FP | 10 in. | 2,318 lbs. | 1,350 lbs. | | | |
| 12" Fig. 212FP | 12 in. | 1,467 lbs. | 1,055 lbs. | | | |

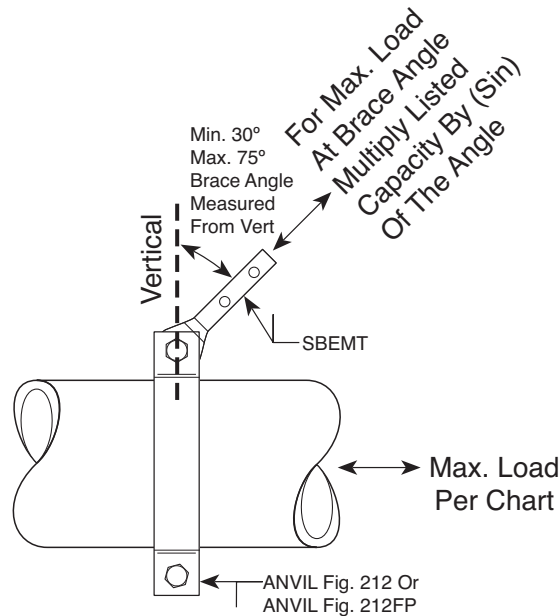


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BADGER INDUSTRIES - Anvil FIG: 212 & FIG: 212FP



NOTES:
 Capacity based on seismic testing considering both tension and compression.
 To convert listed horizontal capacity to angle capacity multiply listed capacity by (sin) of the angle.

Longitudinal Brace - Allowable Load with Factor Of Safety = 3.0

| ANVIL Fig. 212 Fig. 212FP Size | Piping Or Conduit Nominal Size | Steel Pipe, RMC Conduit | Cast-Iron Pipe | Copper Pipe | EMT Conduit | Sch 5 Steel Pipe |
|--------------------------------|--------------------------------|-------------------------|----------------|-------------|-------------|------------------|
| 1" Fig. 212 | 1 in. | (1) | | | | |
| 1-1/4" Fig. 212 | 1-1/4 in. | (1) | | | | |
| 1-1/2" Fig. 212 | 1-1/2 in. | (1) | 369 lbs. | | | |
| 2" Fig. 212 | 2 in. | 600 lbs. | 582 lbs. | (1) | (1) | (1) |
| 2-1/2" Fig. 212 | 2-1/2 in. | 734 lbs. | Size N/A | (1) | 490 lbs. | 490 lbs. |
| 3" Fig. 212 | 3 in. | 734 lbs. | 504 lbs. | (1) | 628 lbs. | 628 lbs. |
| 3-1/2" Fig. 212 | 3-1/2 in. | 553 lbs. | Size N/A | Not Tested | 553 lbs. | 553 lbs. |
| 4" Fig. 212 | 4 in. | 504 lbs. | 376 lbs. | (1) | 371 lbs. | 371 lbs. |
| 5" Fig. 212FP | 5 in. | 734 lbs. | 550 lbs. | (1) | | |
| 6" Fig. 212FP | 6 in. | 734 lbs. | 580 lbs. | (1) | | |
| 8" Fig. 212FP | 8 in. | 787 lbs. | 436 lbs. | | | |
| 10" Fig. 212FP | 10 in. | 707 lbs. | 450 lbs. | | | |
| 12" Fig. 212FP | 12 in. | 489 lbs. | 351 lbs. | | | |



(1) Design and locate transverse bracing at changes in direction to provided longitudinal restraint.

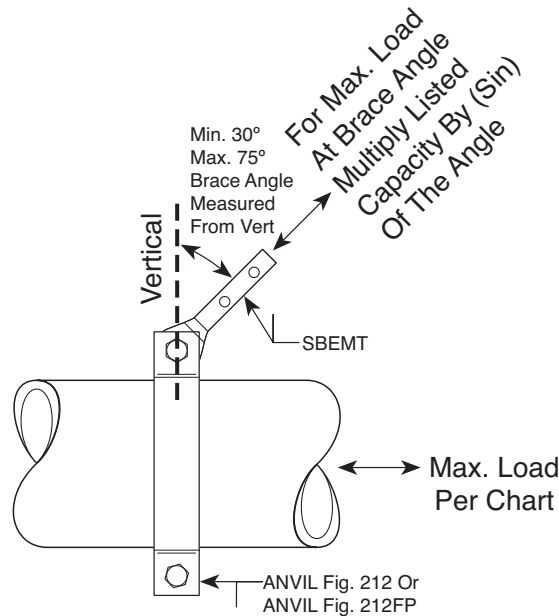


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BADGER INDUSTRIES - Anvil FIG: 212 & FIG: 212FP

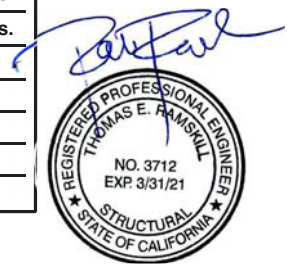


NOTES:
 Capacity based on seismic testing considering both tension and compression.
 To convert listed horizontal capacity to angle capacity multiply listed capacity by (sin) of the angle.

Longitudinal Brace - (LRFD) Load with Factor Of Safety = 2.0

| ANVIL Fig. 212 Fig. 212FP Size | Piping Or Conduit Nominal Size | Steel Pipe, RMC Conduit | Cast-Iron Pipe | Copper Pipe | EMT Conduit | Sch 5 Steel Pipe |
|--------------------------------|--------------------------------|-------------------------|----------------|-------------|-------------|------------------|
| 1" Fig. 212 | 1 in. | (1) | | | | |
| 1-1/4" Fig. 212 | 1-1/4 in. | (1) | | | | |
| 1-1/2" Fig. 212 | 1-1/2 in. | (1) | 554 lbs. | | | |
| 2" Fig. 212 | 2 in. | 900 lbs. | 874 lbs. | (1) | (1) | (1) |
| 2-1/2" Fig. 212 | 2-1/2 in. | 1,102 lbs. | Size N/A | (1) | 735 lbs. | 735 lbs. |
| 3" Fig. 212 | 3 in. | 1,102 lbs. | 756 lbs. | (1) | 942 lbs. | 942 lbs. |
| 3-1/2" Fig. 212 | 3-1/2 in. | 829 lbs. | Size N/A | Not Tested | 829 lbs. | 829 lbs. |
| 4" Fig. 212 | 4 in. | 75 lbs. | 564 lbs. | (1) | 557 lbs. | 557 lbs. |
| 5" Fig. 212FP | 5 in. | 1,102 lbs. | 825 lbs. | (1) | | |
| 6" Fig. 212FP | 6 in. | 1,102 lbs. | 871 lbs. | (1) | | |
| 8" Fig. 212FP | 8 in. | 1,181 lbs. | 655 lbs. | | | |
| 10" Fig. 212FP | 10 in. | 1,061 lbs. | 675 lbs. | | | |
| 12" Fig. 212FP | 12 in. | 734 lbs. | 527 lbs. | | | |

(1) Design and locate transverse bracing at changes in direction to provided longitudinal restraint.

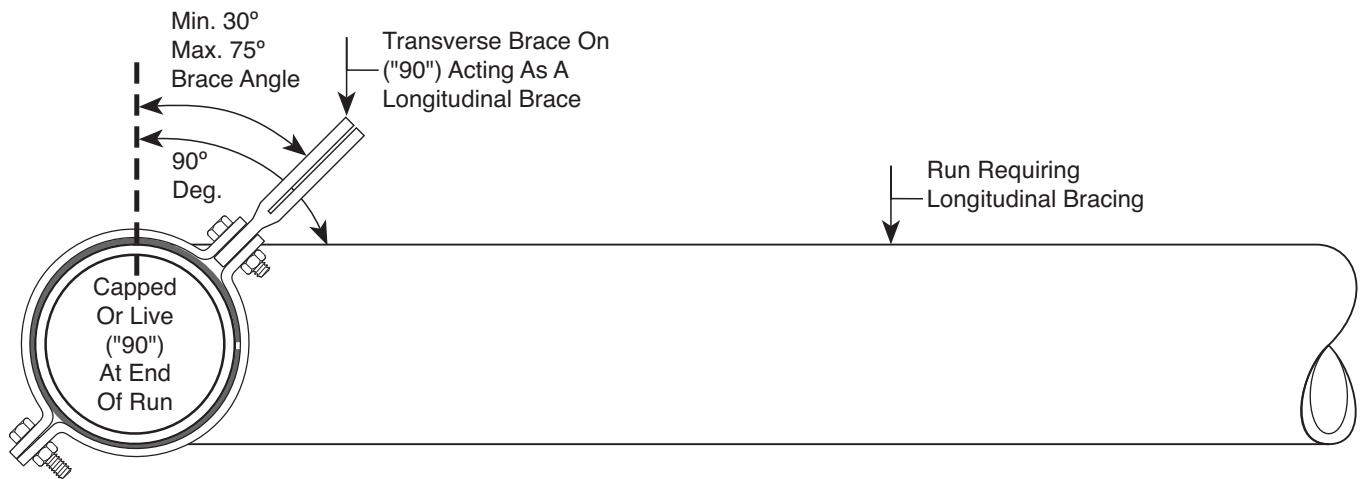
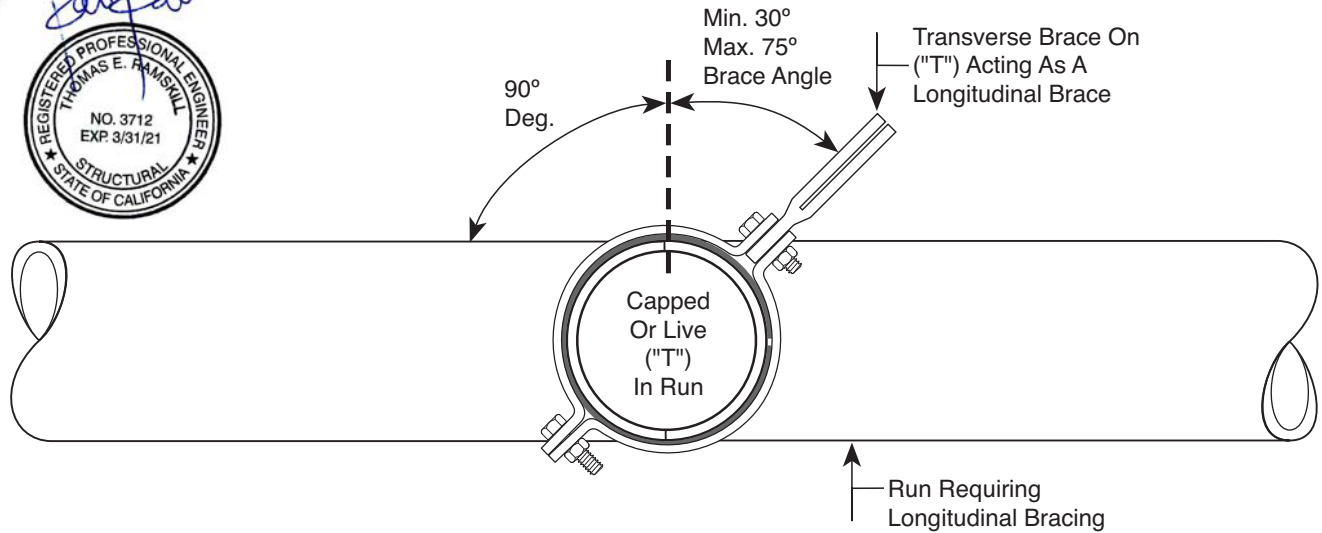


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BADGER INDUSTRIES - (TLN) Transverse as Longitudinal Notice



Notice:
 Except when engineered to qualify a greater distance, depicted transverse brace shall be located within (2 feet) of the "Run Requiring Longitudinal Bracing. Orientations other than depicted shall maintain identified angles.
 Brace type can be rigid or cable, and shall be installed per the trade system type. The number of brace arms per given brace location shall be as required by the engineered bracing design and thus may differ from that depicted.



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