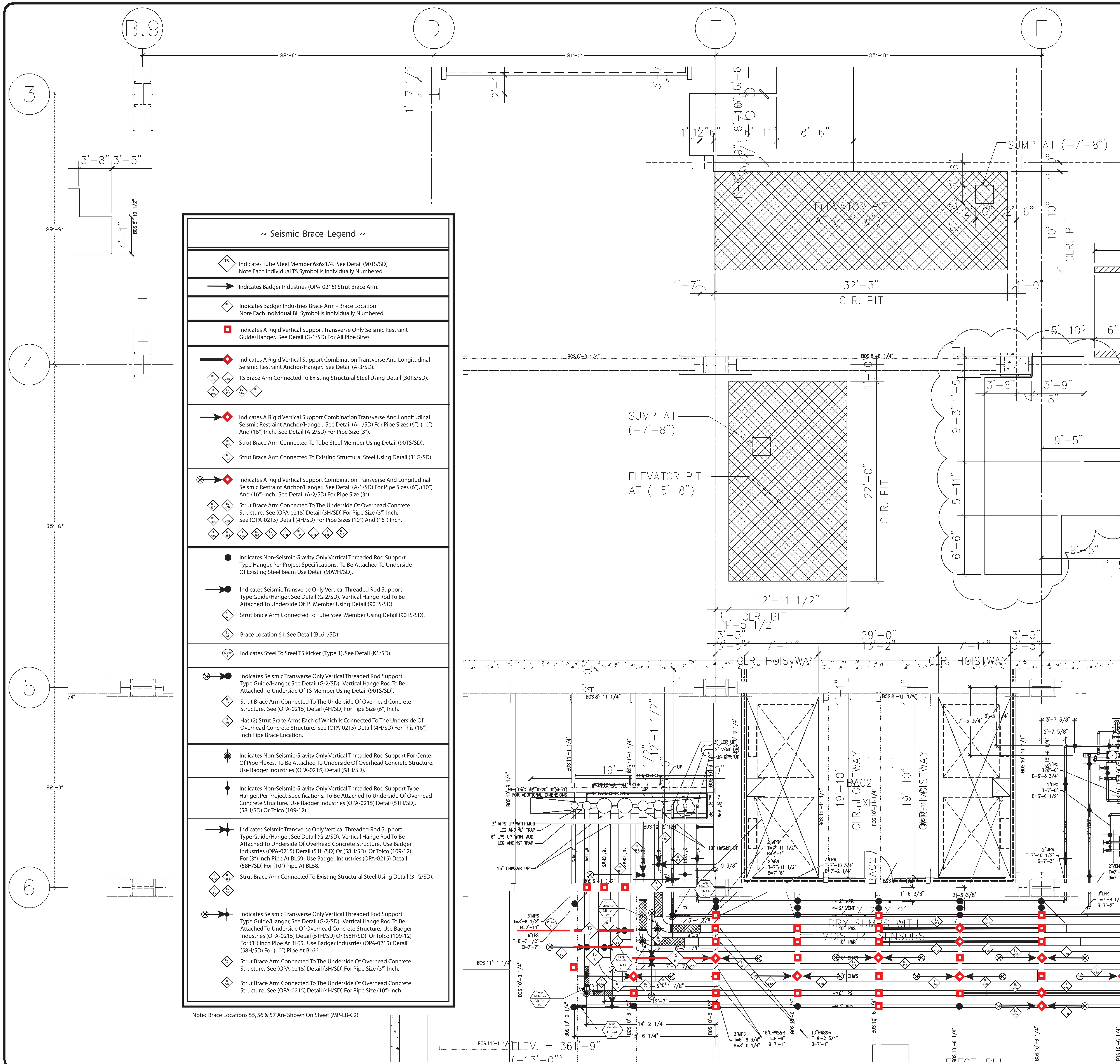


~ Seismic Brace Legend ~

TS — Indicates Tube Steel Member 6x6x1/4. See Detail (90TS/SD)
Note Each Individual TS Symbol Is Individually Numbered.

Indicates Badger Industries (OPA-0215) Strut Brace Arm.

BL — Indicates Badger Industries Brace Arm - Brace Location
Note Each Individual BL Symbol Is Individually Numbered.

Indicates A Rigid Vertical Support Transverse Only Seismic Restraint Guide/Hanger. See Detail (G-1/SD) For All Pipe Sizes.

Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-3/SD).

BL 47A, BL 47B, BL 50A, BL 50B, BL 51A, BL 51B — TS Brace Arm Connected To Existing Structural Steel Using Detail (30TS/SD).

Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-1/SD) For Pipe Sizes (6"), (10") And (16") Inch. See Detail (A-2/SD) For Pipe Size (3").

BL 54A — Strut Brace Arm Connected To Tube Steel Member Using Detail (90TS/SD).

BL 64A — Strut Brace Arm Connected To Existing Structural Steel Using Detail (31G/SD).

Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-1/SD) For Pipe Sizes (6"), (10") And (16") Inch. See Detail (A-2/SD) For Pipe Size (3").

BL 45A, BL 45B, BL 46A, BL 46B, BL 48A, BL 48B, BL 49A, BL 49B, BL 52A, BL 52B, BL 53A, BL 53B, BL 54B, BL 64B — Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (3H/SD) For Pipe Size (3") Inch.
See (OPA-0215) Detail (4H/SD) For Pipe Sizes (10") And (16") Inch.

Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support Type Hanger, Per Project Specifications. To Be Attached To Underside Of Existing Steel Beam Use Detail (90WH/SD).

Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of TS Member Using Detail (90TS/SD).

BL 63 — Strut Brace Arm Connected To Tube Steel Member Using Detail (90TS/SD).

BL 61 — Brace Location 61, See Detail (BL61/SD).

Kicker 1 — Indicates Steel To Steel TS Kicker (Type 1), See Detail (K1/SD).

Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of TS Member Using Detail (90TS/SD).

BL 62 — Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (4H/SD) For Pipe Size (6") Inch.

BL 60 — Has (2) Strut Brace Arms Each of Which Is Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (4H/SD) For This (16") Inch Pipe Brace Location.

Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support For Center Of Pipe Flexes. To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (58H/SD).

Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support Type Hanger, Per Project Specifications. To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD), (58H/SD) Or Tolco (109-12).

Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD) Or (58H/SD) Or Tolco (109-12) For (3") Inch Pipe At BL59. Use Badger Industries (OPA-0215) Detail (58H/SD) For (10") Pipe At BL58.

BL 58A, BL 58B, BL 59, BL 66B — Strut Brace Arm Connected To Existing Structural Steel Using Detail (31G/SD).

Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD) Or (58H/SD) Or Tolco (109-12) For (3") Inch Pipe At BL65. Use Badger Industries (OPA-0215) Detail (58H/SD) For (10") Pipe At BL66.

BL 65 — Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (3H/SD) For Pipe Size (3") Inch.

BL 66A — Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (4H/SD) For Pipe Size (10") Inch.

Note: Brace Locations 55, 56 & 57 Are Shown On Sheet (MP-LB-C2).

NUSIG

BADGER INDUSTRIES — Code Compliant Seismic Bracing Solutions

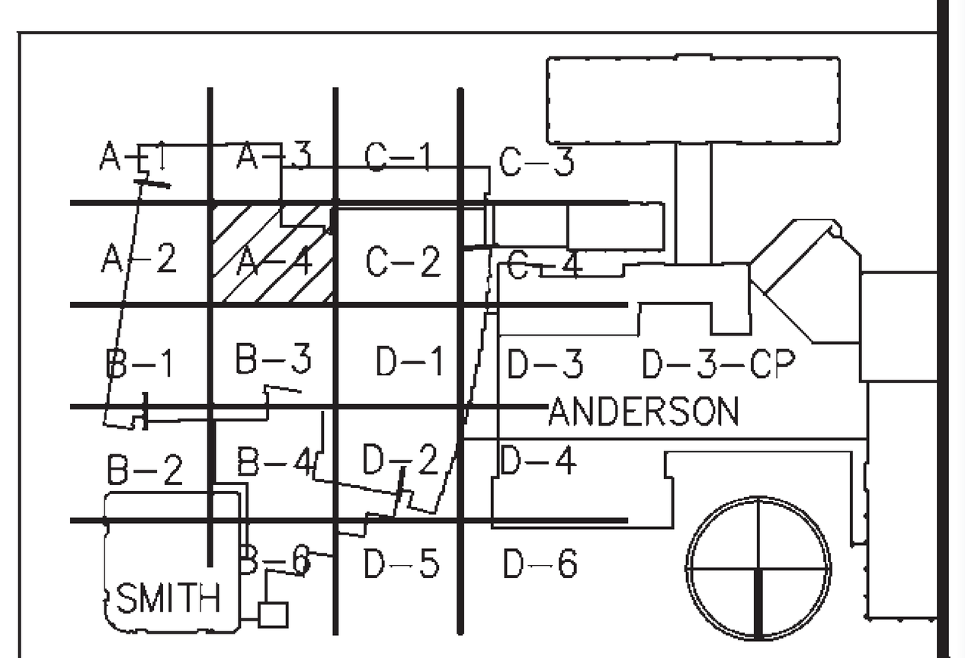
(ESS)

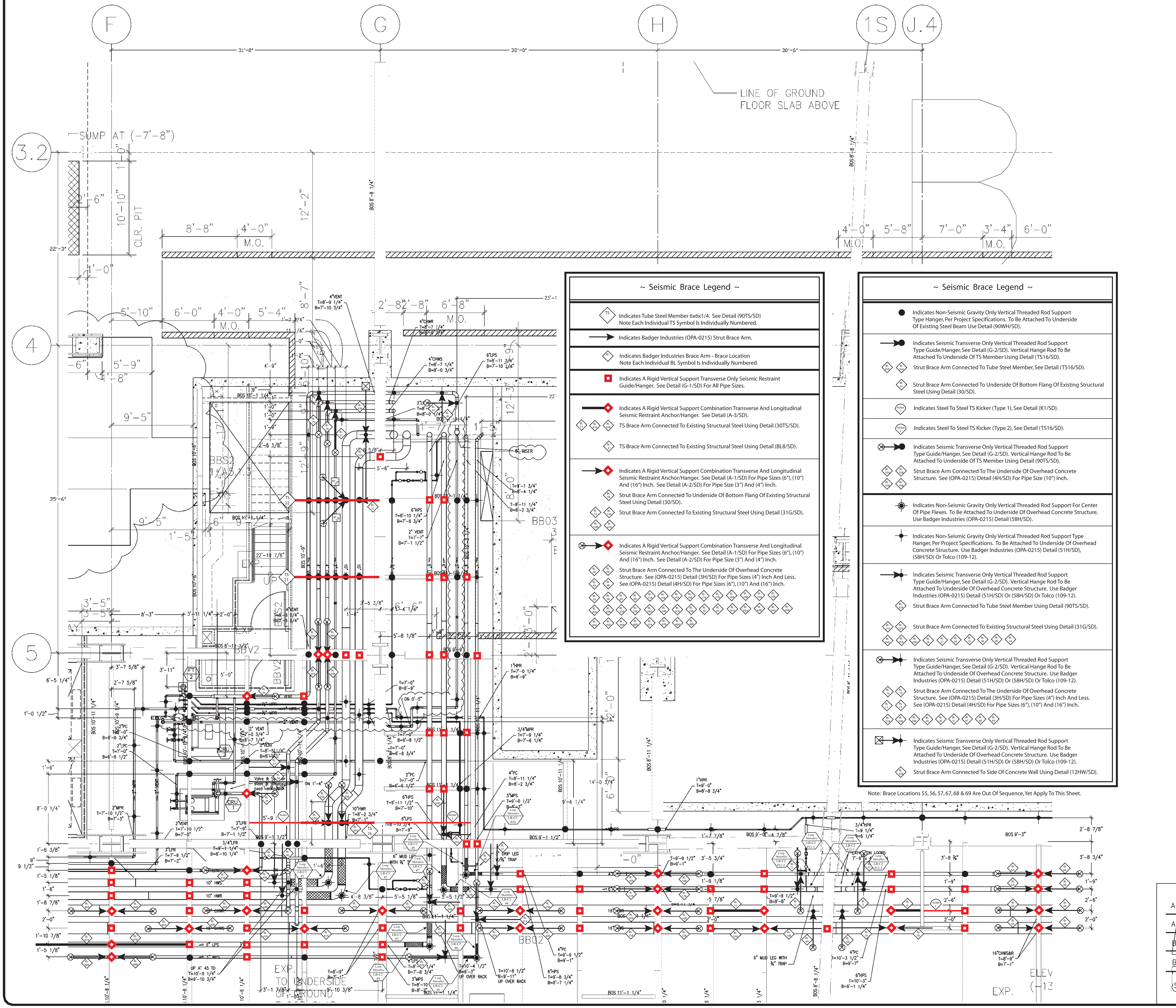
ENGINEERED SEISMIC SUBMITTAL

Piping shown on this sheet (without) bracing met code allowance for exemption of bracing.

Riser shaft supports have been design to provide both transverse and longitudinal seismic restraint for horizontal piping shown on this sheet. See riser shaft support submittal for anchorage designs and details.

REGISTERED PROFESSIONAL ENGINEER — DANIEL G. LEWIN — S 3... — Exp. 3-31-09 — STRUCTURAL — STATE OF CALIFORNIA





~ Seismic Brace Legend ~

- (TS) Indicates Tube Steel Member 6x6x1/4. See Detail (90TS/SD) Note Each Individual TS Symbol Is Individually Numbered.
- Indicates Badger Industries (OPA-0215) Strut Brace Arm.
- (BL) Indicates Badger Industries Brace Arm - Brace Location Note Each Individual BL Symbol Is Individually Numbered.
- Indicates A Rigid Vertical Support Transverse Only Seismic Restraint Guide/Hanger. See Detail (G-1/SD) For All Pipe Sizes.
- Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-3/SD).
  - BL 13, BL 47A, BL 47B: TS Brace Arm Connected To Existing Structural Steel Using Detail (30TS/SD).
  - BL 8: TS Brace Arm Connected To Existing Structural Steel Using Detail (BL8/SD).
- Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-1/SD) For Pipe Sizes (6"), (10") And (16") Inch. See Detail (A-2/SD) For Pipe Size (3") And (4") Inch.
  - BL 7B: Strut Brace Arm Connected To Underside Of Bottom Flang Of Existing Structural Steel Using Detail (30/SD).
  - BL 7A, BL 14A, BL 14B, BL 41B: Strut Brace Arm Connected To Existing Structural Steel Using Detail (31G/SD).
- ⊗ Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-1/SD) For Pipe Sizes (6"), (10") And (16") Inch. See Detail (A-2/SD) For Pipe Size (3") And (4") Inch.
  - BL 3A, BL 3B, BL 4A, BL 4B: Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (3H/SD) For Pipe Sizes (4") Inch And Less. See (OPA-0215) Detail (4H/SD) For Pipe Sizes (6"), (10") And (16") Inch.
  - BL 5A, 5B, 6A, 6B, 15A, 15B, 16A, 16B, 17A, 17B, 18A, 18B, 19A, 19B, 20A, 20B, 23A, 23B, 34A, 34B, 35A, 35B, 36, 39, 41A, 43A, 43B, 44A, 44B, 45A, 45B, 46A, 46B, 47A, 47B, 48A, 48B

~ Seismic Brace Legend ~

- ● Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support Type Hanger, Per Project Specifications. To Be Attached To Underside Of Existing Steel Beam Use Detail (90WH/SD).
- Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of TS Member Using Detail (TS16/SD).
  - BL 55A, BL 56A: Strut Brace Arm Connected To Tube Steel Member, See Detail (TS16/SD).
  - BL 57: Strut Brace Arm Connected To Underside Of Bottom Flang Of Existing Structural Steel Using Detail (30/SD).
- (Kicker 1) Indicates Steel To Steel TS Kicker (Type 1), See Detail (K1/SD).
- (Kicker 2) Indicates Steel To Steel TS Kicker (Type 2), See Detail (TS16/SD).
- ⊗ Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of TS Member Using Detail (90TS/SD).
  - BL 33A, BL 33B, BL 55B, BL 56B: Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (4H/SD) For Pipe Size (10") Inch.
- Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support For Center Of Pipe Flexes. To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (58H/SD).
- Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support Type Hanger, Per Project Specifications. To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD), (58H/SD) Or Tolco (109-12).
- Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD) Or (58H/SD) Or Tolco (109-12).
  - BL 32A: Strut Brace Arm Connected To Tube Steel Member Using Detail (90TS/SD).
  - BL 21A, BL 22A: Strut Brace Arm Connected To Existing Structural Steel Using Detail (31G/SD).
  - BL 24A, 25A, 25B, 26, 27, 28, 37, 38, 40, 42
- ⊗ Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD) Or (58H/SD) Or Tolco (109-12).
  - BL 9, BL 10, BL 11, BL 12: Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (3H/SD) For Pipe Sizes (4") Inch And Less. See (OPA-0215) Detail (4H/SD) For Pipe Sizes (6"), (10") And (16") Inch.
  - BL 21B, 22B, 24B, 29, 30, 31, 67, 68, 69
- ⊠ Indicates Seismic Transverse Only Vertical Threaded Rod Support Type Guide/Hanger, See Detail (G-2/SD). Vertical Hange Rod To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD) Or (58H/SD) Or Tolco (109-12).
  - BL 32B: Strut Brace Arm Connected To Side Of Concrete Wall Using Detail (12HW/SD).

Note: Brace Locations 55, 56, 57, 67, 68 & 69 Are Out Of Sequence, Yet Apply To This Sheet.

NUSIG

Badger Industries — Code Compliant Seismic Bracing Solutions

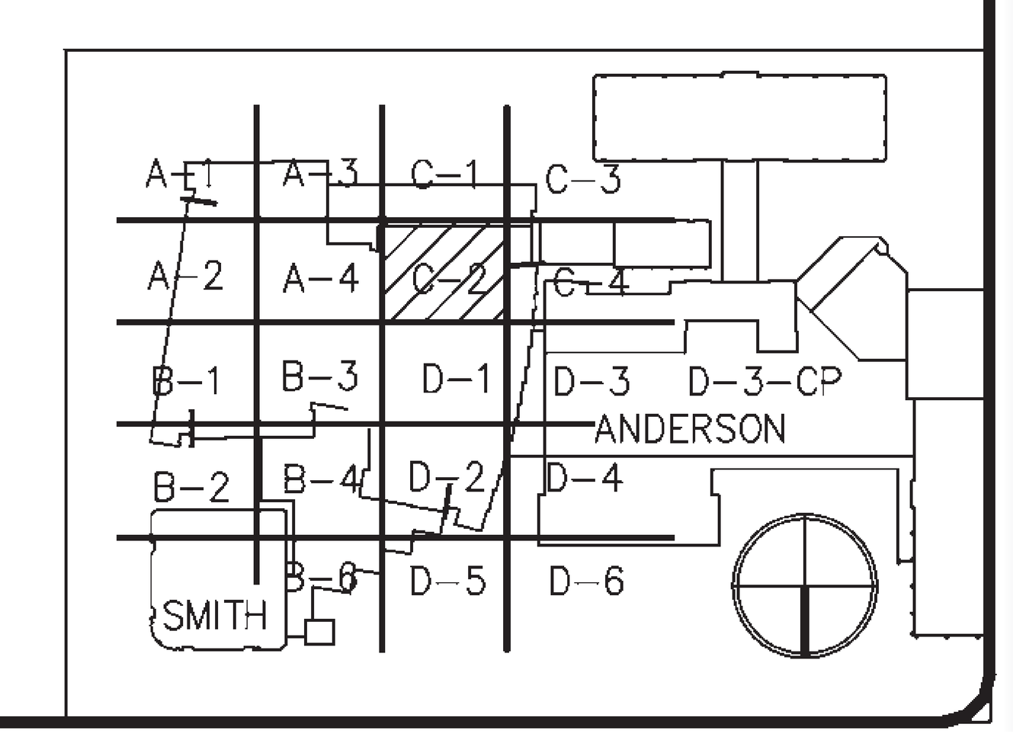
(ESS)

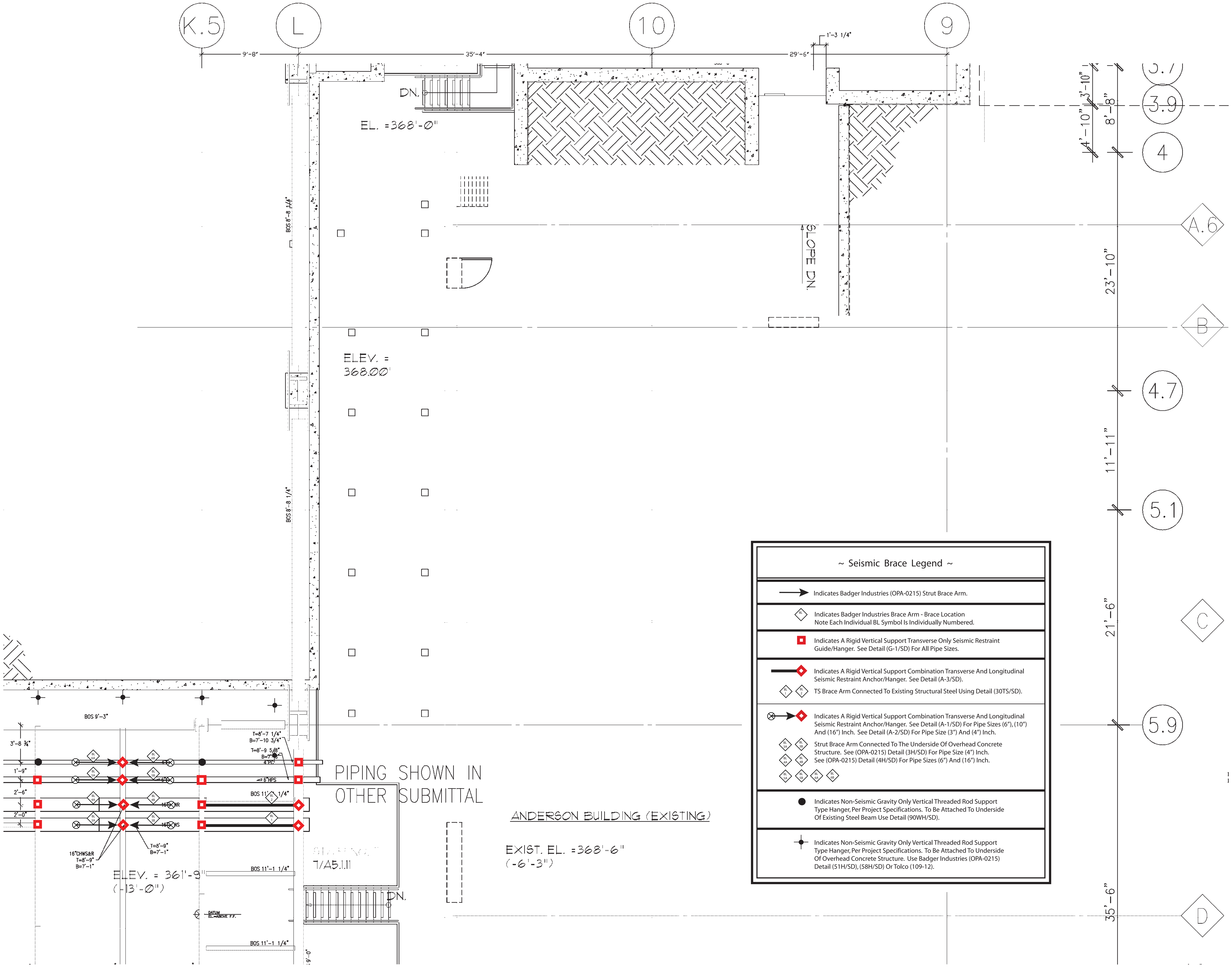
Engineered Seismic Submittal

Piping shown on this sheet (without) bracing met code allowance for exemption of bracing.

Riser shaft supports have been design to provide both transverse and longitudinal seismic restraint for horizontal piping shown on this sheet. See riser shaft support submittal for anchorage designs and details.

Registered Professional Engineer — Daniel G. Lewin — S 3270 — Exp. 3-31-09 — Structural — State of California





~ Seismic Brace Legend ~

Symbol	Description
Arrow	Indicates Badger Industries (OPA-0215) Strut Brace Arm.
BL	Indicates Badger Industries Brace Arm - Brace Location Note Each Individual BL Symbol Is Individually Numbered.
Red square	Indicates A Rigid Vertical Support Transverse Only Seismic Restraint Guide/Hanger. See Detail (G-1/SD) For All Pipe Sizes.
Bar with red diamond	Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-3/SD).
BL 1, BL 2	TS Brace Arm Connected To Existing Structural Steel Using Detail (30TS/SD).
Arrow with red diamond	Indicates A Rigid Vertical Support Combination Transverse And Longitudinal Seismic Restraint Anchor/Hanger. See Detail (A-1/SD) For Pipe Sizes (6"), (10") And (16") Inch. See Detail (A-2/SD) For Pipe Size (3") And (4") Inch.
BL 3A, BL 3B, BL 4A, BL 4B, BL 5A, BL 5B, BL 6A, BL 6B	Strut Brace Arm Connected To The Underside Of Overhead Concrete Structure. See (OPA-0215) Detail (3H/SD) For Pipe Size (4") Inch. See (OPA-0215) Detail (4H/SD) For Pipe Sizes (6") And (16") Inch.
Solid dot	Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support Type Hanger, Per Project Specifications. To Be Attached To Underside Of Existing Steel Beam Use Detail (90WH/SD).
Crosshair dot	Indicates Non-Seismic Gravity Only Vertical Threaded Rod Support Type Hanger, Per Project Specifications. To Be Attached To Underside Of Overhead Concrete Structure. Use Badger Industries (OPA-0215) Detail (51H/SD), (58H/SD) Or Tolco (109-12).

NUSIG

BADGER INDUSTRIES

CODE COMPLIANT SEISMIC BRACING SOLUTIONS

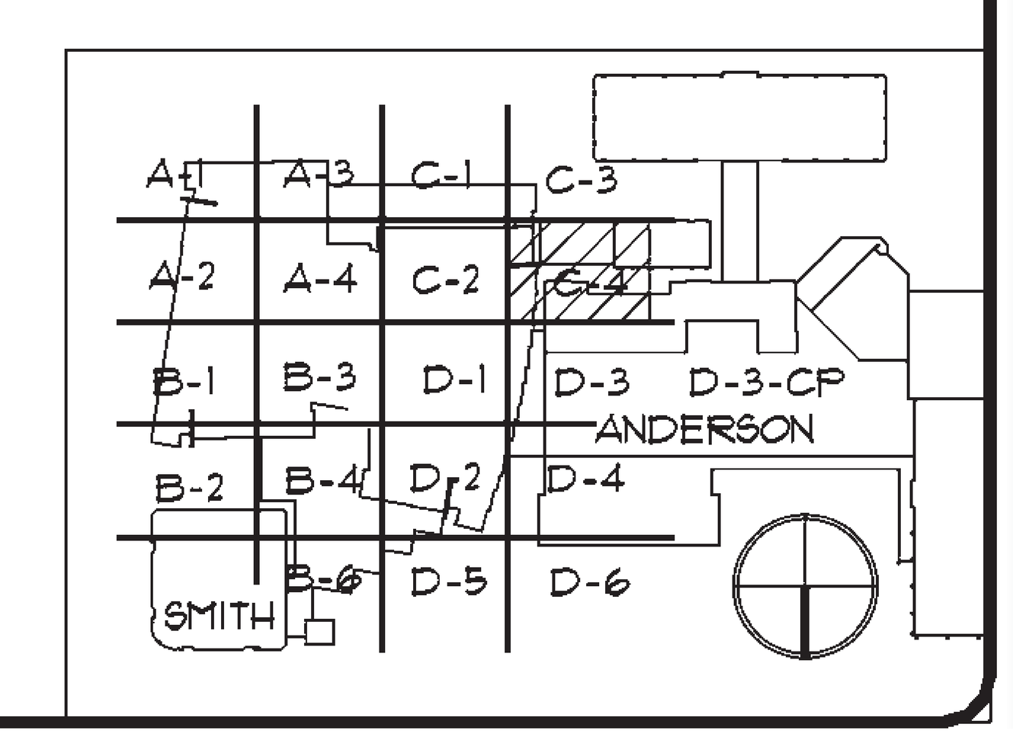
(ESS)

ENGINEERED SEISMIC SUBMITTAL

Piping shown on this sheet (without) bracing met code allowance for exemption of bracing.

Riser shaft supports have been design to provide both transverse and longitudinal seismic restraint for horizontal piping shown on this sheet. See riser shaft support submittal for anchorage designs and details.

REGISTERED PROFESSIONAL ENGINEER
DANIEL G. LEWIN
S 3270
Exp. 3-31-09
STRUCTURAL
STATE OF CALIFORNIA



(P) Maximum
for Strut Member (Slot Face) Connections shall not exceed;

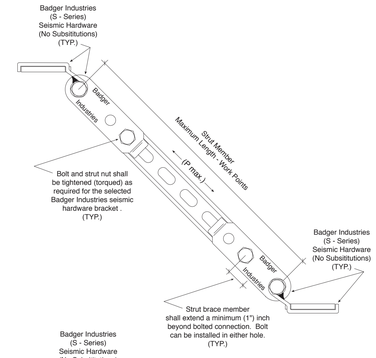
(12ga. x 1-5/8" x 1-3/8")	Work Points	4 feet 0 inches or Less -	3,820 Pounds
(12ga. x 1-5/8" x 1-3/8")	Work Points	5 feet 0 inches or Less -	3,235 Pounds
(12ga. x 1-5/8" x 1-3/8")	Work Points	6 feet 0 inches or Less -	2,770 Pounds
(12ga. x 1-5/8" x 1-3/8")	Work Points	7 feet 0 inches or Less -	2,410 Pounds
(12ga. x 1-5/8" x 1-3/8")	Work Points	8 feet 0 inches or Less -	2,115 Pounds
(12ga. x 1-5/8" x 1-5/8")	Work Points	5 feet 0 inches or Less -	3,495 Pounds
(12ga. x 1-5/8" x 1-5/8")	Work Points	6 feet 0 inches or Less -	3,000 Pounds
(12ga. x 1-5/8" x 1-5/8")	Work Points	7 feet 0 inches or Less -	2,630 Pounds
(12ga. x 1-5/8" x 1-5/8")	Work Points	8 feet 0 inches or Less -	2,340 Pounds
(12ga. x 1-5/8" x 1-5/8")	Work Points	9 feet 0 inches or Less -	2,095 Pounds
(12ga. x 1-5/8" x 1-5/8")	Work Points	9 feet 6 inches or Less -	1,880 Pounds

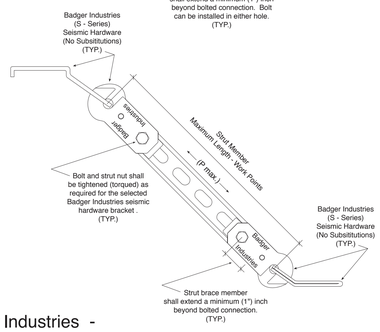
(P) Maximum
for Double Strut Member (Slot Face) Connections shall not exceed;

(12ga. x 1-5/8" x 2-3/4")	Work Points	4 feet 0 inches or Less -	7,910 Pounds
(12ga. x 1-5/8" x 2-3/4")	Work Points	5 feet 0 inches or Less -	6,235 Pounds
(12ga. x 1-5/8" x 2-3/4")	Work Points	6 feet 0 inches or Less -	4,580 Pounds
(12ga. x 1-5/8" x 2-3/4")	Work Points	7 feet 0 inches or Less -	3,460 Pounds
(12ga. x 1-5/8" x 2-3/4")	Work Points	8 feet 0 inches or Less -	2,670 Pounds
(12ga. x 1-5/8" x 2-3/4")	Work Points	9 feet 0 inches or Less -	2,110 Pounds
(12ga. x 1-5/8" x 2-3/4")	Work Points	10 feet 0 inches or Less -	1,705 Pounds
(12ga. x 1-5/8" x 3-1/4")	Work Points	5 feet 0 inches or Less -	7,100 Pounds
(12ga. x 1-5/8" x 3-1/4")	Work Points	6 feet 0 inches or Less -	5,270 Pounds
(12ga. x 1-5/8" x 3-1/4")	Work Points	7 feet 0 inches or Less -	4,020 Pounds
(12ga. x 1-5/8" x 3-1/4")	Work Points	8 feet 0 inches or Less -	3,130 Pounds
(12ga. x 1-5/8" x 3-1/4")	Work Points	9 feet 0 inches or Less -	2,480 Pounds
(12ga. x 1-5/8" x 3-1/4")	Work Points	10 feet 0 inches or Less -	2,005 Pounds

The values listed above are based on Maximum Column Loading @ Slot Face. Prior to installation check with the manufacturer of the strut selected for use to varify that the selected strut is equal to or greater in capacity than the values listed above.

All of the load(s) shown above represent the service load capacity of the strut member. Note, the service load capacity of the other components (ie; seismic bracket, drill-in anchor, threaded rod, etc.), or the building structure may be weaker. In all cases the weakest service load capacity of the complete seismic brace assembly/connection shall be the controlling service load capacity. These service load capacities do include a (1/3) increase for seismic.





APPROVED
Fixed Equipment Anchorage
Office of Statewide Health Planning and Development
OPA-0215
on
Friday, April 08, 2005
**** Valid for 3 Years Maximum ****
Anthony R. Pike (916) 654-3362

RBM
SD

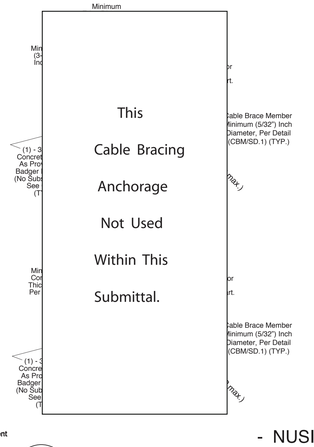
- NUSIG / Badger Industries -
Rigid Brace Members
(Elev. View) - (Not To Scale)

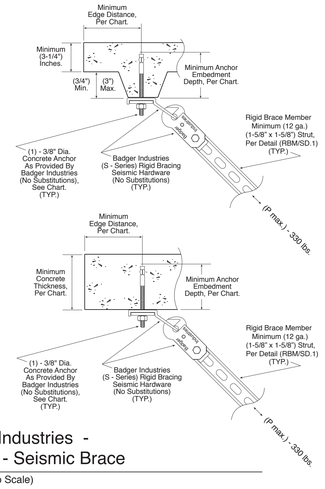
Minimum 3,000 psi, Lightweight or Normal Weight Concrete, (Underside) of Slab or Concrete Filled Metal Decking Installations						
Badger Industries Detail (ID. #)	Anchor Installation Torque	Anchor Inspection Code	Minimum Anchor Embedment Depth	Minimum Edge Distance	Minimum Between Anchor Spacing	Minimum Concrete Thickness
(2H / SD)	20 ft./lbs.	H	3 in.	6-1/2 in.	8 in.	4-1/2 in.

Installation, Testing and Inspection: Per concrete anchor manufacturer (ICBO Evaluation Report), Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Metal decking shall be minimum (20 gauge) steel deck. Anchors that are installed in the underside of the metal decking, shall be installed through the center of the metal decking rib/flute, allowable offset from center shall not exceed (1") inch. Metal decking rib/flute shall have a minimum width of (4-1/2") inches. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record. Badger Industries Seismic Hardware can be oriented in plan 360 degrees about the center of the connection. Substitution of Badger Industries Seismic Hardware shall invalidate (void) all aspects of this page.





APPROVED
Fixed Equipment Anchorage
Office of Statewide Health Planning and Development
OPA-0215
on
Friday, April 08, 2005
**** Valid for 3 Years Maximum ****
Anthony R. Pike (916) 654-3362

2H
SD

- NUSIG / Badger Industries -
Single Concrete Anchor - Seismic Brace
(Elev. View) - (Not To Scale)

NUSIG
BADGER INDUSTRIES
CODE COMPLIANT SEISMIC BRACING SOLUTIONS
(ESS)
ENGINEERED SEISMIC SUBMITTAL

HOHBACH-LEWIN INC.
STRUCTURAL ENGINEERS
260 Sheridan Avenue, Suite 150
Palo Alto, CA 94306
(650) 617-5930, Fax (650) 617-5932

REGISTERED PROFESSIONAL ENGINEER
DANIEL G. LEWIN
STRUCTURAL
STATE OF CALIFORNIA

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Revisions:

No.	Revisions	Date

Facility:

HOSPITAL
TOWER
Boulevard

Client:

AIR CONDITIONING
ION

Sheet Title:

PRE-APPROVED (OPA-0215)
NUSIG / BADGER INDUSTRIES
SEISMIC BRACING DETAILS

Approved / Architect:

Checked: Date:

Drawn: Scale: N.T.S.

Sheet Number:

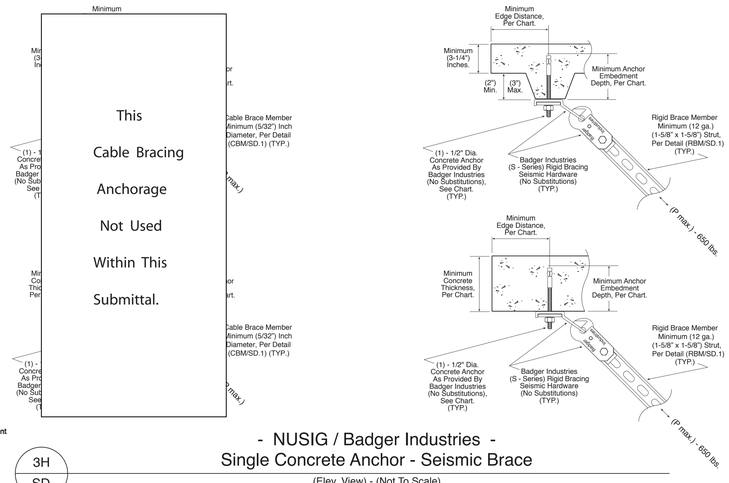
SD.1

Minimum 3,000 psi, Lightweight or Normal Weight Concrete, (Underside) of Slab or Concrete Filled Metal Decking Installations						
Badger Industries Detail (ID. #)	Anchor Installation Torque	Anchor Inspection Code	Minimum Anchor Embedment Depth	Minimum Edge Distance	Minimum Between Anchor Spacing	Minimum Concrete Thickness
(3H / SD)	40 ft./lbs.	I	4 in.	9 in.	10-1/2 in.	6 in.

Installation, Testing and Inspection: Per concrete anchor manufacturer (ICBO Evaluation Report), Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Metal decking shall be minimum (20 gauge) steel deck. Anchors that are installed in the underside of the metal decking, shall be installed through the center of the metal decking rib/flute, allowable offset from center shall not exceed (1") inch. Metal decking rib/flute shall have a minimum width of (4-1/2") inches. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record. Badger Industries Seismic Hardware can be oriented in plan 360 degrees about the center of the connection. Substitution of Badger Industries Seismic Hardware shall invalidate (void) all aspects of this page.



APPROVED
Fixed Equipment Anchorage
Office of Statewide Health Planning and Development
OPA-0215
on
Friday, April 08, 2005
**** Valid for 3 Years Maximum ****
Anthony R. Pike (916) 654-3362

3H / SD

- NUSIG / Badger Industries - Single Concrete Anchor - Seismic Brace

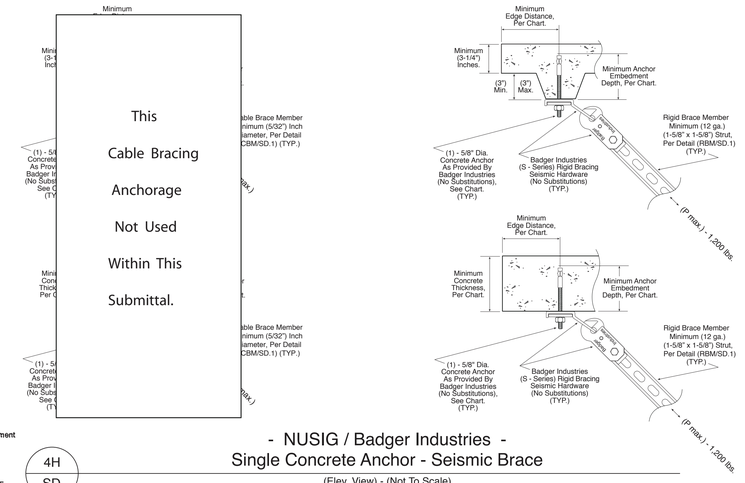
(Elev. View) - (Not To Scale)

Minimum 3,000 psi, Lightweight or Normal Weight Concrete, (Underside) of Slab or Concrete Filled Metal Decking Installations						
Badger Industries Detail (ID. #)	Anchor Installation Torque	Anchor Inspection Code	Minimum Anchor Embedment Depth	Minimum Edge Distance	Minimum Between Anchor Spacing	Minimum Concrete Thickness
(4H / SD)	85 ft./lbs.	L	5 in.	11 in.	12 in.	7-1/2 in.

Installation, Testing and Inspection: Per concrete anchor manufacturer (ICBO Evaluation Report), Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Metal decking shall be minimum (20 gauge) steel deck. Anchors that are installed in the underside of the metal decking, shall be installed through the center of the metal decking rib/flute, allowable offset from center shall not exceed (1") inch. Metal decking rib/flute shall have a minimum width of (4-1/2") inches. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record. Badger Industries Seismic Hardware can be oriented in plan 360 degrees about the center of the connection. Substitution of Badger Industries Seismic Hardware shall invalidate (void) all aspects of this page.



APPROVED
Fixed Equipment Anchorage
Office of Statewide Health Planning and Development
OPA-0215
on
Friday, April 08, 2005
**** Valid for 3 Years Maximum ****
Anthony R. Pike (916) 654-3362

4H / SD

- NUSIG / Badger Industries - Single Concrete Anchor - Seismic Brace

(Elev. View) - (Not To Scale)

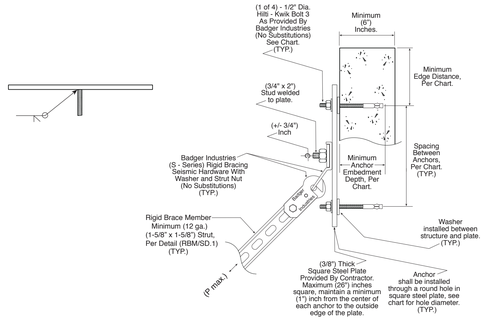
Minimum 3,000 psi, Lightweight or Normal Weight Concrete, Slab Concrete Wall Installations								
Badger Industries Detail (ID. #)	Anchor Installation Torque	Anchor Inspection Code	Minimum Anchor Embedment Depth	Minimum Edge Distance	Minimum Spacing Between Anchors	Maximum Spacing Between Anchors	Dia. Of Hole Through Plate For Anchor	OSHPD, DSA (P max.)
(12HW / SD)	40 ft./lbs.	I	4 in.	9 in.	12 in.	24 in.	9/16 in.	2,350 lbs.

Installation, Testing and Inspection: Per concrete anchor manufacturer (ICBO Evaluation Report), Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Maintain proper spacing between all anchors and inserts. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.

Badger Industries Seismic Hardware can be oriented in plan 360 degrees about the center of the connection. The (4) anchors required for this connection are to be equally spaced in a square pattern. Badger Industries Seismic Hardware shall be located in the center of the anchor group. Substitution of Badger Industries Seismic Hardware shall invalidate (void) all aspects of this page.



Deferred Approval Detail
Pending OSHPD Review
And Approval

12HW / SD

- NUSIG / Badger Industries - Quadruple Concrete Anchor To Wall - Seismic Brace

(Elev. View) - (Not To Scale)

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HOHBACH-LEWIN INC.
STRUCTURAL ENGINEERS
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(650) 617-5930, Fax (650) 617-5932

REGISTERED PROFESSIONAL ENGINEER
DANIEL G. LEWIN
STRUCTURAL
STATE OF CALIFORNIA

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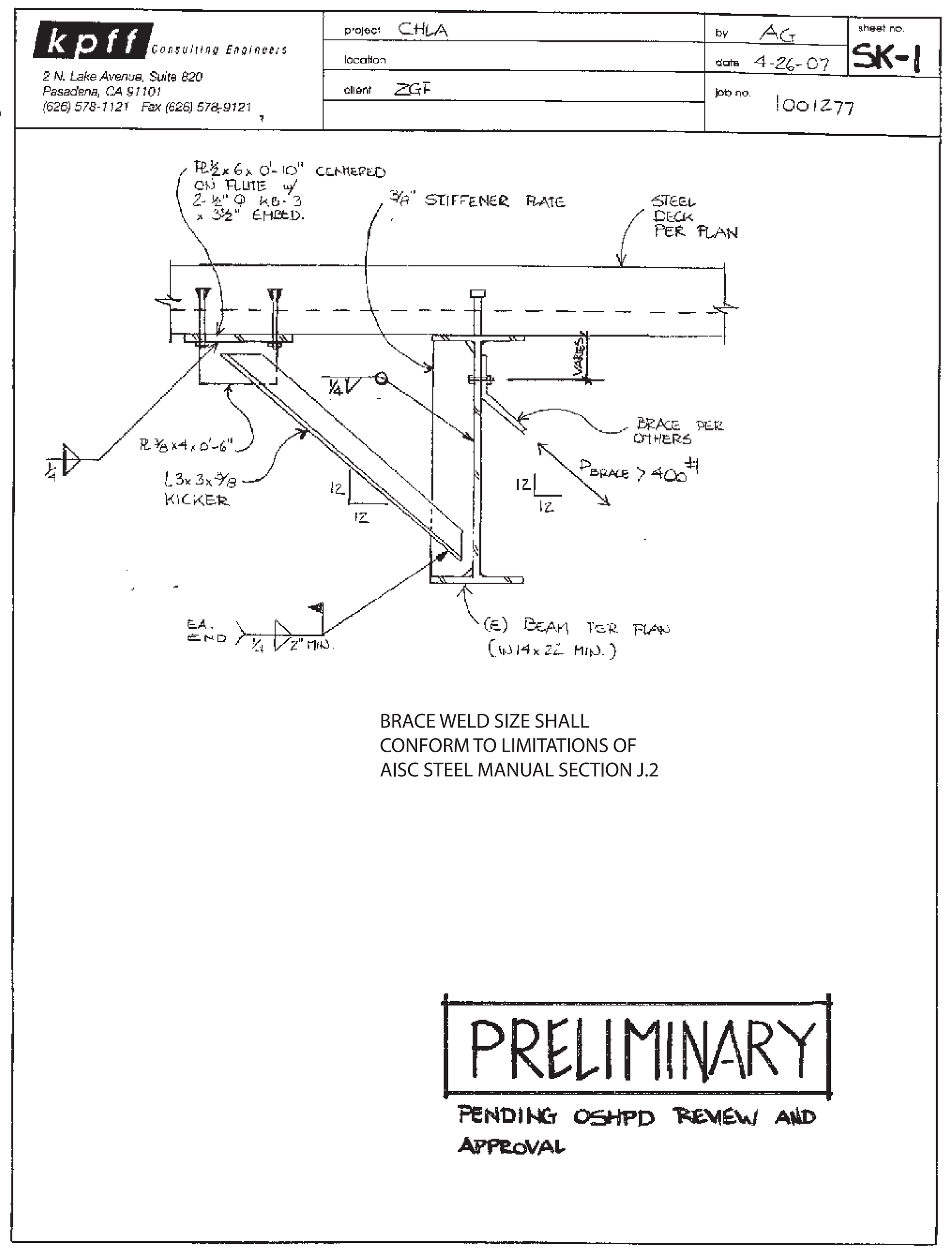
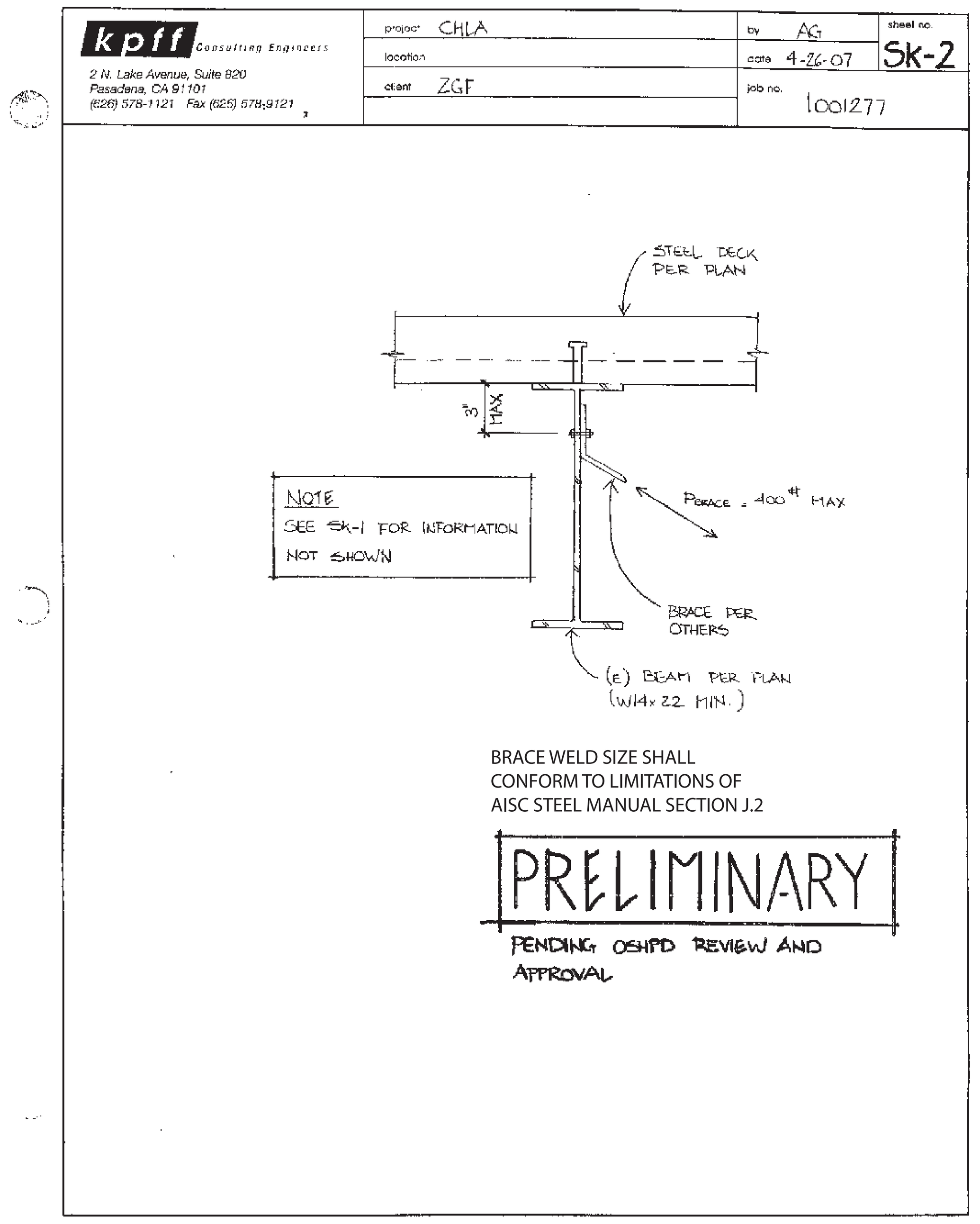


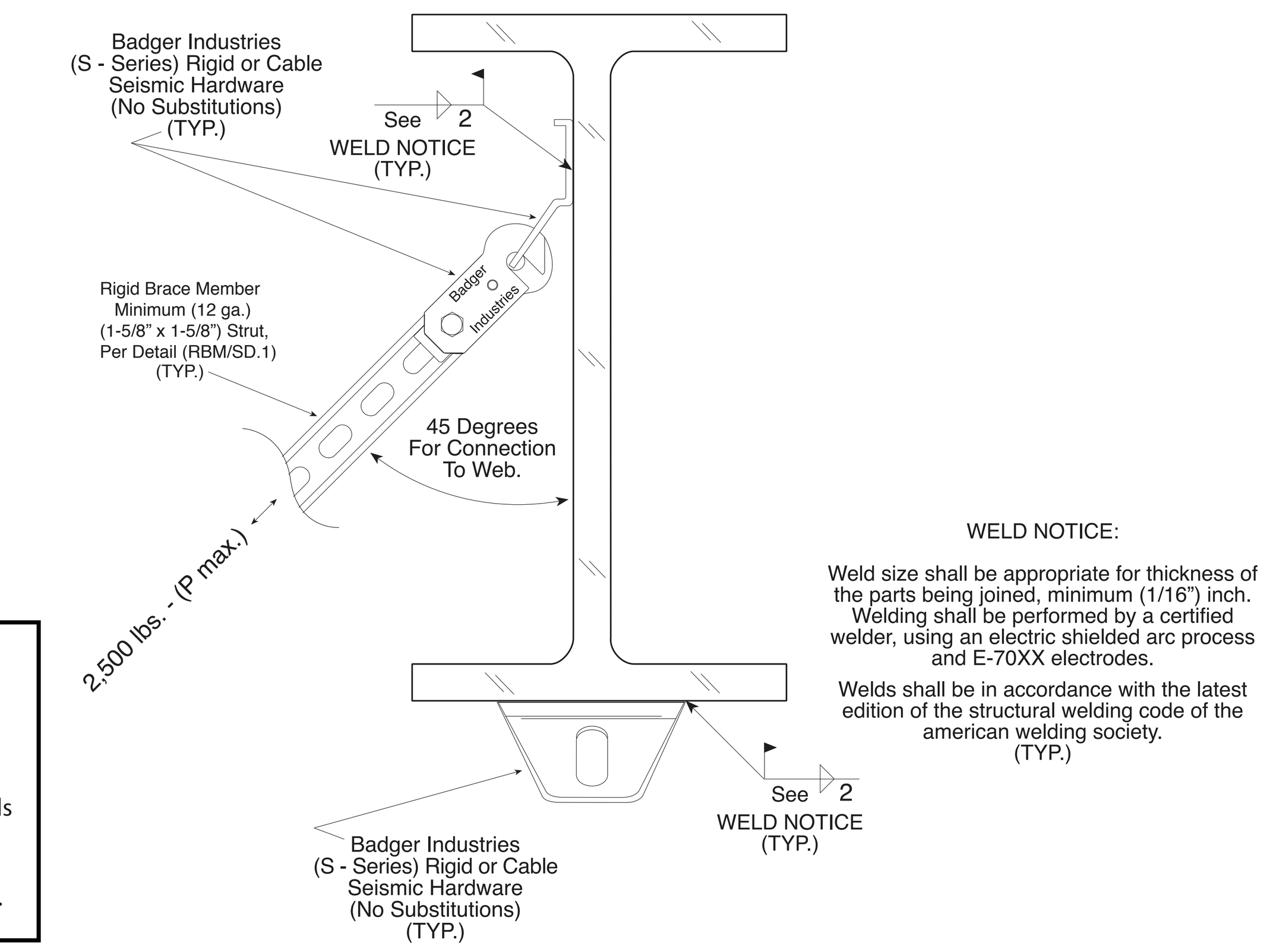


Installation, Testing and Inspection: Per Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded, when applicable check beam for torsional loading, weak axis bending, axial loads, etc. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.

Badger Industries Seismic Hardware installed on the bottom flange must be oriented in-line (parallel) with the web of the beam. Badger Industries Seismic Hardware installed on the upper web or upper flange can be oriented 180 degrees about the center of the connection. Substitution of Badger Industries Seismic Hardware shall invalidate (void) all aspects of this page.



WELD NOTICE:

Weld size shall be appropriate for thickness of the parts being joined, minimum (1/16") inch. Welding shall be performed by a certified welder, using an electric shielded arc process and E-70XX electrodes.

Welds shall be in accordance with the latest edition of the structural welding code of the american welding society. (TYP.)

This Detail Has Been Revised To Comply With Project Structural Engineer Of Record Requirements. See Sheet SD.4, KPFF Details SK-1 And SK-2 When Using This Seismic Brace Conn. To Existing Structural Steel.

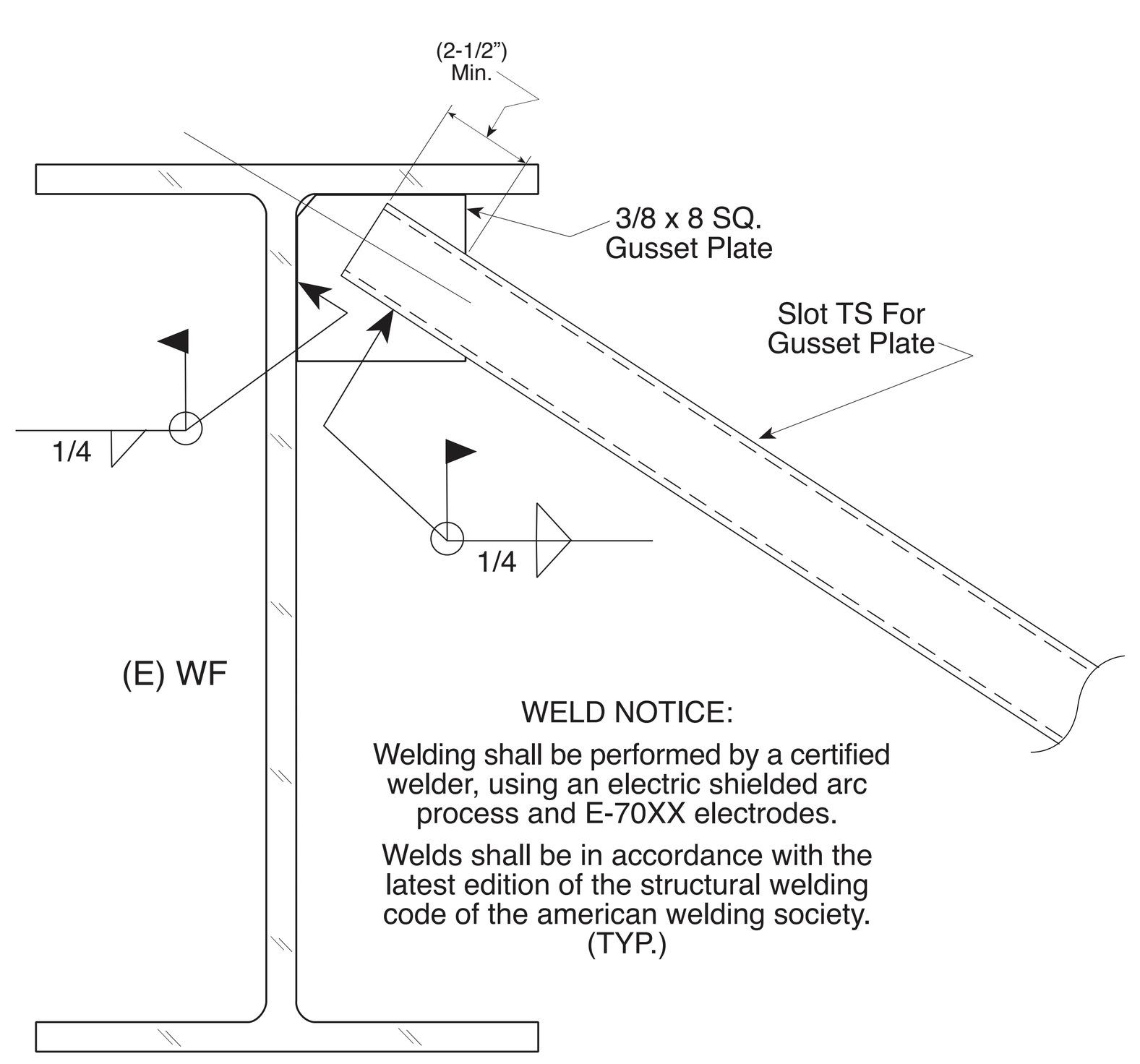
APPROVED
Fixed Equipment Anchorage
Office of Statewide Health Planning and Development
OPA-0215
on
Friday, April 08, 2005
**** Valid for 3 Years Maximum ****
Anthony R. Pike (916) 654-3362

30 / SD — NUSIG / Badger Industries -
Welded To Steel Beam - Seismic Brace
(Elev. View) - (Not To Scale)

Installation, Testing and Inspection: Per Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded, when applicable check beam for torsional loading, weak axis bending, axial loads, etc. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.



WELD NOTICE:

Welding shall be performed by a certified welder, using an electric shielded arc process and E-70XX electrodes.

Welds shall be in accordance with the latest edition of the structural welding code of the american welding society. (TYP.)

Deferred Approval Detail Pending OSHPD Review And Approval

30TS / SD — NUSIG / Badger Industries -
Tube Steel With Gusset Plate - Seismic Brace
(Elev. View) - (Not To Scale)

Installation, Testing and Inspection: Per Engineer of Record and OSHPD Jurisdictional requirements.

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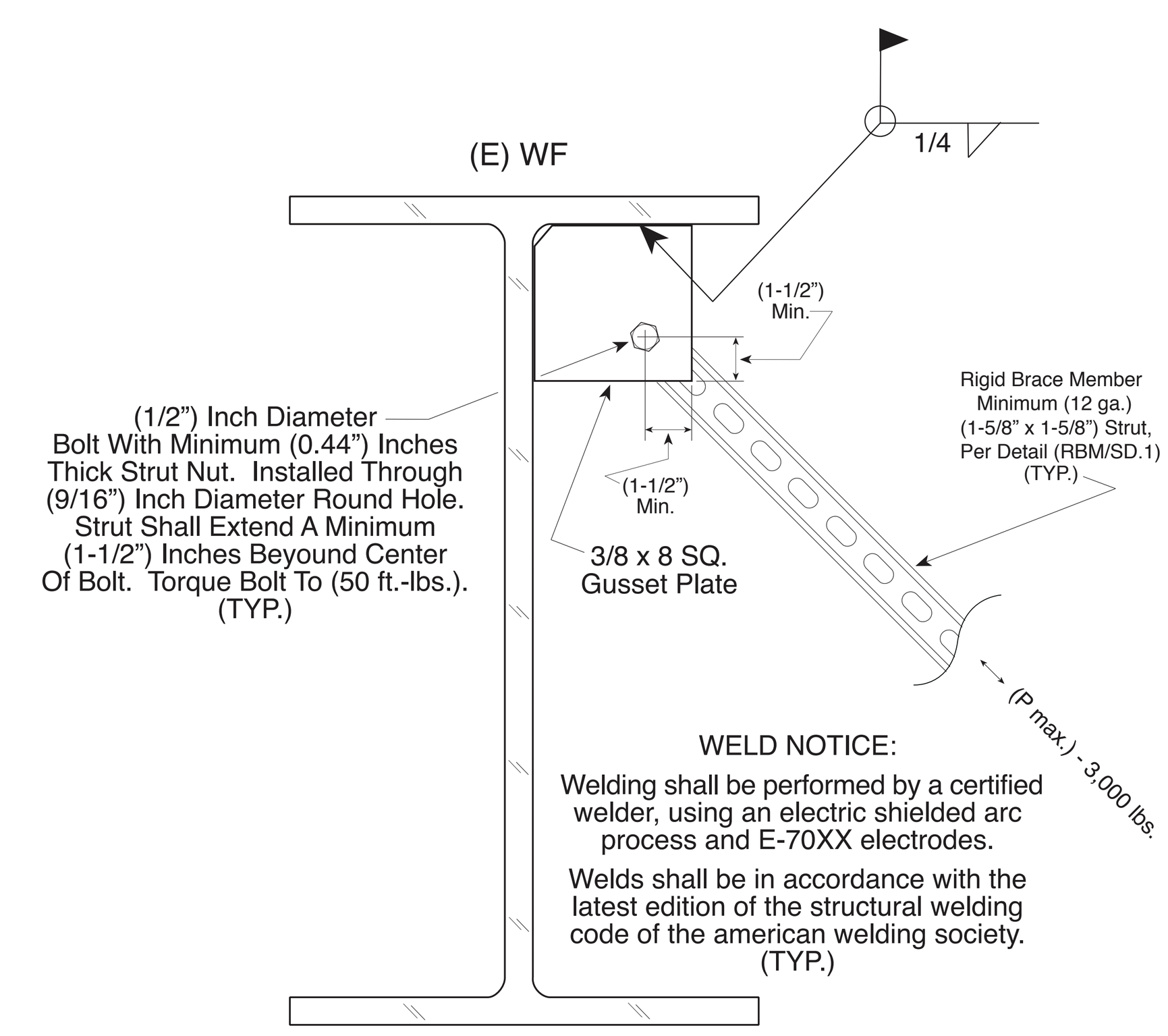
Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded, when applicable check beam for torsional loading, weak axis bending, axial loads, etc. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.



WELD NOTICE:

Welding shall be performed by a certified welder, using an electric shielded arc process and E-70XX electrodes.

Welds shall be in accordance with the latest edition of the structural welding code of the american welding society. (TYP.)

Deferred Approval Detail Pending OSHPD Review And Approval

31G / SD — NUSIG / Badger Industries -
Strut Bolted To Gusset Plate - Seismic Brace
(Elev. View) - (Not To Scale)

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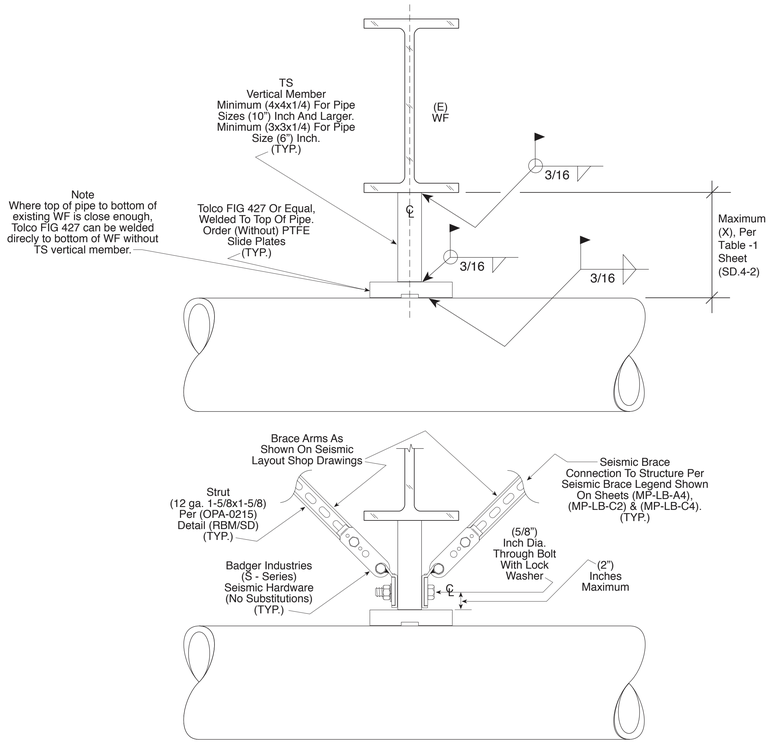

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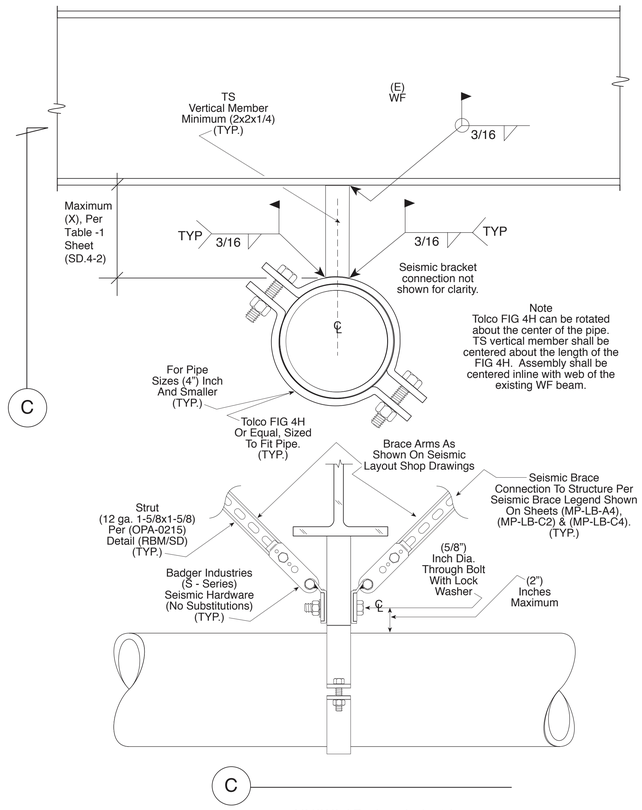
And Approval

A-1
SD

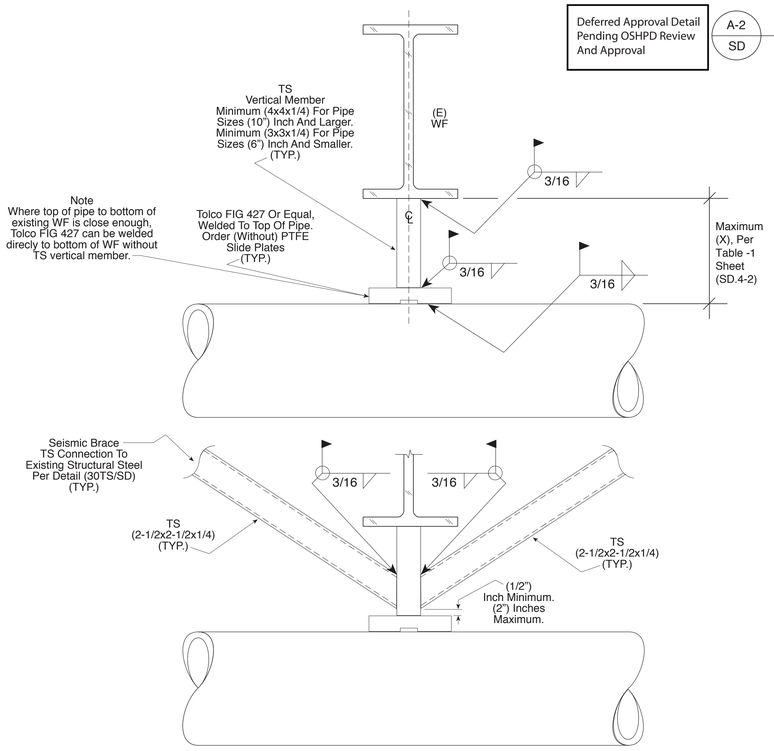
- NUSIG / Badger Industries -
Rigid Beam Anchor - Vertical And Seismic
(Elev. View) - (Not To Scale)



Deferred Approval Detail
Pending OSHPD Review
And Approval

A-2
SD

- NUSIG / Badger Industries -
Rigid Beam Anchor - Vertical And Seismic
(Elev. View) - (Not To Scale)



Deferred Approval Detail
Pending OSHPD Review
And Approval

A-3
SD

- NUSIG / Badger Industries -
Rigid Beam Anchor - Vertical And Seismic
(Elev. View) - (Not To Scale)

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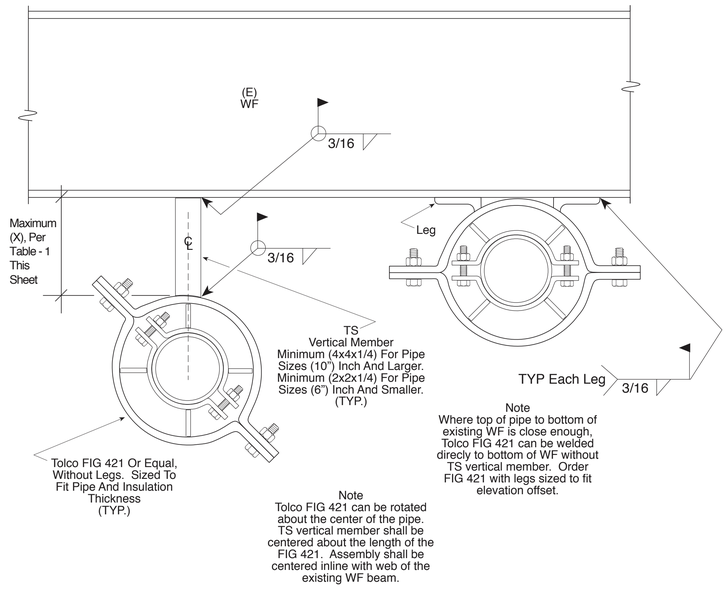

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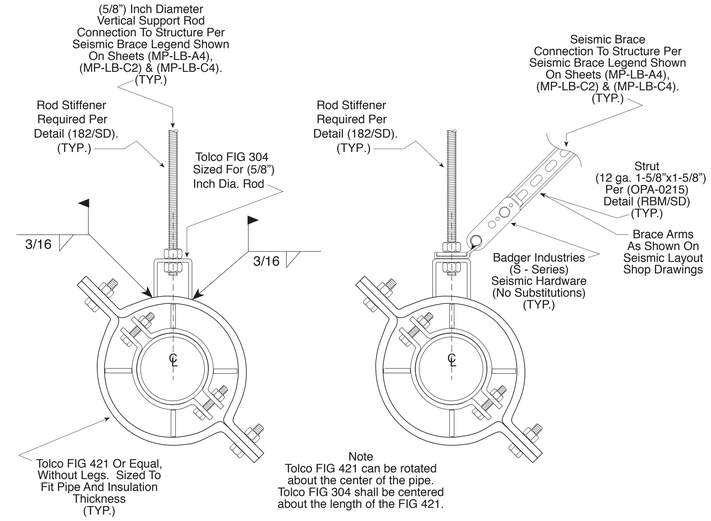
G-1
SD

- NUSIG / Badger Industries -
Rigid Beam Guide - Vertical And Seismic
(Elev. View) - (Not To Scale)



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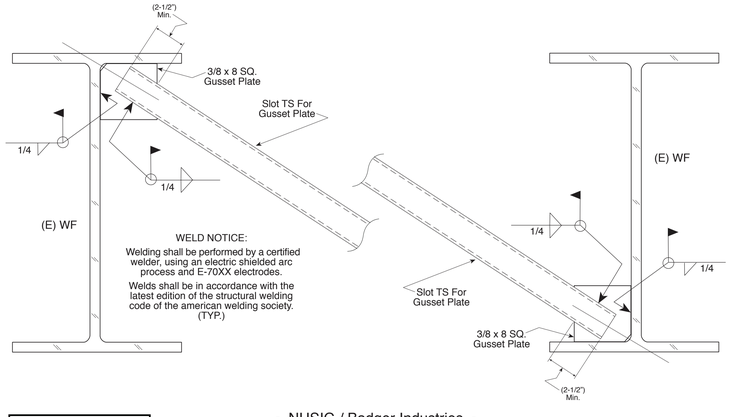
Pending OSHPD Review
And Approval

G-2
SD

- NUSIG / Badger Industries -
Hanger Guide - Vertical And Seismic
(Elev. View) - (Not To Scale)

Table - 1		
(E) WF	Pipe Size	Maximum (X)
W40	16 in.	32 in.
W40	10 in.	36 in.
W40	4 in.	14 in.
W27	16 in.	36 in.
W27	6 in.	36 in.
W27	4 in.	27 in.
W24	16 in.	36 in.
W24	6 in.	36 in.
W24	3 in.	36 in.
W21	16 in.	36 in.
W21	10 in.	36 in.
W21	6 in.	36 in.
W21	4 in.	35 in.
W21	3 in.	36 in.

Installation, Testing and Inspection: Per Engineer of Record and OSHPD Jurisdictional requirements. Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official. Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded, when applicable check beam for torsional loading, weak axis bending, axial loads, etc. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.



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And Approval

K1
SD

- NUSIG / Badger Industries -
Tube Steel Kicker - Steel To Steel
(Elev. View) - (Not To Scale)

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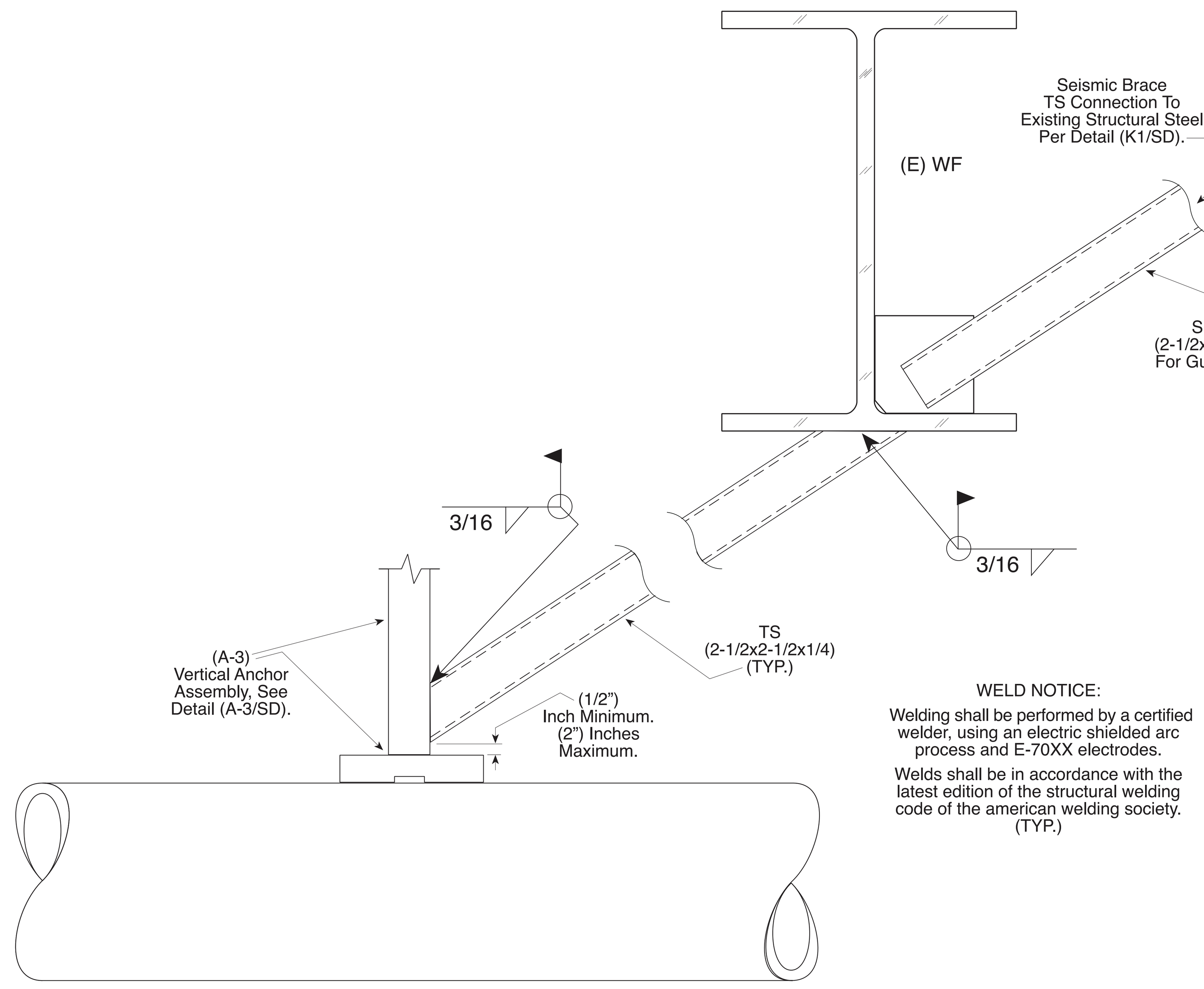

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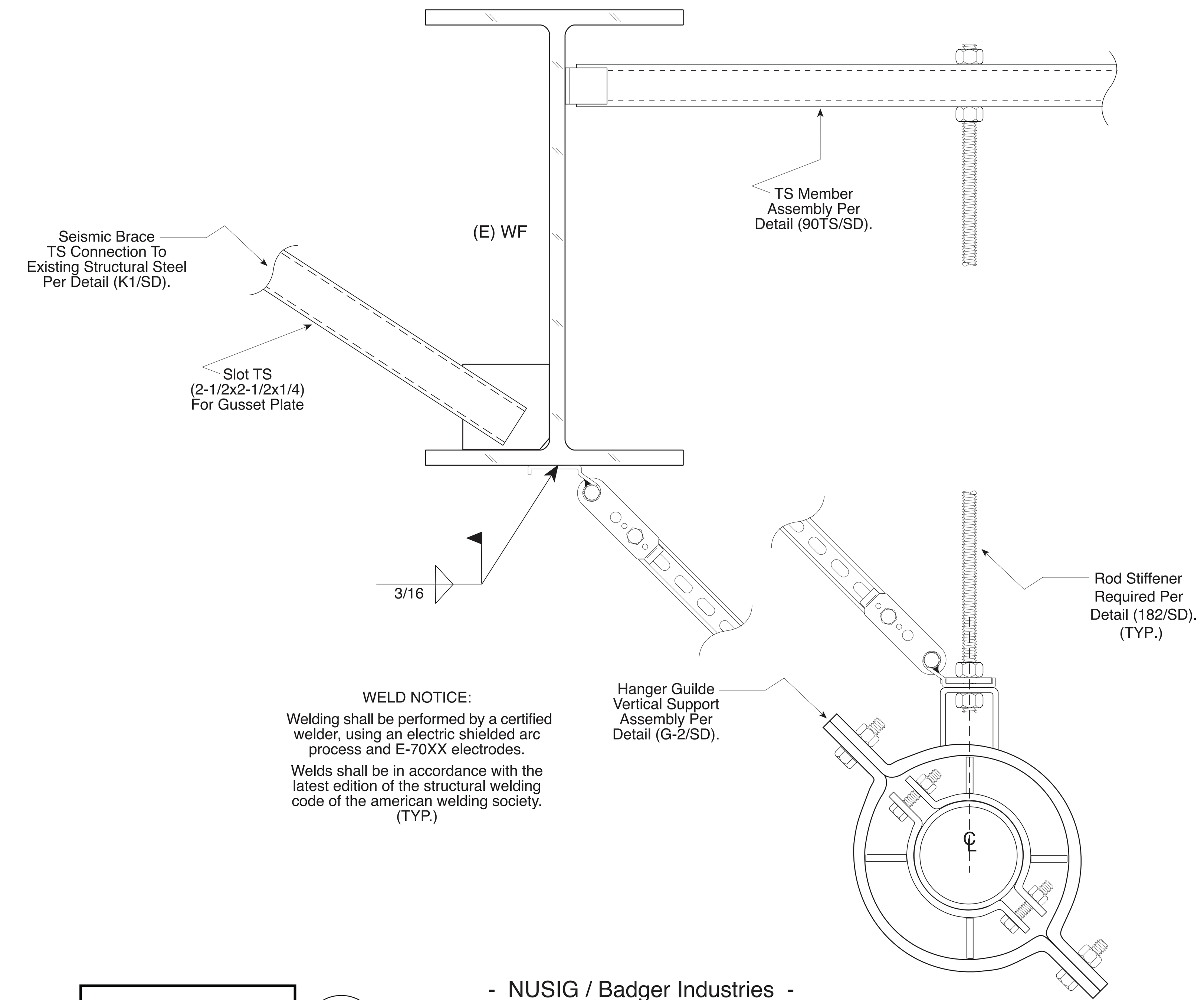
BL8 / SD

- NUSIG / Badger Industries -
Brace Location 8 - Seismic Brace
(Elev. View) - (Not To Scale)



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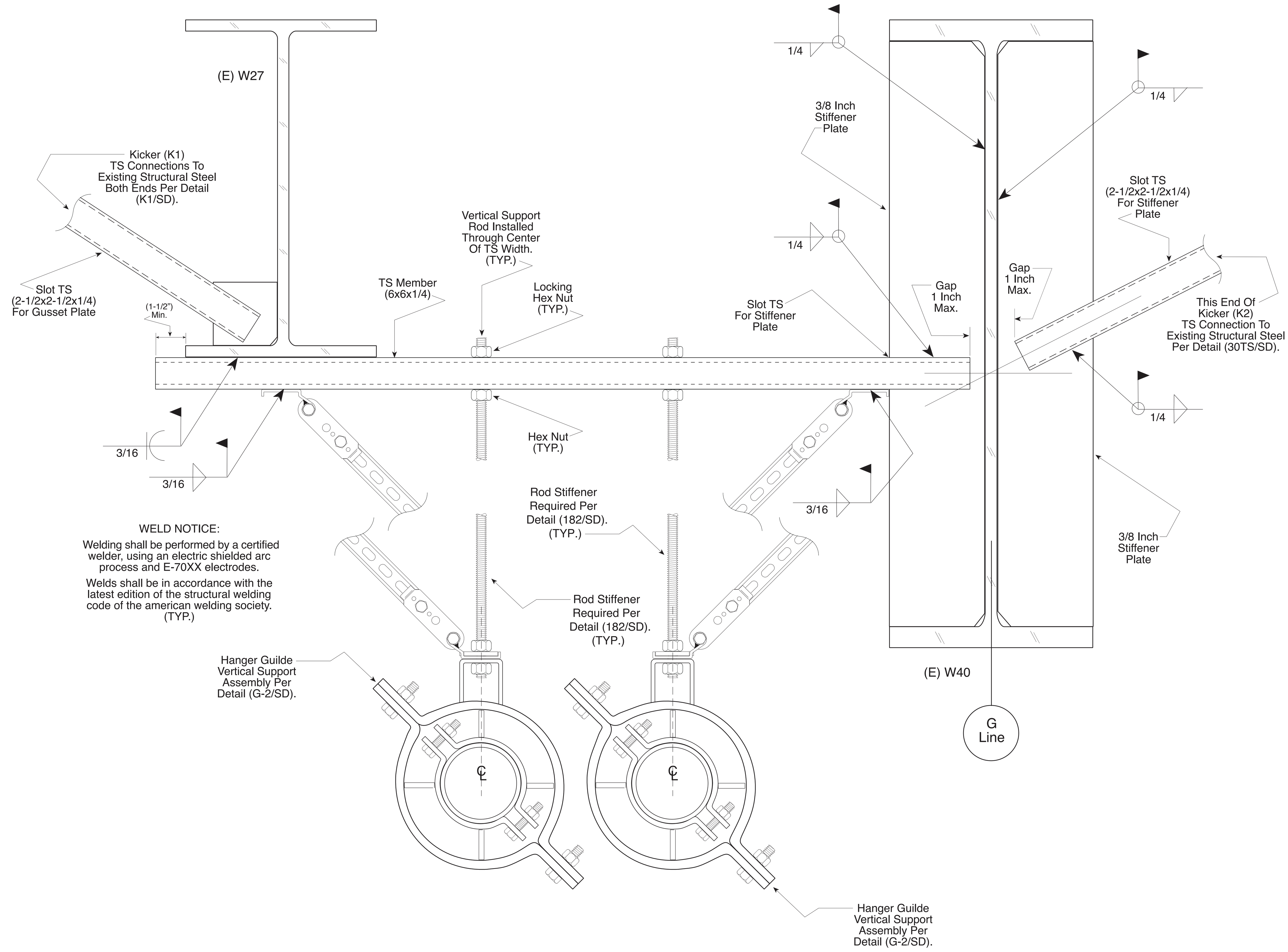
BL61 / SD

- NUSIG / Badger Industries -
Brace Location 61 - Seismic Brace
(Elev. View) - (Not To Scale)



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Pending OSHPD Review
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TS16 / SD

- NUSIG / Badger Industries -
Tube Steel - Support With Seismic Brace
(Elev. View) - (Not To Scale)

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TOLCO
a brand of NIBCO
www.tolco.com
Revision 9/1/2006

Fig. 304 - Weld Beam Attachment
Fig. 305 - Weld Beam Attachment with Pin

Size Range — 3/8" thru 3½" rod
Material — Carbon Steel
Function — Designed for attaching hanger rod to bottom of steel structures. Can be used in an upright (Fig. 304) or inverted position (Fig. 305). When using Fig. 305, attach hanger rod to bolt or pin with a Fig. 330 Weldless Eye Nut or Fig. 101 and Fig. 102 series Eyerods.
Approvals — Conforms to Federal Specification WW-H-171E, Type 22 and Manufacturers Standardization Society SP-69, Type 22.
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order By — Figure number, rod size and finish.

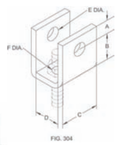


FIG. 304

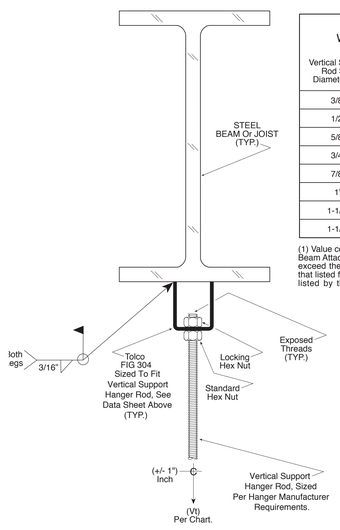
FIG. 305

Dimensions · Weights

Rod Size	A	B	C	D	E	F	Bolt Size	Max. Rec. Load Lbs. 650°F	Max. Rec. Load Lbs. 750°F	304 Approx. Wt./100	305 Approx. Wt./100
3/8	7/8	2	2	1¼	9/16	7/16	1/2 x 2½	610	510	86	107
1/2	7/8	2	2	1¼	11/16	9/16	5/8 x 2½	1130	940	83	118
5/8	1	2	2	1¼	13/16	11/15	3/4 x 2½	1810	1510	84	140
3/4	1⅛	2	2½	1½	15/16	13/16	7/8 x 3	2710	2260	174	261
7/8	1¼	3	2½	2	1⅛	15/16	1 x 4	3770	3150	232	374
1	1½	3	3	2	1¼	1⅛	1¼ x 4½	4960	4150	394	595
1⅛	2	3	4	2½	1⅜	1⅜	1½ x 5¼	8000	6660	738	1026
1¼	2⅛	4	5	3	1⅛	1⅜	1¾ x 6½	11630	9700	1449	1892
1⅜	2⅜	5	5	3⅜	2⅛	1⅞	2 x 7¼	15700	14000	1747	2437
2	3⅛	5	6	3⅝	2⅝	2⅛	2¼ x 7½	20700	18460	2201	3074
2¼	3½	6	6	4½	2⅝	2	2½ x 7¾	27200	24260	2523	3601
2½	3⅝	6	6	4½	2⅛	2⅛	2¾ x 8	33500	29880	2552	3898
*2¾	4	5¼	6	3¾	3¼	—	3 x 7¾	41580	37066	3675	4202
*3	4	6⅛	7	3¾	3⅝	—	3¼ x 7½	50580	45085	3250	5043
*3¼	4½	7	7	4¼	3⅝	—	3½ x 8½	60480	53936	4500	6817
*3½	4½	7½	8	4¼	3⅞	—	3¾ x 8½	71280	63493	5320	7980

Note: Sizes 3/8" thru 1" furnished with machine bolt; sizes 1¼" thru 3½" furnished with pin and cotter.
* Welded Plate.

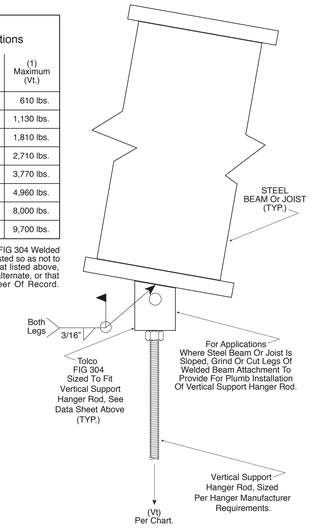
Structural steel shall be A36 or equal. Welding shall be performed by a certified welder, using an electric shielded arc process and E-70XX electrodes. Welds shall be in accordance with the latest edition of the structural welding code of the American Welding Society.



Badger Industries
Welded Hanger Installations

Vertical Support Rod Size Diameter (in.)	Electric Shielded Arc Electrode	(1) Maximum (Vt.)
3/8"	E-70XX	610 lbs.
1/2"	E-70XX	1,130 lbs.
5/8"	E-70XX	1,810 lbs.
3/4"	E-70XX	2,710 lbs.
7/8"	E-70XX	3,770 lbs.
1"	E-70XX	4,960 lbs.
1-1/4"	E-70XX	8,000 lbs.
1-1/2"	E-70XX	9,700 lbs.

(1) Value controlled by capacity of Tolco FIG 304 Welded Beam Attachment part. Value to be adjusted so as not to exceed the capacity of the weaker of that listed above, that listed for a reviewed and accepted alternate, or that listed by the project Structural Engineer Of Record.



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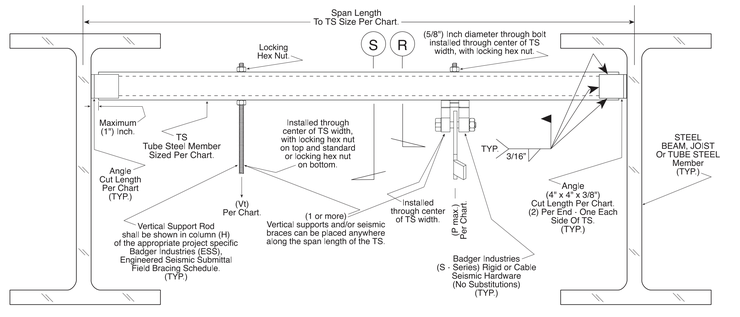
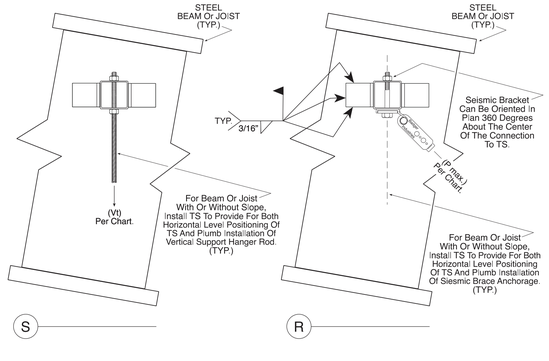
90WH
SD

- NUSIG / Badger Industries -
Welded Hanger Steel Beam Connection - Vertical Support
(Elev. View) - (Not To Scale)

Structural steel shall be A36 or equal. Welding shall be performed by a certified welder, using an electric shielded arc process and E-70XX electrodes. Welds shall be in accordance with the latest edition of the structural welding code of the American Welding Society. TS members and/or angle plates can be plain or painted unless specified otherwise within project specifications.





Badger Industries
Tube Steel Member Chart

TS Tube Steel Size	Span Length (Maximum)	(1) (2) (3) Maximum (Vt.), (P max.) Or Combination	Angle Cut Length
6" x 6" x 1/4"	10 ft.	8,740 lbs.	5 in.

(1) Value to be adjusted so as not to exceed the capacity of the weaker of that listed above, that listed by the project Structural Engineer Of Record.

(2) Value is for a single vertical support, or a single seismic brace, or for the accumulated total of multiple vertical supports, or multiple seismic braces, or for the accumulated total of combinations of single or multiple vertical supports and seismic braces located on the same TS member.

(2) Vertical supports can share the same point of connection with single or multiple seismic braces. Multiple seismic braces can share the same point of connection.

(2) When one or more TS members intersect into another TS member, the loads from intersecting TS members shall be account for and figured into the accumulated total loads when sizing the primary TS member.

(3) Location of individual TS members throughout the building structure shall be as reviewed and accepted by the project structural engineer of record.

(3) When TS member is used for vertical support only applications, TS member can be located anywhere about the depth of the the steel beams or joists.

(3) TS members used for seismic brace (Pmax.) conncections shall be located about the upper (1/3) of the depth of the steel beams or joists.

Deferred Approval Detail Pending OSHPD Review And Approval

90TS
SD

- NUSIG / Badger Industries -
Tube Steel Member - Vertical Support And/Or Seismic Brace
(Elev. View) - (Not To Scale)

NUSIG
BADGER INDUSTRIES
CODE COMPLIANT SEISMIC BRACING SOLUTIONS
(ESS)
ENGINEERED SEISMIC SUBMITTAL

HOHBACH-LEWIN INC.
STRUCTURAL ENGINEERS
260 Sheridan Avenue, Suite 150
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REGISTERED PROFESSIONAL ENGINEER
DANIEL G. LEWIN
STRUCTURAL
STATE OF CALIFORNIA

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DEFERRED APPROVAL
NUSIG / BADGER INDUSTRIES
SEISMIC BRACING DETAILS

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Sheet Number:

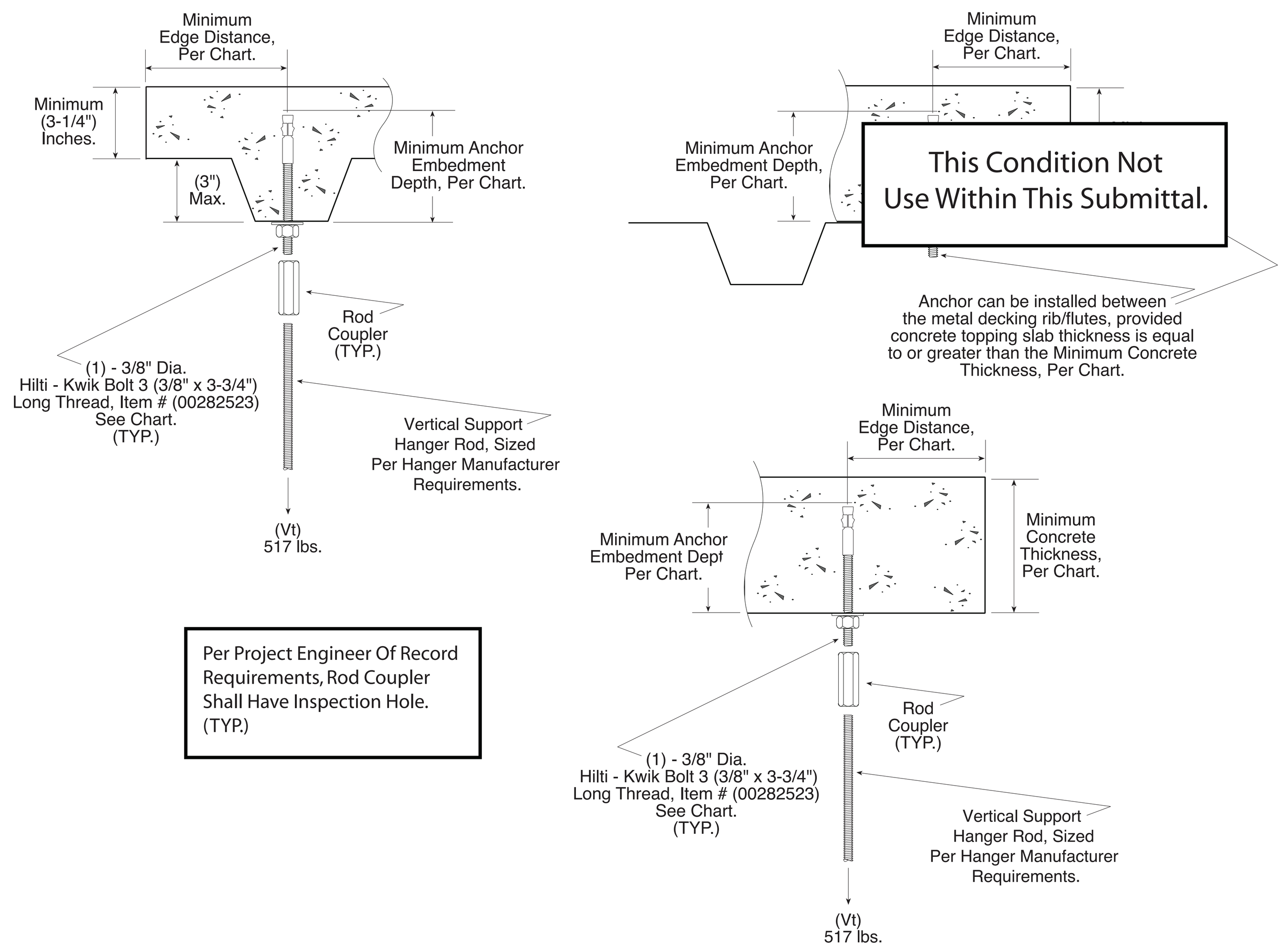
SD.7

Minimum 3,000 psi, Lightweight or Normal Weight Concrete, (Underside) of Slab or Concrete Filled Metal Decking Installations						
Badger Industries Detail (ID. #)	Anchor Installation Torque	Anchor Inspection Code	Minimum Anchor Embedment Depth	Minimum Edge Distance	Minimum Between Anchor Spacing	Minimum Concrete Thickness
(50H / SD)	20 ft./lbs.	E	2-1/2 in.	6-1/2 in.	8 in.	3-3/4 in.

Installation, Testing and Inspection: Per concrete anchor manufacturer (ICBO Evaluation Report), Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Metal decking shall be minimum (20 gauge) steel deck. Anchors that are installed in the underside of the metal decking, shall be installed through the center of the metal decking rib/flute, allowable offset from center shall not exceed (1") inch. Metal decking rib/flute shall have a minimum width of (4-1/2") inches. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.



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Fixed Equipment Anchorage
Office of Statewide Health Planning and Development
OPA-0215
on
Friday, April 08, 2005
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50H / SD

- NUSIG / Badger Industries -
Single Concrete Anchor - Vertical Support

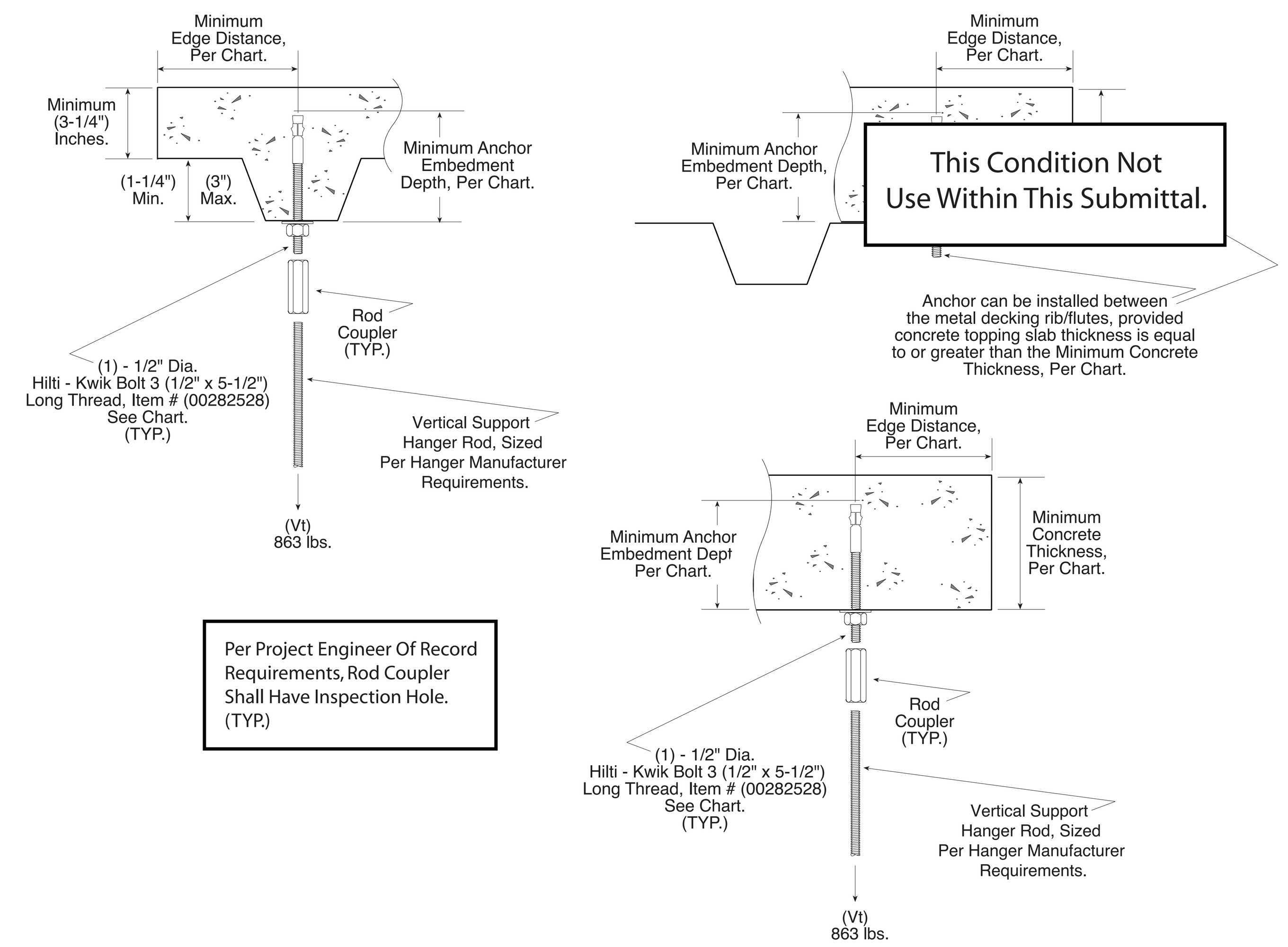
(Elev. View) - (Not To Scale)

Minimum 3,000 psi, Lightweight or Normal Weight Concrete, (Underside) of Slab or Concrete Filled Metal Decking Installations						
Badger Industries Detail (ID. #)	Anchor Installation Torque	Anchor Inspection Code	Minimum Anchor Embedment Depth	Minimum Edge Distance	Minimum Between Anchor Spacing	Minimum Concrete Thickness
(51H / SD)	40 ft./lbs.	I	3-1/2 in.	9 in.	10-1/2 in.	5-1/4 in.

Installation, Testing and Inspection: Per concrete anchor manufacturer (ICBO Evaluation Report), Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Metal decking shall be minimum (20 gauge) steel deck. Anchors that are installed in the underside of the metal decking, shall be installed through the center of the metal decking rib/flute, allowable offset from center shall not exceed (1") inch. Metal decking rib/flute shall have a minimum width of (4-1/2") inches. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.



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51H / SD

- NUSIG / Badger Industries -
Single Concrete Anchor - Vertical Support

(Elev. View) - (Not To Scale)

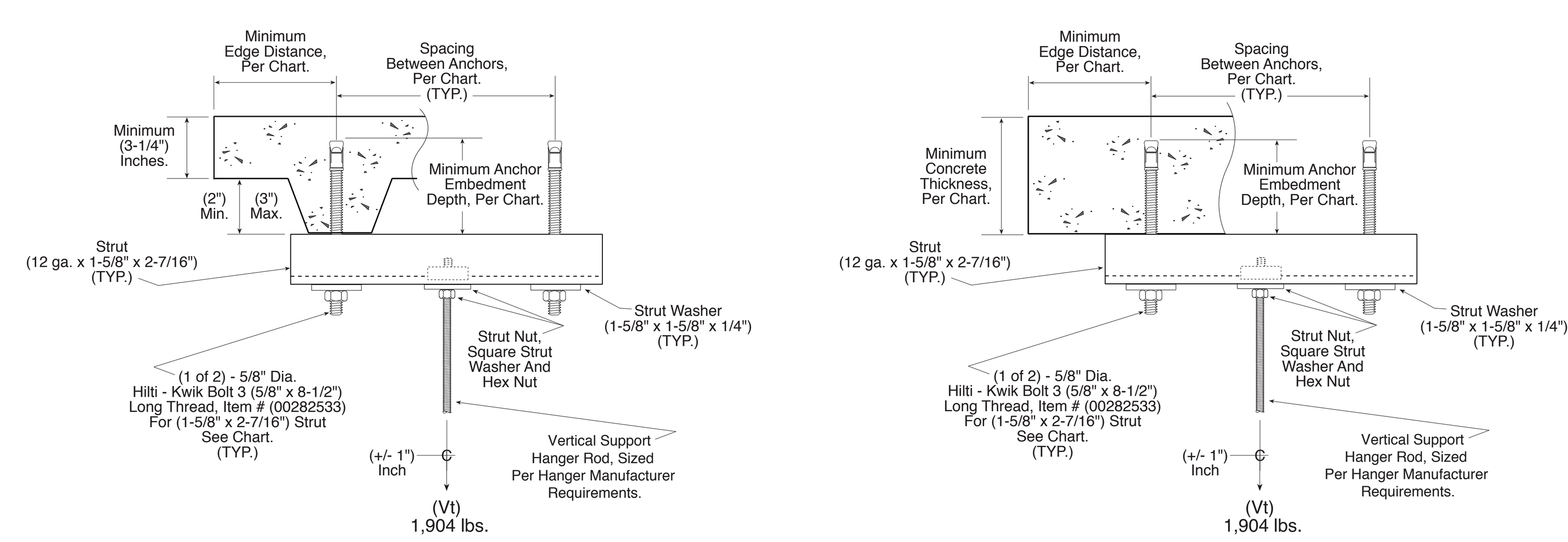
Minimum 3,000 psi, Lightweight or Normal Weight Concrete, (Underside) of Slab or Concrete Filled Metal Decking Installations							
Badger Industries Detail (ID. #)	Anchor Installation Torque	Anchor Inspection Code	Minimum Anchor Embedment Depth	Minimum Edge Distance	Minimum Spacing Between Anchors	Maximum Spacing Between Anchors	Minimum Concrete Thickness
(58H / SD)	85 ft./lbs.	O = 8-1/2 in.	4 in.	11 in.	12 in.	16 in.	7-1/2 in.

Installation, Testing and Inspection: Per concrete anchor manufacturer (ICBO Evaluation Report), Engineer of Record and OSHPD Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Metal decking shall be minimum (20 gauge) steel deck. Anchors that are installed in the underside of the metal decking, shall be installed through the center of the metal decking rib/flute, allowable offset from center shall not exceed (1") inch. Metal decking rib/flute shall have a minimum width of (4-1/2") inches. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.

Vertical support rod shall be located within (1") inch of the center of the anchor group. Double anchor strut assembly can be installed in the same metal decking rib/flute.



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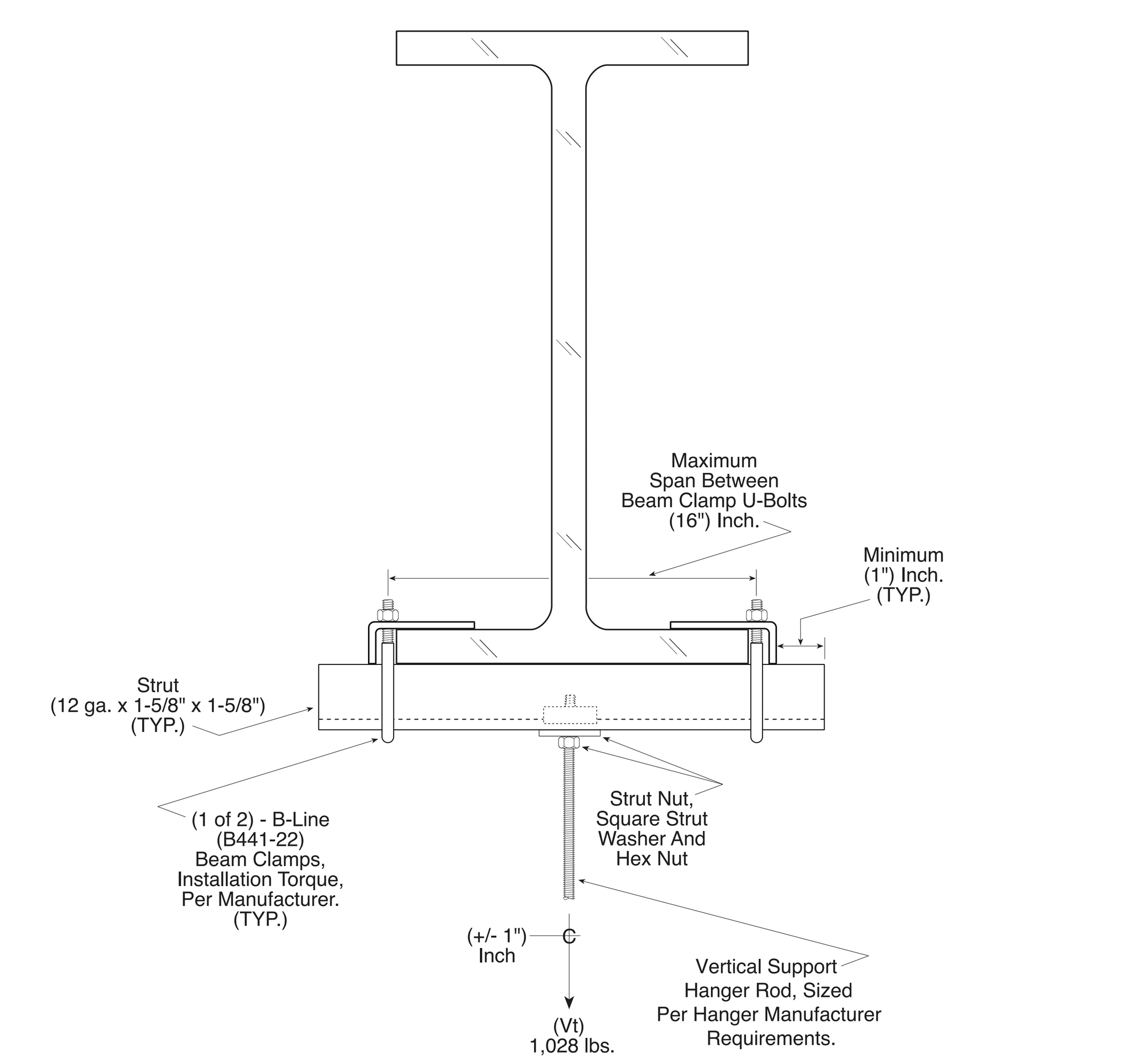
58H / SD

- NUSIG / Badger Industries -
Double Concrete Anchor - Vertical Support

(Elev. View) - (Not To Scale)



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90 / SD

- NUSIG / Badger Industries -
Strut Clamped To Steel Beam - Vertical Support

(Elev. View) - (Not To Scale)

NUSIG
BADGER INDUSTRIES
CODE COMPLIANT SEISMIC BRACING SOLUTIONS
(ESS)
ENGINEERED SEISMIC SUBMITTAL

HOHBACH-LEWIN INC.
STRUCTURAL ENGINEERS
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NUSIG / BADGER INDUSTRIES
SEISMIC BRACING DETAILS

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SD.8

Badger Industries - (S - Series)
(NUSIG - Listed)

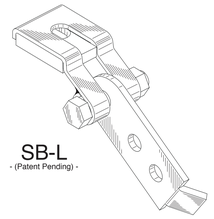
Part Number - (SB-L)
Retrofit - Vibration Resistant - Progressive Locking - Captive Assembly

(P) Maximum for
Badger Industries Part # (SB-L)
seismic hardware bracket when properly connected shall not exceed the values listed below. The values were derived from Independent Lab Testing.

*** (STW-L) - 4,755 Pounds,
when installed on (1) - (3/4", 7/8", 1", 1-1/8" or 1-1/4") diameter ASTM - A36 or equal threaded rod or anchor with a Badger Industries (STW-L) Slotted Tabbed Washer, torqued to (100) foot pounds.

*** When the (SB-L) is connected to the strut using (1) bolt, the (P) Maximum shall not exceed 3,000 pounds.

All of the load(s) shown above represent the service load capacity of the (SB-L) seismic hardware bracket. Note, the service load capacity of the brace member (ie; cable, wire, strut, etc.), the brace to structure connection anchorage or the building structure may be weaker. In all cases the weakest service load capacity of the complete seismic brace assembly/connection shall be the controlling service load capacity. These service load capacities do not include a (1/3) increase for seismic.



SB-L
- (Patent Pending) -

Installation, Testing and Inspection: Per Engineer of Record and Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded.

The Badger Industries (SB-L) Seismic Hardware brackets can be installed as single or as multiple (stacked) units, however, each individual (SB-L) bracket must be installed with a properly sized Badger Industries retrofit (STW-L) slotted tab washer-large. These brackets are pre-bent at the factory to a (35 degree) angle. Brace members shall be attached (+/- 10 degrees) of the pre-bent angle. Installation of strut nuts to the open face of strut requires that the toothed grooves of the strut nut fully engage the internal flanges on each side of the strut. A minimum of (1), (1/2") inch diameter bolt and standard thick strut nuts torqued to (50 ft./lbs.) must be used when attaching the Badger Industries (SB-L) Seismic Hardware bracket to the open face of the strut member. Do not use thin or shallow strut nuts with this assembly. When attaching the Badger Industries (SB-L) bracket to the back side of strut a minimum of (2), (1/2") inch diameter bolts with nuts must be used and properly installed. When connecting cable to the Badger Industries (SB-L) bracket, the pivot arm portion of the (SB-L) bracket shall be removed and the cable shall be looped around the cross-bolt of the (SB-L) bracket.

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OPA-0215
on
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202
SD

- NUSIG / Badger Industries -
Seismic Hardware
(Not To Scale)

Badger Industries - (S - Series)
(NUSIG - Listed)

Part Number - (SB)
Retrofit - Vibration Resistant - Progressive Locking - Captive Assembly

(P) Maximum for
Badger Industries Part # (SB)
seismic hardware bracket when properly connected shall not exceed the values listed below. The values were derived from Independent Lab Testing.

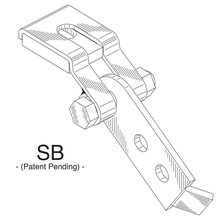
5/8" - 3,180 Pounds,
when installed on (1) - (5/8") diameter ASTM - A36 or equal threaded rod or anchor with a Badger Industries (STW) Slotted Tabbed Washer, torqued to (50) foot pounds.

1/2" - 3,180 Pounds,
when installed on (1) - (1/2") diameter ASTM - A36 or equal threaded rod or anchor with a Badger Industries (STW) Slotted Tabbed Washer, torqued to (50) foot pounds.

3/8" - 2,175 Pounds,
when installed on (1) - (3/8") diameter ASTM - A36 or equal threaded rod or anchor with a Badger Industries (STW) Slotted Tabbed Washer, torqued to (19) foot pounds.

*** When the (SB) is connected to strut using (1) bolt, the (P) Maximum shall not exceed 3,000 pounds.

All of the load(s) shown above represent the service load capacity of the (SB) seismic hardware bracket. Note, the service load capacity of the brace member (ie; cable, wire, strut, etc.), the brace to structure connection anchorage or the building structure may be weaker. In all cases the weakest service load capacity of the complete seismic brace assembly/connection shall be the controlling service load capacity. These service load capacities do not include a (1/3) increase for seismic.



SB
- (Patent Pending) -

Installation, Testing and Inspection: Per Engineer of Record and Jurisdictional requirements.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded.

The Badger Industries (SB) Seismic Hardware brackets can be installed as single or as multiple (stacked) units, however, each individual (SB) bracket must be installed with a properly sized Badger Industries retrofit (STW) slotted tab washer, Badger Industries (SQW) square washer or a (1-5/8" x 1-5/8" x 1/4") inch thick square strut washer. These brackets are pre-bent at the factory to a (35 degree) angle. Brace members shall be attached (+/- 10 degrees) of the pre-bent angle. Installation of strut nuts to the open face of strut requires that the toothed grooves of the strut nut fully engage the internal flanges on each side of the strut. A minimum of (1), (1/2") inch diameter bolt and standard thick strut nuts torqued to (50 ft./lbs.) must be used when attaching the Badger Industries (SB) Seismic Hardware bracket to the open face of the strut member. Do not use thin or shallow strut nuts with this assembly. When attaching the Badger Industries (SB) bracket to the back side of strut a minimum of (2), (1/2") inch diameter bolts with nuts must be used and properly installed. When connecting cable to the Badger Industries (SB) bracket, the pivot arm portion of the (SB) bracket shall be removed and the cable shall be looped around the cross-bolt of the (SB) bracket.

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206
SD

- NUSIG / Badger Industries -
Seismic Hardware
(Not To Scale)

Minimum 3,000 psi, Lightweight or Normal Weight Concrete,
Concrete Filled Metal Decking Installations

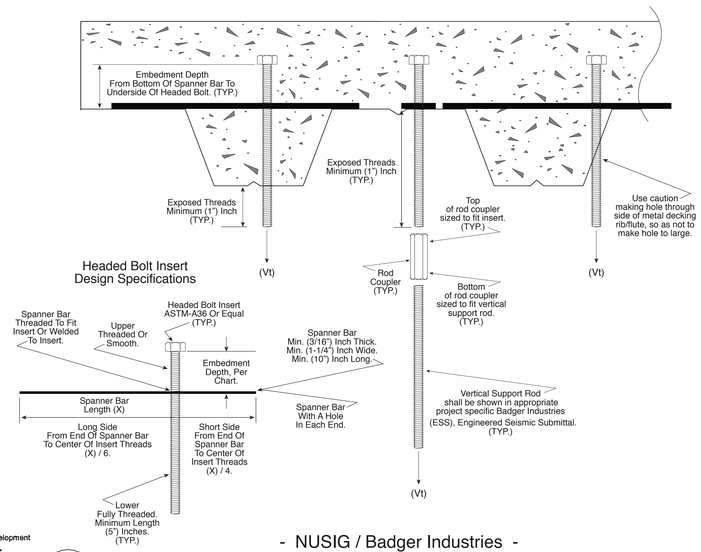
Badger Industries Detail (I.D. #)	Insert Thread Diameter	(Vt) Vertical Tension	Embedment Depth	Minimum Edge Distance	Minimum Between Insert Spacing
(209A / SD)	1/2" Inch	1,340 lbs.	2 in.	3-3/4 in.	7-1/2 in.
(209B / SD)	1/2" Inch	1,600 lbs.	2-1/2 in.	3-3/4 in.	7-1/2 in.
(209C / SD)	5/8" Inch or Larger	1,530 lbs.	2 in.	3-3/4 in.	7-1/2 in.
(209D / SD)	5/8" Inch or Larger	1,740 lbs.	2-1/2 in.	3-3/4 in.	7-1/2 in.

Install through drilled or punched round holes in metal decking, holes shall not be more than (1/16") of an inch larger than the diameter of the selected insert. Recommend that holes be sized to match the measured outside diameter of the insert. Unused holes must be sealed prior to the concrete pour, seal thickness shall be (1/8") of an inch or less. When located through a rib/flute both ends of the insert spanner bar shall rest on the top of the metal decking. Recommend that insert spanner bar be secured to metal decking with a minimum of (1) - (#8 x 3/4") or larger self-drilling screw. The head of the insert must be positioned above the top of the metal decking, inserts can be positioned anywhere across the metal decking provided minimum edge distance and minimum between insert spacings are maintained. The head of the insert shall not be installed down inside the lower rib/flute portions of the metal decking.

Obtain approval from the Engineer of Record prior to using, making alterations to and/or deviations from, the information contained on this page. The (Vt) vertical tension values listed above are based on the capacity of the insert, project/application specific capacity shall be as identified by the project Engineer of Record. Vertical tension capacities can be used for vertical support locations with or without seismic bracing. Conflicts shall be resolved by the Engineer of Record and the Governing Building Official.

Prior to installation consult with the Engineer of Record regarding the intent and acceptability of this connection for each individual application. Caution shall be used when reviewing the usability of this connection singularly or in combination with itself and/or other connections/loads so that the building structure is not over loaded. Acceptability, spacing and coordination requirements shall be as determined by the Engineer of Record.

Insert can be provided by any manufacturer that conforms to the insert design specifications identified on this page. Maximum deviation from plumb shall not exceed (1° in 12"). Inserts shall not be bent.



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209
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- NUSIG / Badger Industries -
Concrete Filled Metal Decking (Headed Bolt) Insert - Vertical Support
(Elev. View) - (Not To Scale)

NUSIG
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ENGINEERED SEISMIC SUBMITTAL

HOHBACH-LEWIN INC.
STRUCTURAL ENGINEERS
260 Sheridan Avenue, Suite 150
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SEISMIC BRACING DETAILS

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