All structural details for the installation of this roll-up gate must be incorporated into the plans and stamped by the Engineer of record not just as a part of this calculation documents.

KG consultants

5816 SW Gillcrest ct
Portland, OR 97221
Ph: 503.896.7712

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

Project:

UPS ROLL UP GATE

Location

4227 S MERIDIAN STE, PUYALLUP, WA 98373

PERMIT SUBMITTAL

PRCTI20220017

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

KG consultants
5816 SW Gillcrest ct
Portland, OR 97221
Ph: 503.896.7712

SKETCH

KG consultants
5816 SW Gillcrest Ct.
Portland, OR 97221
Tel: 503.896.7712

Project:
Location:
Client:
Date: By:

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Development & Permitting Services
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Building | Planning
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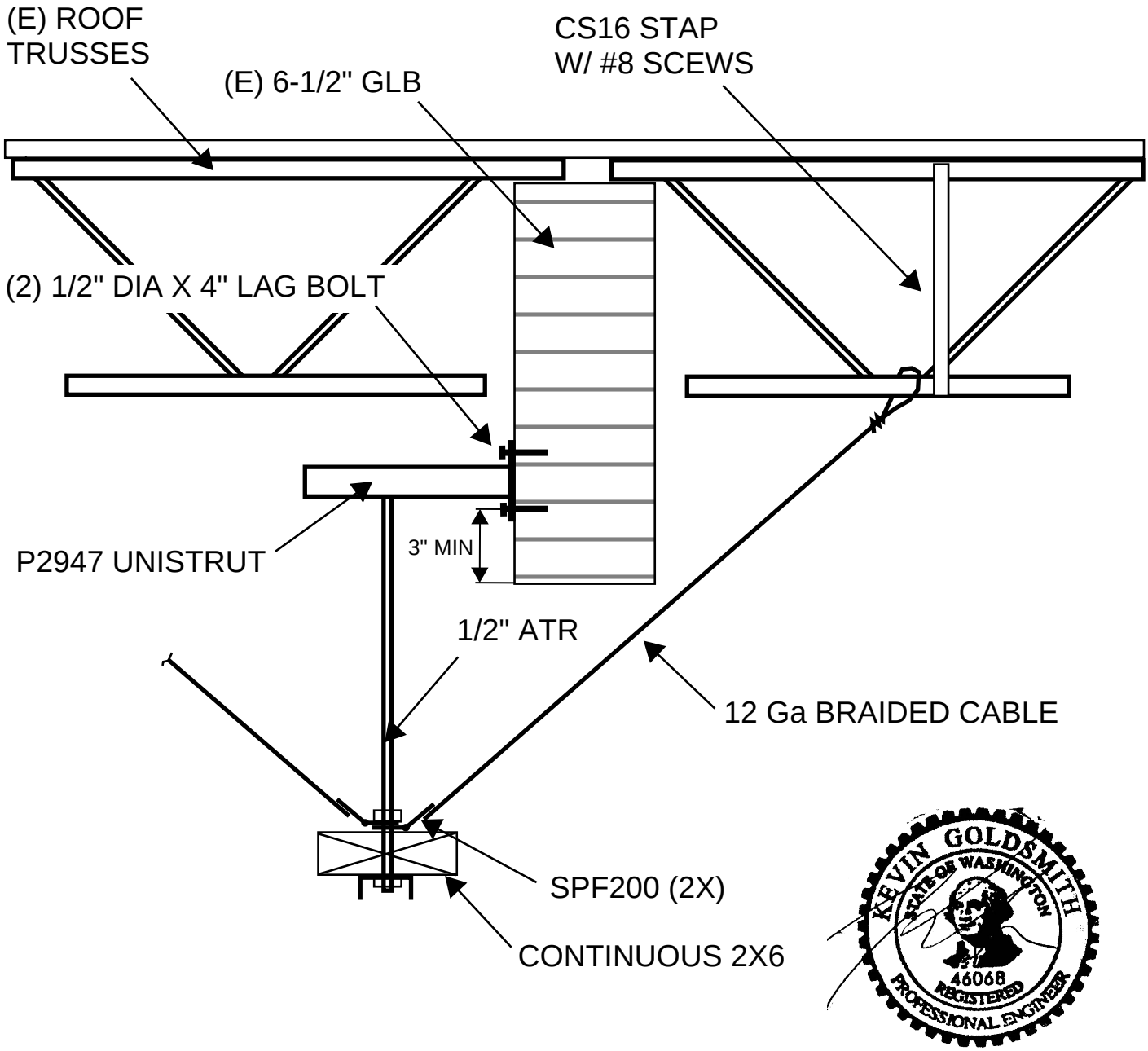
Fire | Traffic

Sheet #
Job #



KEVIN GOLDSMITH
STATE OF WASHINGTON
46068
REGISTERED
PROFESSIONAL ENGINEER

GATE TOP RESTRAINT SUPPORT

INSTALL 24" OC

KG consultants
5816 SW Gillcrest ct
Portland, OR 97221
Ph: 503.896.7712

CALCULATIONS

KG consultants
5816 SW Gillcrest Ct.
Portland, OR 97221
Tel: 503.896.7712

Project:
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PROJECT INFORMATION

UPS GATE SUPPORT

ADDRESS: 4227 S MERIDIAN STE
PUYALLUP, WA 98373

SEISMIC: S_{ds} = 1.008 I = 1.0

CODE IBC 2018

Hazards by Location

Search Information

Address: 4227 S Meridian, Puyallup, WA 98373, USA

Coordinates: 47.1515005, -122.2923182

Elevation: 442 ft

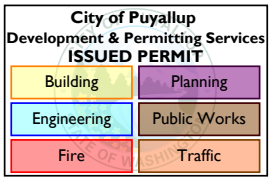
Timestamp: 2022-01-14T22:22:29.330Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D-default



Basic Parameters

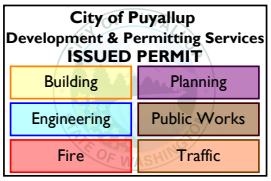
Name	Value	Description
S_S	1.26	MCE_R ground motion (period=0.2s)
S_1	0.435	MCE_R ground motion (period=1.0s)
S_{MS}	1.512	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.008	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.914	Coefficient of risk (0.2s)
CR_1	0.898	Coefficient of risk (1.0s)
PGA	0.5	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.6	Site modified peak ground acceleration

7



T_L	6	Long-period transition period (s)
SsRT	1.26	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.379	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.435	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.484	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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KG consultants
5816 SW Gillcrest Ct.
Portland, OR 97221
Tel: 503.896.7712

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GATE INFO

TYPICAL DOOR WT ≈ 184# (use 200#)

LATERAL RESTRAINT @ TOP

AL GRATE DOOR $a_p = 2\frac{1}{2}$, $R_p \sim 3\frac{1}{2}$

$$F_p = \frac{0.4(1)(2.5)(1.008)\,wt\left(1+2\frac{8}{H}\right)}{3\frac{1}{2}} \simeq 0.29\,wt$$

$wt \sim 200^{\#} \therefore F_p \simeq 60^{\#}$

$F_V = 0.2(1.008)(1)(200^{\#}) \simeq 40^{\#}$

$\therefore R = [(60)^2 + (40)^2]^{\frac{1}{2}}$

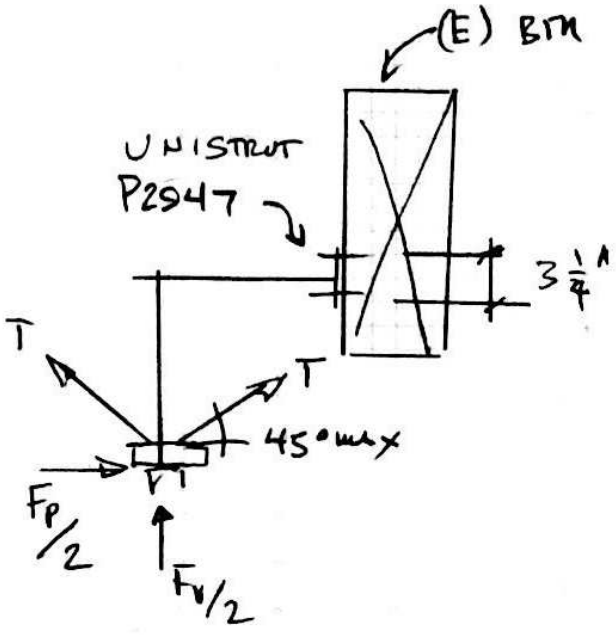
$\simeq 72^{\#}$

@ 45° BRACE WIRE

$60^{\#}/\cos 45° = 85^{\#}$

MAX THRUST TO ROD / STRUT

$F_V = 40^{\#}$



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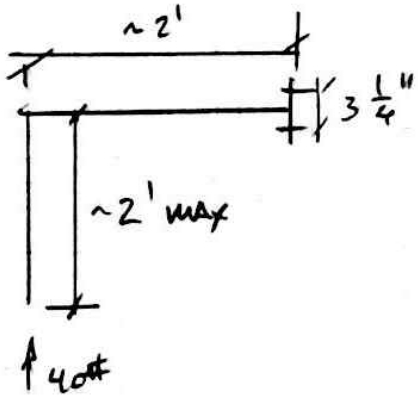
GATE RESTRAINT (CONT)

THRUST (F_V) TO STRT / BRKT

$F_V = 40^{\#}$



CHECK ATR

½Ø $I = \frac{\pi r^4}{4} = 0.003\ in^4$

$F = \frac{\pi^2 E I}{L^2}$

$\frac{\pi^2 \times 29\times10^6\ psi\ (0.003\ in^4)}{(24")^2} \cong 1400^{\#}$ OK

M @ BEAM $\Rightarrow$ $40^{\#} \times 24" = 960"lbs$

$T_C \approx \frac{M}{3.25} \cong 300^{\#}$

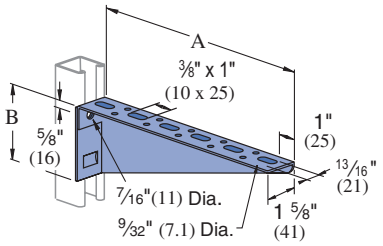
W ½Ø LAG BOLT = $367^{\#}/in$

$C_d = 1.6$ ∴ $587^{\#}/in$ USE ½" × 4" LAG OK

KG consultants
5816 SW Gillcrest ct
Portland, OR 97221
Ph: 503.896.7712

REFERENCE

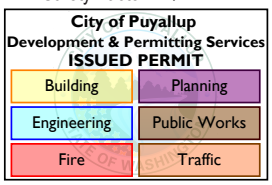
P2494 R-L THRU P2499 R-L



Material : 12 Gauge Steel.
R - As shown; L - Opposite hand

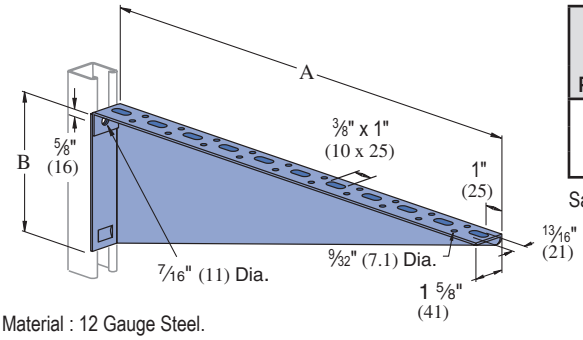
Vertical Channel		Uniform Design Load
Part No.	Gauge	Lbs *(kN)*
P1000	12	300 *(1.33)*
P1100	14	250 *(1.11)*
P2000	16	200 *(.89)*

Safety Factor - 2½



Part Number	Stamped Ident. No.	"A" In *(mm)*	"B" In *(mm)*	Wt/100 pcs Lbs *(kg)*
P2494 R-L	121895 R-L	12 *305*	3 7/16 *87*	152 *68.9*
P2495 R-L	121896 R-L	14 *356*	3 15/16 *100*	173 *78.5*
P2496 R-L	121897 R-L	16 *406*	4 7/16 *113*	223 *101.2*
P2497 R-L	121898 R-L	18 *457*	4 15/16 *125*	266 *120.7*
P2498 R-L	121899 R-L	20 *508*	5 7/16 *138*	308 *139.7*
P2499 R-L	121900 R-L	22 *559*	5 15/16 *151*	355 *161.0*

P2500 R-L THRU P2503 R-L



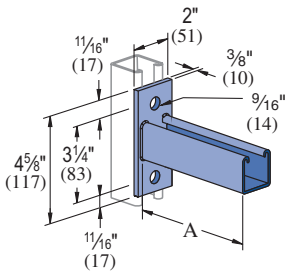
Material : 12 Gauge Steel.
R - As shown; L - Opposite hand

Vertical Channel		Uniform Design Load
Part No.	Gauge	Lbs *(kN)*
P1000	12	300 *(1.33)*
P1100	14	250 *(1.11)*
P2000	16	200 *(.89)*

Safety Factor - 2½

Part Number	Stamped Ident. No.	"A" In *(mm)*	"B" In *(mm)*	Wt/100 pcs Lbs *(kg)*
P2500 R-L	121901 R-L	24 *610*	6 7/16 *164*	400 *181.4*
P2501 R-L	121902 R-L	26 *660*	6 15/16 *176*	445 *201.8*
P2502 R-L	121903 R-L	28 *711*	7 7/16 *189*	493 *223.6*
P2503 R-L	121904 R-L	30 *762*	7 15/16 *202*	545 *247.2*

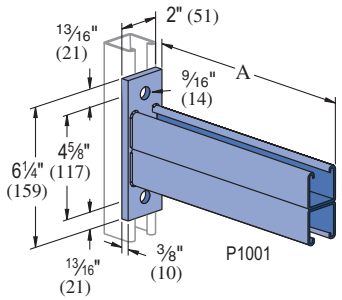
P2944, P2945, P2946, P2947



Part Number	"A" In *(mm)*	Wt/100 pcs Lbs *(kg)*	Uniform Load* Lbs *(kN)*
P2944	6 *152*	185 *84*	1200 *5.34*
P2945	12 *305*	293 *133*	600 *2.67*
P2946	18 *457*	401 *182*	400 *1.78*
P2947	24 *610*	509 *231*	300 *1.33*

Safety Factor 2½
* Mounted on 12 Ga. Channel

P2542 THRU P2546

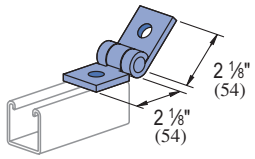


Safety Factor - 2½

Part Number	"A" In *(mm)*	Wt/100 pcs Lbs *(kg)*	Vertical Channel Part No.	Vertical Channel Gauge	Uniform Design Load Lbs *(kN)*
P2542	12 *305*	502 *228*	P1000 P1100 P2000	12 14 16	2,000 *(8.90)* 1,400 *(6.23)* 1,000 *(4.45)*
P2543	18 *457*	692 *314*	P1000 P1100 P2000	12 14 16	1,300 *(5.78)* 900 *(4.00)* 650 *(2.89)*
P2544	24 *610*	882 *400*	P1000 P1100 P2000	12 14 16	1,000 *(4.45)* 700 *(3.11)* 500 *(2.22)*
P2545	30 *762*	1,072 *486*	P1000 P1100 P2000	12 14 16	800 *(3.56)* 560 *(2.49)* 400 *(1.78)*
P2546	36 *914*	1,262 *572*	P1000 P1100 P2000	12 14 16	650 *(2.89)* 450 *(2.00)* 320 *(1.42)*

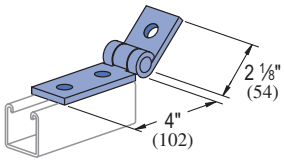
Standard Dimensions for 1⅝" (41mm) width series channel fittings *(Unless Otherwise Shown on Drawing)*
Hole Diameter: 9/16" (14mm); Hole Spacing - From End: 13/16" (21mm); Hole Spacing - On Center: 1⅞" (48mm); Width: 1⅝"(41mm); Thickness: ¼" (6mm)
Note : When used for mechanical supports, load capacities of brackets and fittings should be in compliance with the American Standard Code for Pressure Piping.

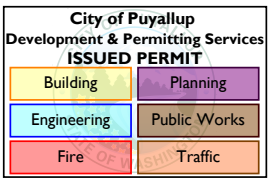
P1843 Adj. Hinge Connection



Wt/100 pcs: 68 Lbs (30.8 kg)

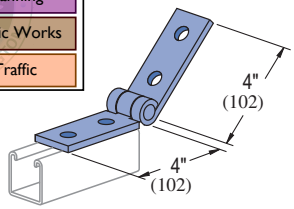
P1354A Adj. Hinge Connection





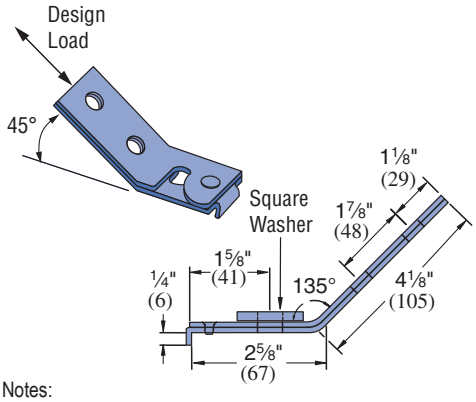
Wt/100 pcs: 89 Lbs (40.4 kg)

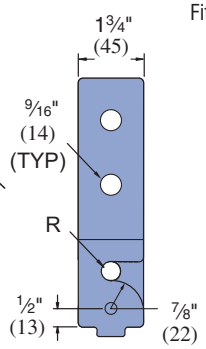
P1354 Adj. Hinge Connection

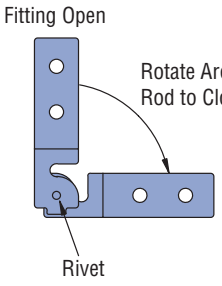


Wt/100 pcs: 109 Lbs (49.4 kg)

SPF® 100 Seismic Pivot Fittings





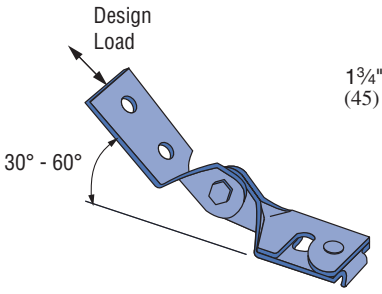


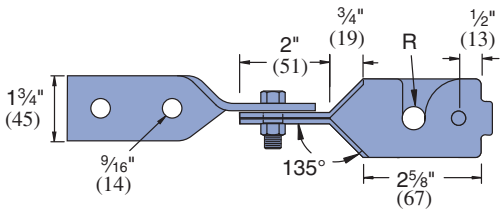
Part Number	Rod Size In *(mm)*	"R" - Hole Diameter In *(mm)*	Design Load Lbs *(KN)*
SPF 100-037	⅜ *10*	7/16 *11*	1,400 *6.23*
SPF 100-050	½ *13*	9/16 *14*	2,100 *9.34*
SPF 100-062	⅝ *16*	11/16 *18*	2,100 *9.34*
SPF 100-075	¾ *19*	13/16 *21*	2,400 *10.68*

Safety Factor = 3.0
FINISH
Electro-galvanized (EG), conforming to ASTM B633 Type III SC1.

Notes:
1. Design load is limited to slip capacity of a channel nut at hole "R".
2. Allowable loads have been determined by the manufacturers testing, analysis and technical specifications.
3. For retrofit application, engineer of record must verify.
4. Patented.
5. Square washer provided with fitting.
6. When a hanger rod is thru-bolted (in lieu of channel nut installation), higher transverse loads may be transmitted due to the higher allowed rod shear loads compared to channel nut slip values. This higher load may be used with verification through engineering calculations.

SPF® 200 Adjustable Seismic Pivot Fittings





FINISH
Electro-galvanized (EG), conforming to ASTM B633 Type III SC1.

Part Number	Rod Size In *(mm)*	"R" - Hole Diameter In *(mm)*	Design Load Lbs *(KN)*
SPF 200-037	⅜ *10*	7/16 *11*	1,400 *6.23*
SPF 200-050	½ *13*	9/16 *14*	2,100 *9.34*
SPF 200-062	⅝ *16*	11/16 *18*	2,100 *9.34*
SPF 200-075	¾ *19*	13/16 *21*	2,400 *10.68*

Safety Factor = 3.0

Notes:
1. Design load is limited to slip capacity of a channel nut at hole "R"..
2. Allowable loads have been determined by the manufacturers testing, analysis and technical specifications at 45° from horizontal.
3. For retrofit application, engineer of record must verify.
4. Patented.
5. Square washer provided with fitting.
6. When a hanger rod is thru-bolted (in lieu of channel nut installation), higher transverse loads may be transmitted due to the higher allowed rod shear loads compared to channel nut slip values. This higher load may be used with verification through engineering calculations.