

# TOLBrace™ Seismic Bracing Calculations

**Project Address:** UNITED MOVING  
1740 FUSON ROAD  
BREMERTON, WA 98311  
Job # 11-2193

**Contractor:** Patriot Fire Protection  
**Address:** 2707 70th Ave E  
Tacoma, WA 98424  
**Phone:** 253.926.2290  
**License:** PATRIFP099CF



Calculations based on 2013 NFPA Pamphlet #13

Brace Information	TOLCO™ Brace Components		
<b>Maximum Brace Length</b> <u>7' 0" (2.134 m)</u> <b>Diameter of Brace</b> <u>1" Sch.40</u> <b>Type of Brace</b> <u>Sch. 10</u> <b>Angle of Brace</b> <u>45° Min.</u> <b>Least Rad. of Gyration</b> <u>0.42" (11 mm)</u> <b>L/R Value</b> <u>200</u> <b>Max Horizontal Load</b> <u>1310 lbs (594 kg)</u>	<b>TOLCO™ Component</b>	<b>Listed Load</b>	<b>Adjusted Load</b>
	Fig. 1001 Clamp	2015 lbs (914 kg)	1425 lbs (646 kg)
	Fig.980 Universal Swivel	2015 lbs (914 kg)	1425 lbs (646 kg)
	Fig.828 Across Beam	2015 lbs (914 kg)	1425 lbs (646 kg)
	*Calculation Based on CONCENTRIC Loading *Please Note: These calculations are for TOLCO™ components only. Use of any other components voids these calculations and the listing of the assembly.		
	<b>Seismic Brace Assembly Detail</b>		
	<b>Brace Identification on Plans</b> 4" LATERAL		
	<b>Brace Type</b>	Lateral [X]	Longitudinal [ ]    4-Way [ ]

Fastener Information	
<b>Orientation to Connecting Surface</b>	<u>NFPA Type B</u>
<b>Fastener</b>	
<b>Type</b>	<u>Fig.828 Across Beam</u>
<b>Diameter</b>	<u>N/A</u>
<b>Length</b>	<u>N/A</u>
<b>Maximum Load</b>	<u>1425 lbs (646 kg)</u>
<b>Prying Factor</b>	<u>N/A</u>

Sprinkler System Load Calculation (Fpw = CpWp)					
Cp = <u>0.655</u>					
Diameter	Type	Length	Total Length	Weight Per Unit Length	Total Weight
4" (100 mm)	Sch. 10	24.08 ft (7.3 m)	24.08 ft (7.3 m)	11.78 lb/ft (17.53 kg/m)	284 lbs (129 kg)
2" (50 mm)	Sch. 10	183 ft (55.8 m)	183 ft (55.8 m)	4.22 lb/ft (6.28 kg/m)	772 lbs (350 kg)
Subtotal Weight					1056 lbs (479 kg)
Wp (incl. 15%)					1214 lbs (551 kg)
<b>Main Size</b> 4"	<b>Type/Sch.</b> Sch. 10	<b>Spacing (ft)</b> 24.08	<b>Total (Fpw)</b>		795 lbs (361 kg)
<b>Maximum Fpw per 9.3.5.5.2 (if applicable)</b>					1307 lb (592 kg)

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Brace Identification	4" LATERAL
Brace Type (Per NFPA#13)	NFPA Type B
Braced Pipe (ft)	4" Sch.10 Steel Pipe
Spacing of Brace	24' 1.2" (7.34 m)
Orientation of Brace	Lateral
Bracing Material	1" Sch.40
Maximum Brace Length	7' 0" (2.13 m)
Slenderness Ratio used for Load Calculation	200
True Angle of Brace for Calculation	45°
Type of Fastener	Fig.828 Across Beam
Length of Fastener	N/A

## Summary of Pipe within Zone of Influence

4" Sch.10 Steel Pipe (101.6 mm)	24.08 ft (7.3 m)
2" Sch.10 Steel Pipe (50.8 mm)	183 ft (55.8 m)

G-Factor Used 0.655

Allowance for Heads and Fittings 15%

## Conclusions

Total Adjusted Load of Pipe in Zone of Influence	795 lbs (361 kg)
Material Capacity	1310 lbs (594 kg)
Fastener Capacity	1425 lbs (646 kg)
Fig. 1001 Clamp	1425 lbs (646 kg)
Fig.980 Universal Swivel	1425 lbs (646 kg)
Structural Member	STRUCTURAL MAIN FRAME

Calculations prepared by RON SHEARER

\* The description of the Structural Member is for informational purposes only.  
TOLBrace™ software calculates the brace assembly only, not the structure it is attached to.  
Calculated with TOLBrace™ 8  
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**Permit Number: 19-04603**

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Calculations based on 2013 NFPA Pamphlet #13

Brace Information	TOLCO™ Brace Components		
<b>Maximum Brace Length</b> <u>7' 0" (2.134 m)</u> <b>Diameter of Brace</b> <u>1" Sch.40</u> <b>Type of Brace</b> <u>Sch. 10</u> <b>Angle of Brace</b> <u>45° Min.</u> <b>Least Rad. of Gyration</b> <u>0.42" (11 mm)</u> <b>L/R Value</b> <u>200</u> <b>Max Horizontal Load</b> <u>1310 lbs (594 kg)</u>	<b>TOLCO™ Component</b>	<b>Listed Load</b>	<b>Adjusted Load</b>
	Fig. 4L Clamp	2015 lbs (914 kg)	1425 lbs (646 kg)
	Fig.980 Universal Swivel	2015 lbs (914 kg)	1425 lbs (646 kg)
	Fig.828 Across Beam	2015 lbs (914 kg)	1425 lbs (646 kg)
	*Calculation Based on CONCENTRIC Loading *Please Note: These calculations are for TOLCO™ components only. Use of any other components voids these calculations and the listing of the assembly.		
	<b>Seismic Brace Assembly Detail</b>		
	<b>Brace Identification on Plans</b> 4" LONGITUDINAL		
	<b>Brace Type</b> Lateral [ <input type="checkbox"/> ]    Longitudinal [X]    4-Way [ <input type="checkbox"/> ]		
<b>Fastener Information</b> <b>Orientation to Connecting Surface</b> <u>NFPA Type B</u> <b>Fastener</b> <b>Type</b> <u>Fig.828 Across Beam</u> <b>Diameter</b> <u>N/A</u> <b>Length</b> <u>N/A</u> <b>Maximum Load</b> <u>1425 lbs (646 kg)</u>  <b>Prying Factor</b> <u>N/A</u>			

Sprinkler System Load Calculation (Fpw = CpWp)					
Cp = <u>0.655</u>					
Diameter	Type	Length	Total Length	Weight Per Unit Length	Total Weight
4" (100 mm)	Sch. 10	72.25 ft (22 m)	72.25 ft (22 m)	11.78 lb/ft (17.53 kg/m)	851 lbs (386 kg)
Subtotal Weight					851 lbs (386 kg)
Wp (incl. 15%)					979 lbs (444 kg)
Main Size 4"	Type/Sch. Sch. 10	Spacing (ft) 72.25	Total (Fpw)		641 lbs (291 kg)
Maximum Fpw per 9.3.5.5.2 (if applicable)					N/A

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Brace Identification	4" LONGITUDINAL
Brace Type (Per NFPA#13)	NFPA Type B
Braced Pipe (ft)	4" Sch.10 Steel Pipe
Spacing of Brace	72' 2.4" (22.02 m)
Orientation of Brace	Longitudinal
Bracing Material	1" Sch.40
Maximum Brace Length	7' 0" (2.13 m)
Slenderness Ratio used for Load Calculation	200
True Angle of Brace for Calculation	45°
Type of Fastener	Fig.828 Across Beam
Length of Fastener	N/A

**Reviewed for Code Compliance**  
**Kitsap County Building/ Fire Marshals**  
**11/17/2020 2:29:26 PM kwlodarchak**

## Summary of Pipe within Zone of Influence

4" Sch.10 Steel Pipe (101.6 mm)	72.25 ft (22 m)

G-Factor Used 0.655

Allowance for Heads and Fittings 15%

### Conclusions

Total Adjusted Load of Pipe in Zone of Influence	641 lbs (291 kg)
Material Capacity	1310 lbs (594 kg)
Fastener Capacity	1425 lbs (646 kg)
Fig. 4L Clamp	1425 lbs (646 kg)
Fig.980 Universal Swivel	1425 lbs (646 kg)
Structural Member	STRUCTURAL MAIN FRAME

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