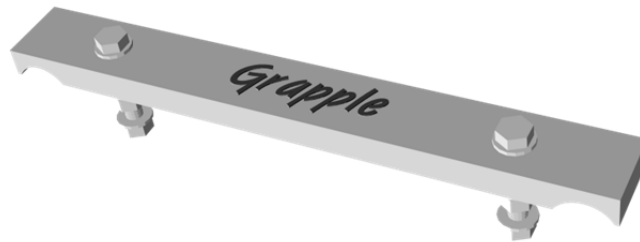


The Grapple™



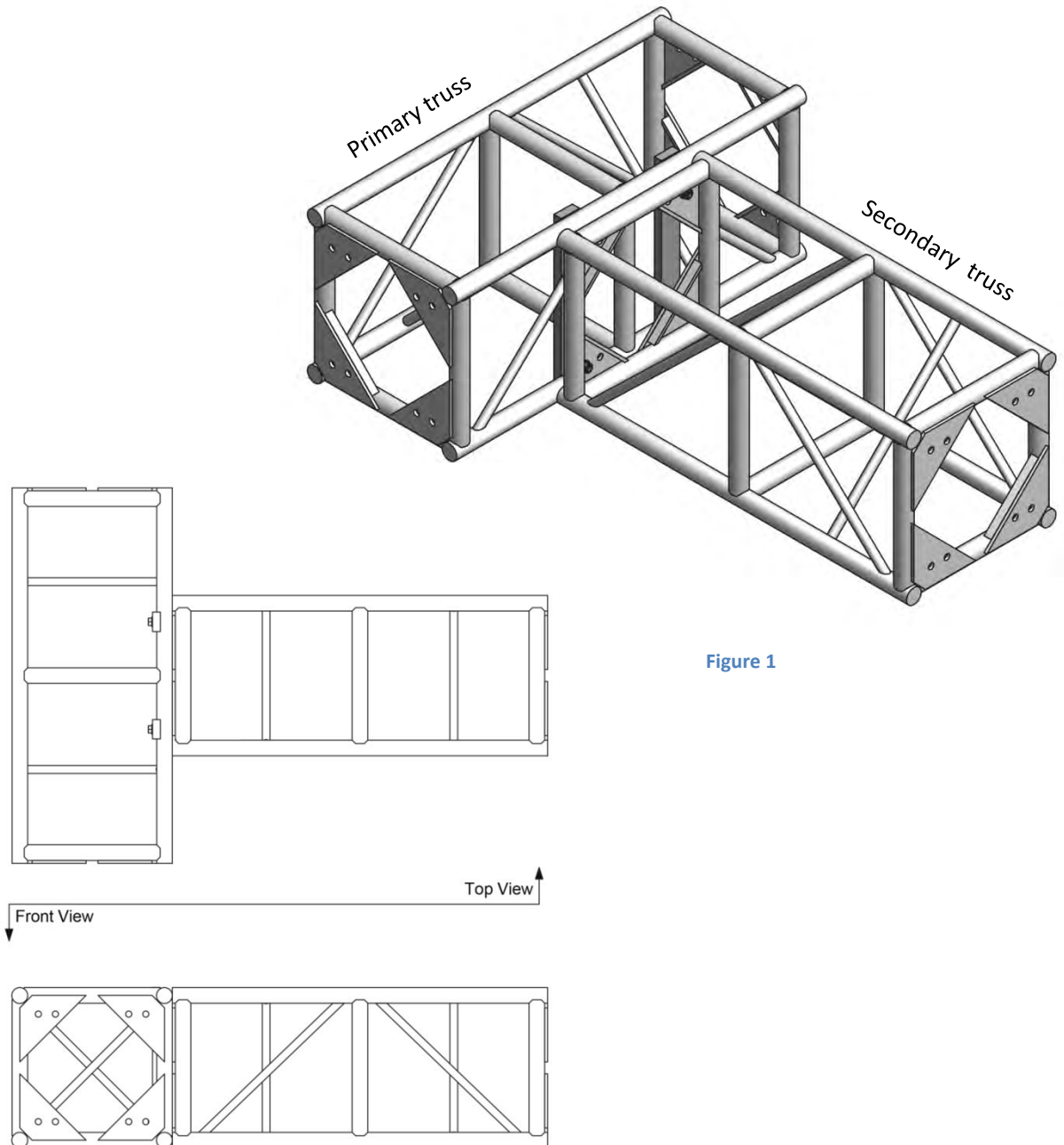
Application Guide

Revised: 6 November 2014

Grapple Application Guide

The Grapple allows you to make inline 90 degree connections between similar trusses anywhere along a perpendicular primary truss. The load capacity of the inline, secondary truss will be 75 percent of the manufacturer's load rating. The primary truss must have point load calculations taken into consideration. The secondary trusses must be supported at both ends. Cantilevering of truss is not recommended.

Grapples are designed to join trusses in the manner shown in Figure 1 below only. Any other configuration is untested and may be dangerous. Two (2) Grapples must be used at each junction when joining box truss. *Do not use more than one pair of Grapples per junction.*



Grapple Application Guide

Grapples ship with the components shown in figure 2 below. All parts are required for safe usage.

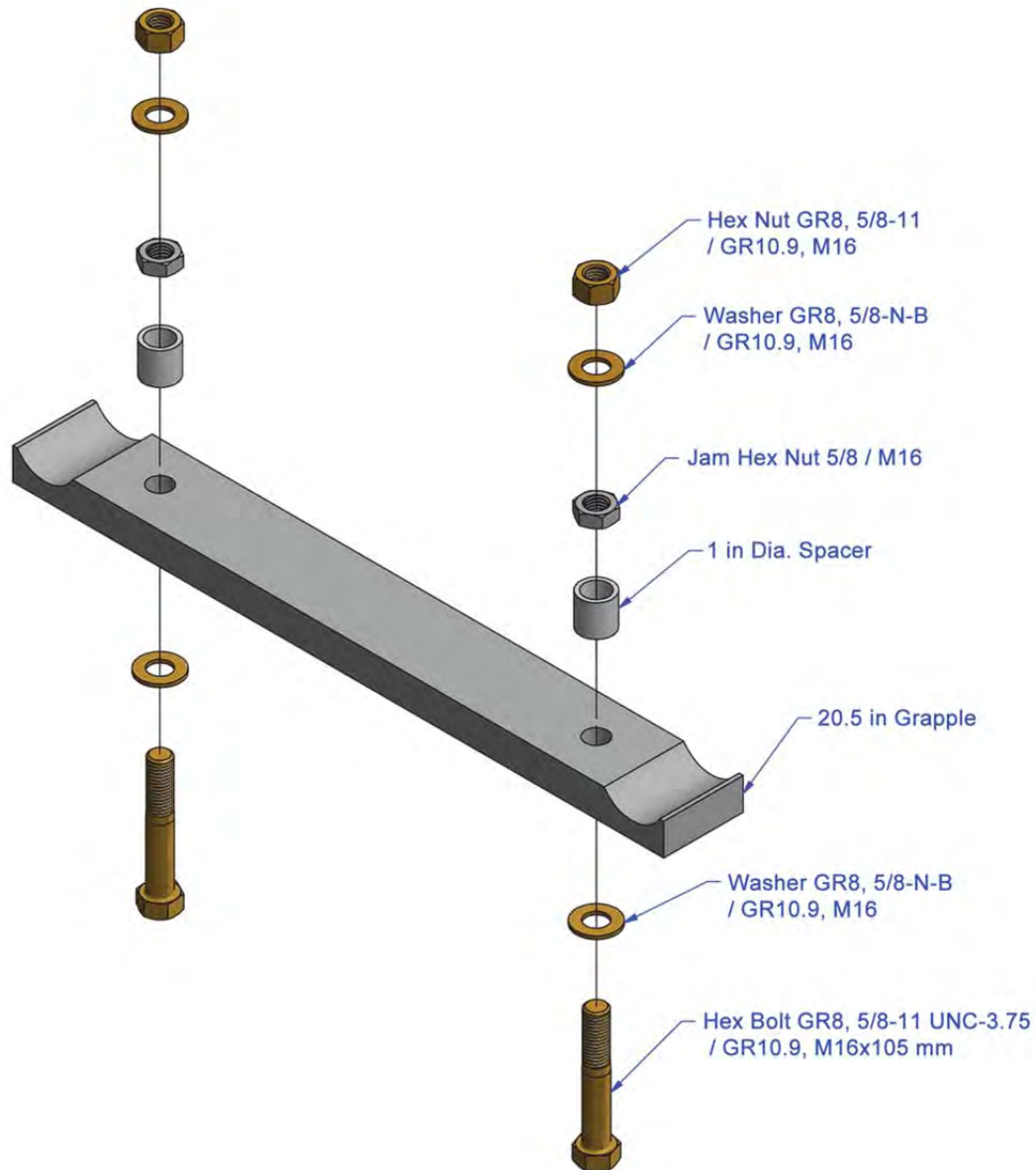




Figure 2

Grapples sold in North America include **Grade 8 imperial** hardware. Grapples sold in Europe include **Grade 10.9 metric** hardware.

Warning: Grapple must only be used with minimum Grade 8 imperial or Grade 10.9 metric. Bolts of lower grade – imperial or metric – are not up to specified engineering ratings and are NOT recommended. Use of lower grade bolts will create unsafe conditions.

Grapple Application Guide

Figure 3 illustrates the identifying marks on Grade 8 and Grade 10.9 bolts and their performance characteristics.

Identification Markings <small>(Fasteners may also have manufacturer I.D. markings)</small>	Specification	Material	Nominal Size Range (inches)	Mechanical Properties		
				Proof Load (psi)	Minimum Yield Strength (psi)	Minimum Tensile Strength (psi)
SAE Inch						
 6 Radial Lines	Grade 8	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 1-1/2	120,000	130,000	150,000
ISO / DIN Metric						
 10.9	Class 10.9	Alloy Steel, Quenched and Tempered	M5 thru M100	120,000	130,000	150,000

Tensile Strength: The maximum load in tension (pulling apart or shearing which a material can withstand before breaking or fracturing).

Yield Strength: The maximum load at which a material exhibits a specific permanent deformation

Proof Load: An axial tensile load which the product must withstand without evidence of any permanent set.

Figure 3

Proper placement of bolts and hardware.

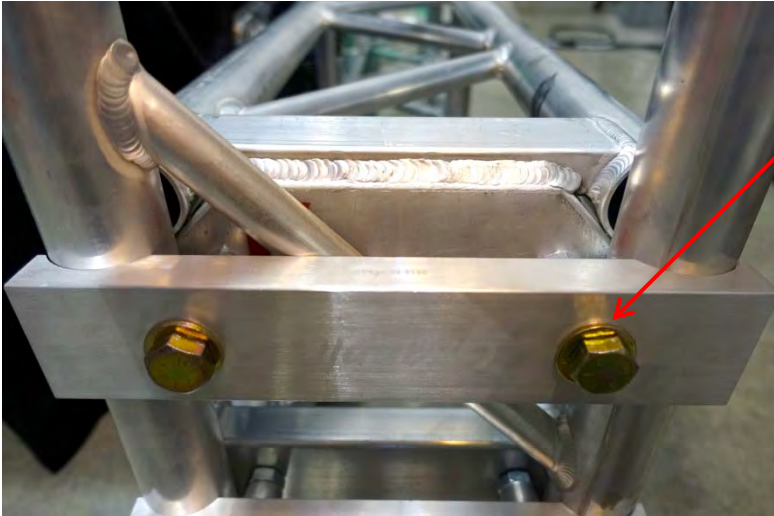


Figure 4

Hex bolt and washer – One washer under bolt head, through the Grapple.



Figure 5

Jam nut – Must be drawn tight (5 foot pounds of torque) against the Grapple spacer. There may be a gap between jam nut and secondary truss end plate. Once installed, DO NOT REMOVE – jam nut holds assembly together during transport.

Spacer – Jam nut holds spacer against the Grapple.

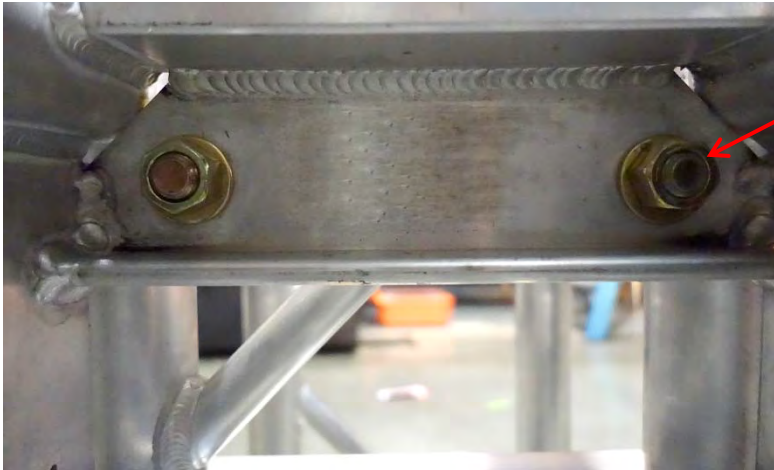


Figure 6

Nut and washer on the secondary truss, inside end plate. *At least* two threads should be exposed beyond the nut.

Figure 7 is a cross section of the junction of two trusses.

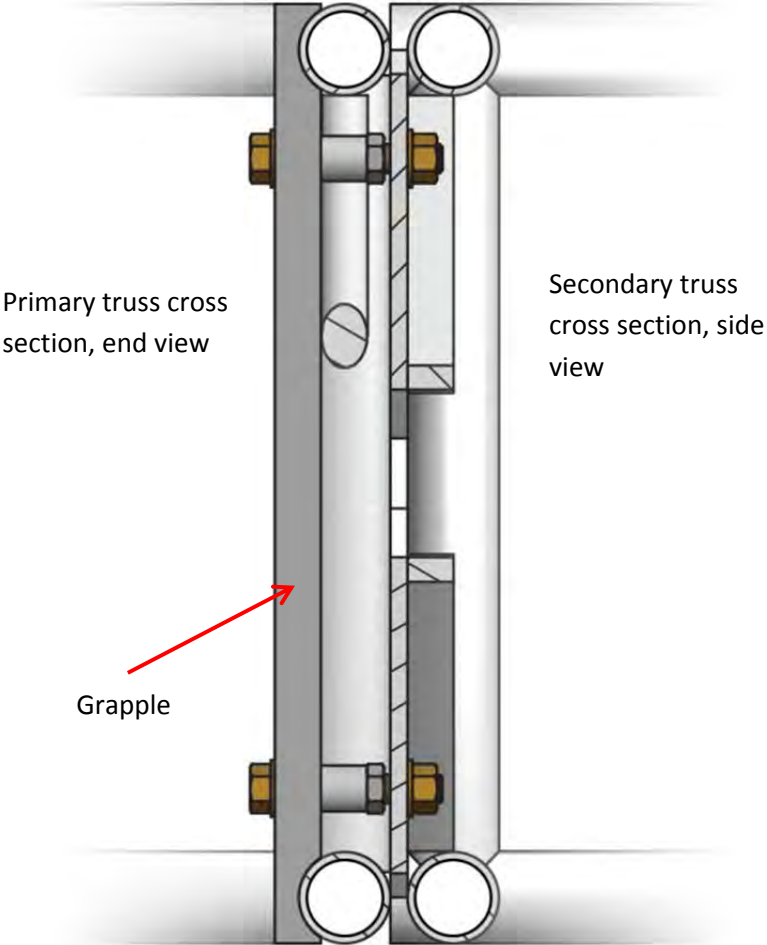


Figure 7

Figure 8 shows Grapple hardware properly positioned.



Figure 8

**HOPPER AND ASSOCIATES
ENGINEERS**

FAX: (310) 791-7308
E-MAIL: haieng@ix.netcom.com

300 Vista Del Mar
Redondo Beach, CA 90277
(310) 373-5573

June 17, 1999

Mr. Colin Waters
TMB Associates
2102 West Kenmere Avenue
Burbank, CA 91504

Subject: "Grapple" "T" Connection Analysis

Reference: C. Waters / W. Brown Telecon on the Subject; June 10, 1999.

Dear Mr. Waters:

We have completed our structural analysis of the 20½-inch by 2½-inch Grapple in a truss "T" connection application.

We found that the Grapple clamp itself is adequate to support the full end loads that would be expected based on the manufacturer allowable loads for 20½-inch aluminum medium duty trusses. However, we also found that the stresses (due to manufacturer's allowable loads) on the top and bottom chords of the perpendicular-connecting truss will be higher than the UBC (Uniform Building Code) specified aluminum allowable. However, the top and bottom chords of the perpendicular truss are capable of supporting 75% of the connecting truss's manufacturer allowable loads.

At this time, we do not see a means of increasing the chord capacities with the present clamp geometry, since the entire truss width is being employed to spread the bearing load. Increased capacity values would likely be obtained by using a clamping bar on both sides of the perpendicular truss chords.

If any questions arise, please contact the undersigned. Thank you for your consideration.

Very truly yours,



Wesley Brown
Professional Engineer

WARNING!

Grapples must be installed by qualified rigging personnel only. Incorrect use of Grapples may cause hazardous conditions and possible injury. Only use Grapples for applications and loadings described in TMB's Grapple Application Guide. A qualified engineer must approve all other applications.

Contact Information

General Information

TMB

US Phone: +1 818.899.8818
Fax: +1 818.899.8813
UK Phone: +44 (0)20.8574.9700
Fax: +44 (0)20.8574.9701
e-mail: tmb-info@tmb.com
web: www.tmb.com

24/7 Technical Support TMB

US/Canada: 1 877.TMB.DUDE (+1 877.862.3833)
Toll-free UK: 0800.652.5418
International: +1 818.794.1286
e-mail: techsupport@tmb.com