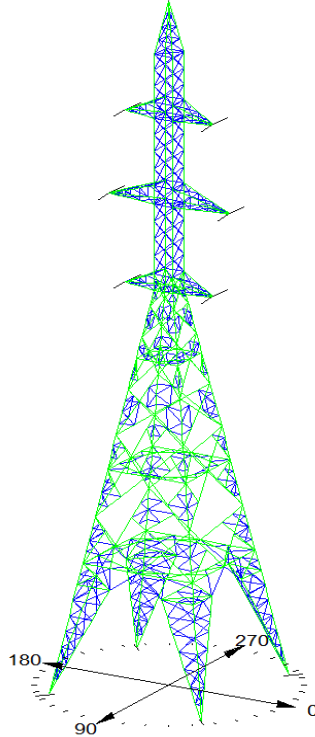


**Construction of
220 kV Loop in Loop out Paliastomi- into Ozurgeti Substation and
110 kV Double Circuit (D/C) Overhead Line from Ozurgeti Substation to Zoti HPP**

Tower Design Report of Light Angle Crossing Tension Tower "12A-LC



02	05.09.2022	Stub revision	I.Özdemir	S.Sahin	S.Nazlı
01	03.08.2022	As per Comments	I.Özdemir	S.Sahin	S.Nazlı
00	20.05.2022	First Submission	I.Özdemir	S.Sahin	S.Nazlı
Rev. No.	Date	Description	Prepared by	Checked by	Approved by
Employer Logo and Business Name			Project Name		
 GEORGIAN STATE ELECTROSYSTEM 2 Baratashvili Street Tbilisi 0105 Georgia			Open Programme Extension of the Transmission Network II BMZ No. 2015 68 286		
Engineer logo and business name			Contract Identification Number		
 Fichtner GmbH & Co. KG Sarweystrasse 3 70191 Stuttgart / Germany			KfW/DSI/OHL-TD-Lot 2		
Contractor logo and business name			Document Number		
 MITAS Energy & Metal Construction Inc. Eski Güvercinlik Yolu No: 113 Gazi 06560 Ankara / Turkey			7145A07-EG-TWR-CLC-0321_02		
Document Title			Scale	Sheet of Sheets	
Tower Design Report of Light Angle Crossing Tension Tower "12A-LC			n.a.	Page 1 of 21	

CONTENT :**PAGE NO**

• A - GENERAL INFORMATION	3
• B - LOAD CASES	4
• C - GROUP SUMMARY	6
• D - CROSSARM BOTTOM CHORD CALCULATION	14
• E - FOUNDATION REACTION	17
• F - STUB DESIGN	19
• G - OUTLINE DRAWING	20

A-GENERAL INFORMATION

1. PROJECT INFORMATION

Project : Open Programme Extension of the Transmission Network II

Tower Type : Double Circuit 110kV - 12A - LC Line Angle 0° - 10°

Extension Details : This tower includes +12,+9,+6, +3, +0, -3 Bodies with +6, +4.5, +3, +1.5, +0, -1.5, -3 Leg Extensions.

2. DESIGN DETAILS

Software : PLS-TOWER version 17.2

Applied Specifications : EN 50341- 1:2012

Material :

Bolts : DIN 7990

Minimum yield strength of the bolt 640 MPa

Minimum tensile strength of the bolt 800 MPa

Profiles: EN10025

	Fy (Mpa)	Fu (Mpa)
S235	235	360
S355	355	470

Fy Minimum yield strength

Fu Ultimate strength

B-LOAD CASES

Load cases which applied the tower for design can be summarized as the list below.

Row #	Load Case Description	Dead Load Factor	Wind Area Factor	Wind/Ice Model	Trans. Wind Pressure (Pa)	Longit. Wind Pressure (Pa)	Ice Thickness (cm)	Ice Density (N/m ³)
1	0° C1,C NA+	1.1	1	EN50341-1:2012F	884.9	0	0	0
2	0° C1-,C NA-	1.1	1	EN50341-1:2012F	-884.9	0	0	0
3	0° C2,C BI+	1.1	1	EN50341-1:2012F	625.7	625.7	0	0
4	0° C2-,C BI-	1.1	1	EN50341-1:2012F	-625.7	-625.7	0	0
5	0° ICE,C NA+	1.1	1	EN50341-1:2012F	0	0	3.2	6867
6	0° C3,C NA+	1.1	1	EN50341-1:2012F	262.2	0	3.2	6867
7	0° C3-,C NA-	1.1	1	EN50341-1:2012F	-262.2	0	3.2	6867
8	0° C4,C BI+	1.1	1	EN50341-1:2012F	185.4	185.4	3.2	6867
9	0° C4-,C BI-	1.1	1	EN50341-1:2012F	-185.4	-185.4	3.2	6867
10	0° C5,C NA+	1.1	1	EN50341-1:2012F	639.3	0	1.59	6867
11	0° C5-,C NA-	1.1	1	EN50341-1:2012F	-639.3	0	1.59	6867
12	0° C6,C BI+	1.1	1	EN50341-1:2012F	452.1	452.1	1.59	6867
13	0° C6-,C BI-	1.1	1	EN50341-1:2012F	-452.1	-452.1	1.59	6867
14	0° C7,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
15	0° C1, Min. WS,C NA+	1.1	1	EN50341-1:2012F	884.9	0	0	0
16	0° C1-, Min. WS,C NA-	1.1	1	EN50341-1:2012F	-884.9	0	0	0
17	0° C2, Min. WS,C BI+	1.1	1	EN50341-1:2012F	625.7	625.7	0	0
18	0° C2-, Min. WS,C BI-	1.1	1	EN50341-1:2012F	-625.7	-625.7	0	0
19	0° ICE, Min. WS,C NA+	1.1	1	EN50341-1:2012F	0	0	3.2	6867
20	0° C3, Min. WS,C NA+	1.1	1	EN50341-1:2012F	262.2	0	3.2	6867
21	0° C3-, Min. WS,C NA-	1.1	1	EN50341-1:2012F	-262.2	0	3.2	6867
22	0° C4, Min. WS,C BI+	1.1	1	EN50341-1:2012F	185.4	185.4	3.2	6867
23	0° C4-, Min. WS,C BI-	1.1	1	EN50341-1:2012F	-185.4	-185.4	3.2	6867
24	0° C5, Min. WS,C NA+	1.1	1	EN50341-1:2012F	639.3	0	1.59	6867
25	0° C5-, Min. WS,C NA-	1.1	1	EN50341-1:2012F	-639.3	0	1.59	6867
26	0° C6, Min. WS,C BI+	1.1	1	EN50341-1:2012F	452.1	452.1	1.59	6867
27	0° C6-, Min. WS,C BI-	1.1	1	EN50341-1:2012F	-452.1	-452.1	1.59	6867
28	0° C7, Min. WS,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
29	0° SC1,EW<,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
30	0° SC1,LT&RT,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
31	0° SC1,LT&LM,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
32	0° SC1,LM&LB,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
33	0° SC1,EW&RT,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
34	0° SC1,RT&RM,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
35	0° SC1,RM&RB,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
36	0° SF1A,EW,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
37	0° SF1A,LT,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
38	0° SF1A,RT,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
39	0° SF1A,LM,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
40	0° SF1A,RM,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
41	0° SF1A,LB,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
42	0° SF1A,RB,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
43	0° SF1A,LT&RT,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
44	0° SF1A,LM&RM,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
45	0° SF1A,LB&RB,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
46	0° SF1B,All Strung,I NA+	1.5	1	EN50341-1:2012F	245.8	0	0	0
47	0° SF1B,All Strung-,I NA-	1.5	1	EN50341-1:2012F	-245.8	0	0	0
48	0° SF2,C NA+	1.5	1	EN50341-1:2012F	0	0	0	0
49	10° C1,C NA+	1.1	1	EN50341-1:2012F	884.9	0	0	0

Row #	Load Case Description	Dead Load Factor	Wind Area Factor	Wind/Ice Model	Trans. Wind Pressure (Pa)	Longit. Wind Pressure (Pa)	Ice Thickness (cm)	Ice Density (N/m ³)
50	10° C1-,C NA-	1.1	1	EN50341-1:2012F	-884.9	0	0	0
51	10° C2,C BI+	1.1	1	EN50341-1:2012F	625.7	625.7	0	0
52	10° C2-,C BI-	1.1	1	EN50341-1:2012F	-625.7	-625.7	0	0
53	10° ICE,C NA+	1.1	1	EN50341-1:2012F	0	0	3.2	6867
54	10° C3,C NA+	1.1	1	EN50341-1:2012F	262.2	0	3.2	6867
55	10° C3-,C NA-	1.1	1	EN50341-1:2012F	-262.2	0	3.2	6867
56	10° C4,C BI+	1.1	1	EN50341-1:2012F	185.4	185.4	3.2	6867
57	10° C4-,C BI-	1.1	1	EN50341-1:2012F	-185.4	-185.4	3.2	6867
58	10° C5,C NA+	1.1	1	EN50341-1:2012F	639.3	0	1.59	6867
59	10° C5-,C NA-	1.1	1	EN50341-1:2012F	-639.3	0	1.59	6867
60	10° C6,C BI+	1.1	1	EN50341-1:2012F	452.1	452.1	1.59	6867
61	10° C6-,C BI-	1.1	1	EN50341-1:2012F	-452.1	-452.1	1.59	6867
62	10° C7,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
63	10° C1, Min. WS,C NA+	1.1	1	EN50341-1:2012F	884.9	0	0	0
64	10° C1-, Min. WS,C NA-	1.1	1	EN50341-1:2012F	-884.9	0	0	0
65	10° C2, Min. WS,C BI+	1.1	1	EN50341-1:2012F	625.7	625.7	0	0
66	10° C2-, Min. WS,C BI-	1.1	1	EN50341-1:2012F	-625.7	-625.7	0	0
67	10° ICE, Min. WS,C NA+	1.1	1	EN50341-1:2012F	0	0	3.2	6867
68	10° C3, Min. WS,C NA+	1.1	1	EN50341-1:2012F	262.2	0	3.2	6867
69	10° C3-, Min. WS,C NA-	1.1	1	EN50341-1:2012F	-262.2	0	3.2	6867
70	10° C4, Min. WS,C BI+	1.1	1	EN50341-1:2012F	185.4	185.4	3.2	6867
71	10° C4-, Min. WS,C BI-	1.1	1	EN50341-1:2012F	-185.4	-185.4	3.2	6867
72	10° C5, Min. WS,C NA+	1.1	1	EN50341-1:2012F	639.3	0	1.59	6867
73	10° C5-, Min. WS,C NA-	1.1	1	EN50341-1:2012F	-639.3	0	1.59	6867
74	10° C6, Min. WS,C BI+	1.1	1	EN50341-1:2012F	452.1	452.1	1.59	6867
75	10° C6-, Min. WS,C BI-	1.1	1	EN50341-1:2012F	-452.1	-452.1	1.59	6867
76	10° C7, Min. WS,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
77	10° SC1,EW<,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
78	10° SC1,LT&RT,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
79	10° SC1,LT&LM,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
80	10° SC1,LM&LB,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
81	10° SC1,EW&RT,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
82	10° SC1,RT&RM,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
83	10° SC1,RM&RB,C NA+	1.1	0	EN50341-1:2012F	0	0	0	0
84	10° SF1A,EW,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
85	10° SF1A,LT,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
86	10° SF1A,RT,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
87	10° SF1A,LM,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
88	10° SF1A,RM,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
89	10° SF1A,LB,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
90	10° SF1A,RB,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
91	10° SF1A,LT&RT,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
92	10° SF1A,LM&RM,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
93	10° SF1A,LB&RB,I NA+	1.5	1	EN50341-1:2012F	0	0	0	0
94	10° SF1B,All Strung,I NA+	1.5	1	EN50341-1:2012F	245.8	0	0	0
95	10° SF1B,All Strung-,I NA-	1.5	1	EN50341-1:2012F	-245.8	0	0	0
96	10° SF2,C NA+	1.5	1	EN50341-1:2012F	0	0	0	0

C-GROUP SUMMARY

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont-rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
1	SAE	75*75*6	355	55.84	Comp	55.84	-94.196	0° C5,C NA+	+12B -3+6+6+6	168.696	308.831	247.515	1	1	1	89.16	1.17	1.311	1	4	M-16(8.8)	39.44	88.755	0° C5, Min. WS,C NA+	+12B -3+6+6+6	225.036	2	1.75
2	SAE	100*100*6	355	43.46	Comp	43.46	-105.483	0° C5,C NA+	+12B +6+6+6-3	242.713	308.831	247.515	1	1	1	78.52	0.94	1.555	1	4	M-16(8.8)	39.7	98.255	0° C5, Min. WS,C NA+	+12B -3+6+6+6	326.556	2	1.75
3	SAE	100*100*6	355	57.97	Comp	57.97	-140.71	0° C5,C NA+	+12B +6+6+6-3	242.713	617.662	247.515	1	1	1	78.52	0.94	1.555	1	4	M-16(8.8)	53.57	132.582	0° C5, Min. WS,C NA+	+12B -3+6+6+6	326.556	2	1.75
4	SAE	100*100*6	355	69.94	Comp	69.94	-169.754	0° C5,C NA+	+12B +6+6+6-3	242.713	617.662	247.515	1	1	1	78.52	0.94	1.555	1	4	M-16(8.8)	64.47	159.581	0° C5, Min. WS,C NA+	+12B -3+6+6+6	326.556	2	1.75
5	SAE	100*100*6	355	85.32	Comp	85.32	-201.9	0° C5,C NA+	+12B +6+6+6-3	236.632	617.662	247.515	1	1	1	80.81	0.96	1.6	1	4	M-16(8.8)	73.91	182.948	0° C5, Min. WS,C NA+	+12B -3+6+6+6	326.556	2	1.75
6	SAE	110*110*10	355	57.3	Comp	57.3	-285.335	0° C5,C NA+	+12B -3+6+6+6	497.965	926.493	676.8	1	1	1	76.16	1	1.645	1	6	M-16(8.8)	47.25	260.639	0° C5, Min. WS,C NA+	+12B +6+6+6-3	551.592	2.8	1.75
7	SAE	110*110*10	355	78.67	Comp	78.67	-391.732	0° C5,C NA+	+12B -3+6+6+6	497.965	926.493	676.8	1	1	1	76.16	1	1.645	1	6	M-16(8.8)	65.7	362.388	0° C5, Min. WS,C NA+	+12B +6+6+6-3	551.592	2.8	1.75
8	SAE	110*110*10	355	98.26	Comp	98.26	-489.304	0° C5,C NA+	+12B -3+6+6+6	497.965	926.493	676.8	1	1	1	76.16	1	1.645	1	6	M-16(8.8)	83.35	459.737	0° C5, Min. WS,C NA+	+12B +6+6+6-3	551.592	2.8	1.75
9	SAE	140*140*12	355	66.21	Comp	66.21	-596.513	0° C5,C NA+	+12B -3+6+6+6	900.972	1235.324	1082.88	1	1	1	59.82	0.78	1.645	1	8	M-16(8.8)	62.45	560.421	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	897.437	2.8	1.75
10	SAE	140*140*12	355	80.27	Comp	80.27	-685.819	0° C5,C NA+	+12B -3+6+6+6	854.426	1235.324	1082.88	1	1	1	66.18	0.87	1.82	1	8	M-16(8.8)	71.29	639.758	0° C5, Min. WS,C NA+	+12B -3-3+6+6	897.437	2.8	1.75
11	SAE	140*140*12	355	96.06	Comp	96.06	-852.533	0° C5,C NA+	+12B -3+6+6+6	887.523	1930.189	1353.6	1	1	1	61.82	0.81	1.7	1	8	M-20(8.8)	93.65	797.825	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	851.956	2.8	2.15
12	SAE	180*180*16	355	63.72	Comp	63.72	-1046.963	0° C5,C NA+	+12B +6+6-3-3	1643.15	2412.736	2256	1	1	1	48.16	0.63	1.7	1	10	M-20(8.8)	63.63	985.429	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	1548.789	2.8	2.15
13	SAE	180*180*16	355	74.18	Tens	73.76	-1212.052	0° C5,C NA+	+12B +6+6-3-3	1643.15	2412.736	2256	1	1	1	48.16	0.63	1.7	1	10	M-20(8.8)	74.18	1148.871	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	1548.789	2.8	2.15
14	SAE	180*180*16	355	85.19	Tens	84.7	-1391.791	0° C5,C NA+	+12B +6+6-3-3	1643.15	2412.736	2256	1	1	1	48.16	0.63	1.7	1	10	M-20(8.8)	85.19	1319.484	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	1548.789	2.8	2.15
15	SAE	180*180*16	355	90.85	Tens	89.04	-1303.894	0° C5,C NA+	+0B +6-3+6+6	1763.657	1688.915	3158.4	1	1	1	22.66	0.3	0.8	1	14	M-20(8.8)	90.85	1407.086	0° C5-, Min. WS,C NA-	+0B +6+6+6-3	1548.789	2.8	2.15
16	SAE	180*180*16	355	91.06	Tens	85.18	-1504.827	0° C5,C NA+	+0B +6-3+6+6	1766.582	1930.189	3609.6	1	1	1	21.81	0.29	0.77	1	16	M-20(8.8)	91.06	1410.264	0° C5-, Min. WS,C NA-	+0B +6-3+6+6	1548.789	2.8	2.15
17	SAE	180*180*16	355	90.09	Tens	85.85	-1494.045	0° C5,C NA+	-3B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	90.09	1395.244	0° C5-, Min. WS,C NA-	-3B -3-3+6+6	1548.789	2.8	2.15
18	SAE	180*180*16	355	82.74	Tens	79.68	-1386.76	0° C5,C NA+	-3B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	82.74	1281.399	0° C5-, Min. WS,C NA-	-3B +6+6-3-3	1548.789	2.8	2.15
19	SAE	180*180*16	355	75.56	Tens	73.55	-1280.104	0° C5,C NA+	-3B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	75.56	1170.277	0° C5-, Min. WS,C NA-	-3B +6+6-3-3	1548.789	2.8	2.15
20	SAE	45*45*4	235	73.49	Climb	13.29	-2.918	0° C5-,C NA-	+12B +6+6-3+6	21.953	77.208	34.56	1	1	1	165.57	1.76	1.457	7	1	M-16(8.8)	8.89	2.943	0° C5, Min. WS,C NA+	+12B +6+6+6-3	33.12	1	1.75
20A	SAE	45*45*4	235	14.45	Comp	14.45	-2.34	0° C1-, Min. WS,C NA-	+12B +6+6-3+6	16.19	77.208	34.56	1	1	1	194.61	2.07	1.713	7	1	M-16(8.8)	7.07	2.342	0° C1-, Min. WS,C NA-	+12B +6-3+6+6	33.12	1	1.75
20B	SAE	45*45*4	355	73.26	Climb	7.09	-1.84	0° C5, Min. WS,C NA+	+12B +6+6+6-3	25.973	77.208	45.12	1	1	1	153.41	2.01	1.35	7	1	M-16(8.8)	3.96	1.713	0° C1, Min. WS,C NA+	+12B +6+6-3+6	43.24	1	1.75
20C	SAE	50*50*4	235	16.47	Comp	16.47	-2.621	0° C1,C NA+	+12B +6-3+6+6	15.918	77.208	34.56	1	1	1	207.82	2.21	2.037	7	1	M-16(8.8)	7.57	2.616	0° C1, Min. WS,C NA+	+12B +6+6-3+6	38.88	1	1.75
20D	SAE	45*45*4	235	21.82	Tens	21.06	-7.277	0° C5-,C NA-	+12B +6+6-3+6	50.173	77.208	34.56	1	1	1	79.98	1.07	0.704	3	1	M-16(8.8)	21.82	7.227	0° C5, Min. WS,C NA+	+12B +6+6+6-3	33.12	1	1.75
20E	SAE	45*45*4	235	19.14	Climb	7.44	-2.572	0° C5-, Min. WS,C NA-	+12B +6-3+6+6	62.461	77.208	34.56	1	1	1	26.8	0.83	0.236	3	1	M-16(8.8)	6.06	2.007	0° C5-,C NA-	+12B +6+6-3+6	33.12	1	1.75
21	SAE	55*55*5	355	52.65	Climb	41.3	-17.604	0° C5, Min. WS,C NA+	+12B -3-3+6-3	42.621	154.416	103.131	1	1	1	168.22	1.93	1.8	8	2	M-16(8.8)	18.33	18.9	0° C5,C NA+	+12B +6+6+6+6	115.432	1	1.75
22	SAE	45*45*5	355	61.97	Climb	4.45	-1.856	0° SC1,EW<,C NA+	-3B +6-3-3+6	41.669	154.416	103.131	0.5	0.5	0.5	146.3	1.74	2.546	6	2	M-16(8.8)	2.84	2.459	0° SC1,EW<,C NA+	-3B +6-3-3+6	86.48	1	1.75
27	SAE	75*75*7	355	78.11	Comp	78.11	-100.445	10° SC1,LT&LM,C NA+	-3B -3-3-3-3	128.6	231.623	216.576	1	1	1	114.74	1.5	1.664	5	3	M-16(8.8)	23.67	51.264	10° SC1,RT&RM,C NA+	+12B +6+6+6+6	235	1	1.75
28	SAE	60*60*6	355	48.53	Tens	23.46	-24.43	10° C7, Min. WS,C NA+	+12B +6-3+6+6	104.152	231.623	185.637	2	1	1	101.44	1.36	0.923	2	3	M-16(8.8)	48.53	74.087	10° C7,C NA+	+12B -3+6+6+6	152.656	1	1.75
29	DAE	80*80*8	355	44.41	Tens	0	0		+12B +6+6+6+6	685.028	154.416	330.021	1	1	1	8.26	0.78	0.2	3	2	M-16(8.8)	44.41	68.576	10° C3-,C NA-	+12B +6-3-3+6	579.04	2	1.75
30	SAE	45*45*4	355	90.69	Climb	15.74	-2.239	10° C4-, Min. WS,C BI-	+12B -3+6-3-3	14.226	77.208	45.12	1	1	1	209.79	2.75	1.846	7	1	M-16(8.8)	0.27	0.116	10° SC1,EW<,C NA+	-3B -3-3-3-3	43.24	1	1.75
31	SAE	45*45*4	235	7.22	Redun	6.92	-2.393	0° C1,C NA+	-3B -3-3-3-3	46.66	77.208	34.56	1	1	1	90.91	1.13	0.8	3	1	M-16(8.8)	7.22	2.393	0° C1,C NA+	-3B -3-3-3-3	33.12	1	1.75
32	SAE	45*45*4	235	87.11	Climb	16.03	-5.539	10° SC1,EW<,C NA+	-3B -3-3-3+6	34.62	77.208	34.56	1	1	1	125.35	1.37	1.103	3	1	M-16(8.8)	9.86	3.267	10° SC1,EW<,C NA+	+12B +6+6-3+6	33.12	1	1.75
33	DAE	45*45*4	235	7.45	Tens	4.68	-3.235	10° SC1,EW<,C NA+	+12B +6+6-3+6	120.518	77.208	69.12	1	1	1	24.46	0.88	0.338	3	1	M-16(8.8)	7.45	4.92	10° SC1,EW<,C NA+	-3B -3-3+6+6	66.01	2	1.75
34	SAE	45*45*5	355	67.05	Climb	2.82	-0.969	0° SC1,LT&RT,C NA+	+3B +6+6+6-3	34.332	154.416	103.131	1	1	1	168.63	1.93	1.467	6	2	M-16(8.8)	7.24	6.257	10° C4-,C BI-	+12B +6-3+6+6	86.48	1	1.75
35	SAE	45*45*5	355	41.51	Climb	18.98	-11.931	10° SC1,LT&RT,C NA+	-3B -3-3-3+6	62.845	154.416	103.131	0.672	0.672	0.672	106.02	1.39	1.373	2	2	M-16(8.8)	4.17	3.607	10° SC1,LT&RT,C NA+	+12B +6+6-3+6	86.48	1	1.75
36	SAE	45*45*5	355	32.82	Tens	9.51	-9.811	10° SC1,LT&RT,C NA+	+12B +6+6-3+6	111.16	154.416	103.131	0.709	0.709	0.709	59.85	0.89	0.734	2	2	M-16(8.8)	32.82	28.383	10° SC1,LT&RT,C NA+	+12B +6+6-3+6	86.48	1	1.75
37	SAE	45*45*5	355	66.98	Climb	8.66	-3.256	10° SC1,EW&RT,C NA+	+12B +6+6-3+6	37.589	154.416	103.131	0.643	0.643	0.643	157.94	1.84	2.137	6	2	M-16(8.8)	5.65	4.886	10° SC1,EW&RT,C NA+	+3B +6+6+6-3	86.48	1	1.75
38	SAE	45*45*5	355	48.33	Climb	28.38	-16.07	10° SC1,RT&RM,C NA+	+3B +6+6+6-3	56.621	154.416	103.131	0.714	0.714	0.714	114.44	1.47	1.394	6	2	M-16(8.8)	11.64	10.064	10° SC1,EW&RT,C NA+	+12B +6+6+6+6	86.48	1	1.75
39	SAE	45*45*5	355	23.63	Comp	23.63	-24.372	10° SC1,EW<,C NA+	+12B +6+6-3+6	123.633	154.416	103.131	0.667	0.667	0.667	39.05	0.71	0.509	2	2	M-16(8.8)	17.97	15.543	10° SC1,EW&RT,C NA+	-3B +6+6+6-3	86.48	1	1.75
R500	SAE	45*45*4	355	42.29	Climb	7.64	-3.445	10° C4-,C BI-	+12B -3-3+6+6	76.42	77.208	45.12	1	1	1	63.77	1.06	0.561	3	1	M-16(8.8)	0.93	0.403	10° C2-, Min. WS,C BI-	+12B -3+6+6-3	43.24	1	1.75
40	DAE	80*80*8	355	46.87	Tens	0	0		+12B +6+6+6+6	685.028	154.416	330.021																

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont-rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
56	SAE	45*45*5	355	39.51	Climb	21.1	-21.758	10° SC1,RT&RM,C NA+	+0B -3-3-3+6	108.516	154.416	103.131	0.634	0.634	0.634	62.55	0.92	0.858	2	2	M-16(8.8)	21.15	18.295	10° SC1,RT&RM,C NA+	+9B -3+6+6+6	86.48	1	1.75
57	SAE	45*45*5	355	31.32	Comp	31.32	-32.299	10° SC1,LT&LM,C NA+	+12B +6+6-3+6	124.84	154.416	103.131	0.621	0.621	0.621	34.73	0.69	0.486	2	2	M-16(8.8)	23.44	20.272	10° SC1,RT&RM,C NA+	-3B +6+6+6-3	86.48	1	1.75
58	DAE	80*80*8	355	7.82	Tens	3.36	-5.195	10° C3, Min. WS,C NA+	+0B +6-3+6+6	666.562	154.416	330.021	1	1	1	13.7	0.83	0.332	3	2	M-16(8.8)	7.82	12.08	10° C3,C NA+	-3B -3-3-3-3	579.04	2	1.75
62	DAE	80*80*8	355	43.99	Tens	0	0		+12B +6+6+6+6	685.028	154.416	330.021	1	1	1	8.26	0.78	0.2	3	2	M-16(8.8)	43.99	67.92	10° C3-,C NA-	+3B -3+6+6-3	579.04	2	1.75
63	SAE	60*60*6	355	67.19	Tens	41.75	-28.124	10° C7, Min. WS,C NA+	+3B +6+6+6+6	67.371	231.623	185.637	1	1	1	132.86	1.74	1.554	5	3	M-16(8.8)	67.19	102.567	0° SC1,RT&RM,C NA+	+3B +6-3-3+6	152.656	1	1.75
64	SAE	75*75*7	355	76.62	Comp	76.62	-126.44	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	165.021	231.623	216.576	1	1	1	97.7	1.3	1.417	2	3	M-16(8.8)	34.5	74.712	10° SC1,RM&RB,C NA+	+0B +6-3-3+6	235	1	1.75
65	SAE	45*45*4	355	15.09	Comp	15.09	-2.487	10° C3, Min. WS,C NA+	+9B +6-3-3+6	16.481	77.208	45.12	1	1	1	194.46	2.54	1.711	7	1	M-16(8.8)	0.86	0.373	10° SC1,RM&RB,C NA+	+3B +6-3-3-3	43.24	1	1.75
66	SAE	45*45*4	235	7.56	Redun	7.25	-2.505	0° C1,C NA+	+0B -3+6+6+6	39.872	77.208	34.56	1	1	1	109.09	1.26	0.96	3	1	M-16(8.8)	7.56	2.505	+0B -3+6+6+6	33.12	1	1.75	
66A	SAE	45*45*4	235	6.58	Comp	6.58	-2.274	10° SC1,RM&RB,C NA+	+0B +6-3-3+6	36.557	77.208	34.56	1	1	1	119.05	1.32	1.048	3	1	M-16(8.8)	2.77	0.919	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	33.12	1	1.75
66B	SAE	45*45*4	235	8.29	Redun	7.95	-2.747	0° C1,C NA+	+0B -3+6+6+6	54.362	77.208	34.56	1	1	1	63.64	0.99	0.56	3	1	M-16(8.8)	8.29	2.747	+0B -3+6+6+6	33.12	1	1.75	
67	SAE	45*45*4	235	57.76	Climb	26.21	-9.057	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	48.875	77.208	34.56	1	1	1	84.98	1.09	0.748	3	1	M-16(8.8)	16.54	5.478	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	33.12	1	1.75
68	DAE	45*45*4	235	10.22	Tens	5.77	-3.988	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	123.751	77.208	69.12	1	1	1	19.15	0.84	0.264	3	1	M-16(8.8)	10.22	6.743	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	66.01	2	1.75
69	SAE	45*45*5	355	59.89	Climb	17.75	-5.804	10° C3,C NA+	+3B +6+6+6+6	32.696	154.416	103.131	0.608	1	0.608	149.89	1.99	2.024	8	2	M-16(8.8)	4.35	3.766	0° C5, Min. WS,C NA+	+3B +6+6+6-3	86.48	1	1.75
70	SAE	45*45*5	355	37.76	Climb	7.14	-5.599	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	78.369	154.416	103.131	0.604	0.604	0.604	89.63	1.21	1.291	2	2	M-16(8.8)	10.72	9.272	10° SC1,RM&RB,C NA+	+0B -3+6+6+6	86.48	1	1.75
70A	SAE	45*45*5	355	31.51	Climb	21.91	-20.8	10° SC1,RM&RB,C NA+	+0B +6-3+6+6	94.928	154.416	103.131	0.663	0.663	0.663	74.9	1.05	0.983	2	2	M-16(8.8)	13.98	12.093	0° SC1,LM&LB,C NA+	+0B -3+6+6-3	86.48	1	1.75
71	SAE	45*45*5	355	30.5	Comp	30.5	-31.46	10° SC1,LM&LB,C NA+	+0B -3+6+6+6	123.859	154.416	103.131	0.659	0.659	0.659	38.26	0.71	0.505	2	2	M-16(8.8)	25.39	21.955	10° SC1,RM&RB,C NA+	+0B +6-3-3+6	86.48	1	1.75
73	SAE	45*45*5	355	59.93	Climb	6.07	-2.483	10° SC1,RT&RM,C NA+	+3B +6+6-3+6	40.907	154.416	103.131	0.608	0.608	0.608	148.35	1.76	2.122	6	2	M-16(8.8)	3.89	3.364	10° SC1,LT&LM,C NA+	+3B -3+6+6+6	86.48	1	1.75
75	SAE	45*45*5	355	37.78	Climb	9.52	-9.512	10° SC1,RT&RM,C NA+	+3B +6+6-3+6	99.945	154.416	103.131	0.633	0.633	0.633	70.52	1.01	0.969	2	2	M-16(8.8)	7.37	6.373	10° SC1,LT&LM,C NA+	+3B -3+6+6+6	86.48	1	1.75
77	SAE	45*45*5	355	30.1	Tens	9.38	-9.677	10° SC1,LT&LM,C NA+	+3B -3+6+6+6	118.095	154.416	103.131	0.688	0.688	0.688	51.69	0.8	0.654	2	2	M-16(8.8)	30.1	26.028	10° SC1,RT&RM,C NA+	+3B +6+6-3+6	86.48	1	1.75
78	DAE	80*80*8	355	8.89	Tens	2.95	-4.562	10° C3, Min. WS,C NA+	-3B -3-3-3-3	657.545	154.416	330.021	1	1	1	16.12	0.85	0.39	3	2	M-16(8.8)	8.89	13.735	10° C3,C NA+	+0B +6+6+6+6	579.04	2	1.75
80	SAE	45*45*5	355	50.64	Comp	50.64	-23.058	0° C5-, Min. WS,C NA-	+12B +6-3+6+6	45.529	154.416	103.131	0.5	0.5	0.5	136.69	1.66	2.378	6	2	M-16(8.8)	27.74	23.988	0° C5,C NA+	+12B -3+6+6+6	86.48	1	1.75
81	SAE	45*45*5	355	56.54	Comp	56.54	-25.743	0° C5,C NA+	+12B -3+6+6+6	45.529	154.416	103.131	0.5	0.5	0.5	136.69	1.66	2.378	6	2	M-16(8.8)	28.16	24.349	0° C5-, Min. WS,C NA-	+12B +6-3+6+6	86.48	1	1.75
82	SAE	45*45*5	355	56.16	Comp	56.16	-25.57	0° C5, Min. WS,C NA+	+12B +6+6-3+6	45.529	154.416	103.131	0.5	0.5	0.5	136.69	1.66	2.378	6	2	M-16(8.8)	31.14	26.93	0° C5-,C NA-	+12B +6+6+6-3	86.48	1	1.75
80A	SAE	45*45*5	355	44.62	Comp	44.62	-20.313	10° SC1,EW&RT,C NA+	+12B +6+6+6+6	45.529	154.416	103.131	0.5	0.5	0.5	136.69	1.66	2.378	6	2	M-16(8.8)	21.86	18.908	10° SC1,EW<,C NA+	+12B +6+6+6+6	86.48	1	1.75
81A	SAE	45*45*5	355	41.86	Comp	41.86	-19.06	10° SC1,EW<,C NA+	+12B +6+6+6+6	45.529	154.416	103.131	0.5	0.5	0.5	136.69	1.66	2.378	6	2	M-16(8.8)	23.64	20.443	10° SC1,EW&RT,C NA+	+12B +6+6+6+6	86.48	1	1.75
82A	SAE	45*45*5	355	45.51	Comp	45.51	-20.722	10° SC1,EW&RT,C NA+	+12B +6+6+6+6	45.529	154.416	103.131	0.5	0.5	0.5	136.69	1.66	2.378	6	2	M-16(8.8)	21.77	18.829	10° SC1,EW<,C NA+	+12B +6+6+6+6	86.48	1	1.75
83	SAE	55*55*5	355	58.72	Comp	58.72	-25.028	0° C5,C NA+	+12B -3+6-3-3	42.621	154.416	103.131	1	1	1	168.22	1.93	1.8	8	2	M-16(8.8)	53.03	54.689	10° C4,C Bi+	+12B -3+6-3-3	115.432	1	1.75
84	SAE	50*50*5	355	85.74	Comp	85.74	-49.787	10° SC1,EW<,C NA+	+12B -3+6+6+6	58.071	154.416	103.131	0.5	0.5	0.5	122.87	1.55	2.408	6	2	M-16(8.8)	33.58	33.773	10° SC1,EW<,C NA+	+12B +6+6+6+6	100.58	1	1.75
84A	SAE	45*45*5	355	96.78	Cross	96.78	-25.377	0° C5,C NA+	+12B +6+6+6+6	26.221	154.416	103.131	0.5	1	0.5	178.39	2.23	2.408	8	2	M-16(8.8)	34.99	30.26	10° SC1,EW<,C NA+	+12B -3+6+6+6	86.48	1	1.75
85	SAE	70*70*5	355	92.7	Comp	92.7	-70.745	0° SC1,LT&RT,C NA+	-3B -3-3-3-3	76.316	154.416	103.131	1	1	1	130.43	1.6	1.8	8	2	M-16(8.8)	33.91	34.974	0° SC1,LT&RT,C NA+	+12B +6+6+6+6	158.484	1	1.75
86	SAE	45*45*5	355	69.32	Comp	69.32	-28.884	10° SC1,RT&RM,C NA+	-3B -3-3-3+6	41.669	154.416	103.131	0.5	0.5	0.5	146.3	1.74	2.546	6	2	M-16(8.8)	23.2	20.066	10° SC1,LT&LM,C NA+	-3B -3+6+6-3	86.48	1	1.75
87	SAE	60*60*5	355	87.12	Comp	87.12	-75.914	0° C5,C NA+	+12B +6+6-3-3	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	70.06	72.252	0° C5-, Min. WS,C NA-	+12B -3-3+6+6	129.532	1	1.75
88	SAE	60*60*5	355	85.23	Comp	85.23	-74.267	0° C5-, Min. WS,C NA-	+12B -3-3+6+6	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	74.56	76.891	0° C5,C NA+	+12B +6+6-3-3	129.532	1	1.75
87A	SAE	60*60*5	355	87.98	Comp	87.98	-76.658	0° SC1,EW&RT,C NA+	-3B +6-3+6+6	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	76.66	79.06	0° SC1,EW&RT,C NA+	-3B +6-3+6+6	129.532	1	1.75
88A	SAE	60*60*5	355	91.31	Comp	91.31	-79.565	0° SC1,EW&RT,C NA+	-3B +6-3-3+6	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	74.47	76.803	0° SC1,EW&RT,C NA+	-3B +6-3-3+6	129.532	1	1.75
89	SAE	60*60*5	355	91.06	Comp	91.06	-79.34	0° C5,C NA+	+12B +6+6-3-3	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	72.47	74.735	0° C5-, Min. WS,C NA-	+12B -3-3+6+6	129.532	1	1.75
90	SAE	60*60*5	355	87.95	Comp	87.95	-76.635	0° C5-, Min. WS,C NA-	+12B -3-3+6+6	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	77.46	79.888	0° C5,C NA+	+12B +6+6-3-3	129.532	1	1.75
89A	SAE	60*60*5	355	88.35	Comp	88.35	-76.986	0° SC1,EW&RT,C NA+	-3B +6-3+6+6	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	76.69	79.095	0° SC1,EW&RT,C NA+	-3B +6-3+6+6	129.532	1	1.75
90A	SAE	60*60*5	355	91.45	Comp	91.45	-79.681	0° SC1,EW&RT,C NA+	-3B +6-3+6+6	87.134	154.416	103.131	0.5	0.5	0.5	104.21	1.37	2.438	2	2	M-16(8.8)	73.65	75.952	0° SC1,EW&RT,C NA+	-3B +6-3+6+6	129.532	1	1.75
91	SAE	60*60*5	355	74.13	Tens	71.2	-37.543	0° C5-,C NA-	+12B -3+6-3-3	52.726	154.416	103.131	1	1	1	153.85	1.81	1.8	8	2	M-16(8.8)	74.13	76.452	0° SC1,EW<,C NA+	-3B -3-3-3-3	129.532	1	1.75
92	SAE	70*70*5	355	88.64	Comp	88.64	-91.414	10° SC1,LT&LM,C NA+	-3B -3-3+6+6	118.654	154.416	103.131	0.5	0.5	0.5	92.75	1.24	2.56	2	2	M-16(8.8)	80.73	83.262	0° C5-,C NA-	+12B -3-3+6+6	158.484	1	1.75
92A	SAE																											

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont-rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
103A	SAE	100*100*7	355	90.66	Comp	90.66	-214.786	0° C5,C NA+	+3B +6+6-3-3	236.913	482.547	369.019	2	1	1	62.19	1.23	0.952	3	4	M-20(8.8)	62.48	204.252	0° C5-, Min. WS,C NA-	+3B +6+6-3-3	326.932	1	2.15
104A	SAE	100*100*6	355	66.68	Comp	66.68	-143.2	10° SC1,EW<,C NA+	+0B -3-3-3+6	214.744	482.547	316.302	2.856	1.428	1.428	78.4	1.14	0.848	2	4	M-20(8.8)	49.92	140.018	10° SC1,EW<,C NA+	+3B -3-3-3+6	280.496	1	2.15
105	SAE	100*100*6	355	87.31	Comp	87.31	-135.804	0° C5-,C NA-	-3B +6-3-3-3	155.536	361.91	237.226	2	1	1	84.28	1.4	1.302	3	3	M-20(8.8)	57.64	136.747	0° C5,C NA+	-3B +6-3-3-3	280.496	1	2.15
105A	SAE	100*100*6	355	71.85	Comp	71.85	-111.745	10° SC1,EW<,C NA+	+3B -3-3-3+6	155.536	361.91	237.226	2	1	1	84.28	1.4	1.302	3	3	M-20(8.8)	42.58	101.009	10° SC1,EW<,C NA+	+0B -3-3-3+6	280.496	1	2.15
106	SAE	110*110*7	355	97.25	Tens	94.54	-136.501	0° C5-,C NA-	-3B -3-3+6+6	152.873	154.416	144.384	1.5	1	1	118.36	1.65	2.604	8	2	M-16(8.8)	97.25	140.413	0° C5,C NA+	-3B -3-3+6+6	380.7	1	1.75
107	SAE	60*60*5	355	23.63	Climb	14.26	-17.418	0° C5, Min. WS,C NA+	+0B +6+6+6-3	122.118	154.416	103.131	1	1	1	83.86	1.1	0.981	1	2	M-16(8.8)	7.36	12.324	0° C5,C NA+	+9B +6+6-3+6	167.339	1	1.75
106A	SAE	110*110*7	355	94.52	Comp	94.52	-136.466	0° C5,C NA+	-3B -3-3+6+6	152.873	154.416	144.384	3	1	1	114.21	1.65	1.302	8	2	M-16(8.8)	90.83	131.15	0° C5-, Min. WS,C NA-	-3B -3-3+6+6	380.7	1	1.75
108	SAE	60*60*5	355	90.76	Comp	90.76	-39.332	0° C5-,C NA-	-3B -3-3+6+6	43.338	154.416	103.131	2	1	1	152.48	2.01	1.388	8	2	M-16(8.8)	37.79	38.974	0° C5-,C NA-	-3B -3-3+6+6	129.532	1	1.75
203	SAE	80*80*6	355	36.12	Climb	17.86	-28.242	0° C5, Min. WS,C NA+	-3B -3+6+6-3	158.168	0	0	1	1	1	97.11	1.27	1.525	1	0	M-16(8.8)	9.54	11.808	0° C5-,C NA-	-3B -3+6+6-3	221.84	1	1.75
204	SAE	80*80*6	235	79.34	Climb	69.11	-34.198	0° C5-,C NA-	-3B -3-3+6+6	49.482	154.416	94.793	2	1	1	176.73	1.93	2.156	8	2	M-16(8.8)	35.03	33.21	0° C5-,C NA-	-3B -3-3+6+6	169.92	1	1.75
301	SAE	180*180*16	355	75.6	Tens	74.55	-1303.213	0° C5-,C NA-	+0B +6+6-3-3	1748.059	2412.736	2256	1	1	1	27.04	0.35	0.955	1	10	M-20(8.8)	75.6	1170.866	0° C5, Min. WS,C NA+	+0B +6+6-3-3	1548.789	2.8	2.15
302	SAE	180*180*16	355	77.24	Tens	77.13	-1342.416	0° C5-,C NA-	+0B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	77.24	1196.272	0° C5, Min. WS,C NA+	+0B +6+6-3-3	1548.789	2.8	2.15
304	SAE	60*60*5	355	90.1	Comp	90.1	-55.209	0° SC1,EW<,C NA+	+0B -3+6+6+6	61.277	0	0	1	1	1	137.29	1.67	1.606	4	0	M-16(8.8)	38.1	39.288	10° SC1,EW&RT,C NA+	+0B +6+6-3+6	129.532	1	1.75
308	SAE	60*60*5	355	89.84	Climb	84.42	-26.22	0° C2-, Min. WS,C BI-	+9B -3+6+6+6	31.058	154.416	103.131	3	1	1	197.35	2.39	1.197	8	2	M-16(8.8)	29.89	30.823	0° C6-,C BI-	+0B -3-3+6+6	129.532	1	1.75
303	SAE	130*130*8	355	95.48	Comp	95.48	-165.397	0° C5,C NA+	+0B -3-3-3+6	173.23	231.623	247.515	5	1	1	132.14	1.79	1.062	8	3	M-16(8.8)	65.33	151.323	0° C5-, Min. WS,C NA-	+0B -3-3-3+6	515.496	1	1.75
303A	SAE	130*130*8	355	88.07	Comp	88.07	-152.56	0° C5-,C NA-	+0B -3+6+6+6	173.23	231.623	247.515	5	1	1	132.14	1.79	1.062	8	3	M-16(8.8)	62.39	144.5	0° C5, Min. WS,C NA+	+0B -3+6+6+6	515.496	1	1.75
306	DAE	55*55*5	355	90.86	Comp	90.86	-90.378	10° SC1,EW<,C NA+	+0B +6+6+6+6	99.474	154.416	206.263	1	1	1	125.61	1.78	2.085	8	2	M-16(8.8)	49.15	75.897	10° SC1,EW&RT,C NA+	+0B +6+6+6+6	230.864	2	1.75
307	SAE	80*80*6	355	17.44	Climb	17.41	-21.545	0° C5, Min. WS,C NA+	+0B -3+6+6-3	154.001	154.416	123.758	1	1	1	97.1	1.29	1.525	2	2	M-16(8.8)	12.2	15.096	0° C1-,C NA-	+0B -3+6+6-3	221.84	1	1.75
309	SAE	80*80*6	355	52.52	Climb	5.34	-3.083	10° C2-, Min. WS,C BI-	+0B -3+6+6+6	57.778	154.416	123.758	2	1	1	176.72	2.21	2.156	8	2	M-16(8.8)	4.18	5.174	10° C2,C BI+	+0B -3+6+6+6	221.84	1	1.75
311	SAE	65*65*5	355	16.01	Comp	16.01	-7.513	10° C2, Min. WS,C BI+	+0B -3+6+6+6	46.913	154.416	103.131	1	1	1	177.96	2.01	2.313	8	2	M-16(8.8)	7.71	7.956	0° C2-,C BI-	+0B -3+6+6+6	144.384	1	1.75
310	SAE	75*75*5	355	26.55	Comp	26.55	-15.162	0° C2-,C BI-	+0B -3+6+6+6	57.119	154.416	103.131	0.655	0.655	0.655	170.03	1.91	3.892	6	2	M-16(8.8)	10.75	11.083	10° C2, Min. WS,C BI+	+0B -3+6+6+6	172.584	1	1.75
305	SAE	70*70*5	355	92.54	Comp	92.54	-44.581	10° SC1,EW&RT,C NA+	+0B +6+6-3+6	48.172	154.416	103.131	2	1	1	158.58	2.05	1.697	8	2	M-16(8.8)	51.53	53.145	10° SC1,EW<,C NA+	+0B -3+6+6+6	158.484	1	1.75
201	SAE	180*180*16	355	81.05	Tens	79.08	-1383.926	0° C5-,C NA-	-3B +6+6-3-3	1749.935	2412.736	2256	1	1	1	26.53	0.35	0.937	1	10	M-20(8.8)	81.05	1255.257	0° C5, Min. WS,C NA+	-3B +6+6-3-3	1548.789	2.8	2.15
202	SAE	110*110*9	355	89.07	Comp	89.07	-151.579	0° C5,C NA+	-3B -3-3-3+6	170.188	231.623	278.455	4	1	1	131.3	1.83	1.109	8	3	M-16(8.8)	60.29	139.656	0° C5-, Min. WS,C NA-	-3B -3-3-3+6	474.324	1	1.75
202A	SAE	110*110*9	355	69.95	Comp	69.95	-119.053	0° C5-,C NA-	-3B -3+6+6+6	170.188	231.623	278.455	4	1	1	131.3	1.83	1.109	8	3	M-16(8.8)	50.06	115.944	0° C5, Min. WS,C NA+	-3B -3+6+6+6	474.324	1	1.75
4000	SAE	180*180*16	355	65.77	Comp	65.77	-1099.69	0° C5,C NA+	+12B +0+0+0+0	1672.026	2412.736	2256	1	1	1	43.61	0.57	1.539	1	10	M-20(8.8)	61.88	958.372	0° C5, Min. WS,C NA+	-3B +0+0+0+0	1548.789	2.8	2.15
4010	SAE	90*90*6	355	57.22	Comp	57.22	-70.815	10° C6,C BI+	+12B +0+0+0+0	141.697	154.416	123.758	1	1	1	110.99	1.42	1.976	6	2	M-16(8.8)	47.99	59.397	0° C2-, Min. WS,C BI-	+12B +0+0+0+0	257.56	1	1.75
601	SAE	180*180*16	355	72.67	Tens	71.82	-1259.719	0° C5-,C NA-	+6B +6+6-3-3	1753.895	2412.736	2256	1	1	1	25.44	0.33	0.898	1	10	M-20(8.8)	72.67	1125.49	0° C5, Min. WS,C NA+	+6B +6+6-3-3	1548.789	2.8	2.15
602	SAE	180*180*16	355	73.81	Tens	73.72	-1292.951	0° C5,C NA+	+6B +6+6-3-3	1753.895	2412.736	2256	1	1	1	25.44	0.33	0.898	1	10	M-20(8.8)	73.81	1143.186	0° C5-, Min. WS,C NA-	+6B +6+6-3-3	1548.789	2.8	2.15
603	SAE	180*180*16	355	76	Comp	76	-1322.729	0° C5,C NA+	+6B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	74.71	1157.11	0° C5-, Min. WS,C NA-	+6B +6+6-3-3	1548.789	2.8	2.15
604	SAE	100*100*6	355	85.01	Comp	85.01	-65.684	0° C5-,C NA-	+6B -3-3-3+6	77.265	154.416	123.758	2	1	1	164.03	2.04	2.534	8	2	M-16(8.8)	56.06	69.38	0° C5,C NA+	+6B -3-3-3+6	289.52	1	1.75
604A	SAE	100*100*6	355	92.14	Comp	92.14	-71.194	0° C5-,C NA-	+6B +6+6-3-3	77.265	154.416	123.758	4	1	1	164.03	2.04	1.267	8	2	M-16(8.8)	54.15	67.01	0° C5, Min. WS,C NA+	+6B +6+6-3-3	289.52	1	1.75
606	SAE	70*70*5	355	69.1	Comp	69.1	-43	10° C6, Min. WS,C BI+	+6B -3+6+6-3	62.225	0	0	1	1	1	151.93	1.77	2.097	4	0	M-16(8.8)	21.42	22.088	0° C2-,C BI-	+6B -3+6+6+6	158.484	1	1.75
607	SAE	70*70*5	355	87.87	Climb	80	-25.143	0° C5,C NA+	+6B -3-3+6+6	31.427	154.416	103.131	3	1	1	219.08	2.56	1.563	8	2	M-16(8.8)	31.71	32.698	0° C6-,C BI-	+6B +6-3+6+6	158.484	1	1.75
608	DAE	60*60*5	355	84.03	Comp	84.03	-82.907	10° C6,C BI+	+6B +6+6+6+6	98.667	154.416	206.263	1	1	1	136.84	1.87	2.504	8	2	M-16(8.8)	48.11	74.291	10° C6, Min. WS,C BI+	+6B +6+6+6+6	259.064	2	1.75
609	SAE	65*65*5	355	10.17	Comp	10.17	-5.391	10° C2, Min. WS,C BI+	+6B -3+6+6+6	53.006	154.416	103.131	1	1	1	163.15	1.89	2.121	8	2	M-16(8.8)	5.91	6.097	10° C2-,C BI-	+6B -3+6+6+6	144.384	1	1.75
610	SAE	70*70*5	355	39.01	Climb	26.1	-13.082	10° C2-, Min. WS,C BI-	+6B -3+6+6+6	50.117	154.416	103.131	0.593	0.593	0.593	178.5	2	4.157	6	2	M-16(8.8)	8.94	9.222	10° C2,C BI+	+6B -3+6+6+6	158.484	1	1.75
611	SAE	65*65*5	355	67.58	Comp	67.58	-27.545	10° C2,C BI+	+6B +6+6+6+6	40.758	154.416	103.131	2	1	1	171.4	2.17	1.697	8	2	M-16(8.8)	32.68	33.706	10° C2,C BI+	+6B -3+6+6+6	144.384	1	1.75
612	SAE	80*80*6	355	17.44	Climb	17.07	-21.13	0° C5, Min. WS,C NA+	+6B -3+6+6-3	153.995	154.416	123.758	1	1	1	97.11	1.29	1.525	2	2	M-16(8.8)	11.86	14.676	0° C2-,C BI-	+6B -3+6+6-3	221.84	1	1.75
613	SAE	80*80*6	355	52.52	Climb	6.55	-3.786	10° C2-, Min. WS,C BI-	+6B -3+6+6+6	57.776	154.416	123.758	2	1	1	176.72	2.21	2.156	8	2	M-16(8.8)	5	6.193	10° C2, Min. WS,C BI+	+6B -3+6+6+6	221.84	1	1.75
605	SAE	100*100*7	355	86.37	Comp	86.37	-78.671	0° C5,C NA+	+6B -3-3-3+6	91.09	154.416	144.384	4	1	1	165.64	2.1	1.267	8	2	M-16(8.8)	48.24	69.651	0° C5-, Min. WS,C NA-	+6B -3-3-3+6	337.46	1	1.75
605A	SAE	100*100*7	355	92.29	Comp	92.29	-84.067	0° C5-,C NA-	+6B -3+6+6+6	91.09	154.416	144.384	4	1	1													

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont- rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
R18	SAE	50°50°4	355	85.92	Climb	17.14	-2.975	0° C5-, Min. WS,C NA-	+0B -3+6+6-3	17.357	77.208	45.12	1	1	1	200.24	2.62	1.962	7	1	M-16(8.8)	8.24	3.717	0° C5,C NA+	+0B -3+6+6-3	50.76	1	1.75
R30	SAE	45°45°4	355	83.61	Tens	69.15	-49.226	0° C5, Min. WS,C NA+	+0B -3+6+6+6	71.182	154.416	82.505	1	1	1	73.01	1.12	0.643	3	2	M-16(8.8)	83.61	59.415	0° C5-,C NA-	+0B +6+6+6-3	71.064	1	1.75
R31	SAE	65°65°4	355	90.44	Comp	90.44	-72.135	0° C5-,C NA-	+0B +6+6+6-3	79.757	154.416	82.505	1	1	1	94.81	1.28	1.233	3	2	M-16(8.8)	72.53	59.842	0° C5, Min. WS,C NA+	+0B -3+6+6+6	117.688	1	1.75
R32	SAE	45°45°4	355	87.11	Comp	87.11	-24.838	0° C5, Min. WS,C NA+	+0B -3+6+6+6	28.512	77.208	45.12	1	1	1	146.03	1.91	1.285	7	1	M-16(8.8)	69.94	30.24	0° C5,C NA+	+0B +6+6-3+6	43.24	1	1.75
R33	SAE	55°55°4	235	85.63	Comp	85.63	-24.566	0° C5-,C NA-	+0B +6+6+6-3	28.687	77.208	34.56	1	1	1	160.6	1.71	1.718	7	1	M-16(8.8)	57.42	19.843	0° C5, Min. WS,C NA+	+0B +6+6+6-3	45.216	1	1.75
R34	SAE	55°55°4	355	82.63	Comp	82.63	-19.483	0° C5-, Min. WS,C NA-	+0B +6+6+6+6	23.579	77.208	45.12	1	1	1	180.15	2.34	1.928	7	1	M-16(8.8)	47.79	21.563	0° C5,C NA+	+0B +6+6+6+6	59.032	1	1.75
R36A	SAE	65°65°4	235	92.61	Comp	92.61	-30.208	0° C5-,C NA-	+0B +6+6-3-3	32.618	77.208	34.56	2	1	1	147.52	1.75	1.46	7	1	M-16(8.8)	82.92	28.659	0° C5, Min. WS,C NA+	+0B +6+6-3-3	57.312	1	1.75
R35	SAE	45°45°4	235	52.79	Redun	52.79	-15.469	0° C1,C NA+	+0B +6+6-3-3	29.302	77.208	34.56	1	1	1	141.34	1.51	1.244	7	1	M-16(8.8)	46.71	15.469	0° C1,C NA+	+0B +6+6-3-3	33.12	1	1.75
R36	SAE	45°45°4	355	76.32	Redun	73.14	-33.001	0° C1,C NA+	+0B +6+6-3-3	48.237	77.208	45.12	1	1	1	109.52	1.43	0.964	7	1	M-16(8.8)	76.32	33.001	0° C1,C NA+	+0B +6+6-3-3	43.24	1	1.75
R40	SAE	55°55°4	355	92.31	Redun	92.31	-34.445	0° C1,C NA+	+0B +6+6-3-3	37.314	77.208	45.12	1	1	1	141.54	1.84	1.514	7	1	M-16(8.8)	76.34	34.445	0° C1,C NA+	+0B +6+6-3-3	59.032	1	1.75
R41	SAE	45°45°4	235	61.75	Climb	0	0		+12B +6+6+6+6	0	0	0	0	0	0	0	0	0	0	0		33.92	11.234	10° C2-, Min. WS,C BI-	+0B -3+6+6-3	33.12	1	1.75
R42	SAE	50°50°4	355	93.94	Climb	0	0		+12B +6+6+6+6	0	0	0	0	0	0	0	0	0	0	0		49.95	22.54	10° C2-, Min. WS,C BI-	+0B -3+6+6-3	50.76	1	1.75
R43	SAE	45°45°4	235	43.58	Climb	1.23	-0.423	0° C1,C NA+	+9B +6+6+6-3	55.057	77.208	34.56	1	1	1	60.85	0.98	0.535	3	1	M-16(8.8)	1.37	0.453	0° C1, Min. WS,C NA+	+9B +6+6+6+6	33.12	1	1.75
R38	SAE	45°45°4	235	80.82	Comp	80.82	-10.018	10° C6,C BI+	+0B -3+6+6+6	12.395	77.208	34.56	1	1	1	223.72	2.38	1.969	7	1	M-16(8.8)	25.52	8.452	0° C5, Min. WS,C NA+	+0B +6+6-3-3	33.12	1	1.75
R37	SAE	55°55°4	355	92.24	Redun	92.24	-33.994	0° C1,C NA+	+0B +6+6-3-3	36.854	77.208	45.12	1	1	1	142.48	1.85	1.525	7	1	M-16(8.8)	75.34	33.994	0° C1,C NA+	+0B +6+6-3-3	59.032	1	1.75
R45	SAE	50°50°4	355	94.58	Climb	16.64	-2.406	10° C2,C BI+	+0B -3+6+6-3	14.457	77.208	45.12	1	1	1	220	2.88	2.156	7	1	M-16(8.8)	4.26	1.922	10° C2-, Min. WS,C BI-	+0B -3+6+6-3	50.76	1	1.75
R44	SAE	45°45°4	355	82.86	Climb	5.87	-1.209	0° C1,C BI-	+0B -3+6+6+6	20.593	77.208	45.12	1	1	1	173.24	2.27	1.525	7	1	M-16(8.8)	2.88	1.244	+0B -3+6+6+6		43.24	1	1.75
R19	SAE	45°45°4	355	83.4	Tens	79.6	-49.059	0° C5-, Min. WS,C NA-	-3B +6+6+6+6	61.628	154.416	82.505	1	1	1	86.63	1.24	0.762	3	2	M-16(8.8)	83.4	59.268	0° C5,C NA+	-3B +6+6+6+6	71.064	1	1.75
R20	SAE	55°55°5	355	92	Comp	92	-60.123	0° C5,C NA+	-3B +6+6+6+6	65.35	154.416	103.131	1	1	1	121.34	1.53	1.298	8	2	M-16(8.8)	47.9	49.399	0° C5-, Min. WS,C NA-	-3B +6+6+6+6	115.432	1	1.75
R21	SAE	50°50°4	355	87.34	Comp	87.34	-24.621	0° C5-, Min. WS,C NA-	-3B +6+6+6+6	28.191	77.208	45.12	1	1	1	155.57	2.04	1.525	7	1	M-16(8.8)	62.42	28.164	0° C5,C NA+	-3B +6+6+6+6	50.76	1	1.75
R23A	SAE	60°60°4	355	94.39	Comp	94.39	-33.044	0° C5-,C NA-	-3B -3+6+6+6	35.007	77.208	45.12	2	1	1	141.89	1.96	1.298	7	1	M-16(8.8)	71.75	32.373	0° C5, Min. WS,C NA+	-3B +6+6-3-3	66.552	1	1.75
R22	SAE	45°45°4	235	47.3	Redun	45.53	-15.666	0° C1,C NA+	-3B +6+6-3-3	34.406	77.208	34.56	1	1	1	126.07	1.37	1.109	3	1	M-16(8.8)	47.3	15.666	0° C1,C NA+	-3B +6+6-3-3	33.12	1	1.75
R23	SAE	45°45°4	355	81.05	Redun	77.67	-35.045	0° C1,C NA+	-3B +6+6-3-3	61.628	77.208	45.12	1	1	1	86.63	1.24	0.762	3	1	M-16(8.8)	81.05	35.045	0° C1,C NA+	-3B +6+6-3-3	43.24	1	1.75
R25	SAE	50°50°4	355	94.58	Climb	35.5	-5.132	0° C5,C NA+	-3B -3+6+6-3	14.456	77.208	45.12	1	1	1	220.01	2.88	2.156	7	1	M-16(8.8)	10.91	4.92	10° C2-, Min. WS,C BI-	-3B -3+6+6-3	50.76	1	1.75
R24	SAE	45°45°4	355	82.87	Climb	19.15	-3.943	0° C5-,C NA-	-3B -3+6+6-3	20.591	77.208	45.12	1	1	1	173.25	2.27	1.525	7	1	M-16(8.8)	8.91	3.852	0° C5,C NA+	-3B -3+6+6-3	43.24	1	1.75
R26	SAE	65°65°4	355	79.95	Climb	49.29	-8.278	0° C5-,C NA-	-3B -3+6+6-3	16.795	77.208	45.12	1	1	1	234.55	2.95	3.049	7	1	M-16(8.8)	17.96	8.103	0° C5,C NA+	-3B -3+6+6-3	74.824	1	1.75
500	SAE	50°50°4	235	72.02	Redun	72.02	-8.828	0° C1,C NA+	+12B +0+0+0+0	12.258	77.208	34.56	1	1	1	238.02	2.53	2.333	7	1	M-16(8.8)	25.54	8.828	0° C1,C NA+	+12B +0+0+0+0	38.88	1	1.75
R501	SAE	45°45°4	235	20.47	Redun	20.47	-4.041	0° C1,C NA+	+12B +0+0+0+0	19.737	77.208	34.56	1	1	1	175.27	1.87	1.542	7	1	M-16(8.8)	12.2	4.041	0° C1,C NA+	+12B +0+0+0+0	33.12	1	1.75
R502	SAE	50°50°4	355	95.63	Redun	95.63	-15.501	0° C1,C NA+	+12B +0+0+0+0	16.209	77.208	45.12	1	1	1	207.43	2.71	2.033	7	1	M-16(8.8)	34.35	15.501	0° C1,C NA+	+12B +0+0+0+0	50.76	1	1.75
R503	SAE	50°50°4	355	96.08	Comp	96.08	-21.89	0° C5-,C NA-	-3B +0+0+0+0	22.784	77.208	45.12	1	1	1	173.91	2.28	1.704	7	1	M-16(8.8)	49.93	22.53	0° C5, Min. WS,C NA+	-3B +0+0+0+0	50.76	1	1.75
R504	SAE	45°45°4	235	83.09	Climb	69.98	-24.187	0° C5, Min. WS,C NA+	-3B +0+0+0+0	37.697	77.208	34.56	1	1	1	115.52	1.3	1.017	3	1	M-16(8.8)	73.85	24.459	0° C5-,C NA-	-3B +0+0+0+0	33.12	1	1.75
R505	SAE	60°60°5	355	94.33	Climb	7.95	-1.699	10° C2, Min. WS,C BI+	+12B +0+0+0+0	21.381	77.208	56.4	1	0.6	0.6	221.8	2.9	4.037	7	1	M-16(8.8)	3.57	2.013	10° C2, Min. WS,C BI+	+12B +0+0+0+0	82.532	1	1.75
R506	SAE	45°45°4	235	25.31	Comp	25.31	-3.333	10° C2,C BI+	+12B +0+0+0+0	13.168	77.208	34.56	1	0.667	0.667	214.7	2.31	2.834	7	1	M-16(8.8)	8.68	2.875	10° C2, Min. WS,C BI+	+12B +0+0+0+0	33.12	1	1.75
R507	SAE	45°45°4	355	78.08	Climb	18.8	-4.332	0° C2-, Min. WS,C BI-	+12B +0+0+0+0	23.043	77.208	45.12	1	1	1	163.36	2.14	1.438	7	1	M-16(8.8)	10.41	4.503	0° C2,C BI+	+12B +0+0+0+0	43.24	1	1.75
401	SAE	180°180°16	355	78.08	Tens	76.74	-1328.97	0° C5-,C NA-	+3B -3+6+6+6	1731.74	2412.736	2256	1	1	1	31.26	0.41	1.103	1	10	M-20(8.8)	78.08	1209.276	0° C5, Min. WS,C NA+	+3B -3+6+6+6	1548.789	2.8	2.15
501	SAE	180°180°16	355	74.94	Tens	74.78	-1291.352	0° C5-,C NA-	+3B +6+6-3-3	1726.756	2412.736	2256	1	1	1	32.47	0.42	1.146	1	10	M-20(8.8)	74.94	1160.71	0° C5, Min. WS,C NA+	+3B +6+6-3-3	1548.789	2.8	2.15
502	SAE	180°180°16	355	76.01	Comp	76.01	-1322.808	0° C5-,C NA-	+3B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	75.65	1171.718	0° C5, Min. WS,C NA+	+3B +6+6-3-3	1548.789	2.8	2.15
504	SAE	70°70°5	355	68.29	Climb	62.58	-45.765	10° C6,C BI+	+3B -3+6+6+6	73.128	0	0	1	1	1	134.17	1.62	1.851	4	0	M-16(8.8)	24.7	25.476	0° C2-, Min. WS,C BI-	+3B -3+6+6+6	158.484	1	1.75
509	SAE	65°65°5	355	91.1	Comp	91.1	-28.481	0° C2-, Min. WS,C BI-	+12B -3+6+6+6	31.262	154.416	103.131	3	1	1	209.09	2.49	1.38	8	2	M-16(8.8)	32.99	34.021	0° C2,C BI+	+12B -3+6+6+6	144.384	1	1.75
402	SAE	110°110°7	355	67.36	Tens	63.44	-91.604	0° C5-,C NA-	+3B +6-3-3-3	248.06	154.416	144.384	2	1	1	90.81	1.25	1.553	2	2	M-16(8.8)	67.36	97.264	0° C5,C NA+	+3B +6-3-3-3	380.7	1	1.75
402A	SAE	110°110°7	355	62.51	Cross	62.51	-46.335	0° C5-, Min. WS,C NA-	+3B +6+6+6+6	74.128	154.416	144.384	2	3.554	1	207.65	2.42	1.998	8	2	M-16(8.8)	49.64	71.668	10° SC1,EW<,C NA+	+3B -3-3+6+6	380.7	1	1.75
506	DAE	55°55°5	355	86.84	Comp	86.84	-79.138	10° C6,C BI+	+3B +6+6+6+6	91.128	154.416	206.263	1	1	1	135.63	1.86	2.251	8	2	M-16(8.8)	46.16	71.271	10° C6, Min. WS,C BI+	+3B +6+6+6+6	230.864	2	1.75
508	SAE	80°80°6	355	18.37	Comp	18.37	-22.738	0° C5, Min. WS,C NA+	+3B -3+6+6-3	154.01	154.416	123.758	1	1	1	97.1	1.29	1.524	2	2	M-16(8.8)	12.85	15.909	0° C5-,C NA-	+3B -3+6+6-3	221.84	1	1.

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont- rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
R62	SAE	60°60*4	355	90.63	Redun	90.63	-33.942	0° C1,C NA+	+3B +6+6-3-3	37.45	77.208	45.12	1	1	1	147.93	1.89	1.746	7	1	M-16(8.8)	75.23	33.942	0° C1,C NA+	+3B +6+6-3-3	66.552	1	1.75
R63	SAE	45°45*4	235	71.25	Climb	0	0		+12B +6+6+6+6	43.469	77.208	34.56	1	1	1	99.18	1.19	0.873	3	1	M-16(8.8)	33.95	11.245	10° C2-,C BI-	+3B -3-3+6+6	33.12	1	1.75
R64	SAE	55°55*4	355	89.9	Climb	0	0		+12B +6+6+6+6	30.357	77.208	45.12	2	1	1	147.82	2.05	1.234	7	1	M-16(8.8)	50.36	22.722	10° C5-, Min. WS,C NA-	+3B -3-3+6+6-3	59.032	1	1.75
R65	SAE	45°45*4	235	50.27	Climb	1.74	-0.601	0° C1-,C NA-	+12B +6-3+6+6	52.714	77.208	34.56	1	1	1	70.13	1.02	0.617	3	1	M-16(8.8)	1.94	0.644	0° C1, Min. WS,C NA+	+12B +6+6+6+6	33.12	1	1.75
R61	SAE	45°45*4	235	90.68	Comp	90.68	-11.241	0° C5,C NA+	+3B +6+6-3-3	12.396	77.208	34.56	1	1	1	223.71	2.38	1.969	7	1	M-16(8.8)	28.07	9.296	0° C5-, Min. WS,C NA-	+3B +6+6-3-3	33.12	1	1.75
R60	SAE	55°55*4	235	96.93	Redun	96.93	-33.498	0° C1,C NA+	+3B +6+6-3-3	35.675	77.208	34.56	1	1	1	142.47	1.52	1.524	7	1	M-16(8.8)	96.93	33.498	0° C1,C NA+	+3B +6+6-3-3	45.216	1	1.75
R67	SAE	50°50*4	355	94.57	Climb	16.94	-2.449	10° C2,C BI+	+3B -3-3+6-3	14.459	77.208	45.12	1	1	1	219.99	2.88	2.156	7	1	M-16(8.8)	4.32	1.948	10° C2-, Min. WS,C BI-	+3B -3-3+6-3	50.76	1	1.75
R66	SAE	45°45*4	355	82.86	Climb	6.4	-1.317	0° C2-,C BI-	+3B -3+6+6+6	20.595	77.208	45.12	1	1	1	173.23	2.27	1.524	7	1	M-16(8.8)	3.14	1.36	10° C2,C BI+	+3B -3+6+6+6	43.24	1	1.75
R70	SAE	50°50*4	355	92.05	Comp	92.05	-26.803	0° C5,C NA+	+6B +6+6-3+6	29.118	77.208	45.12	2	1	1	142.3	2	1.081	7	1	M-16(8.8)	56.31	25.407	0° C5, Min. WS,C NA+	+6B +6+6-3-3	50.76	1	1.75
R73	SAE	50°50*4	355	71.59	Comp	71.59	-20.183	0° C5-, Min. WS,C NA-	+6B +6+6-3+6	28.191	77.208	45.12	1	1	1	155.57	2.04	1.525	7	1	M-16(8.8)	51.52	23.246	0° C5,C NA+	+6B +6+6-3+6	50.76	1	1.75
R72	SAE	45°45*4	235	63.9	Comp	63.9	-18.112	0° C5,C NA+	+6B -3-3+6+6	28.344	77.208	34.56	1	1	1	143.99	1.53	1.267	7	1	M-16(8.8)	47.45	15.714	0° C5-, Min. WS,C NA-	+6B -3-3+6+6	33.12	1	1.75
R71	SAE	45°45*4	235	96.32	Redun	92.3	-31.9	0° C1,C NA+	+6B +6+6-3-3	48.358	77.208	34.56	1	1	1	86.63	1.1	0.762	3	1	M-16(8.8)	96.32	31.9	0° C1,C NA+	+6B +6+6-3-3	33.12	1	1.75
R74	SAE	50°50*4	355	86.22	Comp	86.22	-38.903	0° C5,C NA+	+6B +6+6-3+6	53.059	77.208	45.12	1	1	1	110.36	1.44	1.081	7	1	M-16(8.8)	71.04	32.052	0° C5-, Min. WS,C NA-	+6B +6+6-3+6	50.76	1	1.75
R75	SAE	45°45*4	355	72.21	Tens	67.25	-41.444	0° C5-, Min. WS,C NA-	+6B +6-3+6+6	61.628	154.416	82.505	1	1	1	86.63	1.24	0.762	3	2	M-16(8.8)	72.21	51.315	0° C5,C NA+	+6B +6+6-3+6	71.064	1	1.75
R76	SAE	45°45*4	355	94.08	Tens	76.74	-31.886	0° C5-, Min. WS,C NA-	+6B +6+6-3+6	41.551	77.208	45.12	1	1	1	119.13	1.56	1.048	7	1	M-16(8.8)	94.08	40.679	0° C5,C NA+	+6B +6+6-3+6	43.24	1	1.75
R77	SAE	55°55*4	235	94.36	Comp	94.36	-32.612	0° C5,C NA+	+6B +6+6-3+6	37.375	77.208	34.56	1	1	1	138.79	1.48	1.485	7	1	M-16(8.8)	72.87	25.185	0° C5-, Min. WS,C NA-	+6B +6+6-3+6	45.216	1	1.75
R78	SAE	55°55*4	355	95.75	Comp	95.75	-19.196	0° C5-, Min. WS,C NA-	+6B +6+6-3+6	20.048	77.208	45.12	1	1	1	195.95	2.55	2.097	7	1	M-16(8.8)	51.32	23.156	0° C5,C NA+	+6B +6+6-3+6	59.032	1	1.75
R81	SAE	60°60*4	235	91.09	Comp	91.09	-23.783	0° C5,C NA+	+6B +6+6-3+6	26.109	77.208	34.56	2	1	1	162.3	1.89	1.485	7	1	M-16(8.8)	60.6	20.943	0° C5-, Min. WS,C NA-	+6B +6+6-3-3	50.976	1	1.75
R79	SAE	45°45*4	235	61.68	Redun	61.68	-17.481	0° C1,C NA+	+6B +6+6-3-3	28.344	77.208	34.56	1	1	1	143.99	1.53	1.267	7	1	M-16(8.8)	52.78	17.481	0° C1,C NA+	+6B +6+6-3-3	33.12	1	1.75
R80	SAE	45°45*4	355	78.8	Redun	78.8	-32.742	0° C1,C NA+	+6B +6+6-3-3	41.551	77.208	45.12	1	1	1	119.13	1.56	1.048	7	1	M-16(8.8)	75.72	32.742	0° C1,C NA+	+6B +6+6-3-3	43.24	1	1.75
R85	SAE	65°65*4	355	87.79	Redun	87.79	-33.94	0° C1,C NA+	+6B +6+6-3-3	38.659	77.208	45.12	1	1	1	152.06	1.91	1.977	7	1	M-16(8.8)	75.22	33.94	0° C1,C NA+	+6B +6+6-3-3	74.824	1	1.75
R86	SAE	45°45*4	235	80.77	Climb	0	0		+12B +6+6+6+6	0	0	0	0	0	0	0	0	0	0	0		31.15	10.315	10° C5-,C NA-	+6B -3+6+6-3	33.12	1	1.75
R87	SAE	60°60*4	355	85.28	Climb	0	0		+12B +6+6+6+6	0	0	0	0	0	0	0	0	0	0	0		47.86	21.597	10° C5-,C NA-	+6B -3+6+6-3	66.552	1	1.75
R88	SAE	45°45*4	235	56.97	Climb	0.96	-0.333	0° C1, Min. WS,C NA+	+6B -3+6+6-3	50.317	77.208	34.56	1	1	1	79.42	1.07	0.699	3	1	M-16(8.8)	1.06	0.352	0° C1-, Min. WS,C NA-	+6B +6+6-3-3	33.12	1	1.75
R83	SAE	45°45*4	235	78.67	Redun	78.67	-9.751	0° C1,C NA+	+6B +6+6-3-3	12.395	77.208	34.56	1	1	1	223.72	2.38	1.969	7	1	M-16(8.8)	29.44	9.751	0° C1,C NA+	+6B +6+6-3-3	33.12	1	1.75
R90	SAE	50°50*4	355	94.58	Climb	16.28	-2.353	10° C2,C BI+	+6B -3-3+6-3	14.457	77.208	45.12	1	1	1	220	2.88	2.156	7	1	M-16(8.8)	4.06	1.832	10° C2-, Min. WS,C BI-	+6B -3-3+6-3	50.76	1	1.75
R89	SAE	45°45*4	355	82.86	Climb	6.6	-1.358	0° C2-,C BI-	+6B -3+6+6+6	20.592	77.208	45.12	1	1	1	173.24	2.27	1.525	7	1	M-16(8.8)	3.25	1.405	10° C2,C BI+	+6B -3+6+6+6	43.24	1	1.75
R82	SAE	55°55*4	235	96.92	Redun	96.92	-33.496	0° C1,C NA+	+6B +6+6-3-3	35.671	77.208	34.56	1	1	1	142.48	1.52	1.525	7	1	M-16(8.8)	96.92	33.496	0° C1,C NA+	+6B +6+6-3-3	45.216	1	1.75
909	DAE	65°65*5	355	95.17	Comp	95.17	-97.493	10° C6,C BI+	+9B +6+6+6+6	102.437	154.416	206.263	1	1	1	142.44	1.92	2.82	8	2	M-16(8.8)	56.69	87.538	10° C6, Min. WS,C BI+	+9B +6+6+6+6	288.392	2	1.75
910	SAE	80°80*6	355	17.44	Climb	16.36	-20.252	0° C5, Min. WS,C NA+	+9B -3+6+6-3	154.003	154.416	123.758	1	1	1	97.1	1.29	1.524	2	2	M-16(8.8)	11.96	14.802	0° C2-,C BI-	+9B -3+6+6-3	221.84	1	1.75
912	SAE	80°80*6	355	52.52	Climb	8.84	-5.111	10° C2-, Min. WS,C BI-	+9B -3+6+6+6	57.779	154.416	123.758	2	1	1	176.72	2.21	2.156	8	2	M-16(8.8)	4.29	5.31	10° C2, Min. WS,C BI+	+9B -3+6+6+6	221.84	1	1.75
908	SAE	60°60*5	355	14.86	Comp	14.86	-6.489	10° C2, Min. WS,C BI+	+9B -3+6+6+6	43.666	154.416	103.131	1	1	1	176.23	2	2.062	8	2	M-16(8.8)	5.3	5.464	10° C2-,C BI-	+9B -3+6+6+6	129.532	1	1.75
913	SAE	70°70*5	355	38.93	Climb	24.44	-12.454	10° C2-,C BI-	+9B -3+6+6+6	50.951	154.416	103.131	0.566	0.566	0.566	176.44	1.99	4.305	6	2	M-16(8.8)	11.41	11.768	10° C2, Min. WS,C BI+	+9B -3+6+6+6	158.484	1	1.75
907	SAE	70°70*5	355	90.55	Comp	90.55	-43.619	10° C6,C BI+	+9B +6+6+6+6	48.173	154.416	103.131	2	1	1	158.58	2.05	1.697	8	2	M-16(8.8)	44.86	46.268	10° C6, Min. WS,C BI+	+9B +6+6+6+6	158.484	1	1.75
901	SAE	180°180*16	355	71.56	Tens	71.2	-1246.833	0° C5-,C NA-	+9B +6+6-3-3	1751.264	2412.736	2256	1	1	1	26.17	0.34	0.924	1	10	M-20(8.8)	71.56	1108.246	0° C5, Min. WS,C NA+	+9B +6+6-3-3	1548.789	2.8	2.15
902	SAE	180°180*16	355	73.84	Comp	73.84	-1293.097	0° C5,C NA+	+9B +6+6-3-3	1751.264	2412.736	2256	1	1	1	26.17	0.34	0.924	1	10	M-20(8.8)	73.03	1131.147	0° C5-, Min. WS,C NA-	+9B +6+6-3-3	1548.789	2.8	2.15
903	SAE	180°180*16	355	75.54	Comp	75.54	-1314.636	0° C5,C NA+	+9B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	73.37	1136.42	0° C5-, Min. WS,C NA-	+9B +6+6-3-3	1548.789	2.8	2.15
904	SAE	110°110*8	355	68.55	Comp	68.55	-71.778	10° C2-,C BI-	+9B +6+6-3-3	104.708	154.416	165.01	5	1	1	177.4	2.21	1.206	8	2	M-16(8.8)	40.19	62.054	10° C2-, Min. WS,C BI-	+9B -3-3+6-3	424.88	1	1.75
904A	SAE	110°110*8	355	94.11	Comp	94.11	-98.541	0° C5-,C NA-	+9B +6+6-3-3	104.708	154.416	165.01	5	1	1	177.4	2.21	1.206	8	2	M-16(8.8)	60.09	92.787	0° C5, Min. WS,C NA+	+9B +6+6-3-3	424.88	1	1.75
905	SAE	110°110*7	355	80.66	Comp	80.66	-74.228	0° C5,C NA+	+9B -3-3-3+6	92.031	154.416	144.384	5	1	1	176.36	2.16	1.206	8	2	M-16(8.8)	45.02	65.008	0° C5-, Min. WS,C NA-	+9B -3-3-3+6	380.7	1	1.75
905A	SAE	110°110*7	355	92.56	Comp	92.56	-85.185	0° C5-,C NA-	+9B -3+6+6+6	92.031	154.416	144.384	5	1	1	176.36	2.16	1.206	8	2	M-16(8.8)	53.97	77.93	0° C5, Min. WS,C NA+	+9B -3+6+6+6	380.7	1	1.75
R100	SAE	50°50*4	235	89.09	Comp	89.09	-19.428	0° C5,C NA+	+9B +6+6-3+6	21.806	77.208	34.56	2	1	1	161.08	1.88	1.224	7	1	M-16(8.8)	58.43	20.192	0° C5, Min. WS,C NA+	+9B +6+6-3-3	38.88	1	1.75
R101	SAE	45°45*4	235	95.33	Redun	91.36	-31.574	0° C1,C NA+	+9B +6+6-3-3	39.722	77.208	34.56	1	1	1	109.52	1.26	0.964	3	1	M-16(8.8)	95.33	31.574	0° C1,C NA+	+9B +6+6-3-3	33.12	1	1.75

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont-rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
R117	SAE	45*45*4	235	74.32	Comp	74.32	-9.212	0° C6,C BI+	+9B -3+6+6+6	12.396	77.208	34.56	1	1	1	223.72	2.38	1.969	7	1	M-16(8.8)	27.42	9.082	0° C1,C NA+	+9B +6+6-3-3	33.12	1	1.75
R119	SAE	65*65*5	235	88.69	Redun	88.69	-33.732	0° C1,C NA+	+9B +6+6-3-3	38.034	77.208	43.2	1	1	1	169.84	1.81	2.208	7	1	M-16(8.8)	78.08	33.732	0° C1,C NA+	+9B +6+6-3-3	70.992	1	1.75
R120	SAE	45*45*4	235	90.31	Climb	19.7	-6.81	10° C2, Min. WS,C BI+	+9B -3+6+6-3	34.591	77.208	34.56	1	1	1	125.45	1.37	1.104	3	1	M-16(8.8)	18.66	6.18	0° C2-,C BI-	+9B -3+6+6-3	33.12	1	1.75
R121	SAE	60*60*4	355	95.61	Climb	51.63	-13.591	0° C1, Min. WS,C NA+	+9B -3+6+6-3	26.326	77.208	45.12	2	1	1	170.62	2.28	1.561	7	1	M-16(8.8)	27.34	12.334	10° C1-,C NA-	+9B -3+6+6-3	66.552	1	1.75
R122	SAE	45*45*4	235	63.67	Climb	1.04	-0.358	0° C1,C NA+	+9B +6+6+6+6	47.531	77.208	34.56	1	1	1	88.7	1.11	0.781	3	1	M-16(8.8)	1.09	0.36	0° C1, Min. WS,C NA+	+9B -3+6+6-3	33.12	1	1.75
R123	SAE	45*45*4	355	82.86	Climb	7.57	-1.56	0° C2-,C BI-	+9B -3+6+6-3	20.594	77.208	45.12	1	1	1	173.24	2.27	1.524	7	1	M-16(8.8)	3.71	1.606	10° C2,C BI+	+9B -3+6+6-3	43.24	1	1.75
R124	SAE	50*50*4	355	94.57	Climb	16.81	-2.43	10° C2,C BI+	+9B -3+6+6-3	14.458	77.208	45.12	1	1	1	220	2.88	2.156	7	1	M-16(8.8)	4.16	1.877	10° C2-, Min. WS,C BI-	+9B -3+6+6-3	50.76	1	1.75
906	SAE	75*75*6	355	55.19	Comp	55.19	-41.72	0° C6-, Min. WS,C BI-	+9B +6+6+6+6	75.594	0	0	1	1	1	159.31	1.86	2.342	4	0	M-16(8.8)	31.79	39.348	+9B +6+6+6+6	+9B +6+6+6+6	204.92	1	1.75
911	SAE	75*75*6	355	97.77	Comp	97.77	-36.982	10° C2, Min. WS,C BI+	+9B -3+6+6+6	37.826	154.416	123.758	3	1	1	229.67	2.66	1.745	8	2	M-16(8.8)	29.26	36.215	10° C2-,C BI-	+9B -3+6+6+6	204.92	1	1.75
R200	SAE	60*60*4	235	90.32	Comp	90.32	-26.81	0° C5,C NA+	+12B +6+3+6+6	29.685	77.208	34.56	2	1	1	148.64	1.76	1.36	7	1	M-16(8.8)	76.83	26.552	0° C5-, Min. WS,C NA-	+12B -3+3+6+6	50.976	1	1.75
R201	SAE	50*50*4	355	96.6	Comp	96.6	-18.764	0° C5-, Min. WS,C NA-	+12B +6+3+6+6	19.424	77.208	45.12	1	1	1	188.93	2.47	1.851	7	1	M-16(8.8)	46.54	21	0° C5,C NA+	+12B +6+3+6+6	50.76	1	1.75
R202	SAE	45*45*4	235	93.19	Redun	89.3	-30.864	0° C1,C NA+	+12B +6+6-3-3	41.251	77.208	34.56	1	1	1	105.2	1.23	0.926	3	1	M-16(8.8)	93.19	30.864	0° C1,C NA+	+12B +6+6-3-3	33.12	1	1.75
R203	SAE	50*50*4	235	77.93	Comp	77.93	-19.782	0° C5,C NA+	+12B +6+6-3-3	25.385	77.208	34.56	1	1	1	162.33	1.73	1.591	7	1	M-16(8.8)	49.81	17.213	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	38.88	1	1.75
R204	SAE	55*55*4	355	89.43	Comp	89.43	-40.351	0° C5,C NA+	+12B +6+3+6+6	45.554	77.208	45.12	1	1	1	127.11	1.65	1.36	7	1	M-16(8.8)	72.81	32.85	0° C5-, Min. WS,C NA-	+12B +6+3+6+6	59.032	1	1.75
R205	SAE	45*45*4	235	93.2	Comp	93.2	-38.448	0° C5-, Min. WS,C NA-	+12B +6+3+6+6	41.251	154.416	63.195	1	1	1	105.2	1.23	0.926	3	2	M-16(8.8)	89.09	48.494	0° C5,C NA+	+12B +6+3+6+6	54.432	1	1.75
R206	SAE	50*50*4	355	95.96	Tens	86.96	-33.385	0° C5-, Min. WS,C NA-	+12B +6+3+6+6	38.393	77.208	45.12	1	1	1	131.99	1.73	1.293	7	1	M-16(8.8)	95.96	43.298	0° C5,C NA+	+12B +6+3+6+6	50.76	1	1.75
R207	SAE	60*60*5	235	95.4	Comp	95.4	-37.433	0° C5,C NA+	+12B +6+3+6+6	39.24	77.208	43.2	1	1	1	159.49	1.7	1.866	7	1	M-16(8.8)	65.05	28.102	0° C5-, Min. WS,C NA-	+12B +6+3+6+6	63.216	1	1.75
R208	SAE	65*65*4	355	74.9	Comp	74.9	-17.308	0° C5-, Min. WS,C NA-	+12B +6+3+6+6	23.109	77.208	45.12	1	1	1	199	2.5	2.587	7	1	M-16(8.8)	44.56	20.105	0° C5,C NA+	+12B +6+3+6+6	74.824	1	1.75
R209	SAE	60*60*5	355	90.99	Comp	90.99	-22.174	0° C5,C NA+	+12B -3+3+6+6	24.369	77.208	56.4	2	1	1	205.06	2.71	1.866	7	1	M-16(8.8)	34.39	19.399	0° C5-, Min. WS,C NA-	+12B -3+3+6+6	82.532	1	1.75
R210	SAE	45*45*4	235	79.94	Redun	79.94	-14.885	0° C1,C NA+	+12B +6+6-3-3	18.621	77.208	34.56	1	1	1	180.77	1.92	1.591	7	1	M-16(8.8)	44.94	14.885	0° C1,C NA+	+12B +6+6-3-3	33.12	1	1.75
R211	SAE	50*50*4	235	94.64	Redun	94.64	-32.709	0° C1,C NA+	+12B +6+6-3-3	36.463	77.208	34.56	1	1	1	131.99	1.41	1.293	3	1	M-16(8.8)	94.64	32.709	0° C1,C NA+	+12B +6+6-3-3	38.88	1	1.75
R212	SAE	70*70*5	235	88.84	Redun	88.84	-33.829	0° C1,C NA+	+12B +6+6-3-3	38.079	77.208	43.2	1	1	1	176.74	1.88	2.439	7	1	M-16(8.8)	78.31	33.829	0° C1,C NA+	+12B +6+6-3-3	78.192	1	1.75
R213	SAE	45*45*4	355	66.11	Climb	20.48	-6.441	0° C1, Min. WS,C NA+	+12B -3+6+6-3	31.458	77.208	45.12	1	1	1	138.58	1.81	1.22	7	1	M-16(8.8)	13.37	5.779	10° C1-,C NA-	+12B -3+6+6-3	43.24	1	1.75
R214	SAE	65*65*4	355	90.9	Climb	47.48	-13.088	0° C1, Min. WS,C NA+	+12B -3+6+6-3	27.563	77.208	45.12	2	1	1	174.21	2.29	1.725	7	1	M-16(8.8)	25.95	11.71	10° C1-,C NA-	+12B -3+6+6-3	74.824	1	1.75
R215	SAE	45*45*4	235	70.39	Climb	1.14	-0.394	0° C1-,C NA-	+12B +6+6+6+6	43.919	77.208	34.56	1	1	1	97.99	1.18	0.862	3	1	M-16(8.8)	1.2	0.396	0° C1, Min. WS,C NA+	+12B -3+6+6-3	33.12	1	1.75
R216	SAE	55*55*4	235	96.6	Redun	96.6	-33.386	0° C1,C NA+	+12B +6+6-3-3	35.675	77.208	34.56	1	1	1	142.47	1.52	1.524	7	1	M-16(8.8)	96.6	33.386	0° C1,C NA+	+12B +6+6-3-3	45.216	1	1.75
R217	SAE	45*45*4	235	80.39	Comp	80.39	-9.965	0° C6,C BI+	+12B -3+6+6+6	12.396	77.208	34.56	1	1	1	223.71	2.38	1.969	7	1	M-16(8.8)	22.72	7.524	0° C6-, Min. WS,C BI-	+12B -3+3+6+6	33.12	1	1.75
R220	SAE	45*45*4	355	82.86	Climb	7.8	-1.607	0° C2-,C BI-	+12B -3+6+6-3	20.595	77.208	45.12	1	1	1	173.23	2.27	1.524	7	1	M-16(8.8)	3.82	1.653	10° C2,C BI+	+12B -3+6+6-3	43.24	1	1.75
R221	SAE	50*50*4	355	94.57	Climb	17.61	-2.546	10° C2,C BI+	+12B -3+3+6-3	14.459	77.208	45.12	1	1	1	219.99	2.88	2.156	7	1	M-16(8.8)	4.37	1.97	10° C2-, Min. WS,C BI-	+12B -3+3+6-3	50.76	1	1.75
1010	SAE	70*70*5	355	38.94	Climb	23.7	-12.229	10° C2-, Min. WS,C BI-	+12B -3+6+6+6	51.594	154.416	103.131	0.541	0.541	0.541	174.88	1.97	4.461	6	2	M-16(8.8)	11.19	11.54	+12B -3+6+6+6	+12B -3+6+6+6	158.484	1	1.75
1011	SAE	90*90*6	235	91.01	Comp	91.01	-41.326	10° C2, Min. WS,C BI+	+12B -3+6+6+6	45.408	154.416	94.793	3	1	1	209.59	2.16	1.928	8	2	M-16(8.8)	43.12	40.879	10° C2-,C BI-	+12B -3+6+6+6	197.28	1	1.75
1013	DAE	75*75*5	355	85.98	Comp	85.98	-104.353	10° C2,C BI+	+12B +6+6+6+6	121.374	154.416	206.263	1	1	1	137.71	1.85	3.181	8	2	M-16(8.8)	63.99	98.803	10° C2, Min. WS,C BI+	+12B +6+6+6+6	346.296	2	1.75
1009	SAE	80*80*6	355	17.44	Climb	16.94	-20.962	0° C5, Min. WS,C NA+	+12B -3+6+6+6	154.01	154.416	123.758	1	1	1	97.1	1.29	1.524	2	2	M-16(8.8)	12.74	15.77	0° C2-,C BI-	+12B -3+6+6+6	221.84	1	1.75
1012	SAE	80*80*6	355	52.52	Climb	9.9	-5.719	10° C2-, Min. WS,C BI-	+12B -3+6+6+6	57.782	154.416	123.758	2	1	1	176.71	2.21	2.156	8	2	M-16(8.8)	4.69	5.807	10° C2, Min. WS,C BI+	+12B -3+6+6+6	221.84	1	1.75
1001	SAE	180*180*16	355	70.62	Comp	70.62	-1218.791	0° C5-,C NA-	+12B +6+6-3-3	1725.742	2412.736	2256	1	1	1	32.71	0.43	1.155	1	10	M-20(8.8)	69.41	1074.988	0° C5, Min. WS,C NA+	+12B +6+6-3-3	1548.789	2.8	2.15
1002	SAE	180*180*16	355	74.85	Comp	74.85	-1291.653	0° C5,C NA+	+12B +6+6-3-3	1725.742	2412.736	2256	1	1	1	32.71	0.43	1.155	1	10	M-20(8.8)	72.06	1116.039	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	1548.789	2.8	2.15
1003	SAE	180*180*16	355	75.75	Comp	75.75	-1318.384	0° C5,C NA+	+12B +6+6-3-3	1740.365	2412.736	2256	1	1	1	29.08	0.38	1.026	1	10	M-20(8.8)	72.66	1125.372	0° C5-, Min. WS,C NA-	+12B +6+6-3-3	1548.789	2.8	2.15
1004	SAE	120*120*8	355	56.31	Comp	56.31	-66.041	10° C2-,C BI-	+12B +6+6-3-3	117.28	154.416	165.01	4	1	1	172.45	2.14	1.591	8	2	M-16(8.8)	37.12	57.315	10° C2-, Min. WS,C BI-	+12B -3+3+6+6	470	1	1.75
1004A	SAE	120*120*8	355	71.24	Comp	71.24	-83.548	0° C5,C NA+	+12B -3+3+6+6	117.28	154.416	165.01	4	1	1	172.45	2.14	1.591	8	2	M-16(8.8)	46.47	71.762	0° C5-, Min. WS,C NA-	+12B -3+3+6+6	470	1	1.75
1005	SAE	120*120*8	355	44.62	Comp	44.62	-52.326	0° C5,C NA+	+12B +6-3-3+6	117.28	154.416	165.01	4	1	1	172.45	2.14	1.591	8	2	M-16(8.8)	29.99	46.309	0° C5-, Min. WS,C NA-	+12B -3+3-3+6	470	1	1.75
1005A	SAE	120*120*8	355	55.98	Comp	55.98	-65.649	10° C6,C BI+	+12B -3+3+6+6	117.28	154.416	165.01	4	1	1	172.45	2.14	1.591	8	2	M-16(8.8)	41.34	63.833	0° C5, Min. WS,C NA+	+12B +6+6+6-3	470	1	1.75
1006	SAE	90*90*6	355	50.7	Comp	50.7	-50.812	0° C6-, Min. WS,C BI-	+12B +6+3+6+6	100.229	0	0	1	1	1	145.33	1.68	2.587	4	0	M-16(8.8)	40.01	49.516	10° C2,C BI+	+12B +6+3+6+6	257.56	1	1.75
1007	SAE	75*75*6	355	88.51	Comp	88.51	-59.397	10																				

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont-rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
R913	SAE	65*65*5	355	86.36	Climb	29.79	-6.498	10° C2,C BI+	+12B -3+3+6+6	21.814	77.208	56.4	1	0.56	0.56	230.6	3	4.566	7	1	M-16(8.8)	11.05	6.231	0° C2-, Min. WS,C BI-	+12B -3+3+6+6	92.684	1	1.75
R914	SAE	55*55*4	235	36.82	Comp	36.82	-5.158	0° C5, Min. WS,C NA+	+12B -3+6+6-3	14.007	77.208	34.56	1	0.579	0.579	228.7	2.49	3.819	7	1	M-16(8.8)	14.67	5.069	0° C1-,C NA-	+12B -3+6+6-3	45.216	1	1.75
R915	SAE	45*45*4	235	20.95	Comp	20.95	-2.967	0° C5-,C NA-	+12B -3+6+6-3	14.163	77.208	34.56	1	0.571	0.571	199.03	2.22	2.707	7	1	M-16(8.8)	7.98	2.644	0° C5, Min. WS,C NA+	+0B -3+6+6-3	33.12	1	1.75
R916	SAE	45*45*4	235	29.82	Comp	29.82	-5.618	0° C5, Min. WS,C NA+	+12B -3+6+6-3	18.837	77.208	34.56	1	0.6	0.6	165.24	1.91	2.247	7	1	M-16(8.8)	16.8	5.563	10° C2,C BI+	+12B +6+6+6+6	33.12	1	1.75
R917	SAE	45*45*4	235	61.03	Comp	61.03	-14.884	0° C2,C BI+	+12B +6+6+6+6	24.389	77.208	34.56	1	0.667	0.667	142.39	1.67	1.879	7	1	M-16(8.8)	42.01	13.913	0° C2-, Min. WS,C BI-	+12B +6+6+6+6	33.12	1	1.75
R918	SAE	45*45*4	235	50.17	Climb	31.88	-11.019	0° C2-, Min. WS,C BI-	+12B +6+6+6+6	52.749	77.208	34.56	1	1	1	70	1.02	0.616	3	1	M-16(8.8)	34.11	11.296	0° C2,C BI+	+12B +6+6+6+6	33.12	1	1.75
2000	SAE	180*180*16	355	83.63	Tens	80.86	-1428.485	0° C5-,C NA-	-3B +6+6-3-3	1766.582	2412.736	2256	1	1	1	21.81	0.29	0.77	1	10	M-20(8.8)	83.63	1295.228	0° C5, Min. WS,C NA+	-3B +6+6-3-3	1548.789	2.8	2.15
2010	SAE	90*90*6	355	64.84	Comp	64.84	-80.242	10° C2,C BI+	+12B -3+6+6+6	161.215	154.416	123.758	1	1	1	101.9	1.32	1.814	2	2	M-16(8.8)	61.28	75.837	10° SC1,LM&LB,C NA+	-3B -3+6+6-3	257.56	1	1.75
R300	SAE	50*50*4	355	79.35	Redun	79.35	-16.033	0° C1,C NA+	-3B +6+6-3-3	20.206	77.208	45.12	1	1	1	185.11	2.42	1.814	7	1	M-16(8.8)	35.53	16.033	0° C1,C NA+	-3B +6+6-3-3	50.76	1	1.75
R301	SAE	45*45*4	235	47.41	Redun	45.44	-15.703	0° C1,C NA+	-3B +6+6-3-3	48.02	77.208	34.56	1	1	1	87.47	1.11	0.77	3	1	M-16(8.8)	47.41	15.703	0° C1,C NA+	-3B +6+6-3-3	33.12	1	1.75
R302	SAE	50*50*4	355	80.52	Redun	80.52	-22.699	0° C1,C NA+	-3B +6+6-3-3	28.191	77.208	45.12	1	1	1	155.57	2.04	1.525	7	1	M-16(8.8)	50.31	22.699	0° C1,C NA+	-3B +6+6-3-3	50.76	1	1.75
R303	SAE	50*50*4	355	94.58	Climb	39.58	-5.722	10° C2-, Min. WS,C BI-	+12B -3+6+6+6	14.456	77.208	45.12	1	1	1	220.01	2.56	2.156	7	1	M-16(8.8)	13.91	6.277	10° C2,C BI+	+12B +6+6+6+6	50.76	1	1.75
R304	SAE	65*65*4	355	91.5	Climb	20.53	-5.412	10° C2,C BI+	+12B -3+6+6+6	26.356	77.208	45.12	1	0.667	0.667	181.92	2.34	3.548	7	1	M-16(8.8)	11.28	5.09	0° C2-, Min. WS,C BI-	+12B -3+6+6+6	74.824	1	1.75
3000	SAE	180*180*16	355	66.22	Comp	66.22	-1107.157	0° C5,C NA+	+12B -1.5-1.5-1.5-1.5	1672.001	2412.736	2256	1	1	1	43.61	0.57	1.54	1	10	M-20(8.8)	62.19	963.23	0° C5, Min. WS,C NA+	-3B -1.5-1.5-1.5-1.5	1548.789	2.8	2.15
3010	SAE	90*90*6	355	41.58	Comp	41.58	-48.379	10° SC1,EW<,C NA+	-3B -1.5-1.5-1.5-1.5	116.34	154.416	123.758	1	1	1	131.06	1.59	2.333	6	2	M-16(8.8)	33.33	41.251	10° SC1,EW&RT,C NA+	-3B -1.5-1.5-1.5-1.5	257.56	1	1.75
R400	SAE	50*50*4	235	84.35	Comp	84.35	-10.338	0° C5, Min. WS,C NA+	-3B -1.5-1.5-1.5-1.5	12.256	77.208	34.56	1	1	1	238.05	2.53	2.333	7	1	M-16(8.8)	27.09	9.361	0° C1,C NA+	+12B -1.5-1.5-1.5-1.5	38.88	1	1.75
R401	SAE	45*45*4	235	40.82	Redun	40.82	-8.085	0° C1,C NA+	+12B -1.5-1.5-1.5-1.5	19.805	77.208	34.56	1	1	1	174.95	1.86	1.54	7	1	M-16(8.8)	24.41	8.085	0° C1,C NA+	+12B -1.5-1.5-1.5-1.5	33.12	1	1.75
R402	SAE	50*50*4	355	77.74	Redun	77.74	-21.919	0° C1,C NA+	+12B -1.5-1.5-1.5-1.5	28.194	77.208	45.12	1	1	1	155.56	2.04	1.525	7	1	M-16(8.8)	48.58	21.919	0° C1,C NA+	+12B -1.5-1.5-1.5-1.5	50.76	1	1.75
R403	SAE	65*65*4	355	93.58	Climb	16.5	-3.831	10° C2,C BI+	+12B -1.5-1.5-1.5-1.5	23.214	77.208	45.12	1	0.667	0.667	196.88	2.5	3.839	7	1	M-16(8.8)	7.44	3.359	10° C2, Min. WS,C BI+	+12B -1.5-1.5-1.5-1.5	74.824	1	1.75
R404	SAE	50*50*4	355	94.58	Climb	30.69	-4.437	10° C2, Min. WS,C BI+	+12B -1.5-1.5-1.5-1.5	14.457	77.208	45.12	1	1	1	220	2.88	2.156	7	1	M-16(8.8)	11.19	5.05	10° C2,C BI+	+12B -1.5-1.5-1.5-1.5	50.76	1	1.75
5000	SAE	180*180*16	355	65.48	Comp	65.48	-1094.883	0° C5,C NA+	+12B +1.5+1.5+1.5+1.5	1672.001	2412.736	2256	1	1	1	43.61	0.57	1.54	1	10	M-20(8.8)	61.76	956.57	0° C5, Min. WS,C NA+	-3B +1.5+1.5+1.5+1.5	1548.789	2.8	2.15
5001	SAE	90*90*6	355	75.85	Comp	75.85	-93.874	0° C6,C BI+	+12B +1.5+1.5+1.5+1.5	160.06	154.416	123.758	1	1	1	102.44	1.32	1.823	2	2	M-16(8.8)	64.74	80.122	0° C6-, Min. WS,C BI-	+12B +1.5+1.5+1.5+1.5	257.56	1	1.75
R600	SAE	50*50*4	235	68.28	Comp	68.28	-8.368	0° C5, Min. WS,C NA+	-3B +1.5+1.5+1.5+1.5	12.256	77.208	34.56	1	1	1	238.05	2.53	2.333	7	1	M-16(8.8)	24.08	8.321	0° C1,C NA+	+12B +1.5+1.5+1.5+1.5	38.88	1	1.75
R601	SAE	45*45*4	235	21.63	Comp	21.63	-3.959	0° C5-,C NA-	-3B +1.5+1.5+1.5+1.5	18.301	77.208	34.56	1	1	1	182.44	1.94	1.605	7	1	M-16(8.8)	15.2	5.035	0° C5, Min. WS,C NA+	-3B +1.5+1.5+1.5+1.5	33.12	1	1.75
R602	SAE	55*55*4	355	84.94	Redun	84.94	-14.39	0° C1,C NA+	+12B +1.5+1.5+1.5+1.5	16.94	77.208	45.12	1	1	1	213.72	2.78	2.287	7	1	M-16(8.8)	31.89	14.39	0° C1,C NA+	+12B +1.5+1.5+1.5+1.5	59.032	1	1.75
R603	SAE	45*45*4	235	84.5	Redun	84.5	-10.293	0° C1,C NA+	+12B +1.5+1.5+1.5+1.5	12.18	77.208	34.56	1	1	1	225.76	2.4	1.987	7	1	M-16(8.8)	31.08	10.293	0° C1,C NA+	+12B +1.5+1.5+1.5+1.5	33.12	1	1.75
R604	SAE	50*50*4	355	77.5	Redun	77.5	-21.849	0° C1,C NA+	+12B +1.5+1.5+1.5+1.5	28.193	77.208	45.12	1	1	1	155.57	2.04	1.525	7	1	M-16(8.8)	48.42	21.849	0° C1,C NA+	+12B +1.5+1.5+1.5+1.5	50.76	1	1.75
R605	SAE	60*60*4	355	79.03	Comp	79.03	-34.608	0° C5-,C NA-	-3B +1.5+1.5+1.5+1.5	43.792	77.208	45.12	1	1	1	136.06	1.74	1.605	7	1	M-16(8.8)	75	33.839	0° C5, Min. WS,C NA+	-3B +1.5+1.5+1.5+1.5	66.552	1	1.75
R606	SAE	45*45*4	235	92.3	Tens	84.18	-29.093	0° C5, Min. WS,C NA+	-3B +1.5+1.5+1.5+1.5	48.359	77.208	34.56	1	1	1	86.62	1.1	0.762	3	1	M-16(8.8)	92.3	30.569	0° C5-,C NA-	-3B +1.5+1.5+1.5+1.5	33.12	1	1.75
R607	SAE	60*60*5	355	97.71	Climb	8.1	-1.649	10° C1-,C NA-	+12B +1.5+1.5+1.5+1.5	20.362	77.208	56.4	1	0.571	0.571	228.33	2.97	4.156	7	1	M-16(8.8)	3.05	1.717	0° C1, Min. WS,C NA+	+12B +1.5+1.5+1.5+1.5	82.532	1	1.75
R608	SAE	60*60*4	355	86.95	Climb	13.48	-3.398	10° C2, Min. WS,C BI+	+12B +1.5+1.5+1.5+1.5	25.207	77.208	45.12	1	0.6	0.6	175.36	2.33	3.209	7	1	M-16(8.8)	7.63	3.44	10° C2,C BI+	+12B +1.5+1.5+1.5+1.5	66.552	1	1.75
R609	SAE	45*45*4	235	38.9	Comp	38.9	-6.735	10° C2,C BI+	+12B +1.5+1.5+1.5+1.5	17.313	77.208	34.56	1	0.667	0.667	180.07	2	2.377	7	1	M-16(8.8)	17.76	5.884	10° C2, Min. WS,C BI+	+12B +1.5+1.5+1.5+1.5	33.12	1	1.75
R610	SAE	45*45*4	235	88.17	Climb	19.71	-6.811	0° C2-, Min. WS,C BI-	+12B +1.5+1.5+1.5+1.5	35.479	77.208	34.56	1	1	1	122.5	1.35	1.078	3	1	M-16(8.8)	22.22	7.358	0° C2,C BI+	+12B +1.5+1.5+1.5+1.5	33.12	1	1.75
6000	SAE	180*180*16	355	65.17	Comp	65.17	-1089.574	0° C5,C NA+	+12B +3+3+3+3	1672.001	2412.736	2256	1	1	1	43.61	0.57	1.54	1	10	M-20(8.8)	61.67	955.194	0° C5, Min. WS,C NA+	-3B +3+3+3+3	1548.789	2.8	2.15
6010	SAE	90*90*6	355	68.98	Comp	68.98	-117.12	0° C6,C BI+	+12B +3+3+3+3	169.788	231.623	203.04	1	1	1	97.97	1.28	1.744	2	3	M-16(8.8)	49.25	99.991	0° C6-, Min. WS,C BI-	+12B +3+3+3+3	257.56	1	1.75
R700	SAE	50*50*4	235	72.98	Comp	72.98	-8.944	0° C5, Min. WS,C NA+	-3B +3+3+3+3	12.256	77.208	34.56	1	1	1	238.05	2.53	2.333	7	1	M-16(8.8)	23.45	8.106	0° C1,C NA+	+12B +3+3+3+3	38.88	1	1.75
R701	SAE	45*45*4	235	21.69	Comp	21.69	-3.724	0° C6,C BI+	-3B +3+3+3+3	17.164	77.208	34.56	1	1	1	188.73	2.01	1.661	7	1	M-16(8.8)	17.29	5.726	0° C5, Min. WS,C NA+	-3B +3+3+3+3	33.12	1	1.75
R702	SAE	55*55*4	355	88.79	Climb	25.04	-3.741	0° C5, Min. WS,C NA+	-3B +3+3+3+3	14.942	77.208	45.12	1	1	1	227.96	2.97	2.439	7	1	M-16(8.8)	6.89	3.11	0° C5,C NA+	-3B +3+3+3+3	59.032	1	1.75
R703	SAE	50*50*4	235	79.7	Redun	79.7	-10.982	0° C1,C NA+	+12B +3+3+3+3	13.78	77.208	34.56	1	1	1	224.02	2.39	2.195	7	1	M-16(8.8)	31.78	10.982	0° C1,C NA+	+12B +3+3+3+3	38.88	1	1.75
R704	SAE	55*55*4	355	76.52	Redun	76.52	-19.948	0° C1,C NA+	+12B +3+3+3+3	26.07	77.208	45.12	1	1	1	170.97	2.22	1.829	7	1	M-16(8.8)	44.21	19.948	0° C1,C NA+	+12B +3+3+3+3	59.032	1	1.75
R705	SAE	45*45*4	235	75.53	Redun	75.53	-11.056	0° C1,C NA+	+12B +3+3+3+3	14.638	77.208	34.56	1	1	1	205.16	2.18	1.805	7	1	M-16(8.8)	33.38	11.056	0° C1,C NA+	+12B +3+3+3+3	33.12	1	1.75
R706	SAE	45*45*4																										

Group Label	Angle Type	Angle Size	Steel Strength (MPa)	Max Usage %	Usage Cont-rol	Max Use In Comp. %	Comp. Force (kN)	Comp. Control Load Case	Comp. Control Model	L/r Capacity (kN)	Comp. Connect. Shear Capacity (kN)	Comp. Connect. Bearing Capacity (kN)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (m)	Curve No.	No. Of Bolts Comp.	Bolt Type Comp.	Max Use In Tens. %	Tension Force (kN)	Tension Control Load Case	Tension Control Model	Net Section Capacity (kN)	No. Of Holes	Hole Diameter (cm)
R806	SAE	50*50*4	355	74.87	Redun	74.87	-21.112	0° C1,C NA+	+12B +4.5+4.5+4.5+4.5	28.197	77.208	45.12	1	1	1	155.56	2.04	1.524	7	1	M-16(8.8)	46.79	21.112	0° C1,C NA+	+12B +4.5+4.5+4.5+4.5	50.76	1	1.75
R807	SAE	45*45*4	235	73.04	Comp	73.04	-11.935	0° C5-,C NA-	-3B +4.5+4.5+4.5+4.5	16.34	77.208	34.56	1	1	1	193.67	2.06	1.704	7	1	M-16(8.8)	47.7	15.797	0° C5, Min. WS,C NA+	-3B +4.5+4.5+4.5+4.5	33.12	1	1.75
R808	SAE	45*45*4	235	83.07	Climb	39.43	-13.628	0° C5, Min. WS,C NA+	-3B +4.5+4.5+4.5+4.5	37.706	77.208	34.56	1	1	1	115.49	1.3	1.016	3	1	M-16(8.8)	33.71	11.164	0° C5-,C NA-	-3B +4.5+4.5+4.5+4.5	33.12	1	1.75
R809	SAE	65*65*5	235	94.98	Comp	94.98	-63.289	0° C5-,C NA-	-3B +4.5+4.5+4.5+4.5	66.637	154.416	78.994	1	1	1	118.65	1.32	1.542	3	2	M-16(8.8)	70.96	56.051	0° C5, Min. WS,C NA+	-3B +4.5+4.5+4.5+4.5	110.592	1	1.75
R810	SAE	45*45*4	355	89.52	Tens	74.09	-33.429	0° C5, Min. WS,C NA+	-3B +4.5+4.5+4.5+4.5	79.307	77.208	45.12	1	1	1	57.74	1.03	0.508	3	1	M-16(8.8)	89.52	38.71	0° C5-,C NA-	-3B +4.5+4.5+4.5+4.5	43.24	1	1.75
R811	SAE	65*65*5	355	85.12	Climb	15.99	-3.549	0° C1, Min. WS,C NA+	+12B +4.5+4.5+4.5+4.5	22.201	77.208	56.4	1	0.571	0.571	228.21	2.97	4.519	7	1	M-16(8.8)	6.61	3.728	0° C1-,C NA-	+12B +4.5+4.5+4.5+4.5	92.684	1	1.75
R812	SAE	50*50*4	235	20.61	Comp	20.61	-2.388	0° C6,C BI+	-3B +4.5+4.5+4.5+4.5	11.588	77.208	34.56	1	0.6	0.6	241.24	2.61	3.667	7	1	M-16(8.8)	5.45	1.884	0° C2-, Min. WS,C BI-	-3B +4.5+4.5+4.5+4.5	38.88	1	1.75
R813	SAE	45*45*4	235	29.8	Comp	29.8	-4.943	0° C2-, Min. WS,C BI-	+12B +4.5+4.5+4.5+4.5	16.587	77.208	34.56	1	0.6	0.6	179.75	2.05	2.445	7	1	M-16(8.8)	15.39	5.099	10° C2,C BI+	+12B +4.5+4.5+4.5+4.5	33.12	1	1.75
R814	SAE	45*45*4	235	56.48	Comp	56.48	-12.821	10° C2,C BI+	+12B +4.5+4.5+4.5+4.5	22.701	77.208	34.56	1	0.667	0.667	149.82	1.73	1.977	7	1	M-16(8.8)	36.14	11.97	0° C2-, Min. WS,C BI-	+12B +4.5+4.5+4.5+4.5	33.12	1	1.75
R815	SAE	45*45*4	235	58.59	Climb	30.16	-10.422	0° C2-, Min. WS,C BI-	+12B +4.5+4.5+4.5+4.5	49.735	77.208	34.56	1	1	1	81.66	1.08	0.719	3	1	M-16(8.8)	32.53	10.774	0° C2,C BI+	+12B +4.5+4.5+4.5+4.5	33.12	1	1.75

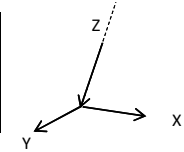
E-FOUNDATION REACTIONS

Factored Maximum Foundation Reactions

+12 Body Extension

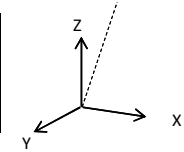
• Maximum Reactions in Leg Direction

Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	1357.05	19.08	16.76	0° C5-,C NA-	+12B +6+6-3-3
Uplift	-1146.06	12.40	13.74	0° C5, Min. WS,C NA+	+12B +6+6-3-3
Max. Transverse	-858.99	71.34	72.15	10° C2-, Min. WS,C BI-	+12B -3+6+6+6
Max. Longitudinal	973.54	69.94	79.48	10° C2, Min. WS,C BI+	+12B -3+6+6+6



• Maximum Reactions in Global direction

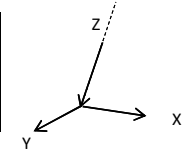
Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	-1316.63	234.27	231.95	0° C5,C NA+	+12B +6+6-3-3
Uplift	1112.56	194.24	195.58	0° C5, Min. WS,C NA+	+12B +6+6-3-3
Max. Transverse	-1142.21	239.66	255.82	0° C6,C BI+	+12B -3+6+6+6
Max. Longitudinal	-1142.21	239.66	255.82	0° C6,C BI+	+12B -3+6+6+6



+9 Body Extension

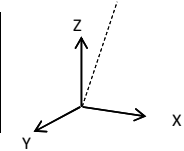
• Maximum Reactions in Leg Direction

Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	1350.49	12.10	20.05	0° C5-,C NA-	+9B +6+6-3-3
Uplift	-1154.64	7.21	14.57	0° C5, Min. WS,C NA+	+9B +6+6-3-3
Max. Transverse	-828.86	60.32	61.28	10° C2-, Min. WS,C BI-	+9B -3+6+6+6
Max. Longitudinal	955.55	58.32	69.74	10° C2,C BI+	+9B -3+6+6+6



• Maximum Reactions in Global direction

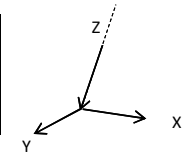
Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	-1310.81	226.33	234.29	0° C5,C NA+	+9B +6+6-3-3
Uplift	1121.60	190.53	197.88	0° C5, Min. WS,C NA+	+9B +6+6-3-3
Max. Transverse	-1310.81	226.33	234.29	0° C5,C NA+	+9B +6+6-3-3
Max. Longitudinal	-1112.01	224.07	243.54	0° C6,C BI+	+9B -3+6+6+6



+6 Body Extension

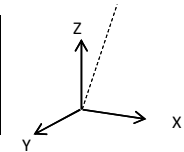
• Maximum Reactions in Leg Direction

Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	1356.56	5.72	22.88	0° C5-,C NA-	+6B +6+6-3-3
Uplift	-1175.29	2.90	18.12	0° C5, Min. WS,C NA+	+6B +6+6-3-3
Max. Transverse	-800.96	48.75	49.80	10° C2-, Min. WS,C BI-	+6B -3+6+6+6
Max. Longitudinal	916.27	45.98	58.06	10° C2,C BI+	+6B -3+6+6+6



• Maximum Reactions in Global direction

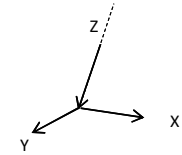
Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	-1317.28	221.01	238.17	0° C5,C NA+	+6B +6+6-3-3
Uplift	1141.84	189.52	204.74	0° C5, Min. WS,C NA+	+6B +6+6-3-3
Max. Transverse	-1317.28	221.02	238.17	0° C5,C NA+	+6B +6+6-3-3
Max. Longitudinal	-1317.28	221.01	238.17	0° C5,C NA+	+6B +6+6-3-3



+3 Body Extension

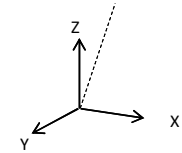
- Maximum Reactions in Leg Direction

Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	1356.73	0.21	26.25	0° C5,C NA+	+3B +6+6-3-3
Uplift	-1189.04	4.92	21.72	0° C5, Min. WS,C NA+	+3B +6+6-3-3
Max. Transverse	10.32	40.90	16.44	10° SC1,LM&LB,C NA+	+3B -3+6+6-3
Max. Longitudinal	994.46	20.24	50.88	10° C6,C BI+	+3B -3+6+6+6



- Maximum Reactions in Global direction

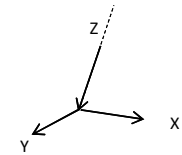
Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	-1317.84	215.18	241.64	0° C5,C NA+	+3B +6+6-3-3
Uplift	1155.89	183.99	210.64	0° C5, Min. WS,C NA+	+3B +6+6-3-3
Max. Transverse	-1317.84	215.18	241.64	0° C5,C NA+	+3B +6+6-3-3
Max. Longitudinal	-1317.84	215.18	241.64	0° C5,C NA+	+3B +6+6-3-3



+0 Body Extension

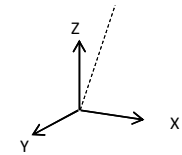
- Maximum Reactions in Leg Direction

Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	1372.40	6.68	27.31	0° C5,C NA+	+0B +6+6-3-3
Uplift	-1212.84	9.70	25.47	0° C5-, Min. WS,C NA-	+0B +6+6-3-3
Max. Transverse	6.06	46.28	16.98	10° SC1,LM&LB,C NA+	+0B -3+6+6-3
Max. Longitudinal	-68.67	15.84	52.92	10° SC1,EW<,C NA+	+0B -3+6+6+6



- Maximum Reactions in Global direction

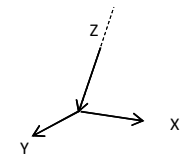
Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	-1333.94	211.34	245.32	0° C5,C NA+	+0B +6+6-3-3
Uplift	1179.24	183.03	218.21	0° C5, Min. WS,C NA+	+0B +6+6-3-3
Max. Transverse	-1333.94	211.34	245.32	0° C5,C NA+	+0B +6+6-3-3
Max. Longitudinal	-1333.94	211.34	245.32	0° C5,C NA+	+0B +6+6-3-3



-3 Body Extension

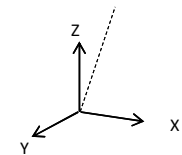
- Maximum Reactions in Leg Direction

Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	1428.33	19.40	12.05	0° C5,C NA+	-3B +6+6-3-3
Uplift	-1284.63	28.48	9.90	0° C5-, Min. WS,C NA-	-3B +6+6-3-3
Max. Transverse	735.11	74.17	6.05	0° C1,C NA+	-3B +6+6+6+6
Max. Longitudinal	735.11	6.42	75.25	0° C1,C NA+	-3B +6+6+6+6



- Maximum Reactions in Global direction

Case	Axial (kN)	Transversal (kN)	Longitudinal (kN)	Load Case	Model
Compression	-1392.78	208.24	239.69	0° C5,C NA+	-3B +6+6-3-3
Uplift	1254.52	176.55	214.94	0° C5, Min. WS,C NA+	-3B +6+6-3-3
Max. Transverse	-714.30	210.31	122.79	0° C1,C NA+	-3B +6+6+6+6
Max. Longitudinal	-714.30	123.16	245.63	0° C1,C NA+	-3B +6+6+6+6



D-CROSSARM BOTTOM CHORD CALCULATION

1.1 Upper Crossarm Bottom chord

1.1.1 Loads (kN)

For Top Crossarm		Axial	FoS	Load	Load Case
	Compression	35.0	1.0	35.0	0° SF1A,LT,I NA+
	Climbing	3.0	1.5	4.5	

1.1.2 Material Properties

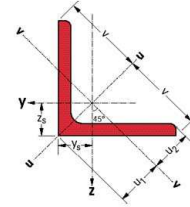
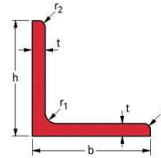
E	210000	N/mm ²	Modulus of Elasticity
Fy	355	N/mm ²	Yield Strength
ε=	0.81		7.3.6.2-EN50341-2012
κσ=	0.43		7.3.6.2-EN50341-2012

1.1.3 Dimensiones

L =	1.664	m	Longest Field of Beam
-----	-------	---	-----------------------

1.1.4 Crossection Properties

Section	L75*75*7	Unit		
b=	75	mm	Width	
h =	75	mm	Height	
t =	7	mm	Thickness	
rz,ry=	2.28	cm	Raius of Gyration z-z, y-y	
rv=	1.45	cm	Raius of Gyration v-v	
S =	9.74	cm ³	Section Modulus z-z, y-y	
A =	10.10	cm ²	Gross cross-section area	
G=	77.86	N/m	Unit weight	
b/t=	10.7		Width-Thickness ratio	
Class	3		Classification	5.5.2- EN1993-1-1-2005
λ'p	0.58			7.3.6.2-EN50341-2012
p	1.00		Reduction factor for effective area	7.3.6.2-EN50341-2012
Aeff=	10.10	cm ²	Effective cross-section area	
λ	114.76		Slenderness	J.4.2.2-EN50341-2012
λ1	76.41			J.4.2.3-EN50341-2012
λ'	1.50		Non-dimensional slenderness	J.4.2.3-EN50341-2012
λeff	1.48		Effective non-dimensional slenderness	J.4.2.4-EN50341-2012
α	0.13		Imperfection factor	J.4.1-EN50341-2012
Φ	1.67			
χ	0.41		Reduction factor for relevant buckling mode	J.4.1-EN50341-2012



1.1.5 Moment Capacity

γM0=	1.0		Partial factor for moment resistance	6.1 -EN50341-2012
Mz,ed=	1.90	kN.m	Design bending moment	
Mz,Rd =	3.46	kN.m	Design resistance for bending about z-z axis	6.2.5-EN50341-2012
Status	54.9 %	OK	Usage	

1.1.6 Compression Capacity

γM1=	1.10		Partial factor for buckling resistance	
Ned=	35.0	kN	Compression force	
Nrd=	132.6	kN	Flexural Buckling resistance	
Status	26.4 %	OK	Usage	



1.1.7 Axial Compression & Bending Check

Check	0.81	OK	$\frac{N_{ed}}{N_{rd}} + \frac{M_{z,ed}}{M_{z,Rd}} \leq 1$	Eq 6.2 6.2.1- EN1993-1-1-2005
-------	------	----	--	-------------------------------

2.1 Middle Crossarm Bottom chord

2.1.1 Loads (kN)

For		Axial	FoS	Load	Load Case
Middle	Compression	53.3	1.0	53.3	0° SF1A,LT,I NA+
Crossarm	Climbing	3.0	1.5	4.5	

2.1.2 Material Properties

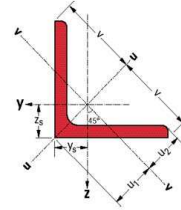
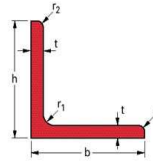
E	210000	N/mm ²	Modulus of Elasticity
Fy	355	N/mm ²	Yield Strength
ε=	0.81		7.3.6.2-EN50341-2012
κσ=	0.43		7.3.6.2-EN50341-2012

2.1.3 Dimensiones

L =	1.605	m	Longest Field of Beam
-----	-------	---	-----------------------

2.1.4 Crossection Properties

Section	L80*80*7	Unit		
b=	80	mm	Width	
h =	80	mm	Height	
t =	7	mm	Thickness	
rz,ry=	2.44	cm	Raius of Gyration z-z, y-y	
rv=	1.57	cm	Raius of Gyration v-v	
S =	11.10	cm ³	Section Modulus z-z, y-y	
A =	10.80	cm ²	Gross cross-section area	
G=	83.26	N/m	Unit weight	
b/t=	11.4		Width-Thickness ratio	
Class	3		Classification	5.5.2- EN1993-1-1-2005
λ'p	0.62			7.3.6.2-EN50341-2012
p	1.00		Reduction factor for effective area	7.3.6.2-EN50341-2012
Aeff=	10.80	cm ²	Effective cross-section area	
λ	102.23		Slenderness	J.4.2.2-EN50341-2012
λ1	76.41			J.4.2.3-EN50341-2012
λ'	1.34		Non-dimensional slenderness	J.4.2.3-EN50341-2012
λeff	1.37		Effective non-dimensional slenderness	J.4.2.4-EN50341-2012
α	0.13		Imperfection factor	J.4.1-EN50341-2012
Φ	1.51			
χ	0.46		Reduction factor for relevant buckling mode	J.4.1-EN50341-2012

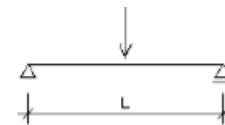


2.1.5 Moment Capacity

γM0=	1.0		Partial factor for moment resistance	6.1 -EN50341-2012
Mz,ed=	1.83	kN.m	Design bending moment	
Mz,Rd =	3.94	kN.m	Design resistance for bending about z-z axis	6.2.5-EN50341-2012
Status	46.5 %	OK	Usage	

2.1.6 Compression Capacity

γM1=	1.10		Partial factor for buckling resistance	
Ned=	53.3	kN	Compression force	
Nrd=	161.4	kN	Flextural Buckling resistance	
Status	33.0 %	OK	Usage	



2.1.7 Axial Compression & Bending Check

Check	0.80	OK	$\frac{N_{ed}}{N_{rd}} + \frac{M_{z,ed}}{M_{z,Rd}} \leq 1$	Eq 6.2 6.2.1- EN1993-1-1-2005
-------	------	----	--	-------------------------------

3.1 Lower Crossarm Bottom chord

3.1.1 Loads (kN)

For Lower Crossarm		Axial	FoS	Load	Load Case
	Compression	41.8	1.0	41.8	0° SF1A,LM,I NA+
	Climbing	3.0	1.5	4.5	

3.1.2 Material Properties

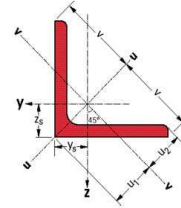
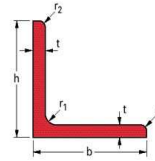
E	210000	N/mm ²	Modulus of Elasticity
Fy	355	N/mm ²	Yield Strength
ε=	0.81		7.3.6.2-EN50341-2012
κσ =	0.43		7.3.6.2-EN50341-2012

3.1.3 Dimensiones

L =	1.417	m	Longest Field of Beam
-----	-------	---	-----------------------

3.1.4 Crossection Properties

Section	L75*75*7	Unit		
b=	75	mm	Width	
h =	75	mm	Height	
t =	7	mm	Thickness	
rz,ry=	2.28	cm	Raius of Gyration z-z, y-y	
rv=	1.45	cm	Raius of Gyration v-v	
S =	9.74	cm ³	Section Modulus z-z, y-y	
A =	10.10	cm ²	Gross cross-section area	
G=	77.86	N/m	Unit weight	
b/t=	10.7		Width-Thickness ratio	
Class	3		Classification	5.5.2- EN1993-1-1-2005
λ'p	0.58			7.3.6.2-EN50341-2012
p	1.00		Reduction factor for effective area	7.3.6.2-EN50341-2012
Aeff=	10.10	cm ²	Effective cross-section area	
λ	97.72		Slenderness	J.4.2.2-EN50341-2012
λ1	76.41			J.4.2.3-EN50341-2012
λ'	1.28		Non-dimensional slenderness	J.4.2.3-EN50341-2012
λeff	1.33		Effective non-dimensional slenderness	J.4.2.4-EN50341-2012
α	0.13		Imperfection Factor	J.4.1-EN50341-2012
Φ	1.46			
χ	0.49		Reduction factor for relevant buckling mode	J.4.1-EN50341-2012



3.1.5 Moment Capacity

γM0=	1.0		Partial factor for moment resistance	6.1 -EN50341-2012
Mz,ed=	1.61	kN.m	Design bending moment	
Mz,Rd =	3.46	kN.m	Design resistance for bending about z-z axis	6.2.5-EN50341-2012
Status	46.7 %	OK	Usage	

3.1.6 Compression Capacity

γM1=	1.10		Partial factor for buckling resistance	
Ned=	41.8	kN	Compression force	
Nrd=	158.3	kN	Flexural Buckling resistance	
Status	26.4 %	OK	Usage	

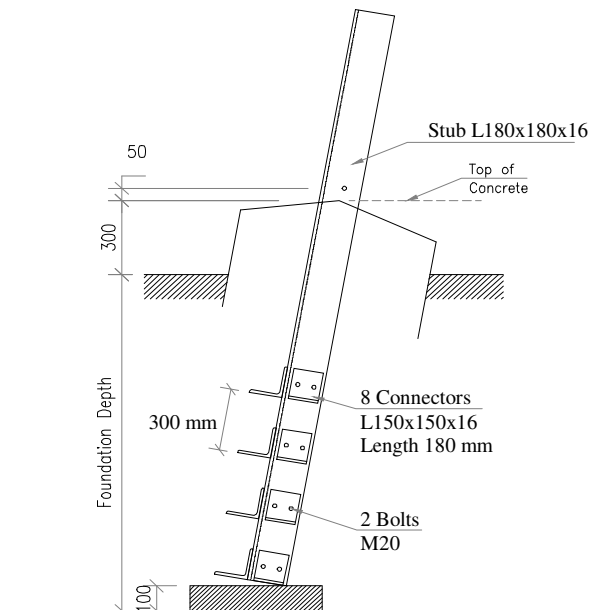


3.1.7 Axial Compression & Bending Check

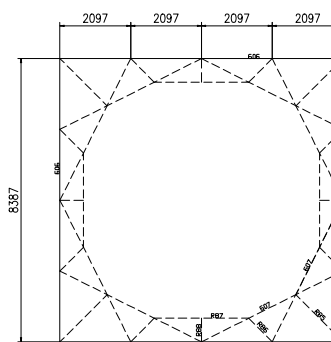
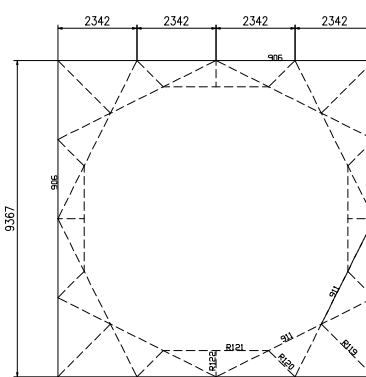
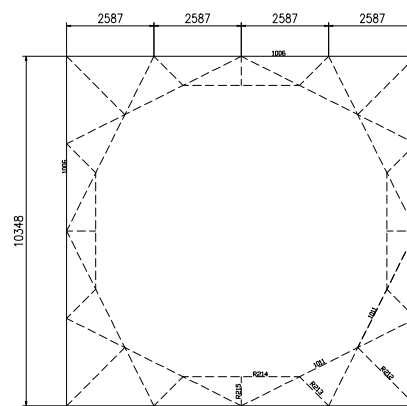
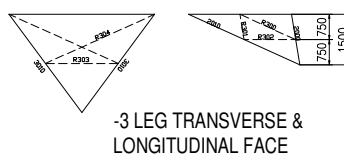
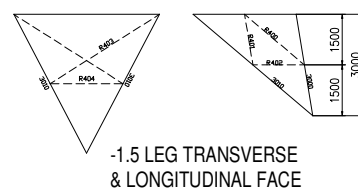
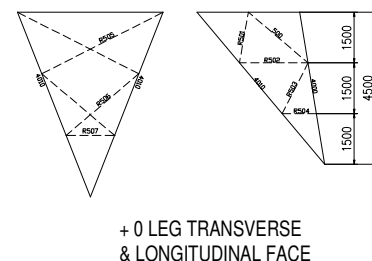
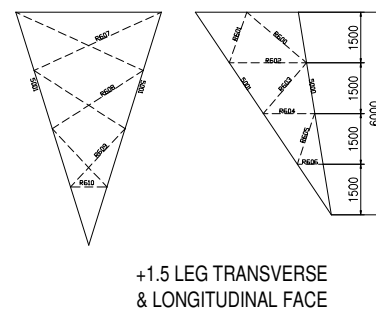
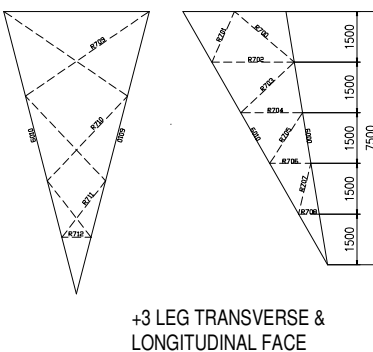
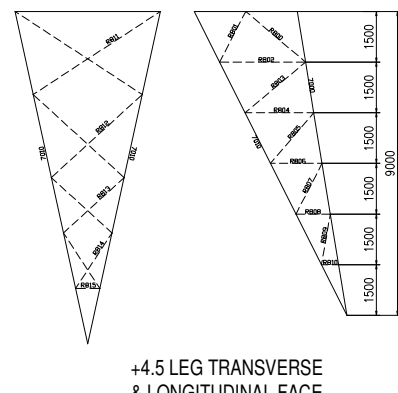
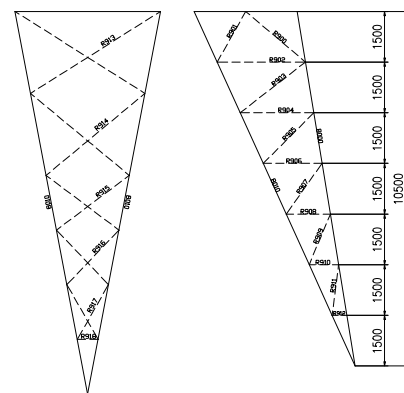
Check	0.73	OK	$\frac{N_{ed}}{N_{rd}} + \frac{M_{z,ed}}{M_{z,Rd}} \leq 1$	Eq 6.2 6.2.1- EN1993-1-1-2005
-------	------	----	--	-------------------------------

F-STUB DESIGN

MATERIAL PROPERTIES		Concrete: C20/25						
		Characteristic Compressive Strength		f_{ck}	MPa	20.0		
		Partial Material Factor:		γ_c		1.5	EN 50341-1:2012 (7.6.4)	
		Maximum Allowable Design Stress		f_{cd}	MPa	13.3	$f_{cd} = f_{ck}/\gamma_c$ EN 1992-1-1 Eq (3.15)	
		Steel : S355J2						
		Yield Strength		f_y	MPa	355.0		
		Bolts : ISO 898-1 Class 8.8 (Shear through unthreaded portion)						
Tensile Strength :		f_{ub}	MPa	800.0				
TOWER REACTIONS ON LEG DIRECTION		MAX COMPRESSION	AXIAL	P	kN	1571.2	Axial force for compression & uplift are increased 10 % as per B 2.5.3.4 "Employer's Requirement"	
			SHEAR	V	kN	22.8		
		MAX UPLIFT	AXIAL	P	kN	1413.1		
			SHEAR	V	kN	30.2		
ANGLES		STUB		Size of Ang.	L180x180x16			
				w	mm	180	w : width of stub angle	
				t	mm	16	t : thickness of stub angle	
				A_s	cm ²	55.40	A_s : Gross area of stub angle	
				n		2.6	n: Number of holes	
				$\varnothing$	mm	21.5	$\varnothing$: Diameter of Holes	
				A_n	cm ²	46.46	A_n : Net area of stub angle at the plane of the intersection with concrete	
				L	mm	1150	L: Minimum Stub Length in Concrete	
		ANGLE SHEAR CONNECTOR		SECTION	Size of Ang.	L150x150x16		
					w	mm	150	w : width of angle shear connector leg
					t	mm	16	t : thickness of angle shear connector
					b	mm	180.0	b : length of angle shear connector
					r	mm	16.0	r : radius of fillet
				NUMBER	#		8	
MIN STUB ANGLE AREA		Compression plus Shear:		A_a	cm ²	45.12	$A_a = \frac{P}{F_y} + \frac{V}{0.75F_y}$ ASCE 10-15 Eq (7.4-1)	
		Tension plus Shear:		A_a	cm ²	40.94		
SHEAR CONNECTORS	ANGLES		x	mm	75.7	$x = t \left[\frac{F_y}{1.19f_{cd}} \right]^{1/2}$ ASCE 10-15 Eq (7.6-3)		
			Capacity of one Angle Shear Connector	P	kN	199.5	$P = 1.19f_{cd}b(t + r + x/2)$ ASCE 10-15 Eq (7.6-2)	
			Total Capacity of Connectors	P	kN	1595.7		
	BOLTS		Diameter	$\varnothing$	mm	20	$P = 0.6f_{ub}A/\gamma_{M2}$ Table J.3. EN50341-1:2012	
			Number	#		16		
			Shear Capacity of one Bolt	$F_{V,Rd}$	kN	120.64		
			Total Capacity of Bolts	$F_{V,Rd}$	kN	1930.2		
CHECKS SUMMARY		STUB ANGLE (COMPRESSION + SHEAR)		cm ²	55.40	> 45.12	OK	
		STUB ANGLE (TENSION + SHEAR)		cm ²	46.46	> 40.94	OK	
		ANGLE SHEAR CONNECTOR		kN	1595.7	> 1571.2	OK	
		CONNECTION BOLTS		kN	1930.2	> 1571.2	OK	



Note:
This drawing is illustrative. For more details see Assembly drawings.



Lab	Angle	Angle Size	Material	Boils	Group	Lab	Angle	Angle Size	Material	Boils	Group	Lab	Angle	Angle Size	Material	Boils	Group	Lab	Angle	Angle Size	Material	Boils	Group	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	SAE	100/1070	S35	2 M 146.818	76	DAE	80/675	S35	2 M 146.818	10	SAE	70/775	S35	2 M 146.818	R6A	SAE	50/575	S35	2 M 146.818	R24	SAE	50/575	S35	2 M 146.818
2	SAE	100/1006	S35	2 M 146.818	80	SAE	40/675	S35	2 M 146.818	61	SAE	70/775	S35	2 M 146.818	R6A	SAE	70/775	S35	2 M 146.818	R20	SAE	40/474	S35	2 M 146.818
3	SAE	100/1006	S35	2 M 146.818	80	SAE	40/675	S35	2 M 146.818	61	SAE	70/775	S35	2 M 146.818	R6A	SAE	70/775	S35	2 M 146.818	R20	SAE	40/474	S35	2 M 146.818
4	SAE	100/1006	S35	2 M 146.818	80	SAE	40/675	S35	2 M 146.818	61	SAE	70/775	S35	2 M 146.818	R6A	SAE	70/775	S35	2 M 146.818	R20	SAE	40/474	S35	2 M 146.818
5	SAE	100/1006	S35	2 M 146.818	82	SAE	40/675	S35	2 M 146.818	13	SAE	80/675	S35	2 M 146.818	R6A	SAE	40/474	S35	2 M 146.818	R27	SAE	60/675	S35	2 M 146.818
6	SAE	111/1110	S35	2 M 146.818	80A	SAE	40/675	S35	2 M 146.818	60S	SAE	100/1007	S35	2 M 146.818	R6A	SAE	40/474	S35	2 M 146.818	R27	SAE	60/675	S35	2 M 146.818
7	SAE	111/1110	S35	2 M 146.818	80A	SAE	40/675	S35	2 M 146.818	60S	SAE	100/1007	S35	2 M 146.818	R6A	SAE	40/474	S35	2 M 146.818	R27	SAE	60/675	S35	2 M 146.818
8	SAE	111/1110	S35	2 M 146.818	82A	SAE	40/675	S35	2 M 146.818	13	SAE	80/675	S35	2 M 146.818	R6A	SAE	40/474	S35	2 M 146.818	R27	SAE	60/675	S35	2 M 146.818
9	SAE	147/1412	S35	2 M 146.818	83	SAE	50/575	S35	2 M 146.818	70	SAE	50/575	S35	2 M 146.818	R6A	SAE	50/575	S35	2 M 146.818	R21	SAE	50/575	S35	2 M 146.818
10	SAE	147/1412	S35	2 M 146.818	83	SAE	50/575	S35	2 M 146.818	70	SAE	50/575	S35	2 M 146.818	R6A	SAE	50/575	S35	2 M 146.818	R21	SAE	50/575	S35	2 M 146.818
11	SAE	147/1412	S35	2 M 146.818	84A	SAE	40/675	S35	2 M 146.818	74	SAE	40/675	S35	2 M 146.818	R6A	SAE	40/675	S35	2 M 146.818	R21	SAE	40/474	S35	2 M 146.818
12	SAE	180/1816	S35	2 M 146.818	85	SAE	70/775	S35	2 M 146.818	76	SAE	40/675	S35	2 M 146.818	R6A	SAE	50/575	S35	2 M 146.818	R20	SAE	40/474	S35	2 M 146.818
13	SAE	180/1816	S35	2 M 146.818	85	SAE	70/775	S35	2 M 146.818	76	SAE	40/675	S35	2 M 146.818	R6A	SAE	50/575	S35	2 M 146.818	R20	SAE	40/474	S35	2 M 146.818
14	SAE	180/1816	S35	2 M 146.818	87	SAE	60/675	S35	2 M 146.818	70	SAE	40/675	S35	2 M 146.818	R6A	SAE	40/675	S35	2 M 146.818	R20	SAE	40/474	S35	2 M 146.818
15	SAE	180/1816	S35	2 M 146.818	88	SAE	60/675	S35	2 M 146.818	70	SAE	40/675	S35	2 M 146.818	R6A	SAE	40/675	S35	2 M 146.818	R20	SAE	40/474	S35	2 M 146.818
16	SAE	180/1816	S35	2 M 146.818	89	SAE	60/675	S35	2 M 146.818	70	SAE	40/675	S3											

02	Constructive member is added in EW						05.09.22	I.OZDEMIR	
	As per comments						03.08.22	I.OZDEMIR	
00	First Submission						20.05.22	I.OZDEMIR	
REV	DESCRIPTION :						DATE	BY	
PROJECT NAME :									
Open Programme Extension of the Transmission Network II BMZ No. 2015 68 286 Contract Identification No. KIW/DSI/OHL-TD-Lot 2									
EMPLOYER : ISC Georgian State Electrosystem (GSE) Baratashvili Street, Tbilisi, Georgia, 0105 info@gse.com.ge									
ENGINEER : Fichtner GmbH & Co. KG Saraystrasse 370191 Stuttgart / Germany www.fichtner.de									
CONTRACTOR : Mitas Energy and Metal Constuction Inc. Eski G�vercnrlk Yolu No: 113 - Gazi Ankara / Turkey info@mitastower.com									
APPROVAL AREA :				STATUS :		STAMP :			
REVIEWED BY :				AP ☐					
				AC ☐					
				NA ☐					
DATE OF REVIEW :									
APPROVED BY :		S.SAHIN		TITLE :					
CHECKED BY :		S. SAHIN		DETAILED OUTLINE DRAWING OF TOWER TYPE 12A-LC					
DESIGNED BY :		I.OZDEMIR							
DRAWN BY :		I.OZDEMIR							
DATE OF ISSUE :		20.05.2022							
SCALE:		DOC NO.:				REV.:		PAGE:	
A3		7154A0-EG-TWR-CLC-0321_02				02		21 of 21	