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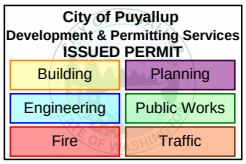
Structural Engineering Calculations

SUN LODGE ART INSTALLATION AT PIERCE COLLEGE

1601 39TH AVE SE
PUYALLUP, WASHINGTON
PROJECT ADDRESS, 98374

PROJECT NUMBER 2369



PERMIT SET **SEPTEMBER 22, 2023**

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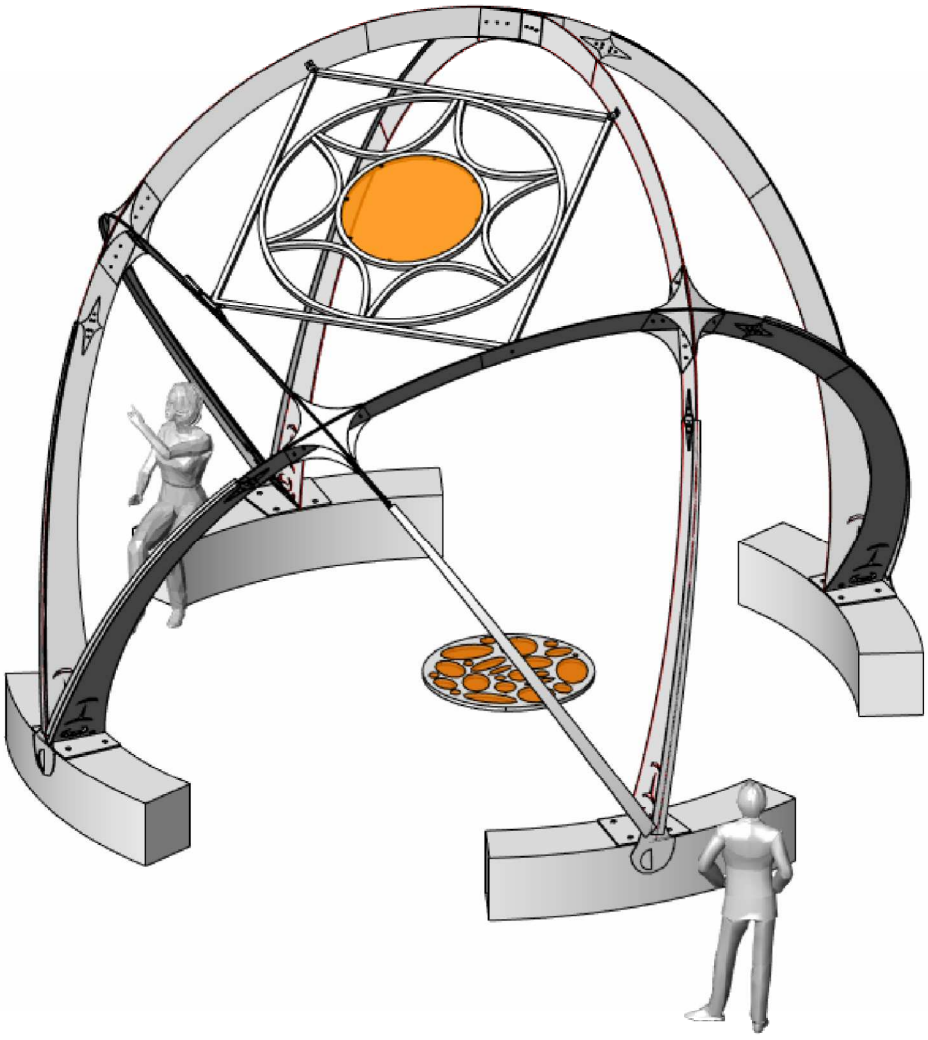
PROJECT DESCRIPTION

Sun Lodge is a 16-foot tall stainless steel sculpture that will be installed at Pierce College in Puyallup, Washington. The center of the sculpture has a glass inset which is angled so it reflects the sun at noon on the summer solstice. The shape draws inspiration from indigenous architecture.

The sculpture lands on (4) reinforced concrete curbs that are attached to (4) reinforced concrete spread footings.



DESIGN LOAD CRITERIA

Hazards by Location

Search Information

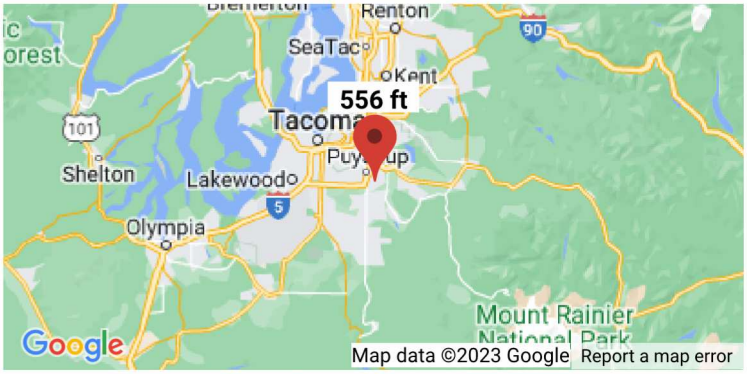
Address: 1601 39th Ave SE, Puyallup, WA 98374, USA

Coordinates: 47.155487, -122.2718194

Elevation: 556 ft

Timestamp: 2023-04-11T21:38:12.976Z

Hazard Type: Wind



ASCE 7-16

MRI 10-Year	67 mph
MRI 25-Year	73 mph
MRI 50-Year	78 mph
MRI 100-Year	82 mph
Risk Category I	92 mph
Risk Category II	97 mph
Risk Category III	104 mph
Risk Category IV	108 mph

ASCE 7-10

MRI 10-Year	72 mph
MRI 25-Year	79 mph
MRI 50-Year	85 mph
MRI 100-Year	91 mph
Risk Category I	100 mph
Risk Category II	110 mph
Risk Category III-IV	115 mph

ASCE 7-05

ASCE 7-05 Wind Speed	85 mph

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

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Project: Sun Lodge Date: 4/17/2023

Job No: Engineer: crc

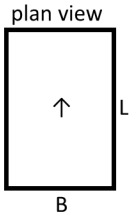
Wind MWFRS - Other Structures and Building Appurtenances

Structure Type:	Solid Freestanding Walls and Solid Freestanding Signs	
Risk Category:	2	ASCE 7-16 Table 1.5-1
Basic Wind Speed, V:	97	ASCE 7-16 Fig 26.5-1B
Exposure Category:	B	ASCE 7-16 Sec 26.7.3
Height to the highest point, z (ft):	16	
Length Perpindicular to Direction 1, B (ft):	15	
Length Parallel to Direction 1, L (ft):	17	
Kd:	0.85	ASCE 7-16 Table 26.6-1
Kzt:	1.00	ASCE 7-16 Sec 26.8.2
Kz:	0.58	ASCE 7-16 Table 26.10-1
Velocity Pressure, q (psf):	11.9	ASCE 7-16 Eq 26.10-1

Direction 1

Gust Factor, Gf:	0.85	ASCE 7-16 Sec 26.11.1
Force Coefficient, Cf:	1.45	ASCE 7-16 Fig 29.3-1
Design Wind Load, p (psf):	16.0	ASCE 7-16 Sec 29.7
Direction 1 Surface Area (ft2):	14	

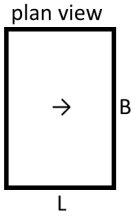
plan view



Direction 2

Gust Factor, Gf:	0.85	ASCE 7-16 Sec 26.11.1
Force Coefficient, Cf:	1.45	ASCE 7-16 Fig 29.3-1
Design Wind Load, p (psf):	16.0	ASCE 7-16 Sec 29.7
Direction 2 Surface Area (ft2):	14	

plan view



Direction 1 Wind Base Shear (lbs):	**224**
Direction 2 Wind Base Shear (lbs:)	**224**

This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Hazards by Location

Search Information

Address: 1601 39th Ave SE, Puyallup, WA 98374, USA

Coordinates: 47.155487, -122.2718194

Elevation: 556 ft

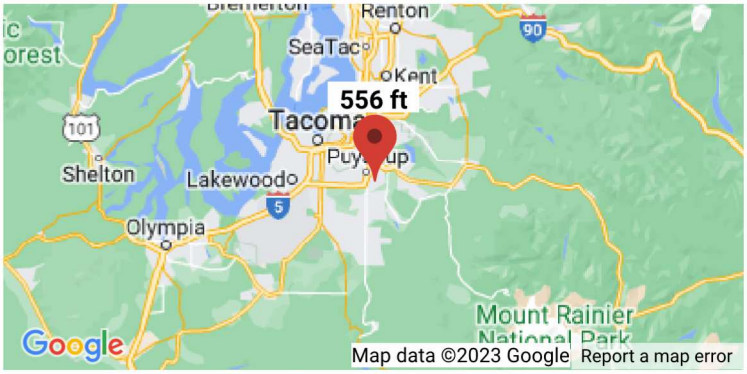
Timestamp: 2023-04-11T21:38:37.960Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D-default



Basic Parameters

Name	Value	Description
S_S	1.253	MCE_R ground motion (period=0.2s)
S_1	0.432	MCE_R ground motion (period=1.0s)
S_{MS}	1.503	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.002	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

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

T_L	6	Long-period transition period (s)
SsRT	1.253	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.371	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.432	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.481	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Project: Sun Lodge Date: 6/15/2023

Job No: Engineer: crc

Seismic Demands on Nonbuilding Sturctures (ASCE 7-16, CHAPTER 15)
Equivalent Lateral Force Procedure:

Lateral System:	Amusement Structures	
Importance Factor, Ie:	1	ASCE 7-16 Sec 15.4.1.1
Response Modification Factor, R:	2	ASCE 7-16 Table 15.4-2
Overstrength Factor, Ω:	2	ASCE 7-16 Table 15.4-2
Deflection Amplification Factor, Cd:	2	ASCE 7-16 Table 15.4-2
Site Class:	D	Per Soils Report
Ss:	1.253	Per Soils Report or USGS
Fa:	1.20	ASCE Table 11.4-1
SMS:	1.504	ASCE 7-16 Eq 11.4-1
SDS:	1.002	ASCE 7-16 Eq 11.4-3
S1:	0.432	Per Soils Report or USGS
Fv:	1.87	ASCE 7-16 Table 11.4-2
SM1:	0.807	ASCE 7-16 Eq 11.4-2
SD1:	0.538	ASCE 7-16 Eq 11.4-4
Seismic Design Category:	D	
hn (ft):	16	max height above grade
Approximate Fundamental period, Ta (s):	0.16	ASCE 7-16 Eq 12.8-7 & Table 12.8-2
Fundamental period of structure, T (s):	0.16	
Long-period transition periods, TL (s):	6	
ρ:	1	ASCE 7-16 Sec 12.3.4
Seismic Effective Weight, W(lb):	3000	ASCE 7-16 Sec 12.7.2
Governing Seismic Response Coefficient Cs:	**0.501**	ASCE 7-16 Eq 12.8-2
min Cs:	0.044	ASCE 7-16 Eq 15.4-1
max Cs:	1.68	ASCE 7-16 Eq 12.8-3
Seismic Base Shear, V (lb):	**1503.6**	ASCE 7-16 Eq 12.8-1
Vertical Seismic Load Coefficient 0.2*SDS:	0.20048	
Vertical Seismic Load, Ev (lb):	601.44	ASCE 7-16 Eq 12.4-4a

Seismic loading governs lateral design

STRUCTURAL DESIGN

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	N314	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N316	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N307	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N315	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Stainless Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e5°F⁻¹]	Density [k/ft³]	n	Yield [ksi]	Fu [ksi]
1	A276 S316	28000	10780	0.3	0.93	0.5	5.6	30	75
2	A276 S321	29000	11165	0.3	0.73	0.48	5.6	65	94
3	A276 S304	28000	10780	0.3	0.93	0.49	5.6	30	75

Stainless Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Top of Ring_SS	SS8X3/8_SSA	Beam	None	A276 S316	Typical	3	0.035	16	0.136
2	Center Piece_SS	HSS1.5X1.5X4_SS	Beam	None	A276 S316	Typical	1.25	0.339	0.339	0.488
3	Ring T_SS	T12X4X3/8	Beam	None	A276 S316	Typical	5.859	2.051	89.288	0.276
4	Tapered Ring T_SS	T8X2X3/8	Beam	None	A276 S316	Typical	3.609	0.284	23.369	0.17
5	Middle Ring T_SS	T10X3X3/8	Beam	None	A276 S316	Typical	4.734	0.886	49.32	0.223

Member Primary Data

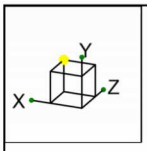
	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M278	N323	N324	300	Middle Ring T	HBrace	None	A276 SS316	Typical
2	M279	N322	N323	300	Middle Ring T	HBrace	None	A276 SS316	Typical
3	M290	N101	N314	270	Ring T	HBrace	None	A276 SS316	Typical
4	M291	N102	N321	300	Ring T	HBrace	None	A276 SS316	Typical
5	M292	N325	N322	300	Tapered Ring T	HBrace	None	A276 SS316	Typical
6	M293	N110	N314	135	Ring T	HBrace	None	A276 SS316	Typical
7	M298	N111	N291	90	Ring T	HBrace	None	A276 SS316	Typical
8	M299	N327	N326	340	Tapered Ring T	HBrace	None	A276 SS316	Typical
9	M300	N326	N328	330	Tapered Ring T	HBrace	None	A276 SS316	Typical
10	M301	N93	N316	260	Ring T	HBrace	None	A276 SS316	Typical
11	M302	N94	N329	330	Ring T	HBrace	None	A276 SS316	Typical
12	M303	N331	N330	330	Middle Ring T	HBrace	None	A276 SS316	Typical
13	M304	N332	N331	330	Middle Ring T	HBrace	None	A276 SS316	Typical
14	M305	N328	N332	330	Tapered Ring T	HBrace	None	A276 SS316	Typical
15	M306	N306	N316	90	Ring T	HBrace	None	A276 SS316	Typical
16	M307	N305	N306	90	Ring T	HBrace	None	A276 SS316	Typical
17	M308	N304	N305	90	Ring T	HBrace	None	A276 SS316	Typical
18	M309	N303	N304	90	Middle Ring T	HBrace	None	A276 SS316	Typical
19	M310	N302	N303	90	Middle Ring T	HBrace	None	A276 SS316	Typical
20	M311	N301	N302	90	Middle Ring T	HBrace	None	A276 SS316	Typical
21	M312	N300	N301	90	Tapered Ring T	HBrace	None	A276 SS316	Typical
22	M313	N95	N315	100	Ring T	HBrace	None	A276 SS316	Typical
23	M314	N96	N333	70	Middle Ring T	HBrace	None	A276 SS316	Typical
24	M315	N335	N334	45	Tapered Ring T	HBrace	None	A276 SS316	Typical
25	M316	N336	N335	25	Tapered Ring T	HBrace	None	A276 SS316	Typical
26	M317	N97	N307	300	Ring T	HBrace	None	A276 SS316	Typical
27	M318	N98	N337	315	Middle Ring T	HBrace	None	A276 SS316	Typical
28	M319	N106	N338	330	Middle Ring T	HBrace	None	A276 SS316	Typical
29	M320	N105	N339	330	Tapered Ring T	HBrace	None	A276 SS316	Typical
30	M321	N109	N292	45	Middle Ring T	HBrace	None	A276 SS316	Typical

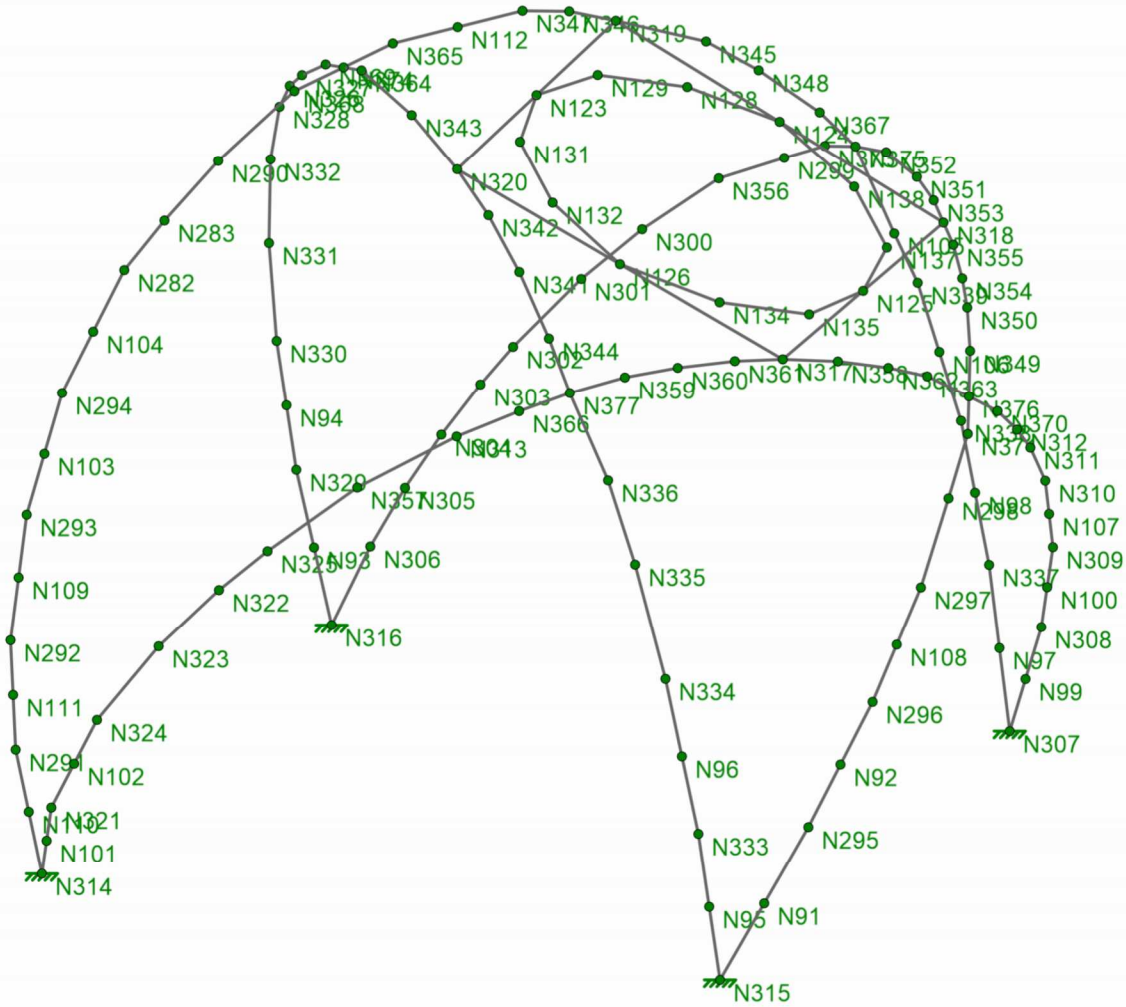
Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
31	M322	N103	N293	45	Tapered Ring T	HBrace	None	A276 SS316	Typical
32	M323	N104	N294	45	Tapered Ring T	HBrace	None	A276 SS316	Typical
33	M324	N283	N282	45	Tapered Ring T	HBrace	None	A276 SS316	Typical
34	M325	N290	N283	45	Tapered Ring T	HBrace	None	A276 SS316	Typical
35	M326	N319	N320		Centerpiece	None	None	A276 SS316	Typical
36	M327	N318	N319		Centerpiece	None	None	A276 SS316	Typical
37	M328	N317	N318		Centerpiece	None	None	A276 SS316	Typical
38	M329	N320	N317		Centerpiece	None	None	A276 SS316	Typical
39	M330	N99	N307	90	Ring T	HBrace	None	A276 SS316	Typical
40	M331	N100	N308	90	Middle Ring T	HBrace	None	A276 SS316	Typical
41	M332	N107	N309	90	Middle Ring T	HBrace	None	A276 SS316	Typical
42	M333	N311	N310	75	Tapered Ring T	HBrace	None	A276 SS316	Typical
43	M334	N312	N311	75	Tapered Ring T	HBrace	None	A276 SS316	Typical
44	M335	N91	N315	300	Ring T	HBrace	None	A276 SS316	Typical
45	M336	N92	N295	300	Middle Ring T	HBrace	None	A276 SS316	Typical
46	M337	N108	N296	315	Middle Ring T	HBrace	None	A276 SS316	Typical
47	M338	N298	N297	315	Tapered Ring T	HBrace	None	A276 SS316	Typical
48	M339	N342	N341		Top of Ring	None	None	A276 SS316	Typical
49	M340	N343	N320		Top of Ring	None	None	A276 SS316	Typical
50	M341	N341	N344		Top of Ring	None	None	A276 SS316	Typical
51	M342	N320	N342		Top of Ring	None	None	A276 SS316	Typical
52	M343	N319	N345		Top of Ring	None	None	A276 SS316	Typical
53	M344	N347	N346		Top of Ring	None	None	A276 SS316	Typical
54	M345	N345	N348		Top of Ring	None	None	A276 SS316	Typical
55	M346	N346	N319		Top of Ring	None	None	A276 SS316	Typical
56	M347	N350	N349	145	Top of Ring	None	None	A276 SS316	Typical
57	M348	N352	N351	145	Top of Ring	None	None	A276 SS316	Typical
58	M349	N351	N353	145	Top of Ring	None	None	A276 SS316	Typical
59	M350	N354	N350	145	Top of Ring	None	None	A276 SS316	Typical
60	M351	N355	N354	145	Top of Ring	None	None	A276 SS316	Typical
61	M352	N318	N355	145	Top of Ring	None	None	A276 SS316	Typical
62	M353	N356	N300	70	Tapered Ring T	HBrace	None	A276 SS316	Typical
63	M354	N299	N356	50	Tapered Ring T	HBrace	None	A276 SS316	Typical
64	M355	N357	N325	300	Tapered Ring T	HBrace	None	A276 SS316	Typical
65	M356	N313	N357	300	Tapered Ring T	HBrace	None	A276 SS316	Typical
66	M357	N358	N317	315	Top of Ring	None	None	A276 SS316	Typical
67	M358	N360	N359	315	Top of Ring	None	None	A276 SS316	Typical
68	M359	N361	N360	315	Top of Ring	None	None	A276 SS316	Typical
69	M360	N317	N361	315	Top of Ring	None	None	A276 SS316	Typical
70	M361	N362	N358	315	Top of Ring	None	None	A276 SS316	Typical
71	M362	N363	N362	315	Top of Ring	None	None	A276 SS316	Typical
72	M363	N364	N343		Top of Ring	None	None	A276 SS316	Typical
73	M364	N112	N347		Top of Ring	None	None	A276 SS316	Typical
74	M365	N366	N313	300	Top of Ring	None	None	A276 SS316	Typical
75	M366	N367	N348		Top of Ring	None	None	A276 SS316	Typical
76	M367	N368	N290	15	Top of Ring	None	None	A276 SS316	Typical
77	M368	N369	N327	345	Top of Ring	None	None	A276 SS316	Typical
78	M369	N370	N312	225	Top of Ring	None	None	A276 SS316	Typical
79	M370	N371	N298	315	Top of Ring	None	None	A276 SS316	Typical
80	M372	N373	N299	35	Top of Ring	None	None	A276 SS316	Typical
81	M373	N374	N369		Top of Ring	None	None	A276 SS316	Typical
82	M374	N374	N368	15	Top of Ring	None	None	A276 SS316	Typical
83	M375	N364	N374		Top of Ring	None	None	A276 SS316	Typical
84	M376	N365	N374		Top of Ring	None	None	A276 SS316	Typical
85	M377	N375	N367		Top of Ring	None	None	A276 SS316	Typical

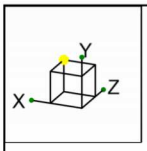
Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
86	M378	N375	N373	35	Top of Ring	None	None	A276 SS316	Typical
87	M380	N352	N375	35	Top of Ring	None	None	A276 SS316	Typical
88	M381	N376	N363	315	Top of Ring	None	None	A276 SS316	Typical
89	M382	N376	N349	35	Top of Ring	None	None	A276 SS316	Typical
90	M383	N370	N376	315	Top of Ring	None	None	A276 SS316	Typical
91	M384	N376	N371	330	Top of Ring	None	None	A276 SS316	Typical
92	M385	N377	N344		Top of Ring	None	None	A276 SS316	Typical
93	M386	N377	N359	225	Top of Ring	None	None	A276 SS316	Typical
94	M388	N377	N366	315	Top of Ring	None	None	A276 SS316	Typical
95	M389	N353	N318	145	Top of Ring	None	None	A276 SS316	Typical
96	M99	N295	N91	300	Ring T	HBrace	None	A276 SS316	Typical
97	M98	N377	N336	15	Top of Ring	None	None	A276 SS316	Typical
98	M100	N296	N92	300	Middle Ring T	HBrace	None	A276 SS316	Typical
99	M101	N329	N93	260	Ring T	HBrace	None	A276 SS316	Typical
100	M102	N330	N94	330	Middle Ring T	HBrace	None	A276 SS316	Typical
101	M103	N333	N95	100	Ring T	HBrace	None	A276 SS316	Typical
102	M104	N334	N96	70	Middle Ring T	HBrace	None	A276 SS316	Typical
103	M105	N337	N97	300	Ring T	HBrace	None	A276 SS316	Typical
104	M106	N338	N98	315	Middle Ring T	HBrace	None	A276 SS316	Typical
105	M107	N308	N99	90	Ring T	HBrace	None	A276 SS316	Typical
106	M108	N309	N100	90	Middle Ring T	HBrace	None	A276 SS316	Typical
107	M109	N321	N101	270	Ring T	HBrace	None	A276 SS316	Typical
108	M110	N324	N102	300	Middle Ring T	HBrace	None	A276 SS316	Typical
109	M111	N294	N103	45	Tapered Ring T	HBrace	None	A276 SS316	Typical
110	M112	N282	N104	45	Tapered Ring T	HBrace	None	A276 SS316	Typical
111	M114	N339	N106	330	Tapered Ring T	HBrace	None	A276 SS316	Typical
112	M115	N310	N107	75	Tapered Ring T	HBrace	None	A276 SS316	Typical
113	M116	N297	N108	315	Tapered Ring T	HBrace	None	A276 SS316	Typical
114	M117	N293	N109	45	Middle Ring T	HBrace	None	A276 SS316	Typical
115	M118	N291	N110	135	Ring T	HBrace	None	A276 SS316	Typical
116	M119	N292	N111	90	Middle Ring T	HBrace	None	A276 SS316	Typical
117	M120	N365	N112		Top of Ring	None	None	A276 SS316	Typical
118	M121	N375	N105		Top of Ring	None	None	A276 SS316	Typical
119	M132	N124	N128	353.579	Centerpiece	None	None	A276 SS316	Typical
120	M133	N128	N129	342.909	Centerpiece	None	None	A276 SS316	Typical
121	M134	N129	N123	337.218	Centerpiece	None	None	A276 SS316	Typical
122	M135	N123	N131	337.218	Centerpiece	None	None	A276 SS316	Typical
123	M136	N131	N132	342.909	Centerpiece	None	None	A276 SS316	Typical
124	M137	N132	N126	353.579	Centerpiece	None	None	A276 SS316	Typical
125	M138	N126	N134	6.421	Centerpiece	None	None	A276 SS316	Typical
126	M139	N134	N135	17.091	Centerpiece	None	None	A276 SS316	Typical
127	M140	N135	N125	22.782	Centerpiece	None	None	A276 SS316	Typical
128	M141	N125	N137	22.782	Centerpiece	None	None	A276 SS316	Typical
129	M142	N137	N138	17.091	Centerpiece	None	None	A276 SS316	Typical
130	M143	N138	N124	6.421	Centerpiece	None	None	A276 SS316	Typical

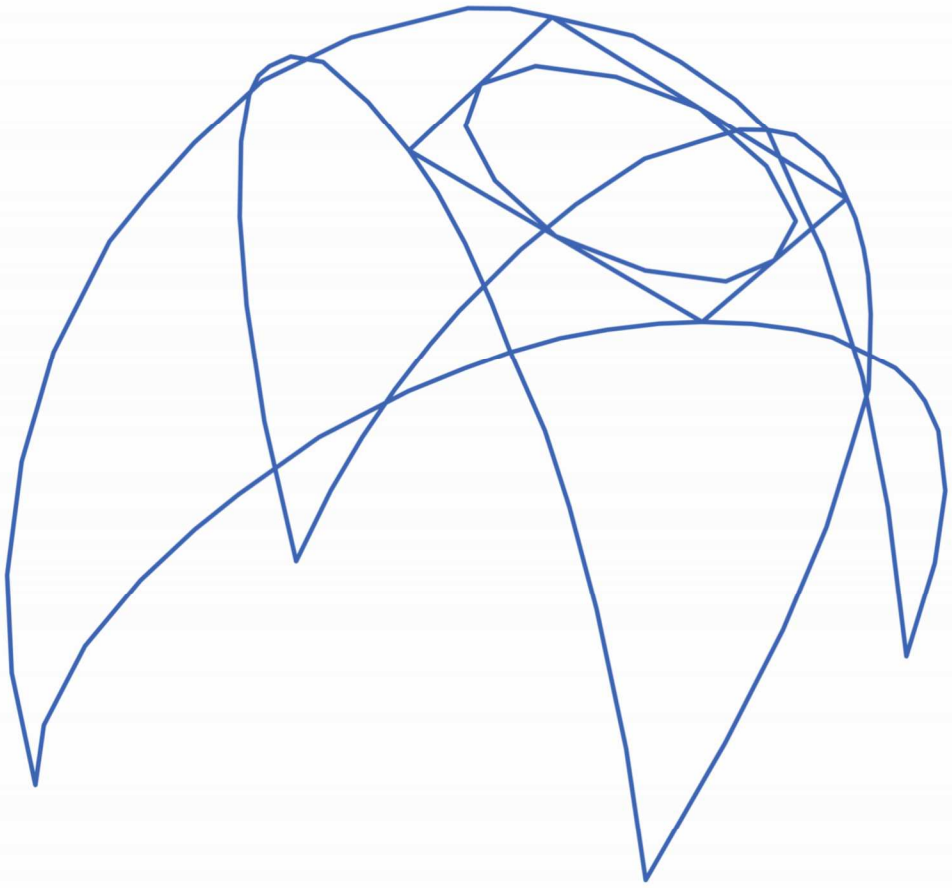




IRISA A NEMETSCHEK COMPANY	Rbhu		SK-1
	CRC		23.05.11_Sun Lodge - 16ft …



Member Material Sets
A276 SS316



IRISA A NEMETSCHEK COMPANY	Rbhu		SK-4
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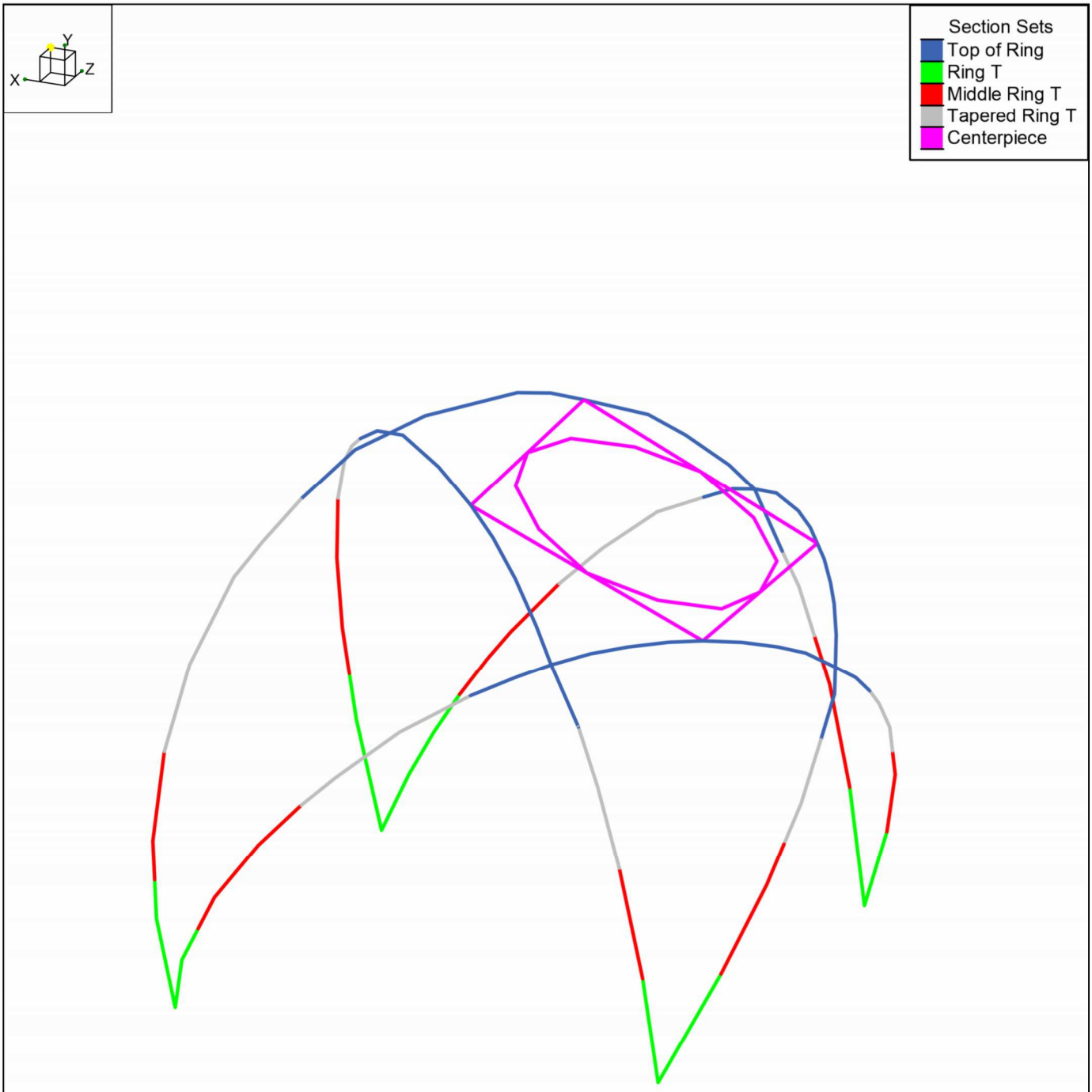


RISA A NEMETSCHEK COMPANY	Rbhu		SK-3
	CRC		23.05.11_Sun Lodge - 16ft …

Member Point Loads (BLC 1 : D)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	M290	z	-0.005	%50
2	M109	z	-0.005	%50
3	M110	z	-0.005	%50
4	M356	z	-0.005	%50
5	M355	z	-0.005	%50
6	M365	z	-0.005	%50
7	M279	z	-0.005	%50
8	M278	z	-0.005	%50
9	M291	z	-0.005	%50
10	M292	z	-0.005	%50
11	M108	z	0.005	%50
12	M383	z	-0.005	%50
13	M107	z	0.005	%50
14	M369	z	-0.005	%50
15	M334	z	0.005	%50
16	M333	z	0.005	%50
17	M331	z	0.005	%50
18	M115	z	0.005	%50
19	M332	z	0.005	%50
20	M330	z	0.005	%50
21	M306	z	0.005	%50
22	M307	z	0.005	%50
23	M308	z	0.005	%50
24	M309	z	0.005	%50
25	M310	z	0.005	%50
26	M311	z	0.005	%50
27	M312	z	0.005	%50
28	M353	z	0.005	%50
29	M354	z	0.005	%50
30	M372	z	0.005	%50
31	M378	z	0.005	%50
32	M384	z	-0.005	%50
33	M370	z	-0.005	%50
34	M338	z	-0.005	%50
35	M116	z	-0.005	%50
36	M337	z	-0.005	%50
37	M100	z	-0.005	%50
38	M336	z	-0.005	%50
39	M99	z	-0.005	%50
40	M335	z	-0.005	%50
41	M313	z	0.005	%50
42	M103	z	0.005	%50
43	M104	z	0.005	%50
44	M315	z	0.005	%50
45	M314	z	0.005	%50
46	M316	z	0.005	%50
47	M98	z	0.005	%50
48	M368	z	-0.005	%50
49	M373	z	-0.005	%50
50	M299	z	-0.005	%50
51	M300	z	-0.005	%50
52	M305	z	-0.005	%50
53	M304	z	-0.005	%50
54	M303	z	-0.005	%50
55	M102	z	-0.005	%50

Member Point Loads (BLC 1 : D) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
56	M302	z	-0.005	%50
57	M101	z	-0.005	%50
58	M301	z	-0.005	%50
59	M121	z	-0.005	%50
60	M320	z	-0.005	%50
61	M114	z	-0.005	%50
62	M319	z	-0.005	%50
63	M106	z	-0.005	%50
64	M318	z	-0.005	%50
65	M105	z	-0.005	%50
66	M317	z	-0.005	%50
67	M293	z	0.005	%50
68	M298	z	0.005	%50
69	M119	z	0.005	%50
70	M117	z	0.005	%50
71	M322	z	0.005	%50
72	M323	z	0.005	%50
73	M111	z	0.005	%50
74	M112	z	0.005	%50
75	M324	z	0.005	%50
76	M325	z	0.005	%50
77	M374	z	0.005	%50
78	M367	z	0.005	%50

Member Distributed Loads (BLC 10 : Pushing LL)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, k-ft/ft]	End Magnitude [lb/ft, F, psf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M314	z	-200	-200	0	%100
2	M103	z	-200	-200	0	%100

Member Area Loads (BLC 5 : Ex)

	Node A	Node B	Node C	Direction	Load Direction	Magnitude [psf]
1	N317	N318	N319	X	Two Way	-1.5
2	N317	N319	N320	X	Two Way	-1.5

Member Area Loads (BLC 6 : Ey)

	Node A	Node B	Node C	Direction	Load Direction	Magnitude [psf]
1	N317	N318	N319	Y	Two Way	-0.6
2	N317	N319	N320	Y	Two Way	-0.6

Member Area Loads (BLC 7 : Ez)

	Node A	Node B	Node C	Direction	Load Direction	Magnitude [psf]
1	N317	N318	N319	Z	Two Way	-1.5
2	N317	N319	N320	Z	Two Way	-1.5

Member Area Loads (BLC 9 : Glass DL)

	Node A	Node B	Node C	Direction	Load Direction	Magnitude [psf]
1	N317	N318	N319	Y	Two Way	-3
2	N317	N319	N320	Y	Two Way	-3

Member Area Loads (BLC 11 : SNOW)

	Node A	Node B	Node C	Direction	Load Direction	Magnitude [psf]
1	N319	N318	N317	Y	Two Way	-18
2	N317	N320	N319	Y	Two Way	-18

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed	Area(Member)
1	D	DL		-1		78		
2	L	LL						
3	Wz	WLZ						
4	Wx	WLX						
5	Ex	ELX	-0.5					2
6	Ey	ELY		-0.2				2
7	Ez	ELZ			-0.5			2
8	Lr	RLL						
9	Glass DL	DL						2
10	Pushing LL	LL					2	
11	SNOW	SL						2

Load Combinations

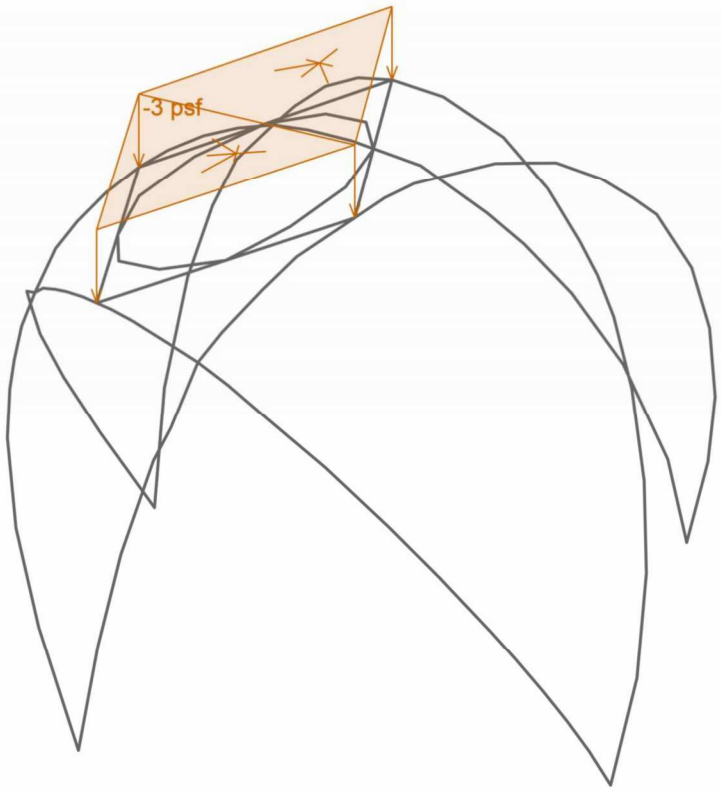
	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	**********LRFD GRAVITY**********																
2	1.4D	Yes	Y	DL	1.4												
3	1.2D+1.6L+0.5S	Yes	Y	DL	1.2	LL	1.6	SL	0.5								
4	1.2D+1.6S+1.0L	Yes	Y	DL	1.2	LL	1	SL	1.6								
5	**********LRFD WIND**********																
6	1.2D+L+0.5Wz+1.6Lr		Y	DL	1.2	LL	1	WLZ	0.5			RLL	1.6				
7	1.2D+L-0.5Wz+1.6Lr		Y	DL	1.2	LL	1	WLZ	-0.5			RLL	1.6				
8	1.2D+L+0.5Wx+1.6Lr		Y	DL	1.2	LL	1	WLX	0.5			RLL	1.6				
9	1.2D+L-0.5Wx+1.6Lr		Y	DL	1.2	LL	1	WLX	-0.5			RLL	1.6				
10	1.2D+L+0.5*0.75(Wz+Wx)+1.6Lr		Y	DL	1.2	LL	1	WLZ	0.375	WLX	0.375	RLL	1.6				
11	1.2D+L+0.5*0.75(Wz-Wx)+1.6Lr		Y	DL	1.2	LL	1	WLZ	0.375	WLX	-0.375	RLL	1.6				
12	1.2D+L+0.5*0.75(-Wz+Wx)+1.6Lr		Y	DL	1.2	LL	1	WLZ	-0.375	WLX	0.375	RLL	1.6				
13	1.2D+L+0.5*0.75(-Wz-Wx)+1.6Lr		Y	DL	1.2	LL	1	WLZ	-0.375	WLX	-0.375	RLL	1.6				
14	1.2D+L+Wz+0.5Lr		Y	DL	1.2	LL	1	WLZ	1			RLL	0.5				
15	1.2D+L-Wz+0.5Lr		Y	DL	1.2	LL	1	WLZ	-1			RLL	0.5				
16	1.2D+L+Wx+0.5Lr		Y	DL	1.2	LL	1	WLX	1			RLL	0.5				
17	1.2D+L-Wx+0.5Lr		Y	DL	1.2	LL	1	WLX	-1			RLL	0.5				
18	1.2D+L+0.75(Wz+Wx)+0.5Lr		Y	DL	1.2	LL	1	WLZ	0.75	WLX	0.75	RLL	0.5				
19	1.2D+L+0.75(Wz-Wx)+0.5Lr		Y	DL	1.2	LL	1	WLZ	0.75	WLX	-0.75	RLL	0.5				
20	1.2D+L+0.75(-Wz+Wx)+0.5Lr		Y	DL	1.2	LL	1	WLZ	-0.75	WLX	0.75	RLL	0.5				
21	1.2D+L+.75(-Wz-Wx)+0.5Lr		Y	DL	1.2	LL	1	WLZ	-0.75	WLX	-0.75	RLL	0.5				
22	0.9D+Wz		Y	DL	0.9		1	WLZ	1								
23	0.9D-Wz		Y	DL	0.9		1	WLZ	-1								
24	0.9D+Wx		Y	DL	0.9		1	WLX	1								
25	0.9D-Wx		Y	DL	0.9		1	WLX	-1								
26	0.9D+.75(Wz+Wx)		Y	DL	0.9		1	WLZ	0.75	WLX	0.75						
27	0.9D+.75(Wz-Wx)		Y	DL	0.9		1	WLZ	0.75	WLX	-0.75						
28	0.9D+.75(-Wz+Wx)		Y	DL	0.9		1	WLZ	-0.75	WLX	0.75						
29	0.9D+.75(-Wz-Wx)		Y	DL	0.9		1	WLZ	-0.75	WLX	-0.75						
30	**********LRFD SEISMIC**********																
31	1.2D+L+Ex+Ey	Yes	Y	DL	1.2	LL	1			ELX	1			ELY	1		
32	1.2D+L-Ex+Ey	Yes	Y	DL	1.2	LL	1			ELX	-1			ELY	1		
33	1.2D+L+Ez+Ey	Yes	Y	DL	1.2	LL	1			ELZ	1			ELY	1		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
34	1.2D+L-Ez+Ey	Yes	Y	DL	1.2	LL	1			ELZ	-1			ELY	1		
35	1.2D+L+.75(Ex+Ez)+Ey	Yes	Y	DL	1.2	LL	1			ELX	0.75	ELZ	0.75	ELY	1		
36	1.2D+L+.75(Ex-Ez)+Ey	Yes	Y	DL	1.2	LL	1			ELX	0.75	ELZ	-0.75	ELY	1		
37	1.2D+L+.75(-Ex+Ez)+Ey	Yes	Y	DL	1.2	LL	1			ELX	-0.75	ELZ	0.75	ELY	1		
38	1.2D+L+.75(-Ex-Ez)+Ey	Yes	Y	DL	1.2	LL	1			ELX	-0.75	ELZ	-0.75	ELY	1		
39	0.9D+Ex-Ey	Yes	Y	DL	0.9					ELX	1			ELY	-1		
40	0.9D-Ex-Ey	Yes	Y	DL	0.9					ELX	-1			ELY	-1		
41	0.9D+Ez-Ey	Yes	Y	DL	0.9					ELZ	1			ELY	-1		
42	0.9D-Ez-Ey	Yes	Y	DL	0.9					ELZ	-1			ELY	-1		
43	0.9D+.75(Ex+Ez)-Ey	Yes	Y	DL	0.9					ELX	0.75	ELZ	0.75	ELY	-1		
44	0.9D+.75(-Ex+Ez)-Ey	Yes	Y	DL	0.9					ELX	-0.75	ELZ	0.75	ELY	-1		
45	0.9D+.75(Ex+-Ez)-Ey	Yes	Y	DL	0.9					ELX	0.75	ELZ	-0.75	ELY	-1		
46	0.9D+.75(-Ex-Ez)-Ey	Yes	Y	DL	0.9					ELX	-0.75	ELZ	-0.75	ELY	-1		
47	***LRFD OVERSTRENGTH SEISMIC***																
48	(OS)1.2D+L+Ex+Ey		Y	DL	1.2	LL	1			Om*ELX	1			Om*ELY	1		
49	(OS)1.2D+L-Ex+Ey		Y	DL	1.2	LL	1			Om*ELX	-1			Om*ELY	1		
50	(OS)1.2D+L+Ez+Ey		Y	DL	1.2	LL	1			Om*ELZ	1			Om*ELY	1		
51	(OS)1.2D+L-Ez+Ey		Y	DL	1.2	LL	1			Om*ELZ	-1			Om*ELY	1		
52	(OS)1.2D+L+.75(Ex+Ez)+Ey		Y	DL	1.2	LL	1			Om*ELX	0.75	Om*ELZ	0.75	Om*ELY	1		
53	(OS)1.2D+L+.75(Ex-Ez)+Ey		Y	DL	1.2	LL	1			Om*ELX	0.75	Om*ELZ	-0.75	Om*ELY	1		
54	(OS)1.2D+L+.75(-Ex+Ez)+Ey		Y	DL	1.2	LL	1			Om*ELX	-0.75	Om*ELZ	0.75	Om*ELY	1		
55	(OS)1.2D+L+.75(-Ex-Ez)+Ey		Y	DL	1.2	LL	1			Om*ELX	-0.75	Om*ELZ	-0.75	Om*ELY	1		
56	(OS)0.9D+Ex-Ey		Y	DL	0.9					Om*ELX	1			Om*ELY	-1		
57	(OS)0.9D-Ex-Ey		Y	DL	0.9					Om*ELX	-1			Om*ELY	-1		
58	(OS)0.9D+Ez-Ey		Y	DL	0.9					Om*ELZ	1			Om*ELY	-1		
59	(OS)0.9D-Ez-Ey		Y	DL	0.9					Om*ELZ	-1			Om*ELY	-1		
60	(OS)0.9D+.75(Ex+Ez)-Ey		Y	DL	0.9					Om*ELX	0.75	Om*ELZ	0.75	Om*ELY	-1		
61	(OS)0.9D+.75(-Ex+Ez)-Ey		Y	DL	0.9					Om*ELX	-0.75	Om*ELZ	0.75	Om*ELY	-1		
62	(OS)0.9D+.75(Ex+-Ez)-Ey		Y	DL	0.9					Om*ELX	0.75	Om*ELZ	-0.75	Om*ELY	-1		
63	(OS)0.9D+.75(-Ex-Ez)-Ey		Y	DL	0.9					Om*ELX	-0.75	Om*ELZ	-0.75	Om*ELY	-1		
64	**********ASD GRAVITY**********																
65	D+L		Y	DL	1	LL	1										
66	D+.75L+0.75Lr		Y	DL	1	LL	0.75					RLL	0.75				
67	**********ASD WIND**********																
68	D+0.6Wz		Y	DL	1			WLZ	0.6								
69	D-0.6Wz		Y	DL	1			WLZ	-0.6								
70	D+0.6Wx		Y	DL	1			WLX	0.6								
71	D-0.6Wx		Y	DL	1			WLX	-0.6								
72	D+0.6(.75(Wz+Wx))		Y	DL	1			WLZ	0.45	WLX	0.45						
73	D+0.6(.75(Wz-Wx))		Y	DL	1			WLZ	0.45	WLX	-0.45						
74	D+0.6(.75(-Wz+Wx))		Y	DL	1			WLZ	-0.45	WLX	0.45						
75	D+0.6(.75(-Wz-Wx))		Y	DL	1			WLZ	-0.45	WLX	-0.45						
76	D+0.75L+0.75(0.6Wz)+0.75Lr		Y	DL	1	LL	0.75	WLZ	0.45							RLL	0.75
77	D+0.75L+0.75(-0.6Wz)+0.75Lr		Y	DL	1	LL	0.75	WLZ	-0.45							RLL	0.75
78	D+0.75L+0.75(0.6Wx)+0.75Lr		Y	DL	1	LL	0.75	WLX	0.45							RLL	0.75
79	D+0.75L+0.75(-0.6Wx)+0.75Lr		Y	DL	1	LL	0.75	WLX	-0.45							RLL	0.75
80	D+0.75L+0.75(0.75(0.6Wx+.6Wz))+0.		Y	DL	1	LL	0.75	WLZ	0.34	WLX	0.34					RLL	0.75
81	D+0.75L+0.75(0.75(0.6Wx-.6Wz))+0.		Y	DL	1	LL	0.75	WLZ	0.34	WLX	-0.34					RLL	0.75
82	D+0.75L+0.75(0.75(-0.6Wx+.6Wz))+0		Y	DL	1	LL	0.75	WLZ	-0.34	WLX	0.34					RLL	0.75
83	D+0.75L+0.75(0.75(-0.6Wx-.6Wz))+0		Y	DL	1	LL	0.75	WLZ	-0.34	WLX	-0.34					RLL	0.75
84	0.6D+0.6Wz		Y	DL	0.6			WLZ	0.6								
85	0.6D-0.6Wz		Y	DL	0.6			WLZ	-0.6								
86	0.6D+0.6Wx		Y	DL	0.6			WLX	0.6								
87	0.6D-0.6Wx		Y	DL	0.6			WLX	-0.6								
88	0.6D+.75(0.6Wz+0.6Wx)		Y	DL	0.6			WLZ	0.45	WLX	0.45						

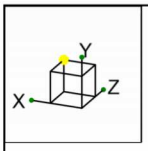
Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
89	0.6D+.75(0.6Wz-0.6Wx)		Y	DL	0.6			WLZ	0.45	WLX	-0.45						
90	0.6D+.75(-0.6Wz+0.6Wx)		Y	DL	0.6			WLZ	-0.45	WLX	0.45						
91	0.6D+.75(-0.6Wz-0.6Wx)		Y	DL	0.6			WLZ	-0.45	WLX	-0.45						
92	**********ASD SEISMIC**********																
93	D+0.75L+0.75(0.7Ex+Ey)		Y	DL	1	LL	0.75			ELX	0.525			ELY	0.525		
94	D+0.75L+0.75(-0.7Ex+Ey)		Y	DL	1	LL	0.75			ELX	-0.525			ELY	0.525		
95	D+0.75L+0.75(0.7Ez+Ey)		Y	DL	1	LL	0.75			ELZ	0.525			ELY	0.525		
96	D+0.75L+0.75(-0.7Ez+Ey)		Y	DL	1	LL	0.75			ELZ	-0.525			ELY	0.525		
97	D+0.75L+0.75(0.7(.75Ex+.75Ez+Ey))		Y	DL	1	LL	0.75			ELX	0.4	ELZ	0.4	ELY	0.525		
98	D+0.75L+0.75(0.7(.75Ex-.75Ez+Ey))		Y	DL	1	LL	0.75			ELX	0.4	ELZ	-0.4	ELY	0.525		
99	D+0.75L+0.75(0.7(-.75Ex+.75Ez+Ey)		Y	DL	1	LL	0.75			ELX	-0.4	ELZ	0.4	ELY	0.525		
100	D+0.75L+0.75(0.7(-.75Ex-.75Ez+Ey)		Y	DL	1	LL	0.75			ELX	-0.4	ELZ	-0.4	ELY	0.525		
101	0.6D+0.7Ex-0.7Ey		Y	DL	0.6					ELX	0.7			ELY	-0.7		
102	0.6D-0.7Ex-0.7Ey		Y	DL	0.6					ELX	-0.7			ELY	-0.7		
103	0.6D+0.7Ez-0.7Ey		Y	DL	0.6					ELZ	0.7			ELY	-0.7		
104	0.6D-0.7Ez-0.7Ey		Y	DL	0.6					ELZ	-0.7			ELY	-0.7		
105	0.6D+0.7(.75Ex+.75Ez)-0.7Ey		Y	DL	0.6					ELX	0.525	ELZ	0.525	ELY	-0.7		
106	0.6D+0.7(.75Ex-.75Ez)-0.7Ey		Y	DL	0.6					ELX	0.525	ELZ	-0.525	ELY	-0.7		
107	0.6D+0.7(-.75Ex+.75Ez)-0.7Ey		Y	DL	0.6					ELX	-0.525	ELZ	0.525	ELY	-0.7		
108	0.6D+0.7(-.75Ex-.75Ez)-0.7Ey		Y	DL	0.6					ELX	-0.525	ELZ	-0.525	ELY	-0.7		
109	D+0.7Ex-0.7Ey		Y	DL	1					ELX	0.7			ELY	0.7		
110	D-0.7Ex-0.7Ey		Y	DL	1					ELX	-0.7			ELY	0.7		
111	D+0.7Ez-0.7Ey		Y	DL	1					ELZ	0.7			ELY	0.7		
112	D-0.7Ez-0.7Ey		Y	DL	1					ELZ	-0.7			ELY	0.7		
113	D+0.7(.75Ex+.75Ez)-0.7Ey		Y	DL	1					ELX	0.525	ELZ	0.525	ELY	0.7		
114	D+0.7(.75Ex-.75Ez)-0.7Ey		Y	DL	1					ELX	0.525	ELZ	-0.525	ELY	0.7		
115	D+0.7(-.75Ex+.75Ez)-0.7Ey		Y	DL	1					ELX	-0.525	ELZ	0.525	ELY	0.7		
116	D+0.7(-.75Ex-.75Ez)-0.7Ey		Y	DL	1					ELX	-0.525	ELZ	-0.525	ELY	0.7		
117	**********SINGLE**********																
118	D	Yes	Y	DL	1												
119	D (P-DELTA OFF)			DL	1												
120	L	Yes	Y			LL	1										
121	Wz		Y					WLZ	1								
122	Wx		Y					WLX	1								
123	Ex	Yes	Y							ELX	1						
124	Ey	Yes	Y							ELY	1						
125	Ez	Yes	Y							ELZ	1						
126	Lr		Y									RLL	1				



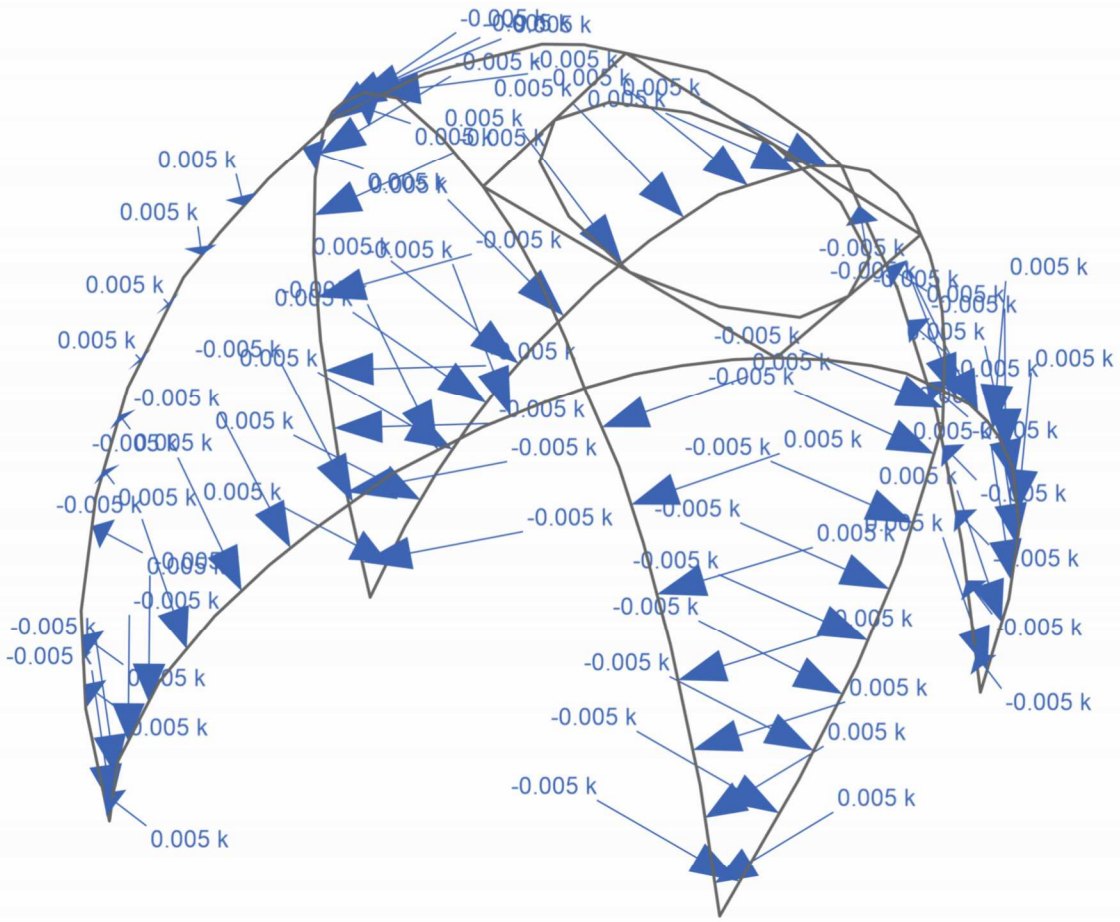
Loads: BLC 9, Glass DL

RISA A NEMETSCHEK COMPANY	Rbhu		SK-9
	CRC		23.05.11_Sun Lodge - 16ft …



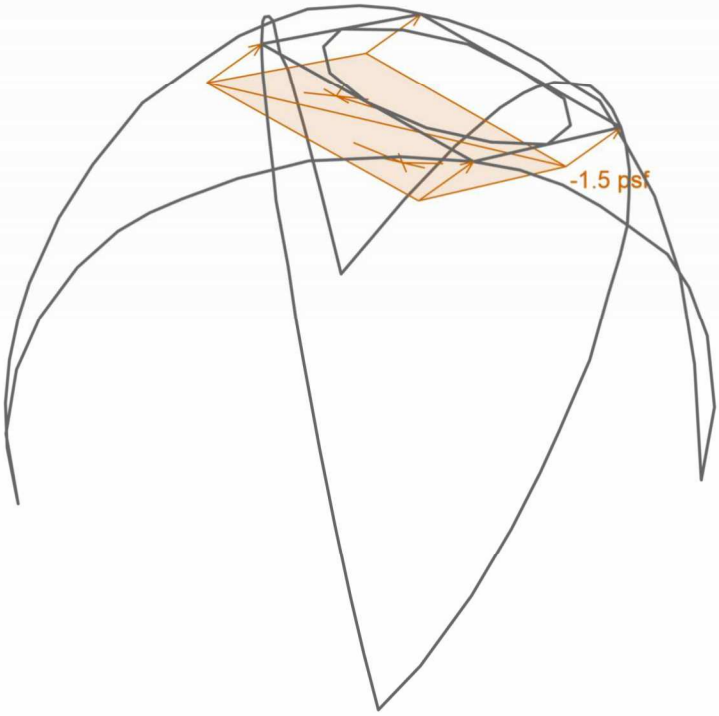
3 LB NOTIONAL LOADS FOR
"OUT-OF-PERFECT" PLATES

TO VERIFY THAT WEAK AXIS
BENDING IS OK



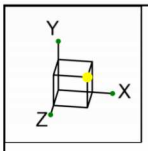
Loads: BLC 1, D

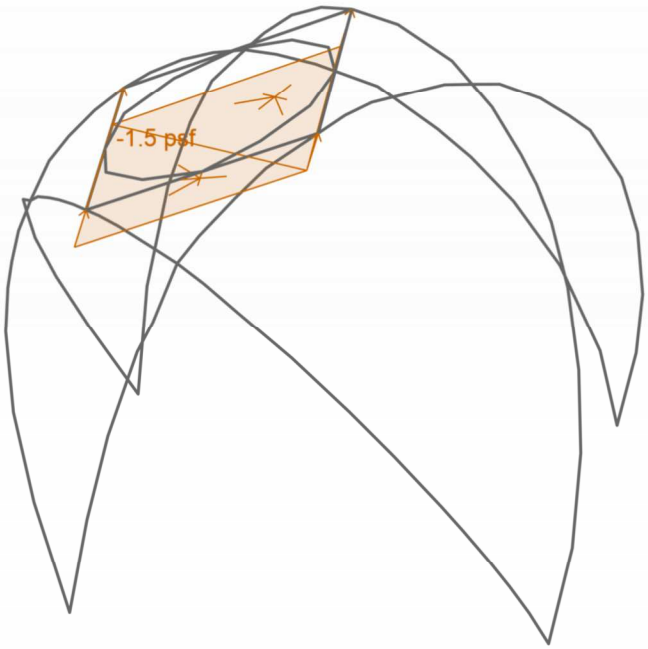
IRISA A NEMETSCHEK COMPANY	Rbhu		SK-5
	CRC		23.05.11_Sun Lodge - 16ft …



Loads: BLC 5, Ex

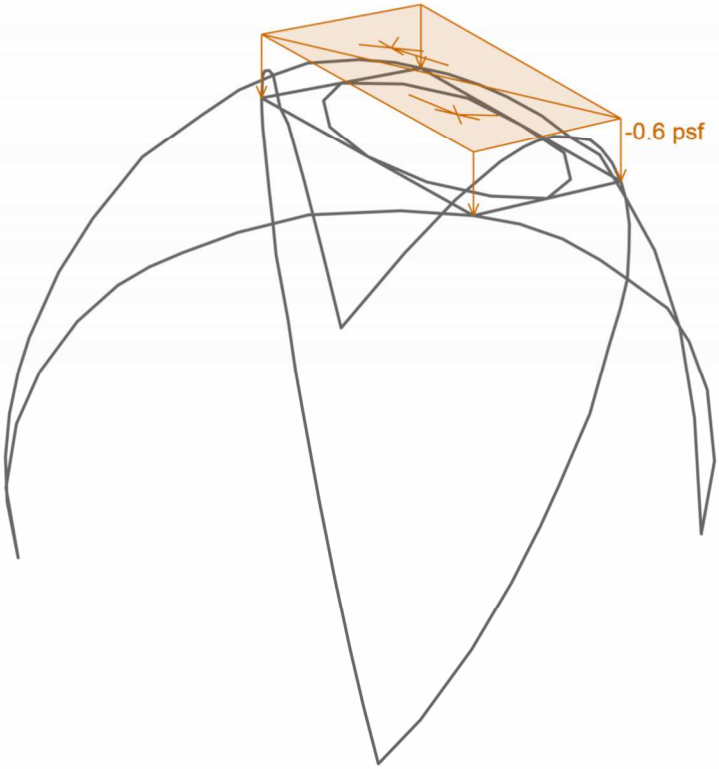
RISA A NEMETSCHEK COMPANY	Rbhu		SK-7
	CRC		23.05.11_Sun Lodge - 16ft …





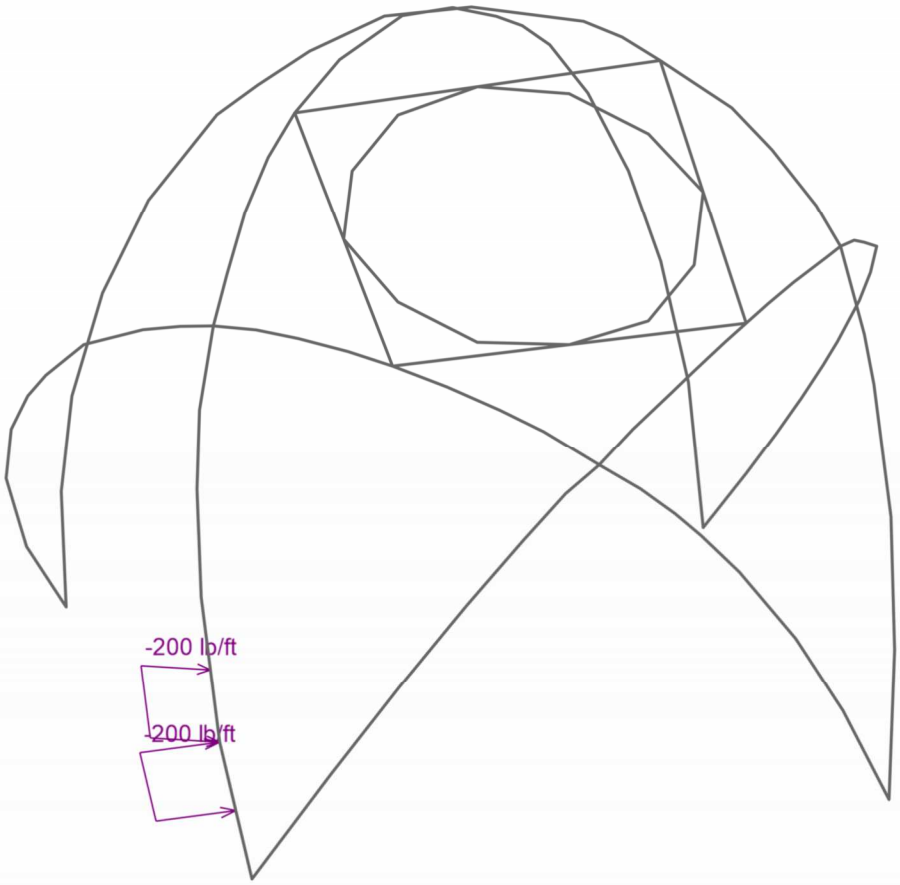
Loads: BLC 7, Ez

RISA A NEMETSCHEK COMPANY	Rbhu		SK-8
	CRC		23.05.11_Sun Lodge - 16ft …



Loads: BLC 6, Ey

RISA A NEMETSCHEK COMPANY	Rbhu		SK-6
	CRC		23.05.11_Sun Lodge - 16ft …



Loads: BLC 10, Pushing LL

RISA A NEMETSCHEK COMPANY	Rbhu		SK-10
	CRC		23.05.11_Sun Lodge - 16ft …

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N314	max	0.235	39	1.101	32	0.347	37	2.362	37	0.662	38	2.233	32
2		min	-0.675	32	0.205	39	-0.105	45	-0.601	45	-1.01	43	-0.941	39
3	N316	max	0.276	39	0.692	38	0.186	41	0.962	43	0.741	45	0.853	32
4		min	-0.337	32	0.095	43	-0.207	34	-1.035	38	-0.555	32	-1.187	39
5	N307	max	0.426	4	1.578	4	0.215	41	0.414	41	0.256	41	0.25	44
6		min	-0.066	40	0.206	41	-0.663	34	-2.325	4	-0.338	34	-3.017	4
7	N315	max	0.808	3	1.001	4	0.362	41	0.841	43	0.221	41	0.802	46
8		min	-0.175	40	-0.158	46	-0.642	34	-1.34	38	-0.889	3	-4.082	3
9	Totals:	max	1.409	31	4.249	4	1.039	41						
10		min	-1.035	40	1.594	40	-1.547	34						

Envelope Node Displacements

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N282	max	1.151	38	0.1	43	1.235	38	1.756e-2	38	-5.138e-4	41	1.358e-3	43
2		min	-0.248	43	-0.321	38	-0.369	43	-3.709e-4	43	-2.858e-2	34	-2.555e-2	38
3	N283	max	1.149	38	0.086	43	1.23	38	1.689e-2	38	1.26e-3	41	1.74e-3	43
4		min	-0.262	43	-0.318	38	-0.363	43	1.13e-3	43	-2.959e-2	34	-2.574e-2	38
5	N290	max	1.129	38	0.053	43	1.178	38	1.626e-2	38	1.865e-3	41	1.812e-3	43
6		min	-0.27	43	-0.283	38	-0.334	43	1.875e-3	43	-3.009e-2	34	-2.577e-2	38
7	N291	max	0.051	38	0.004	43	0.059	38	8.789e-3	38	2.188e-2	38	8.302e-4	43
8		min	-0.014	43	-0.013	38	-0.025	41	-1.875e-3	43	-1.583e-3	43	-2.63e-3	38
9	N292	max	0.222	38	0.016	43	0.248	38	1.137e-2	38	2.202e-2	32	1.356e-3	41
10		min	-0.048	43	-0.06	38	-0.08	43	-3.059e-3	43	-2.297e-3	43	-4.86e-3	38
11	N293	max	0.557	38	0.041	43	0.612	38	1.343e-2	38	9.271e-3	32	1.524e-3	43
12		min	-0.108	43	-0.155	38	-0.176	43	-3.536e-3	43	-3.557e-3	35	-1.089e-2	38
13	N294	max	0.907	38	0.079	43	0.99	38	1.578e-2	38	-1.082e-3	44	1.744e-3	43
14		min	-0.183	43	-0.258	38	-0.295	43	-4.003e-3	41	-1.699e-2	34	-1.887e-2	38
15	N295	max	0.01	46	0.004	46	0.025	35	6.536e-3	4	-1.119e-3	41	2.789e-3	43
16		min	-0.106	35	-0.059	35	0.002	46	9.541e-4	44	-1.264e-2	4	-5.355e-3	38
17	N296	max	0.002	46	-0.013	46	0.087	4	8.397e-3	4	4.322e-4	41	3.978e-3	43
18		min	-0.276	35	-0.152	35	0.018	40	5.985e-4	44	-1.641e-2	4	-6.699e-3	38
19	N297	max	-0.036	40	-0.039	40	0.186	4	7.15e-3	34	3.256e-3	41	2.137e-3	43
20		min	-0.401	35	-0.239	4	0.022	44	-1.571e-3	41	-1.48e-2	4	-7.009e-3	38
21	N298	max	-0.043	40	-0.027	44	0.281	4	6.814e-3	34	3.966e-3	41	1.281e-3	43
22		min	-0.471	4	-0.327	4	-0.001	44	-2.526e-3	41	-1.419e-2	4	-7.364e-3	4
23	N299	max	-0.02	44	-0.082	44	0.564	34	5.44e-2	36	-7.967e-3	44	7.655e-3	32
24		min	-0.549	36	-0.42	36	0.046	41	8.857e-3	44	-4.752e-2	36	-1.117e-3	39
25	N300	max	-0.024	44	-0.046	44	0.836	34	4.401e-2	36	-7.482e-3	44	1.227e-2	36
26		min	-0.978	36	-0.907	36	0.125	44	7.628e-3	44	-3.404e-2	36	1.983e-3	44
27	N301	max	-0.027	44	-0.049	44	0.711	34	3.121e-2	36	-5.781e-3	44	1.547e-2	36
28		min	-0.806	36	-0.743	36	0.124	44	6.204e-3	44	-2.208e-2	36	-7.498e-4	44
29	N302	max	-0.038	44	-0.057	44	0.491	34	1.642e-2	36	-2.412e-3	39	1.541e-2	36
30		min	-0.495	36	-0.459	36	0.103	44	4.169e-3	44	-7.222e-3	4	-7.035e-4	44
31	N303	max	-0.038	44	-0.055	44	0.37	34	9.513e-3	34	4.063e-3	36	1.523e-2	36
32		min	-0.343	36	-0.323	34	0.08	41	2.967e-3	41	-2.086e-3	44	-1.884e-4	44
33	N304	max	-0.031	44	-0.042	41	0.227	38	3.459e-3	32	1.466e-2	36	1.466e-2	36
34		min	-0.184	36	-0.191	34	0.05	41	-5.529e-4	39	-3.561e-4	44	7.915e-4	44
35	N305	max	-0.018	41	-0.02	41	0.118	38	1.72e-3	40	1.954e-2	36	1.471e-2	36
36		min	-0.08	34	-0.092	38	0.021	43	-2.954e-3	31	7.187e-4	44	1.328e-3	44
37	N306	max	-0.003	43	-0.002	43	0.035	38	1.21e-3	40	1.798e-2	36	1.23e-2	36
38		min	-0.018	38	-0.027	38	0.002	43	-3.692e-3	31	1.187e-3	44	1.409e-3	44
39	N307	max	0	40	0	41	0	34	0	4	0	34	0	4
40		min	0	4	0	4	0	41	0	41	0	41	0	44
41	N308	max	-0.003	46	0	46	0.003	46	1.77e-3	46	2.96e-3	43	3.55e-3	34

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
42		min	-0.069	35	-0.067	35	-0.075	35	-4.402e-3	35	-5.237e-3	38	1.1e-3	39
43	N309	max	0.008	46	0.018	46	0.029	46	4.889e-3	34	5.27e-4	43	7.072e-3	34
44		min	-0.177	35	-0.175	35	-0.196	35	-4.128e-3	43	-1.208e-2	38	2.743e-3	39
45	N310	max	0.047	46	0.063	46	0.084	42	7.022e-3	34	-2.298e-3	43	9.459e-3	34
46		min	-0.252	35	-0.245	35	-0.272	35	-1.76e-3	41	-1.629e-2	38	3.718e-3	39
47	N311	max	0.084	46	0.103	42	0.132	42	6.574e-3	34	-3.086e-3	43	1.009e-2	34
48		min	-0.258	35	-0.238	35	-0.268	33	1.204e-4	41	-1.689e-2	34	3.732e-3	39
49	N312	max	0.113	46	0.138	34	0.171	34	6.292e-3	34	-3.177e-3	43	1.012e-2	34
50		min	-0.25	35	-0.219	33	-0.251	33	3.924e-4	44	-1.685e-2	34	3.698e-3	39
51	N313	max	0.518	46	0.427	46	0.375	46	-1.548e-2	45	5.058e-2	32	1.011e-2	3
52		min	-0.634	35	-0.59	35	-0.576	35	-5.175e-2	32	1.41e-2	45	7.918e-4	39
53	N314	max	0	32	0	39	0	45	0	45	0	43	0	39
54		min	0	39	0	32	0	37	0	37	0	38	0	32
55	N315	max	0	40	0	46	0	34	0	38	0	3	0	3
56		min	0	3	0	4	0	41	0	43	0	41	0	46
57	N316	max	0	32	0	43	0	34	0	38	0	32	0	39
58		min	0	39	0	38	0	41	0	43	0	45	0	32
59	N317	max	0.155	32	-0.005	31	0.05	38	6.289e-3	3	2.454e-3	44	1.618e-4	31
60		min	-0.104	39	-0.117	4	-0.066	43	-1.972e-5	44	-3.761e-3	36	-9.204e-3	4
61	N318	max	0.078	32	-0.026	40	0.05	38	1.851e-3	4	1.666e-3	43	5.684e-4	39
62		min	-0.085	39	-0.12	4	-0.065	43	-1.165e-3	43	-5.502e-3	4	-3.25e-3	4
63	N319	max	0.098	32	0.006	45	0.163	38	5.971e-3	4	3.583e-3	2	1.62e-3	45
64		min	-0.098	39	-0.187	4	-0.099	43	-1.901e-3	45	6.078e-4	44	-6.031e-3	4
65	N320	max	0.176	32	-0.006	31	0.161	38	1.15e-3	35	4.263e-3	40	-2.342e-4	31
66		min	-0.103	39	-0.202	4	-0.099	43	-7.583e-3	4	-5.222e-3	31	-7.952e-3	4
67	N321	max	-0.01	45	-0.01	45	-0.011	45	6.474e-3	35	3.499e-3	46	1.787e-2	35
68		min	-0.033	37	-0.045	32	-0.059	32	-3.506e-3	46	-2.707e-2	35	-9.231e-4	46
69	N322	max	0.086	46	0.043	46	-0.064	46	-8.095e-3	39	4.072e-2	32	1.17e-2	35
70		min	-0.711	35	-0.664	35	-0.671	35	-3.803e-2	32	1.937e-3	39	-5.075e-3	46
71	N323	max	0.003	46	-0.033	46	-0.114	46	-1.817e-3	39	2.899e-2	32	1.184e-2	35
72		min	-0.518	35	-0.485	35	-0.519	33	-2.757e-2	32	-5.162e-3	39	-5.118e-3	46
73	N324	max	-0.033	46	-0.059	46	-0.083	42	5.976e-3	39	1.204e-2	46	1.447e-2	35
74		min	-0.253	35	-0.245	33	-0.294	37	-1.359e-2	32	-1.827e-2	35	-3.399e-3	46
75	N325	max	0.168	46	0.121	46	0.001	46	-1.139e-2	45	4.717e-2	32	1.11e-2	35
76		min	-0.809	35	-0.757	35	-0.749	35	-4.543e-2	32	7.063e-3	39	-3.324e-3	46
77	N326	max	0.773	32	0.026	42	0.145	45	1.379e-4	39	3.141e-2	32	1.451e-3	39
78		min	-0.143	39	-0.151	33	-0.564	37	-1.184e-2	32	-4.095e-4	39	-2.241e-2	32
79	N327	max	0.646	32	0.031	42	0.137	45	1.84e-4	39	3.185e-2	32	1.464e-3	39
80		min	-0.15	39	-0.12	33	-0.445	33	-1.153e-2	32	-3.467e-4	39	-2.23e-2	32
81	N328	max	0.846	32	0.032	45	0.149	45	4.402e-5	39	2.983e-2	32	1.488e-3	39
82		min	-0.134	39	-0.17	37	-0.648	37	-1.164e-2	32	-6.05e-4	39	-2.154e-2	32
83	N329	max	0.117	38	0.004	43	0.004	39	1.137e-3	45	5.629e-3	45	1.28e-3	43
84		min	-0.016	43	-0.027	38	-0.044	32	-6.896e-3	37	-2.439e-2	37	-4.842e-3	38
85	N330	max	0.382	32	0.006	39	0.026	45	1.212e-3	45	5.486e-3	42	2.535e-3	43
86		min	-0.045	39	-0.076	32	-0.221	37	-6.212e-3	37	-1.564e-2	33	-6.604e-3	38
87	N331	max	0.618	32	0.016	45	0.073	45	1.513e-3	45	1.056e-2	38	1.788e-3	39
88		min	-0.084	39	-0.124	37	-0.432	37	-7.831e-3	37	-4.82e-3	43	-1.096e-2	32
89	N332	max	0.803	32	0.03	45	0.128	45	1.369e-3	45	2.175e-2	32	1.624e-3	39
90		min	-0.115	39	-0.169	37	-0.617	37	-1.056e-2	37	-9.552e-4	39	-1.722e-2	32
91	N333	max	0.03	43	0.053	3	0.226	3	6.084e-3	3	1.099e-2	32	3.606e-3	31
92		min	-0.125	3	-0.018	43	-0.079	43	-3.656e-3	43	-8.367e-3	31	-2.118e-3	40
93	N334	max	0.104	44	0.094	3	0.421	3	7.601e-3	3	2.713e-2	38	3.818e-3	31
94		min	-0.271	3	-0.034	44	-0.184	41	-4.077e-3	43	-1.227e-2	43	-3.64e-3	40
95	N335	max	0.211	40	0.099	3	0.44	3	9.187e-3	3	3.151e-2	38	5.23e-3	31
96		min	-0.336	31	-0.054	40	-0.239	44	-3.794e-3	43	-1.464e-2	43	-3.95e-3	46

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
97	N336	max	0.302	40	0.122	31	0.38	36	8.115e-3	3	3.194e-2	38	4.835e-3	35
98		min	-0.418	31	-0.08	40	-0.285	44	-3.343e-3	43	-1.491e-2	43	-3.884e-3	46
99	N337	max	0.05	4	-0.002	43	0.113	4	5.674e-3	4	7.464e-3	36	1.936e-5	43
100		min	0.002	43	-0.019	4	0.008	41	2.195e-4	41	-1.661e-3	44	-2.017e-3	4
101	N338	max	0.142	4	-0.003	43	0.343	4	8.095e-3	4	1.026e-2	34	2.844e-5	39
102		min	0.002	43	-0.048	4	0.026	41	3.129e-4	41	-1.659e-3	44	-3.141e-3	4
103	N339	max	0.253	4	-0.002	43	0.629	4	7.349e-3	4	6.364e-3	42	2.4e-4	42
104		min	0.005	43	-0.069	4	0.056	43	7.303e-4	41	-8.727e-3	4	-3.79e-3	4
105	N341	max	0.174	3	0.028	31	0.223	46	1.913e-4	36	-3.291e-4	41	-1.15e-3	45
106		min	-0.075	39	-0.141	4	-0.24	35	-3.883e-3	4	-3.976e-3	3	-6.605e-3	4
107	N342	max	0.147	32	0.011	31	0.192	38	1.501e-3	35	2.544e-3	46	-1.549e-4	31
108		min	-0.084	39	-0.178	4	-0.165	35	-6.981e-3	4	-7.785e-3	35	-8.445e-3	4
109	N343	max	0.241	32	-0.019	39	0.143	34	-2.703e-4	43	2.725e-3	2	-7.01e-4	43
110		min	-0.112	31	-0.203	4	-0.134	41	-1.164e-2	4	-1.146e-4	34	-1.006e-2	4
111	N344	max	0.154	38	0.045	31	0.169	46	3.659e-3	46	5.544e-3	35	1.644e-3	46
112		min	-0.096	43	-0.098	4	-0.204	35	-3.556e-3	35	-5.906e-3	46	-4.35e-3	35
113	N345	max	0.121	32	0.006	45	0.22	34	4.506e-3	4	3.632e-3	4	2.108e-3	45
114		min	-0.049	39	-0.165	4	-0.086	41	-2.302e-3	45	1.465e-3	41	-5.549e-3	4
115	N346	max	0.106	32	0.005	45	0.169	38	8.4e-3	4	2.954e-3	2	1.429e-3	45
116		min	-0.12	39	-0.189	4	-0.116	43	-1.742e-3	45	-2.177e-4	38	-7.672e-3	4
117	N347	max	0.108	32	0.003	45	0.178	38	9.112e-3	4	2.8e-3	2	1.281e-3	45
118		min	-0.134	39	-0.185	4	-0.131	43	-1.633e-3	45	-4.62e-4	34	-7.861e-3	4
119	N348	max	0.107	32	0.002	45	0.226	34	4.214e-3	4	1.545e-3	44	8.208e-4	45
120		min	-0.036	39	-0.145	4	-0.082	41	-7.395e-4	39	-2.129e-3	36	-5.492e-3	4
121	N349	max	0.116	38	0.018	46	-0.003	46	2.067e-3	43	1.657e-3	4	1.196e-4	39
122		min	-0.091	43	-0.049	35	-0.064	4	-2.721e-3	4	-1.759e-3	41	-4.519e-3	4
123	N350	max	0.123	38	0.021	46	-0.008	40	1.713e-3	31	5.554e-4	41	6.841e-4	43
124		min	-0.1	43	-0.067	35	-0.074	4	-1.746e-4	40	-2.116e-3	34	-2.761e-3	4
125	N351	max	0.046	40	-0.014	43	0.088	38	2.953e-4	38	7.625e-4	39	1.767e-3	36
126		min	-0.088	31	-0.181	4	-0.078	43	-4.894e-4	43	-3.391e-3	4	-1.368e-3	4
127	N352	max	0.041	40	0.001	39	0.09	38	6.916e-4	45	2.781e-3	4	2.639e-3	4
128		min	-0.08	31	-0.152	4	-0.082	43	-3.046e-3	4	-3.182e-4	39	-1.829e-4	41
129	N353	max	0.061	32	-0.021	43	0.071	38	2.009e-3	4	7.111e-4	43	6.497e-4	39
130		min	-0.085	31	-0.153	4	-0.073	43	-6.152e-4	43	-6.42e-3	4	-3.156e-3	4
131	N354	max	0.108	38	0.01	46	0.002	46	2.194e-3	34	1.853e-3	41	7.123e-4	43
132		min	-0.095	39	-0.071	35	-0.063	4	-9.433e-4	41	-3.367e-3	34	-2.927e-3	4
133	N355	max	0.091	32	-0.011	46	0.028	38	2.11e-3	34	2.299e-3	43	6.891e-4	43
134		min	-0.091	39	-0.089	4	-0.052	35	-1.479e-3	41	-4.624e-3	4	-3.222e-3	4
135	N356	max	-0.043	44	-0.074	44	0.861	34	5.418e-2	36	-8.043e-3	44	8.72e-3	38
136		min	-0.95	36	-0.867	36	0.106	44	8.887e-3	44	-4.519e-2	36	1.257e-3	39
137	N357	max	0.298	46	0.243	46	0.14	46	-1.529e-2	45	5.193e-2	32	8.872e-3	35
138		min	-0.869	35	-0.821	35	-0.784	35	-5.239e-2	32	1.353e-2	45	2.581e-4	46
139	N358	max	0.131	32	-0.011	41	0.03	46	7.272e-3	4	1.697e-3	44	-2.117e-4	39
140		min	-0.112	31	-0.118	4	-0.088	35	5.401e-4	44	-3.303e-3	34	-1.036e-2	4
141	N359	max	0.173	38	0.126	31	0.093	34	1.012e-2	4	2.414e-3	31	8.254e-4	43
142		min	-0.119	43	-0.128	40	-0.096	41	-1.014e-4	31	-2.401e-3	40	-4.701e-3	4
143	N360	max	0.171	38	0.105	31	0.093	34	9.042e-3	4	1.102e-3	40	1.113e-3	31
144		min	-0.12	43	-0.143	4	-0.095	41	1.289e-3	39	-1.911e-3	31	-8.002e-3	4
145	N361	max	0.168	38	0.047	31	0.074	34	7.348e-3	4	3.4e-3	4	5.047e-4	31
146		min	-0.112	43	-0.135	4	-0.08	41	6.075e-4	44	-3.305e-3	36	-1.07e-2	4
147	N362	max	0.103	32	0.002	44	0.01	40	5.193e-3	4	1.754e-3	33	-5.01e-4	39
148		min	-0.127	31	-0.131	34	-0.097	35	2.73e-5	41	-7.914e-4	42	-9.84e-3	4
149	N363	max	0.088	32	0.009	44	0.004	40	8.927e-4	4	3.945e-3	36	-2.109e-4	43
150		min	-0.113	31	-0.114	34	-0.082	35	-2.818e-3	36	-1.038e-4	44	-8.559e-3	4
151	N364	max	0.205	32	-0.019	45	0.156	38	5.101e-4	35	1.153e-3	31	2.183e-4	44

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
152		min	-0.087	39	-0.142	4	-0.137	41	-4.299e-3	4	-5.837e-3	32	-1.132e-3	4
153	N365	max	0.091	32	-0.008	45	0.177	38	3.773e-3	4	-7.716e-4	3	4.155e-4	45
154		min	-0.12	39	-0.136	4	-0.132	43	-9.001e-4	45	-4.327e-3	2	-1.685e-3	37
155	N366	max	0.266	38	0.08	46	0.162	46	8.856e-3	46	2.722e-2	35	1.488e-2	46
156		min	-0.286	35	-0.162	35	-0.258	35	-1.04e-2	31	-1.757e-2	46	-2.376e-2	35
157	N367	max	0.063	32	-0.002	39	0.147	34	2.774e-3	34	1.445e-3	44	-6.944e-4	43
158		min	-0.058	39	-0.116	4	-0.073	41	-6.66e-5	41	-6.368e-3	36	-2.914e-3	4
159	N368	max	0.334	32	-0.026	43	0.415	38	4.614e-3	43	5.353e-3	43	5.15e-3	38
160		min	-0.097	43	-0.099	4	-0.145	43	-1.301e-2	38	-3.181e-2	38	-1.572e-3	43
161	N369	max	0.204	32	0.01	46	0.162	38	6.257e-3	37	1.602e-2	4	9.142e-3	4
162		min	-0.122	39	-0.078	4	-0.128	41	-4.359e-4	45	-2.51e-3	39	-1.588e-4	39
163	N370	max	0.094	38	0.064	34	0.102	34	1.268e-2	33	7.735e-3	34	-1.78e-3	42
164		min	-0.137	43	-0.1	35	-0.13	33	-8.504e-3	34	-8.953e-3	33	-6.362e-3	4
165	N371	max	0.03	40	0.003	44	0.115	34	-1.549e-3	44	1.535e-2	4	-2.598e-3	44
166		min	-0.192	31	-0.133	4	-0.05	41	-1.445e-2	4	2.1e-3	44	-8.933e-3	4
167	N373	max	0.03	44	-0.041	44	0.233	34	2.674e-3	45	-2.135e-3	44	-3.158e-3	44
168		min	-0.226	36	-0.143	34	-0.035	41	-5.703e-3	4	-2.304e-2	36	-1.676e-2	36
169	N374	max	0.142	32	-0.01	42	0.211	38	7.838e-4	33	-1.007e-3	35	3.521e-3	4
170		min	-0.097	39	-0.111	4	-0.119	43	-8.557e-4	42	-1.145e-2	2	-3.488e-4	39
171	N375	max	0.043	40	-0.003	39	0.104	38	1.749e-3	45	4.491e-3	4	1.508e-3	4
172		min	-0.089	31	-0.098	4	-0.074	43	-6.455e-3	4	-4.307e-3	36	-9.422e-4	38
173	N376	max	0.073	32	-0.005	40	0.032	46	3.354e-3	41	7.213e-3	34	1.089e-4	43
174		min	-0.089	39	-0.056	4	-0.065	35	-7.975e-3	34	-2.839e-3	41	-5.024e-3	4
175	N377	max	0.186	38	0.057	31	0.078	38	7.82e-3	4	1.31e-2	31	4.366e-3	40
176		min	-0.128	43	-0.068	46	-0.097	43	-7.909e-3	31	-8.363e-3	46	-7.641e-3	31
177	N91	max	0.003	46	0.001	46	0.007	35	3.518e-3	4	-7.316e-4	41	2.015e-3	43
178		min	-0.032	35	-0.018	35	0.001	46	6.018e-4	44	-6.511e-3	4	-2.526e-3	38
179	N92	max	0.007	46	-0.004	46	0.052	35	7.741e-3	4	-4.617e-4	41	3.766e-3	43
180		min	-0.189	35	-0.104	35	0.01	40	8.982e-4	44	-1.467e-2	4	-5.874e-3	38
181	N93	max	0.034	38	0.001	43	0.001	39	5.365e-4	45	2.816e-3	45	6.595e-4	43
182		min	-0.004	43	-0.008	38	-0.013	32	-3.68e-3	37	-1.217e-2	37	-3.174e-3	38
183	N94	max	0.249	32	0.004	39	0.011	45	1.136e-3	45	5.515e-3	45	1.766e-3	43
184		min	-0.025	39	-0.051	32	-0.129	37	-6.697e-3	37	-2.027e-2	37	-6.143e-3	38
185	N95	max	0.009	43	0.02	3	0.086	3	7.279e-3	3	5.607e-3	32	3.75e-3	3
186		min	-0.046	3	-0.005	43	-0.023	43	-2.362e-3	43	-4.074e-3	31	-1.126e-3	44
187	N96	max	0.058	44	0.076	3	0.339	3	7.292e-3	3	1.885e-2	38	4.277e-3	31
188		min	-0.206	3	-0.025	41	-0.128	41	-3.902e-3	43	-9.164e-3	43	-3.219e-3	40
189	N97	max	0.014	4	0	43	0.031	4	3.3e-3	4	3.678e-3	36	5.077e-6	43
190		min	0	43	-0.005	4	0.002	41	1.44e-4	41	-8.437e-4	44	-1.244e-3	4
191	N98	max	0.092	4	-0.002	43	0.215	4	7.253e-3	4	8.58e-3	34	3.679e-5	43
192		min	0.002	43	-0.032	4	0.016	41	2.984e-4	41	-1.681e-3	44	-2.744e-3	4
193	N99	max	-0.001	46	0	46	0.001	46	8.614e-4	46	1.476e-3	43	2.013e-3	34
194		min	-0.02	35	-0.02	35	-0.022	35	-2.762e-3	35	-2.601e-3	38	8.441e-4	40
195	N100	max	0.001	46	0.007	46	0.013	46	3.292e-3	38	1.741e-3	43	5.307e-3	34
196		min	-0.121	35	-0.118	35	-0.132	35	-4.523e-3	43	-8.643e-3	38	2.06e-3	39
197	N101	max	-0.003	45	-0.003	45	-0.003	45	2.882e-3	35	1.738e-3	46	9.159e-3	35
198		min	-0.009	37	-0.013	37	-0.017	32	-1.97e-3	46	-1.353e-2	35	-3.484e-4	46
199	N102	max	-0.021	46	-0.036	46	-0.05	42	5.495e-3	39	7.058e-3	46	1.672e-2	35
200		min	-0.142	35	-0.142	33	-0.172	33	-7.924e-3	38	-2.351e-2	35	-1.838e-3	46
201	N103	max	0.734	38	0.059	43	0.804	38	1.506e-2	38	2.486e-3	44	1.829e-3	43
202		min	-0.145	43	-0.207	38	-0.234	43	-4.263e-3	43	-8.543e-3	36	-1.508e-2	38
203	N104	max	1.033	38	0.096	43	1.122	38	1.675e-2	38	-1.104e-3	41	1.586e-3	43
204		min	-0.22	43	-0.294	38	-0.346	43	-2.375e-3	43	-2.268e-2	34	-2.222e-2	38
205	N105	max	0.31	4	-0.003	39	0.769	4	7.955e-3	4	6.387e-3	42	2.933e-4	42
206		min	0.008	39	-0.084	4	0.075	43	8.828e-4	41	-9.052e-3	4	-4.316e-3	4

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
207	N106	max	0.194	4	-0.002	43	0.478	4	7.289e-3	4	8.452e-3	34	1.814e-4	39
208		min	0.001	43	-0.058	4	0.039	41	3.743e-4	41	-3.674e-3	4	-2.981e-3	4
209	N107	max	0.027	46	0.041	46	0.054	46	5.53e-3	34	-6.431e-4	43	8.385e-3	34
210		min	-0.218	35	-0.216	35	-0.241	35	-3.272e-3	41	-1.392e-2	38	3.374e-3	39
211	N108	max	-0.018	46	-0.031	40	0.14	4	8.06e-3	4	1.324e-3	41	3.812e-3	43
212		min	-0.353	35	-0.193	35	0.025	44	8.073e-5	41	-1.605e-2	4	-6.733e-3	38
213	N109	max	0.384	38	0.028	43	0.424	38	1.274e-2	38	1.572e-2	32	1.461e-3	43
214		min	-0.077	43	-0.106	38	-0.126	43	-3.363e-3	43	-2.415e-3	43	-8.175e-3	38
215	N110	max	0.014	38	0.001	43	0.016	38	4.64e-3	38	1.089e-2	38	4.871e-4	43
216		min	-0.004	43	-0.004	38	-0.007	41	-1.05e-3	43	-7.67e-4	43	-1.541e-3	38
217	N111	max	0.13	38	0.009	43	0.145	38	9.751e-3	38	2.172e-2	38	1.018e-3	43
218		min	-0.029	43	-0.035	38	-0.049	43	-2.323e-3	43	-1.89e-3	43	-3.47e-3	38
219	N112	max	0.089	32	-0.002	45	0.173	38	6.547e-3	4	1.531e-3	44	8.296e-4	45
220		min	-0.138	39	-0.164	4	-0.141	43	-1.254e-3	45	-1.1e-3	36	-4.601e-3	4
221	N123	max	0.484	4	-0.088	39	0.162	38	4.794e-4	35	3.764e-4	43	1.73e-4	39
222		min	-0.073	39	-1.121	4	-0.099	43	-6.607e-4	46	-8.579e-4	38	-5.017e-3	4
223	N124	max	0.398	4	-0.082	39	0.113	38	4.197e-4	37	4.655e-4	41	3.651e-4	45
224		min	-0.062	39	-0.922	4	-0.085	43	-1.652e-4	39	-1.649e-3	4	-2.008e-3	4
225	N125	max	0.373	4	-0.093	39	0.049	38	6.551e-4	35	2.772e-4	39	1.985e-4	31
226		min	-0.068	39	-0.864	4	-0.066	43	-4.606e-4	46	-6.069e-4	32	-3.621e-3	4
227	N126	max	0.417	4	-0.073	39	0.109	38	2.428e-3	4	9.336e-4	35	-5.982e-5	39
228		min	-0.076	39	-0.861	4	-0.088	43	8.447e-5	40	-1.218e-3	46	-2.32e-3	4
229	N128	max	0.446	4	-0.081	39	0.144	38	2.118e-4	37	2.62e-4	41	7.381e-5	45
230		min	-0.061	39	-0.994	4	-0.089	43	-8.226e-4	4	-1.427e-3	38	-4.754e-3	4
231	N129	max	0.485	4	-0.085	39	0.159	38	4.091e-4	33	5.936e-4	4	8.986e-5	39
232		min	-0.064	39	-1.089	4	-0.096	43	-6.525e-4	4	-7.602e-4	38	-5.276e-3	4
233	N131	max	0.492	4	-0.088	39	0.158	38	8.523e-4	35	1.828e-4	41	-9.772e-5	39
234		min	-0.072	39	-1.105	4	-0.098	43	-6.487e-4	46	-1.113e-3	4	-6.221e-3	4
235	N132	max	0.46	4	-0.08	39	0.141	38	2.694e-3	4	4.647e-4	35	-2.481e-4	39
236		min	-0.072	39	-0.975	4	-0.097	43	-6.956e-5	46	-1.112e-3	38	-6.019e-3	4
237	N134	max	0.405	4	-0.077	39	0.07	38	2.274e-3	4	8.77e-4	35	2.36e-4	31
238		min	-0.073	39	-0.841	4	-0.07	43	1.123e-4	44	-1.327e-3	38	-1.707e-3	4
239	N135	max	0.391	4	-0.085	39	0.051	38	1.857e-3	4	1.228e-4	43	2.183e-4	31
240		min	-0.07	39	-0.846	4	-0.065	43	-2.794e-4	46	-7.171e-4	38	-2.329e-3	4
241	N137	max	0.396	4	-0.094	39	0.05	38	4.578e-4	35	6.233e-4	4	2.83e-4	31
242		min	-0.057	39	-0.866	4	-0.067	43	-7.314e-4	4	-6.891e-4	38	-2.341e-3	4
243	N138	max	0.401	4	-0.09	39	0.069	38	3.251e-4	36	6.182e-4	41	4.865e-4	36
244		min	-0.056	39	-0.885	4	-0.075	43	-2.197e-4	4	-1.753e-3	38	-1.514e-3	4

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M278	W9X3X1/4	0.334	0	32	0.134	2.331	z	33	4.024	79.313	1.377	3.166	1	H1-1b
2	M279	W9X3X1/4	0.307	0	32	0.117	1.84	z	33	4.024	79.313	1.377	3.166	1	H1-1b
3	M290	WT12X4X1/4	0.533	1.114	35	0.225	1.114	y	35	7.66	106.313	2.428	4.349	1	H1-1b
4	M291	WT12X4X1/4	0.292	1.385	35	0.098	1.385	y	32	7.66	106.313	2.428	4.349	1	H1-1b
5	M292	WT8X2X1/4	0.868	1.319	38	0.107	1.319	z	33	1.323	65.813	0.636	1.89	1	H1-1a
6	M293	WT12X4X1/4	0.297	1.252	38	0.145	1.252	y	38	7.66	106.313	2.428	15.15	1	H1-1b
7	M298	WT12X4X1/4	0.171	1.067	38	0.015	1.067	y	37	7.66	106.313	2.428	15.15	1	H1-1b
8	M299	WT8X2X1/4	0.145	1.098	34	0.005	0	z	37	1.323	65.813	0.636	1.89	1	H1-1b*
9	M300	WT8X2X1/4	0.251	1.225	34	0.02	0	z	37	1.323	65.813	0.636	1.89	1	H1-1b
10	M301	WT12X4X1/4	0.345	1.601	37	0.12	1.601	y	37	7.66	106.313	2.428	4.349	1	H1-1b
11	M302	WT12X4X1/4	0.156	1.442	33	0.046	1.442	y	37	7.66	106.313	2.428	4.349	1	H1-1b
12	M303	W9X3X1/4	0.168	2.438	37	0.091	2.438	z	37	4.024	79.313	1.377	3.166	1	H1-1b
13	M304	W9X3X1/4	0.152	2.447	38	0.082	2.447	z	37	4.024	79.313	1.377	3.166	1	H1-1b
14	M305	WT8X2X1/4	0.314	1.958	34	0.059	1.958	z	37	1.323	65.813	0.636	1.89	1	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
15	M306	WT12X4X1/4	0.459	1.673	36	0.202	1.673	y	36	8.467	106.313	2.428	4.491	1	H1-1b
16	M307	WT12X4X1/4	0.392	1.307	31	0.026	1.307	y	36	8.467	106.313	2.428	4.491	1	H1-1b
17	M308	WT12X4X1/4	0.325	1.262	31	0.073	0	y	36	8.467	106.313	2.428	4.491	1	H1-1b
18	M309	W9X3X1/4	0.387	1.28	31	0.127	1.28	z	36	4.593	79.313	1.377	3.319	1	H1-1b
19	M310	W9X3X1/4	0.259	1.036	31	0.138	1.036	z	36	4.593	79.313	1.377	3.319	1	H1-1b
20	M311	W9X3X1/4	0.169	2.096	31	0.131	2.096	z	36	4.593	79.313	1.377	3.319	1	H1-1b
21	M312	WT8X2X1/4	0.223	0	32	0.114	1.846	z	36	1.527	65.813	0.636	2.004	1	H1-1b
22	M313	WT12X4X1/4	0.936	1.643	3	0.07	0	z	38	8.467	106.313	2.428	17.017	1	H1-1b
23	M314	W9X3X1/4	0.475	1.618	3	0.114	1.618	z	3	4.593	79.313	1.377	7.316	1	H1-1b
24	M315	WT8X2X1/4	0.616	2.309	4	0.039	0	y	3	1.527	65.813	0.636	3.099	1	H1-1a
25	M316	WT8X2X1/4	0.531	1.691	4	0.006	0	y	3	1.527	65.813	0.636	3.099	1	H1-1a
26	M317	WT12X4X1/4	0.418	1.642	4	0.047	1.642	y	36	9.365	106.313	2.428	18.856	1	H1-1b
27	M318	W9X3X1/4	0.479	1.446	4	0.021	1.446	y	34	5.284	79.313	1.377	8.177	1	H1-1a
28	M319	W9X3X1/4	0.201	1.439	4	0.038	0	y	4	5.284	79.313	1.377	8.177	1	H1-1b
29	M320	WT8X2X1/4	0.678	1.075	4	0.006	1.075	z	4	1.78	65.813	0.636	3.417	1	H1-1a
30	M321	W9X3X1/4	0.22	1.218	37	0.086	1.218	z	38	4.024	79.313	1.377	6.613	1	H1-1b
31	M322	WT8X2X1/4	0.541	1.212	37	0.11	1.212	z	38	1.323	65.813	0.636	2.833	1	H1-1a
32	M323	WT8X2X1/4	0.522	0	33	0.067	1.315	z	38	1.323	65.813	0.636	1.89	1	H1-1a
33	M324	WT8X2X1/4	0.572	1.228	33	0.012	1.228	z	33	1.323	65.813	0.636	1.89	1	H1-1a
34	M325	WT8X2X1/4	0.471	1.543	4	0.004	1.543	z	33	1.323	65.813	0.636	1.89	1	H1-1a
35	M326	HSS1.5X1.5X1/4	0.79	4.064	4	0.061	8.128	y	4	7.762	33.75	1.336	1.336	1.286	H1-1b
36	M327	HSS1.5X1.5X1/4	0.568	3.746	4	0.104	7.491	y	4	9.138	33.75	1.336	1.336	1.223	H1-1b
37	M328	HSS1.5X1.5X1/4	0.594	3.907	4	0.086	0	y	4	8.397	33.75	1.336	1.336	1.139	H1-1b
38	M329	HSS1.5X1.5X1/4	0.544	3.646	4	0.127	0	y	4	9.642	33.75	1.336	1.336	1.236	H1-1b
39	M330	WT12X4X1/4	0.24	1.693	31	0.034	0	y	38	9.365	106.313	2.428	18.856	1	H1-1b
40	M331	W9X3X1/4	0.162	1.342	34	0.042	1.342	y	34	5.284	79.313	1.377	8.177	1	H1-1b
41	M332	W9X3X1/4	0.143	1.196	34	0.026	1.196	z	35	5.284	79.313	1.377	3.485	1	H1-1b*
42	M333	WT8X2X1/4	0.499	1.326	34	0.012	0	z	35	1.78	65.813	0.636	2.133	1	H1-1a
43	M334	WT8X2X1/4	0.467	0.802	34	0.006	0	z	43	1.78	65.813	0.636	2.133	1	H1-1a
44	M335	WT12X4X1/4	0.288	1.693	36	0.07	1.693	y	34	8.467	106.313	2.428	4.491	1	H1-1b
45	M336	W9X3X1/4	0.191	1.342	4	0.024	1.342	z	4	4.593	79.313	1.377	3.319	1	H1-1b
46	M337	W9X3X1/4	0.172	0.598	33	0.011	1.196	z	31	4.593	79.313	1.377	3.319	1	H1-1b
47	M338	WT8X2X1/4	0.439	1.858	33	0.004	0	z	35	1.527	65.813	0.636	2.004	1	H1-1a
48	M339	8X3/8	0.472	0	4	0.05	1.455	y	4	2.13	81	0.633	4.676	1	H1-1a
49	M340	8X3/8	0.35	2.156	4	0.05	0	y	4	2.13	81	0.633	4.676	1	H1-1b
50	M341	8X3/8	0.429	0	4	0.091	1.49	y	4	2.13	81	0.633	4.676	1	H1-1a
51	M342	8X3/8	0.559	0	4	0.031	1.434	y	4	2.13	81	0.633	4.676	1	H1-1a
52	M343	8X3/8	0.587	0	4	0.017	1.92	y	4	2.13	81	0.633	4.676	1	H1-1a
53	M344	8X3/8	0.266	0.962	4	0.021	0	y	4	2.13	81	0.633	4.676	1	H1-1b
54	M345	8X3/8	0.452	0	4	0.045	1.257	y	4	2.13	81	0.633	4.676	1	H1-1a
55	M346	8X3/8	0.321	0.995	4	0.056	0	y	4	2.13	81	0.633	4.676	1	H1-1b
56	M347	8X3/8	0.29	0	4	0.037	1.149	y	4	2.13	81	0.633	4.676	1	H1-1b
57	M348	8X3/8	0.277	1.508	4	0.017	0	y	4	2.13	81	0.633	4.676	1	H1-1b
58	M349	8X3/8	0.326	1.031	4	0.015	0	y	4	2.13	81	0.633	4.676	1	H1-1b
59	M350	8X3/8	0.311	0	4	0.018	0.825	y	4	2.13	81	0.633	4.676	1	H1-1b
60	M351	8X3/8	0.366	0	4	0.018	1.028	y	4	2.13	81	0.633	4.676	1	H1-1b
61	M352	8X3/8	0.391	0	4	0.014	0.788	y	4	2.13	81	0.633	4.676	1	H1-1b
62	M353	WT8X2X1/4	0.199	2.159	36	0.071	0	z	36	1.527	65.813	0.636	2.004	1	H1-1b
63	M354	WT8X2X1/4	0.186	2.093	32	0.008	0	z	36	1.527	65.813	0.636	2.004	1	H1-1b
64	M355	WT8X2X1/4	0.863	2.273	38	0.069	2.273	z	35	1.323	65.813	0.636	1.89	1	H1-1a
65	M356	WT8X2X1/4	0.796	2.156	38	0.007	2.156	z	38	1.323	65.813	0.636	1.89	1	H1-1a
66	M357	8X3/8	0.429	1.26	4	0.033	0	y	4	2.13	81	0.633	4.676	1	H1-1b
67	M358	8X3/8	0.27	0	4	0.039	1.064	y	3	2.13	81	0.633	4.676	1	H1-1b
68	M359	8X3/8	0.317	0	4	0.029	1.189	y	31	2.13	81	0.633	4.676	1	H1-1b
69	M360	8X3/8	0.37	0	4	0.052	1.04	y	4	2.13	81	0.633	4.676	1	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

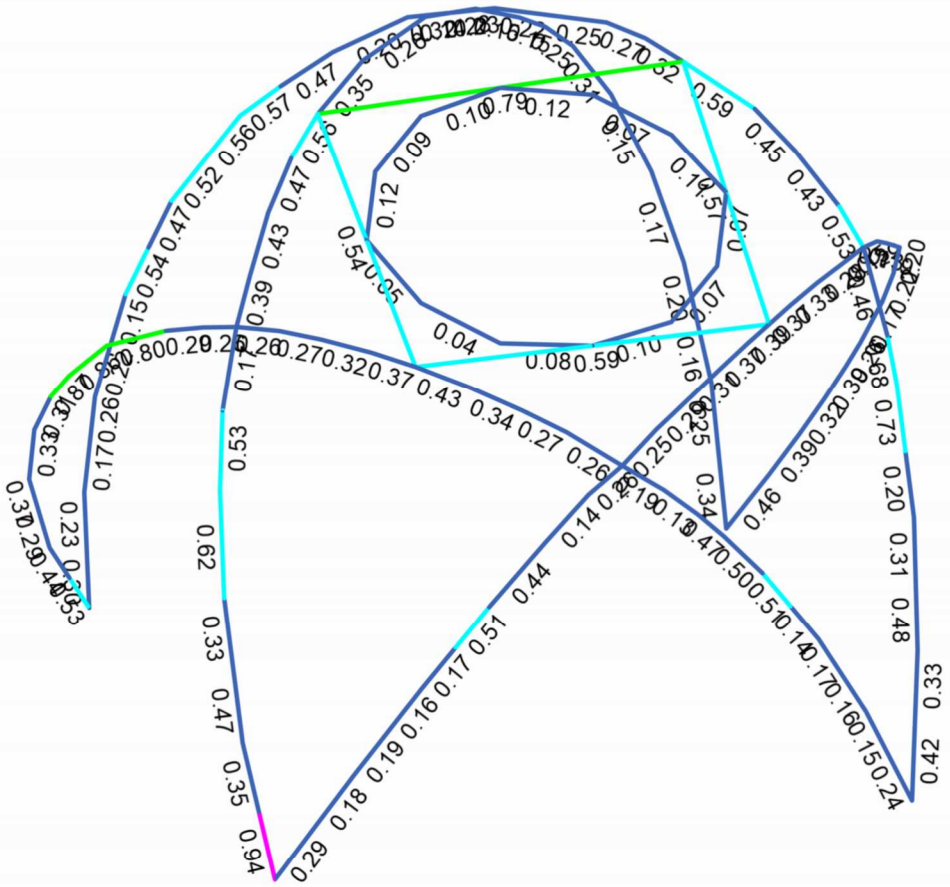
	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
70	M361	8X3/8	0.338	1.235	4	0.032	0	y	4	2.13	81	0.633	4.676	1	H1-1b
71	M362	8X3/8	0.266	0.989	4	0.054	0	y	4	2.13	81	0.633	4.676	1	H1-1b
72	M363	8X3/8	0.26	2.687	4	0.098	0	y	4	2.13	81	0.633	4.676	1	H1-1b
73	M364	8X3/8	0.247	1.35	4	0.067	0	y	4	2.13	81	0.633	4.676	1	H1-1b
74	M365	8X3/8	0.289	0	38	0.007	1.296	y	32	5.367	81	0.633	10.974	1	H1-1b
75	M366	8X3/8	0.434	0	4	0.058	0	y	4	2.13	81	0.633	4.676	1	H1-1a
76	M367	8X3/8	0.201	0	38	0.004	2.013	y	4	5.367	81	0.633	10.974	1	H1-1b
77	M368	8X3/8	0.147	0	37	0.003	1.831	y	34	5.367	81	0.633	10.974	1	H1-1b
78	M369	8X3/8	0.127	0.972	34	0.006	0.972	y	34	5.367	81	0.633	10.974	1	H1-1b*
79	M370	8X3/8	0.141	0	35	0.004	1.36	y	33	5.367	81	0.633	10.974	1	H1-1b
80	M372	8X3/8	0.13	0	36	0.002	0	y	31	5.367	81	0.633	10.974	1	H1-1b
81	M373	8X3/8	0.276	0	32	0.035	0	y	37	5.367	81	0.633	10.974	1	H1-1b
82	M374	8X3/8	0.317	0	38	0.058	1.075	y	38	5.367	81	0.633	10.974	1	H1-1b
83	M375	8X3/8	0.137	0	4	0.13	1.079	y	4	2.13	81	0.633	4.676	1	H1-1b
84	M376	8X3/8	0.225	1.084	4	0.09	1.084	y	4	2.13	81	0.633	4.676	1	H1-1b
85	M377	8X3/8	0.531	0	4	0.048	0	y	37	2.13	81	0.633	4.676	1	H1-1a
86	M378	8X3/8	0.29	0	36	0.031	0	y	36	5.367	81	0.633	10.974	1	H1-1b
87	M380	8X3/8	0.151	0	4	0.084	1.061	y	4	2.13	81	0.633	4.676	1	H1-1b
88	M381	8X3/8	0.259	0	34	0.058	0	y	4	2.13	81	0.633	4.676	1	H1-1b
89	M382	8X3/8	0.248	1.077	4	0.02	0	y	4	2.13	81	0.633	4.676	1	H1-1b
90	M383	8X3/8	0.188	1.049	35	0.018	0	y	36	5.367	81	0.633	10.974	1	H1-1b
91	M384	8X3/8	0.257	0	35	0.063	0.997	y	35	5.367	81	0.633	10.974	1	H1-1b
92	M385	8X3/8	0.392	1.166	4	0.079	0	y	4	2.13	81	0.633	4.676	1	H1-1a
93	M386	8X3/8	0.261	0	38	0.109	0	y	3	2.13	81	0.633	4.676	1	H1-1b
94	M388	8X3/8	0.264	0	35	0.022	1.029	y	38	5.367	81	0.633	10.974	1	H1-1b
95	M389	8X3/8	0.368	0.788	4	0.013	0	y	34	2.13	81	0.633	4.676	1	H1-1b
96	M99	WT12X4X1/4	0.18	1.693	36	0.069	1.693	y	34	8.467	106.313	2.428	4.491	1	H1-1b
97	M98	8X3/8	0.168	0	3	0.005	0	y	38	5.367	81	0.633	10.974	1	H1-1b
98	M100	W9X3X1/4	0.162	0	33	0.023	1.342	z	4	4.593	79.313	1.377	3.319	1	H1-1b
99	M101	WT12X4X1/4	0.25	1.601	37	0.12	1.601	y	37	7.66	106.313	2.428	4.349	1	H1-1b
100	M102	W9X3X1/4	0.2	1.442	33	0.053	1.442	z	32	4.024	79.313	1.377	3.166	1	H1-1b
101	M103	WT12X4X1/4	0.348	0	3	0.07	1.643	z	38	8.467	106.313	2.428	17.017	1	H1-1b
102	M104	W9X3X1/4	0.327	1.618	3	0.084	0	y	3	4.593	79.313	1.377	7.316	1	H1-1b
103	M105	WT12X4X1/4	0.326	1.642	4	0.046	1.642	y	36	9.365	106.313	2.428	18.856	1	H1-1b
104	M106	W9X3X1/4	0.314	1.446	4	0.021	1.446	y	34	5.284	79.313	1.377	8.177	1	H1-1b
105	M107	WT12X4X1/4	0.15	1.693	31	0.034	0	y	38	9.365	106.313	2.428	18.856	1	H1-1b
106	M108	W9X3X1/4	0.165	1.342	34	0.042	1.342	y	34	5.284	79.313	1.377	3.485	1	H1-1b
107	M109	WT12X4X1/4	0.437	1.114	35	0.225	1.114	y	35	7.66	106.313	2.428	4.349	1	H1-1b
108	M110	W9X3X1/4	0.37	0.75	31	0.106	1.385	z	32	4.024	79.313	1.377	3.166	1	H1-1b
109	M111	WT8X2X1/4	0.466	0	33	0.108	1.212	z	38	1.323	65.813	0.636	1.89	1	H1-1a
110	M112	WT8X2X1/4	0.561	0	33	0.066	0	z	38	1.323	65.813	0.636	1.89	1	H1-1a
111	M114	WT8X2X1/4	0.729	1.439	4	0.045	0	y	4	1.78	65.813	0.636	3.417	1	H1-1a
112	M115	WT8X2X1/4	0.509	0.598	34	0.031	1.196	y	36	1.78	65.813	0.636	2.133	1	H1-1a
113	M116	WT8X2X1/4	0.512	1.196	33	0.012	0	z	31	1.527	65.813	0.636	2.004	1	H1-1a
114	M117	W9X3X1/4	0.155	1.218	37	0.085	1.218	z	38	4.024	79.313	1.377	6.613	1	H1-1b
115	M118	WT12X4X1/4	0.229	1.252	38	0.145	1.252	y	38	7.66	106.313	2.428	15.15	1	H1-1b
116	M119	W9X3X1/4	0.26	1.067	32	0.016	1.067	z	36	4.024	79.313	1.377	6.613	1	H1-1b
117	M120	8X3/8	0.219	1.35	4	0.068	0	y	4	2.13	81	0.633	4.676	1	H1-1b
118	M121	8X3/8	0.463	0	4	0.004	0	y	4	5.367	81	0.633	10.974	1	H1-1b
119	M132	HSS1.5X1.5X1/4	0.113	0	4	0.014	0	y	4	30.9	33.75	1.336	1.336	1.388	H1-1b
120	M133	HSS1.5X1.5X1/4	0.072	0	4	0.025	0	y	4	30.768	33.75	1.336	1.336	2.141	H1-1b
121	M134	HSS1.5X1.5X1/4	0.123	1.957	4	0.03	1.957	y	4	30.768	33.75	1.336	1.336	2.369	H1-1b
122	M135	HSS1.5X1.5X1/4	0.103	1.692	4	0.047	0	y	4	30.768	33.75	1.336	1.336	1.766	H1-1b
123	M136	HSS1.5X1.5X1/4	0.089	0	4	0.042	1.957	y	4	30.768	33.75	1.336	1.336	1.838	H1-1b
124	M137	HSS1.5X1.5X1/4	0.122	1.971	4	0.034	1.971	y	4	30.727	33.75	1.336	1.336	1.499	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
125	M138	HSS1.5X1.5X1/4	0.05	0	4	0.012	0	y	3	30.501	33.75	1.336	1.336	2.135	H1-1b
126	M139	HSS1.5X1.5X1/4	0.04	1.957	4	0.007	0	y	3	30.768	33.75	1.336	1.336	1.321	H1-1b
127	M140	HSS1.5X1.5X1/4	0.082	1.981	4	0.027	0	z	4	30.697	33.75	1.336	1.336	1.035	H1-1b
128	M141	HSS1.5X1.5X1/4	0.101	0	4	0.036	1.86	z	4	31.045	33.75	1.336	1.336	1.013	H1-1b
129	M142	HSS1.5X1.5X1/4	0.067	0	4	0.008	1.957	y	4	30.768	33.75	1.336	1.336	1.333	H1-1b
130	M143	HSS1.5X1.5X1/4	0.072	2.152	4	0.012	0	z	4	30.177	33.75	1.336	1.336	2.112	H1-1b

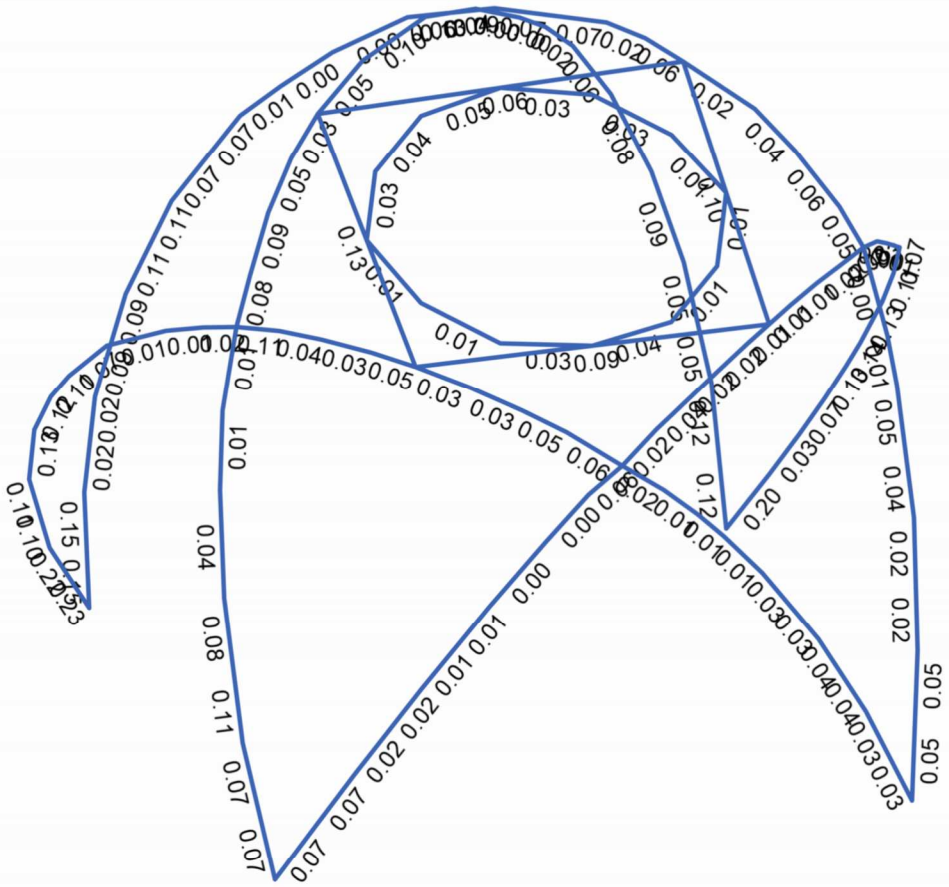
Material Take-Off

	Material	Size	Pieces	Length[ft]	Weight[K]
1	Hot Rolled Steel				
2	A276 SS316	8X3/8	47	60.5	0.617
3	A276 SS316	HSS1.5X1.5X1/4	16	54.4	0.231
4	A276 SS316	W9X3X1/4	23	35.1	0.351
5	A276 SS316	WT12X4X1/4	20	29.4	0.394
6	A276 SS316	WT8X2X1/4	24	37	0.307
7	Total HR Steel		130	216.4	1.901



Member Code Checks Displayed (Enveloped)

IRISA A NEMETSCHEK COMPANY	Rbhu		SK-12
	CRC		23.05.11_Sun Lodge - 16ft …



Member Shear Checks Displayed (Enveloped)

IRISA A NEMETSCHEK COMPANY	Rbhu		SK-13
	CRC		23.05.11_Sun Lodge - 16ft …

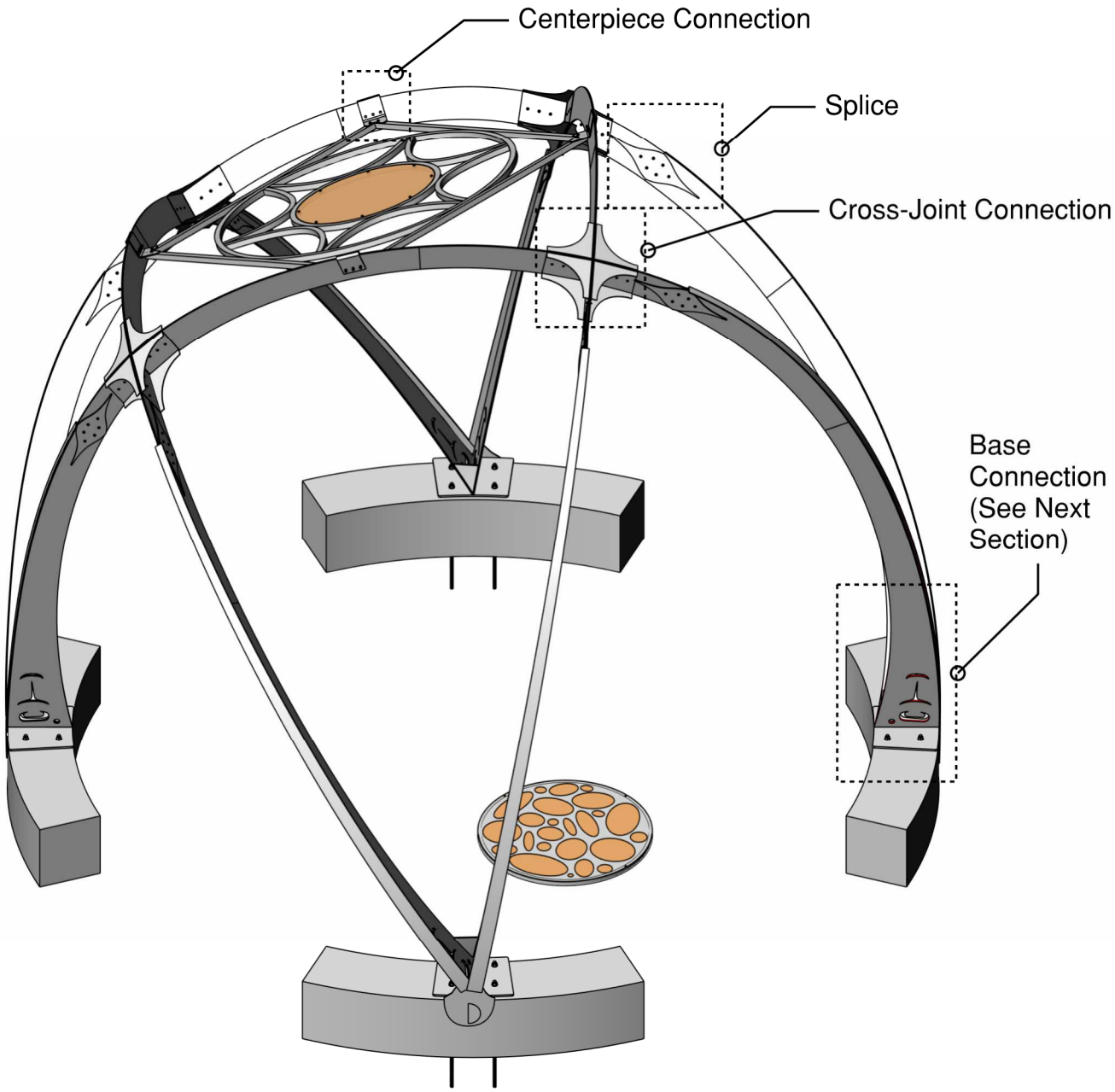
CONNECTION DETAIL DESIGN

RBHU ENGINEERING IMAGINATION

Project: Sun Lodge
Date: 09/15/2023

Project #:

Subject: Connection Detail Calcs



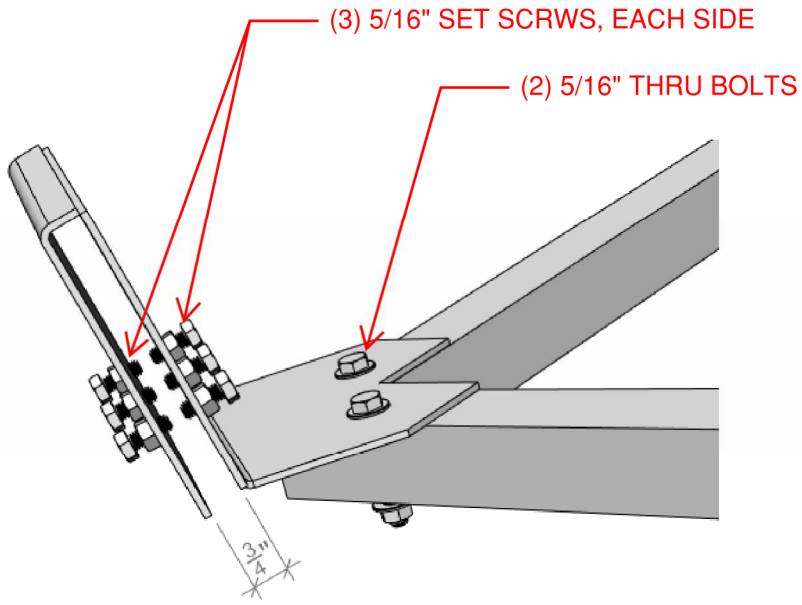
RBHU ENGINEERING IMAGINATION

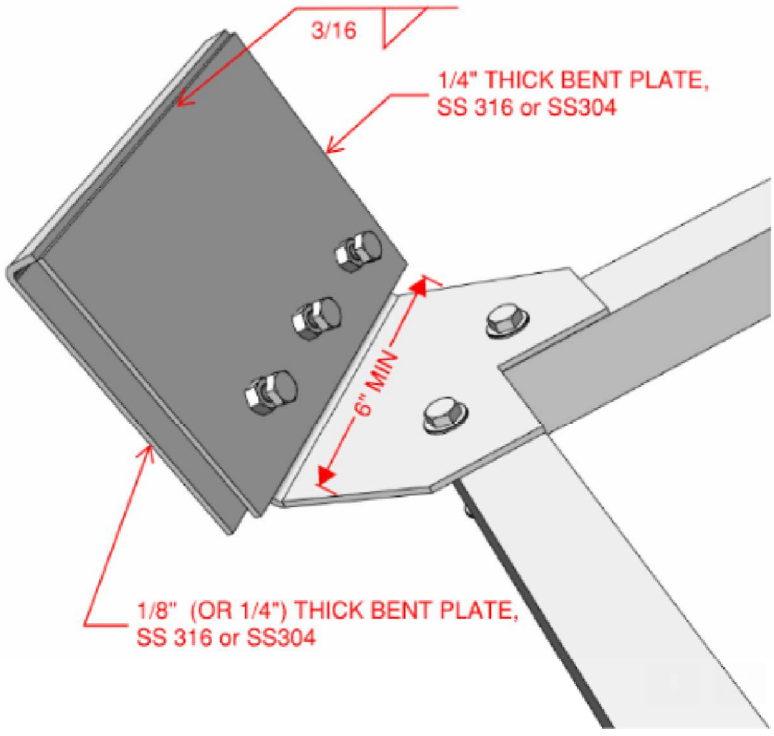
Project: Sun Lodge
Date: 09/15/2023

Project #:

Subject: Connection Detail Calcs

CENTERPIECE CONNECTION





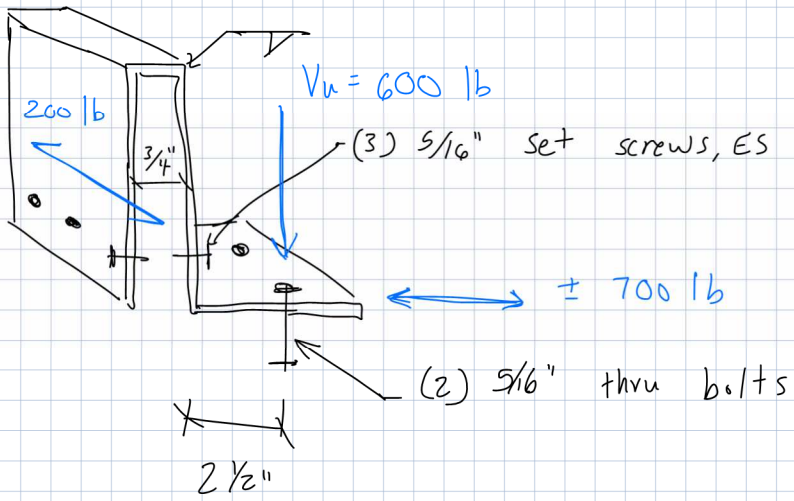
RBHU ENGINEERING IMAGINATION

Project: Sun Lodge
Date: 09/15/2023

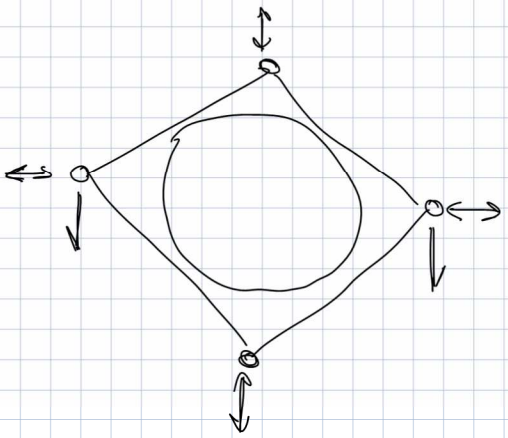
Project #:

Subject: Connection Detail Calcs

CENTERPIECE CONNECTION DETAIL CALCS



WHOLE CENTER INSERT ACTS RIGID



Axial = ± 1000 lb
Shear = 600 lb
(2) 5/16" BOLTS OK
BY OBSERVATION

$$\phi M_{n\,PLATE} = 0.9\,(30\,ksi)\,\frac{6"\,(1/4")^2}{6} = 1.69\ k\cdot in$$

$$M_u = (2.5")(600\,lb) = 1.5\ k\cdot in$$ OK

RBHU ENGINEERING IMAGINATION

Project: Sun Lodge
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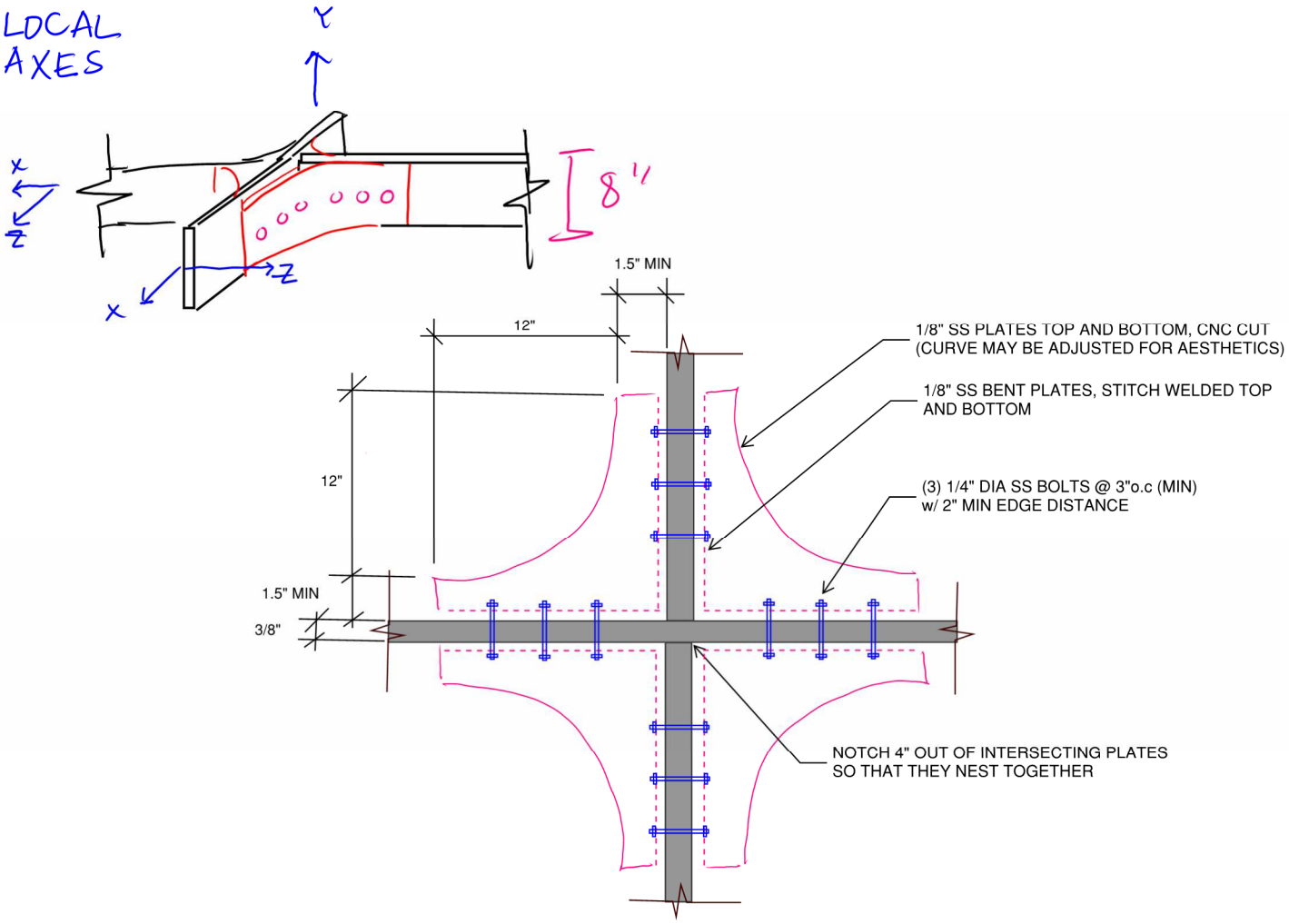
Subject: Connection Detail Calcs

CROSS-JOINT CONNECTION



PLAN

RBHU ENGINEERING IMAGINATION

Project: Sun Lodge
Date: 09/15/2023

Project #:

Subject: Connection Detail Calcs

CROSS-JOINT CONNECTION DETAIL CALCS

BOLT SHEAR

$V_u = 2.42k$ (COMBINED BOLT SHEAR & SHEAR FROM BENDING)

(3) 1/4" Ø SS BOLTS

$\phi V_n = (0.75)(30ksi)(\pi(\frac{0.25}{2})^2) = 1.1k \times 3 = 3.3k$

$V_u \leq \phi V_n$ OK

PLATE BENDING W/ STIFFENER

$M_{u-x} = 0.636\ k\text{-in}$

$\phi M_n = \phi F_y Z = (0.9)(30ksi)(\frac{8(3.375^2)}{6}) = 410\ k\text{-in}$

$M_{u-x} \leq \phi M_n$ OK

$M_y = 0.594\ k\text{-ft}$

$\phi M_n = (0.75)(30ksi)[\frac{3.375(8in)^2}{6}] = 810\ k\text{-in}$
$= 67.5\ k\text{-ft}$

OK

RBHU ENGINEERING IMAGINATION

Project: Sun Lodge
Date: 09/15/2023

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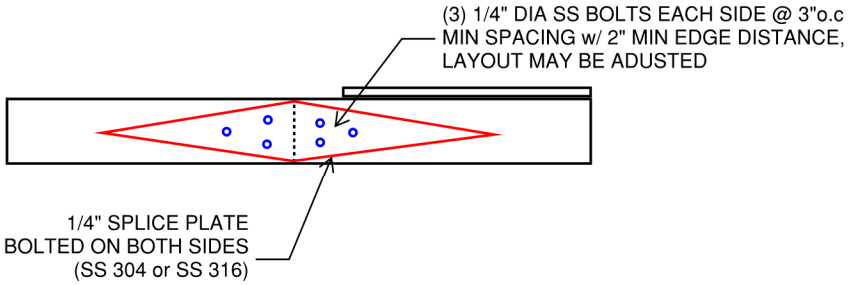
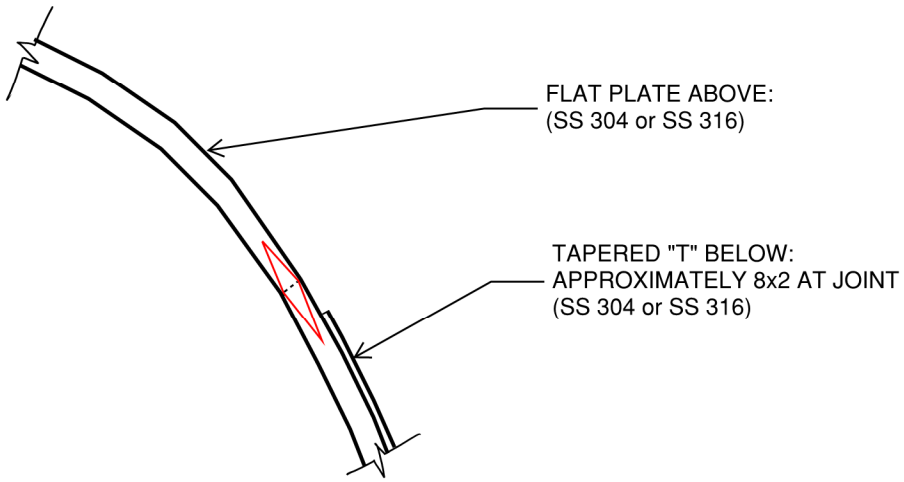
Subject: Connection Detail Calcs

ARCH SPLICE CONNECTION



ELEVATION



RBHU ENGINEERING IMAGINATION

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Subject: Connection Detail Calcs

ARCH SPLICE CONNECTION DETAIL CALCS

$V_u = 1.04\ k/6\ BOLTS = 0.173\ k/BOLT$

1/4" ϕ SS BOLTS

$\phi V_n = (0.75)(30\ ksi)(\pi(\frac{0.25}{2})^2) = 1.10\ K/BOLT$

$V_u \leq \phi V_n$ OK

FOUNDATION AND ANCHORAGE DESIGN

Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Concrete - Apr 24, 2023	Date:	4/26/2023
Fastening point:			

Specifier's comments:

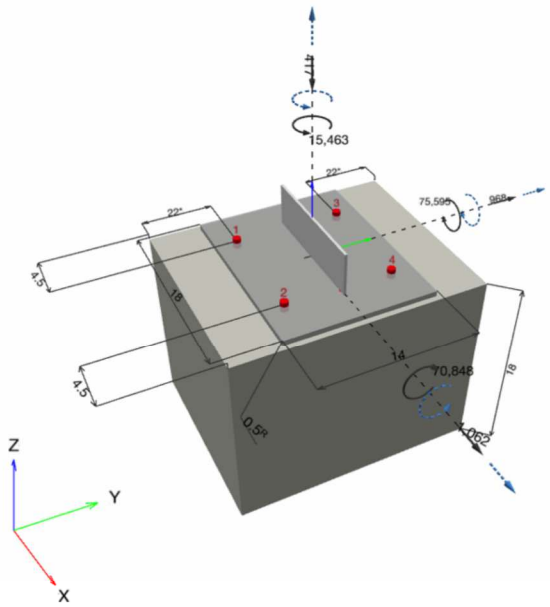
1 Input data

Anchor type and diameter:	**Hex Head ASTM F 1554 GR. 36 3/4**
Item number:	not available
Effective embedment depth:	h_{ef} = 12.000 in.
Material:	ASTM F 1554
Evaluation Service Report:	Hilti Technical Data
Issued I Valid:	- | -
Proof:	Design Method ACI 318-19 / CIP
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate[R]:	l_x x l_y x t = 18.000 in. x 14.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Rectangular plates and bars (AISC), 12 - 1/4; (L x W x T) = 12.000 in. x 0.250 in.
Base material:	cracked concrete, 2500, f_c' = 2,500 psi; h = 18.000 in.
Reinforcement:	tension: present, shear: not present; anchor reinforcement: tension edge reinforcement: > No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.10.5.3 (d)) Shear load: yes (17.10.6.3 (c))

OR SS304 OR SS316 ANCHORS

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



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1.1 Unfactored loads

	Sustained load factor	Load factor f_1 or f_2	V_x [lb]	V_y [lb]	N [lb]	M_x [in.lb]	M_y [in.lb]	M_z [in.lb]
D (Dead)	-	-	170	169	-785	-18,360	12,216	2,916
F (Fluid)	-	-	-	-	-	-	-	-
T (Temperature)	-	-	-	-	-	-	-	-
L (Live)	-	1.000	54	5	5	-552	1,848	324
H (Lateral)	-	-	-	-	-	-	-	-
L_r (Roof live)	-	-	-	-	-	-	-	-
S (Snow)	-	0.200	-	-	-	-	-	-
R (Rain)	-	-	-	-	-	-	-	-
W (Wind)	-	-	-	-	-	-	-	-
E (Earthquake)	-	-	804	760	520	-48,264	59,088	11,640

1.2 Load combination and design results

1.2.1 Load combination

Load case	Load combination
Equation (16-1)	1.4 (D + F)
Equation (16-2a)	1.2 (D + F) + 1.6 (L + H) + 0.5 (L_r)
Equation (16-5)	1.2 (D + F) + 1.0 (E) + f_1L + 1.6 (H) + f_2S
Equation (16-7)	0.9 (D + F) + 1.0 (E) + 1.6 (H)

1.2.2 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
Equation (16-1)	1.4 (D + F)	N = -1,099; V_x = 238; V_y = 237; M_x = -25,704; M_y = 17,102; M_z = 4,082;	yes	16
Equation (16-2a)	1.2 (D + F) + 1.6 (L + H) + 0.5 (L_r)	N = -934; V_x = 290; V_y = 211; M_x = -22,915; M_y = 17,616; M_z = 4,018;	yes	15
Equation (16-5)	1.2 (D + F) + 1.0 (E) + f_1L + 1.6 (H) + f_2S	N = -417; V_x = 1,062; V_y = 968; M_x = -70,848; M_y = 75,595; M_z = 15,463;	yes	72
Equation (16-7)	0.9 (D + F) + 1.0 (E) + 1.6 (H)	N = -187; V_x = 957; V_y = 912; M_x = -64,788; M_y = 70,082; M_z = 14,264;	yes	64

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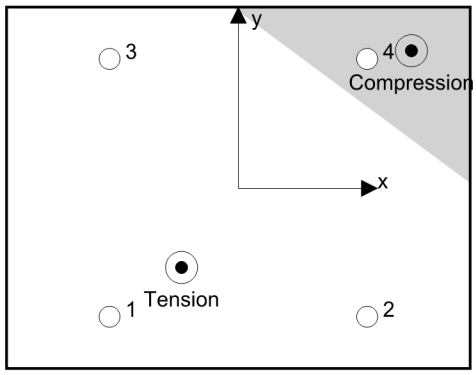
2 Load case/Resulting anchor forces

Controlling load case: Equation (16-5) 1.2 (D + F) + 1.0 (E) + f_1L + 1.6 (H) + f_2S



Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	4,325	668	652	-145
2	2,279	906	652	629
3	1,552	189	-121	-145
4	0	640	-121	629

max. concrete compressive strain: 0.19 [‰]
max. concrete compressive stress: 838 [psi]
resulting tension force in (x/y)=(-2.205/-3.097): 8,156 [lb]
resulting compression force in (x/y)=(6.719/5.318): 8,573 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

SS ANCHORS OK ALT.

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	4,325	14,529	30	OK
Pullout Strength*	4,325	6,867	63	OK
Concrete Breakout Failure**[1]	N/A	N/A	N/A	N/A
Concrete Side-Face Blowout, direction x-**	5,877	22,441	27	OK

* highest loaded anchor **anchor group (anchors in tension)
[1] Tension Anchor Reinforcement has been selected!

CONCRETE BREAKOUT CHECK W/ REBAR:

$\phi P_n = (0.75)(60\,ksi)(0.20in^2 \times 6)$
$= 54,000 lbs$

#4 → $0.20in^2$

3.1 Steel Strength

$N_{sa} = A_{se,N} f_{uta}$ ACI 318-19 Eq. (17.6.1.2)
$\phi N_{sa} \geq N_{ua}$ ACI 318-19 Table 17.5.2

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.33	58,000

Calculations

N_{sa} [lb]
19,372

Results

N_{sa} [lb]	ϕ_{steel}	ϕ N_{sa} [lb]	N_{ua} [lb]
19,372	0.750	14,529	4,325

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3.2 Pullout Strength

$N_{pN} = \psi_{c,p} N_p$ ACI 318-19 Eq. (17.6.3.1)
$N_p = 8 A_{brg} f'_c$ ACI 318-19 Eq. (17.6.3.2.2a)
$\phi N_{pN} \geq N_{ua}$ ACI 318-19 Table 17.5.2

Variables

$\psi_{c,p}$	A_{brg} [in.^{2}]	λ_a	f'_c [psi]
1.000	0.65	1.000	2,500

Calculations

N_p [lb]
13,080

Results

N_{pn} [lb]	$\phi_{concrete}$	$\phi_{seismic}$	$\phi_{nonductile}$	ϕN_{pn} [lb]	N_{ua} [lb]
13,080	0.700	0.750	1.000	6,867	4,325

3.3 Concrete Side-Face Blowout, direction x-

$N_{sb} = 160 c_{a1} \sqrt{A_{brg}} \lambda_a \sqrt{f'_c}$ ACI 318-19 Eq. (17.6.4.1)
$N_{sbg} = \alpha_{group} N_{sb}$ ACI 318-19 Eq. (17.6.4.2)
$\phi N_{sbg} \geq N_{ua}$ ACI 318-19 Table 17.5.2
$\alpha_{group} = \left(1 + \frac{s}{6 c_{a1}}\right)$ see ACI 318-19, Section 17.6.4.2, Eq. (17.6.4.2)

Variables

c_{a1} [in.]	c_{a2} [in.]	A_{brg} [in.^{2}]	λ_a	f'_c [psi]	s [in.]
4.500	22.000	0.65	1.000	2,500	10.000

Calculations

α_{group}	N_{sb} [lb]
1.370	29,113

Results

N_{sbg} [lb]	$\phi_{concrete}$	$\phi_{seismic}$	$\phi_{nonductile}$	ϕN_{sbg} [lb]	$N_{ua,edge}$ [lb]
39,896	0.750	0.750	1.000	22,441	5,877

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4 Shear load

SS ANCHORS OK ALT.

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi$ V_n	Status
Steel Strength*	906	7,555	12	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength*	906	9,205	10	OK
Concrete edge failure in direction x+**	1,811	4,096	45	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

$V_{sa} = 0.6\ A_{se,V}\ f_{uta}$ ACI 318-19 Eq. (17.7.1.2b)
$\phi\ V_{steel} \geq V_{ua}$ ACI 318-19 Table 17.5.2

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]
0.33	58,000

Calculations

V_{sa} [lb]
11,623

Results

V_{sa} [lb]	ϕ_{steel}	$\phi\ V_{sa,eq}$ [lb]	V_{ua} [lb]
11,623	0.650	7,555	906

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4.2 Pryout Strength

$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right]$ ACI 318-19 Eq. (17.7.3.1a)

$\phi V_{cp} \geq V_{ua}$ ACI 318-19 Table 17.5.2

A_{Nc} see ACI 318-19, Section 17.6.2.1, Fig. R 17.6.2.1(b)

$A_{Nc0} = 9 h_{ef}^2$ ACI 318-19 Eq. (17.6.2.1.4)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e'_N}{3 h_{ef}}} \right) \leq 1.0$ ACI 318-19 Eq. (17.6.2.3.1)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0$ ACI 318-19 Eq. (17.6.2.4.1b)

$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0$ ACI 318-19 Eq. (17.6.2.6.1b)

$N_b = 16 \lambda_a \sqrt{f'_c} h_{ef}^{5/3}$ ACI 318-19 Eq. (17.6.2.2.3)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	12.000	0.000	0.000	4.500

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f'_c [psi]
1.000	∞	16	1.000	2,500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
218.50	1,296.00	1.000	1.000	0.775	1.000	50,318

Results

V_{cp} [lb]	$\phi_{concrete}$	$\phi_{seismic}$	$\phi_{nonductile}$	ϕV_{cp} [lb]	V_{ua} [lb]
13,149	0.700	1.000	1.000	9,205	906

4.3 Concrete edge failure in direction x+

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} \Psi_{parallel,V} V_b$ ACI 318-19 Eq. (17.7.2.1b)

$\phi V_{cbg} \geq V_{ua}$ ACI 318-19 Table 17.5.2

A_{Vc} see ACI 318-19, Section 17.7.2.1, Fig. R 17.7.2.1(b)

$A_{Vc0} = 4.5 c_{a1}^2$ ACI 318-19 Eq. (17.7.2.1.3)

$\Psi_{ec,V} = \left(\frac{1}{1 + \frac{e'_v}{1.5c_{a1}}}\right) \leq 1.0$ ACI 318-19 Eq. (17.7.2.3.1)

$\Psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ ACI 318-19 Eq. (17.7.2.4.1b)

$\Psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ ACI 318-19 Eq. (17.7.2.6.1)

$V_b = 9 \lambda_a \sqrt{f'_c} c_{a1}^{1.5}$ ACI 318-19 Eq. (17.7.2.2.1b)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\Psi_{c,V}$	h_a [in.]
4.500	22.000	3.600	1.200	18.000

l_e [in.]	λ_a	d_a [in.]	f'_c [psi]	$\Psi_{parallel,V}$
6.000	1.000	0.750	2,500	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{h,V}$	V_b [lb]
158.62	91.12	0.652	1.000	1.000	4,296

Results

V_{cbg} [lb]	$\phi_{concrete}$	$\phi_{seismic}$	$\phi_{nonductile}$	ϕV_{cbg} [lb]	V_{ua} [lb]
5,852	0.700	1.000	1.000	4,096	1,811

5 Combined tension and shear loads, per ACI 318-19 section 17.8

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.630	0.442	5/3	72	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- "An anchor design approach for structures assigned to Seismic Design Category C, D, E or F is given in ACI 318-19, Chapter 17, Section 17.10.5.3 (a) that requires the governing design strength of an anchor or group of anchors be limited by ductile steel failure. If this is NOT the case, the connection design (tension) shall satisfy the provisions of Section 17.10.5.3 (b), Section 17.10.5.3 (c), or Section 17.10.5.3 (d). The connection design (shear) shall satisfy the provisions of Section 17.10.6.3 (a), Section 17.10.6.3 (b), or Section 17.10.6.3 (c)."
- Section 17.10.5.3 (b) / Section 17.10.6.3 (a) require the attachment the anchors are connecting to the structure be designed to undergo ductile yielding at a load level corresponding to anchor forces no greater than the controlling design strength. Section 17.10.5.3 (c) / Section 17.10.6.3 (b) waive the ductility requirements and require the anchors to be designed for the maximum tension / shear that can be transmitted to the anchors by a non-yielding attachment. Section 17.10.5.3 (d) / Section 17.10.6.3 (c) waive the ductility requirements and require the design strength of the anchors to equal or exceed the maximum tension / shear obtained from design load combinations that include E, with E increased by ω_0.
- The design of Anchor Reinforcement is beyond the scope of PROFIS Engineering. Refer to ACI 318-19, Section 17.5.2.1 (a) for information about Anchor Reinforcement.
- Anchor Reinforcement has been selected as a design option, calculations should be compared with PROFIS Engineering calculations.

Fastening meets the design criteria!

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Address:		Specifier:	
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7 Installation data

Profile: Rectangular plates and bars (AISC), 12 - 1/4; (L x W x T) = 12.000 in. x 0.250 in.

Hole diameter in the fixture: d_f = 0.812 in.

Plate thickness (input): 0.500 in.

Recommended plate thickness: not calculated

Anchor type and diameter: Hex Head ASTM F 1554 GR. 36 3/4

Item number: not available

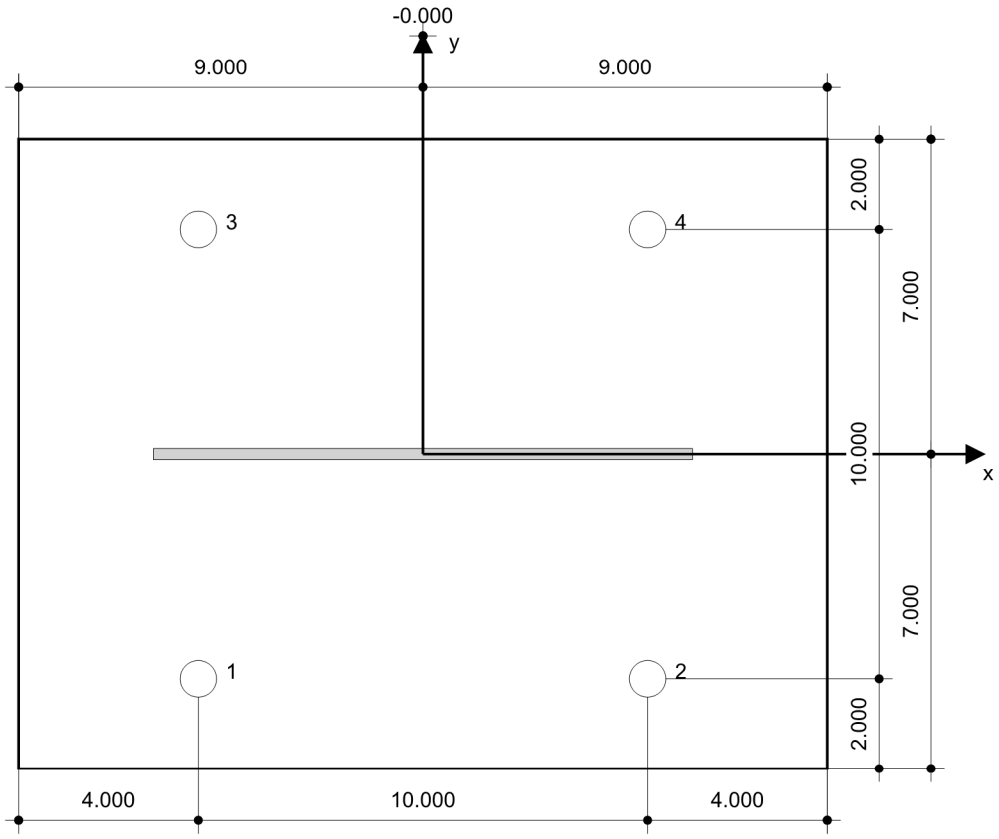
Maximum installation torque: -

Hole diameter in the base material: - in.

Hole depth in the base material: 12.000 in.

Minimum thickness of the base material: 13.000 in.

Hilti Hex Head headed stud anchor with 12 in embedment, 3/4, Steel galvanized, installation per instruction for use



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-5.000	-5.000	4.500	14.500	22.000	32.000
2	5.000	-5.000	14.500	4.500	22.000	32.000
3	-5.000	5.000	4.500	14.500	32.000	22.000
4	5.000	5.000	14.500	4.500	32.000	22.000

8 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
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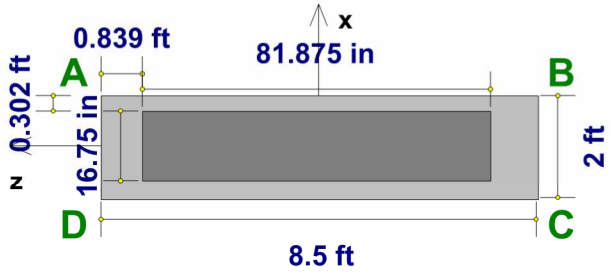
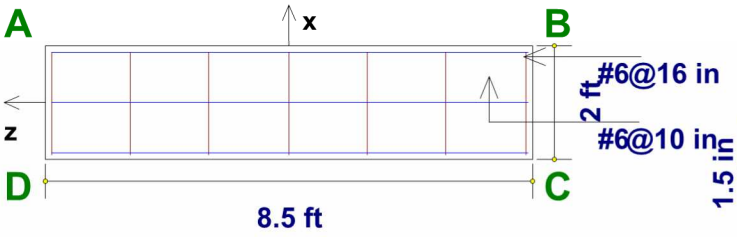
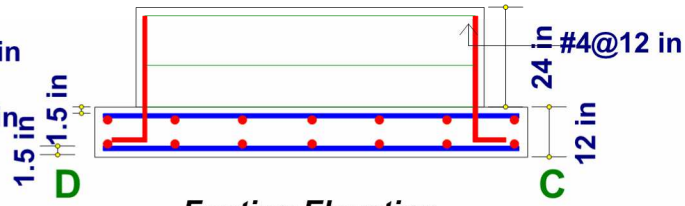
Sketch



Details



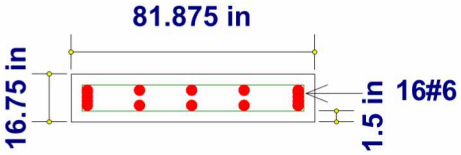


Footing Elevation

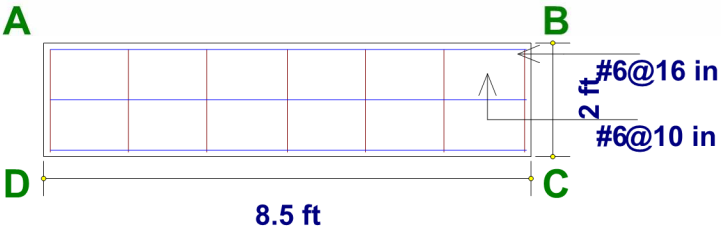
x Dir. Steel: 3.09 in^2 (7 #6)

z Dir. Steel: 1.33 in^2 (3 #6)

Bottom Rebar Plan



Pedestal Rebar Plan



x Dir. Steel: 3.09 in^2 (7 #6)

z Dir. Steel: 1.33 in^2 (3 #6)

Top Rebar Plan

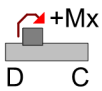
Geometry, Materials and Criteria

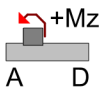
Length:	8.5 ft	eX:	0 in	Gross Allow. Bearing:	1500 psf (gross)	Steel fy:	60 ksi
Width:	2 ft	eZ:	0 in	Concrete Weight:	0.145 k/ft^3	Minimum Steel:	.0018
Thickness:	12 in	pX:	16.75 in	Concrete f'c:	2.5 ksi	Maximum Steel:	.0075
Height:	24 in	pZ:	81.875 in	Design Code:	ACI 318-19		
Rot. Angle:	0 deg						

Footing Top Bar Cover:	1.5 in	Overturning / Sliding SF:	VARIES	Φ for Flexure:	0.9
Footing Bottom Bar Cover:	1.5 in	Coefficient of Friction:	0.3	Φ for Shear:	0.75
Pedestal Longitudinal Bar Cover:	1.5 in	Passive Resistance of Soil:	0 k	Φ for Bearing:	0.65

Loads

	P (k)	Vx (k)	Vz (k)	Mx (k-ft)	Mz (k-ft)	Overburden (psf)
DL	**0.797**	**-0.176**	**-0.203**	**0.802**	**-1.205**	**0.1**
LL	**0.025**	**0.017**	**-0.03**	**0.019**		
SL	**0.414**	**-0.129**	**-0.141**	**0.698**	**-0.81**	
ELX	**0.106**	**-0.193**	**0.018**	**0.267**	**-0.652**	
ELZ	**-0.364**	**0.022**	**0.36**	**-1.008**	**0.847**	





Soil Bearing

Description	Categories and Factors	Gross Allow.(psf)	Max Bearing (psf)	Max/Allowable Ratio
Service	1DL+1LL+1HL	1500	717.043 (C)	0.478
IBC 21/ASCE 1	1DL	1500	718.692 (C)	0.479
IBC 21/ASCE 2	1DL+1HL+1LL+1LLS	1500	717.043 (C)	0.478
IBC 21/ASCE 3..	1DL+1HL+1RLL	1500	718.692 (C)	0.479
IBC 21/ASCE 3..	1DL+1HL+1SL	1500	1062.367 (C)	0.708
IBC 21/ASCE 3..	1DL+1HL+1RL	1500	718.692 (C)	0.479
IBC 21/ASCE 4..	1DL+1HL+0.75LL+0.75LLS..	1500	717.454 (C)	0.478
IBC 21/ASCE 4..	1DL+1HL+0.75LL+0.75LLS..	1500	957.97 (C)	0.639
IBC 21/ASCE 4..	1DL+1HL+0.75LL+0.75LLS..	1500	717.454 (C)	0.478
IBC 21/ASCE 5..	1DL+1HL+0.6WLX	1500	718.692 (C)	0.479
IBC 21/ASCE 5..	1DL+1HL+0.6WLZ	1500	718.692 (C)	0.479
IBC 21/ASCE 6..	1DL+1HL+0.45WLX+0.75LL..	1500	717.454 (C)	0.478
IBC 21/ASCE 6..	1DL+1HL+0.45WLZ+0.75LL..	1500	717.454 (C)	0.478
IBC 21/ASCE 6..	1DL+1HL+0.45WLX+0.75LL..	1500	957.97 (C)	0.639
IBC 21/ASCE 6..	1DL+1HL+0.45WLZ+0.75LL..	1500	957.97 (C)	0.639
IBC 21/ASCE 6..	1DL+1HL+0.45WLX+0.75LL..	1500	717.454 (C)	0.478
IBC 21/ASCE 6..	1DL+1HL+0.45WLZ+0.75LL..	1500	717.454 (C)	0.478
IBC 21/ASCE 7..	0.6DL+1HL+0.6WLX	1500	431.215 (C)	0.287
IBC 21/ASCE 7..	0.6DL+1HL+0.6WLZ	1500	431.215 (C)	0.287
IBC 21/ASCE 7..	0.6DL+0.6HL+0.6WLX	1500	431.215 (C)	0.287
IBC 21/ASCE 7..	0.6DL+0.6HL+0.6WLZ	1500	431.215 (C)	0.287
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	819.309 (C)	0.546
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	819.309 (C)	0.546
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	819.309 (C)	0.546
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	819.309 (C)	0.546
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	819.309 (C)	0.546
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	819.309 (C)	0.546
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	819.309 (C)	0.546
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	819.309 (C)	0.546
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	1029.832 (C)	0.687
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	1029.832 (C)	0.687
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	1029.832 (C)	0.687
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	1029.832 (C)	0.687
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	1029.832 (C)	0.687
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	1029.832 (C)	0.687
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	1029.832 (C)	0.687
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	1029.832 (C)	0.687
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22

IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	330.598 (C)	0.22
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	936.608 (C)	0.624
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	679.605 (C)	0.453
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	1079.657 (C)	0.72
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+0.7..	1500	582.154 (C)	0.388
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	713.402 (C)	0.476
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	966.424 (C)	0.644
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	600.352 (C)	0.4
IBC 21/ASCE 8..	1DL+0.14Sds*DL+1HL+-0...	1500	1090.824 (C)	0.727
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	1156.749 (C)	0.771
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	906.403 (C)	0.604
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	1292.207 (C)	0.861
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+0...	1500	826.724 (C)	0.551
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	929.808 (C)	0.62
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	1166.651 (C)	0.778
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	840.352 (C)	0.56
IBC 21/ASCE 9..	1DL+0.105Sds*DL+1HL+-0..	1500	1292.094 (C)	0.861
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	483.004 (C)	0.322
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	254.656 (D)	0.17
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	723.481 (C)	0.482
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	199.952 (A)	0.133
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	224.699 (C)	0.15
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	492.657 (C)	0.328
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	201.826 (B)	0.135
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+1HL+..	1500	688.954 (C)	0.459
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	483.004 (C)	0.322
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	254.656 (D)	0.17
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	723.481 (C)	0.482
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	199.952 (A)	0.133
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	224.699 (C)	0.15
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	492.657 (C)	0.328
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	201.826 (B)	0.135
IBC 21/ASCE 1..	0.6DL+-0.14Sds*DL+0.6H..	1500	688.954 (C)	0.459