STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

April 21, 2023

Paul R. Michaud, Esq.
Michaud Law Group LLC
515 Centerpoint Dr., Suite 502
Middletown, CT 06457
pmichaud@michaud.law

RE: **PETITION NO. 1492** – CT NSB ProjectCo LLC declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 1.99-megawatt AC solar photovoltaic electric generating facility located at 486 Fitch Hill Road, Montville (Uncasville), Connecticut, and associated electrical interconnection.

Dear Attorney Michaud:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated April 20, 2023, regarding compliance with Condition No. 3 of the Council's Declaratory Ruling issued on June 24, 2022 for the above-referenced facility. The correspondence includes the final structural design of the racking system, stamped by a Professional Engineer duly licensed in the State of Connecticut, in accordance with Condition No. 3.

Therefore, the Council acknowledges that Condition No. 3 has been satisfied. This acknowledgment applies only to the condition satisfied by the April 20, 2023 correspondence.

Please be advised that deviations from the standards established by the Council in the Declaratory Ruling are enforceable under the provisions of Connecticut General Statutes §16-50u.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MB/RDM/laf

MLG | MICHAUD
RENEWABLE ENERGY LAW IS OUR BUSINESS LAWGROUP

PAUL R. MICHAUD
Managing Attorney / Principal
515 Centerpoint Drive, Suite 503
Middletown, CT 06457
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Web: www.michaudlaw.com

April 20, 2023

FILED BY ELECTRONIC MAIL AND US MAIL

Melanie Bachman, Esq.
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **PETITION NO. 1492** – CT NSB ProjectCo LLC petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 1.99-megawatt AC solar photovoltaic electric generating facility located at 486 Fitch Hill Road, Montville (Uncasville), Connecticut, and associated electrical interconnection.

Dear Attorney Bachman:

On behalf of CT NSB ProjectCo LLC ("Petitioner"), this letter to the Connecticut Siting Council ("Council") is in response to Council's Petition No. 1492 Decision dated June 24, 2022 ("Decision"), specifically Condition #3.

Enclosed – and in response to Condition #3 of the Decision – please find a copy of the final structural design for the racking system stamped by a Connecticut Professional Engineer. Petitioner believes they have satisfied the Conditions required to construct the solar panel racking system; however, Petitioner will refrain from doing so until they receive Council's acknowledgement.

Consistent with Council requirements, Petitioner submits one electronic version, an original, and fifteen hard copies of all necessary documents.

Please feel free to contact me if you have any questions.

Very truly yours,

Paul R. Michaud

Paul R. Michaud

Prepared For:

SOLV Inc.

North Silver Brook Solar Project

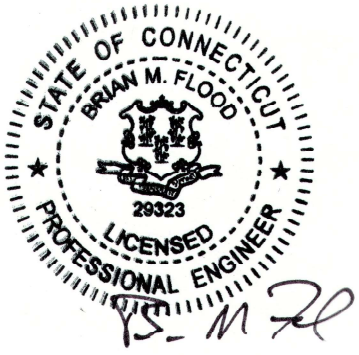
SFDC ID# 17010

1x53 FTS - Structural Calculations
486 Fitch Hill Rd. – Uncasville, CT 06382

A product of Northern States Metals (NSM)

3207 Innovation Place, Youngstown, Ohio, 44509-4023

Prepared By: NZ Checked By: JS



Rev 0

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Customer:	Solv Inc.
SFDC ID #:	17010
Project/Location:	North Silver Brook - 486 Fitch Hill Rd. Uncasville, CT 06382
Date/Engineer:	01/20/23 - JS

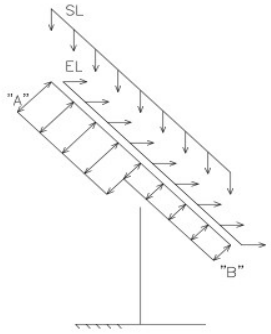
Solar Flexrack Loading Analysis

Configuration Data

Configuration 1:	1x53 FTS	Configuration 2:	1x41 FTS	Configuration 3:	1x35 FTS
Horiz. Length (N-S):	195.74 ft	Horiz. Length (N-S):	151.73 ft	Horiz. Length (N-S):	129.73 ft
Array Surface Area:	1530.96 ft²	Array Surface Area:	1186.79 ft²	Array Surface Area:	1014.70 ft²
Number of Posts:	9	Number of Posts:	7	Number of Posts:	7

Design Data Summary

Module Length:	7.82 ft
Solar Panel Dead Load:	2.56 psf
Max Stow Wind Speed:	122 mph
Max Operation:	35 mph
Snow Load:	30 psf
Ground Clearance:	36.82 in
Exposure Category:	C
Building Classification:	I



Snow Load Parameters

Flat Roof Snow Load, P_f:	Pf=0.7*Ce*Ct*I*Pg
Sloped Roof Snow Load, P_s:	Ps = Pf*Cs
Snow Exposure Category, Ce:	0.9
Snow Thermal Factor, Ct:	1.2
Snow Importance Factor, I:	0.8
P_f:	18.14 psf
Snow Density:	17.9 pcf
Snow Height:	20.11 in

Snow Load Design

Tilt Angle	C_s	P_s psf
0 - 15	1.00	18.14
20	0.91	16.51
25	0.82	14.88
30	0.73	13.25
35	0.64	11.61
40	0.55	9.98
45	0.46	8.35
50	0.37	6.71
55	0.28	5.08

Wind Load Parameters

Exposure Coefficient, Kz:	0.85	Wind Load: qh = 0.00256*kz*kzt*kd*V²		n:	2.9	Hz
Topographic Factor, Kzt:	1.00	qh_{Vult}	27.53 psf	Damping Ratio	2.50	%
Wind Directionality Factor, Kd:	0.85	qh_{35}	3.77 psf	nL/Vult:	0.164	
				nL/V35:	0.442	

Wind Load Design

Perimeter Loading

Stow Position

	Static								Inertial								
Tilt Angle	A Distribution	B Distribution	GCp Up	GCp Dn	A*qz*GCp Up	B*qz*GCp Up	A*qz*GCp Dn	B*qz*GCp Dn	A Distribution	B Distribution	Mod. Factor	GCp Up	GCp Dn	A*qz*GCp Up	B*qz*GCp Up	A*qz*GCp Dn	B*qz*GCp Dn
0	2.00	0.00	-0.38	0.27	-20.73	0.00	14.76	0.00	1.18	0.82	0.58	-0.96	0.85	-31.09	-21.61	27.57	19.16

Tilted Position (35 mph max)

	Static								Inertial								
Tilt Angle	A Distribution	B Distribution	GCp Up	GCp Dn	A*qz*GCp Up	B*qz*GCp Up	A*qz*GCp Dn	B*qz*GCp Dn	A Distribution	B Distribution	Mod. Factor	GCp Up	GCp Dn	A*qz*GCp Up	B*qz*GCp Up	A*qz*GCp Dn	B*qz*GCp Dn
5	1.95	0.05	-0.56	0.54	-4.14	-0.12	3.93	0.11	1.85	0.15	0.30	-0.87	0.84	-6.06	-0.49	5.86	0.47
10	1.89	0.11	-0.76	0.68	-5.44	-0.32	4.84	0.28	1.85	0.15	0.30	-1.07	0.98	-7.44	-0.60	6.85	0.55
15	1.84	0.17	-0.71	0.89	-4.91	-0.44	6.18	0.56	2.00	0.00	0.06	-0.77	0.95	-5.81	0.00	7.20	0.00
20	1.78	0.22	-0.79	0.92	-5.33	-0.66	6.15	0.76	2.00	0.00	0.06	-0.86	0.98	-6.45	0.00	7.37	0.00
25	1.73	0.28	-0.79	0.84	-5.17	-0.82	5.50	0.88	2.00	0.00	0.06	-0.86	0.91	-6.45	0.00	6.84	0.00
30	1.67	0.33	-0.80	0.78	-5.07	-1.00	4.94	0.98	2.00	0.00	0.06	-0.87	0.85	-6.53	0.00	6.38	0.00
35	1.62	0.39	-0.81	0.93	-4.94	-1.18	5.69	1.36	2.00	0.00	0.06	-0.87	0.99	-6.58	0.00	7.50	0.00
40	1.56	0.44	-0.88	0.87	-5.21	-1.47	5.11	1.44	2.00	0.00	0.06	-0.95	0.93	-7.14	0.00	7.01	0.00
45	1.51	0.50	-0.90	0.92	-5.10	-1.68	5.23	1.72	2.00	0.00	0.06	-0.96	0.98	-7.24	0.00	7.41	0.00
50	1.45	0.55	-0.90	0.92	-4.92	-1.86	5.04	1.91	2.00	0.00	0.06	-0.96	0.98	-7.24	0.00	7.41	0.00
55	1.40	0.61	-0.98	1.02	-5.17	-2.24	5.39	2.34	2.00	0.00	0.06	-1.04	1.09	-7.88	0.00	8.19	0.00

Seismic Load Parameters / Design

S_S:	0.167	S_{DS}:	$S_{DS} = (2/3) \times F_a \times S_S$	Site Class:	D	
S_1:	0.060	S_{DS}:	0.178	Seismic Design Category:	B	
Site Coefficient, F_a:	1.600	S_{D1}:	$S_{D1} = (2/3) \times F_v \times S_S$			
Site Coefficient, F_V:	2.400	S_{D1}:	0.096	Seismic Response Coefficient, Cs:	0.089	
Response Modification Coefficent, R:	2	Cu =	1.7	Panel Seismic Load,V =	Cs x (Panel DL)	
Importance Factor, I_e:	1	TL =	6	V =	0.228	psf

This Base Shear Value represents the seismic effect of the panel weight on the rack. This Base Shear includes 20% of the design snow load when the flat roof snow load exceeds 30 psf per ASCE. A separate term in the Risa load combination accounts for the remaining Dead Load caused by member self-weight.

Note: GCp values for 20° and 45° were not given in results from RWDI and are assumed to be the higher value of the two adjacent values.

Loading analysis and design in accordance with wind and snow load information obtained from ASCE 7-10 Minimum Design Loads for Building and Other Structures

Model Settings

Solution
Members

Number of Reported Sections	20
Number of Internal Sections	200
Member Area Load Mesh Size (in^2)	1
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Wall Panels

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Processor Core Utilization

Single	No
Multiple (Optimum)	Yes
Maximum	No

Axis
Vertical Global Axis

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Member Orientation

Default Global Plane for z-axis	XZ

Plate Axis

Plate Local Axis Orientation	Nodal

Codes

Hot Rolled Steel	AISC 14th (360-10): ASD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): ASD
Cold Formed Steel	AISI S100-12: ASD
Stiffness Adjustment	Yes (Iterative)
Wood	None
Temperature	< 100F
Concrete	None
Masonry	None
Aluminum	None
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	None
Stiffness Adjustment	Yes (Iterative)

Concrete

Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No

Model Settings (Continued)

List forces which were ignored for design in the Detail Report	Yes

Rebar

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No

Shear Reinforcement

Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Seismic

RISA-3D Seismic Load Options

Code	ASCE 7-10
Risk Category	I or II
Drift Cat	Other
Base Elevation (ft)	
Include the weight of the structure in base shear calcs	Yes

Site Parameters

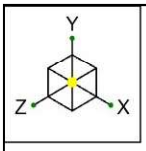
S_1 (g)	0.06
SD_1 (g)	0.096
SD_S (g)	0.178
T_L (sec)	6

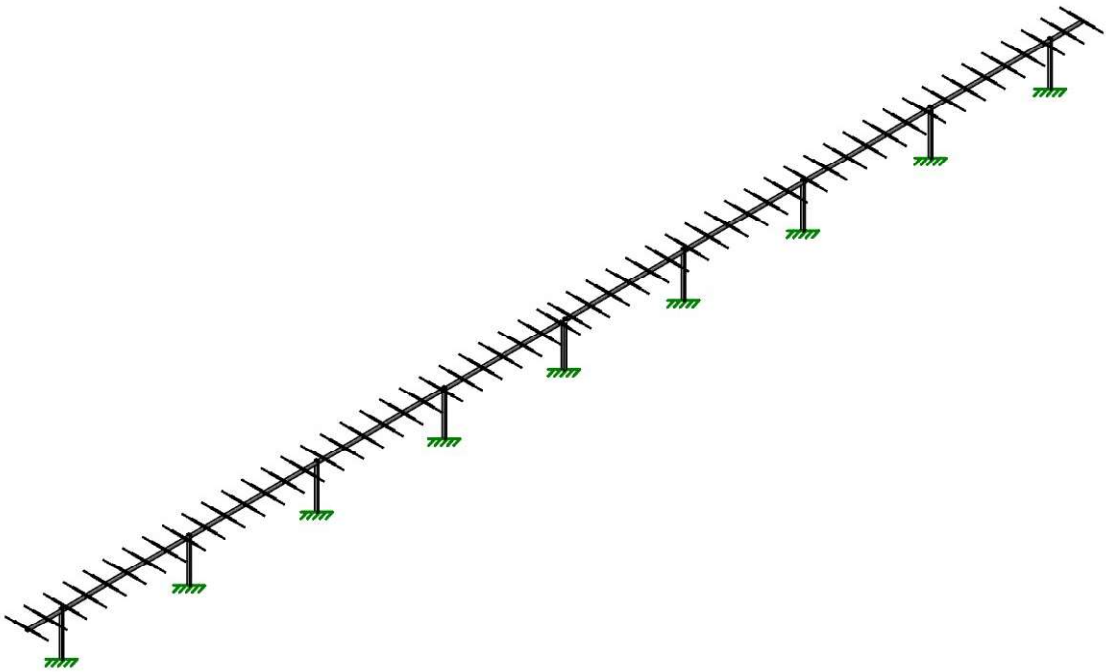
Structure Characteristics

T Z (sec)	
T X (sec)	
C_tX	0.02
C_tExp. Z	0.75
C_tExp. X	0.75
R Z	2
R X	2
Ω_0Z	2
Ω_0X	2
C_dZ	2
C_dX	2
ρ Z	1
ρ X	1

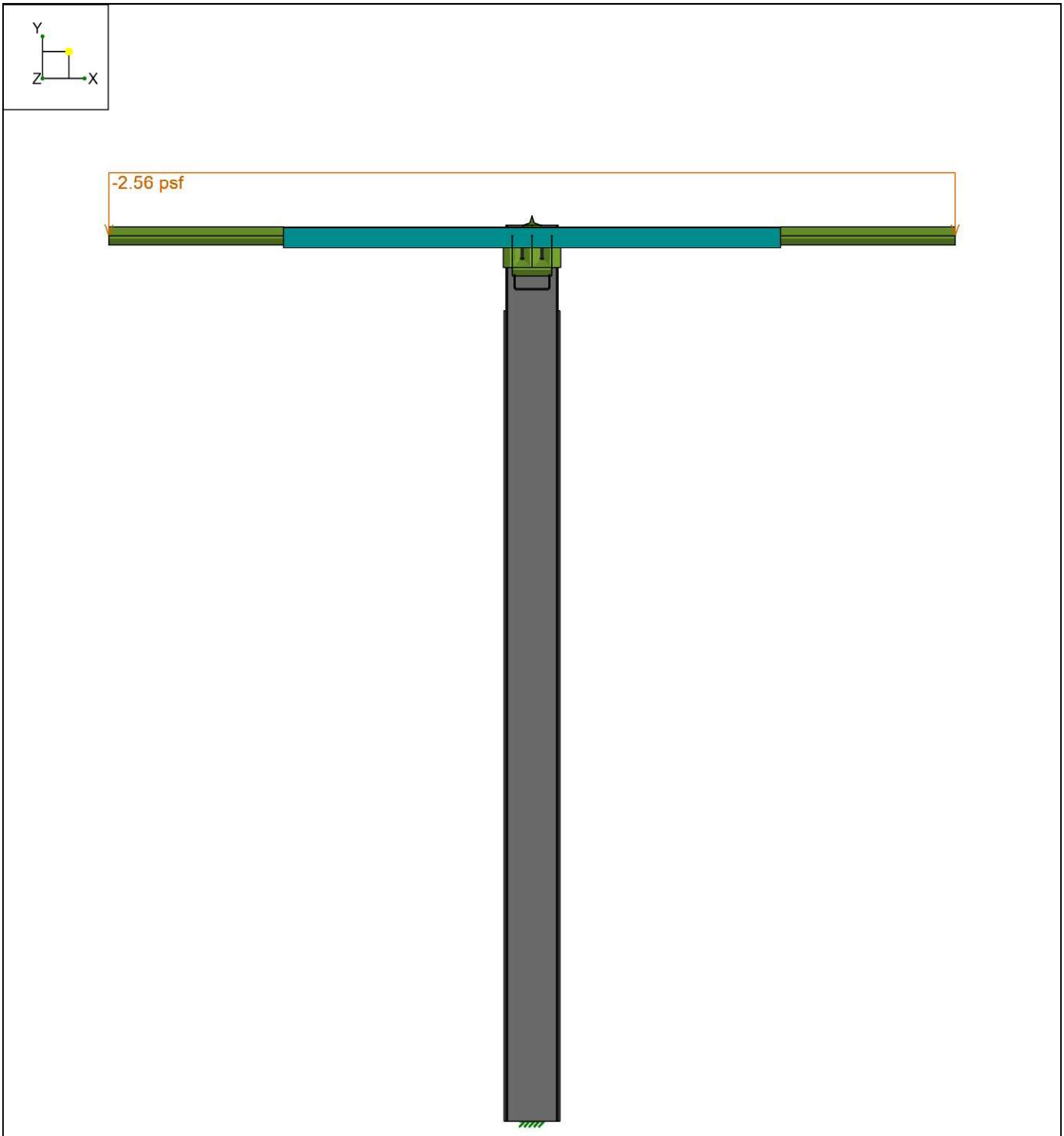
Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1		Yes	Y	DL	1						
2	IBC 16-10	Yes	Y	DL	1	SL	1				
3	IBC 16-12 (A)	Yes	Y	DL	1	WL+X	0.6	OL3	0.6		
4	IBC 16-12 (B)	Yes	Y	DL	1	WL-X	0.6	OL3	0.6		
5	IBC 16-13 (A) (static wind)	Yes	Y	DL	1	OL1	0.45	SL	0.75	OL3	0.45
6	IBC 16-13 (B) (static wind)	Yes	Y	DL	1	OL2	0.45	SL	0.75	OL3	0.45
7	Total WL + 0.25 SL	Yes	Y	DL	1	WL+X	0.45	SL	0.25		
8	Total WL + 0.25 SL	Yes	Y	DL	1	WL-X	0.45	SL	0.25		
9	IBC 16-15 (A)	Yes	Y	DL	0.6	WL+X	0.6	OL3	0.6		
10	IBC 16-15 (B)	Yes	Y	DL	0.6	WL-X	0.6	OL3	0.6		
11	Seismic										
12	IBC 16-12 C (A)	Yes	Y	DL	1	ELX	0.7			SDS*DL	0.14
13	IBC 16-12 C (B)	Yes	Y	DL	1	ELX	-0.7			SDS*DL	0.14
14	IBC 16-12 (D) (A)	Yes	Y	DL	1	ELZ	0.7			SDS*DL	0.14
15	IBC 16-12 (D) (B)	Yes	Y	DL	1	ELZ	-0.7			SDS*DL	0.14
16	IBC 16-14 (A) (A)	Yes	Y	DL	1	ELX	0.525	SL	0.75	SDS*DL	0.105
17	IBC 16-14 (A) (B)	Yes	Y	DL	1	ELX	-0.525	SL	0.75	SDS*DL	0.105
18	IBC 16-14 (B) (A)	Yes	Y	DL	1	ELZ	0.525	SL	0.75	SDS*DL	0.105
19	IBC 16-14 (B) (B)	Yes	Y	DL	1	ELZ	-0.525	SL	0.75	SDS*DL	0.105
20	IBC 16-16 (A) (A)	Yes	Y	DL	0.6	ELX	0.7			SDS*DL	-0.14
21	IBC 16-16 (A) (B)	Yes	Y	DL	0.6	ELX	-0.7			SDS*DL	-0.14
22	IBC 16-16 (B) (A)	Yes	Y	DL	0.6	ELZ	0.7			SDS*DL	-0.14
23	IBC 16-16 (B) (B)	Yes	Y	DL	0.6	ELZ	-0.7			SDS*DL	-0.14



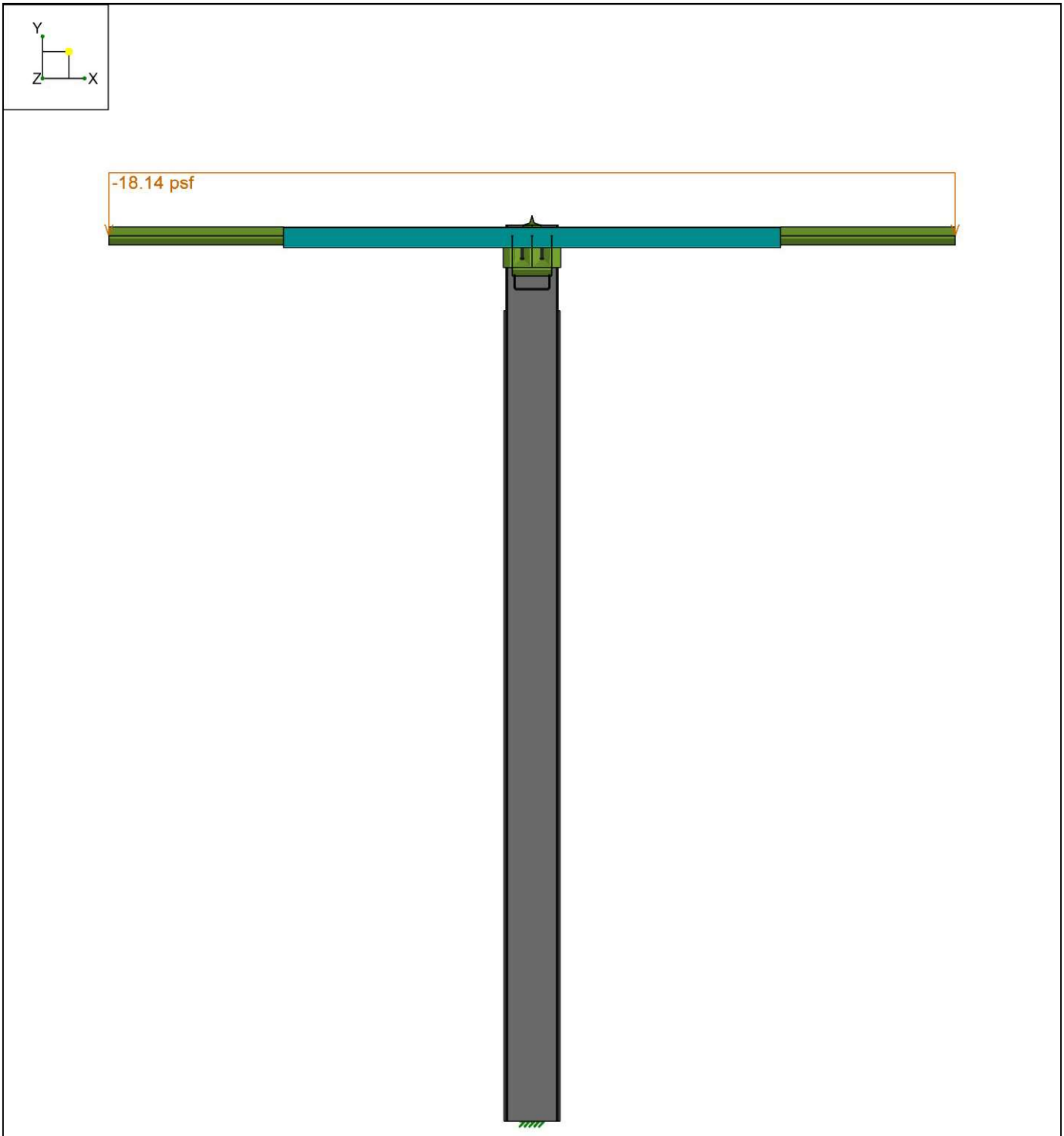


Solv Inc.	North Silver Brook	SK-1
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



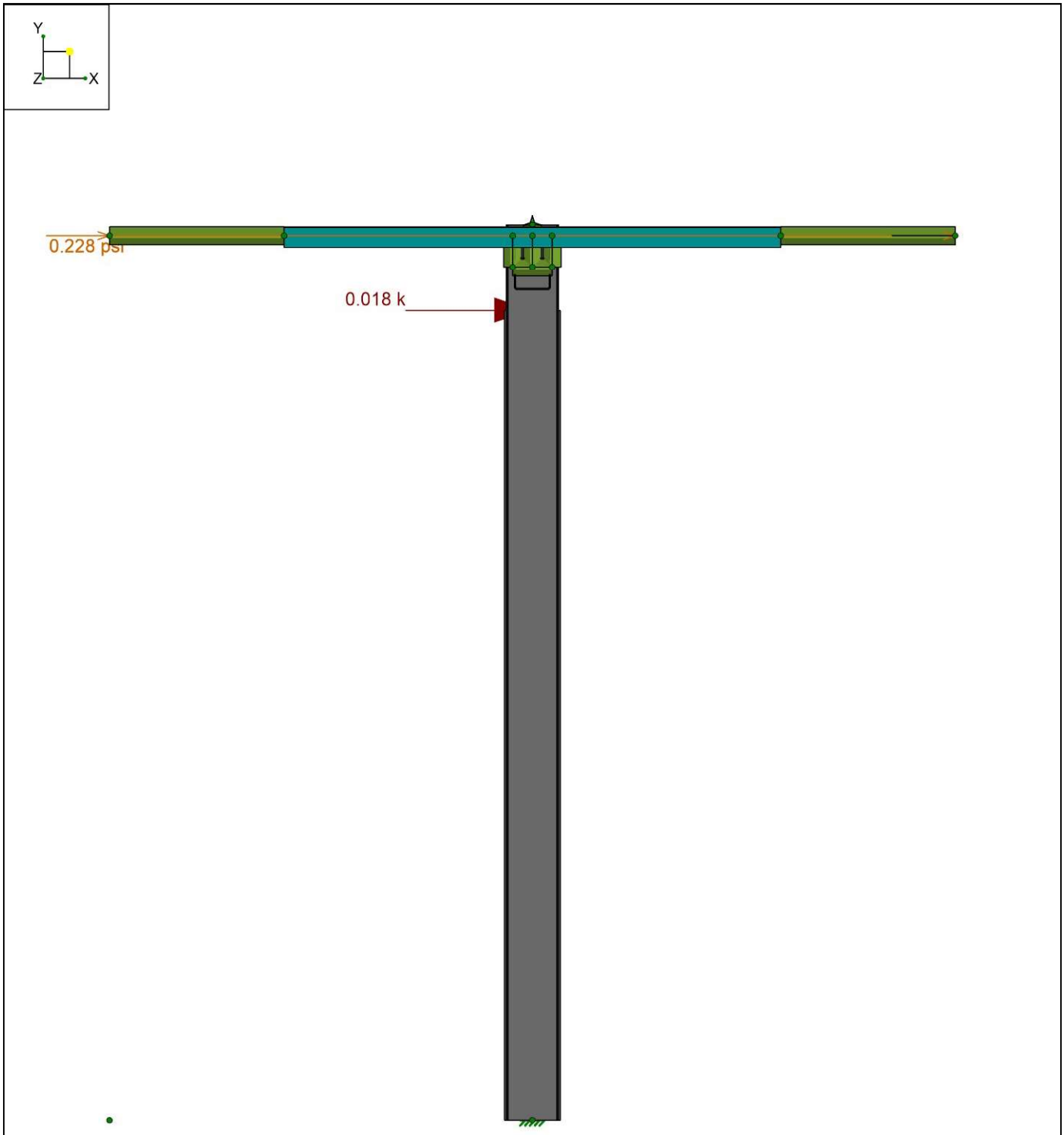
Loads: BLC 2, Solar Panels

Solv Inc.	North Silver Brook	SK-2
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



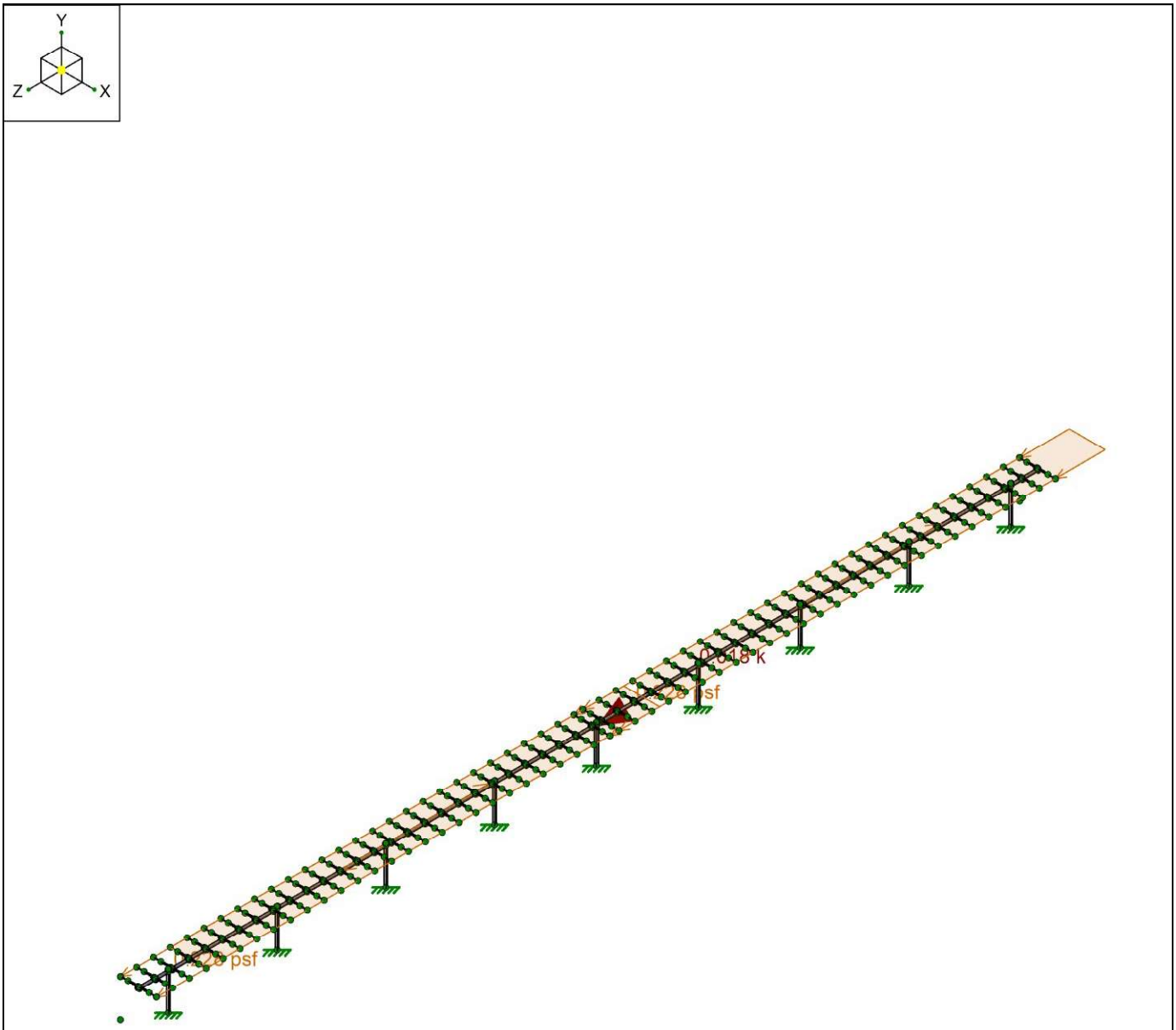
Loads: BLC 3, Snow

Solv Inc.	North Silver Brook	SK-3
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



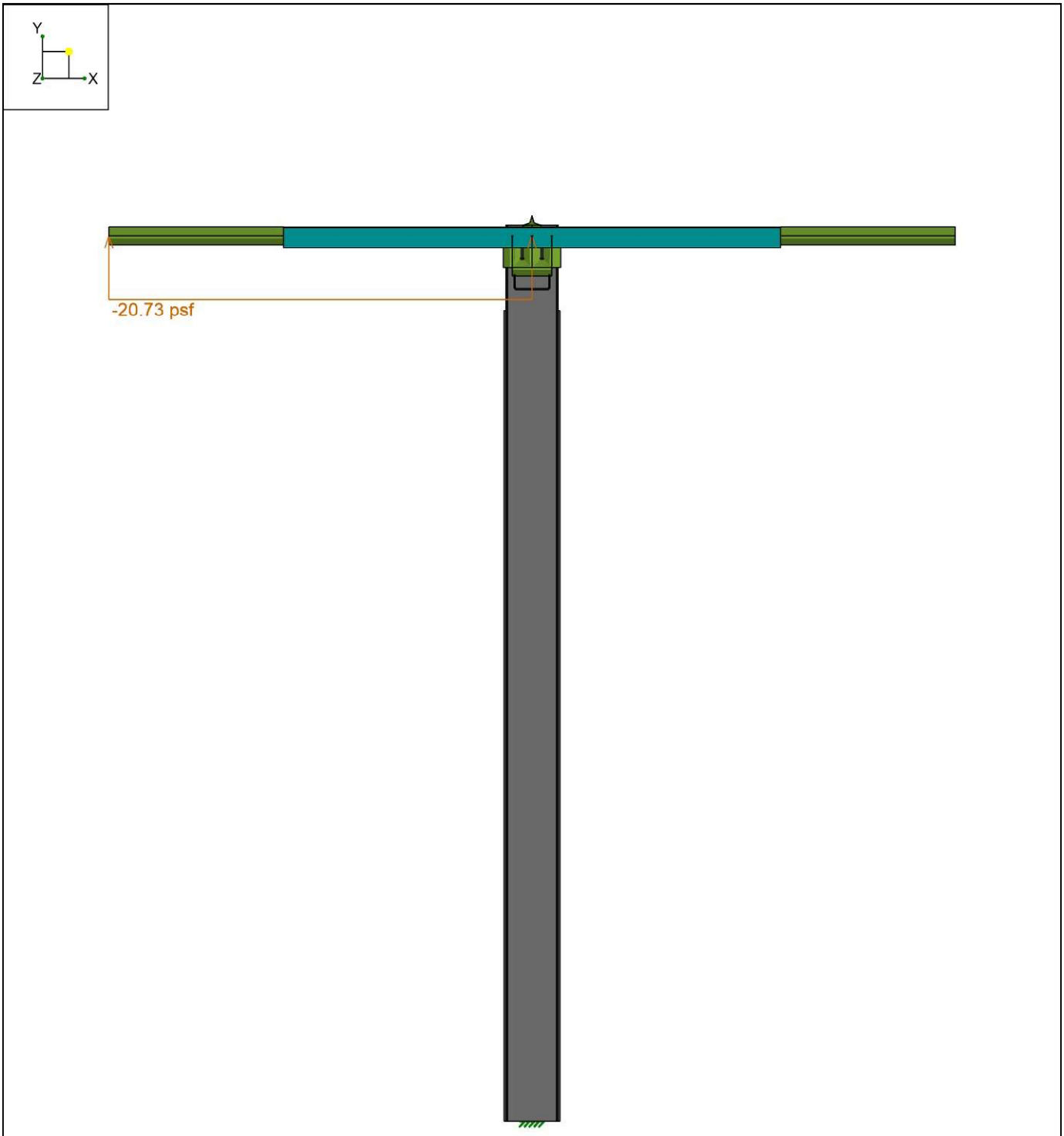
Loads: BLC 4, Seismic X

Solv Inc.	North Silver Brook	SK-4
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



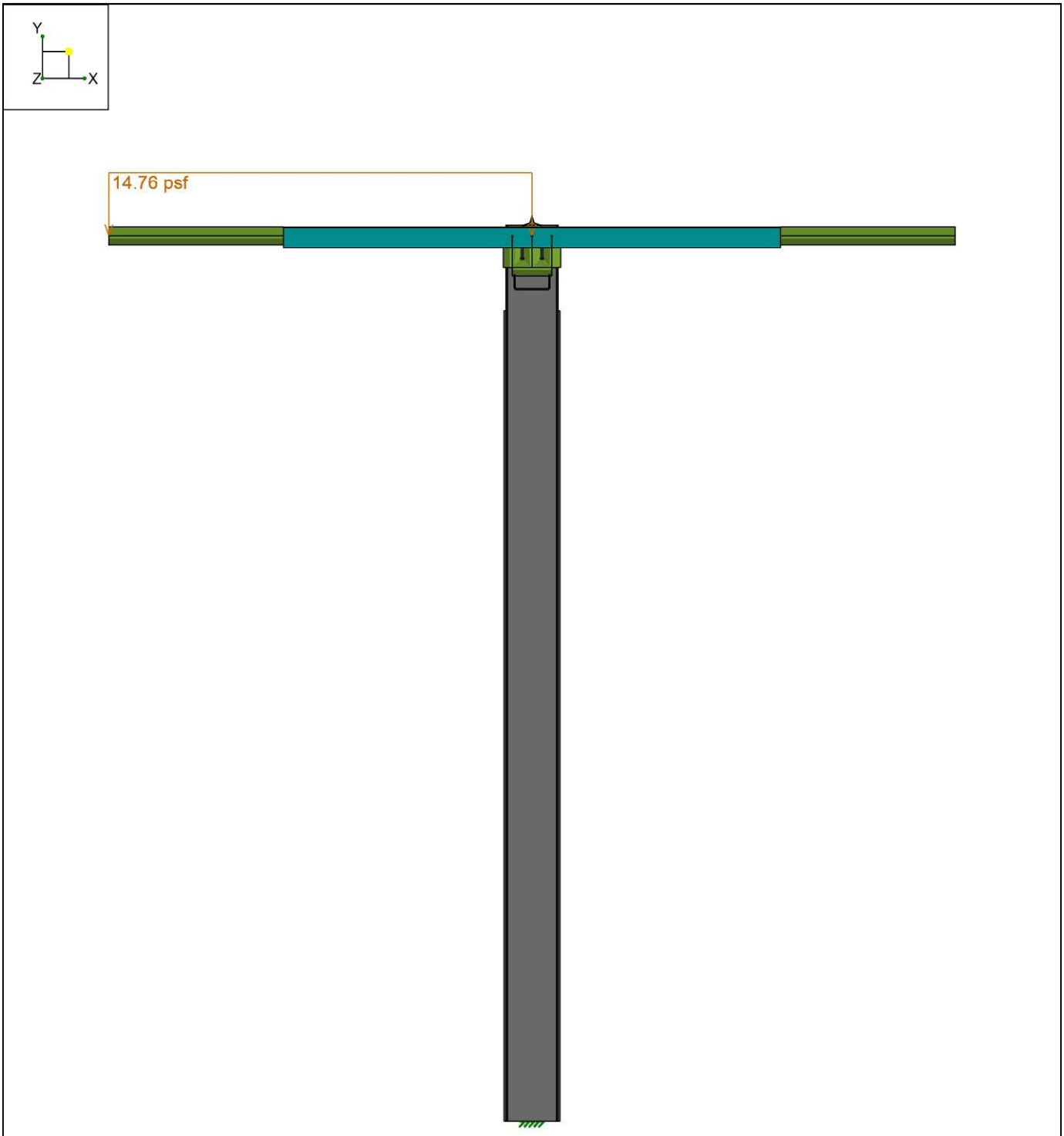
Loads: BLC 5, Seismic Z

Solv Inc.	North Silver Brook	SK-5
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



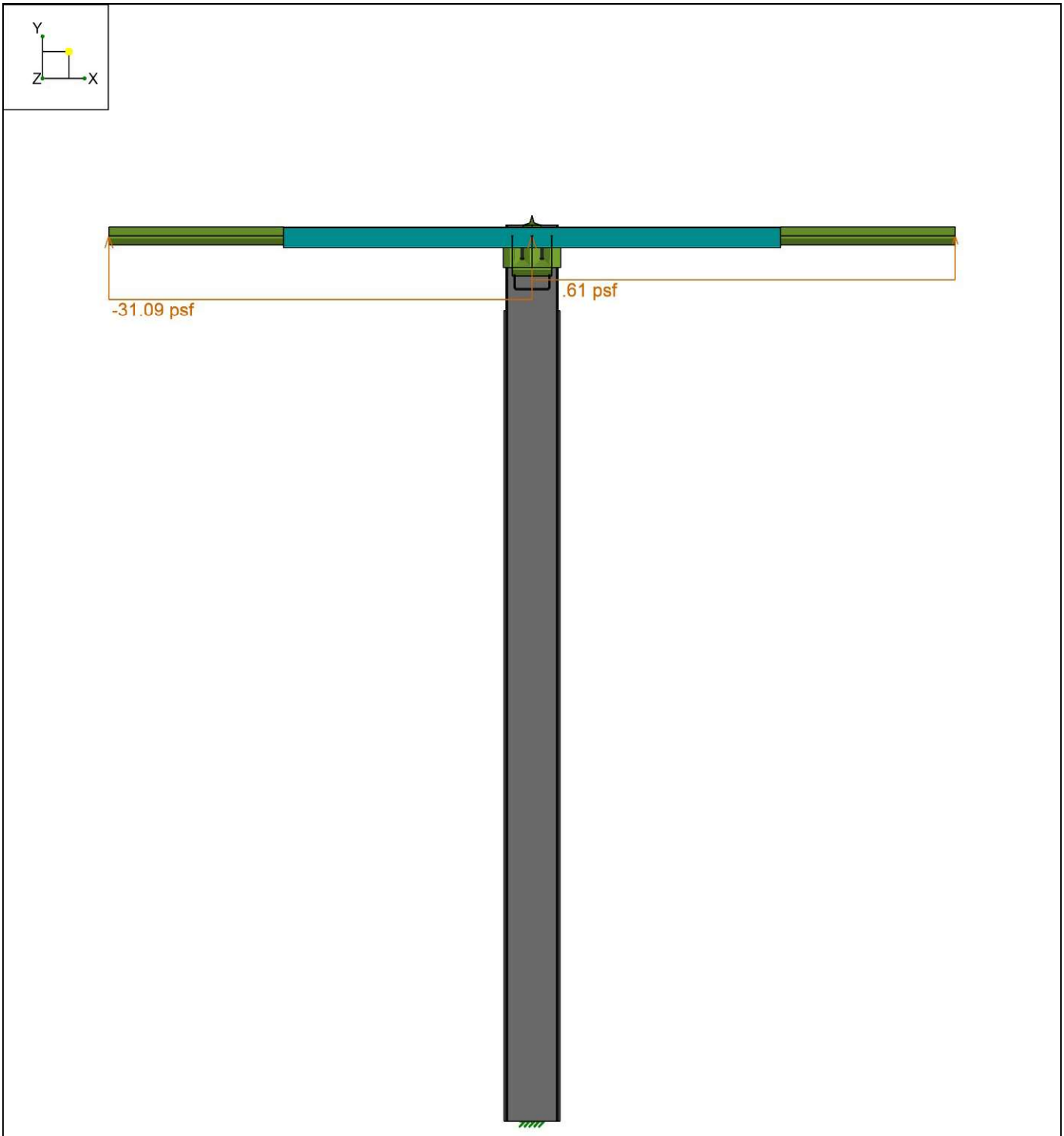
Loads: BLC 6, Wind Uplift - Static

Solv Inc.	North Silver Brook	SK-6
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



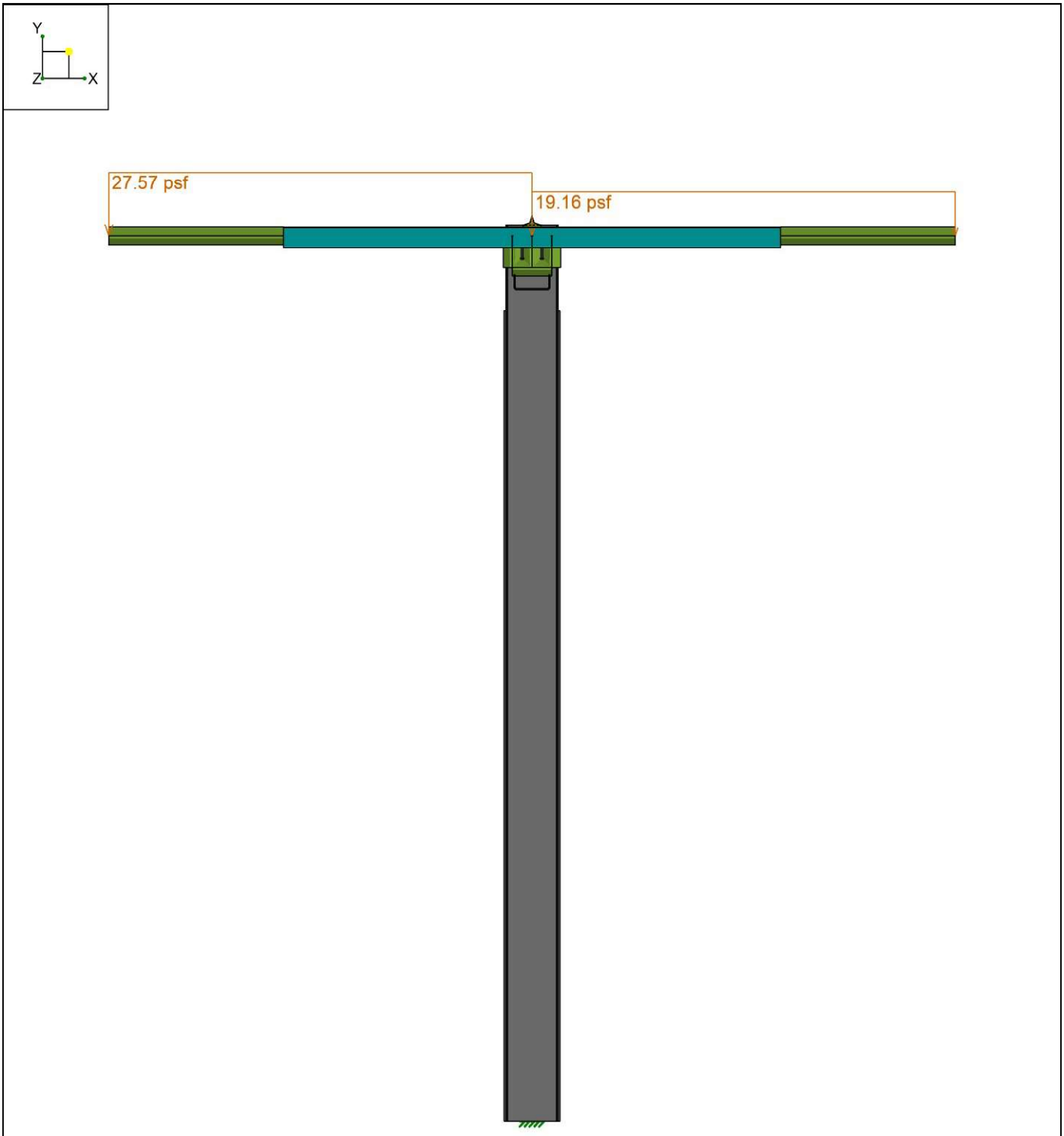
Loads: BLC 7, Wind Downforce - Static

Solv Inc.	North Silver Brook	SK-7
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



Loads: BLC 8, Wind Uplift - Dynamic

Solv Inc.	North Silver Brook	SK-8
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…



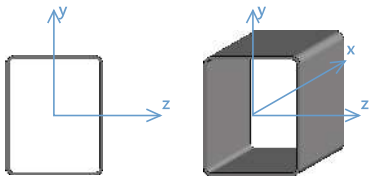
Loads: BLC 9, Wind Downforce - Dynamic

Solv Inc.	North Silver Brook	SK-9
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 0°- Trin…

Envelope AISC 14th (360-10): ASD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	Pnc/om [k]	Pnt/om [k]	Mnyy/om [k-in]	Mnzz/om [k-in]	Cb	Eqn
1	TUBE 1	5X4X0.134	0.992	6.263	5	0.756	6.263	y	5	11.498	84.078	106.058	139.548	1	H3-6
2	TUBE 2	5X4X0.134	0.964	6.031	5	0.734	6.031	y	5	11.498	84.078	106.058	139.548	1	H3-6
3	DRIVE POST	W6X15	0.531	90	5	0.007	0	z	15	100.092	132.635	130.007	298.256	1	H1-1b
4	IDLER POST 2	W6X7	0.173	0	2	0.003	0	y	13	25.331	59.947	35.079	92.729	1	H1-1b*
5	IDLER POST 7	W6X7	0.169	0	2	0.003	0	y	13	25.331	59.947	35.079	92.729	1	H1-1b*
6	IDLER POST 5	W6X7	0.163	0	5	0.007	99.513	y	5	25.331	59.947	35.079	92.729	1	H1-1b
7	IDLER POST 4	W6X7	0.163	0	5	0.007	99.513	y	5	25.331	59.947	35.079	92.729	1	H1-1b
8	IDLER POST 3	W6X7	0.161	0	2	0.003	0	y	12	25.331	59.947	35.079	92.729	1	H1-1b*
9	IDLER POST 6	W6X7	0.157	0	2	0.003	0	y	12	25.331	59.947	35.079	92.729	1	H1-1b*
10	IDLER POST 1	W6X7	0.118	0	2	0.002	0	y	13	25.331	59.947	35.079	92.729	1	H1-1b*
11	M424	W6X7	0.107	0	2	0.002	0	y	13	25.331	59.947	35.079	92.729	1	H1-1b*

Detail Report: TUBE 1 **Unity Check:** 0.992 (axial/bending) **Load Combination:** LC 5: IBC 16-13 (A) (static wind)



Input Data:

Shape:	5X4X0.134	I Node:	GA
Member Type:	Beam	J Node:	VX1E
Length (in):	1189.953	I Release:	Fixed
Material Type:	Hot Rolled Steel	J Release:	Fixed
Design Rule:	Typical	I Offset (in):	N/A
Number of Internal Sections:	20	J Offset (in):	N/A

Material Properties:

Material:	A500 Gr. 60	Therm. Coeff. ($1e^{5}°F^{-1}$):	0.65	R_y:	1.5
E (ksi):	29000	Density (k/ft^3):	0.49	F_u (ksi):	70
G (ksi):	11154	F_y (ksi):	60	R_t:	1.2
Nu:	0.3				

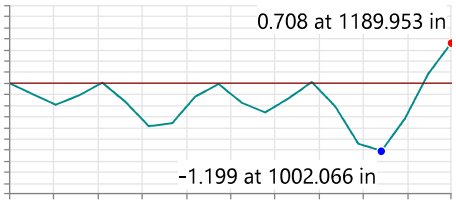
Shape Properties:

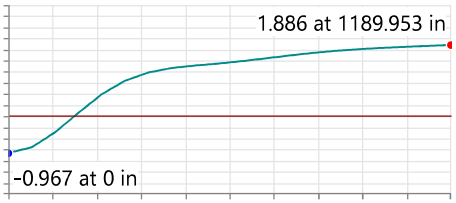
d (in):	5	I_{yy} (in^4):	6.17	Area (in^2):	2.34
b_f (in):	4	I_{zz} (in^4):	8.714	J (in^4):	10.861
t (in):	0.134				

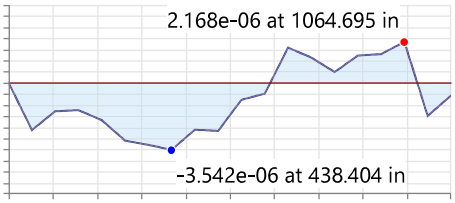
Design Properties:

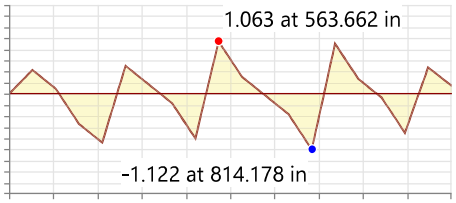
$L_{b\ y-y}$ (in):	284	K_{y-y}:	1	Max Defl Ratio:	L/652
$L_{b\ z-z}$ (in):	284	K_{z-z}:	1	Max Defl Location:	983.277
$L_{comp\ top}$ (in):	Lbyy	y sway:	No	Span:	1
$L_{comp\ bot}$ (in):	Lbyy	z sway:	No		
L_{torque} (in):	N/A	Function:	Lateral		
C_b:	1	Seismic DR:	None		

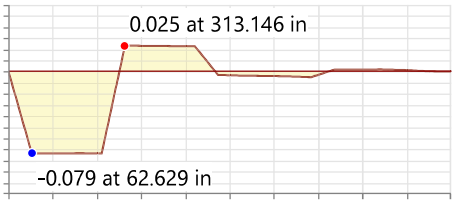
Diagrams:

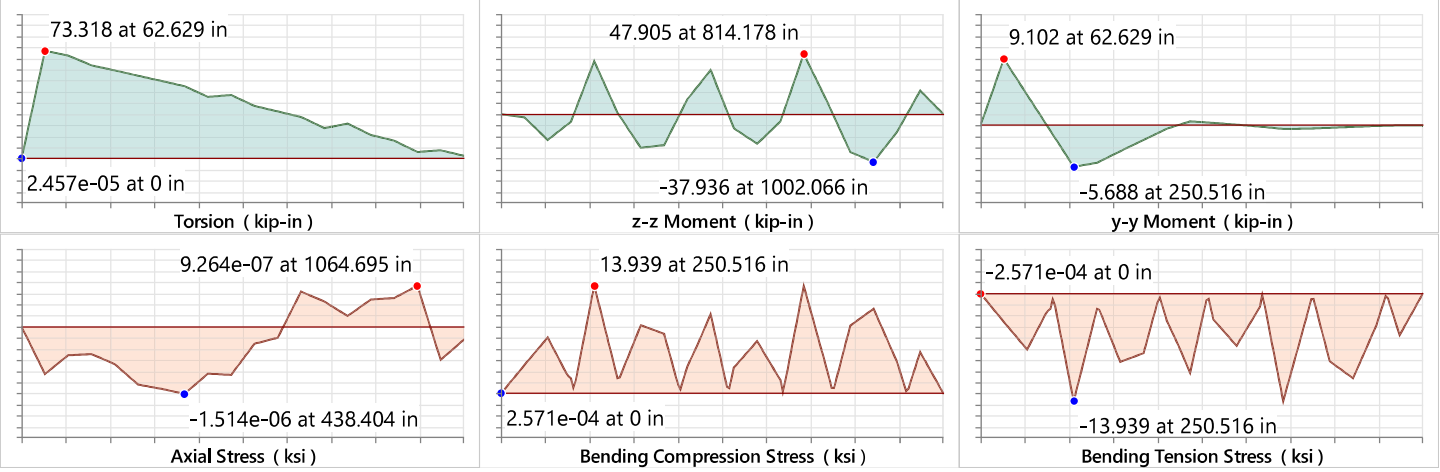








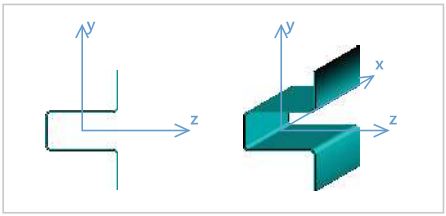




AISC 14th (360-10): ASD Code Check

Limit State	Required	Available	Unity Check	Result
Applied Loading - Bending/Axial				
Applied Loading - Shear + Torsion	-	-	-	-
Axial Tension Analysis	0.000 k	84.078 k	-	-
Axial Compression Analysis	0.000 k	11.498 k	-	-
Flexural Analysis (Strong Axis)	39.746 k-in	139.548 k-in	-	-
Flexural Analysis (Weak Axis)	13.557 k-in	106.058 k-in	-	-
Shear Analysis (Major Axis y)	20.085 k	26.564 k	0.756	Pass
Shear Analysis (Minor Axis z)	14.999 k	20.787 k	0.722	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.992	Pass
Torsional Analysis	78.007 k-in	108.481 k-in	0.719	Pass

Detail Report: VP 26 **Unity Check:** 0.986 (axial/bending) **Load Combination:** LC 6: IBC 16-13 (B) (static wind)



Input Data:

Shape:	V-HU-2.25X0.055X1.25	I Node:	V26B
Member Type:	Beam	J Node:	V26C
Length (in):	55.118	I Release:	Fixed
Material Type:	Cold Formed Steel	J Release:	Fixed
Design Rule:	Typical	I Offset (in):	N/A
Number of Internal Sections:	191	J Offset (in):	N/A

Material Properties:

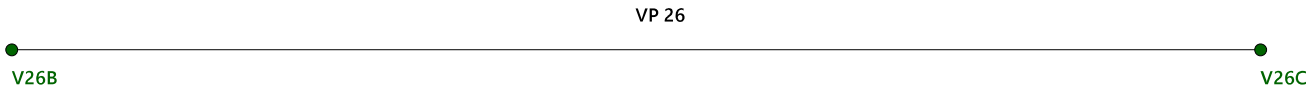
Material:	A653 Grade 50	Nu:	0.3	F_y (ksi):	50
E (ksi):	29500	Therm. Coeff. ($1e^5°F^{-1}$):	0.65	F_u (ksi):	70
G (ksi):	11346	Density (k/ft^3):	0.49		

Shape Properties:

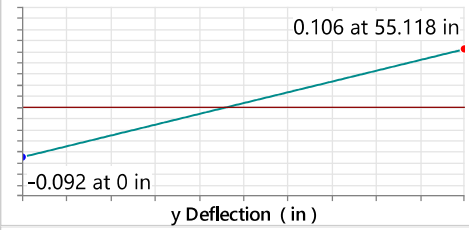
D (in):	2.25	J (in^4):	0.000432	r_y (in):	N/A
B (in):	1.25	C_w (in^6):	0.21	x_0 (in):	-1.446
t (in):	0.055	r_o (in):	1.875	$S_{e,z}$ (in^3):	N/A
R (in):	0.112	X_c (in):	1.274	S_{fz} (in^3):	N/A
d (in):	1.25	m (in):	0.172	$S_{c,z}$ (in^3):	N/A
I_{yy} (in^4):	0.308	j (in):	1.589	$S_{e,y}$ (in^3):	N/A
I_{zz} (in^4):	0.303	r_z (in):	N/A	S_{fy} (in^3):	N/A
Area (in^2):	0.428				

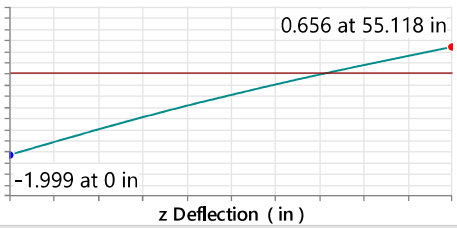
Design Properties:

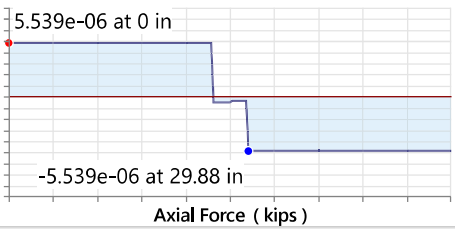
$L_{b\ y-y}$ (in):	N/A	K_{y-y}:	1	Max Defl Ratio:	L/10000
$L_{b\ z-z}$ (in):	N/A	K_{z-z}:	1	Max Defl Location:	0
$L_{comp\ top}$ (in):	Lbyy	R:	N/A	Span:	N/A
$L_{comp\ bot}$ (in):	N/A	y sway:	No		
C_b:	1	z sway:	No		
$C_{m\ y-y}$:	N/A	a (in):	N/A		
$C_{m\ z-z}$:	N/A				

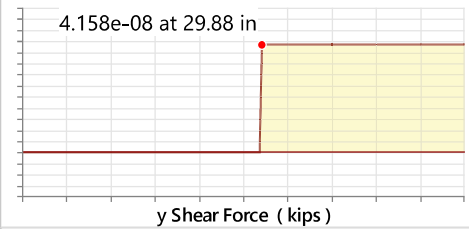


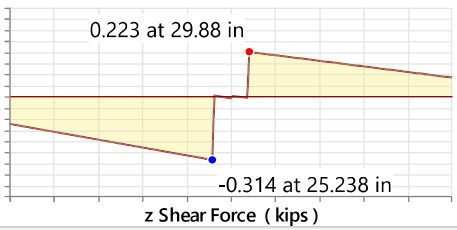
Diagrams:

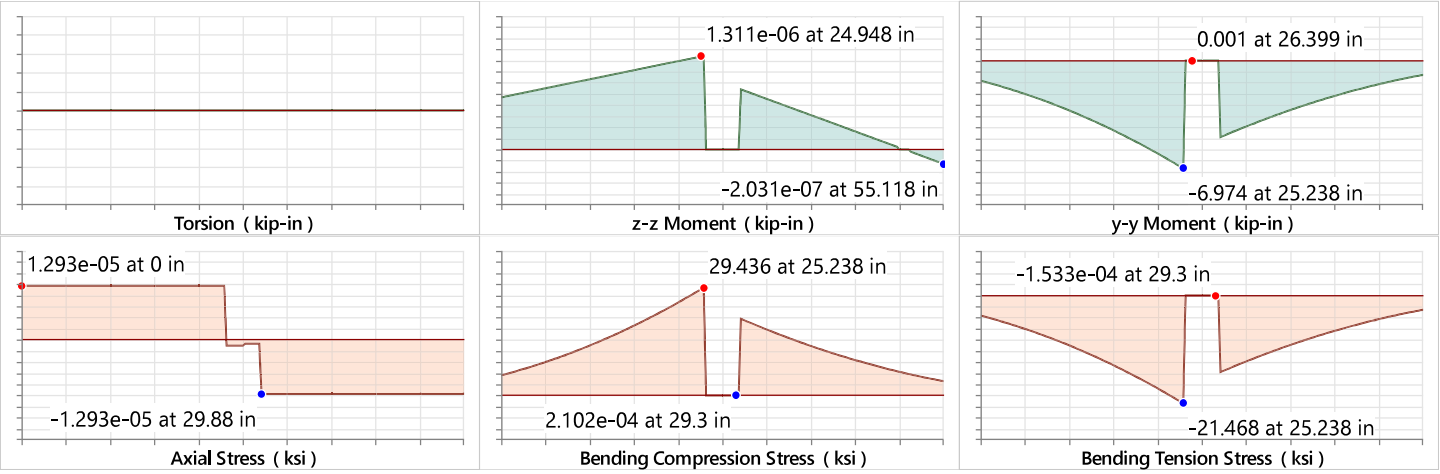










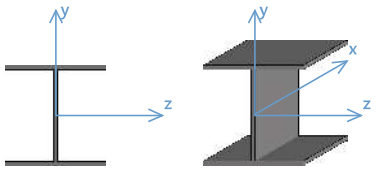


AISI S100-12: ASD Code Check

Max Bending Loc:	25.238 in	Cm (y-y):	0.85	Ae (Fy):	0.373 in^2
Equation:	C3.3.1-1	Cm (z-z):	0.6	Ae (Fn):	0.428 in^2
Gov Φ Equation:	C3.1.1	Cb:	1	Iy eff:	0.308 in^4
R (D6.1.1)	Not Used	KL/r (y-y):	64.983	Sy eff (L):	0.237 in^3
Max Shear Loc:	25.238 in	KL/r (z-z):		Sy eff (R):	0.325 in^3
Max Defl Ratio:	L/10000	L Comp Flange:	55.118 in	Iz eff:	0.247 in^4
Location:	0 in	L Torque:	55.118 in	Sz eff (T):	0.142 in^3
Span:	N/A			Sz eff (B):	0.13 in^3

Limit State	Required	Available	Unity Check	Result
Axial Tension Analysis	-	12.829 k	-	-
Axial Compression Analysis	-	2.992 k	-	-
Flexural Analysis (Strong Axis)	-	3.903 k-in	-	-
Flexural Analysis (Weak Axis)	-	7.094 k-in	-	-
Shear Analysis (Major Axis y)	-	0.945 k	-	-
Shear Analysis (Minor Axis z)	-	3.952 k	0.079	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.986	Pass

Detail Report: DRIVE POST **Unity Check:** 0.531 (axial/bending) **Load Combination:** LC 5: IBC 16-13 (A) (static wind)



Input Data:

Shape:	W6X15	I Node:	D1
Member Type:	Column	J Node:	D2
Length (in):	90	I Release:	Fixed
Material Type:	Hot Rolled Steel	J Release:	Fixed
Design Rule:	Typical	I Offset (in):	N/A
Number of Internal Sections:	191	J Offset (in):	N/A

Material Properties:

Material:	A992	Therm. Coeff. ($1e^{5}°F^{-1}$):	0.65	R_y:	1.1
E (ksi):	29000	Density (k/ft^3):	0.49	F_u (ksi):	65
G (ksi):	11154	F_y (ksi):	50	R_t:	1.1
Nu:	0.3				

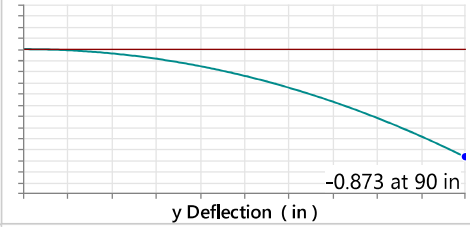
Shape Properties:

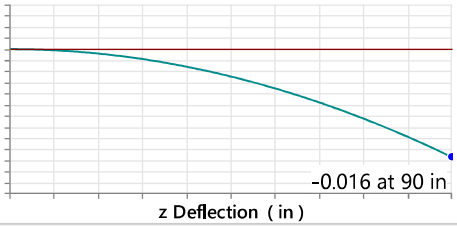
d (in):	5.99	Area (in^2):	4.43	S_w (in^4):	3.34
b_f (in):	5.99	Z_{yy} (in^3):	4.75	r_T (in):	1.61
t_f (in):	0.26	Z_{zz} (in^3):	10.8	J (in^4):	0.101
t_w (in):	0.23	C_w (in^6):	76.5	k_{det} (in):	0.75
I_{yy} (in^4):	9.32	W_{no} (in^2):	8.58	k_{des} (in):	0.51
I_{zz} (in^4):	29.1				

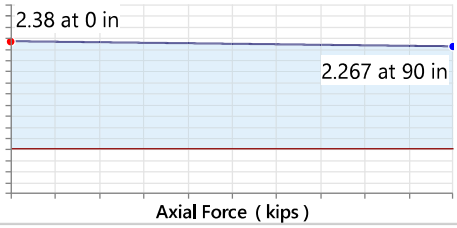
Design Properties:

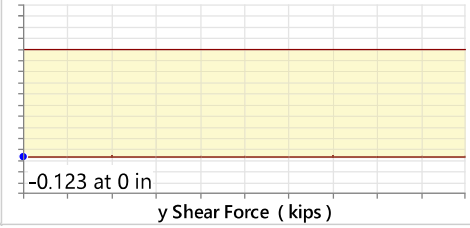
$L_{b\ y-y}$ (in):	N/A	K_{y-y}:	1	Max Defl Ratio:	L/103
$L_{b\ z-z}$ (in):	N/A	K_{z-z}:	1	Max Defl Location:	0
$L_{comp\ top}$ (in):	Lbyy	y sway:	No	Span:	N/A
$L_{comp\ bot}$ (in):	N/A	z sway:	No		
L_{torque} (in):	N/A	Function:	Lateral		
C_b:	1	Seismic DR:	None		

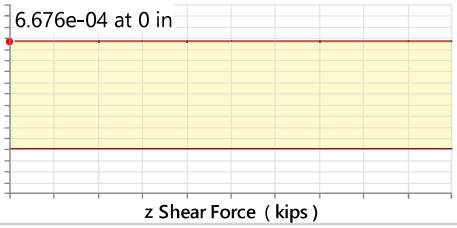
Diagrams:

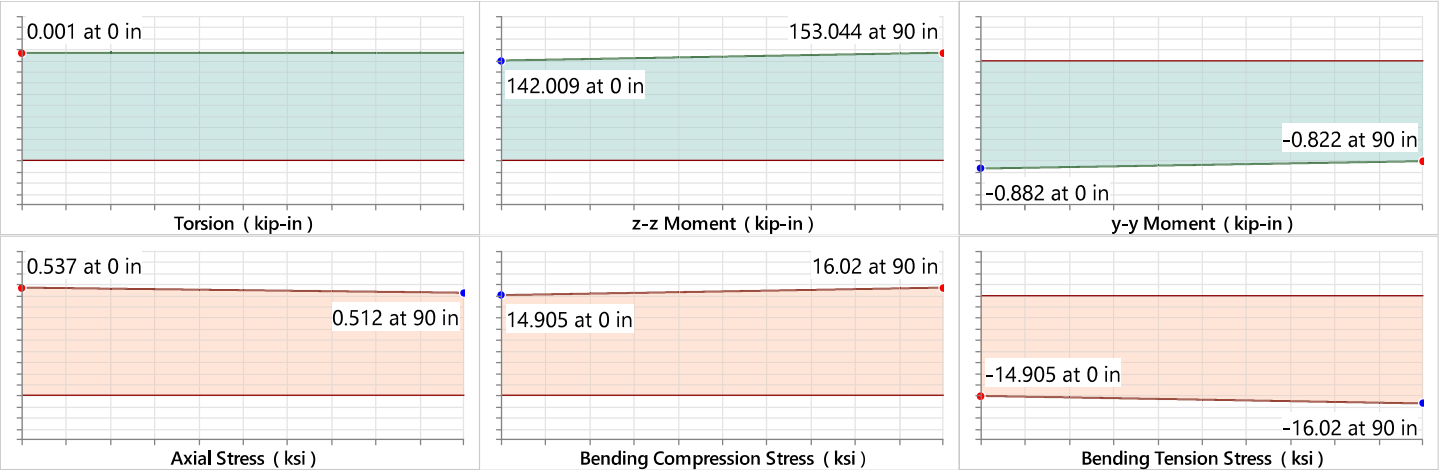








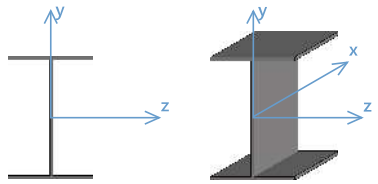




AISC 14th (360-10): ASD Code Check

Limit State	Required	Available	Unity Check	Result
Applied Loading - Bending/Axial				
Applied Loading - Shear + Torsion	-	-	-	-
Axial Tension Analysis	0.000 k	132.635 k	-	-
Axial Compression Analysis	2.267 k	100.092 k	-	-
Flexural Analysis (Strong Axis)	153.044 k-in	298.256 k-in	-	-
Flexural Analysis (Weak Axis)	0.836 k-in	130.007 k-in	-	-
Shear Analysis (Major Axis y)	0.125 k	27.554 k	0.005	Pass
Shear Analysis (Minor Axis z)	0.006 k	55.954 k	0.000	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.531	Pass

Detail Report: IDLER POST 2 **Unity Check:** 0.173 (axial/bending) **Load Combination:** LC 2: IBC 16-10



Input Data:

Shape:	W6X7	I Node:	N597
Member Type:	Column	J Node:	N598
Length (in):	99.513	I Release:	Fixed
Material Type:	Hot Rolled Steel	J Release:	Custom
Design Rule:	Typical	I Offset (in):	N/A
Number of Internal Sections:	191	J Offset (in):	N/A

Material Properties:

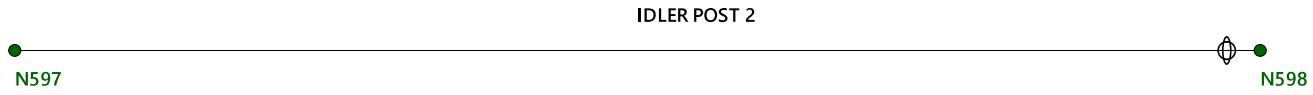
Material:	A992	Therm. Coeff. ($1e^5°F^{-1}$):	0.65	R_y:	1.1
E (ksi):	29000	Density (k/ft^3):	0.49	F_u (ksi):	65
G (ksi):	11154	F_y (ksi):	50	R_t:	1.1
Nu:	0.3				

Shape Properties:

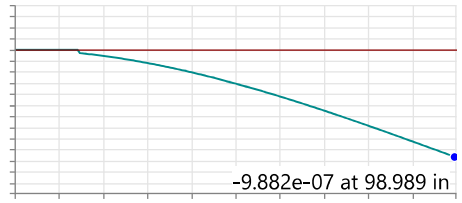
d (in):	5.772	Area (in^2):	2.002	S_w (in^4):	0.898
b_f (in):	3.94	Z_{yy} (in^3):	1.303	r_T (in):	1.047
t_f (in):	0.165	Z_{zz} (in^3):	4.6	J (in^4):	0.016
t_w (in):	0.129	C_w (in^6):	13.227	k_{det} (in):	0.69
I_{yy} (in^4):	1.683	W_{no} (in^2):	5.523	k_{des} (in):	0.46
I_{zz} (in^4):	11.955				

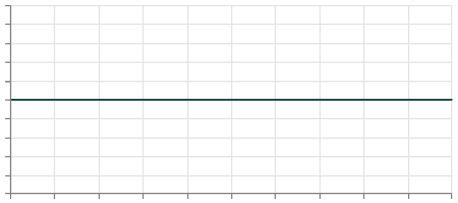
Design Properties:

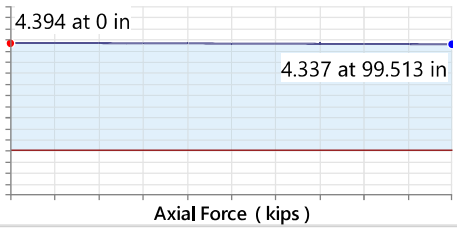
$L_{b\ y\text{-}y}$ (in):	N/A	$K_{y\text{-}y}$:	1	Max Defl Ratio:	L/10000
$L_{b\ z\text{-}z}$ (in):	N/A	$K_{z\text{-}z}$:	1	Max Defl Location:	0
$L_{comp\ top}$ (in):	Lbyy	y sway:	No	Span:	N/A
$L_{comp\ bot}$ (in):	N/A	z sway:	No		
L_{torque} (in):	N/A	Function:	Lateral		
C_b:	1	Seismic DR:	None		

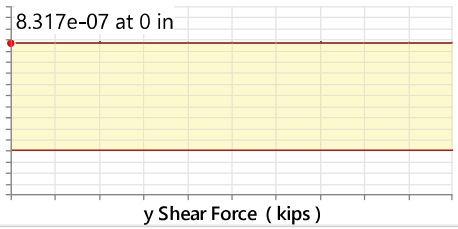


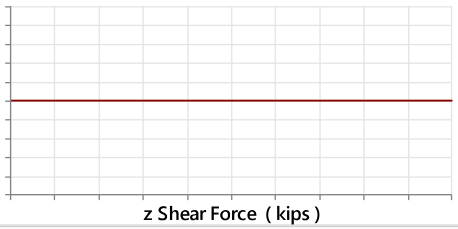
Diagrams:

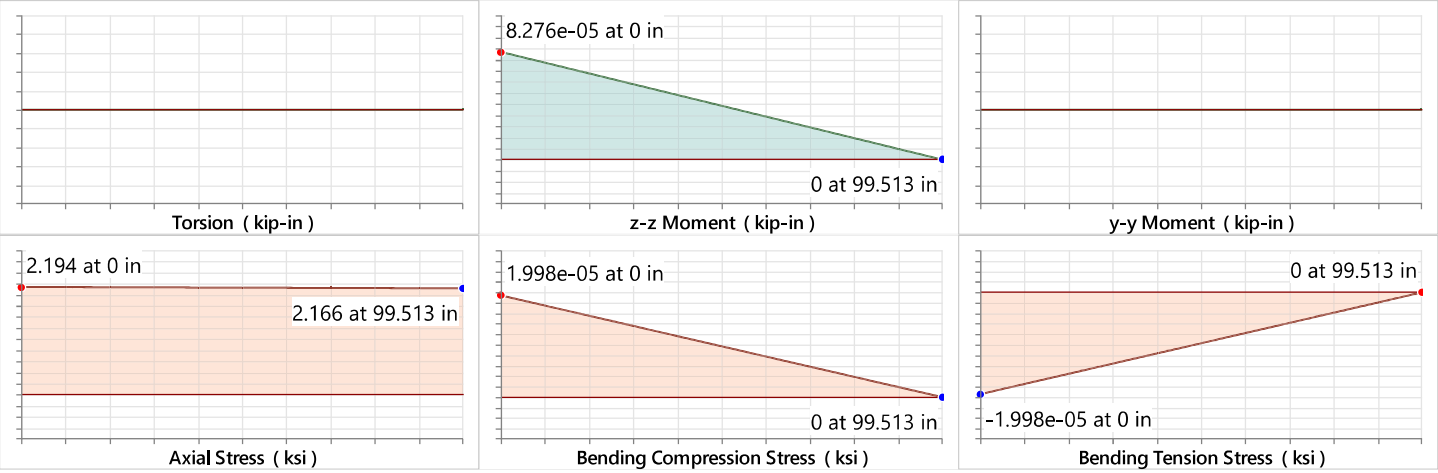






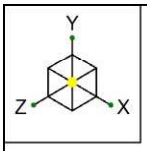


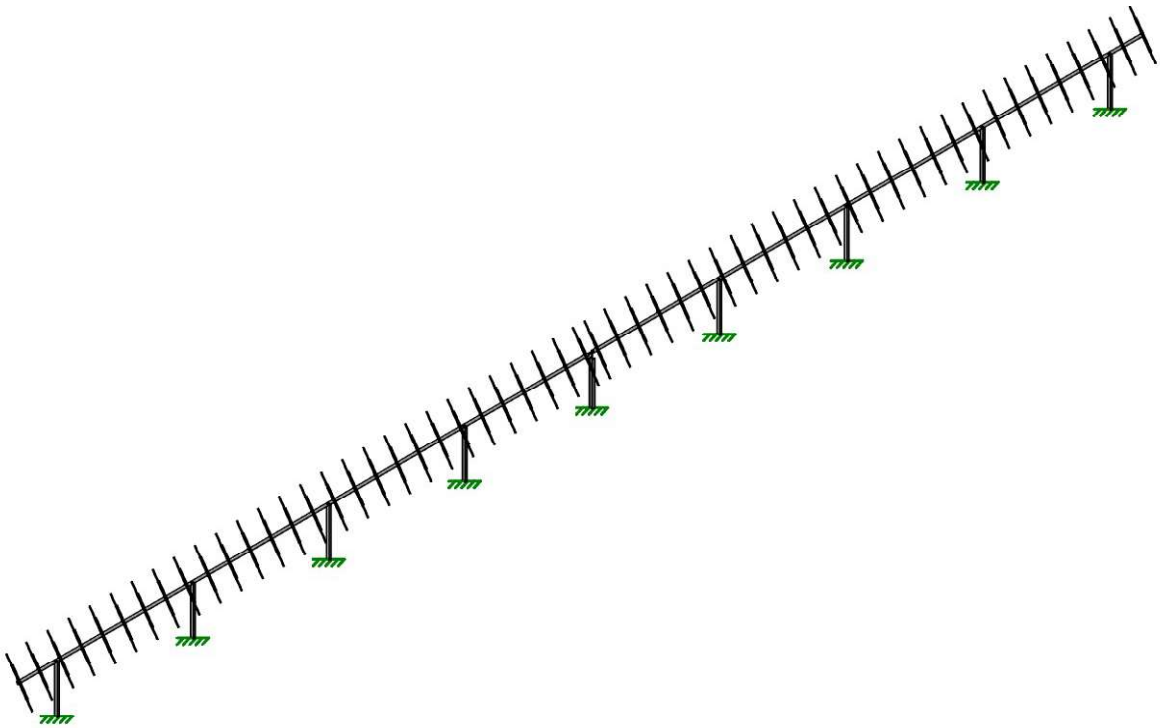




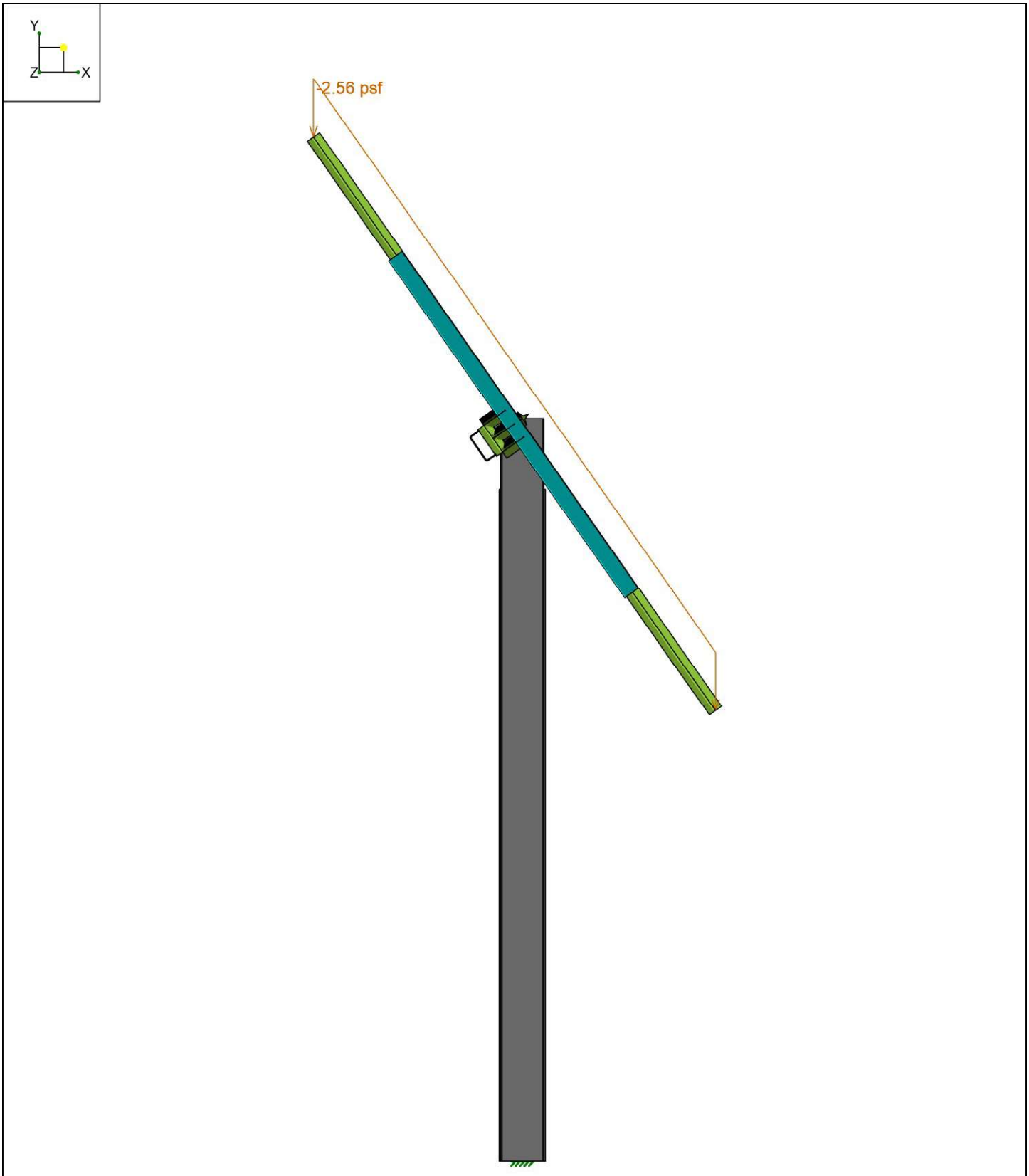
AISC 14th (360-10): ASD Code Check

Limit State	Required	Available	Unity Check	Result
Applied Loading - Bending/Axial				
Applied Loading - Shear + Torsion	-	-	-	-
Axial Tension Analysis	0.000 k	59.947 k	-	-
Axial Compression Analysis	4.394 k	25.331 k	-	-
Flexural Analysis (Strong Axis)	0.000 k-in	92.729 k-in	-	-
Flexural Analysis (Weak Axis)	0.000 k-in	35.079 k-in	-	-
Shear Analysis (Major Axis y)	0.000 k	14.892 k	0.000	Pass
Shear Analysis (Minor Axis z)	0.000 k	23.357 k	0.000	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.173	Pass



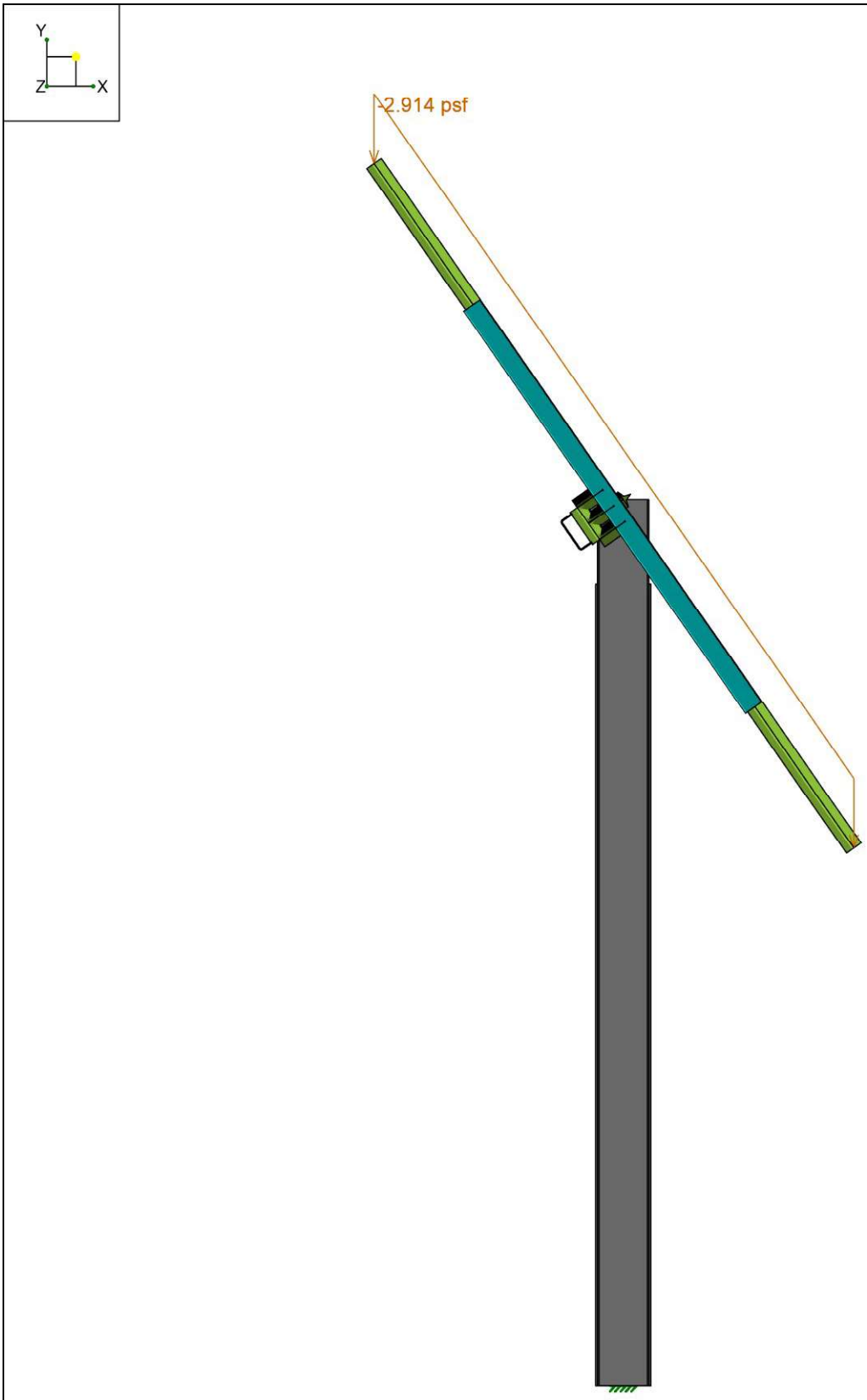


Solv Inc.	North Silver Brook	SK-10
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…



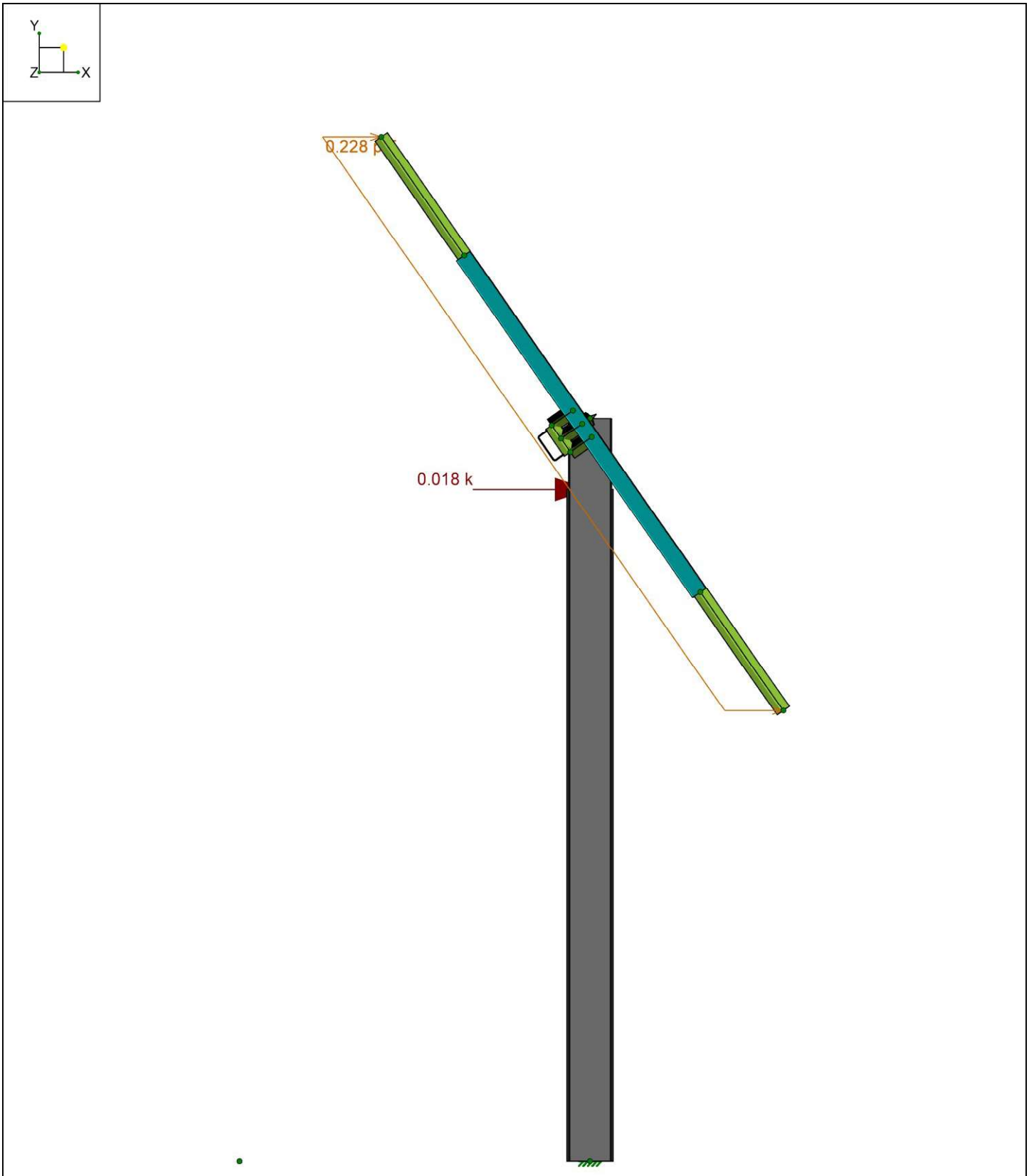
Loads: BLC 2, Solar Panels

Solv Inc.	North Silver Brook	SK-11
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…



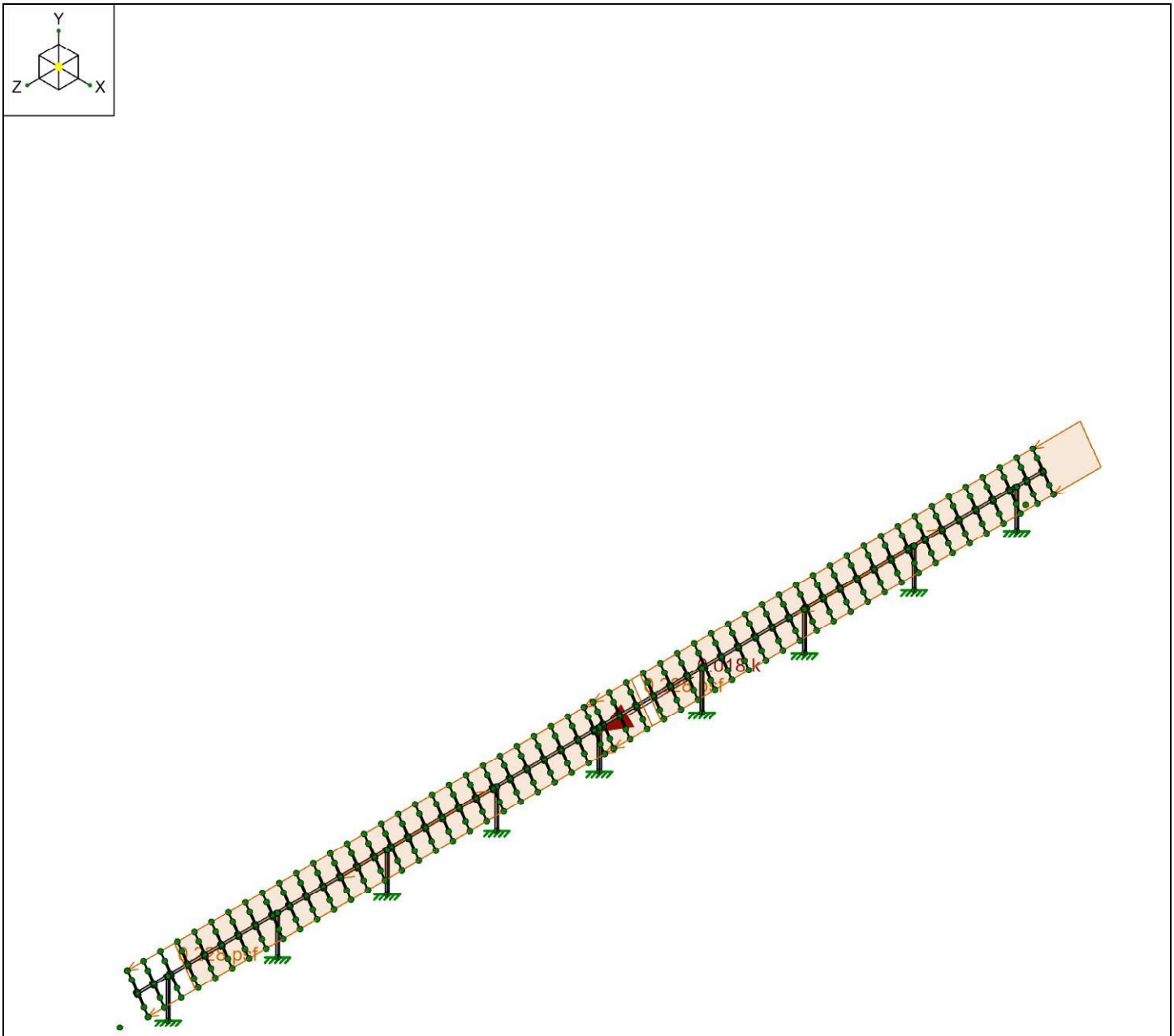
Loads: BLC 3, Snow

Solv Inc.	North Silver Brook	SK-12
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…



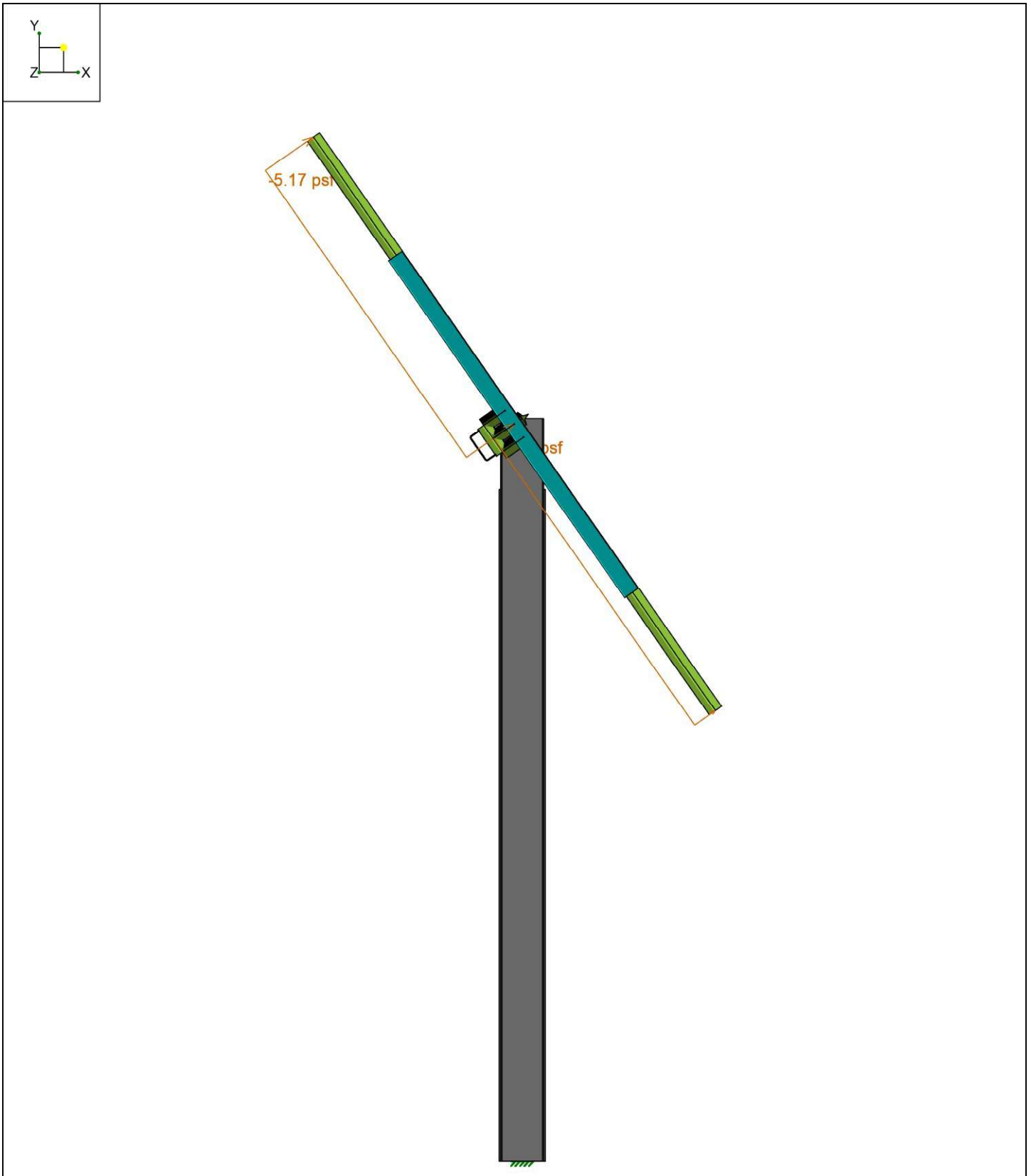
Loads: BLC 4, Seismic X

Solv Inc.	North Silver Brook	SK-13
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…



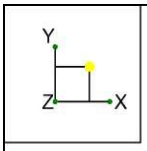
Loads: BLC 5, Seismic Z

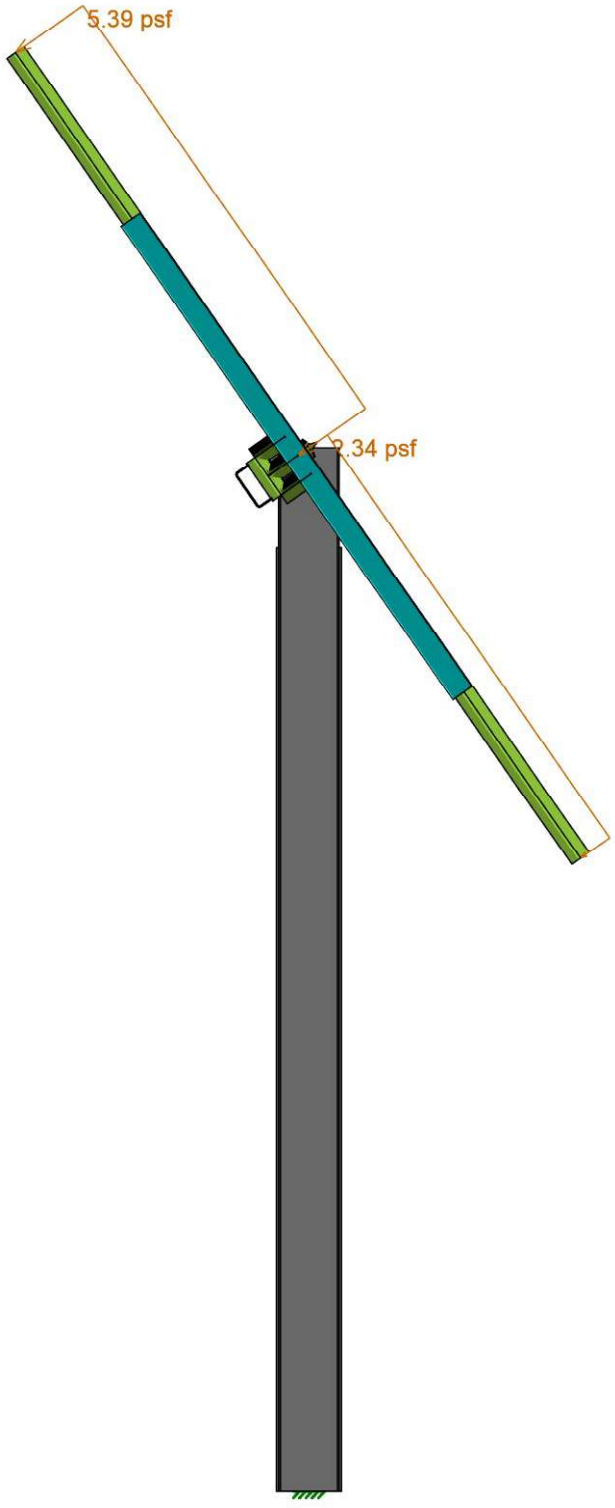
Solv Inc.	North Silver Brook	SK-14
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…



Loads: BLC 6, Wind Uplift - Static

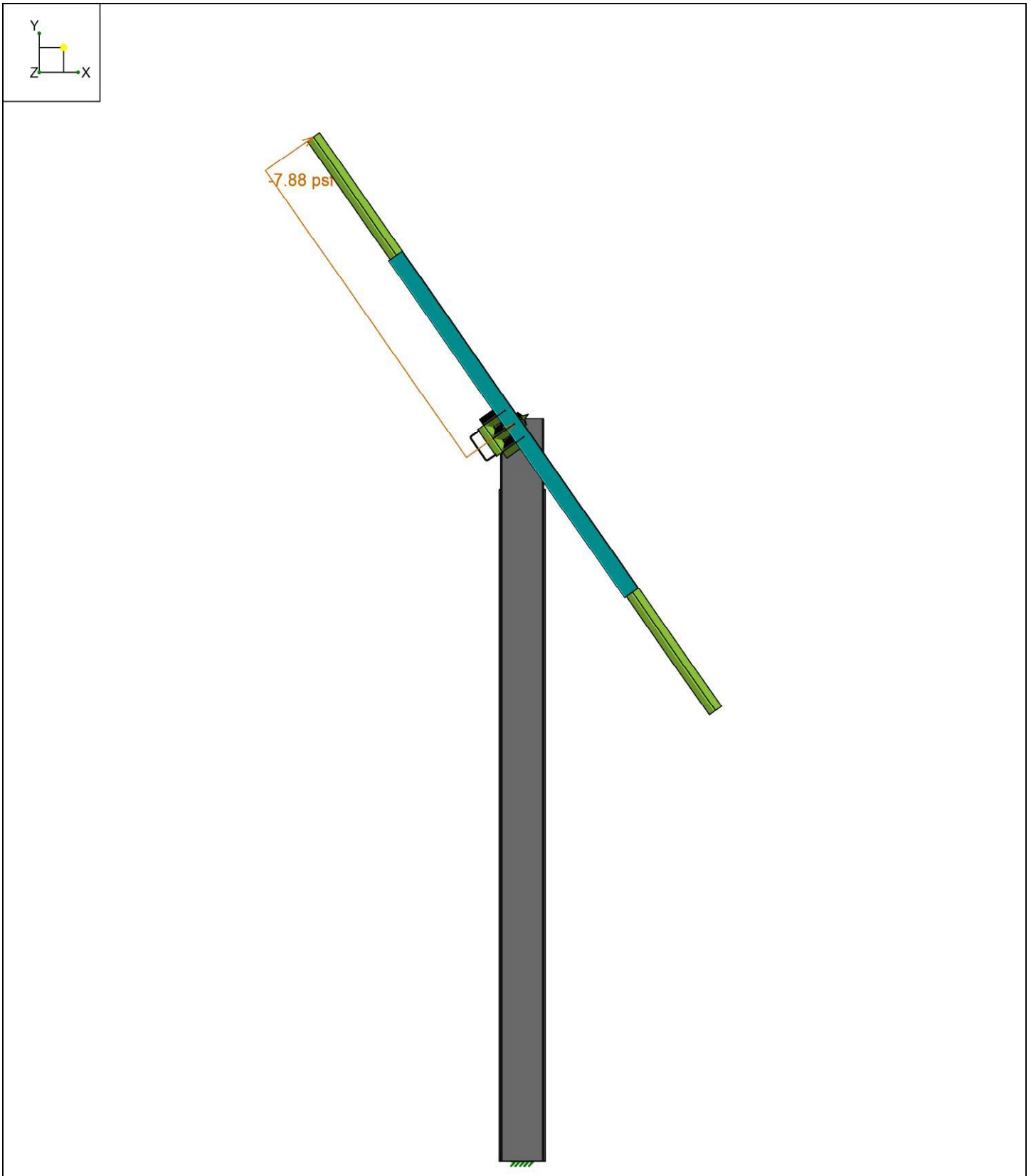
Solv Inc.	North Silver Brook	SK-15
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…





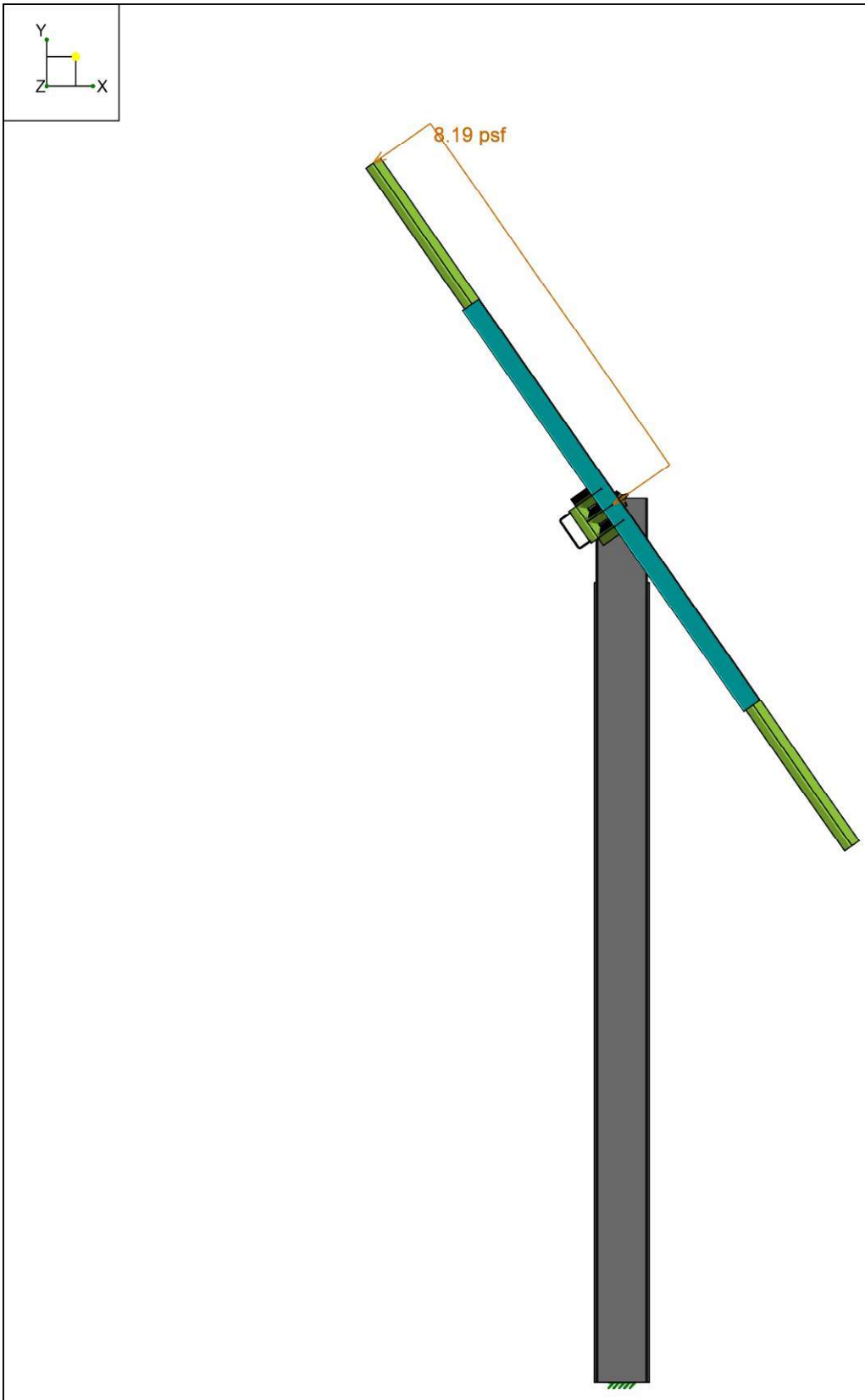
Loads: BLC 7, Wind Downforce - Static

Solv Inc.	North Silver Brook	SK-16
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…



Loads: BLC 8, Wind Uplift - Dynamic

Solv Inc.	North Silver Brook	SK-17
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…



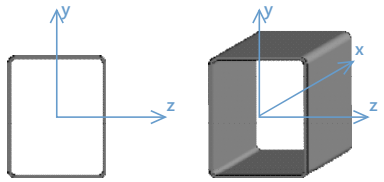
Loads: BLC 9, Wind Downforce - Dynamic

Solv Inc.	North Silver Brook	SK-18
JRD		Apr 13, 2023
17010		22_0912 - 1x53 TDP 2.0 55°- Trin…

Envelope AISC 14th (360-10): ASD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	Pnc/om [k]	Pnt/om [k]	Mnyy/om [k-in]	Mnzz/om [k-in]	Cb	Eqn
1	IDLER POST 4	W6X7	0.458	0	4	0.027	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b
2	IDLER POST 2	W6X7	0.454	0	4	0.027	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b
3	IDLER POST 7	W6X7	0.442	0	4	0.026	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b
4	IDLER POST 5	W6X7	0.442	0	4	0.026	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b
5	TUBE 1	5X4X0.134	0.43	6.263	4	0.446	6.263	z	4	11.498	84.078	106.058	139.548	1	H3-6
6	TUBE 2	5X4X0.134	0.42	6.031	4	0.43	6.031	z	4	11.498	84.078	106.058	139.548	1	H3-6
7	DRIVE POST	W6X15	0.417	0	4	0.01	49.737	y	3	100.092	132.635	130.007	298.256	1	H1-1b
8	IDLER POST 3	W6X7	0.415	0	4	0.025	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b
9	IDLER POST 6	W6X7	0.402	0	4	0.024	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b
10	IDLER POST 1	W6X7	0.309	0	4	0.018	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b
11	M424	W6X7	0.281	0	4	0.017	99.513	y	4	25.331	59.947	35.079	92.729	1	H1-1b

Detail Report: TUBE 1 **Unity Check:** 0.446 (shear) **Load Combination:** LC 4: IBC 16-12 (B)



Input Data:

Shape:	5X4X0.134	**I Node:**	GA
Member Type:	Beam	**J Node:**	VX1E
Length (in):	1189.953	**I Release:**	Fixed
Material Type:	Hot Rolled Steel	**J Release:**	Fixed
Design Rule:	Typical	**I Offset (in):**	N/A
Number of Internal Sections:	191	**J Offset (in):**	N/A

Material Properties:

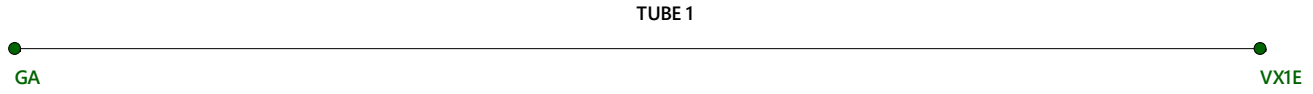
Material:	A500 Gr. 60	**Therm. Coeff. ($1e^5°F^{-1}$):**	0.65	**R_y:**	1.5
E (ksi):	29000	**Density (k/ft^3):**	0.49	**F_u (ksi):**	70
G (ksi):	11154	**F_y (ksi):**	60	**R_t:**	1.2
Nu:	0.3				

Shape Properties:

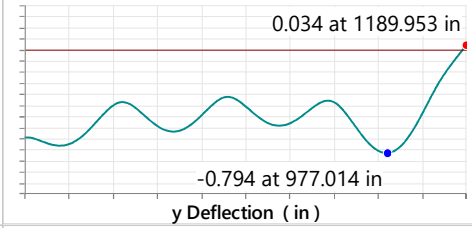
d (in):	5	**I_{yy} (in^4):**	6.17	**Area (in^2):**	2.34
b_f (in):	4	**I_{zz} (in^4):**	8.714	**J (in^4):**	10.861
t (in):	0.134				

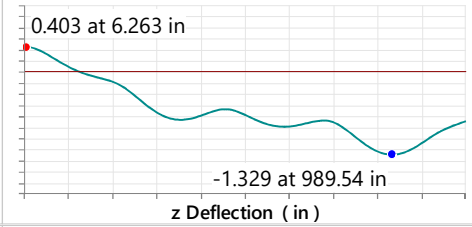
Design Properties:

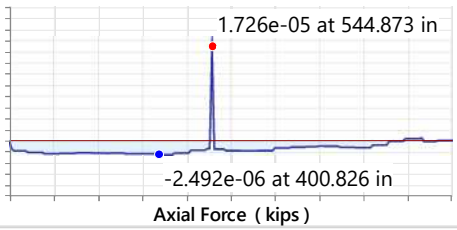
$L_{b\ y\text{-}y}$ (in):	284	**$K_{y\text{-}y}$:**	1	**Max Defl Ratio:**	L/1693
$L_{b\ z\text{-}z}$ (in):	284	**$K_{z\text{-}z}$:**	1	**Max Defl Location:**	983.277
$L_{comp\ top}$ (in):	Lbyy	**y sway:**	No	**Span:**	1
$L_{comp\ bot}$ (in):	Lbyy	**z sway:**	No		
L_{torque} (in):	N/A	**Function:**	Lateral		
C_b:	1	**Seismic DR:**	None		

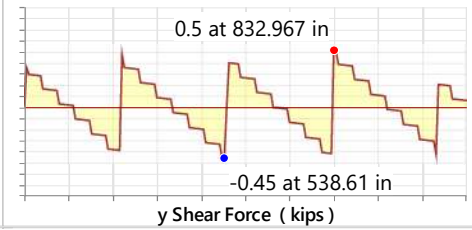


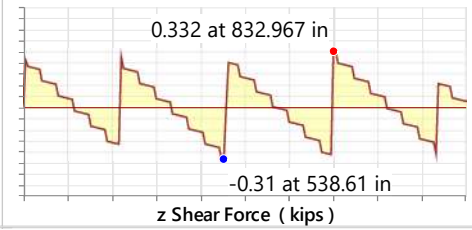
Diagrams:

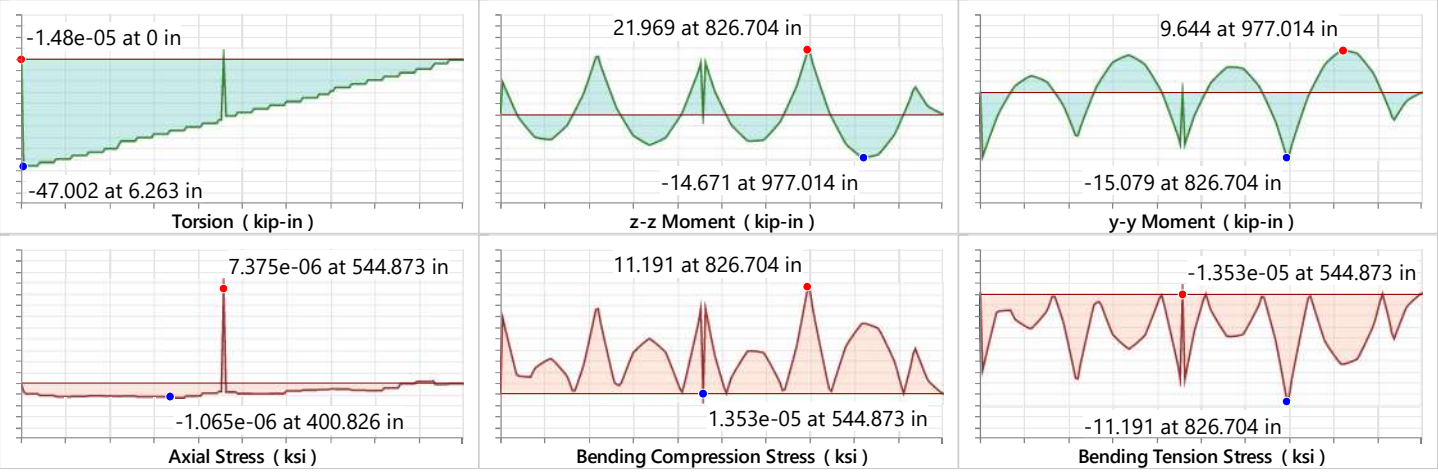








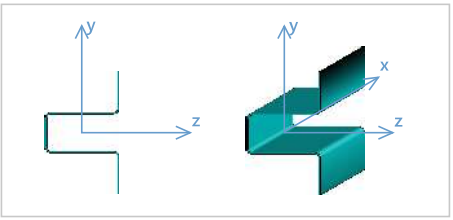




AISC 14th (360-10): ASD Code Check

Limit State	Required	Available	Unity Check	Result
Applied Loading - Bending/Axial				
Applied Loading - Shear + Torsion	-	-	-	-
Axial Tension Analysis	0.000 k	84.078 k	-	-
Axial Compression Analysis	0.000 k	11.498 k	-	-
Flexural Analysis (Strong Axis)	11.006 k-in	139.548 k-in	-	-
Flexural Analysis (Weak Axis)	14.778 k-in	106.058 k-in	-	-
Shear Analysis (Major Axis y)	11.838 k	26.564 k	0.446	Pass
Shear Analysis (Minor Axis z)	9.269 k	20.787 k	0.446	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.43	Pass
Torsional Analysis	47.002 k-in	108.481 k-in	0.433	Pass

Detail Report: VP 3 **Unity Check:** 0.325 (axial/bending) **Load Combination:** LC 4: IBC 16-12 (B)



Input Data:

Shape:	V-HU-2.25X0.055X1.25	I Node:	V3B
Member Type:	Beam	J Node:	V3C
Length (in):	55.118	I Release:	Fixed
Material Type:	Cold Formed Steel	J Release:	Fixed
Design Rule:	Typical	I Offset (in):	N/A
Number of Internal Sections:	191	J Offset (in):	N/A

Material Properties:

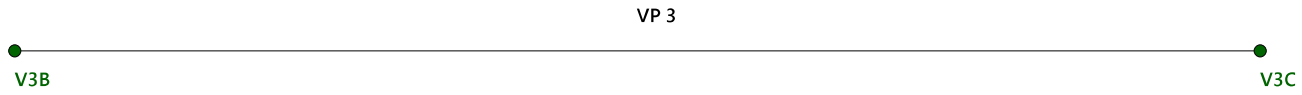
Material:	A653 Grade 50	Nu:	0.3	F_y (ksi):	50
E (ksi):	29500	Therm. Coeff. ($1e^5°F^{-1}$):	0.65	F_u (ksi):	70
G (ksi):	11346	Density (k/ft^3):	0.49		

Shape Properties:

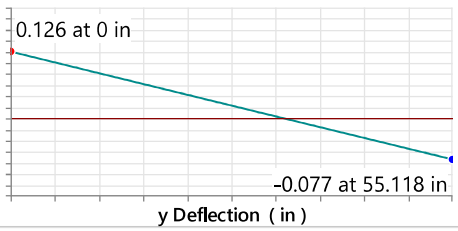
D (in):	2.25	J (in^4):	0.000432	r_y (in):	N/A
B (in):	1.25	C_w (in^6):	0.21	x_0 (in):	-1.446
t (in):	0.055	r_o (in):	1.875	$S_{e,z}$ (in^3):	N/A
R (in):	0.112	X_c (in):	1.274	S_{fz} (in^3):	N/A
d (in):	1.25	m (in):	0.172	$S_{c,z}$ (in^3):	N/A
I_{yy} (in^4):	0.308	j (in):	1.589	$S_{e,y}$ (in^3):	N/A
I_{zz} (in^4):	0.303	r_z (in):	N/A	S_{fy} (in^3):	N/A
Area (in^2):	0.428				

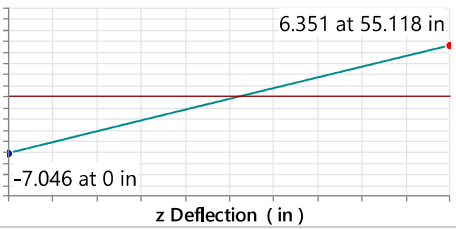
Design Properties:

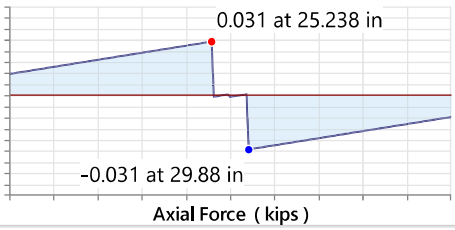
$L_{b\ y-y}$ (in):	N/A	K_{y-y}:	1	Max Defl Ratio:	L/10000
$L_{b\ z-z}$ (in):	N/A	K_{z-z}:	1	Max Defl Location:	0
$L_{comp\ top}$ (in):	Lbyy	R:	N/A	Span:	N/A
$L_{comp\ bot}$ (in):	N/A	y sway:	No		
C_b:	1	z sway:	No		
$C_{m\ y-y}$:	N/A	a (in):	N/A		
$C_{m\ z-z}$:	N/A				

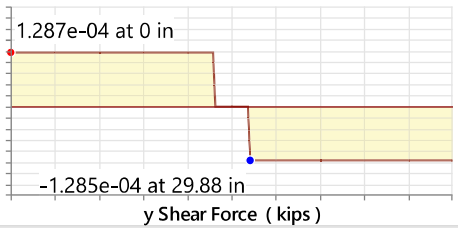


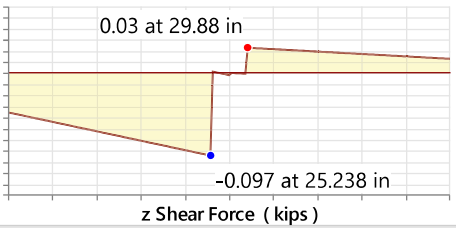
Diagrams:

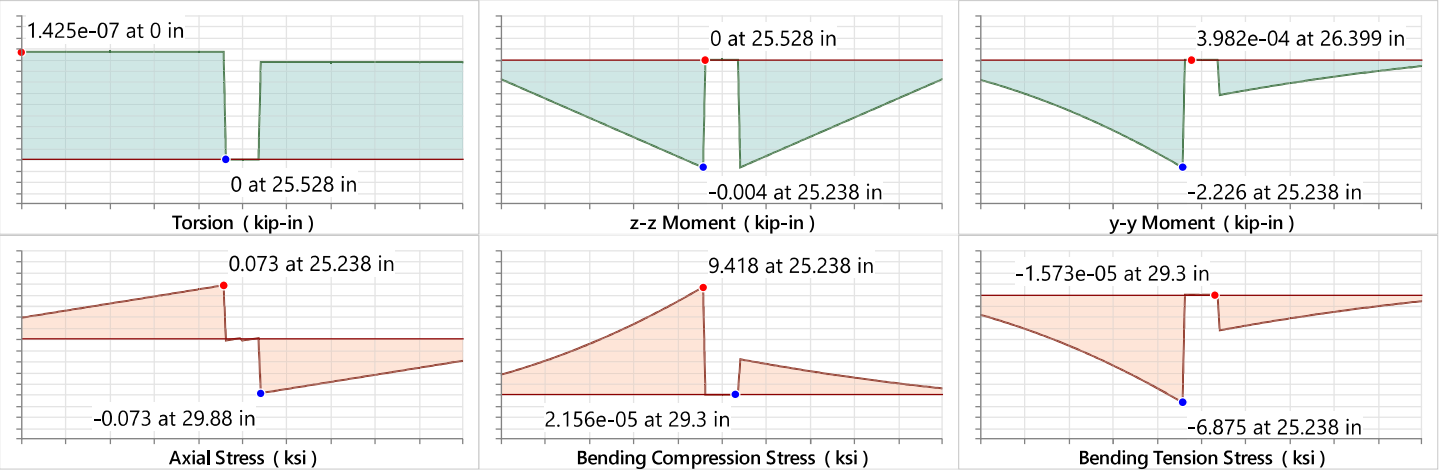










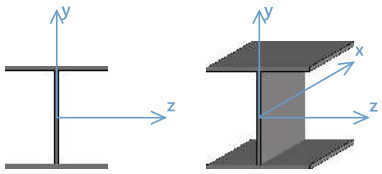


AISI S100-12: ASD Code Check

Max Bending Loc:	25.238 in	Cm (y-y):	0.85	Ae (Fy):	0.373 in^2
Equation:	C5.2.1-3	Cm (z-z):	0.6	Ae (Fn):	0.428 in^2
Gov Φ Equation:	C3.1.1	Cb:	1	Iy eff:	0.308 in^4
R (D6.1.1)	Not Used	KL/r (y-y):	64.983	Sy eff (L):	0.237 in^3
Max Shear Loc:	25.238 in	KL/r (z-z):		Sy eff (R):	0.325 in^3
Max Defl Ratio:	L/10000	L Comp Flange:	55.118 in	Iz eff:	0.247 in^4
Location:	0 in	L Torque:	55.118 in	Sz eff (T):	0.13 in^3
Span:	N/A			Sz eff (B):	0.142 in^3

Limit State	Required	Available	Unity Check	Result
Axial Tension Analysis	-	12.829 k	-	-
Axial Compression Analysis	-	2.992 k	-	-
Flexural Analysis (Strong Axis)	-	3.903 k-in	-	-
Flexural Analysis (Weak Axis)	-	7.094 k-in	-	-
Shear Analysis (Major Axis y)	-	0.945 k	-	-
Shear Analysis (Minor Axis z)	-	3.952 k	0.025	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.325	Pass

Detail Report: DRIVE POST **Unity Check:** 0.417 (axial/bending) **Load Combination:** LC 4: IBC 16-12 (B)



Input Data:

Shape:	W6X15	I Node:	D1
Member Type:	Column	J Node:	D2
Length (in):	90	I Release:	Fixed
Material Type:	Hot Rolled Steel	J Release:	Fixed
Design Rule:	Typical	I Offset (in):	N/A
Number of Internal Sections:	191	J Offset (in):	N/A

Material Properties:

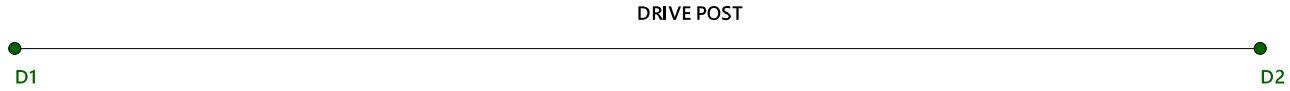
Material:	A992	Therm. Coeff. ($1e^{5}°F^{-1}$):	0.65	R_y:	1.1
E (ksi):	29000	Density (k/ft^3):	0.49	F_u (ksi):	65
G (ksi):	11154	F_y (ksi):	50	R_t:	1.1
Nu:	0.3				

Shape Properties:

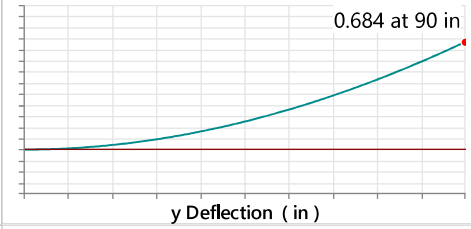
d (in):	5.99	Area (in^2):	4.43	S_w (in^4):	3.34
b_f (in):	5.99	Z_{yy} (in^3):	4.75	r_T (in):	1.61
t_f (in):	0.26	Z_{zz} (in^3):	10.8	J (in^4):	0.101
t_w (in):	0.23	C_w (in^6):	76.5	k_{det} (in):	0.75
I_{yy} (in^4):	9.32	W_{no} (in^2):	8.58	k_{des} (in):	0.51
I_{zz} (in^4):	29.1				

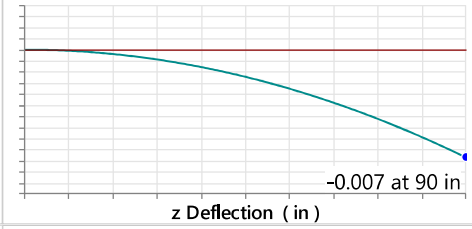
Design Properties:

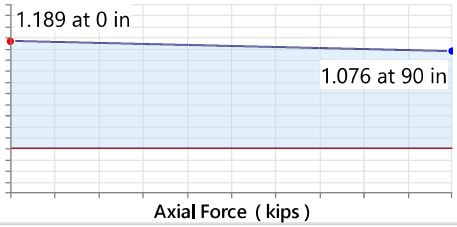
$L_{b\ y\text{-}y}$ (in):	N/A	$K_{y\text{-}y}$:	1	Max Defl Ratio:	L/131
$L_{b\ z\text{-}z}$ (in):	N/A	$K_{z\text{-}z}$:	1	Max Defl Location:	0
$L_{comp\ top}$ (in):	Lbyy	y sway:	No	Span:	N/A
$L_{comp\ bot}$ (in):	N/A	z sway:	No		
L_{torque} (in):	N/A	Function:	Lateral		
C_b:	1	Seismic DR:	None		

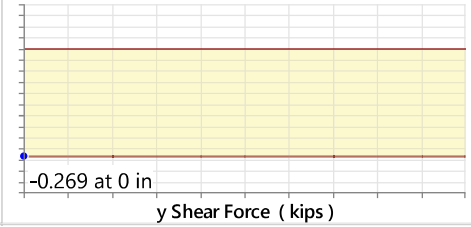


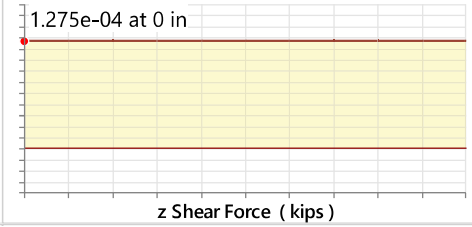
Diagrams:

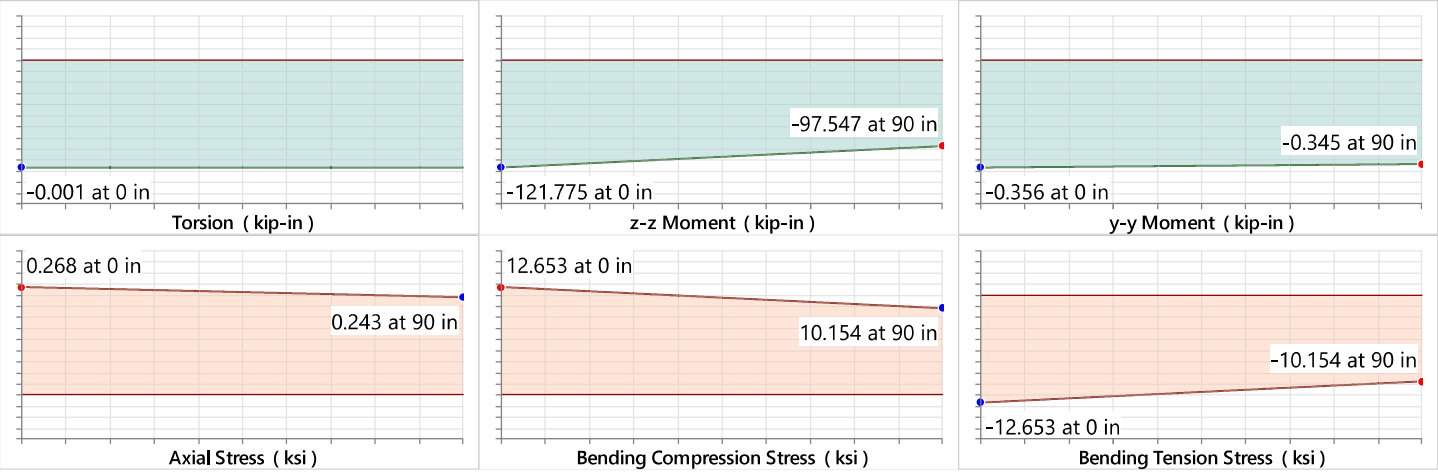








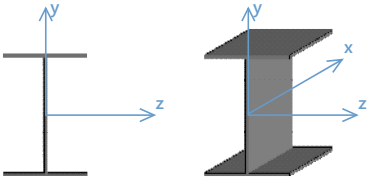




AISC 14th (360-10): ASD Code Check

Limit State	Required	Available	Unity Check	Result
Applied Loading - Bending/Axial				
Applied Loading - Shear + Torsion	-	-	-	-
Axial Tension Analysis	0.000 k	132.635 k	-	-
Axial Compression Analysis	1.189 k	100.092 k	-	-
Flexural Analysis (Strong Axis)	121.775 k-in	298.256 k-in	-	-
Flexural Analysis (Weak Axis)	0.372 k-in	130.007 k-in	-	-
Shear Analysis (Major Axis y)	0.271 k	27.554 k	0.01	Pass
Shear Analysis (Minor Axis z)	0.005 k	55.954 k	0.000	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.417	Pass

Detail Report: IDLER POST 4 **Unity Check:** 0.458 (axial/bending) **Load Combination:** LC 4: IBC 16-12 (B)



Input Data:

Shape:	W6X7	**I Node:**	I4A
Member Type:	Column	**J Node:**	I4B
Length (in):	99.513	**I Release:**	Fixed
Material Type:	Hot Rolled Steel	**J Release:**	Custom
Design Rule:	Typical	**I Offset (in):**	N/A
Number of Internal Sections:	191	**J Offset (in):**	N/A

Material Properties:

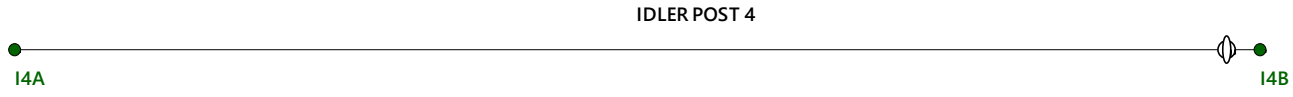
Material:	A992	**Therm. Coeff. ($1e^{5}°F^{-1}$):**	0.65	**R_y:**	1.1
E (ksi):	29000	**Density (k/ft^3):**	0.49	**F_u (ksi):**	65
G (ksi):	11154	**F_y (ksi):**	50	**R_t:**	1.1
Nu:	0.3				

Shape Properties:

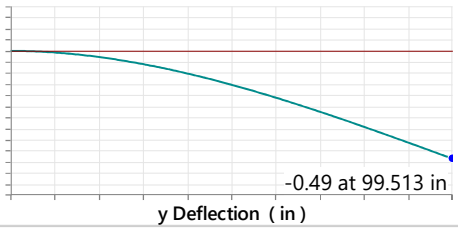
d (in):	5.772	**Area (in^2):**	2.002	**S_w (in^4):**	0.898
b_f (in):	3.94	**Z_{yy} (in^3):**	1.303	**r_T (in):**	1.047
t_f (in):	0.165	**Z_{zz} (in^3):**	4.6	**J (in^4):**	0.016
t_w (in):	0.129	**C_w (in^6):**	13.227	**k_{det} (in):**	0.69
I_{yy} (in^4):	1.683	**W_{no} (in^2):**	5.523	**k_{des} (in):**	0.46
I_{zz} (in^4):	11.955				

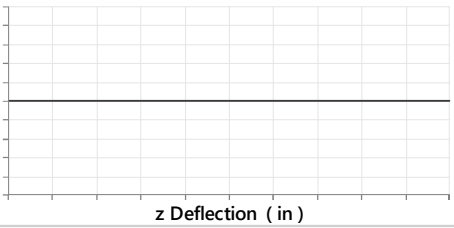
Design Properties:

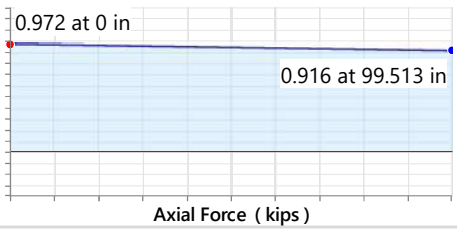
$L_{b\ y-y}$ (in):	N/A	**K_{y-y}:**	1	**Max Defl Ratio:**	L/203
$L_{b\ z-z}$ (in):	N/A	**K_{z-z}:**	1	**Max Defl Location:**	0
$L_{comp\ top}$ (in):	Lbyy	**y sway:**	No	**Span:**	N/A
$L_{comp\ bot}$ (in):	N/A	**z sway:**	No		
L_{torque} (in):	N/A	**Function:**	Lateral		
C_b:	1	**Seismic DR:**	None		

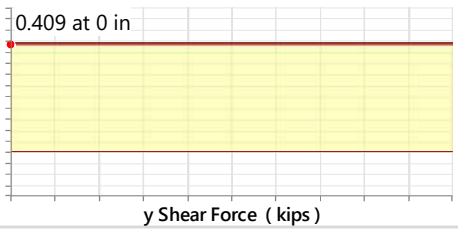


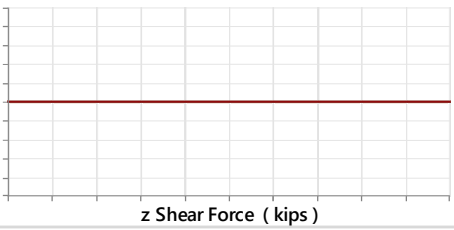
Diagrams:

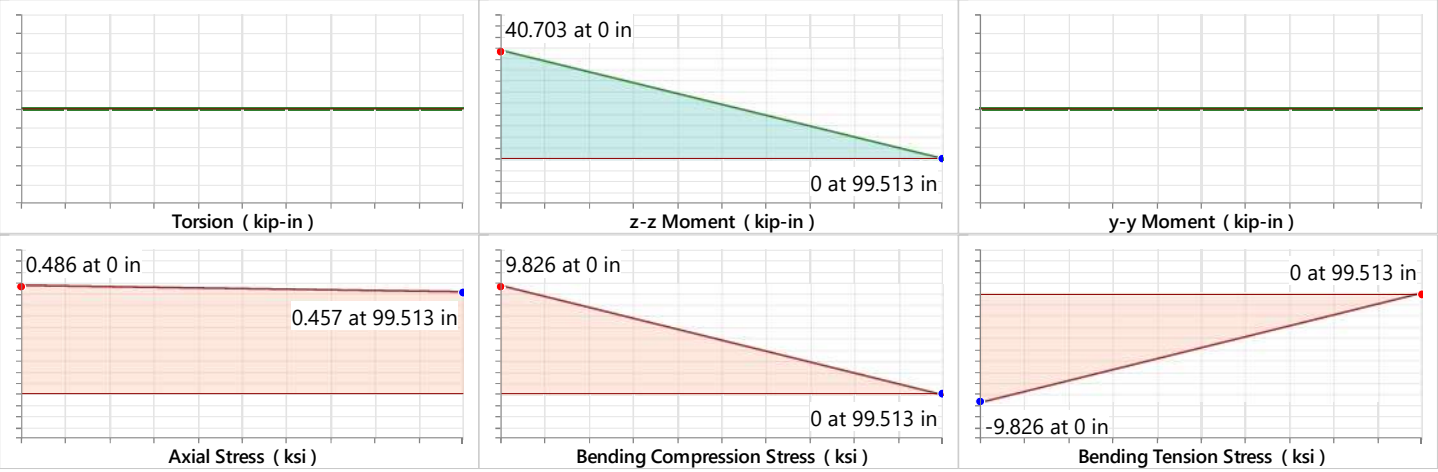












AISC 14th (360-10): ASD Code Check

Limit State	Required	Available	Unity Check	Result
Applied Loading - Bending/Axial				
Applied Loading - Shear + Torsion	-	-	-	-
Axial Tension Analysis	0.000 k	59.947 k	-	-
Axial Compression Analysis	0.972 k	25.331 k	-	-
Flexural Analysis (Strong Axis)	40.703 k-in	92.729 k-in	-	-
Flexural Analysis (Weak Axis)	0.000 k-in	35.079 k-in	-	-
Shear Analysis (Major Axis y)	0.409 k	14.892 k	0.027	Pass
Shear Analysis (Minor Axis z)	0.000 k	23.357 k	0.000	Pass
Bending & Axial Interaction Check (UC Bending Max)	-	-	0.458	Pass