



STRUCTURAL CALCULATIONS
for
JOHN DAY INNOVATION GATEWAY GREENHOUSE
GREENHOUSE STRUCTURE
at
44.4203 N, 118.9672 W
JOHN DAY, OR 97845
for
THE CITY OF JOHN DAY, OR



BY: **WELLS L. HOLMES, S.E.**
PROJECT ENGINEER

PROJECT #: **U3024-001-181**

DATE: **October 26, 2018**

DESIGNED BY FCG; CHECKED BY KGS

NOTE:

The calculations presented in this package are intended for a single use at the location indicated above, for the client listed above. These calculations shall not be reproduced, reused, "card filed", sold to a third party, or altered in any way without the written authorization of Vector Structural Engineering, LLC and City of John Day.

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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

Design Criteria:

Code: Structural design is based on the Oregon Structural Specialty Code, 2014 Edition (2012 IBC)

Wind: Basic wind speed = 100 mph (3-second gust) per the ASCE 7-10 standard

Risk category: I

Wind exposure: C

Seismic: Seismic loads are based on the Oregon Structural Specialty Code, 2014 Edition (2012 IBC)

Seismic importance factor, $I = 1$

Risk category: I

Mapped spectral response accelerations: $S_s = 0.32g$ $S_1 = 0.126g$

Site class: D

Spectral response coefficients: $S_{DS} = 0.329g$ $S_{D1} = 0.193g$

Seismic design category: C

General Notes:

- 1 The contractor shall verify dimensions, conditions and elevations before starting work. The engineer shall be notified immediately if any discrepancies are found.
- 2 The typical notes and details shall apply in all cases unless specifically detailed elsewhere. Where no detail is shown, the construction shall be as shown for other similar work and as required by the building code.
- 3 These calculations are limited to the structural members shown in these calculations only. The connection of the members shown in these calculations to the existing structure shall be by others, with the exception of those explicitly shown on the drawings.
- 4 The contractor shall be responsible for compliance with local construction safety orders. Approval of shop drawings by the architect or structural engineer shall not be construed as accepting this responsibility.
- 5 All structural framing members shall be adequately shored and braced during erection and until full lateral and vertical support is provided by adjoining members.

Structural Steel:

- 1 All structural steel code checks based on the AISC, 14th Edition per the ASCE 7 standard
- 2 All steel pipe to be per ASTM A53 GR. B (35 KSI), U.N.O.
- 3 All steel round tubes (HSS) to be per ASTM A500 GR. B (42 KSI), U.N.O.
- 4 All steel rectangular tubes (HSS) to be per ASTM A500 GR. B (46 KSI), U.N.O.
- 5 All other structural steel shapes & plates shall be per ASTM A36, U.N.O.
- 6 All bolts for steel-to-steel connections shall be per ASTM F3125 GR. A325 U.N.O.
- 7 All bolted connections shall be tightened per the "turn-of-nut" method as defined by AISC.
- 8 All welding shall be performed by certified welders in accordance with the latest edition of the American Welding Society (AWS) D1.1
- 9 All steel surfaces shall be galvanized in accordance with ASTM A123 and ASTM F2329 standards, thoroughly coated with a zinc-rich primer, or otherwise protected as noted on the structural drawings.



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

Foundation / Concrete:

- 1 All concrete mixing, placement, forming, and reinforcing installation shall be performed in accordance with the requirements of "Building Code Requirements for Reinforced Concrete", ACI 318-11. Foundation installation shall be in accordance with the requirements of "Standard Specifications for the Construction of Drilled Piers", ACI 336, latest edition
- 2 All concrete shall have a minimum compressive strength of 3000 psi at 28 days.
- 3 Cement for all concrete shall be Type II with 6% (+/- 1.5%) entrained air. Maximum aggregate size shall be 3/4".
- 4 Reinforcing steel shall be per ASTM A615 Gr. 60, U.N.O.
- 5 Foundation design is based on presumptive soil parameters. Vector Structural Engineering, LLC strongly recommends independent soils testing be performed by a licensed geotechnical engineer to verify soil bearing capacities, slope stability, and any other related soil parameters, as required.

Statement of Special Inspections:

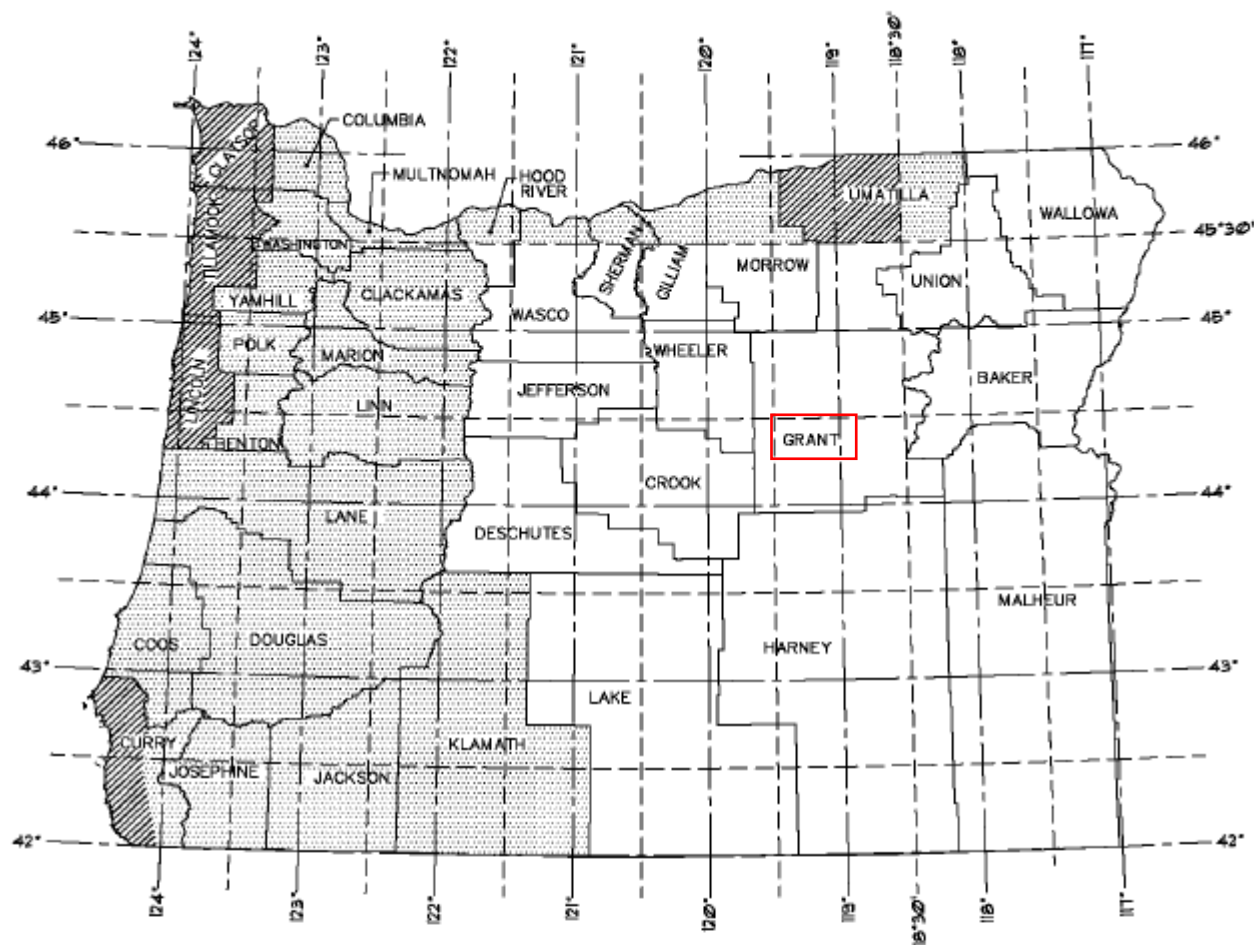
Steel fabrication shall be performed on the premises of a fabricator registered and approved as required by the 2014 OSSC to perform such work without special inspection.

No field welding shall be permitted unless noted otherwise.

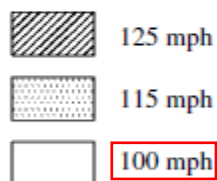
The following special inspections, where applicable, shall be required per Chapter 17 of the 2014 OSSC.

- Periodic special inspection of high-strength bolting
- Special inspection of field welding where permitted (periodic or continuous as required by the 2014 OSSC).
- Continuous special inspection of drilling operations for pier foundations
- Continuous special inspection to verify location, plumbness, diameter, and length of drilled pier foundations.
- Periodic special inspection of placement of reinforcing steel
- Continuous special inspection of concrete placement

OREGON



1. All areas with full exposure to ocean winds shall be designed 125 mph areas.
2. Areas in Hood River and Multnomah Counties with full exposure to Columbia River Gorge winds shall be designed 125 mph areas.



For SI: 1 mile per hour = 0.44 m/s.

FIGURE 1609C
ULTIMATE DESIGN WIND SPEED, V_{ULT} , FOR RISK CATEGORY I
BUILDINGS AND OTHER STRUCTURES

WIND LOADING

Basic Wind Speed, V	100	mph	
Risk Category	I		Importance Factor, I
Exposure	C		Governing Code ASCE 7-10
Length	80	ft	
Width	26	ft	
Eave Height	16	ft	
Roof Rise	6	ft	
Rise-to-Span	0.231		
Enclosure Class	Enclosed		
Mean Roof Height	19	ft	
Table 28.3-1 Eq. z	19.00		
Gust effect Factor	0.85		Assumes rigid building
kd	0.85		Table 26.6-1
Kz, Kh	0.89		Table 28.3-1
kzt	1		Figure 26.8 (assumes 1)
q	19.4	psf	Eq 28.3-1
Internal Pressure Coefficients	0.18		Table 26.11-1
Roof Angle	24.8		

WIND DIRECTION 1 (Normal to Ridge)

Surface	Cp	qGC +qiGC	qGC -qiGC
Windward wall	0.8	16.7	9.7
Side Wall	-0.7	-8.1	-15.0
Leeward Wall	-0.5	-4.8	-11.7
Windward Roof (a)	-0.40	-3.1	-10.1
Windward Roof (b)	0.099113	5.1	-1.9
Leeward Roof (a)	-0.6	-6.4	-13.4

WIND DIRECTION 2 (Parallel to Ridge)

Surface	Cp	qGC +qiGC	qGC -qiGC
Windward wall	0.8	16.7	9.7
Side Wall	-0.7	-8.1	-15.0
Leeward Wall	-0.24615	-0.6	-7.6
Roof (a) 0-h	-0.9	-11.4	-18.3
Roof (b) 0-h	-0.18	0.5	-6.5
Roof (a) h-2h	-0.5	-4.8	-11.7
Roof (b) h-2h	-0.18	0.5	-6.5

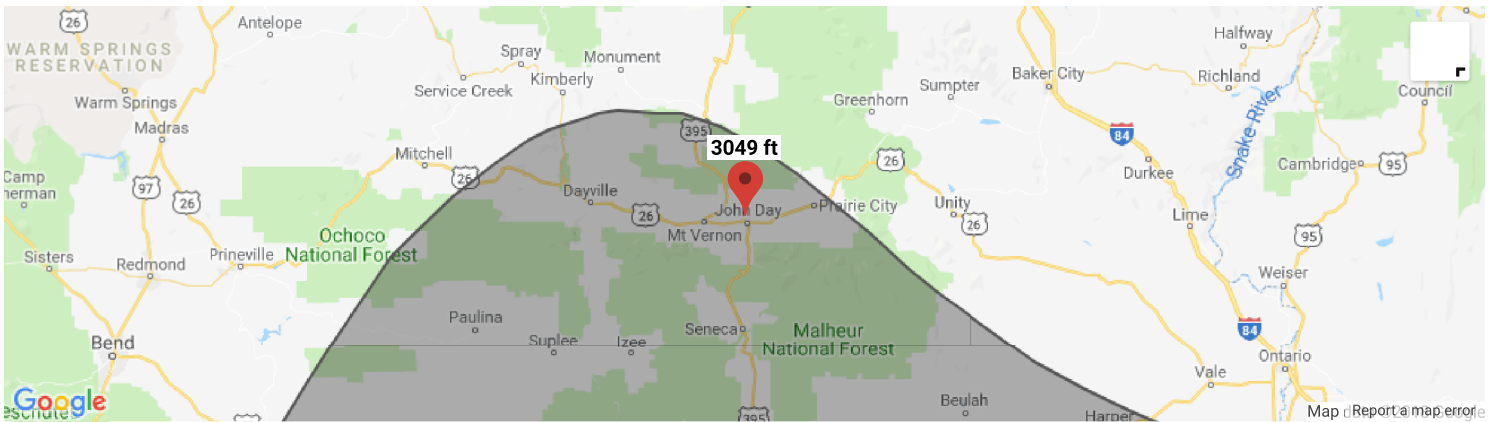
⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

ATC Hazards by Location

Search Information

Coordinates: 44.420297, -118.967161
Timestamp: 2018-10-10T22:46:17.679Z
Hazard Type: Snow

Map Results



Text Results

ASCE 7-16

Ground Snow Load ⚠ No data

This location is not included in the guidance. Please see "Snow Load Analysis for Oregon," 4th Ed., November 2013, Structural Engineers Association of Oregon and the PRISM Climate Group of Oregon State University, <http://snowload.seao.org/lookup.html>, for ground snow load values.

ASCE 7-10

Ground Snow Load ⚠ 10 lb/sqft

The reported ground snow load applies at the query location of 3049 feet up to a maximum elevation of 3200 feet.

ASCE 7-05

Ground Snow Load ⚠ 10 lb/sqft

The reported ground snow load applies at the query location of 3049 feet up to a maximum elevation of 3200 feet.

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.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer.

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SNOW LOADING

Roof Type

Peaked

Snow Load

Chapter 7 of ASCE 7-10

C_e	1	Table 7-2 Partially Exposed
C_t	0.85	Table 7-3 Heated Structure
I	0.8	Table 1.5-2
P_g	10 psf	
Span Width	26 ft	20 ft (lu)
Roof Angle	24.8	0-30

P_f	4.8 psf	$P_f = 0.7C_eC_tIP_g$
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C_t	0.85	1
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C_s	1.0 Per 7.4.4
-------	---------------

P_s	4.8 psf	$P_s = C_sP_f$
-------	---------	----------------

L_r	12 psf	Roof live load
-------	--------	----------------

S load case =	12.0 psf	$L_r > P_s$, roof live load labeled as S in Risa model
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Unbalanced Snow Load (Peaked Roof) Chapter 7 Figure 7-5

If $W < 20\text{ft}$	8 psf
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γ	15.3 pcf
----------	----------

S	2.17
---	------

hd	0.97 ft
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Region 1:	1.4 psf
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Region 2:	14.8 psf
-----------	----------

Region 3:	4.8 psf
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Region 2 (length):	3.8 ft
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USGS Design Maps Summary Report

User-Specified Input

Building Code Reference Document 2012/2015 International Building Code
(which utilizes USGS hazard data available in 2008)

Site Coordinates 44.4203°N, 118.96716°W

Site Soil Classification Site Class D – “Stiff Soil”

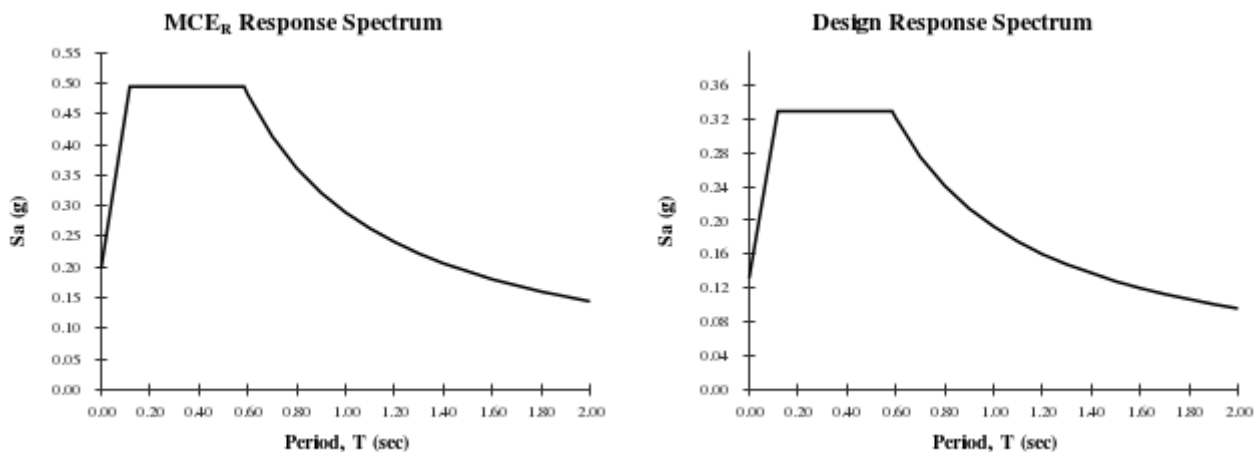
Risk Category I/II/III



USGS-Provided Output

$S_s = 0.320 \text{ g}$	$S_{MS} = 0.494 \text{ g}$	$S_{DS} = 0.329 \text{ g}$
$S_1 = 0.126 \text{ g}$	$S_{M1} = 0.289 \text{ g}$	$S_{D1} = 0.193 \text{ g}$

For information on how the S_s and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.



Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

Seismic Base Shear Calculations:

Seismic Parameters:

Per Oregon Structural Specialty Code, 2014 Edition (2012 IBC), ASCE 7-10

Risk category=	I	F_a =	1.54
Seismic Design Category=	C	F_v =	2.30
I_s =	1.00	S_{MS} =	0.49
Site Class=	D	S_{M1} =	0.29
R =	2.50	S_{DS} =	0.33
S_s =	0.320	S_{D1} =	0.19
S_1 =	0.126		

Reactions From Wind:

 V_u (kips): 3.9 W_t (kips): 4.4

Structure Height

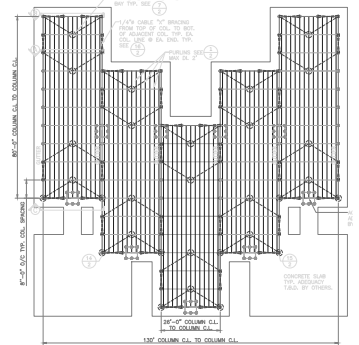
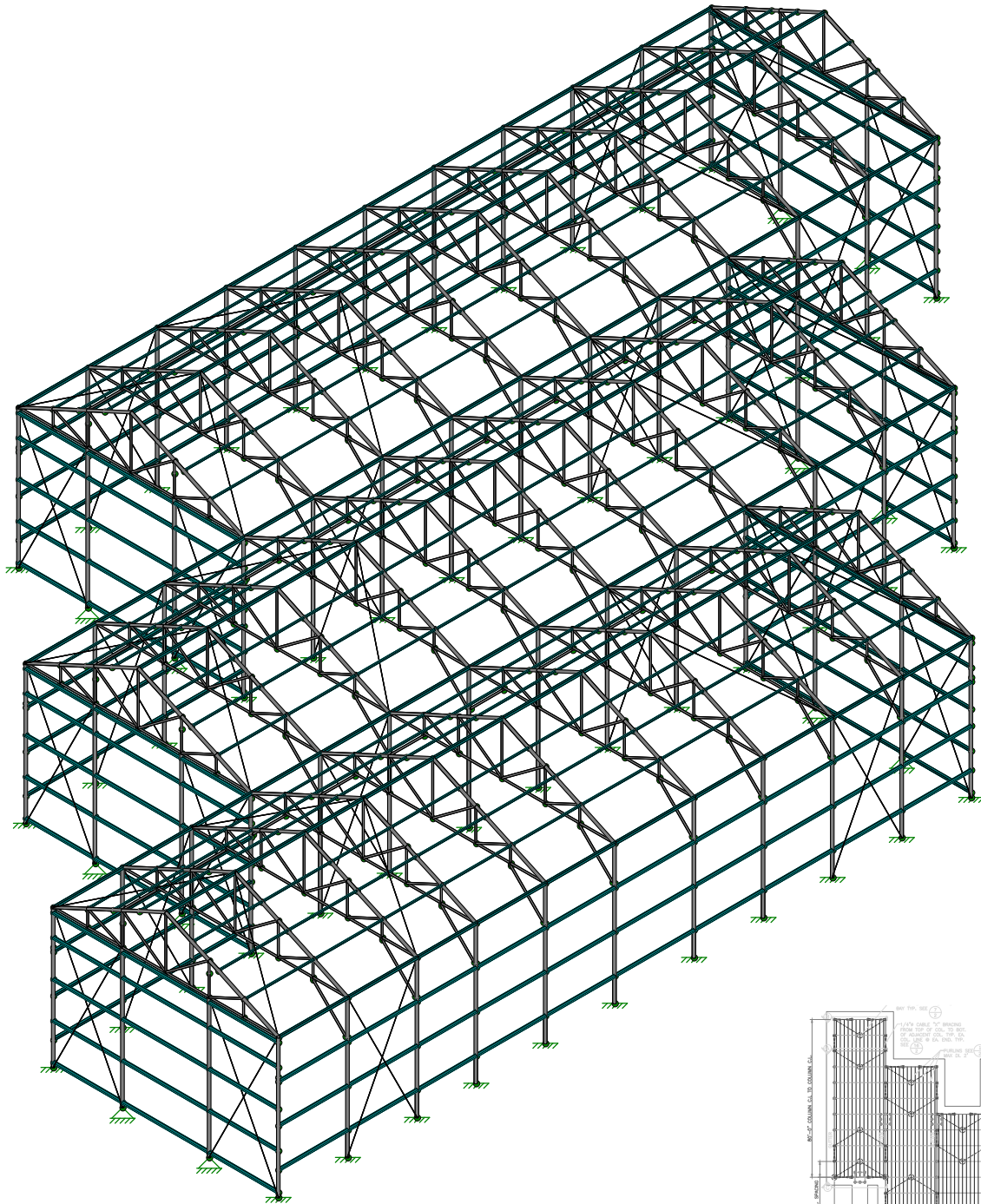
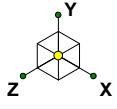
19

Seismic Base Shear:

$C_{S(MIN)} = 0.03$	0.00
$C_{S(MIN)} = 0.8 \times S_1 / (R / I_s) =$	0.0 (if $S_1 \geq 0.6$)
$C_{S(MAX)} = S_{D1} / (T_a \times (R / I_s)) =$	
$T_a = C_t \times h_n^x =$	0.42 s
$C_s = S_{DS} / (R / I_s) =$	0.182
$V = C_s \times W =$	0.60 kips

Total Seismic Shear (V_u):	0.6 Kips
Total Wind Shear:	3.9 Kips

Earthquake Effects May Be Ignored



NOTE: (2) ADDITIONAL BAYS NOT SHOWN

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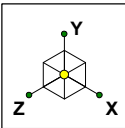
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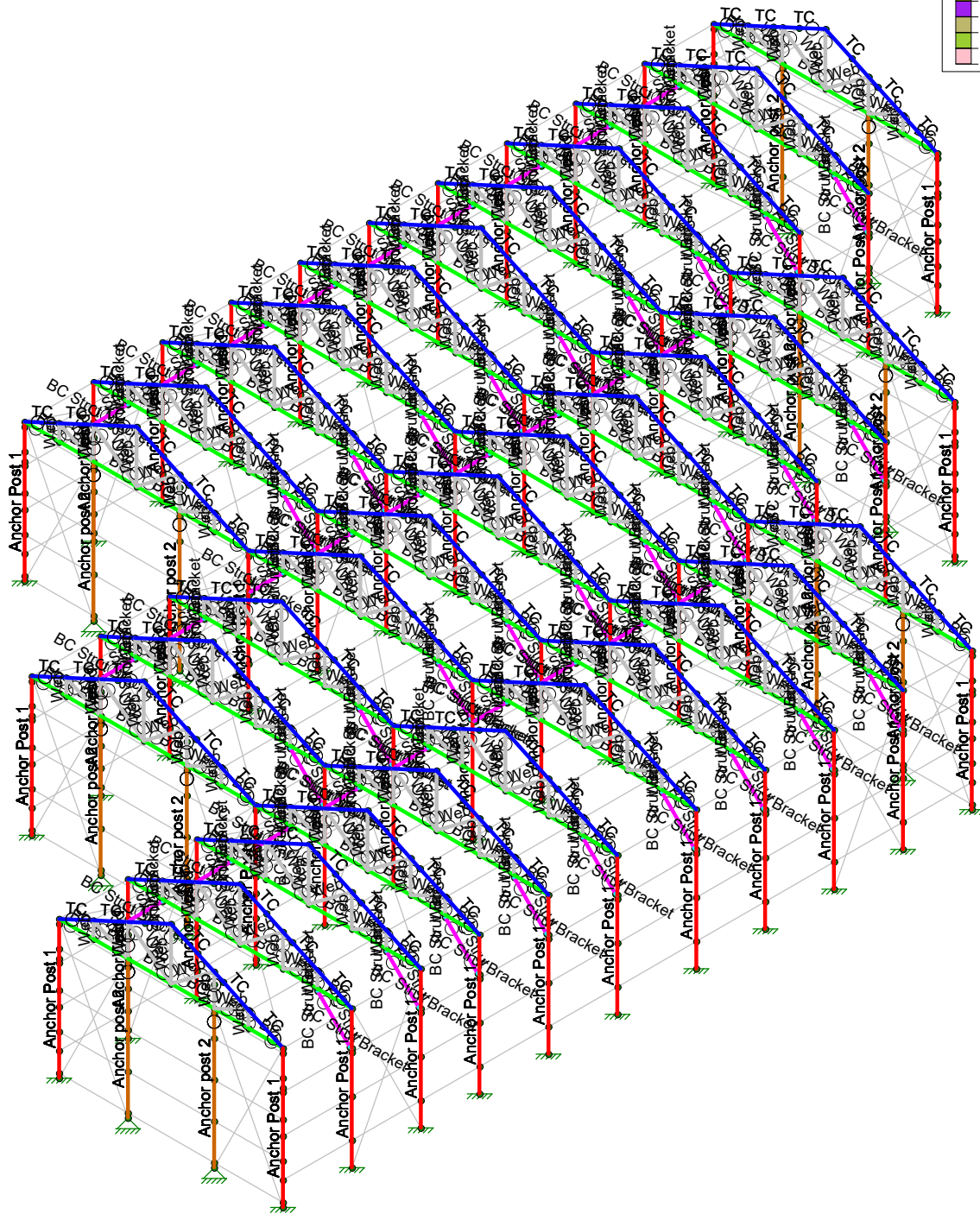
SK - 1

Nov 5, 2018 at 3:58 PM

(Full building) John Day Greenhou...



Section Sets	
■	TC
■	BC
■	Anchor Post 1
■	Web
■	BC Strut
■	BC Strut Bracket
■	Anchor post 2
■	X-Bracing Vertical
■	X-Bracing Horizontal
■	Girt
■	Purlin
■	Gutter



Vectro Structural Engineeri...

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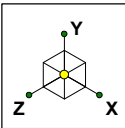
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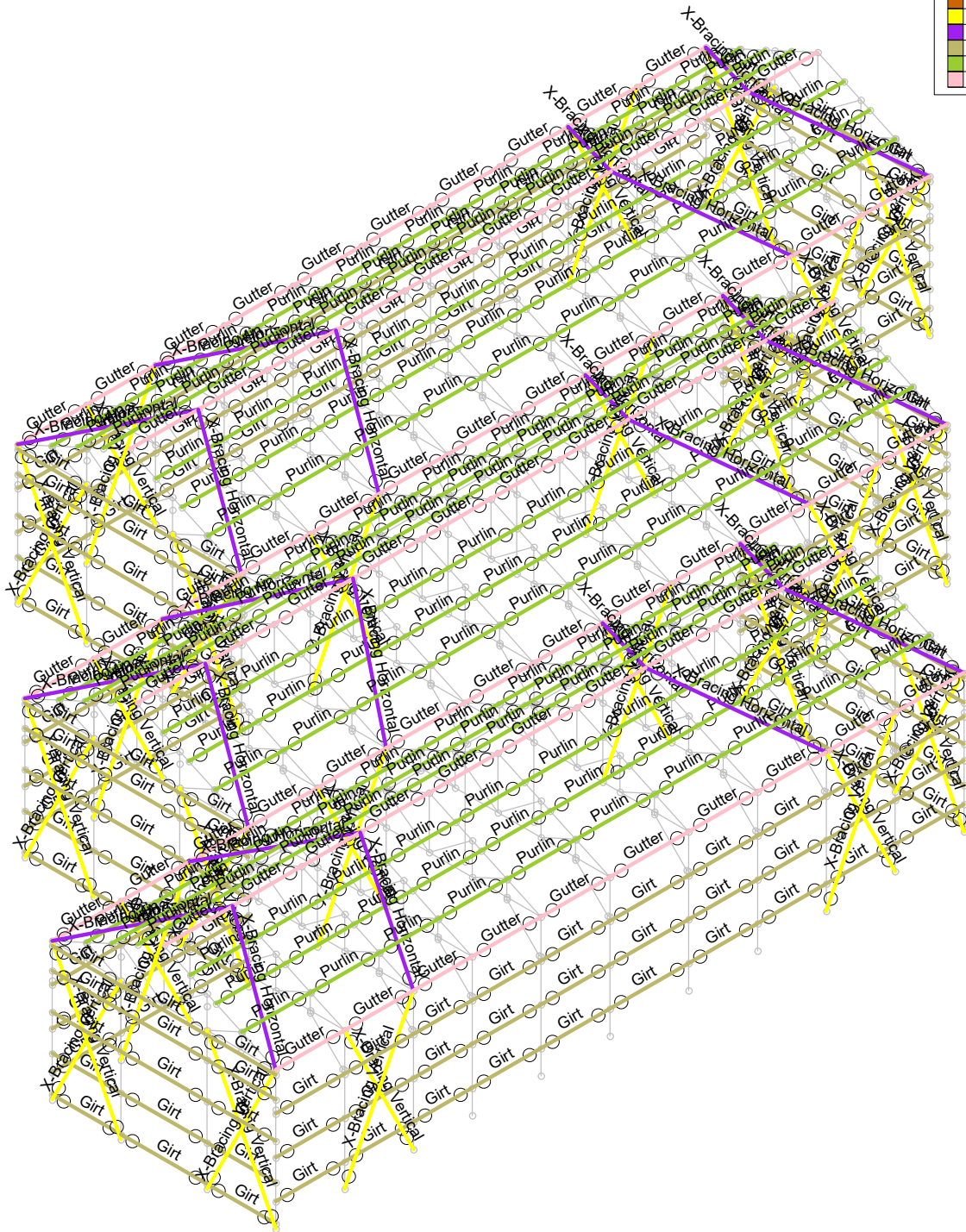
SK - 2

Nov 5, 2018 at 3:59 PM

(Full building) John Day Greenhou...



Section Sets	
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■	Web
■	BC Strut
■	BC Strut Bracket
■	Anchor post 2
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■	X-Bracing Horizontal
■	Girt
■	Purlin
■	Gutter



Vectro Structural Engineeri...

FCG

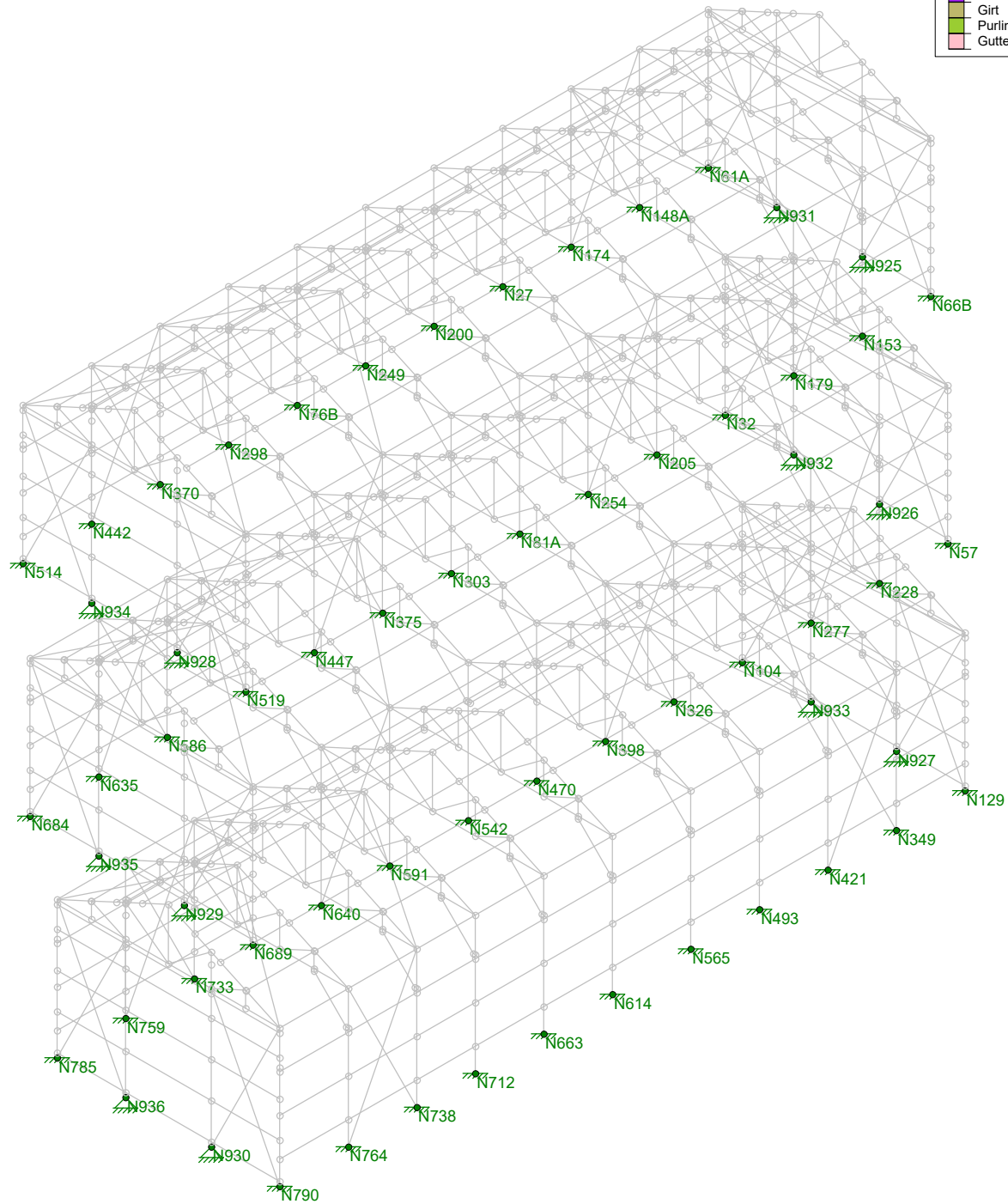
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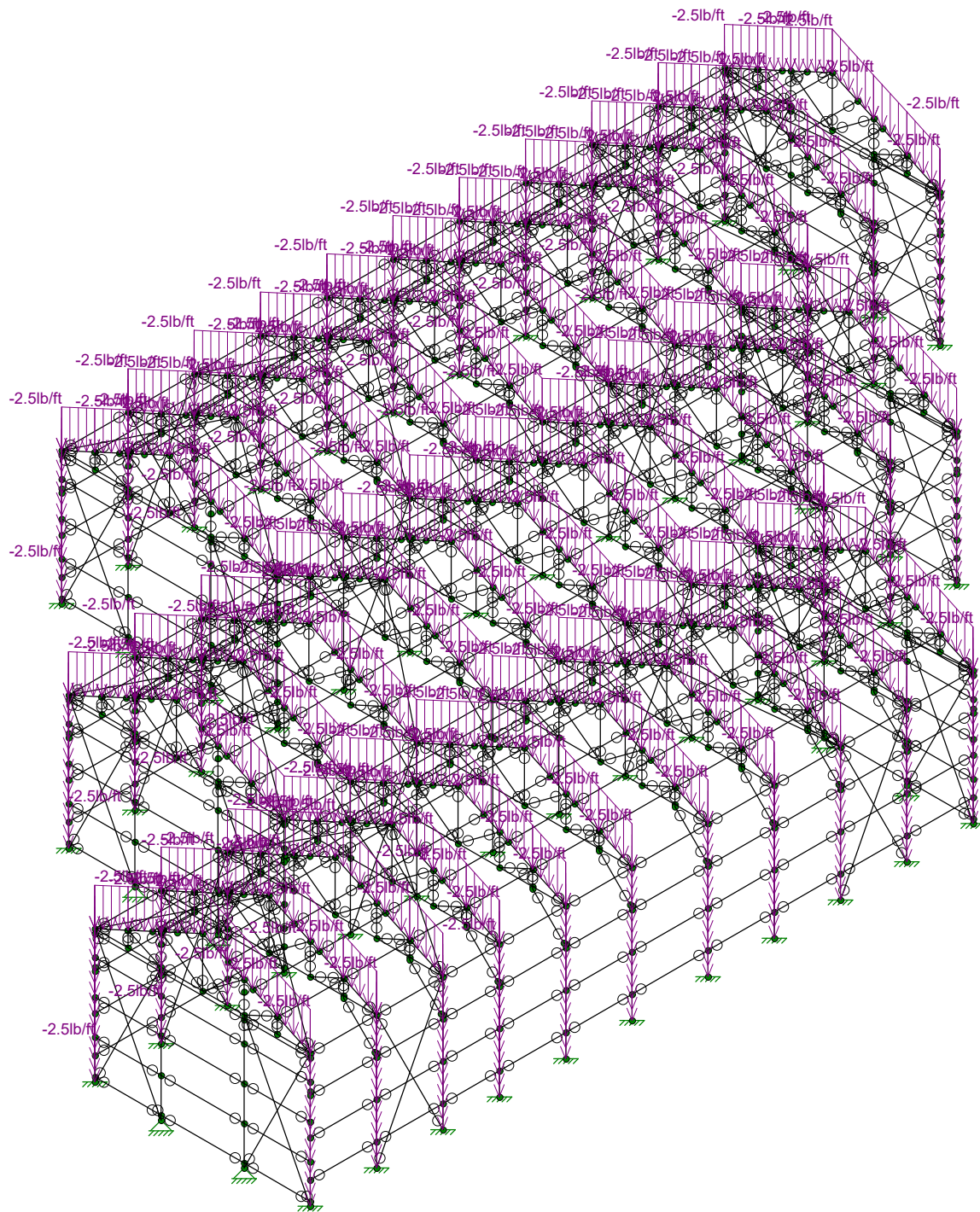
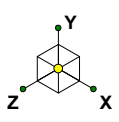
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Nov 5, 2018 at 3:59 PM

(Full building) John Day Greenhou...



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U3024-001-181		(Full building) John Day Greenhou...



Loads: BLC 1, DL

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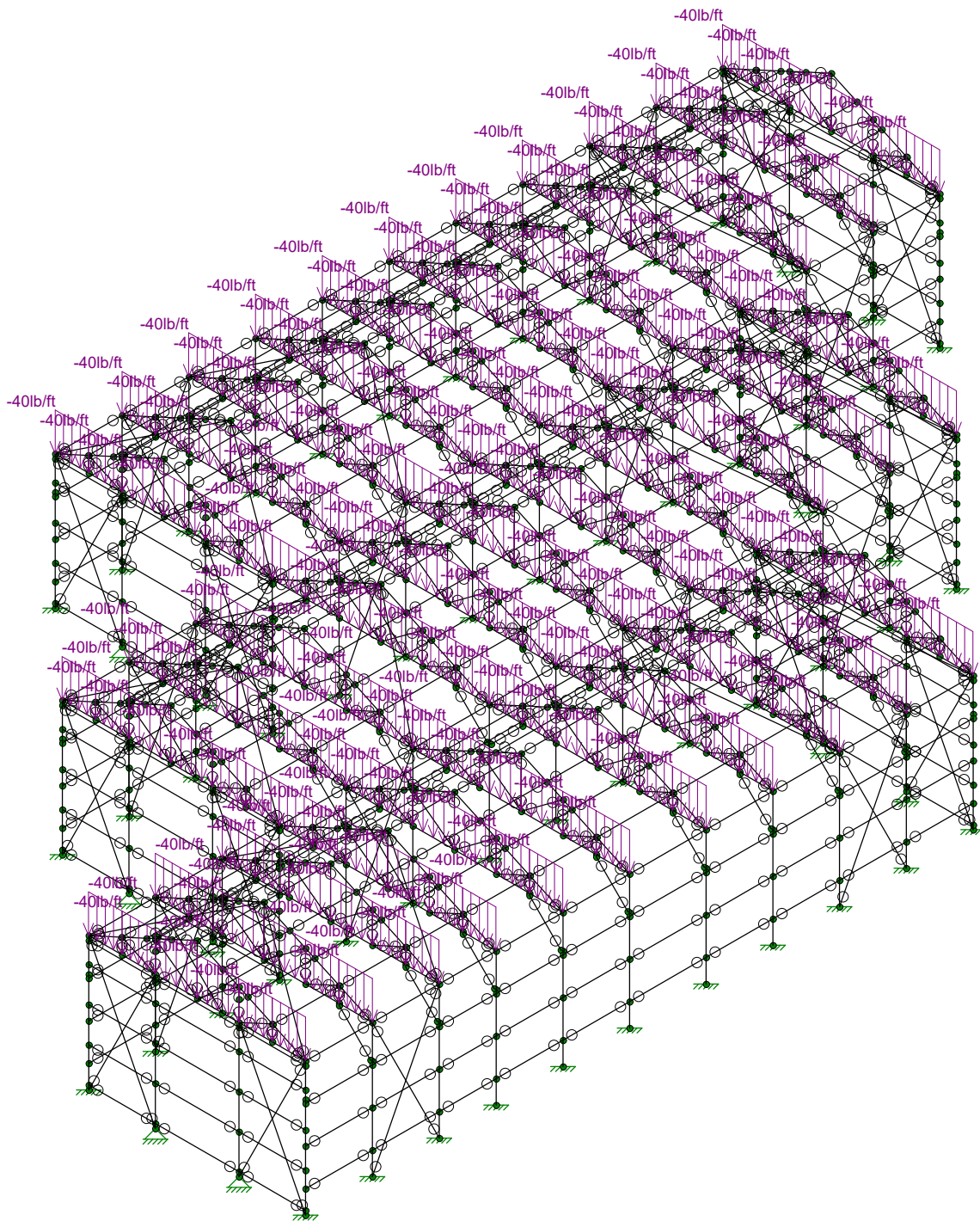
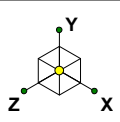
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JohnDay Greenhouse

SK - 5

Nov 5, 2018 at 4:01 PM

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Loads: BLC 3, EL

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FCG

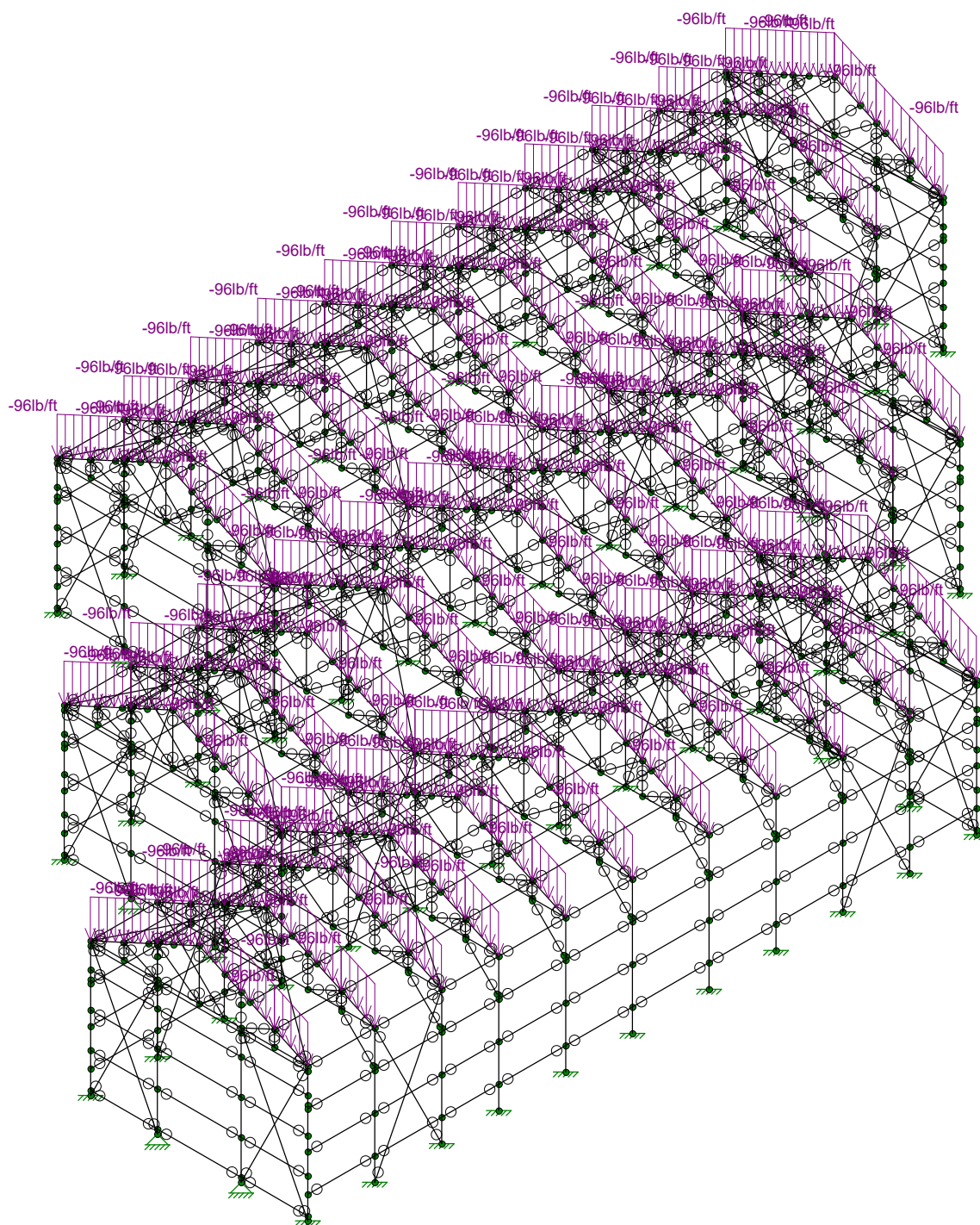
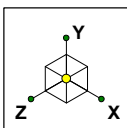
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JohnDay Greenhouse

SK - 6

Nov 5, 2018 at 4:01 PM

(Full building) John Day Greenhou...



Loads: BLC 4, S

Vectro Structural Engineeri...

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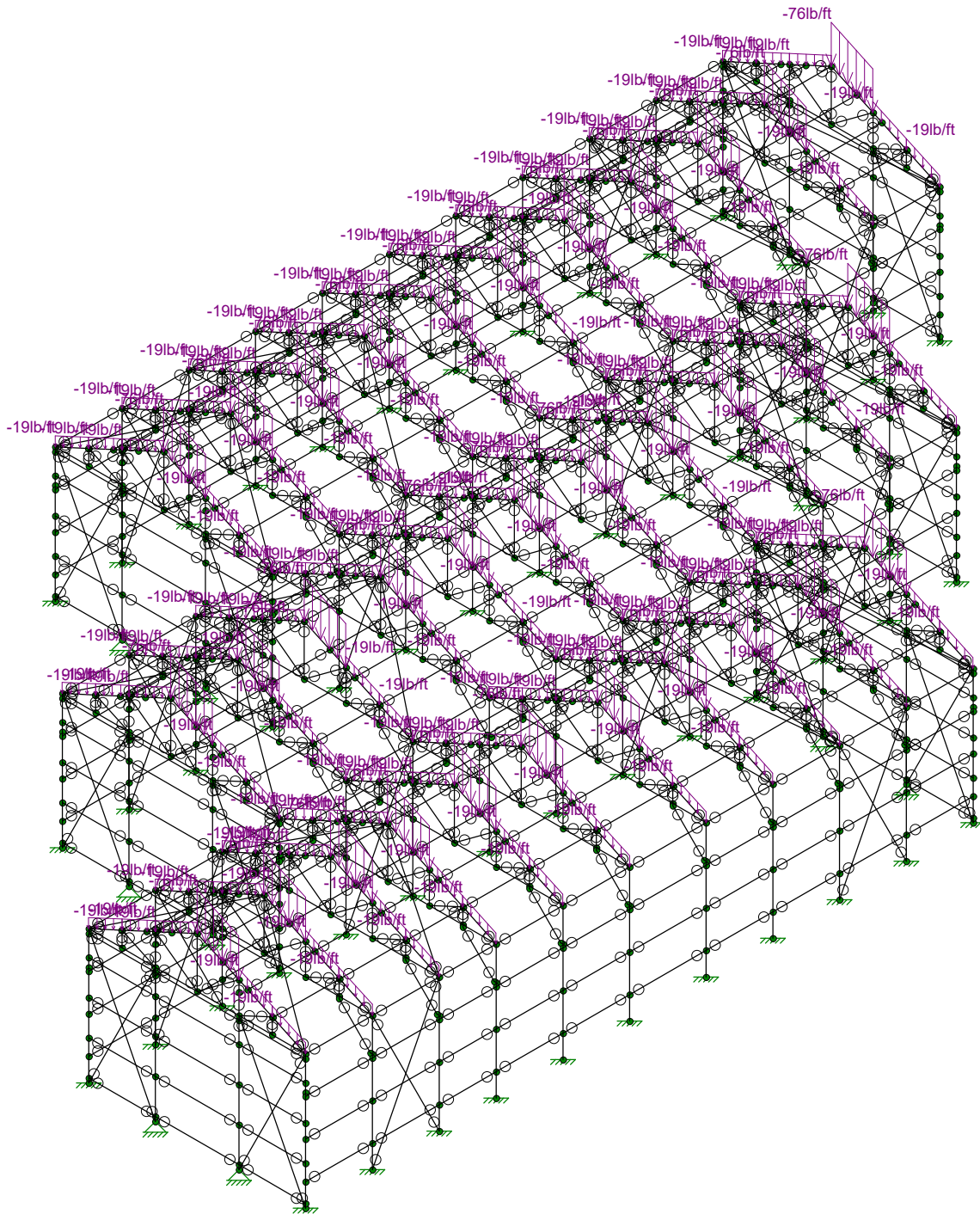
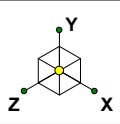
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SK - 7

Nov 5, 2018 at 4:02 PM

(Full building) John Day Greenhou...



Loads: BLC 5, Su

Vectro Structural Engineeri...

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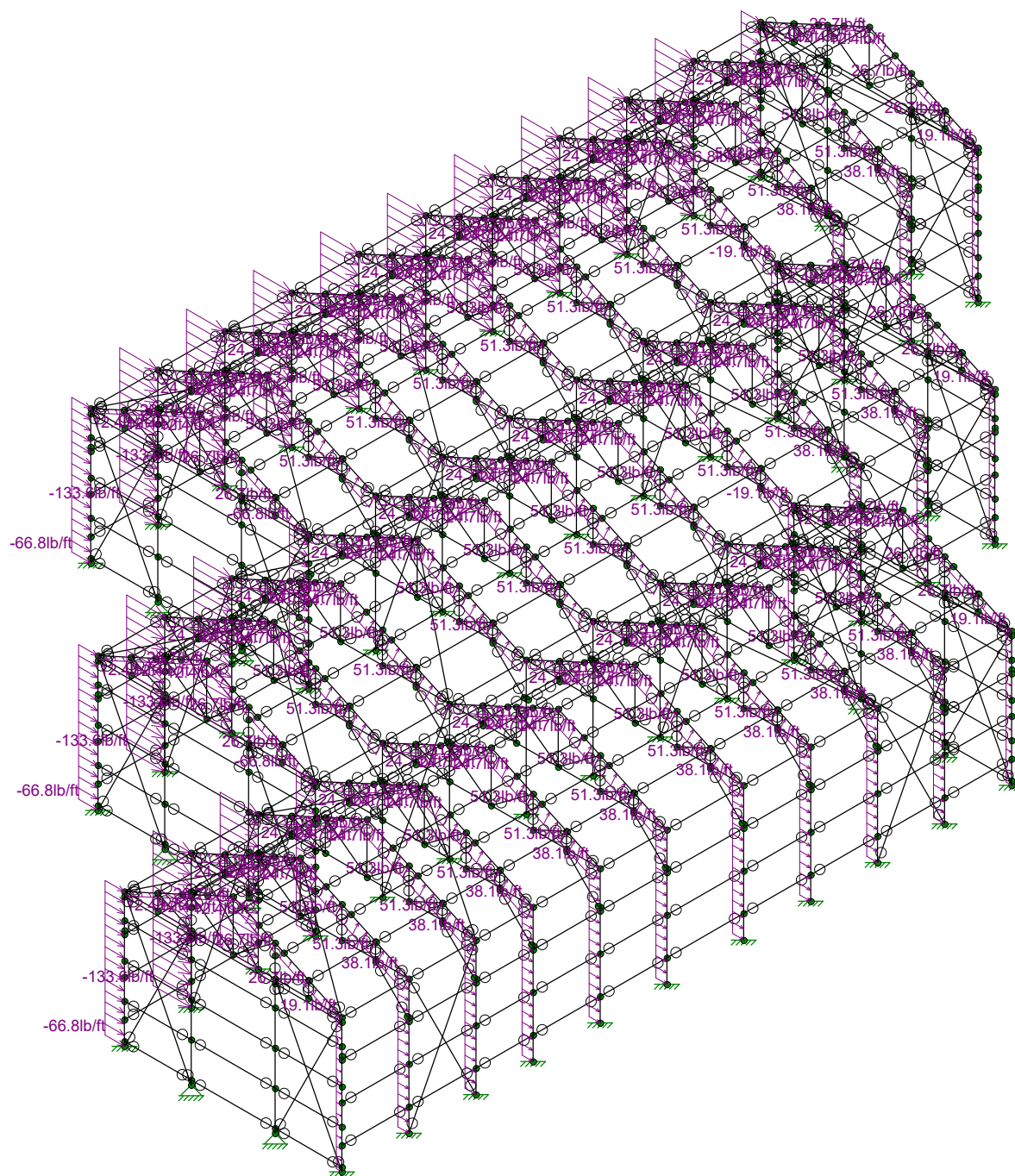
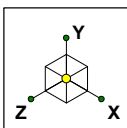
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SK - 8

Nov 5, 2018 at 4:02 PM

(Full building) John Day Greenhou...



Loads: BLC 6, Wx

Vectro Structural Engineeri...

FCG

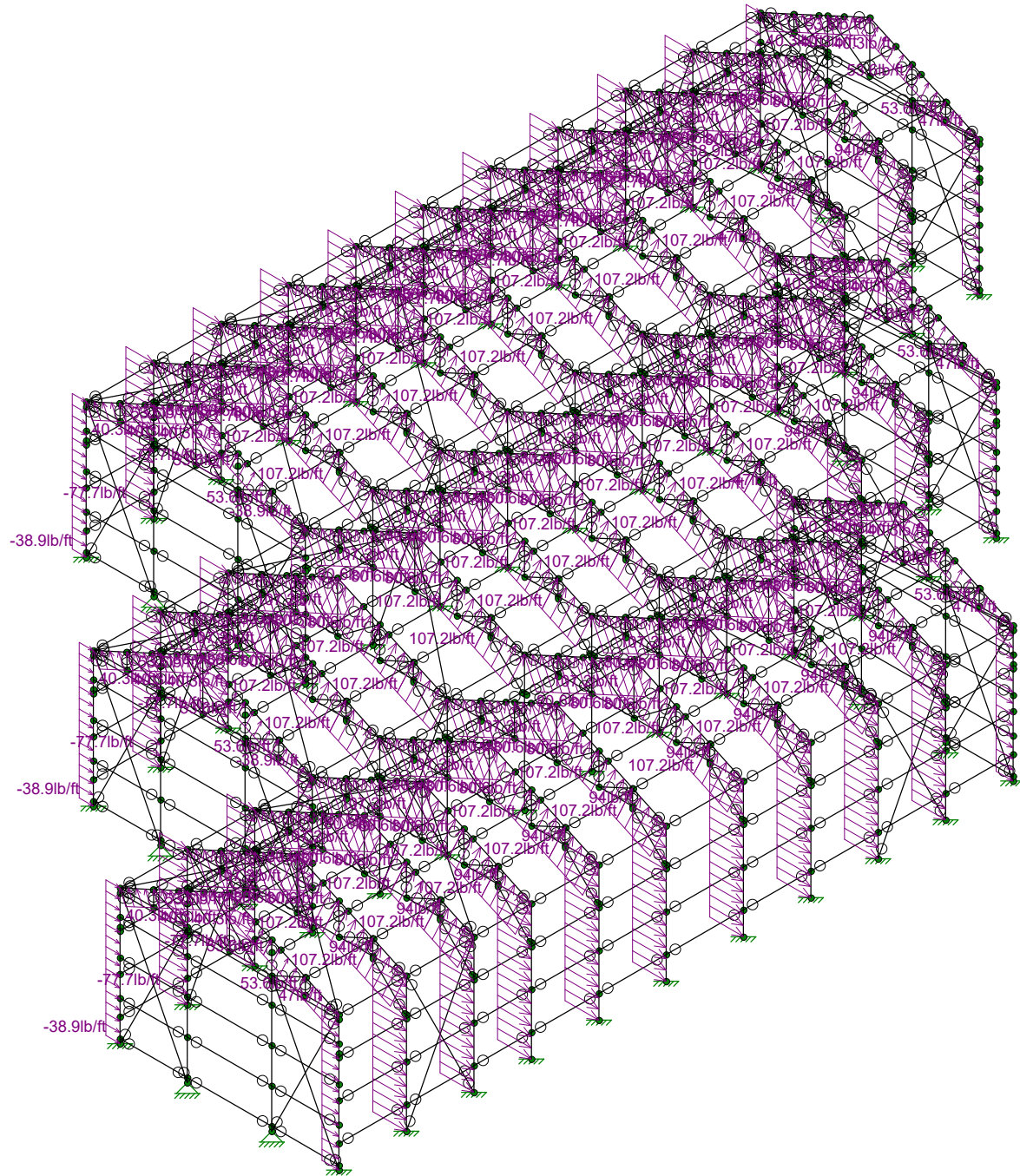
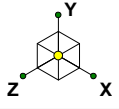
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SK - 9

Nov 5, 2018 at 4:02 PM

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Loads: BLC 7, Wxb

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FCG

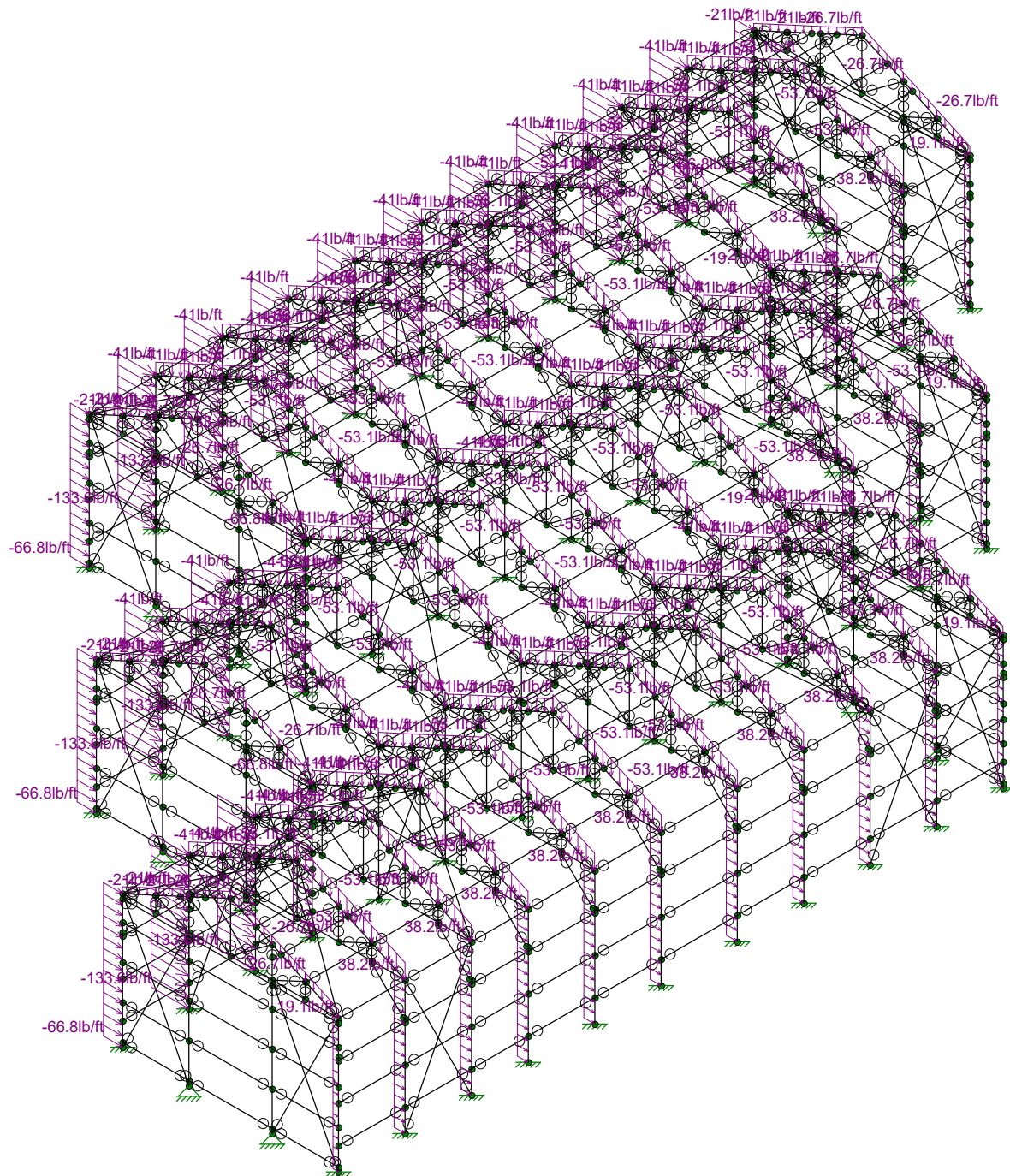
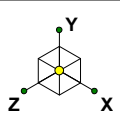
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SK - 10

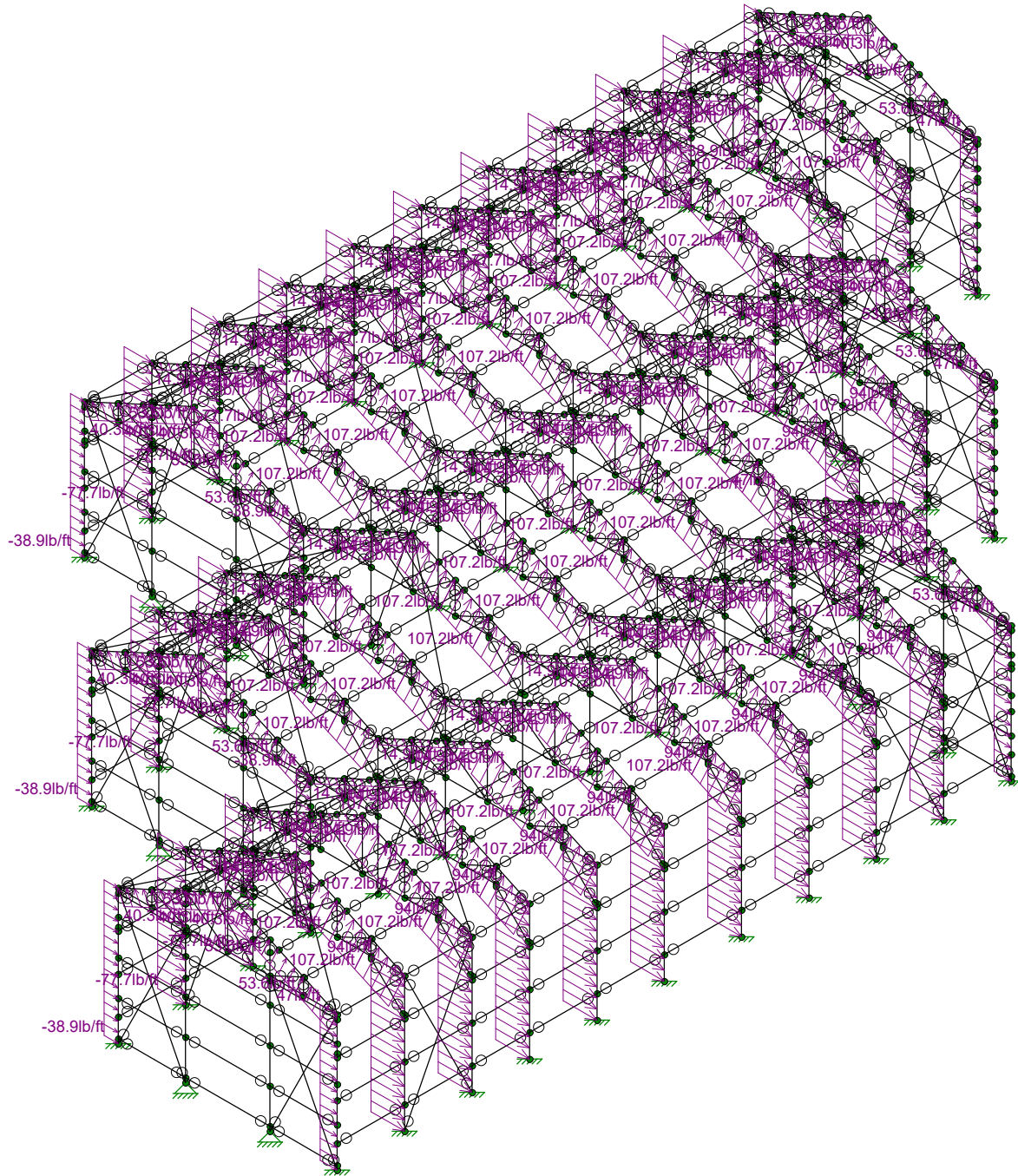
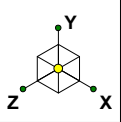
Nov 5, 2018 at 4:02 PM

(Full building) John Day Greenhou...



Loads: BLC 8, Wx2

Vectro Structural Engineeri...	JohnDay Greenhouse	SK - 11
FCG		Nov 5, 2018 at 4:02 PM
U3024-001-181		(Full building) John Day Greenhou...



Loads: BLC 9, Wx2b

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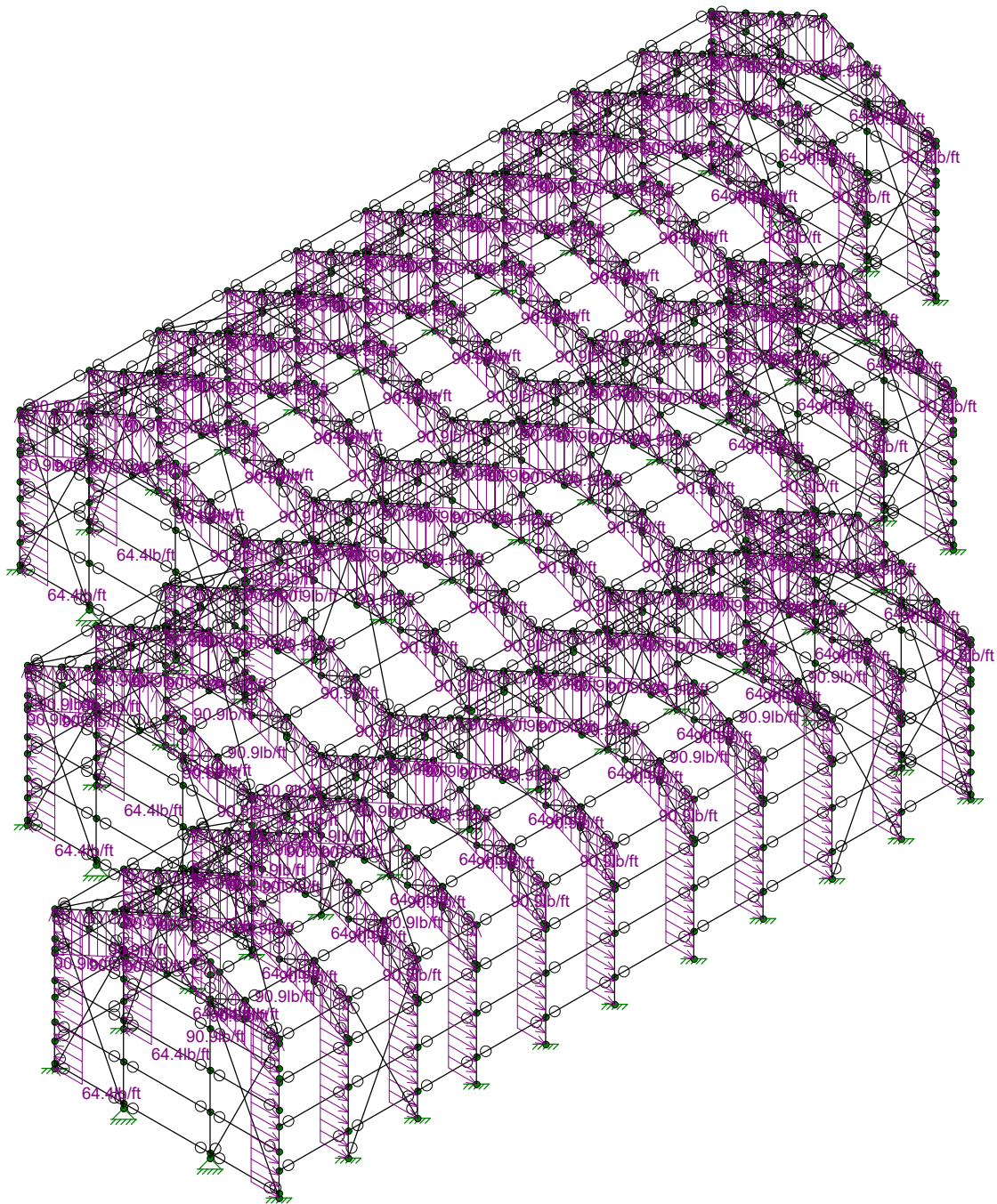
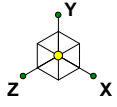
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JohnDay Greenhouse

SK - 12

Nov 5, 2018 at 4:03 PM

(Full building) John Day Greenhou...



Loads: BLC 10, Wz

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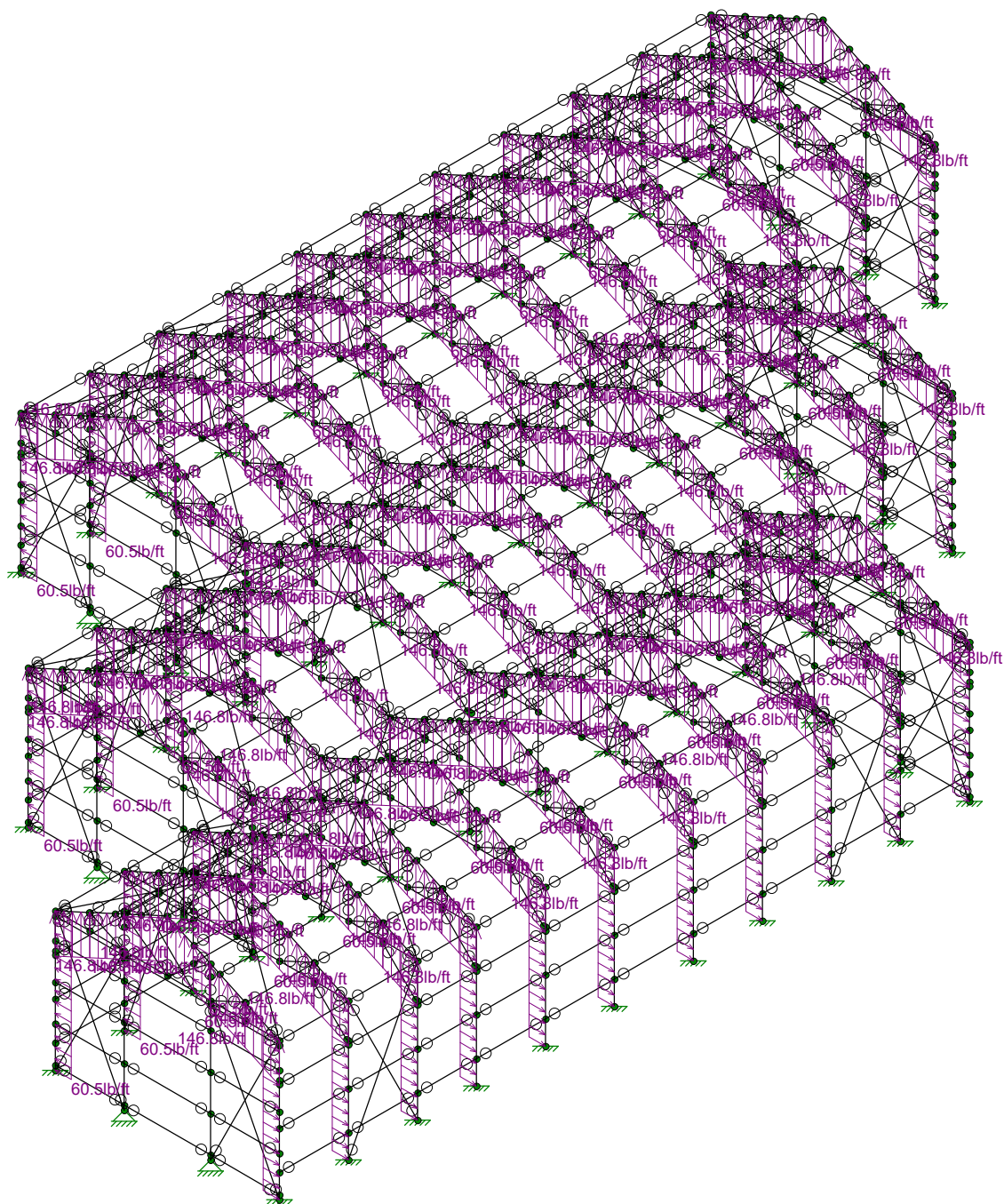
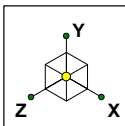
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SK - 13

Nov 5, 2018 at 4:03 PM

(Full building) John Day Greenhou...



Loads: BLC 11, Wz2

Vectro Structural Engineeri...

FCG

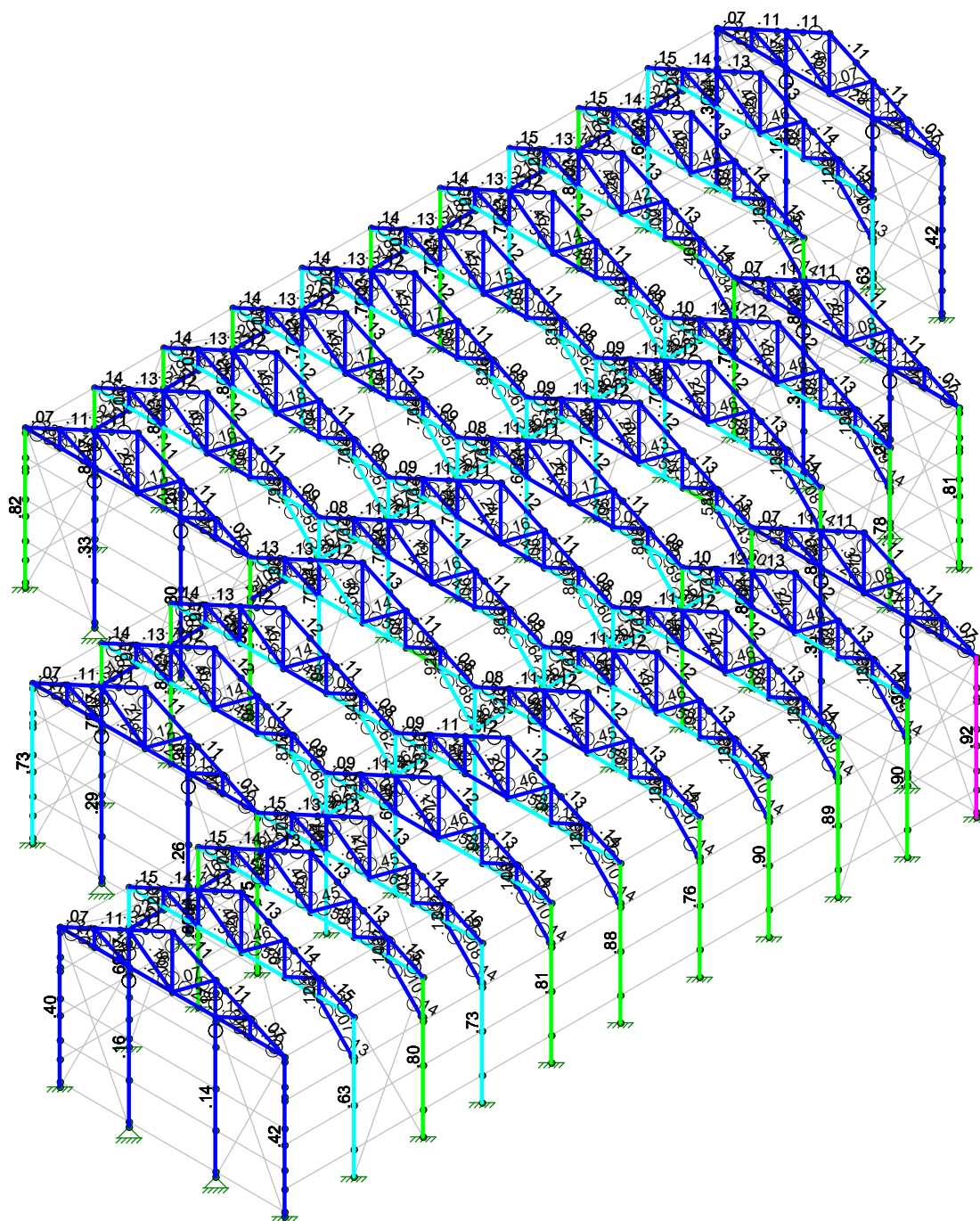
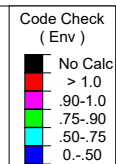
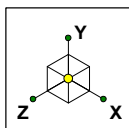
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JohnDay Greenhouse

SK - 14

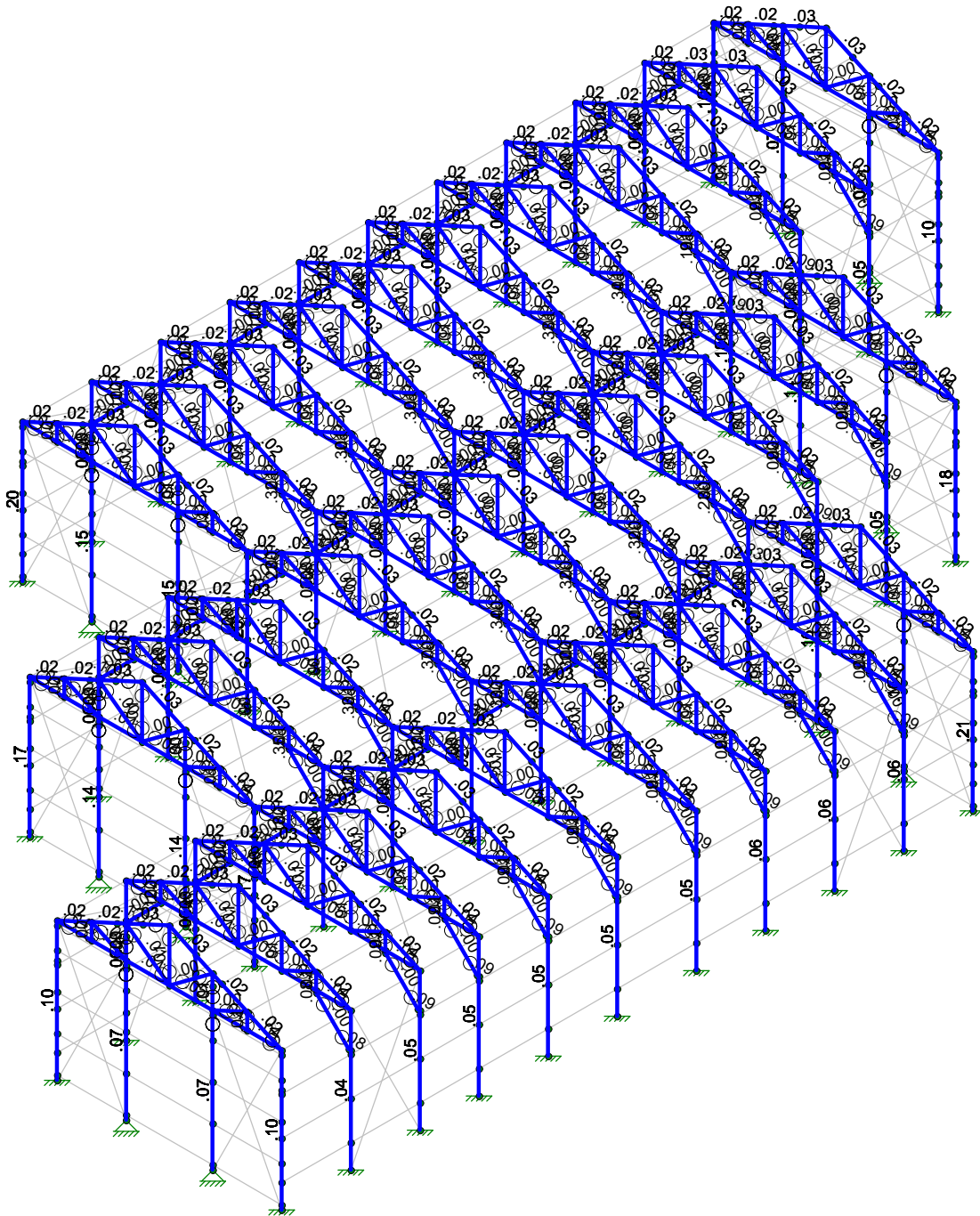
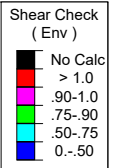
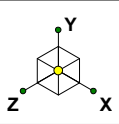
Nov 5, 2018 at 4:03 PM

(Full building) John Day Greenhou...



Member Code Checks Displayed (Enveloped)
Results for LC 1, DL+PL+EL+S

Vectro Structural Engineeri...	JohnDay Greenhouse	SK - 15
FCG		Nov 5, 2018 at 4:04 PM
U3024-001-181		(Full building) John Day Greenhou...



Member Shear Checks Displayed (Enveloped)
Results for LC 1, DL+PL+EL+S

Vectro Structural Engineeri...

FCG

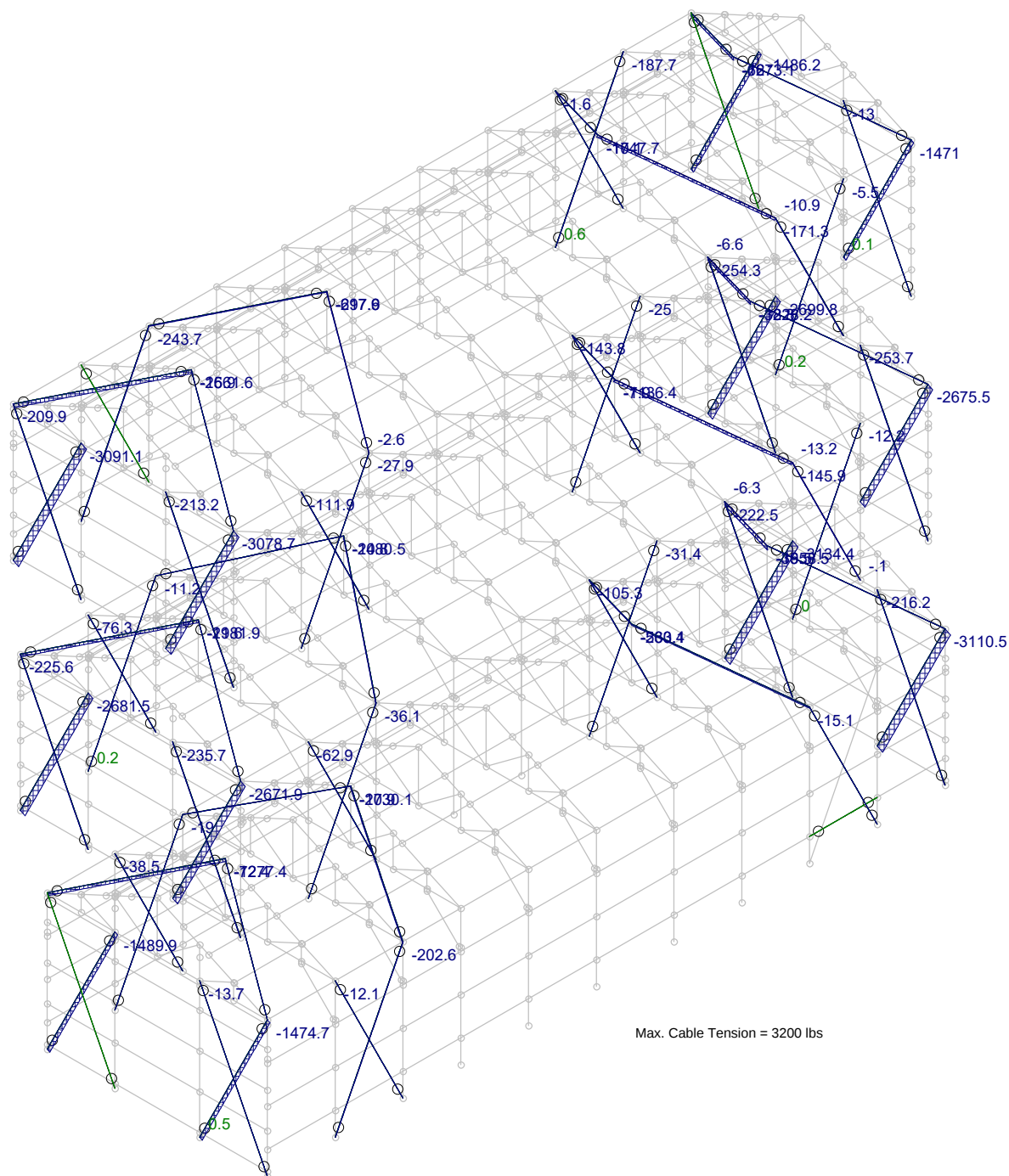
U3024-001-181

JohnDay Greenhouse

SK - 16

Nov 5, 2018 at 4:04 PM

(Full building) John Day Greenhou...



Max. Cable Tension = 3200 lbs

(Full building) John Day Greenhou...

Display Sections for Member Calcs	2
Max Internal Sections for Member Calcs	100
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-07: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR SET ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

Seismic Code	UBC 1997
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	lyy [in4]	lzz [in4]	J [in4]
1	TC	2.875" O.D. x 10 ...	None	None	Pipe 50	Typical	1.276	1.189	1.189	2.378
2	BC	1.625" O.D. x 16 ...	None	None	Pipe 50	Typical	.297	.091	.091	.182
3	Anchor Post 1	3" O.D. x 10Ga (0...	None	None	Pipe 50	Typical	1.318	1.344	1.344	2.688
4	Web	1.625" O.D. x 16 ...	None	None	Pipe 50	Typical	.297	.091	.091	.182
5	BC Strut	1.625" O.D. x 16 ...	None	None	Pipe 50	Typical	.297	.091	.091	.182
6	BC Strut Bracket	PLATE12Ga(0.10...	None	None	A572 Gr.50	Typical	.366	.000334	.374	.001
7	Anchor post 2	3" O.D. x 10Ga (0...	None	None	Pipe 50	Typical	1.318	1.344	1.344	2.688
8	Anchor post (R2)	3" O.D. x 10Ga (0...	None	None	Pipe 50	Typical	1.318	1.344	1.344	2.688
9	X-Bracing Vertical	1/4" Cable	None	None	A36 Gr.36	Typical	.029	6.9e-5	6.9e-5	.000137
10	X-Bracing Horizontal	1/4" Cable	None	None	A36 Gr.36	Typical	.029	6.9e-5	6.9e-5	.000137

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Member)	Surface...
1	DL	None		-1.1				232		
2	PL	None								
3	EL	None						198		
4	S	None						198		
5	Su	None						198		
6	Wx	None						236		
7	Wxb	None						236		
8	Wx2	None						236		
9	Wx2b	None						236		
10	Wz	None						236		
11	Wz2	None						236		

[illegible]

Load Combinations (Continued)

[illegible]



Company : Vectro Structural Engineering
 Designer : FCG
 Job Number : U3024-001-181
 Model Name : JohnDay Greenhouse

Nov 5, 2018
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Envelope AISC 14th(360-10): ASD Steel Code Checks

Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/.....	Eqn		
1	M59	3" O.D. x...	.395	0 18	.095	0	6	39346...	39447...	2987...	2987...	H1-1b
2	M60A	3" O.D. x...	.416	192 6	.095	192	18	39346...	39447...	2987...	2987...	H1-1b
3	M68	2.875" O...	.074	22....1	.021	52....	11	30889...	38204...	2765...	2765...	H1-1b
4	M69	2.875" O...	.074	30....1	.021	0	1	30889...	38204...	2765...	2765...	H1-1b
5	M79	2.875" O...	.106	52....1	.022	52....	1	33696...	38204...	2765...	2765...	H1-1b
6	M80A	2.875" O...	.111	0 1	.028	0	1	33696...	38204...	2765...	2765...	H1-1b
7	M81	2.875" O...	.106	0 1	.022	0	1	33696...	38204...	2765...	2765...	H1-1b
8	M82A	2.875" O...	.111	66....1	.027	66....	1	33696...	38204...	2765...	2765...	H1-1b
9	M30	3" O.D. x...	.735	0 15	.059	0	15	36485...	39447...	2987...	2987...	H1-1b
10	M32	PLATE1...	.226	0 5	.114	0 y	5	3091...	10961...	23.887	799.2...	H1-1b
11	M33	1.625" O...	.210	30....5	.001	63....	5	3353...	8902...	369.6...	369.6...	H1-1a
12	M34	PLATE1...	.216	2.75 5	.113	0 y	5	3154...	10961...	23.887	799.2...	H1-1b
13	M35	PLATE1...	.457	0 6	.186	0 y	6	3154...	10961...	23.887	799.2...	H1-1a
14	M36	1.625" O...	.342	33....6	.001	63....	6	3353...	8902...	369.6...	369.6...	H1-1a
15	M37	PLATE1...	.473	2.8...6	.187	2.8...y	6	3091...	10961...	23.887	799.2...	H1-1a
16	M38	2.875" O...	.147	26.7 1	.021	52....	11	30889...	38204...	2765...	2765...	H1-1b
17	M39	2.875" O...	.142	26.7 1	.021	0	11	30889...	38204...	2765...	2765...	H1-1b
18	M40	1.625" O...	.055	0 17	.002	0	6	7919...	8902...	369.6...	369.6...	1 H1-1...
19	M41	1.625" O...	.034	0 15	.002	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
20	M42	1.625" O...	.257	0 16	.012	0	5	2641...	8902...	369.6...	369.6...	1 H1-1a
21	M43	1.625" O...	.089	0 18	.008	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
22	M44	1.625" O...	.089	0 18	.010	0	5	7919...	8902...	369.6...	369.6...	1 H1-1...
23	M45	1.625" O...	.119	52....13	.003	0	5	4569...	8902...	369.6...	369.6...	H1-1...
24	M46	1.625" O...	.451	38....1	.008	74....	5	2461...	8902...	369.6...	369.6...	H1-1a
25	M47	1.625" O...	.423	38....1	.002	0	5	2461...	8902...	369.6...	369.6...	H1-1a
26	M48	1.625" O...	.088	52....1	.002	0	6	4569...	8902...	369.6...	369.6...	H1-1...
27	M49	2.875" O...	.134	52....1	.024	52....	11	33696...	38204...	2765...	2765...	H1-1b
28	M50	2.875" O...	.127	38....1	.028	0	11	33595...	38204...	2765...	2765...	H1-1b
29	M51	2.875" O...	.133	0 1	.023	0	1	33696...	38204...	2765...	2765...	H1-1b
30	M52	2.875" O...	.130	28....11	.028	66....	11	33595...	38204...	2765...	2765...	H1-1b
31	M53	1.625" O...	.558	21....1	.040	48	8	5137...	8902...	369.6...	369.6...	H1-1a
32	M54	1.625" O...	.549	0 1	.041	0	5	5137...	8902...	369.6...	369.6...	H1-1a
33	M55	1.625" O...	.572	60 1	.044	60	5	3771...	8902...	369.6...	369.6...	H1-1a
34	M56	1.625" O...	.566	0 1	.049	0	5	3771...	8902...	369.6...	369.6...	H1-1a
35	M57	1.625" O...	.766	48 18	.049	48	6	5137...	8902...	369.6...	369.6...	H1-1a
36	M58	1.625" O...	.565	25....1	.039	48	5	5137...	8902...	369.6...	369.6...	H1-1a
37	M59A	3" O.D. x...	.805	192 6	.183	192	6	39346...	39447...	2987...	2987...	H1-1b
38	M66A	2.875" O...	.069	22....1	.021	52....	1	30889...	38204...	2765...	2765...	H1-1b
39	M67	2.875" O...	.072	30....1	.021	0	1	30889...	38204...	2765...	2765...	H1-1b
40	M77	2.875" O...	.110	52....1	.022	52....	1	33696...	38204...	2765...	2765...	H1-1b
41	M78	2.875" O...	.111	0 1	.028	0	1	33696...	38204...	2765...	2765...	H1-1b
42	M79A	2.875" O...	.107	0 1	.022	0	1	33696...	38204...	2765...	2765...	H1-1b
43	M80	2.875" O...	.110	66....1	.028	66....	1	33696...	38204...	2765...	2765...	H1-1b
44	M87A	3" O.D. x...	.737	0 15	.058	0	15	36485...	39447...	2987...	2987...	H1-1b
45	M89	PLATE1...	.233	0 5	.117	0 y	5	3091...	10961...	23.887	799.2...	H1-1b
46	M90	1.625" O...	.217	30....5	.001	63....	5	3353...	8902...	369.6...	369.6...	H1-1a
47	M91	PLATE1...	.223	2.75 5	.116	0 y	5	3154...	10961...	23.887	799.2...	H1-1b
48	M92	PLATE1...	.816	0 1	.325	0 y	1	3154...	10961...	23.887	799.2...	H1-1a
49	M93	1.625" O...	.609	33....1	.001	63....	6	3353...	8902...	369.6...	369.6...	H1-1a
50	M94	PLATE1...	.843	2.8...1	.327	2.8...y	1	3091...	10961...	23.887	799.2...	H1-1a
51	M95	2.875" O...	.137	26....1	.020	52....	11	30889...	38204...	2765...	2765...	H1-1b
52	M96	2.875" O...	.084	29....1	.021	0	11	30889...	38204...	2765...	2765...	H1-1b
53	M97	1.625" O...	.057	0 17	.002	0	6	7919...	8902...	369.6...	369.6...	1 H1-1...
54	M98	1.625" O...	.035	0 15	.003	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
55	M99	1.625" O...	.166	0 20	.009	0	5	2641...	8902...	369.6...	369.6...	1 H1-1...
56	M100	1.625" O...	.047	0 1	.007	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...



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

Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/...	Eqn
57	M101	1.625" O...	.156	0 1 .008	0	5 7919...	8902...	369.6...	369.6...	1 H1-1...
58	M102	1.625" O...	.123	52.... 1 .003	52....	5 4569...	8902...	369.6...	369.6...	1 H1-1...
59	M103	1.625" O...	.453	38.... 1 .007	0	5 2461...	8902...	369.6...	369.6...	1 H1-1a
60	M104	1.625" O...	.171	74.... 11 .003	74....	5 2461...	8902...	369.6...	369.6...	1 H1-1...
61	M105	1.625" O...	.083	52.... 20 .002	52....	5 4569...	8902...	369.6...	369.6...	1 H1-1...
62	M106	2.875" O...	.130	52.... 1 .024	52....	1 33696...	38204...	2765...	2765...	1 H1-1b
63	M107	2.875" O...	.120	0 1 .027	0	11 33696...	38204...	2765...	2765...	1 H1-1b
64	M108	2.875" O...	.113	0 11 .021	0	11 33696...	38204...	2765...	2765...	1 H1-1b
65	M109	2.875" O...	.122	28.... 1 .027	66....	11 33595...	38204...	2765...	2765...	1 H1-1b
66	M110	1.625" O...	.511	20.... 1 .040	48	8 5137...	8902...	369.6...	369.6...	1 H1-1a
67	M111	1.625" O...	.508	0 1 .041	0	5 5137...	8902...	369.6...	369.6...	1 H1-1a
68	M112	1.625" O...	.548	60 1 .044	60	11 3771...	8902...	369.6...	369.6...	1 H1-1a
69	M113	1.625" O...	.482	0 1 .049	0	11 3771...	8902...	369.6...	369.6...	1 H1-1a
70	M114	1.625" O...	.703	48 1 .055	48	11 5137...	8902...	369.6...	369.6...	1 H1-1b
71	M115	1.625" O...	.611	17.... 1 .044	48	11 5137...	8902...	369.6...	369.6...	1 H1-1a
72	M117	PLATE1...	.856	0 1 .332	0 y	1 3091...	10961...	23.887	799.2...	1 H1-1a
73	M118	1.625" O...	.618	30.... 1 .001	0	6 3353...	8902...	369.6...	369.6...	1 H1-1a
74	M119	PLATE1...	.829	2.75 1 .331	0 y	1 3154...	10961...	23.887	799.2...	1 H1-1a
75	M120	PLATE1...	.577	0 6 .231	0 y	6 3154...	10961...	23.887	799.2...	1 H1-1a
76	M121	1.625" O...	.432	33.... 6 .001	0	11 3353...	8902...	369.6...	369.6...	1 H1-1a
77	M122	PLATE1...	.596	2.8.... 6 .232	2.8.... y	6 3091...	10961...	23.887	799.2...	1 H1-1a
78	M123	2.875" O...	.086	22.... 11 .022	52....	1 30889...	38204...	2765...	2765...	1 H1-1b
79	M124	2.875" O...	.132	27.... 1 .020	0	11 30889...	38204...	2765...	2765...	1 H1-1b
80	M125	1.625" O...	.158	0 1 .000	0	6 7919...	8902...	369.6...	369.6...	1 H1-1...
81	M126	1.625" O...	.049	0 1 .002	0	18 5572...	8902...	369.6...	369.6...	1 H1-1...
82	M127	1.625" O...	.188	0 20 .003	0	11 2641...	8902...	369.6...	369.6...	1 H1-1...
83	M128	1.625" O...	.109	0 18 .003	0	18 5572...	8902...	369.6...	369.6...	1 H1-1...
84	M129	1.625" O...	.117	0 18 .002	0	11 7919...	8902...	369.6...	369.6...	1 H1-1...
85	M130	1.625" O...	.176	52.... 18 .002	52....	11 4569...	8902...	369.6...	369.6...	1 H1-1...
86	M131	1.625" O...	.236	38.... 12 .003	74....	11 2461...	8902...	369.6...	369.6...	1 H1-1a
87	M132	1.625" O...	.428	38.... 1 .002	0	6 2461...	8902...	369.6...	369.6...	1 H1-1a
88	M133	1.625" O...	.096	52.... 1 .001	0	11 4569...	8902...	369.6...	369.6...	1 H1-1...
89	M134	2.875" O...	.112	52.... 1 .021	52....	1 33696...	38204...	2765...	2765...	1 H1-1b
90	M135	2.875" O...	.122	37.... 1 .027	0	1 33595...	38204...	2765...	2765...	1 H1-1b
91	M136	2.875" O...	.128	0 1 .023	0	1 33696...	38204...	2765...	2765...	1 H1-1b
92	M137	2.875" O...	.125	28.... 11 .027	66....	11 33595...	38204...	2765...	2765...	1 H1-1b
93	M138	1.625" O...	.607	30.... 1 .041	48	4 5137...	8902...	369.6...	369.6...	1 H1-1a
94	M139	1.625" O...	.706	0 1 .052	0	1 5137...	8902...	369.6...	369.6...	1 H1-1b
95	M140	1.625" O...	.477	60 1 .046	60	1 3771...	8902...	369.6...	369.6...	1 H1-1a
96	M141	1.625" O...	.539	0 1 .045	0	11 3771...	8902...	369.6...	369.6...	1 H1-1a
97	M143	1.625" O...	.598	0 18 .038	0	8 5137...	8902...	369.6...	369.6...	1 H1-1a
98	M144	3" O.D. x...	.917	192 6 .208	192	6 39346...	39447...	2987...	2987...	1 H1-1b
99	M151	2.875" O...	.070	22.... 1 .021	52....	1 30889...	38204...	2765...	2765...	1 H1-1b
100	M152	2.875" O...	.072	30.... 1 .021	0	1 30889...	38204...	2765...	2765...	1 H1-1b
101	M162	2.875" O...	.109	52.... 1 .022	52....	1 33696...	38204...	2765...	2765...	1 H1-1b
102	M163	2.875" O...	.111	0 1 .028	0	1 33696...	38204...	2765...	2765...	1 H1-1b
103	M164	2.875" O...	.107	0 1 .022	0	1 33696...	38204...	2765...	2765...	1 H1-1b
104	M165	2.875" O...	.110	66.... 1 .027	66....	1 33696...	38204...	2765...	2765...	1 H1-1b
105	M169A	3" O.D. x...	.784	192 6 .183	192	6 39346...	39447...	2987...	2987...	1 H1-1b
106	M170A	3" O.D. x...	.617	192 12 .024	0	18 9742...	39447...	2987...	2987...	1 H1-1a
107	M171A	3" O.D. x...	.892	192 6 .209	192	6 39346...	39447...	2987...	2987...	1 H1-1b
108	M172	3" O.D. x...	.689	0 15 .057	0	15 36485...	39447...	2987...	2987...	1 H1-1b
109	M173	3" O.D. x...	.632	192 6 .045	192	6 36485...	39447...	2987...	2987...	1 H1-1b
110	M174	PLATE1...	.232	0 5 .117	0 y	5 3091...	10961...	23.887	799.2...	1 H1-1b
111	M175	1.625" O...	.215	30.... 5 .001	63....	5 3353...	8902...	369.6...	369.6...	1 H1-1a
112	M176	PLATE1...	.222	2.75 5 .116	0 y	5 3154...	10961...	23.887	799.2...	1 H1-1b
113	M177	PLATE1...	.124	0 20 .085	0 y	20 3154...	10961...	23.887	799.2...	1 H1-1b

Nov 5, 2018
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	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o....	Pnt/o....	Mnyv/....	Mnzz/.....	Egn	
114	M178	1.625" O...	.075	63....11	.001	63....	6	3353....	8902....	369.6....	369.6....	H1-1...
115	M179	PLATE1...	.129	2.8....20	.085	0	y	203091....	10961....	23.887...	799.2....	H1-1b
116	M180	2.875" O...	.150	26.7 1	.021	52....	11	30889....	38204....	2765....	2765....	H1-1b
117	M181	2.875" O...	.150	26....1	.020	0	11	30889....	38204....	2765....	2765....	H1-1b
118	M182	1.625" O...	.058	0 17	.002	0	6	7919....	8902....	369.6....	369.6....	1 H1-1...
119	M183	1.625" O...	.042	0 15	.002	0	5	5572....	8902....	369.6....	369.6....	1 H1-1...
120	M184	1.625" O...	.203	0 20	.013	0	5	2641....	8902....	369.6....	369.6....	1 H1-1a
121	M185	1.625" O...	.025	44....13	.008	0	5	5572....	8902....	369.6....	369.6....	1 H1-1b
122	M186	1.625" O...	.030	22....8	.010	0	5	7919....	8902....	369.6....	369.6....	1 H1-1b
123	M187	1.625" O...	.128	52....13	.004	0	5	4569....	8902....	369.6....	369.6....	H1-1...
124	M188	1.625" O...	.456	38....1	.008	0	5	2461....	8902....	369.6....	369.6....	H1-1a
125	M189	1.625" O...	.456	38....1	.002	0	5	2461....	8902....	369.6....	369.6....	H1-1a
126	M190	1.625" O...	.128	52....13	.002	52....	6	4569....	8902....	369.6....	369.6....	H1-1...
127	M191	2.875" O...	.135	52....1	.025	52....	11	33696....	38204....	2765....	2765....	H1-1b
128	M192	2.875" O...	.130	38....11	.029	0	11	33595....	38204....	2765....	2765....	H1-1b
129	M193	2.875" O...	.135	0 1	.025	0	11	33696....	38204....	2765....	2765....	H1-1b
130	M194	2.875" O...	.128	28....1	.028	66....	11	33595....	38204....	2765....	2765....	H1-1b
131	M195	1.625" O...	.565	21....1	.041	48	8	5137....	8902....	369.6....	369.6....	H1-1a
132	M196	1.625" O...	.579	0 11	.041	0	5	5137....	8902....	369.6....	369.6....	H1-1a
133	M197	1.625" O...	.578	60 1	.043	60	5	3771....	8902....	369.6....	369.6....	H1-1a
134	M198	1.625" O...	.578	0 1	.047	0	5	3771....	8902....	369.6....	369.6....	H1-1a
135	M199	1.625" O...	.552	48 1	.040	0	4	5137....	8902....	369.6....	369.6....	H1-1a
136	M200	1.625" O...	.565	26....1	.045	0	4	5137....	8902....	369.6....	369.6....	H1-1a
137	M201	3" O.D. x...	.839	0 15	.063	0	15	36485....	39447....	2987....	2987....	H1-1b
138	M202	3" O.D. x...	.804	192 6	.052	192	6	36485....	39447....	2987....	2987....	H1-1b
139	M203	PLATE1...	.178	0 5	.090	0	y	53091....	10961....	23.887...	799.2....	H1-1b
140	M204	1.625" O...	.160	0 5	.001	0	5	3353....	8902....	369.6....	369.6....	H1-1...
141	M205	PLATE1...	.170	2.75 5	.089	0	y	53154....	10961....	23.887...	799.2....	H1-1b
142	M206	PLATE1...	.133	0 19	.091	0	y	193154....	10961....	23.887...	799.2....	H1-1b
143	M207	1.625" O...	.098	63....9	.001	63....	6	3353....	8902....	369.6....	369.6....	H1-1...
144	M208	PLATE1...	.138	2.8....19	.091	0	y	193091....	10961....	23.887...	799.2....	H1-1b
145	M209	2.875" O...	.149	26.7 1	.021	52....	11	30889....	38204....	2765....	2765....	H1-1b
146	M210	2.875" O...	.150	26....1	.020	0	11	30889....	38204....	2765....	2765....	H1-1b
147	M211											



Company : Vectro Structural Engineering
 Designer : FCG
 Job Number : U3024-001-181
 Model Name : JohnDay Greenhouse

Nov 5, 2018
 4:09 PM
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Envelope AISC 14th(360-10): ASD Steel Code Checks (Continued)

Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/...	Eqn		
171	M235	1.625" O...	.627	33...11	.001	63...	6	3353...	8902...	369.6...	369.6...	H1-1a
172	M236	PLATE1...	.871	2.8...11	.340	2.8...y	11	3091...	10961...	23.887	799.2...	H1-1a
173	M237	2.875" O...	.138	26...1	.021	52...	11	30889...	38204...	2765...	2765...	H1-1b
174	M238	2.875" O...	.083	29...1	.022	0	11	30889...	38204...	2765...	2765...	H1-1b
175	M239	1.625" O...	.050	0 17	.002	0	6	7919...	8902...	369.6...	369.6...	1 H1-1...
176	M240	1.625" O...	.031	0 15	.003	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
177	M241	1.625" O...	.173	0 16	.011	0	5	2641...	8902...	369.6...	369.6...	1 H1-1...
178	M242	1.625" O...	.052	0 12	.008	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
179	M243	1.625" O...	.161	0 11	.009	0	5	7919...	8902...	369.6...	369.6...	1 H1-1...
180	M244	1.625" O...	.127	52...1	.003	52...	5	4569...	8902...	369.6...	369.6...	H1-1...
181	M245	1.625" O...	.456	38...1	.008	0	5	2461...	8902...	369.6...	369.6...	H1-1a
182	M246	1.625" O...	.139	74...1	.002	74...	5	2461...	8902...	369.6...	369.6...	H1-1...
183	M247	1.625" O...	.077	52...20	.002	0	6	4569...	8902...	369.6...	369.6...	H1-1...
184	M248	2.875" O...	.130	52...1	.024	52...	11	33696...	38204...	2765...	2765...	H1-1b
185	M249	2.875" O...	.120	0 1	.028	0	11	33696...	38204...	2765...	2765...	H1-1b
186	M250	2.875" O...	.112	0 1	.021	0	11	33696...	38204...	2765...	2765...	H1-1b
187	M251	2.875" O...	.122	28...1	.028	66...	11	33595...	38204...	2765...	2765...	H1-1b
188	M252	1.625" O...	.510	20...1	.040	48	8	5137...	8902...	369.6...	369.6...	H1-1a
189	M253	1.625" O...	.506	0 1	.040	0	5	5137...	8902...	369.6...	369.6...	H1-1a
190	M254	1.625" O...	.549	60 1	.044	60	11	3771...	8902...	369.6...	369.6...	H1-1a
191	M255	1.625" O...	.481	0 1	.050	0	11	3771...	8902...	369.6...	369.6...	H1-1a
192	M256	1.625" O...	.709	48 1	.057	48	11	5137...	8902...	369.6...	369.6...	H1-1b
193	M257	1.625" O...	.614	16...1	.045	48	11	5137...	8902...	369.6...	369.6...	H1-1a
194	M258	3" O.D. x...	.780	192 6	.051	192	6	36485...	39447...	2987...	2987...	H1-1b
195	M259	PLATE1...	.863	0 1	.335	0 y	1	3091...	10961...	23.887	799.2...	H1-1a
196	M260	1.625" O...	.623	30...1	.001	0	11	3353...	8902...	369.6...	369.6...	H1-1a
197	M261	PLATE1...	.835	2.75 1	.333	0 y	1	3154...	10961...	23.887	799.2...	H1-1a
198	M262	PLATE1...	.134	0 19	.092	0 y	19	3154...	10961...	23.887	799.2...	H1-1b
199	M263	1.625" O...	.088	63...9	.001	63...	11	3353...	8902...	369.6...	369.6...	H1-1...
200	M264	PLATE1...	.139	2.8...19	.092	0 y	19	3091...	10961...	23.887	799.2...	H1-1b
201	M265	2.875" O...	.096	23...11	.021	52...	1	30889...	38204...	2765...	2765...	H1-1b
202	M266	2.875" O...	.138	26.7 1	.019	0	11	30889...	38204...	2765...	2765...	H1-1b
203	M267	1.625" O...	.160	0 1	.000	0	6	7919...	8902...	369.6...	369.6...	1 H1-1...
204	M268	1.625" O...	.050	0 1	.003	0	18	5572...	8902...	369.6...	369.6...	1 H1-1...
205	M269	1.625" O...	.167	0 20	.004	0	11	2641...	8902...	369.6...	369.6...	1 H1-1...
206	M270	1.625" O...	.026	44...13	.003	0	18	5572...	8902...	369.6...	369.6...	1 H1-1b
207	M271	1.625" O...	.031	22...8	.003	0	11	7919...	8902...	369.6...	369.6...	1 H1-1b
208	M272	1.625" O...	.106	52...18	.002	52...	11	4569...	8902...	369.6...	369.6...	H1-1...
209	M273	1.625" O...	.181	74...12	.003	0	11	2461...	8902...	369.6...	369.6...	H1-1...
210	M274	1.625" O...	.460	38...1	.003	0	6	2461...	8902...	369.6...	369.6...	H1-1a
211	M275	1.625" O...	.139	52...13	.001	52...	11	4569...	8902...	369.6...	369.6...	H1-1...
212	M276	2.875" O...	.116	52...11	.021	52...	11	33696...	38204...	2765...	2765...	H1-1b
213	M277	2.875" O...	.124	37...11	.027	0	1	33595...	38204...	2765...	2765...	H1-1b
214	M278	2.875" O...	.130	0 1	.024	0	11	33696...	38204...	2765...	2765...	H1-1b
215	M279	2.875" O...	.120	66...1	.027	66...	11	33696...	38204...	2765...	2765...	H1-1b
216	M280	1.625" O...	.616	31...1	.040	0	1	5137...	8902...	369.6...	369.6...	H1-1a
217	M281	1.625" O...	.712	0 1	.052	0	1	5137...	8902...	369.6...	369.6...	H1-1b
218	M282	1.625" O...	.493	60 11	.046	60	1	3771...	8902...	369.6...	369.6...	H1-1a
219	M283	1.625" O...	.551	0 1	.043	0	11	3771...	8902...	369.6...	369.6...	H1-1a
220	M284	1.625" O...	.525	48 11	.037	0	7	5137...	8902...	369.6...	369.6...	H1-1a
221	M285	1.625" O...	.522	26...11	.041	0	7	5137...	8902...	369.6...	369.6...	H1-1a
222	M286	3" O.D. x...	.701	192 11	.023	0	18	9742...	39447...	2987...	2987...	H1-1a
223	M287	3" O.D. x...	.786	0 18	.060	0	15	36485...	39447...	2987...	2987...	H1-1b
224	M288	PLATE1...	.211	0 5	.106	0 y	5	3091...	10961...	23.887	799.2...	H1-1b
225	M289	1.625" O...	.190	0 5	.001	0	5	3353...	8902...	369.6...	369.6...	H1-1...
226	M290	PLATE1...	.202	2.75 5	.105	0 y	5	3154...	10961...	23.887	799.2...	H1-1b
227	M291	PLATE1...	.826	0 1	.329	0 y	1	3154...	10961...	23.887	799.2...	H1-1a



Company : Vectro Structural Engineering
 Designer : FCG
 Job Number : U3024-001-181
 Model Name : JohnDay Greenhouse

Nov 5, 2018
4:09 PM
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Envelope AISC 14th(360-10): ASD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o....	Pnt/o....	Mnyv/....	Mnz/.....	Eqn	
228	M292	1.625" O...	.617	33....1	.001	63....	6	3353....	8902....	369.6....	369.6....	H1-1a
229	M293	PLATE1...	.854	2.8....1	.331	2.8....	y 1	3091....	10961....	23.887...	799.2....	H1-1a
230	M294	2.875" O...	.137	26....1	.021	52....	11	30889....	38204....	2765....	2765....	H1-1b
231	M295	2.875" O...	.083	29....1	.022	0	11	30889....	38204....	2765....	2765....	H1-1b
232	M296	1.625" O...	.052	0 17	.002	0	6	7919....	8902....	369.6....	369.6....	1 H1-1...
233	M297	1.625" O...	.031	0 15	.003	0	5	5572....	8902....	369.6....	369.6....	1 H1-1...
234	M298	1.625" O...	.168	0 20	.010	0	5	2641....	8902....	369.6....	369.6....	1 H1-1...
235	M299	1.625" O...	.049	0 1	.007	0	5	5572....	8902....	369.6....	369.6....	1 H1-1...
236	M300	1.625" O...	.158	0 1	.009	0	5	7919....	8902....	369.6....	369.6....	1 H1-1...
237	M301	1.625" O...	.130	52....12	.003	52....	5	4569....	8902....	369.6....	369.6....	H1-1...
238	M302	1.625" O...	.455	38....1	.008	74....	5	2461....	8902....	369.6....	369.6....	H1-1a
239	M303	1.625" O...	.152	74....11	.002	74....	5	2461....	8902....	369.6....	369.6....	H1-1...
240	M304	1.625" O...	.079	52....20	.002	0	6	4569....	8902....	369.6....	369.6....	H1-1...
241	M305	2.875" O...	.130	52....1	.024	52....	1	33696....	38204....	2765....	2765....	H1-1b
242	M306	2.875" O...	.120	0 1	.028	0	11	33696....	38204....	2765....	2765....	H1-1b
243	M307	2.875" O...	.112	0 1	.021	0	11	33696....	38204....	2765....	2765....	H1-1b
244	M308	2.875" O...	.122	28....1	.028	66....	11	33595....	38204....	2765....	2765....	H1-1b
245	M309	1.625" O...	.510	20....1	.040	48	8	5137....	8902....	369.6....	369.6....	H1-1a
246	M310	1.625" O...	.507	0 1	.040	0	5	5137....	8902....	369.6....	369.6....	H1-1a
247	M311	1.625" O...	.549	60 1	.044	60	11	3771....	8902....	369.6....	369.6....	H1-1a
248	M312	1.625" O...	.481	0 1	.050	0	11	3771....	8902....	369.6....	369.6....	H1-1a
249	M313	1.625" O...	.707	48 1	.056	48	11	5137....	8902....	369.6....	369.6....	H1-1b
250	M314	1.625" O...	.613	17....1	.044	48	11	5137....	8902....	369.6....	369.6....	H1-1a
251	M315	3" O.D. x...	.814	192 6	.052	192	6	36485....	39447....	2987....	2987....	H1-1b
252	M316	PLATE1...	.863	0 1	.335	0	y 1	3091....	10961....	23.887...	799.2....	H1-1a
253	M317	1.625" O...	.623	30....1	.001	63....	11	3353....	8902....	369.6....	369.6....	H1-1a
254	M318	PLATE1...	.835	2.75 1	.333	0	y 1	3154....	10961....	23.887...	799.2....	H1-1a
255	M319	PLATE1...	.132	0 19	.090	0	y 1	93154....	10961....	23.887...	799.2....	H1-1b
256	M320	1.625" O...	.082	63....9	.001	0	11	3353....	8902....	369.6....	369.6....	H1-1...
257	M321	PLATE1...	.137	2.8....19	.090	0	y 1	93091....	10961....	23.887...	799.2....	H1-1b
258	M322	2.875" O...	.089	22....11	.021	52....	1	30889....	38204....	2765....	2765....	H1-1b
259	M323	2.875" O...	.139	26.7 1	.019	0	11	30889....	38204....	2765....	2765....	H1-1b
260	M324	1.625" O...	.160	0 1	.000	0	6	7919....	8902....	369.6....	369.6....	1 H1-1...
261	M325	1.625" O...	.050	0 1	.002	0	18	5572....	8902....	369.6....	369.6....	1 H1-1...
262	M326	1.625" O...	.166	0 20	.003	0	11	2641....	8902....	369.6....	369.6....	1 H1-1...
263	M327	1.625" O...	.026	44....13	.003	0	18	5572....	8902....	369.6....	369.6....	1 H1-1b
264	M328	1.625" O...	.031	22....8	.003	0	11	7919....	8902....	369.6....	369.6....	1 H1-1b
265	M329	1.625" O...	.157	52....18	.002	52....	11	4569....	8902....	369.6....	369.6....	H1-1...
266	M330	1.625" O...	.223	38....12	.003	0	11	2461....	8902....	369.6....	369.6....	H1-1a
267	M331	1.625" O...	.461	38....1	.002	74....	6	2461....	8902....	369.6....	369.6....	H1-1a
268	M332	1.625" O...	.140	52....13	.001	52....	11	4569....	8902....	369.6....	369.6....	H1-1...
269	M333	2.875" O...	.112	52....1	.021	52....	1	33696....	38204....	2765....	2765....	H1-1b
270	M334	2.875" O...	.122	37....1	.027	0	1	33595....	38204....	2765....	2765....	H1-1b
271	M335	2.875" O...	.130	0 1	.024	0	1	33696....	38204....	2765....	2765....	H1-1b
272	M336	2.875" O...	.120	66....11	.027	66....	11	33696....	38204....	2765....	2765....	H1-1b
273	M337	1.625" O...	.614	31....1	.041	48	4	5137....	8902....	369.6....	369.6....	H1-1a
274	M338	1.625" O...	.711	0 1	.052	0	1	5137....	8902....	369.6....	369.6....	H1-1b
275	M339	1.625" O...	.480	60 1	.046	60	1	3771....	8902....	369.6....	369.6....	H1-1a
276	M340	1.625" O...	.550	0 1	.043	0	11	3771....	8902....	369.6....	369.6....	H1-1a
277	M341	1.625" O...	.502	48 1	.037	0	7	5137....	8902....	369.6....	369.6....	H1-1a
278	M342	1.625" O...	.509	27....1	.041	0	7	5137....	8902....	369.6....	369.6....	H1-1a
279	M343	3" O.D. x...	.696	192 12	.026	0	18	9742....	39447....	2987....	2987....	H1-1a
280	M344	3" O.D. x...	.846	0 18	.060	0	15	36485....	39447....	2987....	2987....	H1-1b
281	M345	PLATE1...	.216	0 5	.108	0	y 5	3091....	10961....	23.887...	799.2....	H1-1b
282	M346	1.625" O...	.195	0 5	.001	0	5	3353....	8902....	369.6....	369.6....	H1-1...
283	M347	PLATE1...	.207	2.75 5	.107	0	y 5	3154....	10961....	23.887...	799.2....	H1-1b
284	M348	PLATE1...	.763	0 1	.304	0	y 1	3154....	10961....	23.887...	799.2....	H1-1...



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 Job Number : U3024-001-181
 Model Name : JohnDay Greenhouse

Nov 5, 2018
 4:09 PM
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Envelope AISC 14th(360-10): ASD Steel Code Checks (Continued)

Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/...	Eqn		
285	M349	1.625" O...	.570	33...1	.001	0	6	3353...	8902...	369.6...	369.6...	H1-1a
286	M350	PLATE1...	.788	2.8...1	.306	2.8...y	1	3091...	10961...	23.887	799.2...	H1-1a
287	M351	2.875" O...	.139	26...1	.020	52...	11	30889...	38204...	2765...	2765...	H1-1b
288	M352	2.875" O...	.093	29...11	.021	0	11	30889...	38204...	2765...	2765...	H1-1b
289	M353	1.625" O...	.053	0 17	.001	0	6	7919...	8902...	369.6...	369.6...	1 H1-1...
290	M354	1.625" O...	.030	0 15	.003	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
291	M355	1.625" O...	.171	0 20	.008	0	5	2641...	8902...	369.6...	369.6...	1 H1-1...
292	M356	1.625" O...	.039	0 1	.007	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
293	M357	1.625" O...	.144	0 1	.008	0	5	7919...	8902...	369.6...	369.6...	1 H1-1...
294	M358	1.625" O...	.140	52...12	.002	0	5	4569...	8902...	369.6...	369.6...	H1-1a
295	M359	1.625" O...	.455	38...1	.007	74...	5	2461...	8902...	369.6...	369.6...	H1-1a
296	M360	1.625" O...	.175	74...11	.003	0	5	2461...	8902...	369.6...	369.6...	H1-1a
297	M361	1.625" O...	.072	52...20	.002	0	5	4569...	8902...	369.6...	369.6...	H1-1a
298	M362	2.875" O...	.131	52...1	.024	52...	1	33696...	38204...	2765...	2765...	H1-1b
299	M363	2.875" O...	.120	0 1	.027	0	1	33696...	38204...	2765...	2765...	H1-1b
300	M364	2.875" O...	.119	0 11	.021	0	11	33696...	38204...	2765...	2765...	H1-1b
301	M365	2.875" O...	.127	28...11	.027	66...	11	33595...	38204...	2765...	2765...	H1-1b
302	M366	1.625" O...	.515	20...1	.041	48	8	5137...	8902...	369.6...	369.6...	H1-1a
303	M367	1.625" O...	.510	0 1	.040	0	5	5137...	8902...	369.6...	369.6...	H1-1a
304	M368	1.625" O...	.552	60 1	.044	60	11	3771...	8902...	369.6...	369.6...	H1-1a
305	M369	1.625" O...	.489	0 1	.049	0	11	3771...	8902...	369.6...	369.6...	H1-1a
306	M370	1.625" O...	.680	48 1	.054	48	11	5137...	8902...	369.6...	369.6...	H1-1b
307	M371	1.625" O...	.607	17...1	.043	48	11	5137...	8902...	369.6...	369.6...	H1-1a
308	M372	PLATE1...	.791	0 1	.307	0 y	1	3091...	10961...	23.887	799.2...	H1-1a
309	M373	1.625" O...	.571	30...1	.001	63...	6	3353...	8902...	369.6...	369.6...	H1-1a
310	M374	PLATE1...	.765	2.75 1	.305	0 y	1	3154...	10961...	23.887	799.2...	H1-1a
311	M375	PLATE1...	.796	0 11	.318	0 y	11	3154...	10961...	23.887	799.2...	H1-1a
312	M376	1.625" O...	.594	33...11	.001	0	11	3353...	8902...	369.6...	369.6...	H1-1a
313	M377	PLATE1...	.823	2.8...11	.320	2.8...y	11	3091...	10961...	23.887	799.2...	H1-1a
314	M378	2.875" O...	.083	22...11	.022	52...	1	30889...	38204...	2765...	2765...	H1-1b
315	M379	2.875" O...	.078	30...1	.022	0	11	30889...	38204...	2765...	2765...	H1-1b
316	M380	1.625" O...	.144	0 1	.000	0	1	7919...	8902...	369.6...	369.6...	1 H1-1...
317	M381	1.625" O...	.039	0 1	.001	0	18	5572...	8902...	369.6...	369.6...	1 H1-1...
318	M382	1.625" O...	.139	0 20	.003	0	15	2641...	8902...	369.6...	369.6...	1 H1-1...
319	M383	1.625" O...	.046	0 12	.003	0	18	5572...	8902...	369.6...	369.6...	1 H1-1...
320	M384	1.625" O...	.151	0 11	.002	0	15	7919...	8902...	369.6...	369.6...	1 H1-1...
321	M385	1.625" O...	.175	52...18	.001	0	11	4569...	8902...	369.6...	369.6...	H1-1a
322	M386	1.625" O...	.256	38...12	.003	0	18	2461...	8902...	369.6...	369.6...	H1-1a
323	M387	1.625" O...	.165	74...1	.002	0	6	2461...	8902...	369.6...	369.6...	H1-1a
324	M388	1.625" O...	.070	52...20	.001	0	11	4569...	8902...	369.6...	369.6...	H1-1a
325	M389	2.875" O...	.109	52...1	.021	52...	1	33696...	38204...	2765...	2765...	H1-1b
326	M390	2.875" O...	.115	38...1	.027	0	1	33595...	38204...	2765...	2765...	H1-1b
327	M391	2.875" O...	.109	0 11	.021	0	1	33696...	38204...	2765...	2765...	H1-1b
328	M392	2.875" O...	.115	28...11	.027	66...	11	33595...	38204...	2765...	2765...	H1-1b
329	M393	1.625" O...	.555	30...1	.041	48	4	5137...	8902...	369.6...	369.6...	H1-1a
330	M394	1.625" O...	.663	0 1	.051	0	1	5137...	8902...	369.6...	369.6...	H1-1b
331	M395	1.625" O...	.407	60 1	.046	60	1	3771...	8902...	369.6...	369.6...	H1-1b
332	M396	1.625" O...	.462	0 6	.047	0	11	3771...	8902...	369.6...	369.6...	H1-1a
333	M397	1.625" O...	.662	48 1	.052	48	11	5137...	8902...	369.6...	369.6...	H1-1b
334	M398	1.625" O...	.555	18...1	.040	48	11	5137...	8902...	369.6...	369.6...	H1-1a
335	M399	3" O.D. x...	.896	192 6	.055	192	6	36485...	39447...	2987...	2987...	H1-1b
336	M400	PLATE1...	.791	0 1	.307	0 y	1	3091...	10961...	23.887	799.2...	H1-1a
337	M401	1.625" O...	.571	30...1	.001	63...	5	3353...	8902...	369.6...	369.6...	H1-1a
338	M402	PLATE1...	.765	2.75 1	.305	0 y	1	3154...	10961...	23.887	799.2...	H1-1a
339	M403	PLATE1...	.132	0 20	.090	0 y	20	3154...	10961...	23.887	799.2...	H1-1b
340	M404	1.625" O...	.095	63...9	.001	63...	5	3353...	8902...	369.6...	369.6...	H1-1a
341	M405	PLATE1...	.137	2.8...20	.090	0 y	20	3091...	10961...	23.887	799.2...	H1-1b

Nov 5, 2018
4:09 PM
Checked By: KGS

	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyv/...	Mnz/.....	Eqn
342	M406	2.875" O...	.101	23....11	.021	52....	1 30889...	38204...	2765....	2765....	H1-1b
343	M407	2.875" O...	.139	26.7 1	.019	0	1130889...	38204...	2765....	2765....	H1-1b
344	M408	1.625" O...	.144	0 1	.001	0	127919....	8902....	369.6...	369.6...	1 H1-1...
345	M409	1.625" O...	.039	0 1	.004	0	175572....	8902....	369.6...	369.6...	1 H1-1...
346	M410	1.625" O...	.170	0 20	.007	0	5 2641....	8902....	369.6...	369.6...	1 H1-1...
347	M411	1.625" O...	.032	0 18	.006	0	5 5572....	8902....	369.6...	369.6...	1 H1-1...
348	M412	1.625" O...	.031	22....8	.007	0	5 7919....	8902....	369.6...	369.6...	1 H1-1b
349	M413	1.625" O...	.122	52....18	.002	52....	5 4569....	8902....	369.6...	369.6...	H1-1...
350	M414	1.625" O...	.225	38....12	.007	0	5 2461....	8902....	369.6...	369.6...	H1-1a
351	M415	1.625" O...	.456	38....1	.003	74....	5 2461....	8902....	369.6...	369.6...	H1-1a
352	M416	1.625" O...	.134	52....13	.002	52....	5 4569....	8902....	369.6...	369.6...	H1-1...
353	M417	2.875" O...	.119	52....11	.021	52....	1 33696...	38204...	2765....	2765....	H1-1b
354	M418	2.875" O...	.126	37....11	.027	0	1 33595...	38204...	2765....	2765....	H1-1b
355	M419	2.875" O...	.131	0 1	.024	0	1 33696...	38204...	2765....	2765....	H1-1b
356	M420	2.875" O...	.120	66....1	.027	66....	1 33696...	38204...	2765....	2765....	H1-1b
357	M421	1.625" O...	.607	30....1	.041	48	4 5137....	8902....	369.6...	369.6...	H1-1a
358	M422	1.625" O...	.681	0 1	.050	0	1 5137....	8902....	369.6...	369.6...	H1-1b
359	M423	1.625" O...	.498	60 11	.045	60	1 3771....	8902....	369.6...	369.6...	H1-1a
360	M424	1.625" O...	.552	0 1	.046	0	113771....	8902....	369.6...	369.6...	H1-1a
361	M425	1.625" O...	.526	48 11	.039	48	3 5137....	8902....	369.6...	369.6...	H1-1a
362	M426	1.625" O...	.525	26....11	.043	0	4 5137....	8902....	369.6...	369.6...	H1-1a
363	M427	3" O.D. x...	.736	192 12	.030	0	189742....	39447...	2987....	2987....	H1-1a
364	M428	3" O.D. x...	.765	192 12	.029	0	6 9742....	39447...	2987....	2987....	H1-1a
365	M429	3" O.D. x...	.853	0 18	.060	0	1536485...	39447...	2987....	2987....	H1-1b
366	M430	PLATE1...	.209	0 5	.105	0 y	5 3091....	10961...	23.887	799.2...	H1-1b
367	M431	1.625" O...	.189	0 5	.001	0	5 3353....	8902....	369.6...	369.6...	H1-1...
368	M432	PLATE1...	.200	2.75 5	.104	0 y	5 3154....	10961...	23.887	799.2...	H1-1b
369	M433	PLATE1...	.764	0 1	.305	0 y	1 3154....	10961...	23.887	799.2...	H1-1a
370	M434	1.625" O...	.571	33....1	.001	63....	6 3353....	8902....	369.6...	369.6...	H1-1a
371	M435	PLATE1...	.790	2.8...1	.306	2.8...y	1 3091....	10961...	23.887	799.2...	H1-1a
372	M436	2.875" O...	.139	26....1	.020	52....	1130889...	38204...	2765....	2765....	H1-1b
373	M437	2.875" O...	.089	29....1	.021	0	1130889...	38204...	2765....	2765....	H1-1b
374	M438	1.625" O...	.052	0 17	.001	0	6 7919....	8902....	369.6...	369.6...	1 H1-1...
375	M439	1.625" O...	.029	0 15	.003	0	5 5572....	8902....	369.6...	369.6...	1 H1-1...
376	M440	1.625" O...	.171	0 20	.008	0	5 2641....	8902....	369.6...	369.6...	1

Nov 5, 2018
4:09 PM
Checked By: KGS

	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o.....	Pnt/o.....	Mnyy/.....	Mnzz/.....	Eqn
399	M463	2.875" O...	.085	22....11	.022	52....	1 30889...	38204...	2765....	2765....	H1-1b
400	M464	2.875" O...	.078	30....1	.021	0	1 30889...	38204...	2765....	2765....	H1-1b
401	M465	1.625" O...	.144	0 1	.000	0	1 7919....	8902....	369.6...	369.6...	1 H1-1...
402	M466	1.625" O...	.039	0 1	.001	0	185572....	8902....	369.6...	369.6...	1 H1-1...
403	M467	1.625" O...	.137	0 20	.004	0	182641....	8902....	369.6...	369.6...	1 H1-1...
404	M468	1.625" O...	.051	0 12	.003	0	185572....	8902....	369.6...	369.6...	1 H1-1...
405	M469	1.625" O...	.152	0 11	.003	0	187919....	8902....	369.6...	369.6...	1 H1-1...
406	M470	1.625" O...	.147	52....18	.002	52....	6 4569....	8902....	369.6...	369.6...	H1-1...
407	M471	1.625" O...	.238	38....12	.003	74....	182461....	8902....	369.6...	369.6...	H1-1a
408	M472	1.625" O...	.165	74....1	.002	74....	6 2461....	8902....	369.6...	369.6...	H1-1...
409	M473	1.625" O...	.073	52....20	.001	52....	6 4569....	8902....	369.6...	369.6...	H1-1...
410	M474	2.875" O...	.109	52....1	.021	52....	1 33696...	38204...	2765....	2765....	H1-1b
411	M475	2.875" O...	.115	38....1	.027	0	1 33595...	38204...	2765....	2765....	H1-1b
412	M476	2.875" O...	.109	0 1	.021	0	1 33696...	38204...	2765....	2765....	H1-1b
413	M477	2.875" O...	.115	28....11	.027	66....	1 33595...	38204...	2765....	2765....	H1-1b
414	M478	1.625" O...	.556	30....1	.041	48	4 5137....	8902....	369.6...	369.6...	H1-1a
415	M479	1.625" O...	.663	0 1	.051	0	1 5137....	8902....	369.6...	369.6...	H1-1b
416	M480	1.625" O...	.408	60 1	.046	60	1 3771....	8902....	369.6...	369.6...	H1-1b
417	M481	1.625" O...	.408	0 1	.047	0	113771....	8902....	369.6...	369.6...	H1-1b
418	M482	1.625" O...	.674	48 11	.052	48	115137....	8902....	369.6...	369.6...	H1-1b
419	M483	1.625" O...	.556	17....1	.040	48	115137....	8902....	369.6...	369.6...	H1-1a
420	M484	3" O.D. x...	.893	192 6	.055	192	6 36485...	39447...	2987....	2987....	H1-1b
421	M485	PLATE1...	.790	0 1	.307	0 y	1 3091....	10961...	23.887	799.2...	H1-1a
422	M486	1.625" O...	.571	30....1	.001	63....	5 3353....	8902....	369.6...	369.6...	H1-1a
423	M487	PLATE1...	.764	2.75 1	.305	0 y	1 3154....	10961...	23.887	799.2...	H1-1a
424	M488	PLATE1...	.133	0 20	.091	0 y	203154....	10961...	23.887	799.2...	H1-1b
425	M489	1.625" O...	.093	63....9	.001	0	5 3353....	8902....	369.6...	369.6...	H1-1...
426	M490	PLATE1...	.138	2.8...20	.091	0 y	203091....	10961...	23.887	799.2...	H1-1b
427	M491	2.875" O...	.090	23....11	.021	52....	1 30889...	38204...	2765....	2765....	H1-1b
428	M492	2.875" O...	.139	26.7 1	.019	0	1130889...	38204...	2765....	2765....	H1-1b
429	M493	1.625" O...	.144	0 1	.001	0	127919....	8902....	369.6...	369.6...	1 H1-1...
430	M494	1.625" O...	.039	0 1	.004	0	175572....	8902....	369.6...	369.6...	1 H1-1...
431	M495	1.625" O...	.168	0 20	.007	0	5 2641....	8902....	369.6...	369.6...	1 H1-1...
432	M496	1.625" O...	.031	0 18	.006	0	5 5572....	8902....	369.6...	369.6...	1 H1-1...
433	M497	1.625" O...	.031	22....8	.007	0	5 7919....	8902....	369.6...	369.6...	

Nov 5, 2018
4:09 PM
Checked By: KGS

Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyv/...	Mnz/.....	Eqn	
456	M520	PLATE1...	.821	2.8....11	.321	2.8....y	113091...	10961...	23.887	799.2....	H1-1a
457	M521	2.875" O...	.139	26....1	.019	52....	1130889...	38204...	2765....	2765....	H1-1b
458	M522	2.875" O...	.089	29....1	.021	0	1130889...	38204...	2765....	2765....	H1-1b
459	M523	1.625" O...	.055	0 17	.001	0	6 7919...	8902...	369.6...	369.6...	1 H1-1...
460	M524	1.625" O...	.034	0 15	.003	0	5 5572...	8902...	369.6...	369.6...	1 H1-1...
461	M525	1.625" O...	.191	0 16	.007	0	5 2641...	8902...	369.6...	369.6...	1 H1-1...
462	M526	1.625" O...	.063	0 12	.007	0	5 5572...	8902...	369.6...	369.6...	1 H1-1...
463	M527	1.625" O...	.150	0 11	.007	0	5 7919...	8902...	369.6...	369.6...	1 H1-1...
464	M528	1.625" O...	.130	52....13	.002	0	5 4569...	8902...	369.6...	369.6...	H1-1...
465	M529	1.625" O...	.457	38....1	.007	74....	5 2461...	8902...	369.6...	369.6...	H1-1a
466	M530	1.625" O...	.165	74....1	.003	0	5 2461...	8902...	369.6...	369.6...	H1-1...
467	M531	1.625" O...	.070	26....12	.002	52....	5 4569...	8902...	369.6...	369.6...	H1-1b
468	M532	2.875" O...	.131	52....1	.024	52....	1 33696...	38204...	2765....	2765....	H1-1b
469	M533	2.875" O...	.120	0 1	.027	0	1 33696...	38204...	2765....	2765....	H1-1b
470	M534	2.875" O...	.114	0 1	.021	0	1 33696...	38204...	2765....	2765....	H1-1b
471	M535	2.875" O...	.123	28....1	.027	66....	1133595...	38204...	2765....	2765....	H1-1b
472	M536	1.625" O...	.515	20....1	.040	48	8 5137...	8902...	369.6...	369.6...	H1-1a
473	M537	1.625" O...	.525	0 11	.039	0	5 5137...	8902...	369.6...	369.6...	H1-1a
474	M538	1.625" O...	.552	60 1	.044	60	113771...	8902...	369.6...	369.6...	H1-1a
475	M539	1.625" O...	.489	0 1	.050	0	113771...	8902...	369.6...	369.6...	H1-1a
476	M540	1.625" O...	.684	48 11	.056	48	115137...	8902...	369.6...	369.6...	H1-1b
477	M541	1.625" O...	.607	17....1	.044	48	115137...	8902...	369.6...	369.6...	H1-1a
478	M542	PLATE1...	.789	0 1	.306	0 y	1 3091...	10961...	23.887	799.2....	H1-1a
479	M543	1.625" O...	.570	30....1	.001	63....	6 3353...	8902...	369.6...	369.6...	H1-1a
480	M544	PLATE1...	.763	2.75 1	.305	0 y	1 3154...	10961...	23.887	799.2....	H1-1a
481	M545	PLATE1...	.856	0 11	.342	0 y	113154...	10961...	23.887	799.2....	H1-1a
482	M546	1.625" O...	.638	33....11	.001	0	6 3353...	8902...	369.6...	369.6...	H1-1a
483	M547	PLATE1...	.885	2.8....11	.344	2.8....y	113091...	10961...	23.887	799.2....	H1-1a
484	M548	2.875" O...	.081	22....11	.022	52....	1 30889...	38204...	2765....	2765....	H1-1b
485	M549	2.875" O...	.078	30....1	.021	0	1 30889...	38204...	2765....	2765....	H1-1b
486	M550	1.625" O...	.144	0 1	.000	0	1 7919...	8902...	369.6...	369.6...	1 H1-1...
487	M551	1.625" O...	.039	0 1	.001	0	155572...	8902...	369.6...	369.6...	1 H1-1...
488	M552	1.625" O...	.143	0 20	.005	0	182641...	8902...	369.6...	369.6...	1 H1-1...
489	M553	1.625" O...	.063	0 12	.003	0	185572...	8902...	369.6...	369.6...	1 H1-1...
490	M554	1.625" O...	.164	0 11	.004	0	187919...	8902...	369.6...	369.6...	1 H1-1...
491	M555	1.625" O...	.069								

Nov 5, 2018
4:09 PM
Checked By: KGS

Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/.....	Eqn		
513	M577	2.875" O...	.141	26.7 11	.019	0	1	30889...	38204...	2765...	2765...	H1-1b
514	M578	1.625" O...	.144	0 1	.001	0	12	7919...	8902...	369.6...	369.6...	1 H1-1...
515	M579	1.625" O...	.039	0 1	.003	0	17	5572...	8902...	369.6...	369.6...	1 H1-1...
516	M580	1.625" O...	.171	0 20	.008	0	5	2641...	8902...	369.6...	369.6...	1 H1-1...
517	M581	1.625" O...	.032	0 18	.006	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
518	M582	1.625" O...	.031	22... 8	.007	0	5	7919...	8902...	369.6...	369.6...	1 H1-1b
519	M583	1.625" O...	.067	52... 18	.002	52...	5	4569...	8902...	369.6...	369.6...	H1-1...
520	M584	1.625" O...	.180	74... 12	.007	74...	5	2461...	8902...	369.6...	369.6...	H1-1...
521	M585	1.625" O...	.455	38... 1	.003	74...	5	2461...	8902...	369.6...	369.6...	H1-1a
522	M586	1.625" O...	.132	52... 13	.002	0	5	4569...	8902...	369.6...	369.6...	H1-1...
523	M587	2.875" O...	.114	52... 1	.021	52...	1	33696...	38204...	2765...	2765...	H1-1b
524	M588	2.875" O...	.123	37... 1	.027	0	1	33595...	38204...	2765...	2765...	H1-1b
525	M589	2.875" O...	.132	0 11	.024	0	11	33696...	38204...	2765...	2765...	H1-1b
526	M590	2.875" O...	.123	28... 11	.027	66...	11	33595...	38204...	2765...	2765...	H1-1b
527	M591	1.625" O...	.622	29... 11	.040	48	8	5137...	8902...	369.6...	369.6...	H1-1a
528	M592	1.625" O...	.680	0 1	.050	0	11	5137...	8902...	369.6...	369.6...	H1-1b
529	M593	1.625" O...	.519	60 11	.045	60	11	3771...	8902...	369.6...	369.6...	H1-1a
530	M594	1.625" O...	.577	0 11	.046	0	5	3771...	8902...	369.6...	369.6...	H1-1a
531	M595	1.625" O...	.549	48 11	.039	48	3	5137...	8902...	369.6...	369.6...	H1-1a
532	M596	1.625" O...	.550	26... 11	.043	0	4	5137...	8902...	369.6...	369.6...	H1-1a
533	M597	3" O.D. x...	.720	192 12	.030	0	6	9742...	39447...	2987...	2987...	H1-1a
534	M598	3" O.D. x...	.724	192 12	.029	0	6	9742...	39447...	2987...	2987...	H1-1a
535	M599	3" O.D. x...	.824	0 18	.195	0	18	39346...	39447...	2987...	2987...	H1-1b
536	M606	2.875" O...	.072	22... 1	.021	52...	1	30889...	38204...	2765...	2765...	H1-1b
537	M607	2.875" O...	.070	30... 1	.021	0	1	30889...	38204...	2765...	2765...	H1-1b
538	M617	2.875" O...	.107	52... 1	.022	52...	1	33696...	38204...	2765...	2765...	H1-1b
539	M618	2.875" O...	.110	0 1	.028	0	1	33696...	38204...	2765...	2765...	H1-1b
540	M619	2.875" O...	.109	0 1	.022	0	1	33696...	38204...	2765...	2765...	H1-1b
541	M620	2.875" O...	.111	66... 1	.027	66...	1	33696...	38204...	2765...	2765...	H1-1b
542	M627	PLATE1...	.346	0 18	.230	2.8... y	18	3091...	10961...	23.887	799.2...	H1-1b
543	M628	1.625" O...	.098	0 1	.001	0	6	3353...	8902...	369.6...	369.6...	H1-1...
544	M629	PLATE1...	.333	2.75 18	.229	0 y	18	3154...	10961...	23.887	799.2...	H1-1b
545	M630	PLATE1...	.920	0 11	.367	0 y	11	3154...	10961...	23.887	799.2...	H1-1a
546	M631	1.625" O...	.685	33... 11	.001	0	11	3353...	8902...	369.6...	369.6...	H1-1a
547	M632											

Nov 5, 2018
4:09 PM
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	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o....	Pnt/o....	Mnvy/...	Mnz/.....	Eqn
570	M655	PLATE1...	.845	0 1	.328	0 y 1	3091....	10961....	23.887	799.2....	H1-1a
571	M656	1.625" O...	.610	30....1	.001	0 5	3353....	8902....	369.6...	369.6....	H1-1a
572	M657	PLATE1...	.817	2.75 1	.326	0 y 1	3154....	10961....	23.887	799.2....	H1-1a
573	M658	PLATE1...	.134	0 20	.092	0 y 20	3154....	10961....	23.887	799.2....	H1-1b
574	M659	1.625" O...	.075	63....9	.001	0 5	3353....	8902....	369.6...	369.6....	H1-1...
575	M660	PLATE1...	.139	2.8....20	.092	0 y 20	3091....	10961....	23.887	799.2....	H1-1b
576	M661	2.875" O...	.084	22....1	.021	52....1	30889....	38204....	2765....	2765....	H1-1b
577	M662	2.875" O...	.137	26.7 1	.019	0 1	30889....	38204....	2765....	2765....	H1-1b
578	M663	1.625" O...	.156	0 1	.001	0 12	7919....	8902....	369.6...	369.6....	1 H1-1...
579	M664	1.625" O...	.047	0 1	.003	0 17	5572....	8902....	369.6...	369.6....	1 H1-1...
580	M665	1.625" O...	.170	0 20	.009	0 5	2641....	8902....	369.6...	369.6....	1 H1-1...
581	M666	1.625" O...	.025	44....13	.007	0 5	5572....	8902....	369.6...	369.6....	1 H1-1b
582	M667	1.625" O...	.031	22....8	.008	0 5	7919....	8902....	369.6...	369.6....	1 H1-1b
583	M668	1.625" O...	.062	52....20	.003	0 5	4569....	8902....	369.6...	369.6....	H1-1...
584	M669	1.625" O...	.144	74....1	.007	0 5	2461....	8902....	369.6...	369.6....	H1-1...
585	M670	1.625" O...	.454	38....1	.002	0 5	2461....	8902....	369.6...	369.6....	H1-1a
586	M671	1.625" O...	.135	52....13	.002	0 5	4569....	8902....	369.6...	369.6....	H1-1...
587	M672	2.875" O...	.113	52....1	.021	52....1	33696....	38204....	2765....	2765....	H1-1b
588	M673	2.875" O...	.122	37....1	.027	0 1	33595....	38204....	2765....	2765....	H1-1b
589	M674	2.875" O...	.130	0 1	.024	0 11	33696....	38204....	2765....	2765....	H1-1b
590	M675	2.875" O...	.120	66....1	.027	66....11	33696....	38204....	2765....	2765....	H1-1b
591	M676	1.625" O...	.611	30....1	.040	0 11	5137....	8902....	369.6...	369.6....	H1-1a
592	M677	1.625" O...	.703	0 1	.052	0 11	5137....	8902....	369.6...	369.6....	H1-1b
593	M678	1.625" O...	.484	60 11	.045	60 11	3771....	8902....	369.6...	369.6....	H1-1a
594	M679	1.625" O...	.551	0 11	.046	0 5	3771....	8902....	369.6...	369.6....	H1-1a
595	M680	1.625" O...	.517	48 11	.039	0 4	5137....	8902....	369.6...	369.6....	H1-1a
596	M681	1.625" O...	.517	26....11	.044	0 4	5137....	8902....	369.6...	369.6....	H1-1a
597	M682	3" O.D. x...	.856	192 18	.196	192 18	39346....	39447....	2987....	2987....	H1-1b
598	M683	3" O.D. x...	.711	192 12	.024	0 6	9742....	39447....	2987....	2987....	H1-1a
599	M684	3" O.D. x...	.837	0 18	.062	0 15	36485....	39447....	2987....	2987....	H1-1b
600	M685	PLATE1...	.194	0 5	.096	0 y 5	3091....	10961....	23.887	799.2....	H1-1b
601	M686	1.625" O...	.176	0 5	.001	63....6	3353....	8902....	369.6...	369.6....	H1-1...
602	M687	PLATE1...	.185	2.75 5	.095	0 y 5	3154....	10961....	23.887	799.2....	H1-1b
603	M688	PLATE1...	.836	0 11	.334	0 y 11	3154....	10961....	23.887	799.2....	H1-1a
604	M689	1.625" O...	.624	33....11	.001	63....6					



Company : Vectro Structural Engineering
 Designer : FCG
 Job Number : U3024-001-181
 Model Name : JohnDay Greenhouse

Nov 5, 2018
 4:09 PM
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Envelope AISC 14th(360-10): ASD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o.....	Pnt/o.....	Mnyy/.....	Mnzz/.....	Eqn	
627	M712	3" O.D. x.....	.884	192 6	.055	192	6	36485.....	39447.....	2987.....	2987.....	H1-1b
628	M713	PLATE1.....	.855	0 1	.332	0	y 1	3091.....	10961.....	23.887	799.2.....	H1-1a
629	M714	1.625" O.....	.618	30.....1	.001	0	5	3353.....	8902.....	369.6.....	369.6.....	H1-1a
630	M715	PLATE1.....	.828	2.75 1	.330	0	y 1	3154.....	10961.....	23.887	799.2.....	H1-1a
631	M716	PLATE1.....	.133	0 20	.091	0	y 20	3154.....	10961.....	23.887	799.2.....	H1-1b
632	M717	1.625" O.....	.099	63.....9	.001	0	5	3353.....	8902.....	369.6.....	369.6.....	H1-1.....
633	M718	PLATE1.....	.138	2.8.....20	.091	0	y 20	3091.....	10961.....	23.887	799.2.....	H1-1b
634	M719	2.875" O.....	.089	23.....11	.021	52.....	1	30889.....	38204.....	2765.....	2765.....	H1-1b
635	M720	2.875" O.....	.138	26.7 1	.019	0	11	30889.....	38204.....	2765.....	2765.....	H1-1b
636	M721	1.625" O.....	.158	0 1	.001	0	12	7919.....	8902.....	369.6.....	369.6.....	1 H1-1.....
637	M722	1.625" O.....	.049	0 1	.003	0	17	5572.....	8902.....	369.6.....	369.6.....	1 H1-1.....
638	M723	1.625" O.....	.166	0 20	.010	0	5	2641.....	8902.....	369.6.....	369.6.....	1 H1-1.....
639	M724	1.625" O.....	.031	0 18	.007	0	5	5572.....	8902.....	369.6.....	369.6.....	1 H1-1.....
640	M725	1.625" O.....	.031	22.....8	.008	0	5	7919.....	8902.....	369.6.....	369.6.....	1 H1-1b
641	M726	1.625" O.....	.128	52.....18	.003	0	5	4569.....	8902.....	369.6.....	369.6.....	H1-1.....
642	M727	1.625" O.....	.196	74.....12	.007	0	5	2461.....	8902.....	369.6.....	369.6.....	H1-1.....
643	M728	1.625" O.....	.456	38.....1	.002	74.....	5	2461.....	8902.....	369.6.....	369.6.....	H1-1a
644	M729	1.625" O.....	.135	52.....13	.002	0	5	4569.....	8902.....	369.6.....	369.6.....	H1-1.....
645	M730	2.875" O.....	.112	52.....1	.022	52.....	11	33696.....	38204.....	2765.....	2765.....	H1-1b
646	M731	2.875" O.....	.122	37.....1	.027	0	11	33595.....	38204.....	2765.....	2765.....	H1-1b
647	M732	2.875" O.....	.130	0 1	.024	0	11	33696.....	38204.....	2765.....	2765.....	H1-1b
648	M733	2.875" O.....	.120	66.....1	.027	66.....	11	33696.....	38204.....	2765.....	2765.....	H1-1b
649	M734	1.625" O.....	.613	30.....1	.042	48	4	5137.....	8902.....	369.6.....	369.6.....	H1-1a
650	M735	1.625" O.....	.708	0 1	.051	0	1	5137.....	8902.....	369.6.....	369.6.....	H1-1b
651	M736	1.625" O.....	.494	60 11	.045	60	1	3771.....	8902.....	369.6.....	369.6.....	H1-1a
652	M737	1.625" O.....	.549	0 1	.046	0	5	3771.....	8902.....	369.6.....	369.6.....	H1-1a
653	M738	1.625" O.....	.526	48 11	.039	48	3	5137.....	8902.....	369.6.....	369.6.....	H1-1a
654	M739	1.625" O.....	.523	26.....11	.043	0	4	5137.....	8902.....	369.6.....	369.6.....	H1-1a
655	M740	3" O.D. x.....	.694	192 12	.029	0	18	9742.....	39447.....	2987.....	2987.....	H1-1a
656	M741	3" O.D. x.....	.785	0 15	.060	0	15	36485.....	39447.....	2987.....	2987.....	H1-1b
657	M742	PLATE1.....	.197	0 5	.098	0	y 5	3091.....	10961.....	23.887	799.2.....	H1-1b
658	M743	1.625" O.....	.179	0 5	.001	0	6	3353.....	8902.....	369.6.....	369.6.....	H1-1.....
659	M744	PLATE1.....	.189	2.75 5	.097	0	y 5	3154.....	10961.....	23.887	799.2.....	H1-1b
660	M745	PLATE1.....	.872	0 11	.348	0	y 11	3154.....	10961.....	23.887	799.2.....	H1-1a
661	M746	1.625" O.....	.650	33.....11	.001	0	6	3353.....	8902.....	369.6.....	369.6.....	H1-1a
662	M747	PLATE1.....	.901	2.8.....11	.350	2.8.....y	11	3091.....	10961.....	23.887	799.2.....	H1-1a
663	M748	2.875" O.....	.138	26.....1	.019	52.....	1	30889.....	38204.....	2765.....	2765.....	H1-1b
664	M749	2.875" O.....	.083	29.....1	.021	0	11	30889.....	38204.....	2765.....	2765.....	H1-1b
665	M750	1.625" O.....	.049	0 17	.000	0	18	7919.....	8902.....	369.6.....	369.6.....	1 H1-1.....
666	M751	1.625" O.....	.032	0 15	.001	0	11	5572.....	8902.....	369.6.....	369.6.....	1 H1-1.....
667	M752	1.625" O.....	.184	0 16	.008	0	18	2641.....	8902.....	369.6.....	369.6.....	1 H1-1.....
668	M753	1.625" O.....	.063	0 12	.003	0	18	5572.....	8902.....	369.6.....	369.6.....	1 H1-1.....
669	M754	1.625" O.....	.167	0 11	.006	0	18	7919.....	8902.....	369.6.....	369.6.....	1 H1-1.....
670	M755	1.625" O.....	.130	52.....13	.003	52.....	6	4569.....	8902.....	369.6.....	369.6.....	H1-1.....
671	M756	1.625" O.....	.460	38.....1	.004	74.....	18	2461.....	8902.....	369.6.....	369.6.....	H1-1a
672	M757	1.625" O.....	.137	74.....1	.002	74.....	12	2461.....	8902.....	369.6.....	369.6.....	H1-1.....
673	M758	1.625" O.....	.076	52.....20	.001	0	6	4569.....	8902.....	369.6.....	369.6.....	H1-1.....
674	M759	2.875" O.....	.130	52.....1	.024	52.....	1	33696.....	38204.....	2765.....	2765.....	H1-1b
675	M760	2.875" O.....	.120	0 1	.027	0	1	33696.....	38204.....	2765.....	2765.....	H1-1b
676	M761	2.875" O.....	.112	0 1	.021	0	1	33696.....	38204.....	2765.....	2765.....	H1-1b
677	M762	2.875" O.....	.123	28.....1	.027	66.....	1	33595.....	38204.....	2765.....	2765.....	H1-1b
678	M763	1.625" O.....	.511	20.....1	.040	48	8	5137.....	8902.....	369.6.....	369.6.....	H1-1a
679	M764	1.625" O.....	.513	0 11	.038	0	5	5137.....	8902.....	369.6.....	369.6.....	H1-1a
680	M765	1.625" O.....	.551	60 1	.043	60	11	3771.....	8902.....	369.6.....	369.6.....	H1-1a
681	M766	1.625" O.....	.482	0 1	.046	0	11	3771.....	8902.....	369.6.....	369.6.....	H1-1a
682	M767	1.625" O.....	.718	48 11	.053	48	11	5137.....	8902.....	369.6.....	369.6.....	H1-1b
683	M768	1.625" O.....	.616	16.....1	.041	48	11	5137.....	8902.....	369.6.....	369.6.....	H1-1a

Nov 5, 2018
4:09 PM
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	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnvy/...	Mnz/.....	Eqn	
684	M769	3" O.D. x...	.811	192 6	.052	192	6	36485...	39447...	2987...	2987...	H1-1b
685	M770	PLATE1...	.858	0 1	.333	0	y 1	3091...	10961...	23.887	799.2...	H1-1a
686	M771	1.625" O...	.619	30... 1	.001	63...	5	3353...	8902...	369.6...	369.6...	H1-1a
687	M772	PLATE1...	.830	2.75 1	.331	0	y 1	3154...	10961...	23.887	799.2...	H1-1a
688	M773	PLATE1...	.135	0 20	.093	0	y 20	3154...	10961...	23.887	799.2...	H1-1b
689	M774	1.625" O...	.096	63... 9	.001	0	5	3353...	8902...	369.6...	369.6...	H1-1...
690	M775	PLATE1...	.140	2.8... 20	.093	0	y 20	3091...	10961...	23.887	799.2...	H1-1b
691	M776	2.875" O...	.087	23... 11	.021	52...	1	30889...	38204...	2765...	2765...	H1-1b
692	M777	2.875" O...	.138	26.7 1	.019	0	11	30889...	38204...	2765...	2765...	H1-1b
693	M778	1.625" O...	.159	0 1	.001	0	6	7919...	8902...	369.6...	369.6...	1 H1-1...
694	M779	1.625" O...	.050	0 1	.002	0	17	5572...	8902...	369.6...	369.6...	1 H1-1...
695	M780	1.625" O...	.167	0 20	.010	0	5	2641...	8902...	369.6...	369.6...	1 H1-1...
696	M781	1.625" O...	.026	0 15	.007	0	5	5572...	8902...	369.6...	369.6...	1 H1-1...
697	M782	1.625" O...	.031	22... 8	.008	0	5	7919...	8902...	369.6...	369.6...	1 H1-1b
698	M783	1.625" O...	.085	52... 18	.003	0	5	4569...	8902...	369.6...	369.6...	H1-1...
699	M784	1.625" O...	.168	74... 12	.007	0	5	2461...	8902...	369.6...	369.6...	H1-1...
700	M785	1.625" O...	.456	38... 1	.002	0	5	2461...	8902...	369.6...	369.6...	H1-1a
701	M786	1.625" O...	.135	52... 13	.002	0	5	4569...	8902...	369.6...	369.6...	H1-1...
702	M787	2.875" O...	.112	52... 1	.022	52...	11	33696...	38204...	2765...	2765...	H1-1b
703	M788	2.875" O...	.122	37... 1	.027	0	11	33595...	38204...	2765...	2765...	H1-1b
704	M789	2.875" O...	.130	0 1	.024	0	11	33696...	38204...	2765...	2765...	H1-1b
705	M790	2.875" O...	.120	66... 1	.028	66...	11	33696...	38204...	2765...	2765...	H1-1b
706	M791	1.625" O...	.614	31... 1	.041	48	4	5137...	8902...	369.6...	369.6...	H1-1a
707	M792	1.625" O...	.709	0 1	.051	0	1	5137...	8902...	369.6...	369.6...	H1-1b
708	M793	1.625" O...	.489	60 11	.045	60	1	3771...	8902...	369.6...	369.6...	H1-1a
709	M794	1.625" O...	.550	0 1	.047	0	5	3771...	8902...	369.6...	369.6...	H1-1a
710	M795	1.625" O...	.525	48 11	.039	48	3	5137...	8902...	369.6...	369.6...	H1-1a
711	M796	1.625" O...	.520	26... 11	.043	0	4	5137...	8902...	369.6...	369.6...	H1-1a
712	M797	3" O.D. x...	.704	192 11	.026	0	6	9742...	39447...	2987...	2987...	H1-1a
713	M798	3" O.D. x...	.725	0 18	.173	0	18	39346...	39447...	2987...	2987...	H1-1b
714	M805	2.875" O...	.072	22... 1	.021	52...	1	30889...	38204...	2765...	2765...	H1-1b
715	M806	2.875" O...	.069	30... 1	.021	0	1	30889...	38204...	2765...	2765...	H1-1b
716	M816	2.875" O...	.107	52... 1	.022	52...	1	33696...	38204...	2765...	2765...	H1-1b
717	M817	2.875" O...	.110	0 1	.028	0	1	33696...	38204...	2765...	2765...	H1-1b
718	M818	2.87										

Nov 5, 2018
4:09 PM
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Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o....	Pnt/o....	Mnyy/...	Mnzz/.....	Eqn	
741	M847	2.875" O...	.134	28.....11	.027	66.....11	33595...	38204...	2765....	2765....	H1-1b
742	M848	1.625" O...	.671	48 12	.044	48 4	5137....	8902....	369.6...	369.6....	H1-1a
743	M849	1.625" O...	.685	48 12	.043	48 6	5137....	8902....	369.6...	369.6....	H1-1a
744	M850	1.625" O...	.627	60 12	.042	60 1	3771....	8902....	369.6...	369.6....	H1-1a
745	M851	1.625" O...	.624	0 11	.046	0 5	3771....	8902....	369.6...	369.6....	H1-1a
746	M852	1.625" O...	.607	48 11	.039	0 4	5137....	8902....	369.6...	369.6....	H1-1a
747	M853	1.625" O...	.618	26.....11	.044	0 4	5137....	8902....	369.6...	369.6....	H1-1a
748	M854	3" O.D. x...	.754	192 18	.173	192 18	39346...	39447...	2987....	2987....	H1-1b
749	M855	3" O.D. x...	.821	0 15	.062	0 15	36485...	39447...	2987....	2987....	H1-1b
750	M856	3" O.D. x...	.796	192 6	.051	192 6	36485...	39447...	2987....	2987....	H1-1b
751	M857	PLATE1...	.175	0 5	.088	0 y 5	3091....	10961...	23.887	799.2....	H1-1b
752	M858	1.625" O...	.157	0 5	.001	0 5	3353....	8902....	369.6...	369.6....	H1-1...
753	M859	PLATE1...	.167	2.75 5	.087	0 y 5	3154....	10961...	23.887	799.2....	H1-1b
754	M860	PLATE1...	.136	0 20	.093	0 y 20	3154....	10961...	23.887	799.2....	H1-1b
755	M861	1.625" O...	.104	63.....11	.001	0 5	3353....	8902....	369.6...	369.6....	H1-1...
756	M862	PLATE1...	.141	2.8.....20	.093	0 y 20	3091....	10961...	23.887	799.2....	H1-1b
757	M863	2.875" O...	.150	26.7 1	.020	52.....11	30889...	38204...	2765....	2765....	H1-1b
758	M864	2.875" O...	.149	26.....1	.019	0 11	30889...	38204...	2765....	2765....	H1-1b
759	M865	1.625" O...	.043	0 17	.002	0 6	7919....	8902....	369.6...	369.6....	1 H1-1...
760	M866	1.625" O...	.027	0 15	.002	0 17	5572....	8902....	369.6...	369.6....	1 H1-1...
761	M867	1.625" O...	.203	0 20	.012	0 5	2641....	8902....	369.6...	369.6....	1 H1-1a
762	M868	1.625" O...	.025	44.....13	.008	0 5	5572....	8902....	369.6...	369.6....	1 H1-1b
763	M869	1.625" O...	.031	22.....8	.009	0 5	7919....	8902....	369.6...	369.6....	1 H1-1b
764	M870	1.625" O...	.128	52.....1	.003	0 5	4569....	8902....	369.6...	369.6....	H1-1...
765	M871	1.625" O...	.460	38.....1	.008	74.....5	2461....	8902....	369.6...	369.6....	H1-1a
766	M872	1.625" O...	.451	38.....1	.002	74.....5	2461....	8902....	369.6...	369.6....	H1-1a
767	M873	1.625" O...	.131	52.....13	.002	52.....5	4569....	8902....	369.6...	369.6....	H1-1...
768	M874	2.875" O...	.135	52.....1	.024	52.....1	33696...	38204...	2765....	2765....	H1-1b
769	M875	2.875" O...	.127	38.....1	.027	0 11	33595...	38204...	2765....	2765....	H1-1b
770	M876	2.875" O...	.135	0 1	.024	0 1	33696...	38204...	2765....	2765....	H1-1b
771	M877	2.875" O...	.127	28.....1	.028	66.....11	33595...	38204...	2765....	2765....	H1-1b
772	M878	1.625" O...	.562	20.....1	.041	48 7	5137....	8902....	369.6...	369.6....	H1-1a
773	M879	1.625" O...	.550	48 1	.039	0 5	5137....	8902....	369.6...	369.6....	H1-1a
774	M880	1.625" O...	.577	60 1	.043	60 5	3771....	8902....	369.6...	369.6....	H1-1a
775	M881	1.625" O...	.575	0 1	.047	0 5	3771....	8			

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

	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o.....	Pnt/o.....	Mnyv/.....	Mnz/.....	Eqn
798	M904	2.875" O...	.130	38.....11	.028	0	1133595...	38204...	2765.....	2765.....	H1-1b
799	M905	2.875" O...	.135	0 1	.024	0	1133696...	38204...	2765.....	2765.....	H1-1b
800	M906	2.875" O...	.128	28.....1	.028	66.....	1133595...	38204...	2765.....	2765.....	H1-1b
801	M907	1.625" O...	.565	21.....1	.041	48	7 5137....	8902....	369.6....	369.6....	H1-1a
802	M908	1.625" O...	.580	0 11	.041	0	5 5137....	8902....	369.6....	369.6....	H1-1a
803	M909	1.625" O...	.578	60 1	.043	60	5 3771....	8902....	369.6....	369.6....	H1-1a
804	M910	1.625" O...	.578	0 1	.047	0	5 3771....	8902....	369.6....	369.6....	H1-1a
805	M911	1.625" O...	.552	48 1	.039	0	4 5137....	8902....	369.6....	369.6....	H1-1a
806	M912	1.625" O...	.565	26.....1	.044	0	4 5137....	8902....	369.6....	369.6....	H1-1a
807	M913	3" O.D. x...	.395	0 18	.095	0	1839346...	39447...	2987.....	2987.....	H1-1b
808	M914	3" O.D. x...	.417	192 6	.095	192	1839346...	39447...	2987.....	2987.....	H1-1b
809	M921	2.875" O...	.074	22.....1	.021	52.....	1 30889...	38204...	2765.....	2765.....	H1-1b
810	M922	2.875" O...	.074	30.....1	.021	0	1 30889...	38204...	2765.....	2765.....	H1-1b
811	M932	2.875" O...	.106	52.....1	.022	52.....	1 33696...	38204...	2765.....	2765.....	H1-1b
812	M933	2.875" O...	.111	0 1	.027	0	1 33696...	38204...	2765.....	2765.....	H1-1b
813	M934	2.875" O...	.106	0 1	.022	0	1 33696...	38204...	2765.....	2765.....	H1-1b
814	M935	2.875" O...	.111	66.....1	.027	66.....	1 33696...	38204...	2765.....	2765.....	H1-1b
815	M1294	3" O.D. x...	.142	7.7...6	.071	0	6 32976...	39447...	2987.....	2987.....	H1-1b
816	M1295	3" O.D. x...	.157	7.7...6	.071	0	6 32976...	39447...	2987.....	2987.....	H1-1b
817	M1296	3" O.D. x...	.263	7.7...6	.135	0	1832976...	39447...	2987.....	2987.....	H1-1b
818	M1297	3" O.D. x...	.290	7.7...18	.136	0	1832976...	39447...	2987.....	2987.....	H1-1b
819	M1298	3" O.D. x...	.300	7.7...6	.154	0	1832976...	39447...	2987.....	2987.....	H1-1b
820	M1299	3" O.D. x...	.330	7.7...18	.155	0	1832976...	39447...	2987.....	2987.....	H1-1b
821	M1300	3" O.D. x...	.324	7.7...6	.164	0	6 32976...	39447...	2987.....	2987.....	H1-1b
822	M1301	3" O.D. x...	.354	7.7...6	.164	0	6 32976...	39447...	2987.....	2987.....	H1-1b
823	M1302	3" O.D. x...	.283	7.7...6	.143	0	6 32976...	39447...	2987.....	2987.....	H1-1b
824	M1303	3" O.D. x...	.309	7.7...6	.143	0	6 32976...	39447...	2987.....	2987.....	H1-1b
825	M1304	3" O.D. x...	.142	7.7...6	.071	0	1832976...	39447...	2987.....	2987.....	H1-1b
826	M1305	3" O.D. x...	.157	7.7...6	.071	0	1832976...	39447...	2987.....	2987.....	H1-1b
827	M1347B	1.625" O...	.822	48 6	.047	48	6 6077....	8902....	369.6....	369.6....	H1-1a
828	M1348B	1.625" O...	.010	22.....6	.002	0	6 7919....	8902....	369.6....	369.6....	1 H1-1b
829	M1349B	1.625" O...	.174	0 1	.003	0	5 5572....	8902....	369.6....	369.6....	1 H1-1...
830	M1350A	1.625" O...	.105	0 1	.008	0	5 2641....	8902....	369.6....	369.6....	1 H1-1...
831	M1351A	1.625" O...	.195	0 1	.007	0	5 5572....	8902....	369.6....	369.6....	1 H1-1...
832	M1352A	1.625" O...	.010	22.....8	.007	0	5 7919....	8902....	369.6....	369.6....	1 H1-1b
833	M1353A	1.625" O...	.165	52.....1	.002	0	5 4569....	8902....	369.6....	369.6....	H1-1...
834	M1354A	1.625" O...	.263	38.....18	.007	0	5 2461....	8902....	369.6....	369.6....	H1-1a
835	M1355A	1.625" O...	.114	74.....20	.003	74.....	5 2461....	8902....	369.6....	369.6....	H1-1...
836	M1356A	1.625" O...	.166	52.....1	.002	0	5 4569....	8902....	369.6....	369.6....	H1-1...
837	M1357A	1.625" O...	.225	48 6	.039	48	5 5137....	8902....	369.6....	369.6....	H1-1b
838	M1358A	1.625" O...	.225	0 6	.033	48	115137....	8902....	369.6....	369.6....	H1-1b
839	M1359A	1.625" O...	.284	60 6	.042	60	6 3771....	8902....	369.6....	369.6....	H1-1b
840	M1360A	1.625" O...	.290	0 6	.046	0	6 3771....	8902....	369.6....	369.6....	H1-1b
841	M1361A	1.625" O...	.218	0 1	.038	0	5 5137....	8902....	369.6....	369.6....	H1-1b
842	M1362A	1.625" O...	.201	0 6	.044	0	6 5137....	8902....	369.6....	369.6....	H1-1b
843	M1363A	1.625" O...	.010	22.....8	.000	0	1 7919....	8902....	369.6....	369.6....	1 H1-1b
844	M1364A	1.625" O...	.174	0 1	.001	29.....	115572....	8902....	369.6....	369.6....	1 H1-1...
845	M1365A	1.625" O...	.109	0 1	.008	0	182641....	8902....	369.6....	369.6....	1 H1-1...
846	M1366	1.625" O...	.204	0 11	.003	29.....	185572....	8902....	369.6....	369.6....	1 H1-1a
847	M1367	1.625" O...	.010	22.....8	.005	0	187919....	8902....	369.6....	369.6....	1 H1-1b
848	M1368	1.625" O...	.165	52.....1	.003	0	6 4569....	8902....	369.6....	369.6....	H1-1...
849	M1369	1.625" O...	.207	38.....18	.004	0	182461....	8902....	369.6....	369.6....	H1-1a
850	M1370	1.625" O...	.118	74.....20	.002	0	122461....	8902....	369.6....	369.6....	H1-1...
851	M1371	1.625" O...	.166	52.....1	.002	52.....	6 4569....	8902....	369.6....	369.6....	H1-1...
852	M1372	1.625" O...	.212	48 6	.039	48	6 5137....	8902....	369.6....	369.6....	H1-1b
853	M1373	1.625" O...	.218	48 1	.033	0	6 5137....	8902....	369.6....	369.6....	H1-1b
854	M1374	1.625" O...	.282	60 6	.041	60	6 3771....	8902....	369.6....	369.6....	H1-1b

Nov 5, 2018
4:09 PM
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	Member	Shape	Code Check	Loc.....	Shear Check	Loc.....	Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/.....	Eqn
855	M1375	1.625" O...	.280	0 12	.042	0	6 3771...	8902...	369.6...	369.6...	H1-1b
856	M1376	1.625" O...	.218	0 1	.033	0	6 5137...	8902...	369.6...	369.6...	H1-1b
857	M1377	1.625" O...	.197	0 8	.039	0	6 5137...	8902...	369.6...	369.6...	H1-1b
858	M1378	1.625" O...	.010	22...8	.002	0	6 7919...	8902...	369.6...	369.6...	1 H1-1b
859	M1379	1.625" O...	.174	0 1	.002	0	175572...	8902...	369.6...	369.6...	1 H1-1...
860	M1380	1.625" O...	.077	0 1	.012	0	5 2641...	8902...	369.6...	369.6...	1 H1-1...
861	M1381	1.625" O...	.174	0 1	.008	29...	5 5572...	8902...	369.6...	369.6...	1 H1-1...
862	M1382	1.625" O...	.010	22...8	.009	0	5 7919...	8902...	369.6...	369.6...	1 H1-1b
863	M1383	1.625" O...	.165	52...1	.004	52...	5 4569...	8902...	369.6...	369.6...	H1-1...
864	M1384	1.625" O...	.160	74...18	.008	0	5 2461...	8902...	369.6...	369.6...	H1-1...
865	M1385	1.625" O...	.075	74...20	.002	74...	5 2461...	8902...	369.6...	369.6...	H1-1...
866	M1386	1.625" O...	.165	52...1	.002	0	5 4569...	8902...	369.6...	369.6...	H1-1...
867	M1387	1.625" O...	.206	48 6	.040	48	5 5137...	8902...	369.6...	369.6...	H1-1b
868	M1388	1.625" O...	.220	48 1	.035	48	5 5137...	8902...	369.6...	369.6...	H1-1b
869	M1389	1.625" O...	.266	60 6	.042	60	4 3771...	8902...	369.6...	369.6...	H1-1b
870	M1390	1.625" O...	.283	0 6	.046	0	5 3771...	8902...	369.6...	369.6...	H1-1b
871	M1391	1.625" O...	.220	0 1	.037	0	5 5137...	8902...	369.6...	369.6...	H1-1b
872	M1392	1.625" O...	.197	0 8	.043	0	5 5137...	8902...	369.6...	369.6...	H1-1b
873	M1390A	1.625" O...	.010	22...8	.002	0	6 7919...	8902...	369.6...	369.6...	1 H1-1b
874	M1391A	1.625" O...	.174	0 1	.002	0	5 5572...	8902...	369.6...	369.6...	1 H1-1...
875	M1392A	1.625" O...	.077	0 1	.013	0	5 2641...	8902...	369.6...	369.6...	1 H1-1...
876	M1393	1.625" O...	.174	0 1	.008	0	5 5572...	8902...	369.6...	369.6...	1 H1-1...
877	M1394	1.625" O...	.010	22...8	.010	0	5 7919...	8902...	369.6...	369.6...	1 H1-1b
878	M1395	1.625" O...	.165	52...1	.004	52...	5 4569...	8902...	369.6...	369.6...	H1-1...
879	M1396	1.625" O...	.159	74...18	.008	0	5 2461...	8902...	369.6...	369.6...	H1-1...
880	M1397	1.625" O...	.074	74...20	.002	74...	5 2461...	8902...	369.6...	369.6...	H1-1...
881	M1398	1.625" O...	.165	52...1	.002	0	6 4569...	8902...	369.6...	369.6...	H1-1...
882	M1399	1.625" O...	.206	48 6	.041	48	5 5137...	8902...	369.6...	369.6...	H1-1b
883	M1400	1.625" O...	.220	48 1	.035	48	5 5137...	8902...	369.6...	369.6...	H1-1b
884	M1401	1.625" O...	.266	60 6	.042	60	5 3771...	8902...	369.6...	369.6...	H1-1b
885	M1402	1.625" O...	.283	0 6	.046	0	6 3771...	8902...	369.6...	369.6...	H1-1b
886	M1403	1.625" O...	.220	0 1	.038	0	5 5137...	8902...	369.6...	369.6...	H1-1b
887	M1404	1.625" O...	.197	0 8	.044	0	6 5137...	8902...	369.6...	369.6...	H1-1b
888	M1405	1.625" O...	.010	22...6	.000	0	1 7919...	8902...	369.6...	369.6...	1 H1-1b
889	M1406	1.625" O...	.199	0 1	.003	0	185572...	8902...	369.6...	369.6...	1 H1-1...
890	M1407	1.625" O...	.109								

Nov 5, 2018
4:09 PM
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	Member	Shape	Code	Check	Loc.....	Shear Check	Loc.....	Pnc/o....	Pnt/o....	Mnvy/...	Mnz/.....	Egn
912	M1429	1.625" O...	.249		48 6	.039	48	5 5137....	8902....	369.6...	369.6....	H1-1b
913	M1430	1.625" O...	.249		0 6	.033	48	5 5137....	8902....	369.6...	369.6....	H1-1b
914	M1431	1.625" O...	.277		60 6	.042	60	4 3771....	8902....	369.6...	369.6....	H1-1b
915	M1432	1.625" O...	.306		0 6	.045	0	5 3771....	8902....	369.6...	369.6....	H1-1b
916	M1433	1.625" O...	.227		0 6	.037	0	5 5137....	8902....	369.6...	369.6....	H1-1b
917	M1434	1.625" O...	.224		0 6	.042	0	5 5137....	8902....	369.6...	369.6....	H1-1b

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N61A	max	58.061	7	764.229	1	1.922	18	33.006	18	3.918	5	1172.589	18
2		min	-1779.6	18	-1502.646	18	.001	2	.306	2	-.33	7	-65.553	7
3	N66B	max	.253	1	1651.723	6	.378	1	5.355	1	1.332	5	1180.769	18
4		min	-1122.839	18	-261.002	20	-1.707	6	-25.726	6	-.167	7	.021	2
5	N27	max	272.207	7	2228.978	1	1.828	18	33.007	18	3.062	5	2190.932	15
6		min	-682.825	15	-1067.307	20	.001	2	.307	2	-.332	7	-688.478	13
7	N32	max	292.991	20	2742.112	1	.365	1	5.345	1	1.903	11	2313.463	6
8		min	-3367.629	6	-2419.361	18	-1.825	6	-25.817	6	-.298	1	-319.453	20
9	N57	max	284.478	20	2762.804	6	-.027	20	-.677	20	.515	12	2300.866	6
10		min	-2167.035	6	-424.281	20	-1.357	12	-21.424	6	-.323	1	-192.943	20
11	N76B	max	269.076	7	2047.189	11	2.225	18	33.439	18	1.712	5	2200.891	15
12		min	-683.346	15	-994.256	20	.001	2	.306	2	-.522	18	-671.672	13
13	N81A	max	18.178	13	4655.446	1	.46	1	5.864	1	1.11	11	1470.656	18
14		min	-224.262	18	-2377.185	20	-1.573	6	-21.707	6	-1.513	18	-120.132	13
15	N104	max	276.831	20	2528.143	1	-.05	20	-.693	20	2.019	12	2635.034	6
16		min	-3863.292	6	-2714.264	18	-1.47	6	-21.513	6	-1.568	17	-302.021	20
17	N129	max	263.314	20	3187.467	6	1.905	6	29.725	6	1.397	12	2619.055	6
18		min	-2460.688	6	-415.792	20	.002	2	-.181	2	-.258	17	-175.755	20
19	N148A	max	255.623	7	2505.174	11	1.798	18	32.917	18	3.695	5	2039	15
20		min	-657.655	15	-993.344	20	-.288	20	.306	2	-.324	7	-574.358	7
21	N153	max	-23.886	2	2251.2	1	.379	1	5.357	1	1.291	5	1880.212	6
22		min	-531.321	6	-1045.66	20	-77.957	18	-25.71	6	-.167	7	126.976	2
23	N174	max	272.523	7	2257.139	1	85.479	18	32.919	18	3.32	5	2504.869	15
24		min	-729.811	15	-1071.03	20	.001	2	.306	2	-.325	7	-686.028	7
25	N179	max	-19.376	2	2237.688	1	2.062	20	5.359	1	1.083	5	2399.569	6
26		min	-608.591	6	-1045.395	20	-1.658	6	-25.677	6	-.167	7	97.343	2
27	N200	max	267.551	7	2029.066	1	1.941	18	33.135	18	2.593	5	2309.449	15
28		min	-699.957	15	-997.507	20	.001	2	.306	2	-.338	7	-656.505	7
29	N205	max	15.239	19	4692.756	1	.454	1	5.798	1	1.653	11	1460.818	6
30		min	-221.327	6	-2326.446	20	-65.678	18	-24.688	6	-.306	18	-99.557	19
31	N228	max	-20.419	2	2026.648	1	-.682	2	-.681	20	.459	12	2318.87	6
32		min	-597.801	6	-1003.598	20	-66.215	6						



Company : Vectro Structural Engineering
 Designer : FCG
 Job Number : U3024-001-181
 Model Name : JohnDay Greenhouse

Nov 5, 2018
 4:09 PM
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Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
47	N370	max	261.049	7	2050.976	1	2.423	18	33.682	18	1.101	11	2547.76	18
48		min	-711.434	15	-974.207	20	.001	2	.306	2	-1.651	18	-613.271	7
49	N375	max	9.366	20	4443.86	1	.466	1	5.932	1	.404	11	1853.639	6
50		min	-282.029	6	-2313.977	20	-50.967	18	-18.51	6	-2.97	18	-60.473	20
51	N398	max	11.277	20	4443.885	1	13.772	20	-.487	20	1.238	12	1867.73	6
52		min	-284.392	6	-2282.177	20	-1.437	12	-19.517	12	-2.006	17	-74.766	20
53	N421	max	-24.762	2	2050.965	1	80.102	6	29.823	6	1.084	12	2664.144	6
54		min	-649.316	6	-1032.882	20	.002	2	-.181	2	-.375	17	137.634	2
55	N442	max	263.173	7	2161.841	11	111.103	18	33.671	18	.93	11	2397.525	18
56		min	-694.879	15	-990.379	20	.001	2	.306	2	-2.25	18	-626.856	7
57	N447	max	10.744	20	4451.449	1	12.099	20	5.965	1	.277	13	1801.036	6
58		min	-274.589	6	-2270.681	20	-1.289	12	-17.451	6	-3.692	18	-69.781	20
59	N470	max	12.709	20	4462.453	11	-.031	20	-.37	20	1.108	13	1810.614	6
60		min	-275.497	6	-2286.99	20	-1.311	12	-17.931	12	-2.261	17	-84.04	20
61	N493	max	-25.465	2	2173.547	11	1.993	6	29.822	6	.952	12	2656.319	6
62		min	-649.314	6	-996.807	20	.002	2	-.181	2	-.445	17	142.239	2
63	N514	max	774.668	7	727.043	1	2.16	18	33.521	18	.763	11	2453.683	18
64		min	-3680.305	18	-2971.316	18	.001	2	.306	2	-2.855	18	-772.505	7
65	N519	max	868.169	7	3681.448	12	.452	1	5.9	1	.264	13	2469.295	18
66		min	-2301.588	18	-1477.17	20	-.513	12	-12.687	12	-4.118	18	-764.989	7
67	N542	max	13.587	20	4785.602	11	.128	16	-.212	20	1.097	13	1479.9	6
68		min	-226.544	6	-2268.935	20	-1.123	12	-16.023	12	-2.517	17	-90.121	20
69	N565	max	-28.013	2	2041.582	1	2.012	6	29.854	6	.797	12	2269.648	6
70		min	-589.851	6	-1012.504	20	.002	2	-.181	2	-.585	17	159.416	2
71	N586	max	265.308	7	2025.94	1	.451	1	5.898	1	.352	13	2494.954	18
72		min	-719.951	15	-1000.788	20	-34.183	18	-12.858	12	-2.298	18	-641.628	7
73	N591	max	12.842	20	4693.74	1	-.252	2	-.079	20	1.074	13	1788.876	6
74		min	-271.673	6	-2353.103	20	-28.43	18	-14.191	12	-3.04	16	-83.942	20
75	N614	max	-25.568	2	2070.147	11	2.049	6	29.907	6	.617	12	2627.788	6
76		min	-644.449	6	-1005.954	20	.002	2	-.181	2	-.746	17	143.321	2
77	N635	max	266.584	7	2194.049	11	4.692	20	5.899	1	.347	13	2330.665	15
78		min	-702.048	15	-951.753	20	-.862	12	-12.934	12	-2.723	18	-649.64	7
79	N640	max	15.818	20	4692.529	1	15.89	20	.312	16	1.061	13	1587.534	6
80		min	-241.66	6	-2325.806	20	-.903	12	-13.333	12	-3.49	16	-103.821	20
81	N663	max	-23.936	2	2058.035	11	2.078	6	29.949	6	.52	13	2411.809	6
82		min	-611.609	6	-1013.191	20	.002	2	-.181	2	-.858	17	132.615	2
83	N684	max	798.952	7	698.836	1	.451	1	5.899	1	.349	13	2162.459	18
84		min	-3227.418	18	-2525.518	18	-1.005	12	-13.038	12	-3.149	18	-798.337	7
85	N689	max	898.7	7	3761.088	11	.917	16	3.268	16	1.047	13	2174.999	18
86		min	-2032.231	18	-1570.831	20	-.552	13	-10.607	12	-3.73	16	-791.205	7
87	N712	max	-29.538	2	2442.49	11	2.081	6	29.967	6	.533	12	2150.487	6
88		min	-574.712	6	-1011.343	20	.001	2	-.181	2	-.816	17	164.955	2
89	N733	max	267.783	7	2230.735	1	-.217	2	3.137	16	.975	13	2452.13	15
90		min	-721.829	15	-1037.343	20	-17.386	12	-10.731	12	-3.052	17	-654.855	7
91	N738	max	-28.59	2	2250.878	1	2.057	6	29.955	6	.521	13	2375.945	6
92		min	-604.986	6	-1066.226	20	-5.105	20	-.181	2	-.974	17	158.124	2
93	N759	max	256.266	7	2499.605	11	8.293	20	3.038	16	.971	13	2047.684	15
94		min	-658.979	15	-1022.919	20	-.707	12	-10.828	12	-3.433	17	-578.514	7
95	N764	max	-23.886	2	2251.2	1	92.376	6	30.039	6	.522	13	1860.572	6
96		min	-528.339	6	-1031.172	20	.001	2	-.181	2	-1.203	16	126.979	2
97	N785	max	56.652	7	764.229	1	.423	16	2.91	16	.989	13	1173.836	6
98		min	-1782.179	18	-1506.8	18	-.867	12	-10.947	12	-3.664	17	-65.409	19
99	N790	max	.253	1	1658.024	6	2.195	6	30.078	6	.521	13	1182.043	6
100		min	-1123.877	6	-263.321	20	.002	2	-.181	2	-1.278	16	.021	2
101	N925	max	260.331	5	1627.08	1	0	5	0	20	0	20	0	20
102		min	-3.315	7	-1408.014	18	0	7	0	1	0	1	0	1
103	N926	max	504.659	6	1650.542	1	0	11	0	20	0	20	0	20

Nov 5, 2018
4:09 PM
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	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
104		min	-196.733	20	-2442.556	18	0	18	0	1	0	1	0	1
105	N927	max	551.173	6	1627.791	1	0	13	0	20	0	20	0	20
106		min	-183.698	20	-2815.295	18	0	5	0	1	0	1	0	1
107	N928	max	543.566	15	1748.146	1	0	5	0	20	0	20	0	20
108		min	-481.229	7	-2672.64	18	0	7	0	1	0	1	0	1
109	N929	max	531.767	15	1757.257	1	0	11	0	20	0	20	0	20
110		min	-500.634	7	-2290.054	18	0	18	0	1	0	1	0	1
111	N930	max	259.881	5	1627.08	1	0	13	0	20	0	20	0	20
112		min	-3.08	19	-1411.287	18	0	17	0	1	0	1	0	1
113	N931	max	839.086	18	2010.499	11	0	5	0	20	0	20	0	20
114		min	.288	2	-724.373	20	0	7	0	1	0	1	0	1
115	N932	max	1690.426	6	2602.643	12	0	11	0	20	0	20	0	20
116		min	-85.404	20	-971.872	20	0	15	0	1	0	1	0	1
117	N933	max	1935.432	6	2832.92	12	0	13	0	20	0	20	0	20
118		min	-77.914	20	-959.222	20	0	17	0	1	0	1	0	1
119	N934	max	1828.972	18	2806.068	12	0	5	0	20	0	20	0	20
120		min	-385.504	7	-884.653	20	0	7	0	1	0	1	0	1
121	N935	max	1603.795	18	2658.427	12	0	13	0	20	0	20	0	20
122		min	-408.18	13	-927.144	20	0	18	0	1	0	1	0	1
123	N936	max	840.298	6	2014.666	11	0	13	0	20	0	20	0	20
124		min	.288	2	-725.876	20	0	17	0	1	0	1	0	1
125	Totals:	max	2472.96	19	146328.084	1	0	20						
126		min	-35634.84	6	-70459.281	20	0	1						



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

DESIGN APPROACH ASD**SUBJECT: CALCULATIONS****TURNBUCKLE DESIGN** Location: Cable Connection

Size: 5/8" HG

Working Load Limit (WLL): 6000 lbs

Turnbuckle Load: 3200 lbs

Check: 53.3%

Result: **Select 5/8" HG turnbuckle.**

Note: WLL = 10,000 lbs x 0.6

WIRE ROPE DESIGN Location: Cable Connection

Size: 1/4" Aircraft

Working Load Limit (WLL): 4200 lbs

Wire Rope Load: 3200 lbs

Check: 76.2%

Result: **Select 1/4" Aircraft wire rope.**

Note: WLL = 7,000 lbs x 0.6



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Cable Connection

Bolt or Pin Diameter:	0.5	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.5625	in	Equation	Check?	Capacity
Number of Bolts or Pins:	1		J3-6a	Yes	1918
Plate Thickness:	0.11	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	62	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	0.75	in	(measured from center of hole)		
Bearing Capacity:	1918	lbs			
Perpendicular Edge Distance:	0.75	in	(measured from center of hole)		
Effective Perp. Edge Distance:	0				
Tensile Rupture Capacity:	3197	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	2941	lbs	(AISC Equation D5-2)		

Load: 1600 lbs

Check Bearing: 83.4%

Result: **Selected connection type is adequate.**

Note:

BOLTED SHEAR CONNECTION

Location: Cable Connection

Bolt Grade:	ASTM A325	
Bolt Diameter:	0.5	in
Number of Bolts:	1	
Double Shear?	No	
Bolt Capacity:	5301	lbs

(AISC Equation J3-1)

Shear Load: 1600 lbs

Check Bolt: 30.2%

Result: **Select (1) 0.5 in. dia. ASTM A325 bolt.**

Note:



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE**DESIGN APPROACH** ASD**SUBJECT:** CALCULATIONS**BOLTED SHEAR CONNECTION**

Location: Bottom Chord (DTL 12)

Bolt Grade: ASTM A325
 Bolt Diameter: 0.5 in
 Number of Bolts: 1
 Double Shear? No
 Bolt Capacity: 5301 lbs (AISC Equation J3-1)
 Shear Load: 4055 lbs
 Check Bolt: 76.5%

Result: Select (1) 0.5 in. dia. ASTM A325 bolt.

Note:

BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Bottom Chord (DTL 12)

Bolt or Pin Diameter:	0.5	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.5625	in	Equation	Check?	Capacity
Number of Bolts or Pins:	1		J3-6a	Yes	2559
Plate Thickness:	0.14	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	65	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	0.75	in	(measured from center of hole)		
Bearing Capacity:	2559	lbs			
Perpendicular Edge Distance:	0.75	in	(measured from center of hole)		
Effective Perp. Edge Distance:	0				
Tensile Rupture Capacity:	4266	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	3924	lbs	(AISC Equation D5-2)		
Load:	2028	lbs			

Check Bearing: 79.2%

Result: Selected connection type is adequate.

Note: 10 Ga Clamp



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Bottom Chord (DTL 12)

Bolt or Pin Diameter:	0.8	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.8125	in	Equation	Check?	Capacity
Number of Bolts or Pins:	1		J3-6a	Yes	2895
Plate Thickness:	0.125	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	65	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	1	in	(measured from center of hole)		
Bearing Capacity:	2895	lbs			
Perpendicular Edge Distance:	1	in	(measured from center of hole)		
Effective Perp. Edge Distance:	1				
Tensile Rupture Capacity:	4824	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	4723	lbs	(AISC Equation D5-2)		

Load: 1014 lbs

Check Bearing: 35.0%

Result: **Selected connection type is adequate.**

Note: End plate

BOLTED SHEAR CONNECTION

Location: Webs to Chord (DTL 4 & 11)

Bolt Grade:	ASTM A325	
Bolt Diameter:	0.375	in
Number of Bolts:	1	
Double Shear?	No	
Bolt Capacity:	2982	lbs

(AISC Equation J3-1)

Shear Load: 1550 lbs

Check Bolt: 52.0%

Result: **Select (1) 0.375 in. dia. ASTM A325 bolt.**

Note:



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Webs to Chord (DTL 4 & 11)

Bolt or Pin Diameter:	0.375	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.4375	in	Equation	Check?	Capacity
Number of Bolts or Pins:	1		J3-6a	Yes	3488
Plate Thickness:	0.125	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	62	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	1	in	(measured from center of hole)		
Bearing Capacity:	3488	lbs			
Perpendicular Edge Distance:	1	in	(measured from center of hole)		
Effective Perp. Edge Distance:	1				
Tensile Rupture Capacity:	6055	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	4505	lbs	(AISC Equation D5-2)		
Load:	1550	lbs			

Check Bearing: 44.4%

Result: **Selected connection type is adequate.**

Note:

BOLTED SHEAR CONNECTION

Location: Edge Int. Column to chord (DTL 10)

Bolt Grade:	A307		
Bolt Diameter:	0.375	in	
Number of Bolts:	3		
Double Shear?	No		
Bolt Capacity:	4473	lbs	(AISC Equation J3-1)
Shear Load:	2850	lbs	
Check Bolt:	63.7%		

Result: **Select (3) 0.375 in. dia. A307 bolts.**

Note:



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Edge Int. Column to chord (DTL 10)

Bolt or Pin Diameter:	0.375	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.4375	in	Equation	Check?	Capacity
Number of Bolts or Pins:	3		J3-6a	Yes	21762
Plate Thickness:	0.78	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	62	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	1	in	(measured from center of hole)		
Bearing Capacity:	65286	lbs			
Perpendicular Edge Distance:	1	in	(measured from center of hole)		
Effective Perp. Edge Distance:	1				
Tensile Rupture Capacity:	113344	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	84328	lbs	(AISC Equation D5-2)		

Load: 2850 lbs

Check Bearing: 4.4%

Result: **Selected connection type is adequate.**

Note:

BOLTED SHEAR CONNECTION

Location: Top Chord (DTL 5)

Bolt Grade:	A307	
Bolt Diameter:	0.375	in
Number of Bolts:	3	
Double Shear?	No	
Bolt Capacity:	4473	lbs

(AISC Equation J3-1)

Shear Load: 3020 lbs

Check Bolt: 67.5%

Result: **Select (3) 0.375 in. dia. A307 bolts.**

Note:



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Top Chord (DTL 5)

Bolt or Pin Diameter:	0.375	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.4375	in	Equation	Check?	Capacity
Number of Bolts or Pins:	3		J3-6a	Yes	1743
Plate Thickness:	0.11	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	65	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	0.625	in	(measured from center of hole)		
Bearing Capacity:	5228	lbs			
Perpendicular Edge Distance:	0.625	in	(measured from center of hole)		
Effective Perp. Edge Distance:	0				
Tensile Rupture Capacity:	8714	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	7642	lbs	(AISC Equation D5-2)		

Load: 3020 lbs

Check Bearing: 57.8%

Result: **Selected connection type is adequate.**

Note:

BOLTED SHEAR CONNECTION

Location: Top Chord (DTL 12)

Bolt Grade:	ASTM A325	
Bolt Diameter:	0.5	in
Number of Bolts:	4	
Double Shear?	No	
Bolt Capacity:	21206	lbs

(AISC Equation J3-1)

Shear Load: 4357 lbs

Check Bolt: 20.5%

Result: **Select (4) 0.5 in. dia. ASTM A325 bolts.**

Note:



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Top Chord (DTL 12)

Bolt or Pin Diameter:	0.5	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.5625	in	Equation	Check?	Capacity
Number of Bolts or Pins:	4		J3-6a	Yes	3924
Plate Thickness:	0.14	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	65	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	1	in	(measured from center of hole)		
Bearing Capacity:	15698	lbs			
Perpendicular Edge Distance:	1	in	(measured from center of hole)		
Effective Perp. Edge Distance:	1				
Tensile Rupture Capacity:	26163	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	21158	lbs	(AISC Equation D5-2)		
Load:	4357	lbs			

Check Bearing: 27.8%

Result: **Selected connection type is adequate.**

Note:

BOLTED SHEAR CONNECTION

Location: Clamp to Column (DTL 12)

Bolt Grade:	ASTM A325		
Bolt Diameter:	0.5	in	
Number of Bolts:	1		
Double Shear?	No		
Bolt Capacity:	5301	lbs	(AISC Equation J3-1)
Shear Load:	2400	lbs	
Check Bolt:	45.3%		

Result: **Select (1) 0.5 in. dia. ASTM A325 bolt.**

Note:



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING & MATERIAL TENSILE/SHEAR STRENGTH

Location: Clamp to Column (DTL 12)

Bolt or Pin Diameter:	0.5	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.5625	in	Equation	Check?	Capacity
Number of Bolts or Pins:	1		J3-6a	Yes	3924
Plate Thickness:	0.14	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	65	ksi	J7-1	Yes	3150
Bolt/Pin Parallel Edge Distance:	1	in	(measured from center of hole)		
Bearing Capacity:	3150	lbs			
Perpendicular Edge Distance:	1	in	(measured from center of hole)		
Effective Perp. Edge Distance:	1				
Tensile Rupture Capacity:	6541	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	5289	lbs	(AISC Equation D5-2)		

Load: 2400 lbs

Check Bearing: 76.2%

Result: **Selected connection type is adequate.**

Note:



JOB NO.: U3024-001-181

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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

DESIGN APPROACH ASD

SUBJECT: CALCULATIONS

BOLTED SHEAR CONNECTION

Location: Knee Brace Connection (DTL 17)

Bolt Grade: A307
 Bolt Diameter: 0.5 in
 Number of Bolts: 1
 Double Shear? No
 Bolt Capacity: 2651 lbs (AISC Equation J3-1)
 Shear Load: 2300 lbs
 Check Bolt: 86.8%

Result: **Select (1) 0.5 in. dia. A307 bolt.**

Note:

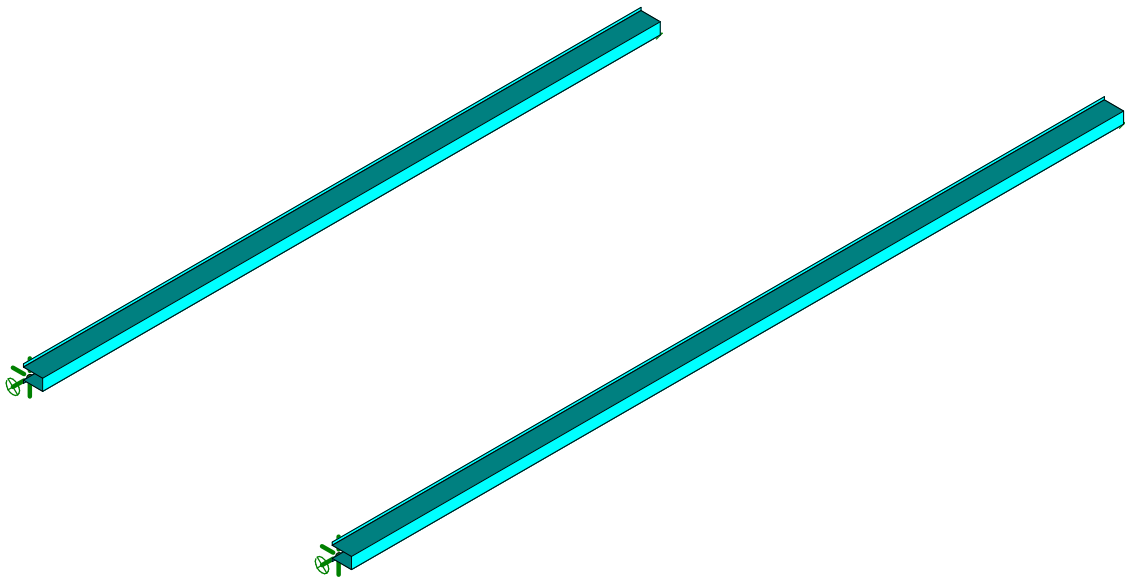
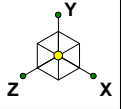
BOLT/PIN BEARING

Location: Knee Brace Connection (DTL 17)

& MATERIAL TENSILE/SHEAR STRENGTH

Bolt or Pin Diameter:	0.5	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.5625	in	Equation	Check?	Capacity
Number of Bolts or Pins:	1		J3-6a	Yes	1918
Plate Thickness:	0.11	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	62	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	0.75	in	(measured from center of hole)		
Bearing Capacity:	1918	lbs			
Perpendicular Edge Distance:	0.75	in	(measured from center of hole)		
Effective Perp. Edge Distance:	0				
Tensile Rupture Capacity:	3197	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	2941	lbs	(AISC Equation D5-2)		
Load:	1150	lbs			
Check Bearing:	60.0%				

Result: **Selected connection type is adequate.**



Vector Structural Engineeri...

FCG-VSE

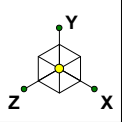
U3024-001-181

Girt

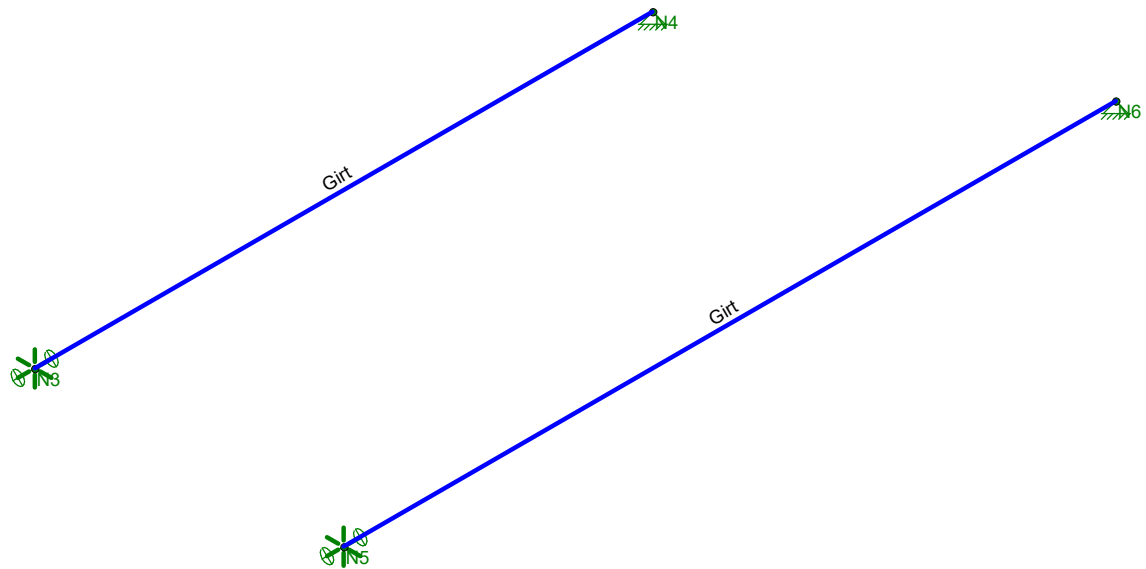
SK - 1

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Girt.r3d



Section Sets
■ Girt



Vector Structural Engineeri...

FCG-VSE

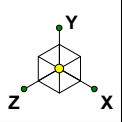
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Girt

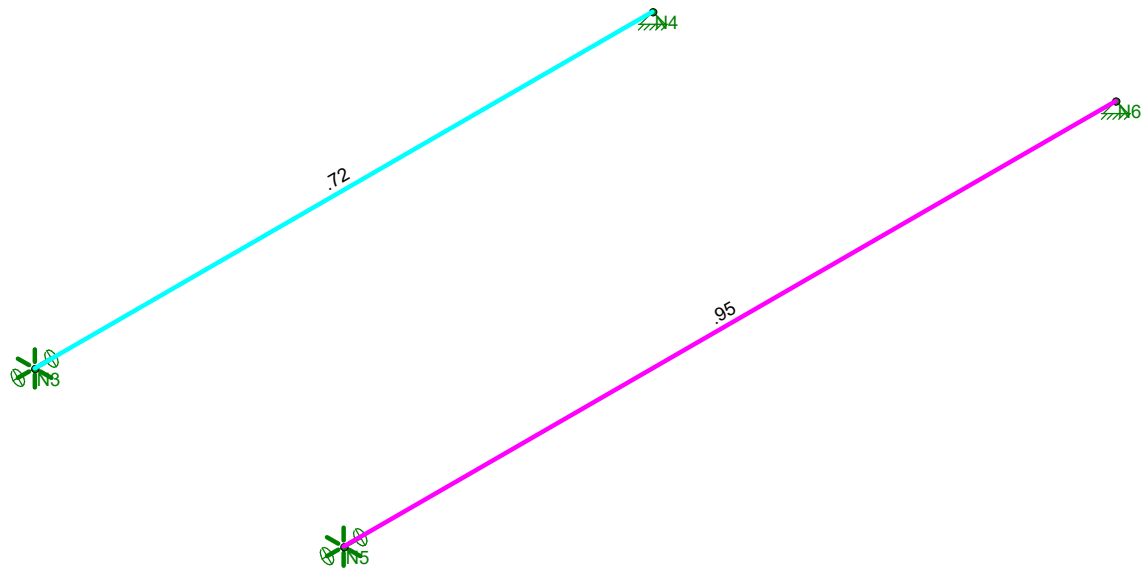
SK - 2

Nov 5, 2018 at 4:42 PM

Girt.r3d

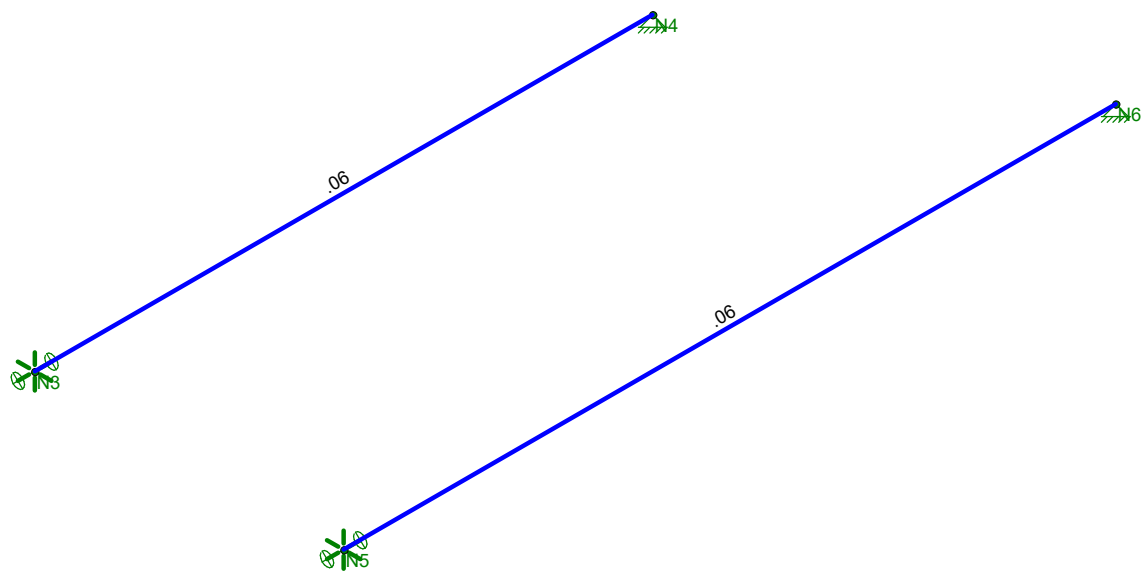
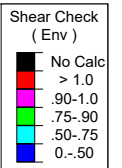
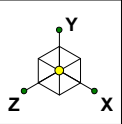


Code Check (Env)	
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	.75-.90
	.50-.75
	0-.50



Member Code Checks Displayed (Enveloped)
Results for LC 1, DL+0.6Wi

Vector Structural Engineeri...	Girt	SK - 3
FCG-VSE		Nov 5, 2018 at 4:42 PM
U3024-001-181		Girt.r3d



Member Shear Checks Displayed (Enveloped)
Results for LC 1, DL+0.6Wi

Vector Structural Engineeri...	Girt	SK - 4
FCG-VSE		Nov 5, 2018 at 4:43 PM
U3024-001-181		Girt.r3d



Company : Vector Structural Engineering
 Designer : FCG-VSE
 Job Number : U3024-001-181
 Model Name : Girt

Nov 5, 2018
 5:15 PM
 Checked By: KGS

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 Grade 50	29500	11346	.3	.65	.49	50	65

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Girt	3x1.75 18GA (0.05")	None	None	A653 Grad...	Typical	.452	.555	.368	.000377

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Member)	Surface...
1	DL	None		-1.1				2		
2	Wi	None						2		
3	Wo	None						2		

Load Combinations

	Description	Sol...	PDelta	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	DL+0.6Wi	Yes			1	1	2	.6														
2	DL+0.6Wo	Yes			1	1	3	.6														
3	DL+0.75(0.6)Wi	Yes			1	1	2	.45														
4	DL+0.75(0.6)Wo	Yes			1	1	3	.45														
5	0.6DL+0.6Wi	Yes			1	.6	2	.6														
6	0.6DL+0.6Wo	Yes			1	.6	3	.6														
7																						
8	DL				1	1																
9	Wi				2	1																
10	Wo				3	1																
11	Wi Deflection	Yes			2	.42																
12	Wo Deflection	Yes			3	.42																

Member Distributed Loads (BLC 1 : DL)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M2	Y	-1.36	-1.36	0	0
2	M3	Y	-1.36	-1.36	0	0

Member Distributed Loads (BLC 2 : Wi)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M2	X	-93	-93	0	0
2	M3	X	-90	-90	0	0

Member Distributed Loads (BLC 3 : Wo)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M2	X	119	119	0	0
2	M3	X	99	99	0	0

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N3	max	223.2	5	12.209	4	0	12	0	12	0	12	0	12
2		min	-285.6	2	0	11	0	1	0	1	0	1	0	1
3	N4	max	223.2	5	12.209	4	0	12	0	12	0	12	0	12



Company : Vector Structural Engineering
 Designer : FCG-VSE
 Job Number : U3024-001-181
 Model Name : Girt

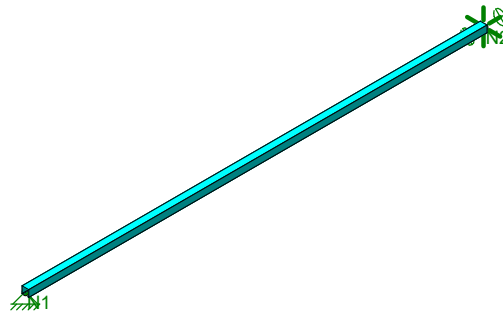
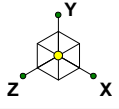
Nov 5, 2018
 5:15 PM
 Checked By: KGS

Envelope Joint Reactions (Continued)

Joint			X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
4		min	-285.6	2	0	11	0	1	0	1	0	1	0	1
5	N5	max	270	5	15.262	4	0	12	0	12	0	12	0	12
6		min	-297	2	0	11	0	1	0	1	0	1	0	1
7	N6	max	270	5	15.262	4	0	12	0	12	0	12	0	12
8		min	-297	2	0	11	0	1	0	1	0	1	0	1
9	Totals:	max	986.4	5	54.942	4	0	12						
10		min	-1165.2	2	0	11	0	1						

Envelope AISI S100-12: ASD Cold Formed Steel Code Checks

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	Pn/Om[lb]	Tn/Om[lb]	Mnyy/O...	Mnzz/O...	Cb	Cmyy	Cmzz	Eqn
1	M2	3x1.75 1...	.719	48	2	.057	0	z	6	10040.9...	13536.6...	.854	.488	1.136	.85	.85	C5.2.1-2
2	M3	3x1.75 1...	.948	60	2	.060	0	z	6	10040.9...	13536.6...	.854	.488	1.136	.85	.85	C5.2.1-2



Vector Structural Engineeri...

FCG-VSE

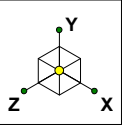
U3024-001-181

Purlin

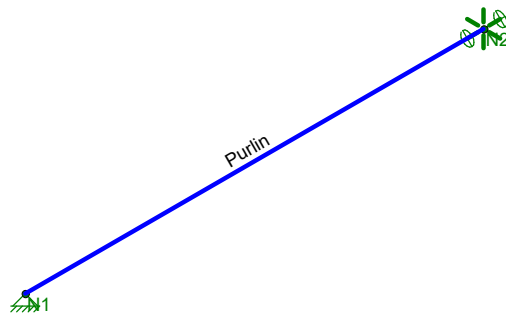
SK - 1

Nov 5, 2018 at 4:46 PM

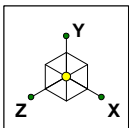
Purlin - adequate at 2ft o.c..r3d



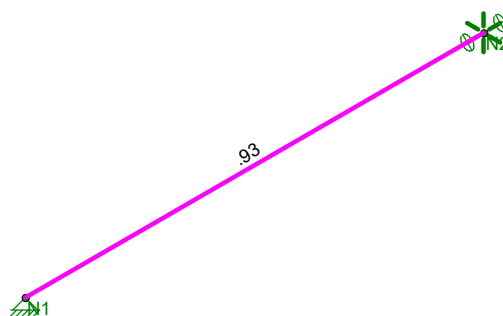
Section Sets
 Purlin



Vector Structural Engineeri...	Purlin	SK - 2
FCG-VSE		Nov 5, 2018 at 4:47 PM
U3024-001-181		Purlin - adequate at 2ft o.c..r3d



Code Check (Env)	
 	No Calc
 	> 1.0
 	.90-1.0
 	.75-.90
 	.50-.75
 	0-.50



Member Code Checks Displayed (Enveloped)
Results for LC 1, DL+PL+EL+S

Vector Structural Engineeri...	Purlin	SK - 3
FCG-VSE		Nov 5, 2018 at 4:48 PM
U3024-001-181		Purlin - adequate at 2ft o.c..r3d



Company : Vector Structural Engineering
 Designer : FCG-VSE
 Job Number : U3024-001-181
 Model Name : Purlin

Nov 5, 2018
 4:49 PM
 Checked By: KGS

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 Grade 50	29500	11346	.3	.65	.49	50	65

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Purlin	Purlin 2ft	None	None	A653 Grad...	Typical	.372	.099	.105	.000755
2	Girt	girt 2 1/4	None	None	A653 Grad...	Typical	.379	.281	.192	.000316
3	Purlin op2	2x2 tube	None	None	A653 Grad...	Typical	.379	.237	.237	.371
4	Reinforced purlin	1.375x1.375x.078	None	None	A653 Grad...	Typical	.386	.105	.105	.17

Member Distributed Loads (BLC 1 : DL)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M504	Y	-47	-47	0	0

Member Distributed Loads (BLC 4 : S)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M504	PY	-24	-24	0	0

Member Distributed Loads (BLC 5 : Su)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M504	PY	-14.5	-14.5	0	0

Member Distributed Loads (BLC 6 : Wo)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M504	Y	24.8	24.8	0	0

Member Distributed Loads (BLC 7 : Wi)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M504	Y	69	69	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Member)	Surface...
1	DL	None		-1.1				1		
4	S	None						1		
5	Su	None						1		
6	Wo	None				1		1		
7	Wi	None				1		1		

Load Combinations

	Description	Sol...	PDelta	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	DL+PL+EL+S	Yes			1	1	2	1	3	1	4	1								
2	DL+PL+EL+Su	Yes			1	1	2	1	3	1	5	1								
3	DL+PL+0.6Wo	Yes			1	1	2	1	6	.6										
4	DL+PL+0.6Wi	Yes			1	1	2	1	7	.6										
5	DL+PL+EL+0.75S+0.45Wo	Yes			1	1	2	1	3	1	4	.75	6	.45						
6	DL+PL+EL+0.75S+0.45Wi	Yes			1	1	2	1	3	1	4	.75	7	.45						
7	0.6DL+0.6PL+0.6Wo	Yes			1	.6	2	.6	6	.6										
8	0.6DL+0.6PL+0.6Wi	Yes			1	.6	2	.6	7	.6										
9																				



Company : Vector Structural Engineering
 Designer : FCG-VSE
 Job Number : U3024-001-181
 Model Name : Purlin

Nov 5, 2018
 4:49 PM
 Checked By: KGS

Load Combinations (Continued)

	Description	Sol...	PDelta	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
10	DL				1	1															
11	PL				2	1															
12	EL				3	1															
13	S				4	1															
14	Su				5	1															
15	Wo				6	1															
16	Wi				7	1															

Envelope AISI S100-07: ASD Cold Formed Steel Code Checks

	Member	Shape	Code ...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	Pn/Om[lb]	Tn/Om[lb]	Mnyy/O...	Mnzz/O...	Cb	Cmyy	Cmzz	Eqn
1	M504	Purlin 2ft	.927	48	8	.054	0	z	8	1526.018	11149.7...	347.771	247.822	1	.85	.6	C3.3.1-1

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N1	max	0	8	103.456	1	600	8	0	8	0	8	0	8
2		min	0	1	-161.127	8	0	1	0	1	0	1	0	1
3	N2	max	0	8	103.456	1	0	8	0	8	0	8	0	8
4		min	0	1	-161.127	8	0	1	0	1	0	1	0	1
5	Totals:	max	0	8	206.911	1	600	8						
6		min	0	1	-322.253	8	0	1						



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

DESIGN APPROACH ASD**SUBJECT: CALCULATIONS****BOLTED TENSION CONNECTION**

Location: Purlin

Bolt Grade: A307
 Bolt Diameter: 0.3125 in
 Number of Bolts: 2
 Bolt Capacity: 3451 lbs (AISC Equation J3-1)
 Tension Load: 162 lbs
 Check Bolt: 4.7%

Result: Select (2) 0.3125 in. dia. A307 bolts.

Note:

BOLTED SHEAR CONNECTION

Location: Purlin

Bolt Grade: A307
 Bolt Diameter: 0.3125 in
 Number of Bolts: 2
 Double Shear? No
 Bolt Capacity: 2071 lbs (AISC Equation J3-1)
 Shear Load: 600 lbs
 Check Bolt: 29.0%

Result: Select (2) 0.3125 in. dia. A307 bolts.

Note:



JOB NO.: U3024-001-181

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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING Location: Purlin
& MATERIAL TENSILE/SHEAR STRENGTH

Bolt or Pin Diameter:	0.3125	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.375	in	Equation	Check?	Capacity
Number of Bolts or Pins:	2		J3-6a	Yes	1046
Plate Thickness:	0.05	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	62	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	0.75	in	(measured from center of hole)		
Bearing Capacity:	2093	lbs			
Perpendicular Edge Distance:	1	in	(measured from center of hole)		
Effective Perp. Edge Distance:	1				
Tensile Rupture Capacity:	4526	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	2674	lbs	(AISC Equation D5-2)		
Load:	600	lbs			
Check Bearing:	28.7%				

Result: **Selected connection type is adequate.**

Note:

PLATE IN BENDING Location: Purlin

Plate depth:	0.11	in	<u>Intermediate Values</u>		
Plate width:	3.5	in	$L_b d/t^2$	0.00897959	
Moment arm/unbraced length:	1	in	S_x	0.00705833	in ³
Yield strength:	50	ksi	Z_x	0.011	in ³
Moment capacity:	26.42	ft-lbs			
Load:	162	lbs			
Moment:	14	ft-lbs			
Check Plate:	51.1%				

Result: **Selected plate is adequate.**

Note:



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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE**BOLTED TENSION CONNECTION**

Location: Girt

Bolt Grade: A307
 Bolt Diameter: 0.3125 in
 Number of Bolts: 2
 Bolt Capacity: 3451 lbs (AISC Equation J3-1)
 Tension Load: 285 lbs
 Check Bolt: 8.3%

Result: **Select (2) 0.3125 in. dia. A307 bolts.**

Note:

BOLTED SHEAR CONNECTION

Location: Girt

Bolt Grade: A307
 Bolt Diameter: 0.3125 in
 Number of Bolts: 2
 Double Shear? No
 Bolt Capacity: 2071 lbs (AISC Equation J3-1)
 Shear Load: 18 lbs
 Check Bolt: 0.9%

Result: **Select (2) 0.3125 in. dia. A307 bolts.**

Note:



JOB NO.: U3024-001-181

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PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE
BOLT/PIN BEARING Location: Girt
& MATERIAL TENSILE/SHEAR STRENGTH

Bolt or Pin Diameter:	0.3125	in	Available AISC Checks:		
Hole Diameter or Slot Width:	0.375	in	Equation	Check?	Capacity
Number of Bolts or Pins:	1		J3-6a	Yes	1046
Plate Thickness:	0.05	in	J3-6b	No	
Plate Yield Strength (F_y):	50	ksi	J3-6c	No	
Plate Ultimate Strength (F_u):	62	ksi	J7-1	No	
Bolt/Pin Parallel Edge Distance:	0.75	in	(measured from center of hole)		
Bearing Capacity:	1046	lbs			
Perpendicular Edge Distance:	1	in	(measured from center of hole)		
Effective Perp. Edge Distance:	1				
Tensile Rupture Capacity:	2263	lbs	(AISC Equation D5-1)		
Shear Rupture Capacity:	1337	lbs	(AISC Equation D5-2)		
Load:	18	lbs			
Check Bearing:	1.7%				

Result: **Selected connection type is adequate.**

Note:

PLATE IN BENDING Location: Girt

Plate depth:	0.078	in	<u>Intermediate Values</u>		
Plate width:	3.25	in	$L_b d/t^2$	0.00738462	
Moment arm/unbraced length:	1	in	S_x	0.0032955	in ³
Yield strength:	50	ksi	Z_x	0.005	in ³
Moment capacity:	12.33	ft-lbs			
Load:	143	lbs			
Moment:	12	ft-lbs			
Check Plate:	96.3%				

Result: **Selected plate is adequate.**

Note:

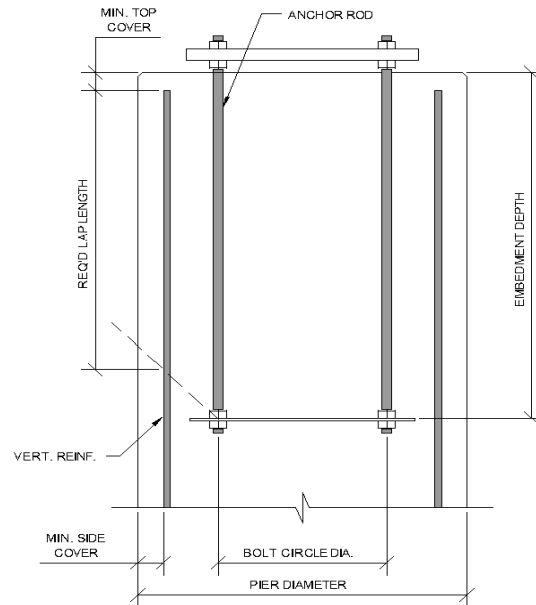


JOB NO.: U3024-001-181

PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

Anchorage Embedment Design

Vertical Bar Size:	#5	
Conc. Comp. Strength:	3000	psi
Pier Diameter:	2	ft
Pier Depth:	7.1	ft
Top of Pier Elevation:	0.00	inches
Concrete Volume	0.8	yards
Side Conc. Cover:	3	inches
Top Conc. Cover:	3	inches
Bolt Circle Dia.:	3	inches
Horizontal Tie Size:	#3	
# Anchor Rods:	4	
Anchor Rod Dia:	0.25	inches
ψ_t (bar loc. factor):	1.0	ACI 12.2.4a
ψ_e (epoxy coating factor):	1.0	ACI 12.2.4b
ψ_s (bar size factor):	0.8	ACI 12.2.4.c
λ (concrete type factor):	1.0	ACI 12.2.4.d
Bar Diameter:	0.6	in
Horiz. Tie Diameter:	0.4	in
Min. Clr Dist. Btwn Anchor & Vert:	6.4	in
Req'd Lap Length:	21.4	in ACI 12.2.2
Min. Required Embedment Depth:	31.2	in

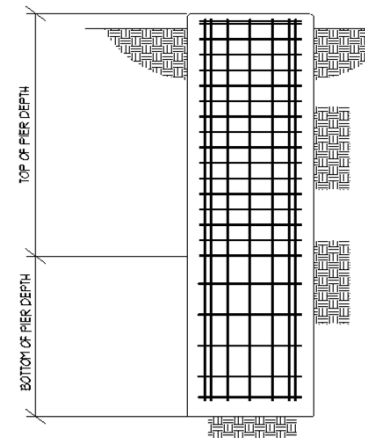


Required Lap Length + Max distance between anchor and rod + $0.5 \times \text{Bar diameter}$ + $0.5 \times \text{Anchor diameter}$ + Top cover

Transverse Reinforcement Design

(see IBC Sections 1810.3.9.4.1 and 1810.3.9.4.2)

Seismic Design Category:	C	
Site Class:	D	
Type of Transverse Reinforcement:	Spiral	
Transverse f_{yt} :	60	ksi
Seismic Hooks Required?	Yes	
Tie Size OK?	Yes	
Spacing at Top of Pier:	5.0	in
Spacing at Bottom of Pier:	10	in
Total Pier Length	7.1	ft
Top Pier Length:	6	ft
Bottom Pier Length:	1.1	ft





JOB NO.: U3024-001-181

PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

Drilled Pier Design

Building column

Design Methodology:

ASD

Design Loads:

For ASD methodology, input ASD loads.

For LRFD methodology, input LRFD loads divided by $\Phi_s = 0.75$ **Design Loads:**Max. Shear, $V =$

3.9

k

Max. Down, $P_{down} =$

4.8

k

Max. Moment, $M =$

2.7

k-ft

Max. Uplift, $P_{uplift} (opt'l) =$

2.4

k

Pier Properties:

Pier Shape

Round

Pier Diameter, $b =$

2.0

ft

Min. Pier Diameter, $b_{min} (opt'l) =$

ft

Top of Pier Elevation:

0.00

ft

Pier Depth, $d =$

7

ft

Min. Pier Depth, $d_{min} (opt'l) =$

ft

Max. Pier Depth, $d_{max} (opt'l) =$

ft

Volume of Concrete:

22

ft³

Volume of Concrete:

0.8

yd³

Weight of Concrete:

3.3

k

Soil Properties:

Allow. Bearing Pressure:

1,500

psf

Optional Parameters for Uplift:

1/3 increase for short term loads?

No

Skin Friction:

100

psf

Lateral Bearing, $S =$

150

pcf

Top Length to Ignore:

0.0

ft

Factor of Safety:

1

1/3 increase for short

Max. Lateral Bearing (opt'l):

2,250

psf

term loads?

No

Top Depth to Ignore:

0.0

ft

Combine w/ Bearing:

Yes

1/3 increase for short term loads?

No

1/2" deflection at t/o pier allowed:

Yes

Check Bearing:

Bearing Capacity:

9.2

k

Bearing capacity OK.**Check Uplift:**

Uplift Capacity:

7.5

k

Uplift capacity OK.**Check Lateral Bearing:**

Per IBC 1807.3.2

Lateral constraint at ground surface?

No

Applied Lateral Force, $P =$

3,900

lb

Point of Application, $h =$

0.7

ft

 $S_{1_max} =$

2,250

psf

 $S_1 =$

710

psf

 $A = 2.34 * P / (S_1 b) =$

6.43

Required Pier Depth, $d_{reqd} =$

7

ft

IBC Eqn. 18-1

Lateral bearing capacity OK.



JOB NO.: U3024-001-181

PROJECT: JOHN DAY INNOVATION GATEWAY GREENHOUSE

Drilled Pier Design

Interior Column

Design Methodology:

ASD

Design Loads:

For ASD methodology, input ASD loads.

For LRFD methodology, input LRFD loads divided by $\Phi_s = 0.75$ **Design Loads:**Max. Shear, $V =$

2.2

k

Max. Down, $P_{down} =$

1.3

k

Max. Moment, $M =$

0.0

k-ft

Max. Uplift, $P_{uplift} (opt'l) =$

3.3

k

Pier Properties:

Pier Shape

Round

Pier Diameter, $b =$

2.0

ft

Min. Pier Diameter, $b_{min} (opt'l) =$

ft

Top of Pier Elevation:

0.00

ft

Pier Depth, $d =$

5.3

ft

Min. Pier Depth, $d_{min} (opt'l) =$

ft

Max. Pier Depth, $d_{max} (opt'l) =$

ft

Volume of Concrete:

17

ft³

Volume of Concrete:

0.6

yd³

Weight of Concrete:

2.5

k

Soil Properties:

Allow. Bearing Pressure:

1,500

psf

Optional Parameters for Uplift:

1/3 increase for short term loads?

No

Skin Friction:

100

psf

Lateral Bearing, $S =$

150

pcf

Top Length to Ignore:

0.0

ft

Factor of Safety:

1

1/3 increase for short

Max. Lateral Bearing (opt'l):

2,250

psf

term loads?

No

Top Depth to Ignore:

0.0

ft

Combine w/ Bearing:

Yes

1/3 increase for short term loads?

No

1/2" deflection at t/o pier allowed:

Yes

Check Bearing:

Bearing Capacity:

8.0

k

Bearing capacity OK.**Check Uplift:**

Uplift Capacity:

5.6

k

Uplift capacity OK.**Check Lateral Bearing:**

Per IBC 1807.3.2

Lateral constraint at ground surface?

No

Applied Lateral Force, $P =$

2,200

lb

Point of Application, $h =$

0.0

ft

 $S_{1_max} =$

2,250

psf

 $S_1 =$

530

psf

 $A = 2.34 * P / (S_1 b) =$

4.86

Required Pier Depth, $d_{reqd} =$

4.9

ft

IBC Eqn. 18-1

Lateral bearing capacity OK.

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Concrete Column

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Description : Pier

Code References

Calculations per ACI 318-11, IBC 2012, CBC 2013, ASCE 7-10

Load Combinations Used : ASCE 7-10

General Information

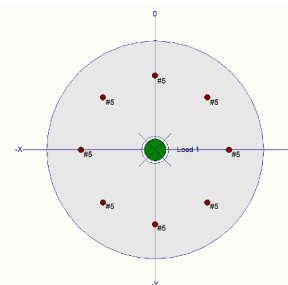
f'_c : Concrete 28 day strength = 2.50 ksi
 E = 3,605.0 ksi
 Density = 145.0 pcf
 β = 0.850
 f_y - Main Rebar = 60.0 ksi
 E - Main Rebar = 29,000.0 ksi
 Allow. Reinforcing Limits *ASTM A615 Bars Used*
 Min. Reinf. = 0.50 %
 Max. Reinf. = 8.0 %

Overall Column Height = 7.0 ft
 End Fixity **Top Free, Bottom Fixed**
 Brace condition for deflection (buckling) along columns :
 X-X (width) axis :
 Unbraced Length for X-X Axis buckling = 29.50 ft, K = 2.10
 Y-Y (depth) axis :
 Unbraced Length for X-X Axis buckling = 29.50 ft, K = 2.10

Column Cross Section

Column Dimensions : 24.0in Diameter, 3.0in inside diameter,
 Column Edge to Rebar Edge Cover = 3.50in

Column Reinforcing : 8.0 - #5 bars



Entered loads are factored per load combinations specified by user.

Applied Loads

Column self weight included : 3,126.0 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 7.0 ft above base, D = 4.80 k

BENDING LOADS . . .

Moment acting about X-X axis at 9.50 ft, W = 3.20 k-ft

Lat. Point Load at 9.50 ft creating Mx-x, W = 3.50 k

DESIGN SUMMARY

Load Combination **+0.90D+W+0.90H**
 Location of max. above base **6.953 ft**

Maximum Stress Ratio **0.182 : 1**

Ratio = $(P_u^2 + M_u^2)^{.5} / (\Phi P_n^2 + \Phi M_n^2)^{.5}$

P_u = 7.133 k $\Phi * P_n$ = 37.982 k

M_{u-x} = -22.109 k-ft $\Phi * M_{n-x}$ = -122.963 k-ft

M_{u-y} = 0.0 k-ft $\Phi * M_{n-y}$ = 0.0 k-ft

M_u Angle = 0.0 deg

M_u at Angle = 22.109 k-ft ΦM_n at Angle = 121.653 k-ft

P_n & M_n values located at P_u-M_u vector intersection with capacity curve

Column Capacities . . .

P_nmax : Nominal Max. Compressive Axial Capacity **1,085.95 k**

P_nmin : Nominal Min. Tension Axial Capacity **k**

ΦP_n , max : Usable Compressive Axial Capacity **564.69 k**

ΦP_n , min : Usable Tension Axial Capacity **k**

Maximum SERVICE Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	3.50 k

Maximum SERVICE Load Deflections . . .

Along Y-Y **0.009507 in** at **7.0 ft** above base
 for load combination : **W Only**

Along X-X **0.0 in** at **0.0 ft** above base
 for load combination :

General Section Information . ϕ = 0.650 β = 0.850 θ = 0.80

ρ : % Reinforcing **0.5592 %** Rebar % Ok

Reinforcing Area **2.480 in²**

Concrete Area **443.492 in²**

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Description : Pier

Governing Load Combination Results

Governing Factored Load Combination	Moment		Dist. from base ft	Axial Load k		Bending Analysis k-ft						Utilization	
	X-X	Y-Y		Pu	$\phi * P_n$	δx	$\delta x * M_{ux}$	δy	$\delta y * M_{uy}$	Alpha (deg)	δM_u	ϕM_n	Ratio
+1.40D+1.60H		M2,min	6.95	11.10	564.69			1.000	1.22	90.000	1.22	61.22	0.020
+1.40D+1.60H	M2,min		6.95	11.10	564.69	1.000	1.22			0.000	1.22	61.22	0.020
+1.20D+0.50Lr+1.60L+1.60H		M2,min	6.95	9.51	564.69			1.000	1.05	90.000	1.05	61.22	0.017
+1.20D+0.50Lr+1.60L+1.60H	M2,min		6.95	9.51	564.69	1.000	1.05			0.000	1.05	61.22	0.017
+1.20D+1.60L+0.50S+1.60H		M2,min	6.95	9.51	564.69			1.000	1.05	90.000	1.05	61.22	0.017
+1.20D+1.60L+0.50S+1.60H	M2,min		6.95	9.51	564.69	1.000	1.05			0.000	1.05	61.22	0.017
+1.20D+1.60Lr+0.50L+1.60H		M2,min	6.95	9.51	564.69			1.000	1.05	90.000	1.05	61.22	0.017
+1.20D+1.60Lr+0.50L+1.60H	M2,min		6.95	9.51	564.69	1.000	1.05			0.000	1.05	61.22	0.017
+1.20D+1.60Lr+0.50W+1.60H		M2,min	6.95	9.51	143.16	1.051	-11.20			0.000	11.20	167.31	0.067
+1.20D+0.50L+1.60S+1.60H		M2,min	6.95	9.51	564.69			1.000	1.05	90.000	1.05	61.22	0.017
+1.20D+0.50L+1.60S+1.60H	M2,min		6.95	9.51	564.69	1.000	1.05			0.000	1.05	61.22	0.017
+1.20D+1.60S+0.50W+1.60H			6.95	9.51	143.16	1.051	-11.20			0.000	11.20	167.31	0.067
+1.20D+0.50Lr+0.50L+W+1.60H			6.95	9.51	55.79	1.051	-22.39			0.000	22.39	131.87	0.170
+1.20D+0.50L+0.50S+W+1.60H			6.95	9.51	55.79	1.051	-22.39			0.000	22.39	131.87	0.170
+1.20D+0.50L+0.20S+E+1.60H		M2,min	6.95	9.51	564.69			1.000	1.05	90.000	1.05	61.22	0.017
+1.20D+0.50L+0.20S+E+1.60H	M2,min		6.95	9.51	564.69	1.000	1.05			0.000	1.05	61.22	0.017
+0.90D+W+0.90H			6.95	7.13	37.98	1.038	-22.11			0.000	22.11	121.65	0.182
+0.90D+E+0.90H		M2,min	6.95	7.13	564.69			1.000	0.78	90.000	0.78	61.22	0.013
+0.90D+E+0.90H	M2,min		6.95	7.13	564.69	1.000	0.78			0.000	0.78	61.22	0.013

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k		Y-Y Axis Reaction k		Axial Reaction @ Base	My - End Moments k-ft		Mx - End Moments k-ft	
	@ Base	@ Top	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
+D+H					7.926				
+D+L+H					7.926				
+D+Lr+H					7.926				
+D+S+H					7.926				
+D+0.750Lr+0.750L+H					7.926				
+D+0.750L+0.750S+H					7.926				
+D+0.60W+H			2.100		7.926	12.780			
+D+0.70E+H					7.926				
+D+0.750Lr+0.750L+0.450W+H			1.575		7.926	9.585			
+D+0.750L+0.750S+0.450W+H			1.575		7.926	9.585			
+D+0.750L+0.750S+0.5250E+H					7.926				
+0.60D+0.60W+0.60H			2.100		4.756	12.780			
+0.60D+0.70E+0.60H					4.756				
D Only					7.926				
Lr Only									
L Only									
S Only									
W Only			3.500			21.300			
E Only									
H Only									

Maximum Moment Reactions

Note: Only non-zero reactions are listed.

Load Combination	Moment About X-X Axis			Moment About Y-Y Axis	
	@ Base	@ Top		@ Base	@ Top
+D+H			k-ft		k-ft
+D+L+H			k-ft		k-ft
+D+Lr+H			k-ft		k-ft
+D+S+H			k-ft		k-ft
+D+0.750Lr+0.750L+H			k-ft		k-ft
+D+0.750L+0.750S+H			k-ft		k-ft
+D+0.60W+H	12.780		k-ft		k-ft
+D+0.70E+H			k-ft		k-ft
+D+0.750Lr+0.750L+0.450W+H	9.585		k-ft		k-ft
+D+0.750L+0.750S+0.450W+H	9.585		k-ft		k-ft

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Concrete Column

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Description : Pier

Note: Only non-zero reactions are listed.

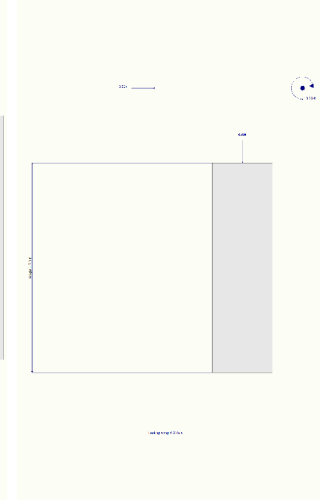
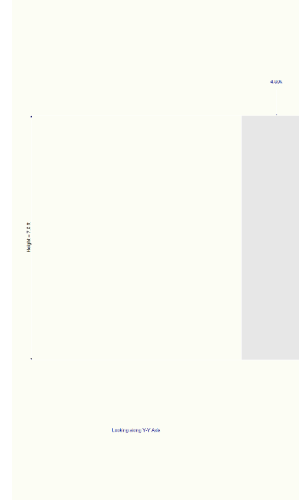
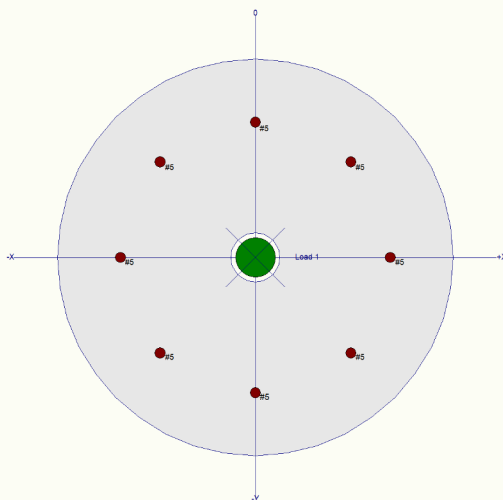
Maximum Moment Reactions

Load Combination	Moment About X-X Axis		Moment About Y-Y Axis	
	@ Base	@ Top	@ Base	@ Top
+D+0.750L+0.750S+0.5250E+H	12.780	k-ft		k-ft
+0.60D+0.60W+0.60H		k-ft		k-ft
+0.60D+0.70E+0.60H		k-ft		k-ft
D Only		k-ft		k-ft
Lr Only		k-ft		k-ft
L Only	21.300	k-ft		k-ft
S Only		k-ft		k-ft
W Only		k-ft		k-ft
E Only		k-ft		k-ft
H Only		k-ft		k-ft

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
+D+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+L+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+Lr+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+S+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750Lr+0.750L+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.60W+H	0.0000	in	0.000	ft	0.006	in	7.000	ft
+D+0.70E+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750Lr+0.750L+0.450W+H	0.0000	in	0.000	ft	0.004	in	7.000	ft
+D+0.750L+0.750S+0.450W+H	0.0000	in	0.000	ft	0.004	in	7.000	ft
+D+0.750L+0.750S+0.5250E+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+0.60D+0.60W+0.60H	0.0000	in	0.000	ft	0.006	in	7.000	ft
+0.60D+0.70E+0.60H	0.0000	in	0.000	ft	0.000	in	0.000	ft
D Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
Lr Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
L Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
S Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
W Only	0.0000	in	0.000	ft	0.010	in	7.000	ft
E Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
H Only	0.0000	in	0.000	ft	0.000	in	0.000	ft

Sketches



Interaction Diagrams

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Concrete Column

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Description : Pier

Concrete Column P-M Interaction Diagram



Circular Column Interaction Diagram

Reinforcement Tie

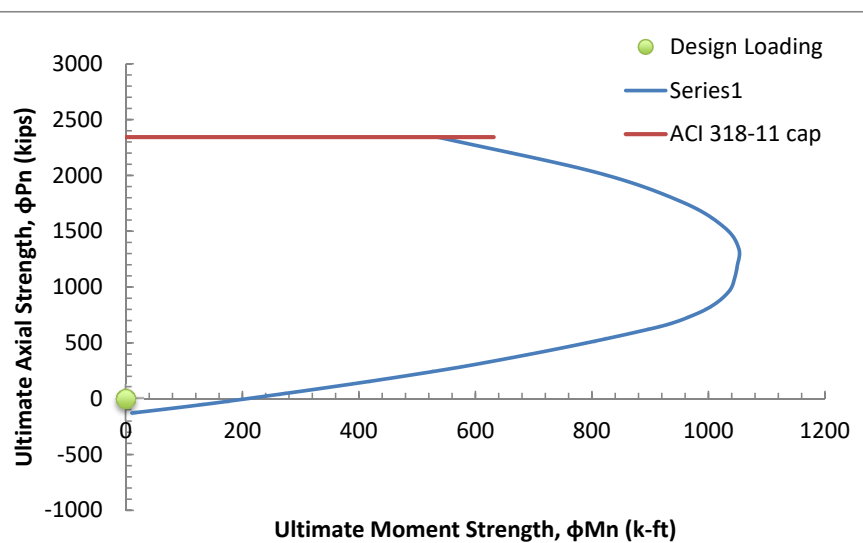
☒ Spiral
 ☐ Tied

Rebar Placement

☐ 1 bars on top
 ☒ 2 bar on top

Beam Info

Concrete Yield Strain (ϵ_{cu}) =	0.003	in/in
Steel Yield Strain (ϵ_y) =	0.002069	in/in
Concrete Strength (f'_c) =	3000	psi
Yield Strength (f_y) =	60000	psi
B_1 =	0.85	
Bar Size =	5	
Bar Diameter (d_b) =	0.625	inch
Number of Bars =	8	
Column Diameter, d_c =	42	inch
Conc. Surface to Vert. Rebar =	4.5	inch
Angle Between Bars, δ =	0.785	radians
Area of Steel (A_s) =	2.48	inches ²
Gross Column Area (A_g) =	1385.44	inches ²
Amount of steel (ρ) =	0.0018	
P_o =	3675	kips
ϕP_n (pure compression) =	2343	kips



Interaction Diagram

X-X

Design Requirement

Tie Support

Location	Depth	Number of bars in row	Area of steel in row
BOTTOM: Row (1) Steel =	36.24	2	0.62
Row (2) Steel =	27.31	2	0.62
Row (3) Steel =	14.69	2	0.62
Row (4) Steel =	5.76	2	0.62
Row (5) Steel =	0.00	0	0
Row (6) Steel =	0.00	0	0
Row (7) Steel =	0.00	0	0
Row (8) Steel =	0.00	0	0
Row (9) Steel =	0.00	0	0
Row (10) Steel =	0.00	0	0

Eccentric Distance, e =	0	inch
P_u =	-2.4	kips
Applied M =	0.0	k-ft
Applied V =	0.0	kips
Height of V =	7.000	ft
M_u =	0.0	k-ft
% Limit =	100%	
ϕP_n =	4.0	
ϕM_n =	202.2	
UC =	1%	OK

Tie size =	4	
Tie Diameter =	0.5	inch
Tie Area, A_{sp} =	0.2	inches ²
Core Area, A_c =	941.6	inches ²
Volume Ratio, ρ_s =	0.0106	
Conc. Volume, V_c =	16625	inches ³
Volume of Reinf. Require, V_{req} =	176.3	inches ³
Spiral Circumf. C_s =	107.2	inch
Pitch, s =	1.46	inch
Pitch passes		