



Civil Engineering Services

SPECIFIC IMPLEMENTATION PLAN

Site Improvements
Science On a River - SOAR
826 South 8th Street, Sheboygan, WI 53081

June 2025

OWNER CONTACT:
Leslie Kohler – Project Manager
SOAR
826 South 8th Street
Sheboygan, WI 53081
(920) 629-8986
lkohler@windway.com

REGISTERED PROFESSIONAL ENGINEER:
Joel VanEss, P.E.
Abacus Architects, Inc.
1135A Michigan Avenue
Sheboygan, WI 53081
(920) 452-4444
jvaness@abacusarch.com

PROJECT DESCRIPTION

Tax Key Numbers: 59281110032

Zoning: Unit Development

A total of about 10,000 sq.ft. of site additions will be added to the outside of the existing building at 826 South 8th Street to bring in children/students for a series of outdoor learning experiences.

Proposed additions will include:

- Asphalt, limestone, concrete and pavers pathways throughout the site.
- A proposed solar tree and solar table.
- A proposed pavilion.
- A proposed greenhouse.
- A proposed bio-filtration pond and rain garden.

The current zoning of the site is Unit Development. No modifications are required for land use, density and intensity, or parking and loading requirements.

Civil plans found in the appendix show the extent of proposed changes for the project, as well as a proposed grading plan, and a proposed stormwater and utility plan.

Engineering plans found in the appendix show the proposed solar tree, pavilion, and greenhouse and provide details as to the materials and elevations used for the project.

The original landscape plan for the project can be found in the appendix. A future landscape plan will be updated and sent when received.

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LOCATION MAP

OWNER AND ZONING MAP

CIVIL PLAN SET

ENGINEERING PLAN SETS

LANDSCAPING PLAN

LOCATION MAP



LOCATION MAP



SCALE: 1"=100'

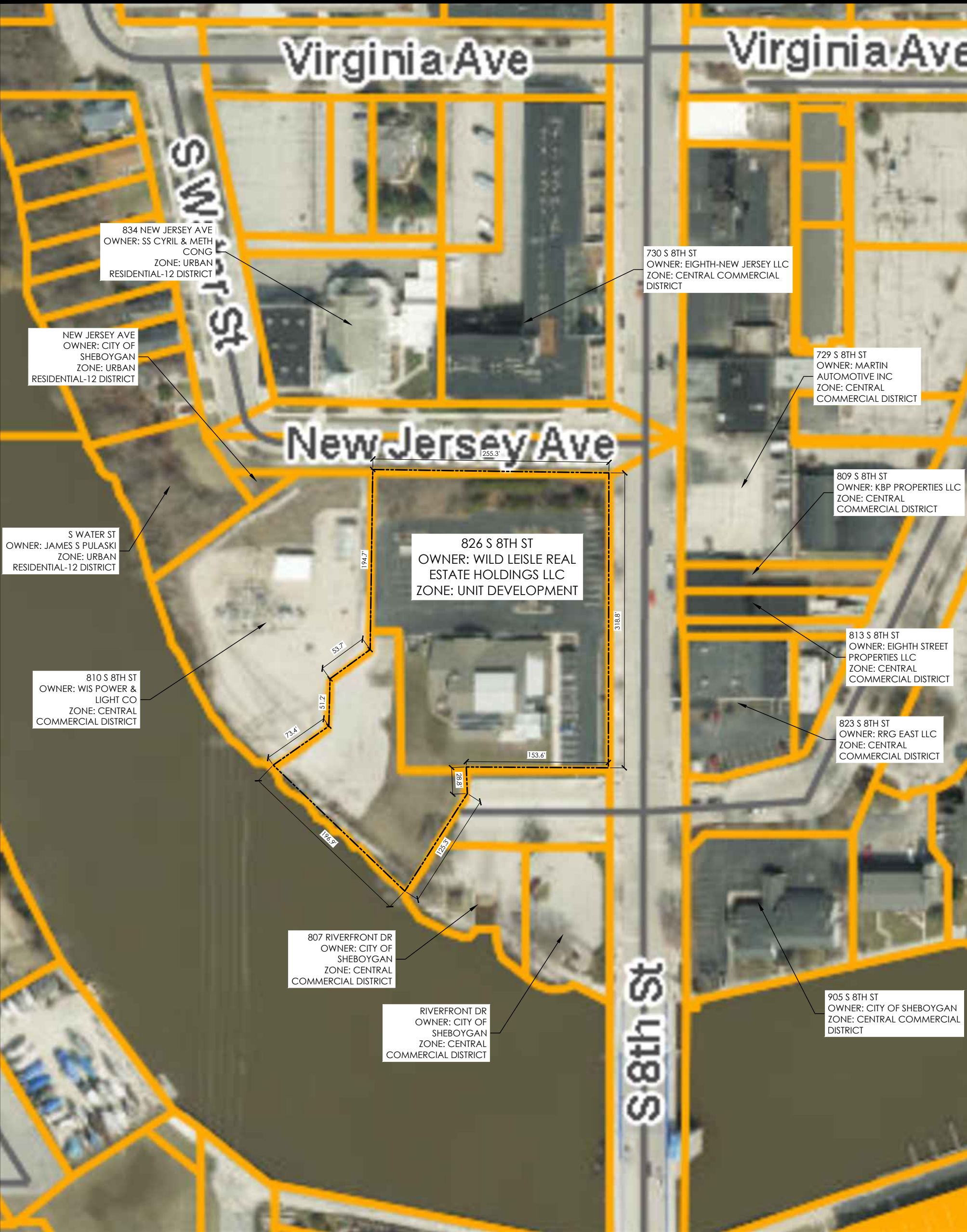
June 24, 2025
SOAR
Sheboygan, WI

Proj. No. 2024-147

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OWNERS AND ZONING MAP



ZONING MAP



SCALE: 1"=100'

June 24, 2025
SOAR
Sheboygan, WI

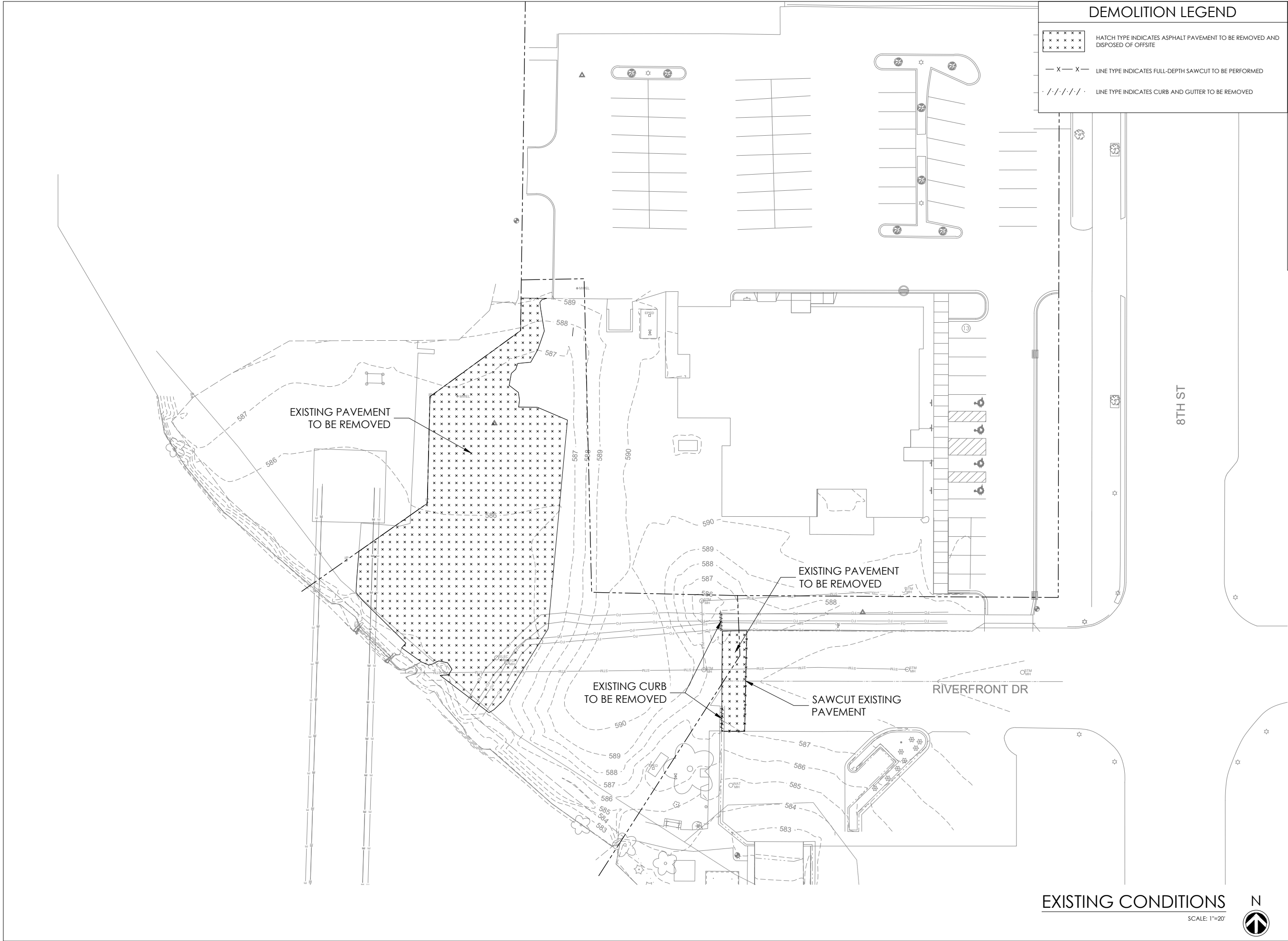
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CIVIL PLAN SET

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June 24, 2025



DEMOLITION LEGEND

- HATCH TYPE INDICATES ASPHALT PAVEMENT TO BE REMOVED AND DISPOSED OF OFFSITE
- LINE TYPE INDICATES FULL-DEPTH SAWCUT TO BE PERFORMED
- LINE TYPE INDICATES CURB AND GUTTER TO BE REMOVED



REVISIONS:

NOTICE TO BIDDERS
BIDDERS SHALL REVIEW ALL DRAWINGS AND SPECIFICATION SECTIONS TO DETERMINE THE IMPACT OF OTHER SECTIONS OF WORK ON THEIR OWN WORK.

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June 24, 2025
SITE ADDITIONS

VISIT SHEBOYGAN SOAR

824 SOUTH 8TH STREET, SHEBOYGAN, WI

1135A MICHIGAN AVE. SHEBOYGAN, WI 53081 | 920) 452-4444 | 640 N. VEL R. PHILLIPS AVE. SUITE 210 MILWAUKEE, WI 53202 | 414) 837-6450

DRAWN BY: JMN

CHECKED BY: JRV

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PROJ. NO. 2024-147

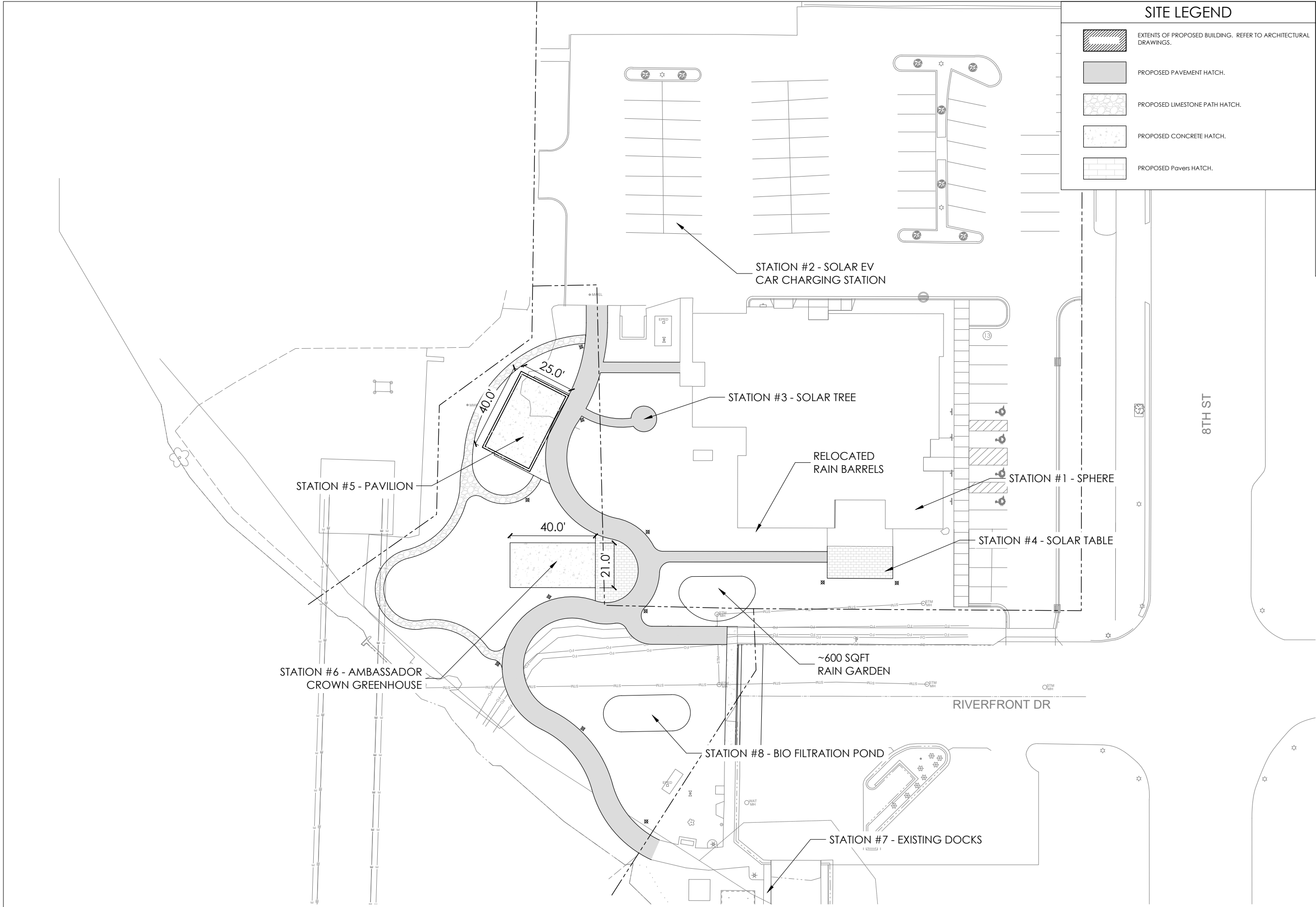
EXISTING CONDITIONS

SCALE: 1"=20'



June 24, 2025

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SITE LEGEND

- EXTENTS OF PROPOSED BUILDING. REFER TO ARCHITECTURAL DRAWINGS.
- PROPOSED PAVEMENT HATCH.
- PROPOSED LIMESTONE PATH HATCH.
- PROPOSED CONCRETE HATCH.
- PROPOSED Pavers HATCH.

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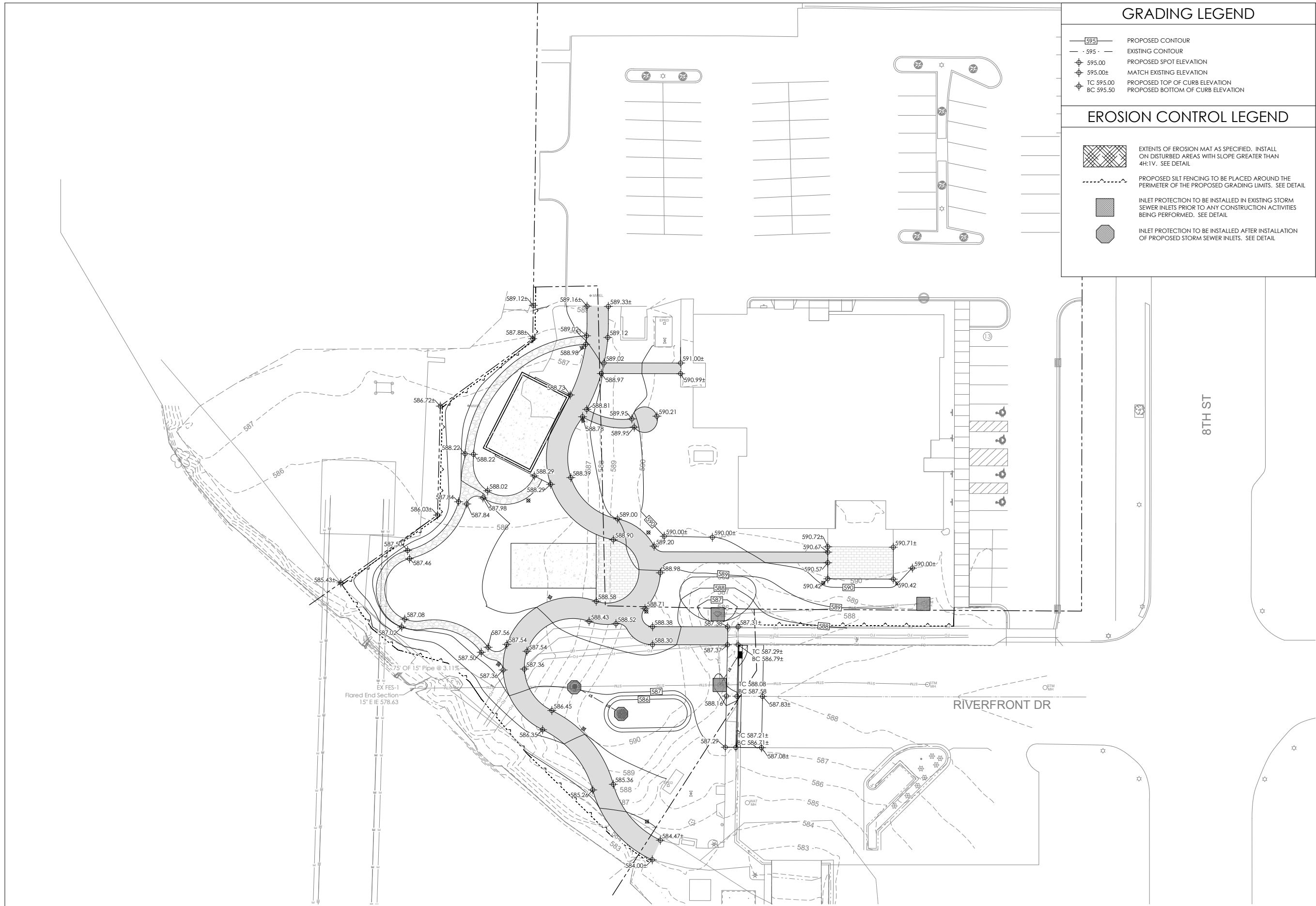
SITE PLAN

SCALE: 1"=20'

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June 24, 2025



GRADING LEGEND

- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED SPOT ELEVATION
- MATCH EXISTING ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- PROPOSED BOTTOM OF CURB ELEVATION

EROSION CONTROL LEGEND

- EXTENTS OF EROSION MAT AS SPECIFIED. INSTALL ON DISTURBED AREAS WITH SLOPE GREATER THAN 4H:1V. SEE DETAIL
- PROPOSED SILT FENCING TO BE PLACED AROUND THE PERIMETER OF THE PROPOSED GRADING LIMITS. SEE DETAIL
- INLET PROTECTION TO BE INSTALLED IN EXISTING STORM SEWER INLETS PRIOR TO ANY CONSTRUCTION ACTIVITIES BEING PERFORMED. SEE DETAIL
- INLET PROTECTION TO BE INSTALLED AFTER INSTALLATION OF PROPOSED STORM SEWER INLETS. SEE DETAIL



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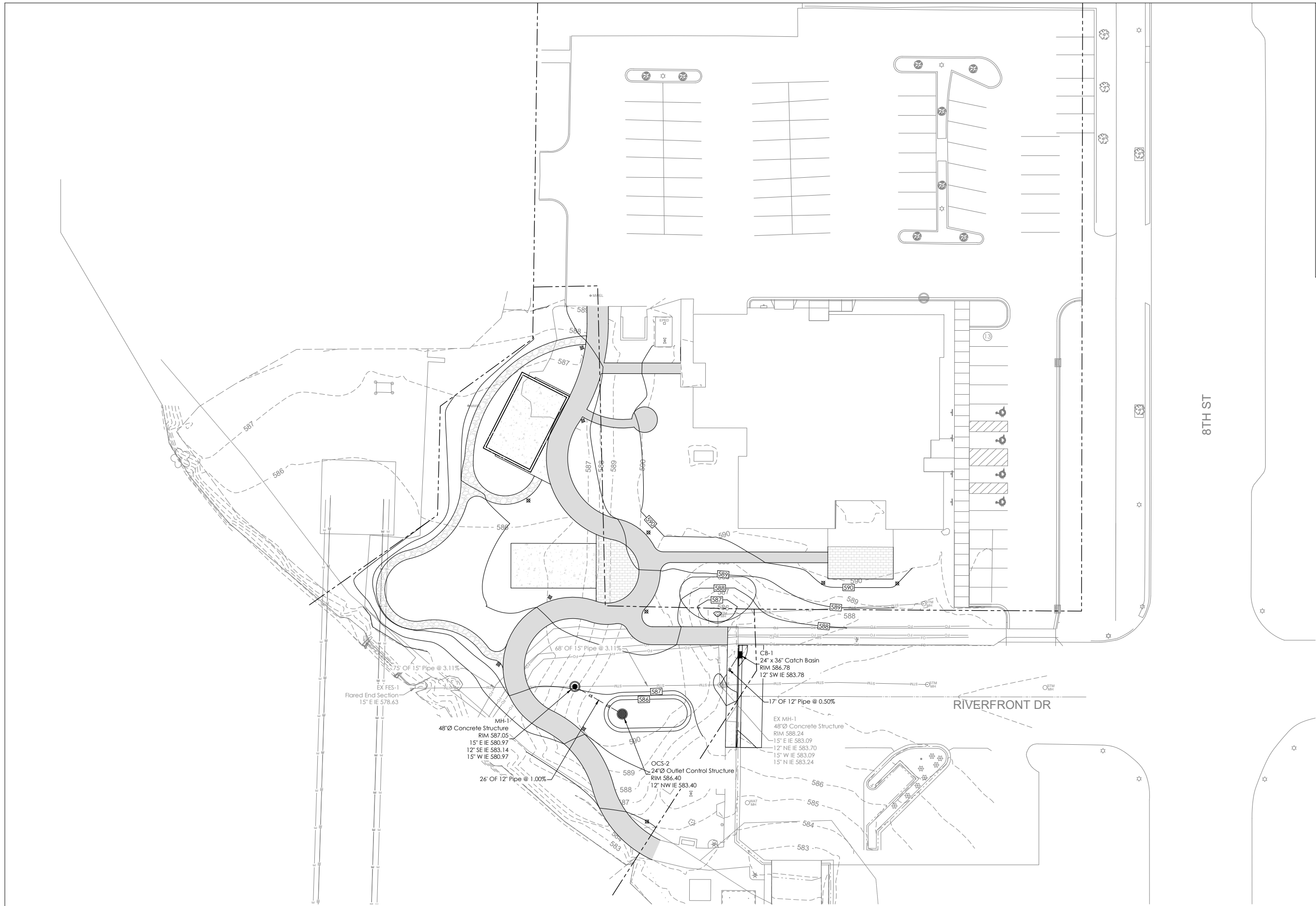
GRADING AND EROSION CONTROL PLAN

SCALE: 1"=20'



June 24, 2025

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UTILITY PLAN
SCALE: 1"=20'



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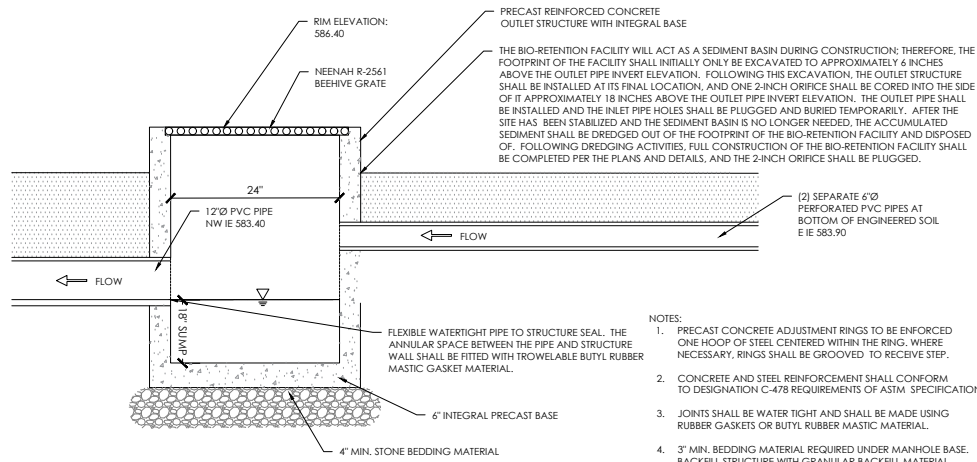
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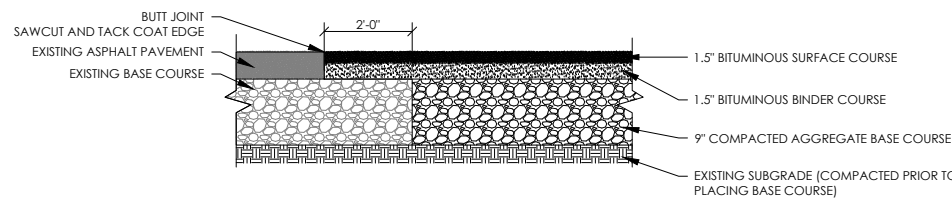
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PROJ. NO. 2024-147

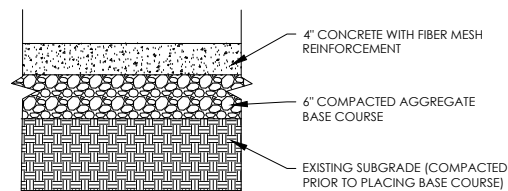
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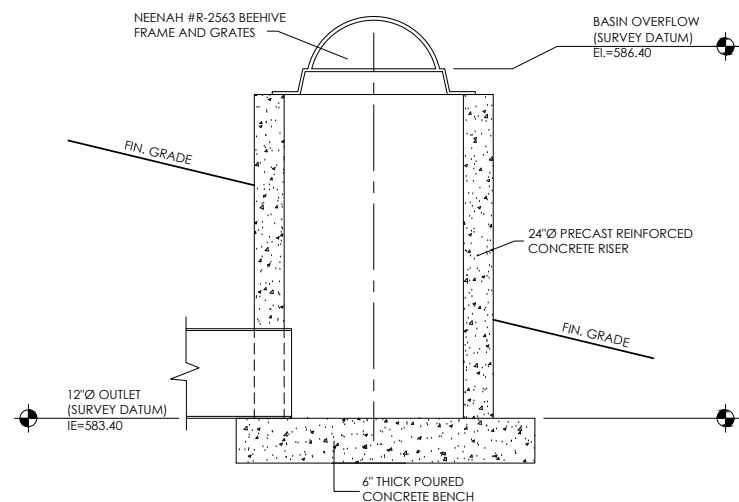
BIO-RETENTION OUTLET STRUCTURE DETAIL



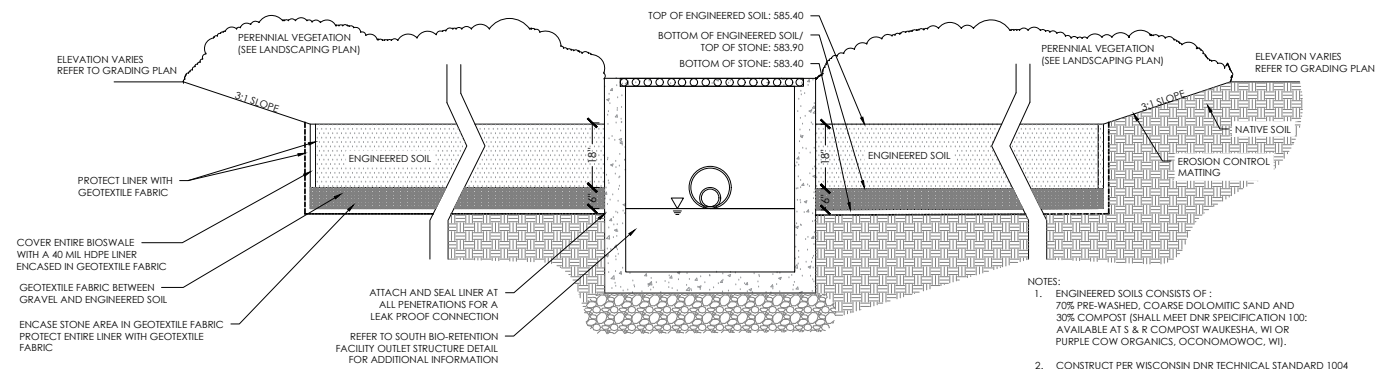
PATH ASPHALT PAVEMENT CROSS SECTION



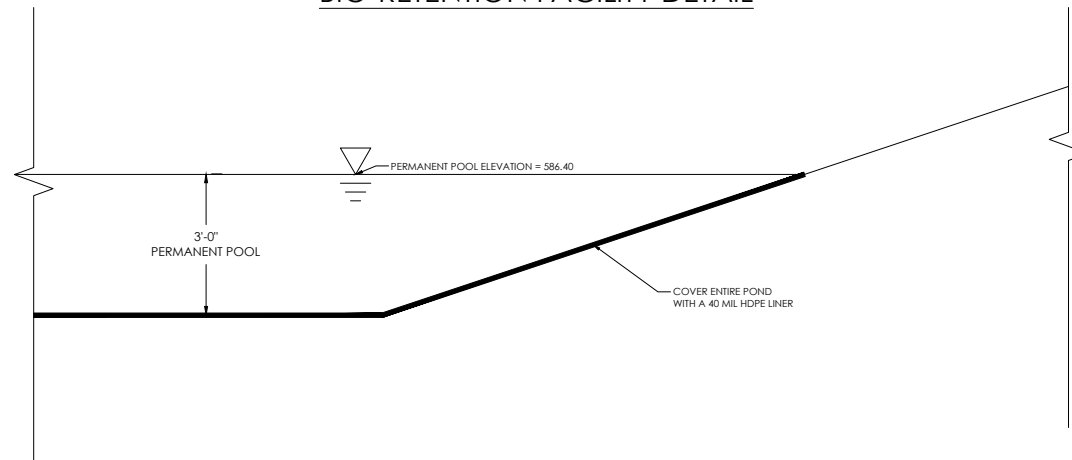
CONCRETE PAVEMENT CROSS SECTION



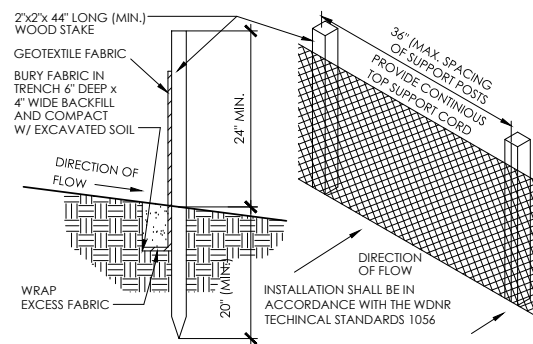
POND OUTLET SECTION



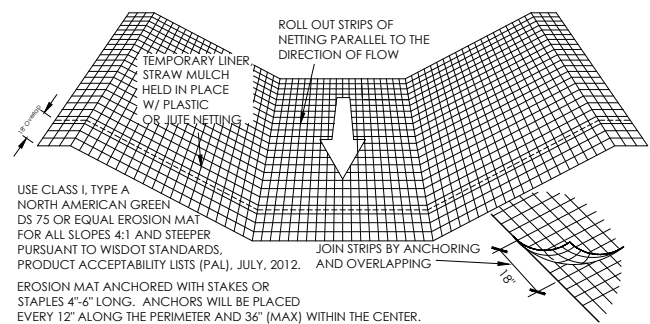
BIO-RETENTION FACILITY DETAIL



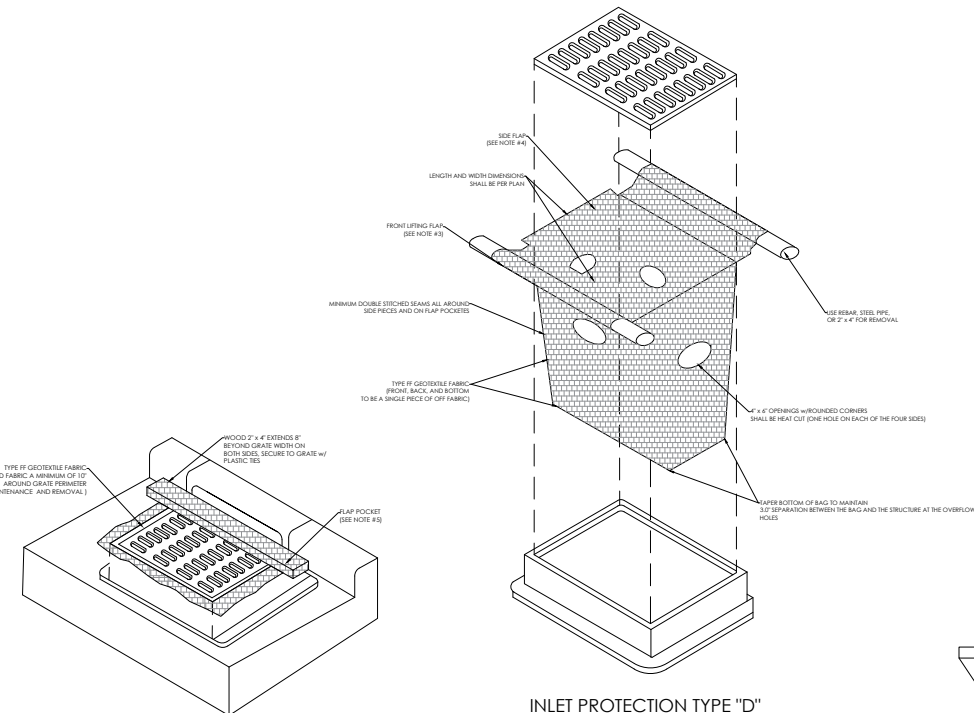
WET DETENTION POND CROSS SECTION



SILT FENCE SECTION & DETAIL



EROSION MATTING DETAIL
(FOR SIDE SLOPES ONLY - NOT FOR CHANNELIZED FLOW)



INLET PROTECTION TYPE "C"

MAINTENANCE NOTES:

1. WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED IN THE FABRIC DOES NOT FALL INTO THE STRUCTURE. MATERIAL THAT HAS FALLEN INTO THE INLET SHALL BE IMMEDIATELY REMOVED.

DETAILS

REVISIONS:

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ENGINEERING PLAN SETS



SOLAR FORMA DESIGN

Installer Specification Sheet

Solar Forma Design provides artisan structures built to support solar power generation. Our structures are partially assembled before being shipped to the final installation site. This packet contains relevant information for installation service providers to scope installation services.

E-Cacia Solar Tree Reference Installation¹



¹ Note: Reference Install in standard color. See specification index for specific install color details.

SOLAR FORMA

E-CACIA SOLAR TREE - 120/240V GRID-TIED

1903 Keith Street
Eau Claire 54701

SHEET INDEX					
SHEET NUMBER	SHEET NAME	REVISION DATE	SHEET REVISION NUMBER	REVISION DESCRIPTION	REVISION RESPONSIBILITY
E-1	TITLE SHEET - SHEET INDEX	03/26/2021	0	ISSUE FOR PRODUCTION	CMK
E-2	AC/DC STRINGING LAYOUT	03/26/2021	0	ISSUE FOR PRODUCTION	CMK
E-3	ELECTRICAL DETAILS	03/26/2021	0	ISSUE FOR PRODUCTION	CMK
E-4	ONE-LINE DIAGRAM	03/26/2021	0	ISSUE FOR PRODUCTION	CMK



SOLAR FORMA

E-CACIA SOLAR TREE - 120/240V GRID-TIED

TITLE SHEET - SHEET INDEX

DATE: 03/26/2021

BY: CMK

CHK: CMK

APP: CMK

REV: 0

ISSUE FOR PRODUCTION

PROJECT NUMBER

2104300

DRAWN BY: CMK

DESIGNED BY: CMK

APPROVED BY: CMK

DATE: 03/26/2021

SCALE: NONE

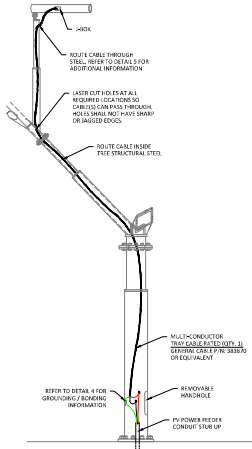
SHEET

E-1

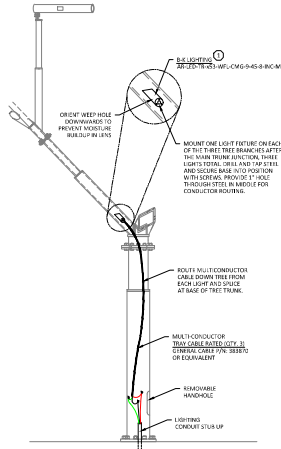


- GENERAL NOTES:**
- THE INSTALLATION SHALL COMPLY WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT, THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL CODES.
 - ALL WIRING SHALL BE COMPLETED IN A NEAT AND WORKMANLIKE MANNER.
 - MAINTAIN PROPER BEND RADII WHEN COMPLETING WORKING.
 - MODULOS THAT ARE GROUPED TOGETHER IN STRINGS SHALL BE WIRING TOGETHER IN SERIES AND SHALL BE CONNECTED TO A CORRESPONDING MICROPROCESSOR. REFER TO THE DATA-LOG DIAGRAM ON SHEET 5-4 FOR ADDITIONAL INFORMATION.
 - WHERE CONDUCTORS MUST PASS FROM ONE TRIANGLE TO ANOTHER, ROUTE CONDUCTORS THROUGH TUBULAR STEEL OR THE PROVIDED ELECTRICAL CHASE.
 - ROUND THE MICROPROCESSOR USING MOUNTING BRACKETS TO THE FLOOR STRUCTURE USING

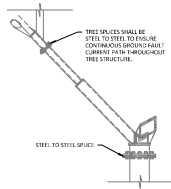
SOLAR FORMA					
E-CACIA SOLAR TREE - 120/240V GRID-TIED					
AC/DC STRINGING LAYOUT					
PROJECT NUMBER 2104300					
DRAWN BY:	CABRILLO	DATE:	08/29/2017	NO.	1
DESIGNED BY:	CABRILLO	DATE FOR PRODUCTION:			
APPROVED BY:	CABRILLO				
SCALE:	AS SHOWN				
REVISIONS:	$\Delta E = 17^\circ C$				
SHEET E-2					



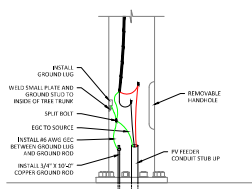
1 PV FEEDER ROUTING DETAIL
Scale: 1/2" = 1'-0"



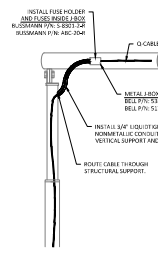
2 LIGHTING DETAIL - TYPICAL OF THREE LIGHTS
Scale: 1/2" = 1'-0"



3 TREE STRUCTURE SPLICE DETAIL
Scale: 1/2" = 1'-0"



4 TRUNK BONDING / GROUNDING DETAIL
Scale: 1" = 1'-0"



5 CANOPY WIRING - ENLARGED VIEW
Scale: 1" = 1'-0"

GENERAL NOTES:

- A. PART NUMBERS PROVIDED HAVE BEEN SELECTED TO COMPLY WITH DESIGN REQUIREMENTS. IF ALTERNATE PARTS ARE SELECTED, THEY WILL NEED TO BE EVALUATED TO INSURE PROPER FUNCTION AND COMPLIANCE.

PLANNING:

1. FURNISH AND INSTALL REMOTE PROTECTORS TO CONTROL LIGHTING.

SOLAR FORMA
E-CACIA SOLAR TREE - 120V/240V GRID-TIED
ELECTRICAL DETAILS

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272	07/20/2021	CHE		
273	07/20/2021	CHE		

NO.	REVISION	DATE	BY	CHKD	APP'D
0	ISSUE FOR PRODUCTION	3/26/2021			

PROJECT NUMBER					
2104300					

DRAWN BY:	CHESTER
DESIGNED BY:	CHESTER
APPROVED BY:	CHESTER
DATE:	3/26/2021
SCALE:	VARIABLE

SHEET
E-3

E-Cacia Solar Tree Convenience Outlet
Installation Specifications

5/27/2024

B

SCALE: 1:200

SHEET 1 OF 1

Rev

Aluminum Cladding

Hubbell-Raco 5320-0 BELL
Weatherproof Outlet Box
#5320-1 or equivalent

Single Gang Vertical Weatherproof
In-use Cover (TayMac RaynGuard
Model # MX3200) by Solar Forma
(Painted to match RAL #5011)

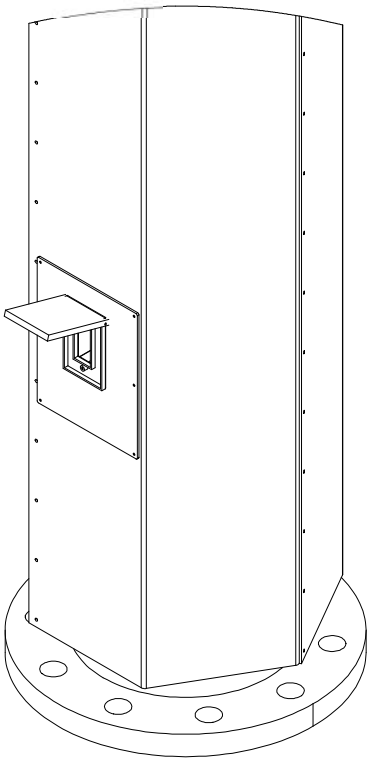
Removable Access Panel
in cladding
18-24" above grade

Flexible Conduit wired to box
with enough extra slack to
pull panel away from trunk
(BY OTHERS)

Reinforced Access Hole
in Trunk structure

Steel Structure

Single Gang Vertical GFCI Plug
Receptacle by others



IN-USE COVERS
CONDUIT BODIES
WALLPLATES



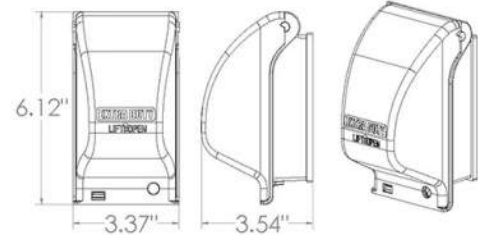
Commercial, Industrial and Residential Electrical Products

RaynGuard® 1-Gang Weatherproof In-Use Cover

Catalog #:
MX3200



MX3200



FEATURE BENEFIT

Extra Deep, provides 3-1/2 inches of depth inside while in use



PRODUCT FEATURES

- Heavy duty die-cast aluminum construction
- Patented QuickFit keyhole mounting system allows installation in under a minute
- Includes attached gasket and mounting hardware
- Pre-configured for GFCI with patented Knockout technology for alternate devices
- Lockable tab (fits up to 1/8 in. shackable)
- Premium Powder Coat

APPLICATIONS

Designed for use whenever weatherproof protection is required while an outlet is in use

CERTIFICATIONS



NEMA 3R Rated

NEC - Extra Duty Rated

PRODUCT SPECIFICATIONS

UPC Number:	092326104760
Ea Length/Depth (in.):	3.54
Ea Width (in.):	3.37
Ea Height (in.):	6.12
Wt. Ea. (Lbs.):	0.620
Color:	Gray
Gangs:	1
Package Type:	Shrink
Package Contents:	1
Product UPC-A Labeled:	Yes

SHIPPING

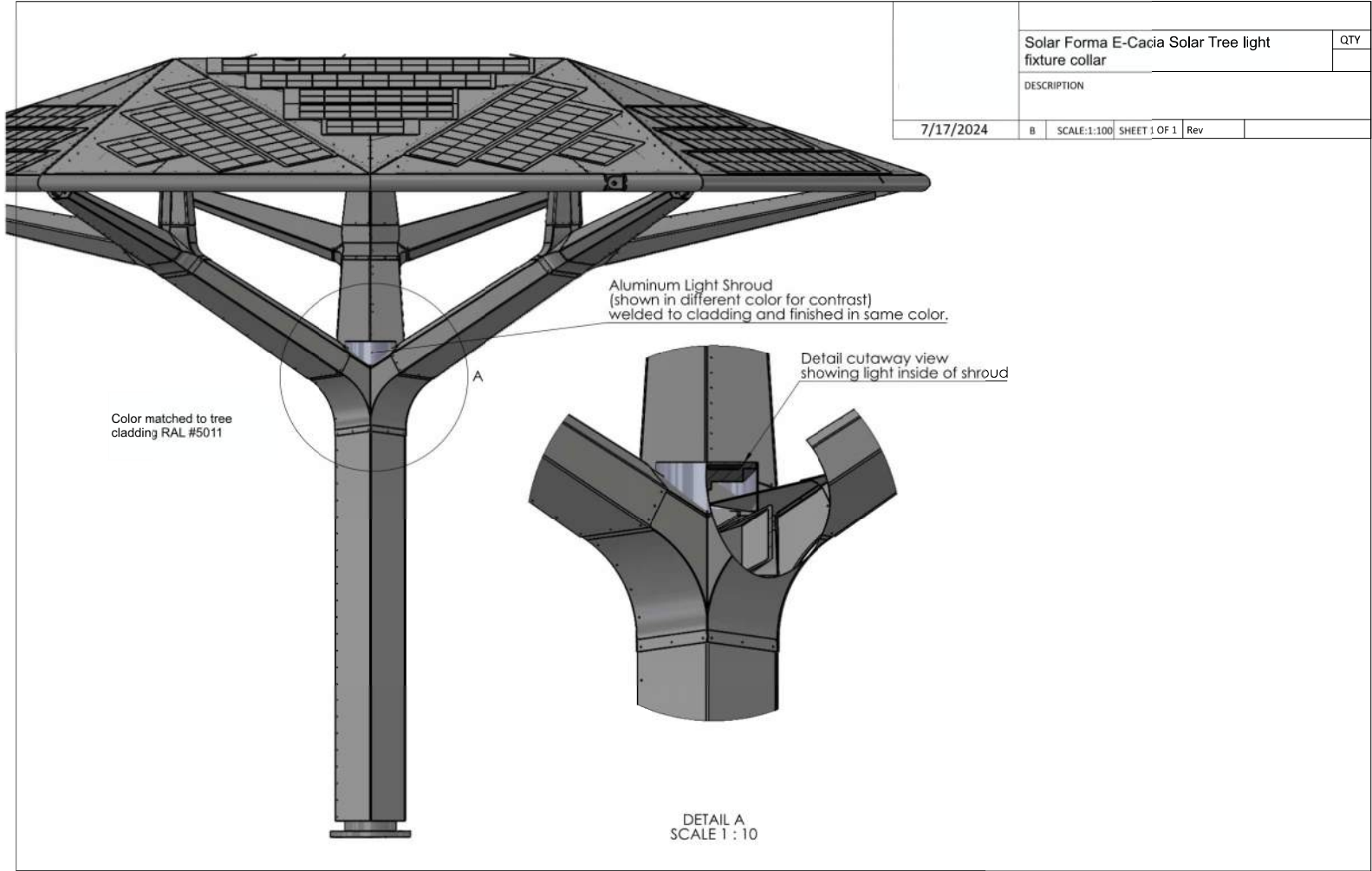
I2of5:	40092326104768
Standard Carton Qty:	4
Min Order Qty:	1
Ship Carton Length (in.):	14.61
Ship Carton Width (in.):	3.86
Ship Carton Height (in.):	7.08
Ship Carton Weight (Lbs.):	2.80
Pallet Qty:	720



TayMac
2520 E. University Dr.
Tempe, AZ 85281
800-526-5416
www.hubbell.com/taymac/en



Revision 1, July 2018



C-HB-B-RD Series

Round LED UFO High Bay Light

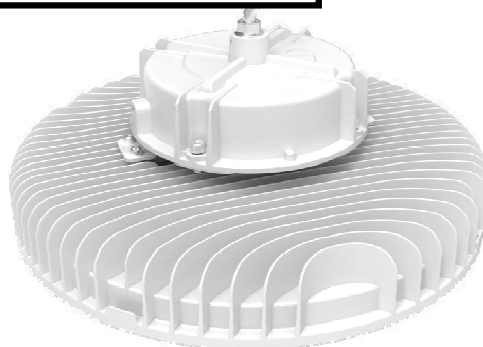
Replaces up to 400W PSMH

C-LITE
LED LIGHTING

Solar Forma E-Cacia Solar
Tree Light full part number:
C-HB-B-RD-20L-40K-UL-BK

THE HIGH BAY MADE FOR YOU

Our cETLus Listed Round LED UFO High Bay Light delivers up to 140 lumens per watt and features an integrated hook for easy mounting. Sold separately, accessories include a plug-and-play motion sensor with a remote to control your settings. It comes with high voltage options for more demanding applications.



Shown with
optional motion
sensor accessory.



PRODUCT SPECIFICATIONS

OVERVIEW

- Max. Delivered Lumens: 14,000 **(14L)**; 21,000 **(20L)**; 27,000 **(27L)**; 33,600 **(33L)**
- CRI: ≥ 80
- CCT: 3500K, 4000K or 5000K
- Input Power: 100W **(14L)**; 150W **(20L)**; 200W **(27L)**; 240W **(33L)**
- Dimmable: 0-10V to 10% with UL (120-277V) voltage only. UH (347-480V) luminaires may only be dimmed using the motion sensor accessory
- Operating Temperature Range: -4°F to 122°F (-20°C to 50°C)
- Estimated L₇₀ Lifetime @ 25°C (77°F): >75,000 hours
- Power Factor: >.9 at full load
- Total Harmonic Distortion: <20% at full load
- Limited Warranty: 5-Year*
- Replaces: 250W PSMH **(14L)**; 320W PSMH **(20L)**; 400W PSMH **(27L, 33L)**

FEATURES	RECOMMENDED USE	INPUT VOLTAGE
• 140 LPW • Wide variety of accessories sold separately — including a plug-and-play motion sensor with a remote to control the settings • High voltage options • IP65 rated • FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions	• Auto Dealerships • Commercial • Gymnasium • Industrial • Manufacturing • Storage Facilities • Warehouses	• UL: Universal (120-277V) • UH: High voltage (347-480V)

CERTIFICATIONS:



CA RESIDENTS WARNING: Cancer and Reproductive Harm –
www.p65warnings.ca.gov



C-HB-B-RD Series

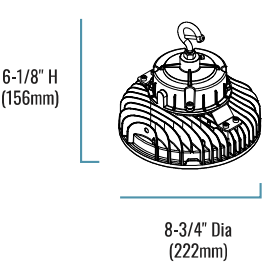
ORDERING INFORMATION
Example SKU: C-HB-B-RD-20L-50K-UL-WH

C-HB	B	RD				
PRODUCT	SERIES	STYLE	LUMEN PACKAGE	CCT	VOLTAGE	COLOR
C-HB High Bay	B	RD Round	14L 14,000 Lumens 20L 21,000 Lumens 27L 27,000 Lumens 33L 33,600 Lumens	35K Warm White (3500K*) 40K Neutral White (4000K) 50K Cool White (5000K)	UL Universal 120-277V UH High 347-480V (Available for 20L, 27L and 33L options, only in white housing)	WH White BK Black

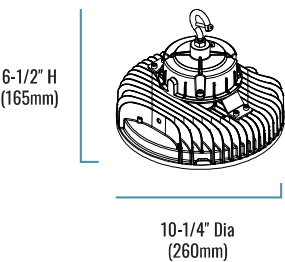
*3500K only available in 14L, 20L & 27L, White housing, 120-277V

Solar Forma E-Cacia Solar Tree Light full part number: C-HB-B-RD-20L-40K-UL-BK

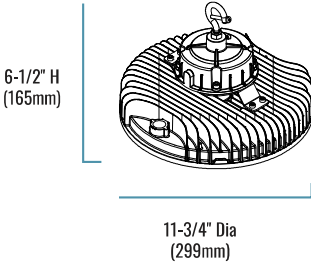
C-HB-B-RD-14L



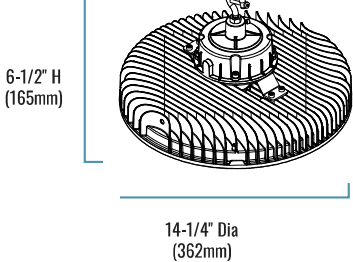
C-HB-B-RD-20L



C-HB-B-RD-27L



C-HB-B-RD-33L



SERIES OVERVIEW

DIMENSIONS	PRODUCT WEIGHT	MOUNTING HEIGHT	SPACING
(14L) 8-3/4" (222mm) Dia x 6-1/8" (156mm) H (20L) 10-1/4" (260mm) Dia x 6-1/2" (165mm) H (27L) 11-3/4" (299mm) Dia x 6-1/2" (165mm) H (33L) 14-1/4" (362mm) Dia x 6-1/2" (165mm) H	(14L) 5.51 lbs. (20L) 6.45 lbs. (27L) 7.72 lbs. (33L) 9.92 lbs.	(14L) 15 - 20 feet (20L) 15 - 25 feet (27L) 20 - 30 feet (33L) > 30 feet	1 to 1-1/2 times the mounting height

FIXTURE SPECIFICATIONS

HOUSING	Die-cast aluminum with a durable, black or white powder-coat finish
LENS ASSEMBLY	Clear polycarbonate
MOUNTING	Integrated hook, pendant mounting option available; included 6-foot power cord
ELECTRICAL	UL models: 6 ft power cord, 12 in dimming cord UH models: 6 ft power cord, no dimming cord (may only be dimmed using the motion sensor accessory)

C-HB-B-RD Series

LUMINAIRE AND ELECTRICAL PERFORMANCE

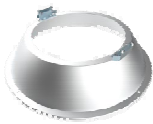
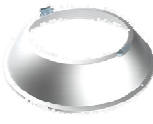
OPERATING TEMPERATURE RANGE	ESTIMATED L ₇₀ LIFETIME @ 25°C (77°F)	POWER FACTOR	TOTAL HARMONIC DISTORTION
-4°F to 122°F (-20°C to 50°C)	>75,000 hours	>.9 at full load	<20% at full load

SERIES	REPLACES	LUMEN OUTPUT	SYSTEM WATTS	CURRENT DRAW (AMPS)					
				120V	208V	240V	277V	347V	480V
C-HB-B-RD-14L	250W PSMH	14,000	100W	0.83	0.53	0.46	0.4	N/A	N/A
C-HB-B-RD-20L	320W PSMH	21,000	150W	1.39	0.8	0.69	0.6		
C-HB-B-RD-27L	400W PSMH	27,000	200W	1.85	1.07	0.93	0.8		
C-HB-B-RD-33L		33,600	240W	2.22	1.28	1.11	0.96		
C-HB-B-RD-20L-UH	320W PSMH	21,000	150W	N/A	N/A	N/A	N/A	0.48	0.35
C-HB-B-RD-27L-UH	400W PSMH	27,000	200W					0.64	0.46
C-HB-B-RD-33L-UH		33,600	240W					0.77	0.56

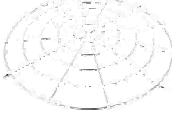
WARRANTY AND CERTIFICATIONS

WARRANTY	cETLus LISTED	DLC
5-Year Limited*	Wet Listed	Premium

ACCESSORIES

	ALUMINUM REFLECTOR SMALL		DROP LENS SMALL
	SKU: C-HB-B-ACC-AR-SM USE: Aluminum reflector for the 100W and 150W C-HB-B-RD Series.		SKU: C-HB-B-ACC-DL-SM USE: Clear prismatic polycarbonate drop lens for the 100W and 150W C-HB-B-RD Series. Additional reflector is required.
	PRISMATIC REFLECTOR SMALL		CONICAL LENS SMALL
	SKU: C-HB-B-ACC-PR-SM USE: Clear prismatic polycarbonate reflector for the 100W and 150W C-HB-B-RD Series.		SKU: C-HB-B-ACC-CL-SM USE: Clear prismatic polycarbonate conical lens for the 100W and 150W C-HB-B-RD Series. Additional reflector is required.
	ALUMINUM REFLECTOR LARGE		DROP LENS LARGE
	SKU: C-HB-B-ACC-AR-LG USE: Aluminum reflector for the 200W and 240W C-HB-B-RD Series.		SKU: C-HB-B-ACC-DL-LG USE: Clear prismatic polycarbonate drop lens for the 200W and 240W C-HB-B-RD Series. Additional reflector is required.
	PRISMATIC REFLECTOR LARGE		CONICAL LENS LARGE
	SKU: C-HB-B-ACC-PR-LG USE: Clear prismatic polycarbonate reflector for the 200W and 240W C-HB-B-RD Series.		SKU: C-HB-B-ACC-CL-LG USE: Clear prismatic polycarbonate conical lens for the 200W and 240W C-HB-B-RD Series. Additional reflector is required.

C-HB-B-RD Series

	WIRE GUARD SMALL SKU: C-HB-B-ACC-WG-SM USE: Wire guard for the 100W & 150W C-HB-B-RD Series. Additional reflector is required.
	WIRE GUARD LARGE SKU: C-HB-B-ACC-WG-LG USE: Wire guard for the 200W & 240W C-HB-B-RD Series. Additional reflector is required.
	MOTION SENSOR SKU: C-HB-B-ACC-MS-UL USE: Plug-and-play microwave motion sensor for C-HB-B-RD Series. Additional remote required for programming sensor settings.
	PENDANT MOUNT WHITE SKU: C-HB-B-ACC-PM-WH USE: Pendant mount adapter for C-HB-B-RD Series, 3/4" threaded NPT for conduit pendant mounting, white.
	PENDANT MOUNT BLACK SKU: C-HB-B-ACC-PM-BK USE: Pendant mount adapter for C-HB-B-RD Series, 3/4" threaded NPT for conduit pendant mounting, black.
	MOTION SENSOR REMOTE SKU: C-HB-B-ACC-MS-REMOTE USE: Remote for programming plug-and-play motion sensor. Remote can control multiple fixture sensors. For use with C-HB-B-RD Series.
	DIMMING ACCESSORY 0-10V DIMMING SKU: C-HB-B-ACC-DIMKIT USE: Dimming accessory kit for 0-10V dimming of the fixture when using a wall switch. Contains 6-foot cord as well as male and female connectors. UH (347-480V) luminaires may only be dimmed using the motion sensor accessory.

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 Patent www.creelighting.com/patents. C-Lite and the C-Lite logo are registered trademarks of Cree Lighting. The cETLus Listed Intertek logo is a trademark of Intertek Testing Services NA, Inc. The DLC QPL logo and the DLC QPL Premium logo are registered trademarks of Northeast Efficiency Partnerships, Inc.

US: creelighting.com, e-conolight.com

Distribution/Sales: 855-617-2733 Customer Service: 888-243-9445

Rev. Date: 06/22/2023

For informational purposes only. Content is subject to change. *See creelighting.com/resources/warranties for details

C-LITE
LED LIGHTING

E-Cacia E2 Solar Tree Product Specifications

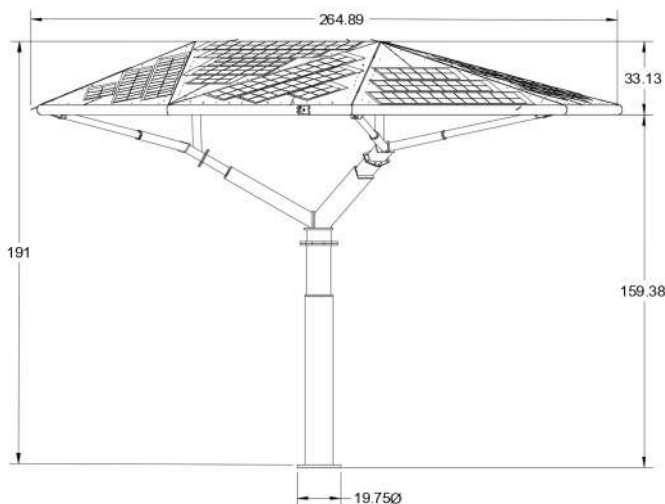
Power Output	
Nominal Output	3.5kW*
Installed Output**	3500-5000kWH/a
Solar PV	
Thirteen facet canopy with mono-cSI PV-Modules	708 cells
Panel Output Warranty	20 years
Panel Product Warranty	20 years
On-Grid Properties	
Inverter Module	On-grid, single phase microinverter array
Inverter Power Compatibility	120/240V (1 ϕ) (480V 3 ϕ option)
Inverter Warranty	Up to 25 years
Off-Grid Properties	
Power	3.5 kW
Voc, Vmp, Isc	460.55V, 368.3V, 9.61V
Temp Coeff: Current, Voltage, Power	0.06%, -0.03%, -0.38
Environmental Requirements	
Temperature Range	-40°C to +65°C
Humidity	4% to 100% (condensing)

* Under Standard Test Conditions (STC)

** Estimates based on regional variation

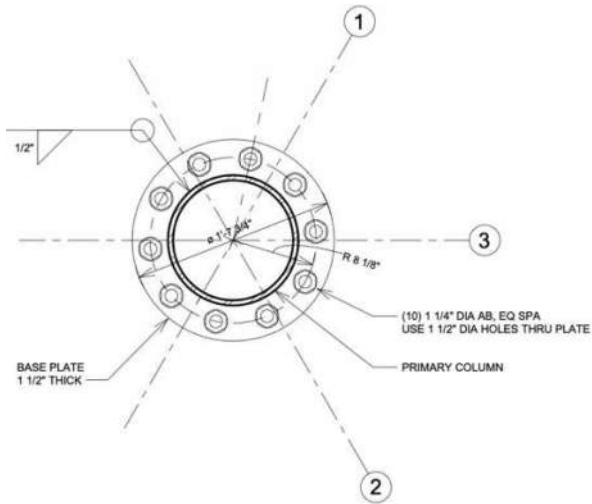
Weight & Dimensions	
Height	17', 5.18-6.71m
Span (canopy)	22', 6.71m
Ground Impact	Site specific, approx. 30"-50" (76-127cm)
Weight	12,000lbs, 5400kg
Installation	
Minimum 10x 1+1/4" anchor bolts rated for site-specific load requirement	
Anchor bolts require hex heading	
Use leveling nuts, washers, nuts, and lock nuts to level and fasten base plate	
Lighting	
Lumens	20000 max
Power	150W (estimate)
Electrical Connections	
Minimum 4 x AWG 12 connections for PV power out and AC power in. Additional connects for data and power constraints may apply. See installation specifications below.	
Distance	Local standards apply
Conduit	3/4" (2cm) minimum

Dimensions (inches)





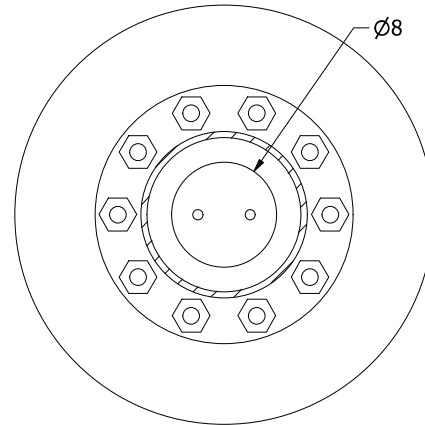
Footing Attachment



NOTES:

1. PROVIDE 1 1/4" DIA HOLES THRU COLUMN AND BASE PLATE (NOT SHOWN) TO ACCOMMODATE ELECTRICAL CONDUITS. LOCATE HOLE IN COLUMN APPROXIMATELY 1'-6" ABOVE BASE PLATE. LOCATE HOLE IN BASE PLATE AT CENTER OF PLATE.
2. PROVIDE (2) 1/4"-THICK PLATES FOR ANCHOR BOLT TEMPLATES. ONE PLATE AT BASE OF ANCHOR BOLTS AND SHALL BE CAST-IN TO CONCRETE FOUNDATION. ONE PLATE AT TOP OF ANCHOR BOLTS AND SHALL BE REMOVED PRIOR SETTING OF BASE PLATE.
3. ANCHOR BOLTS SHALL BE HEX HEADED. USE LEVELING NUTS, WASHERS, NUTS, AND LOCK NUTS TO LEVEL AND FASTEN BASE PLATE.

Electrical Conduit Placement*



SECTION B-B

*Additional conduit as needed based on site requirements conforming to the 8"-on center diameter requirements.



IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.



IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.



Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.



IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.

Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support**
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-S) requirements

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US		IQ8PLUS-72-2-US	
Commonly used module pairings ¹	W	235 – 350		235 – 440	
Module compatibility		60-cell/120 half-cell		60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell	
MPPT voltage range	V	27 – 37		29 – 45	
Operating range	V	25 – 48		25 – 58	
Min/max start voltage	V	30 / 48		30 / 58	
Max input DC voltage	V	50		60	
Max DC current ² [module Isc]	A	15			
Overvoltage class DC port		II			
DC port backfeed current	mA	0			
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			
OUTPUT DATA (AC)		IQ8-60-2-US		IQ8PLUS-72-2-US	
Peak output power	VA	245		300	
Max continuous output power	VA	240		290	
Nominal (L-L) voltage/range ³	V	240 / 211 – 264			
Max continuous output current	A	1.0		1.21	
Nominal frequency	Hz	60			
Extended frequency range	Hz	50 – 68			
AC short circuit fault current over 3 cycles	Arms	2			
Max units per 20 A (L-L) branch circuit ⁴		16		13	
Total harmonic distortion		<5%			
Overvoltage class AC port		III			
AC port backfeed current	mA	30			
Power factor setting		1.0			
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging			
Peak efficiency	%	97.5		97.6	
CEC weighted efficiency	%	97		97	
Night-time power consumption	mW	60			
MECHANICAL DATA					
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)			
Relative humidity range		4% to 100% (condensing)			
DC Connector type		MC4			
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")			
Weight		1.08 kg (2.38 lbs)			
Cooling		Natural convection – no fans			
Approved for wet locations		Yes			
Pollution degree		PD3			
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure			
Environ. category / UV exposure rating		NEMA Type 6 / outdoor			
COMPLIANCE					
Certifications		CA Rule 21 (UL 1741-SB), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.			

(1) No enforced DC/AC ratio. See the compatibility calculator at <https://link.enphase.com/module-compatibility>

(2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-DS-0002-01-EN-US-2022-08-10



LIGHTWEIGHT
FLEXIBLE
PEEL & STICK



SUMMIT SERIES: SRFM24L-B & SRFM24L-W

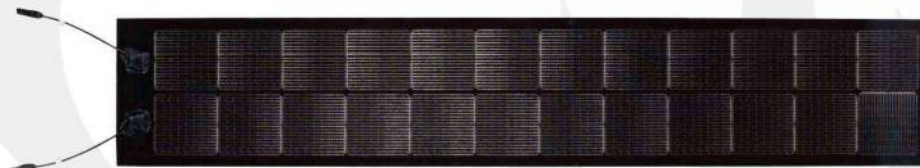
MERLIN® PATENTED DESIGN, MILITARY GRADE, COMPACT HOME POWER SYSTEM, GRID CONNECTED

MERLIN® TECHNOLOGY

Industry leading power output | Enhanced performance under all light conditions | Designed and engineered in USA | Outstanding aesthetics | Redundancy by design | Robust module integrity and performance under extreme conditions | Marine grade design, Materials and approvals | Hurricane Resistant

PRODUCT FEATURES

Modular design allows you to mix and match sizes to maximize roof area | Emergency power anytime | Optimized for maximum performance in scattered light & extreme weather conditions | Compatible with lead acid, AGM, gel, and lithium batteries | Various mounting options, including mechanical, peel & stick, and more



MERLIN® GRID PATENTED TECHNOLOGY: FLEXIBLE – RUGGED – LIGHTWEIGHT – MONO cSi



80% Lighter
than Glass Systems



50X More Durable
vs. Bus-Bar Technology



20% More Energy
In Real World Conditions



2.5X Power Density
vs. Thin Film Technology

POWER USAGE

- Charge Controllers
- Charge Electronics
- Fans & Lights
- Refrigerators & Freezers
- Pumps, Alarms, & Sensors
- TV, Stereos, & Appliances



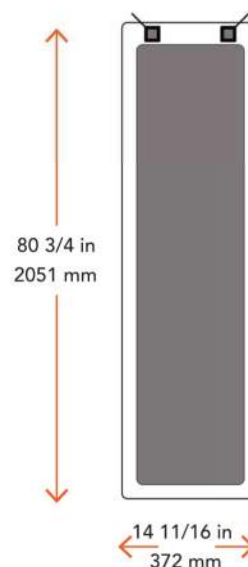
TECHNICAL SPECS

Electrical Characteristics (STC) ¹ MERLIN® PV Module Specs	Unit	SRFM24L-B	SRFM24L-W
Part Number		RFP-F024B114L	RFP-F024W117L
Backsheet Color		Black	White
Cell Type		c-Si (PERC G1)	
Number in Series		24	24
Rated Power (Pmax)	W	114	117
Voltage at Pmax (Vmp)	V	13.43	13.49
Current at Pmax (Imp)	A	8.49	8.67
Open-circuit Voltage (Voc)	V	16.25	16.25
Short-circuit Current (Isc)	A	8.97	9.15
Temperature Co-efficient of Isc	%/°C	0.06	
Temperature Co-efficient of Voc	%/°C	-0.3	
Temperature Co-efficient of Pmax	%/°C	-0.39	
Maximum Series Fuse Rating	A	15	
Maximum System Voltage	VDC	1000	
Nominal Operating Cell Temperature (NOCT) ²	°C	45 +/- 2	
Operating Temperature	°C	- 40 to + 85	
Termination		Jbox with PV cable and polarized connectors	

1. STC standard test conditions: 1000W/m2 intensity, Air Mass 1.5, 25 °C cell temperature. Power tolerance is +/- 5% W at STC. The electrical characteristics are within +/- 10% unless otherwise specified.

2. Mounting on SS metal roof or TPO/EPDM membrane roof.

SRFM24L
Weight 7.3 lb | 3.31 kg



Read more



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For further details, contact: **MERLIN SOLAR TECHNOLOGIES, INC.**

5891 Rue Ferrari, San Jose, CA 95138 | Ph: (408) 321-8258

E-mail: sales@merlinsolar.com | www.merlinsolar.com



Distributed by:

Solar Forma Design

E-Cacia Tree Under Canopy Panels

Material Specifications:

- Thickness 24mm (1")
- Glue type: Phenolic
- # of Plies 17
- Veneer cut face: Birch 1mm-1.5mm
- Grade: B/BB
- Designation: FK - water resistant plywood (MR)
- Mounting Fasteners: Stainless Steel

Construction/Design:

1. CNC routed



MARINE

PREMIUM WOOD SEALER

protects against
WATER / MOLD / DECAY

Solar Tree canopy soffit
material and varnish
treatment specifications

TECHNICAL DATA SHEET

PRODUCT DESCRIPTION

SEAL-ONCE® MARINE Premium Wood Sealer protects and stabilizes wood against water damage and decay. It uses proprietary nanotechnology to penetrate, coating the wood fibers at the cellular level. The advanced technology of MARINE allows it to form a superior barrier below the surface, protecting from the inside out.

MARINE allows wood to age naturally without decay, and can be used to preserve old or new wood, extending its natural life. It is non-film forming and will not alter the natural beauty of the wood. It is also completely eco-friendly and can be applied around or over open water, without harming marine life.

MARINE preserves the integrity of the wood by inhibiting warping, cupping, rot, mold, mildew and algae growth. MARINE forms a flexible breathable barrier that allows the wood to expand and contract, and for water vapor to escape.

MARINE goes on milky white and dries clear. It is also available in semi-transparent tints.

RECOMMENDED APPLICATIONS

- Decks
- Docks
- Railings
- Piers
- Retaining walls
- Outdoor furniture

*Not for use below grade or in direct contact with water.

FEATURES

- Eco-friendly
- Non-toxic; will not harm pets, plants, people or marine life
- Ultra-low VOC
- Water based
- Can be applied around or over fresh or salt water
- Flexible, breathable barrier
- Stabilizes & protects wood
- Prevents warping, cupping, wood rot & decay
- Resistant to salt water spray
- Prevents mold, mildew & algae growth
- Soap and water cleanup
- Clear formula can be painted or stained after treatment
- Tinted formula provides additional UV protection

PHYSICAL CHARACTERISTICS

Color	Milky white liquid, dries clear
Flash Point	None
pH	7+
Solvents	Water
Lbs/gal	8.5
Specific Gravity	1.019
Viscosity	50 cps
Application Temp.	45°F/7.22°C* - 95°F/35°C
Odor	Nil
VOC Content	25g/L**

*Do not apply when air or surface temperature is below 45°F/7.22°C or may fall below 45°F/7.22°C within 24 hours after application.

**VOC Content determined via EPA Method 24.

PACKAGING SIZES

1 Gallon Can | 5 Gallon Pail

FREIGHT CLASS

55



MARINE

PREMIUM WOOD SEALER

protects against
WATER / MOLD / DECAY

APPLICATION INSTRUCTIONS

PREPARATION

- All surfaces should be cleaned before sealing for best penetration and performance. Remove all old coatings, dust, debris and loose material. Remove oil, grease, algae, grime, mill glaze and mold and mildew stains with appropriate cleaners. Recommend SEAL-ONCE All Wood Cleaner.
- After cleaning, test absorbency of surface by sprinkling a few drops of water on the surface. If the water does not readily penetrate the surface, stripping will be necessary to remove old coatings prior to applying SEAL-ONCE MARINE Premium Wood Sealer. Retest surface when dry.

APPLICATION

- Do not use if air or surface temperature is below 45°F/7.22°C or above 95°F/35°C.
- Do not apply in rain or when rain is expected within 12-24 hours.
- DO NOT THIN. Mix well. Stir contents or shake thoroughly prior to use.
- Test a small area to ensure acceptable appearance and penetration.
- Apply first coat with a synthetic brush; pump-up garden sprayer; air-assisted; and/or airless sprayer. Use 15-17 tip and medium to coarse spray pattern. When spraying, always back brush for best results.
- Second coat can be applied once first coat has penetrated but is still damp. Second coat must be applied within one hour of applying first coat.
- For best results, apply in the shade and out of direct sunlight.
- When applying in direct sunlight and wood surface is hot, spray with a mist of water and apply SEAL-ONCE MARINE immediately on dampened surface.
- Apply to all surfaces. Apply SEAL ENDS ONCE® to wood ends.
- Do not use with other waterproofing products.
- Wood can be painted or stained as soon as it dries in approximately 2-3 hours, if SEAL-ONCE Semi-Transparent Tints are not being used.

COVERAGE

- Approximate coverage: 250-350 sq. ft./gallon per coat. Actual coverage will vary due to the porosity of the substrate.

DRYING TIME

- Allow approximately 2-3 hours, depending on temperature and humidity, for surface to dry
- Allow 12-24 hours for full cure, depending on temperature and humidity.
- When recoating, apply once previous coat has penetrated and surface is damp, not wet. Second coat must be applied within one hour of applying the first coat.

CLEANUP AND STORAGE

- Clean all application equipment with warm soapy water.
- Store above 32°F/0°C to protect from freezing.
- Shelf life (unopened): 3 years
- Disposal: soap and water cleanup; no special disposal procedure needed.

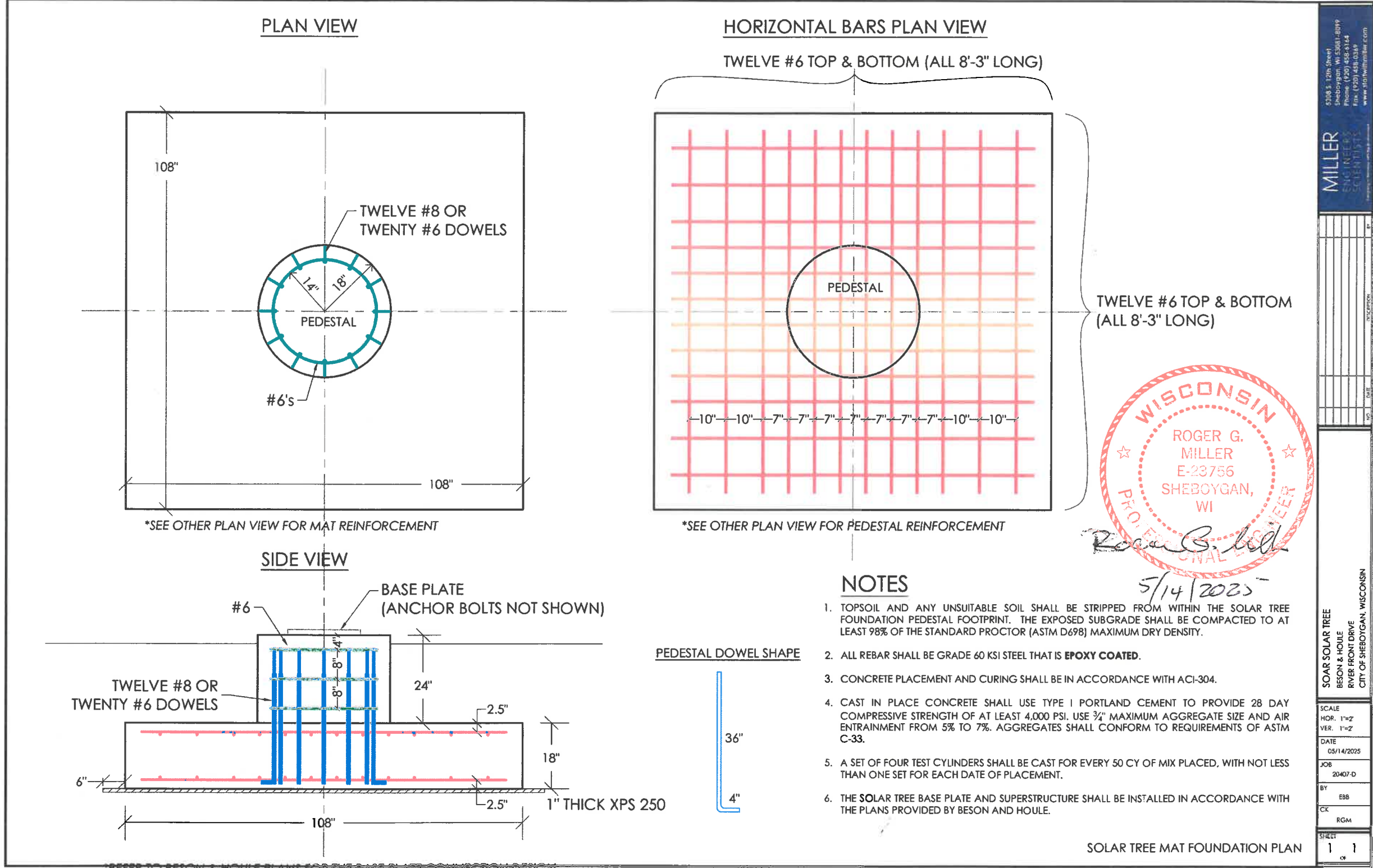
PRECAUTIONS

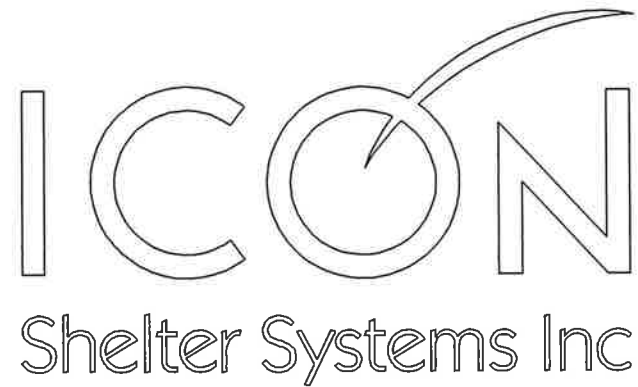
- Protect adjacent areas from overspray and runoff including windows and siding. Immediately remove overspray with soap and water.
- Safety Precautions
 - Avoid breathing in spray. If inhaled, move to fresh air.
 - Avoid contact with eyes. If splashed into eyes, rinse with clean water for 15 minutes.
 - If skin irritation occurs, wash area with soap and water.
 - If accidentally ingested, immediately drink 2 glasses of water and contact a physician. Do not induce vomiting.



Manufactured by U-C Coatings, LLC
P.O. Box 1066 | Buffalo, NY 14215 USA
(716) 833-9366 | sales@seal-once.com | www.seal-once.com

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JOB NUMBER: 11117
JOB NAME: SOAR PROJECT
JOB LOCATION: SHEBOYGAN, WI 53081

REVISION: A
A - INITIAL SUBMITTAL REVISION (DTH 5/14/2025)

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HOLLAND MI, 49423
616.396.0919
800.748.0985
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REV: A DATE: 5/14/2025	APPROVAL FOR FABRICATION REQUIRED:	
	BY SIGNING THIS FABRICATION APPROVAL, I AUTHORIZE ICON SHELTERS TO FABRICATE THE PRODUCT AS REPRESENTED AND DESCRIBED WITHIN THIS SUBMITTAL PACKAGE, WITH NO FURTHER CHANGES OR AMENDMENTS REQUIRED. THIS APPROVED SUBMITTAL DOCUMENT SUPERSEDES ALL OTHER DESIGN DOCUMENTS RELATED TO THIS SHELTER/PRODUCT AND REPRESENTS THE FINAL DESIGN TO BE FABRICATED.	
	PRINT NAME: _____ SIGNATURE: _____	DATE: _____

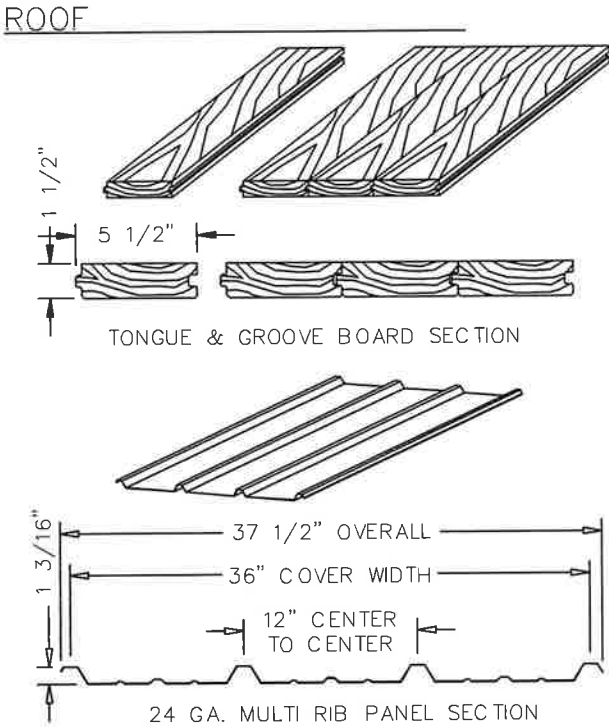
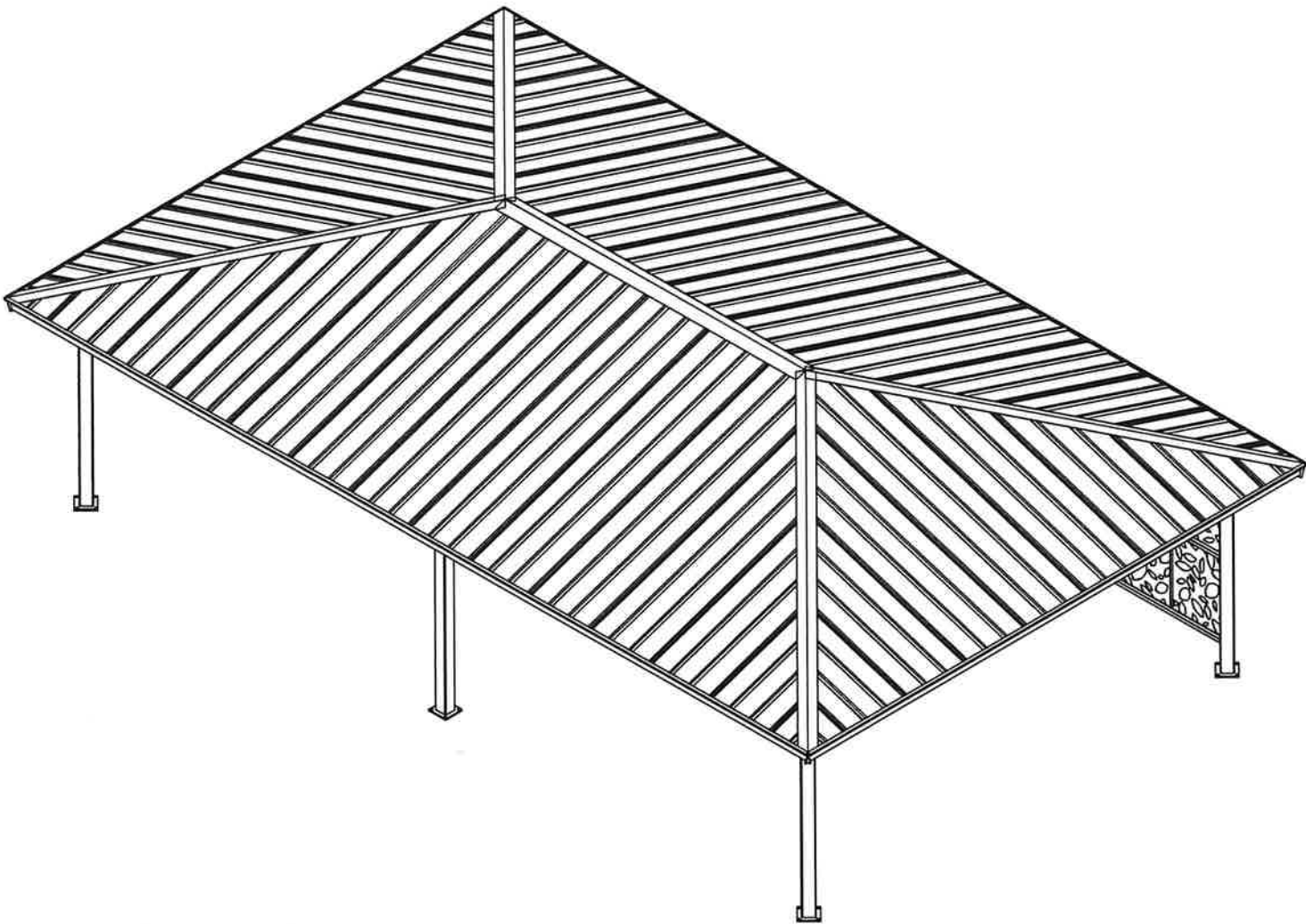
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- 2.0 ELEVATION
- 3.0-3.1 ANCHOR BOLT LAYOUT
- 4.0-4.1 FRAME LAYOUT
- 5.0-5.4 FRAME CONNECTIONS
- 6.0 T&G ROOF LAYOUT
- 7.0 MR ROOF LAYOUT
- R1.0-R1.5 ROOF DETAILS

DESIGN LOADS

CODE: 2015 INTERNATIONAL BUILDING CODE

TOTAL DEAD: 10.33 P.S.F.
FRAME DEAD: 4.33 P.S.F.
ROOF DEAD: 3.50 P.S.F.
COLLATERAL DEAD: 2.50 P.S.F.
ROOF LIVE LOAD: 20.00 P.S.F.
GROUND SNOW LOAD: 35.00 P.S.F.
ROOF SNOW LOAD: 29.40 P.S.F.
WIND SPEED: 115.00 M.P.H.
EXPOSURE: C
SEISMIC USE GROUP: I
SEISMIC SITE CLASS: D
SEISMIC DESIGN CATEGORY: A
SEISMIC ANALYSIS: SIMPLIFIED



MATERIALS
TUBE STEEL (HSS HOLLOW STRUCTURAL SECTION)
WIDE FLANGE SECTIONS
STRUCTURAL STEEL PLATE
ROOF PANELS (STEEL)
ANCHOR BOLTS
CONNECTION BOLTS

(ASTM DESIGNATION)
A-500 GRADE B/C
A-992
A-36, A-572 GRADE 50
A-792
F1554 GRADE 55
F3125 GRADE A325

FABRICATOR APPROVALS
CLARK COUNTY STEEL FABRICATOR NUMBER: 707
CITY OF LOS ANGELES FABRICATOR NUMBER: FB03254

WISCONSIN

PROFESSIONAL ENGINEER

THOMAS J COVINGTON
E-100769-6
HOLLAND MI

5/20/25

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COVER SHEET	DRAWN BY: DTH
	DATE: 5/14/2025
	JOB NO.: 11117
	REVISION: A
	BUILDING TYPE: RH25X40TM-P4
PROJECT NAME: SOAR PROJECT SHEBOYGAN, WI 53081	

SHEET
1.0

NOTES:

ALL WELDING CONFORMS TO THE LATEST EDITION OF AWS D1.1 OR D1.3 AS REQUIRED.
ALL WELDING IS PERFORMED BY AWS CERTIFIED WELDERS. THERE IS NO FIELD WELDING REQUIRED, U.N.O.

FOUNDATIONS HAVE BEEN DESIGNED WITH CLASS 5 SOILS PRESUMPTIVE LOAD-BEARING VALUES IN ACCORDANCE WITH BUILDING CODE REQUIREMENTS. VERTICAL FOUNDATION PRESSURE: 1,500 PSF. LATERAL BEARING PRESSURE: 100 PSF/FT. COHESION 130 PSF. IF SITE-SPECIFIC SGILS DO NOT MEET THE REQUIREMENTS FOR SOIL CLASS 5 , CONTACT A LOCAL GEOTECHNICAL ENGINEER.

DUE TO STANDARDIZED FABRICATION, PARTS SHOWN MAY BE UPGRADED. REFER TO THE SHIPPING BILL OF MATERIALS FOR POSSIBLE SUBSTITUTIONS.

ICON SHELTER SYSTEMS INC. RECOMMENDS THAT THE PRIMARY FRAMING INSTALLER AND THE ROOF INSTALLER HAVE A MINIMUM OF FIVE (5) YEARS OF DOCUMENTED EXPERIENCE INSTALLING THIS TYPE OF PRODUCT.

HIGH STRENGTH BOLTING:
ALL HIGH STRENGTH BOLTS ARE F3125 GRADE A325 BOLTS WITH HEAVY HEX NUTS. THE BOLTS ARE TO BE INSTALLED UTILIZING THE "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS" (8/1/2D14) AS PREPARED BY RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) FOR THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC). THE BOLTS SHALL BE INSTALLED AS SNUG TIGHTENED WHICH IS DEFINED AS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE PLIES INTO FIRM CONTACT, WHICH IS THE CONDITION WHEN THE PLANES OF CONTACT BETWEEN TWO PLIES ARE SOLIDLY SEATED AGAINST EACH OTHER, BUT NOT NECESSARILY IN CONTINUOUS CONTACT WITH UTILIZATION OF THE SNUG TIGHTENING METHOD, NO WASHERS ARE REQUIRED.
ALL CONNECTIONS ARE BEARING TYPE CONNECTIONS UNLESS NOTED OTHERWISE.

BEFORE ERECTING THE FRAME, VERIFY ALL BOLTS AND NUTS ARE CLEAN OF DEBRIS AND BURRS - INCLUDING THE HARDWARE ALREADY FASTENED INSIDE THE MEMBERS. CHASING THREADS ON SOME BOLTS AND NUTS MAY BE REQUIRED. APPLICATION OF THREAD WAX MAY BE USED TO ASSIST IN TIGHTENING (NOT BY ICON).

IT IS THE RESPONSIBILITY OF THE INSTALLER TO INSURE PROPER TIGHTNESS.

PROPER ERECTION OF THE FRAMING MEMBERS REQUIRES THE MAIN COLUMNS TO BE PLUMB & SQUARE. COLUMNS, RAFTER, AND TIE BEAM CONNECTIONS MUST BE TIGHTENED BEFORE INSTALLING THE PURLINS. PURLINS MUST BE PARALLEL TO THE TIE BEAMS AND EAVE BEAMS.

ICON RECOMMENDS TO NOT FULLY TIGHTEN CONNECTION HARDWARE UNTIL THE MAJORITY OR ENTIRETY OF FRAME COMPONENTS ARE ERECTED. PURLINS OR OTHER MEMBERS THAT REQUIRE SCREW FASTENERS SHOULD BE INSTALLED LAST. THIS ALLOWS FOR MOVEMENT OF MEMBERS TO HELP ALIGN THE SHELTER AS INTENDED.

THE TOUCH-UP KIT SHOULD BE UTILIZED FOR ANY EXPOSED STEEL (CHIPS, SCUFFS, OR SCRATCHES) THAT MAY RESULT FROM SHIPPING, HANDLING, OR INSTALLATION OF SHELTER COMPONENTS. ROUTINE TOUCH-UP IS RECOMMENDED.

WHEN DRILLING OPERATIONS ARE REQUIRED, METAL SHAVINGS CAN ACCUMULATE AND MUST BE QUICKLY AND CAREFULLY REMOVED TO PREVENT RUST AND STAINS ON SHELTER COMPONENTS (FRAME AND ROOF). THIS SHOULD BE CHECKED AND PERFORMED AT THE END OE EACH DAY OF INSTALLATION BY SWEEPING, BRUSHING, AND/OR USING COMPRESSED AIR.

THE ENGINEERING AND DETAILING FOR THIS STRUCTURE IS ONLY VALID IF ICON SHELTERS SYSTEMS FABRICATES THE COMPONENTS.

CARE & MAINTENANCE:

ICON REQUIRES THAT THE COATED PRODUCTS LOCATED NEAR A SEASHORE (SALT WATER) ENVIRONMENT BE SYSTEMATICALLY CLEANED, TO REMOVE SALT DEPOSITS PER THE FOLLOWING CLEANING PROGRAM:

A. PERIODIC CLEANING AND INSPECTION OF THE STRUCTURES IS REQUIRED TO REMOVE CONTAMINANTS THAT CAN CAUSE CHEMICAL OR MECHANICAL FILM DEGRADATION IF LEFT EXPOSED FOR LONG PERIODS OF TIME.

B. CLEANING AND INSPECTION MUST COMMENCE IMMEDIATELY AFTER INSTALLATION TO CLEAN ANY SOILS, CONCRETE, OR OTHER CONTAMINANTS THAT HAVE BEEN DEPOSITED DURING THIS TIME. FOR APPLICATION OF WARRANTY, CLEANING MUST BE DGCUMENTED, AND PROPER RECORDS KEPT, OR WARRANTIES ARE CONSIDERED NULL AND VOID.

I. NON-HAZARDOUS ENVIRONMENTS - CLEAN AND CHECK EVERY 12 MONTHS.

II. TROPICAL ENVIRONMENTS - CLEAN AN CHECK EVERY 9 MONTHS.

III. SWIMMING AND LEISURE POOLS - CLEAN AND CHECK EVERY 3 MONTHS.

IV. MARINE ENVIRONMENTS - CLEAN AND CHECK EVERY 3 MONTHS.

V. INDUSTRIAL ENVIRONMENTS - CLEAN AND CHECK EVERY 3 MONTHS.

VI. HAZARDOUS ENVIRONMENTS - CLEAN AND CHECK MONTHLY.

C. DO NOT USE ABRASIVE CLEANERS OR ABRASIVE IMPLEMENTS SUCH AS STEEL WOOL, SANDPAPER, OR WIRE BRUSHES.

D. CLEANING AGENTS SHOULD ALWAYS BE TESTED IN AN AREA THAT IS NOT EASILY SEEN BEFORE USE.

E. STRONG SOLVENTS SHOULD NOT BE USED.

F. ALWAYS RINSE CLEANER WITH PLENTIFUL AMOUNTS OF CLEAN WATER.

G. MILDEW CAN BE REMOVED WITH A SOLUTION OF:

I. 1/3 CUP DETERGENT.

II. 2/3 CUP TRISODIUM PHOSPHATE

III. 1-OUART SODIUM HYPOCHLORITE, 5% SOLUTION (BLEACH)

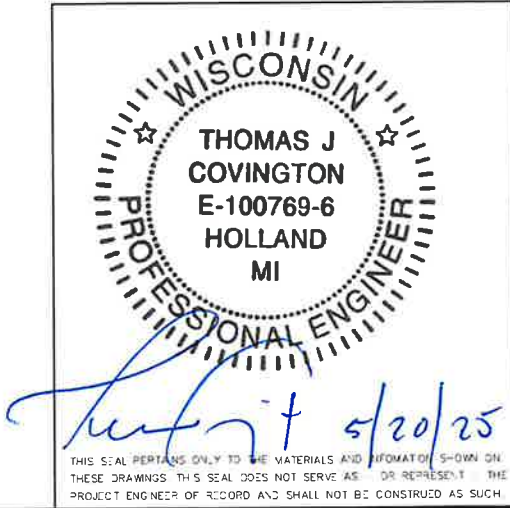
RECEIVING SHIPMENTS:

PERFORM A FULL INVENTORY OF ALL ITEMS RECEIVED UPON DELIVERY. ANY DEFECTS OR DAMAGE MUST BE ANNOTATED ON THE BILL OF LADING AND REPORTED TO ICON SHELTER SYSTEMS AS SOON AS POSSIBLE.

PLASTIC WRAP ON COMPONENT BUNDLES MUST BE REMOVED WITHIN 5 DAYS OF DELIVERY. FAILURE TO COMPLY MAY DAMAGE COATING AND WILL VOID WARRANTY. EXTRA PRECAUTION SHOULD BE TAKEN TO AVOID DAMAGE TO MEMBER FINISH.

TOUCH-UP KITS SHOULD BE REMOVED FROM SHIPMENT BUNDLES AND STORED INDOORS WITH MINIMAL HEAT FLUCTUATION. OPTIMAL STORAGE TEMPERATURE IS 70 DEG F. PAINT WILL QUICKLY DEGRADE AT TEMPERATURES LOWER THAN 4D DEG F, AND HIGHER THAN 9D DEG F.

IF METAL ROOF PANELS ARE NOT TO BE INSTALLED WITHIN 2 WEEKS, ICON RECOMMENDS KEEPING IN A CLIMATE CONTROLLED STORAGE FACILITY OR A COVERED, LOW HUMIDITY ENVIRONMENT. ROOF MATERIALS CAN QUICKLY DEVELOP STORAGE STAINS FROM EXCESS MOISTURE BETWEEN PANELS/TRIM WHICH CAN BE DIFFICULT, OR IMPOSSIBLE, TO FULLY REMOVE.



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NOTES

DRAWN BY:

DTH

DATE:

5/14/2025

JOB NO.:

11117

REVISION:

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BUILDING TYPE:

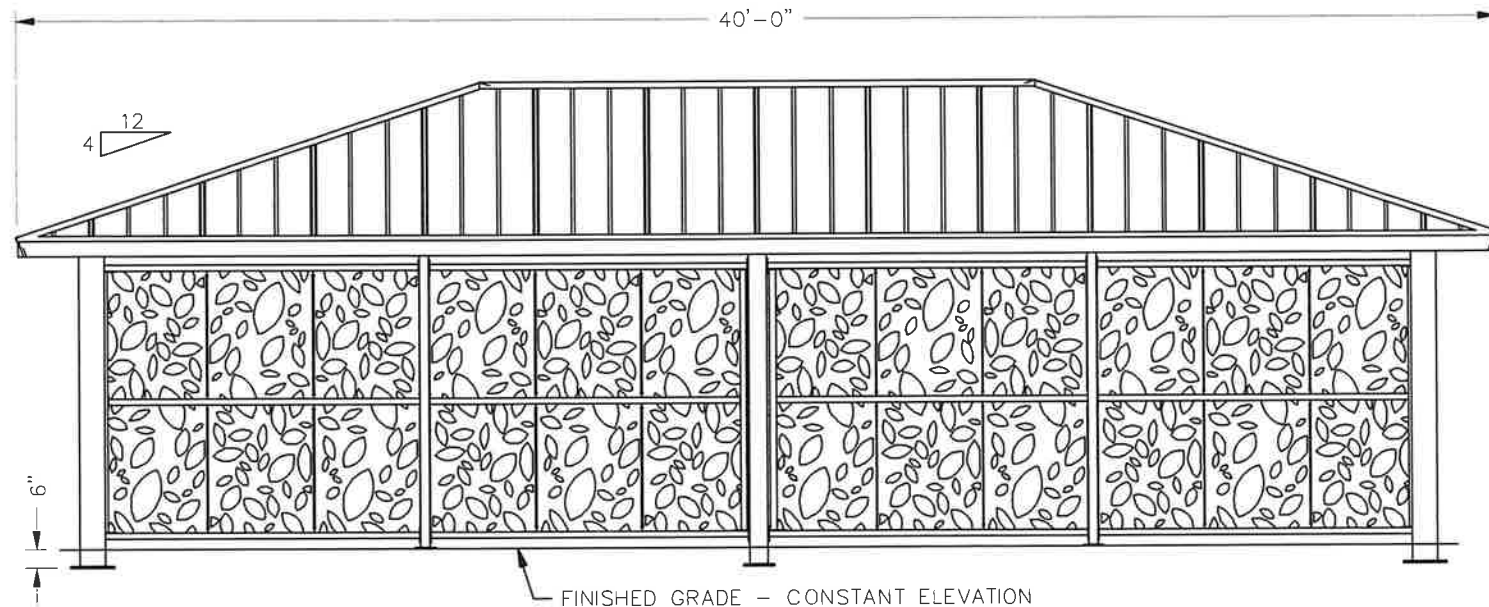
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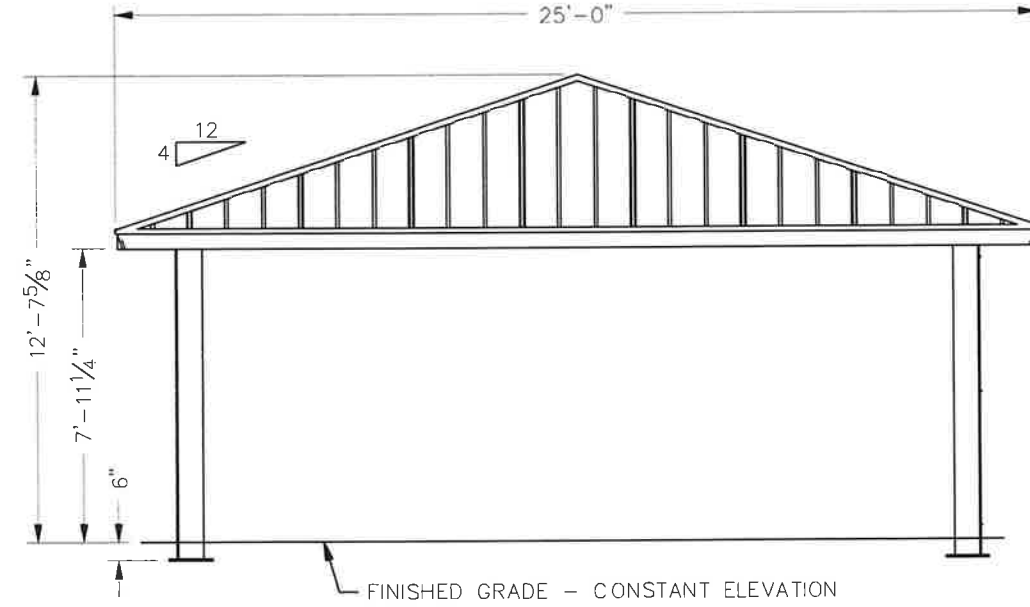
SOAR PROJECT
SHEBOYGAN, WI
53081

SHEET

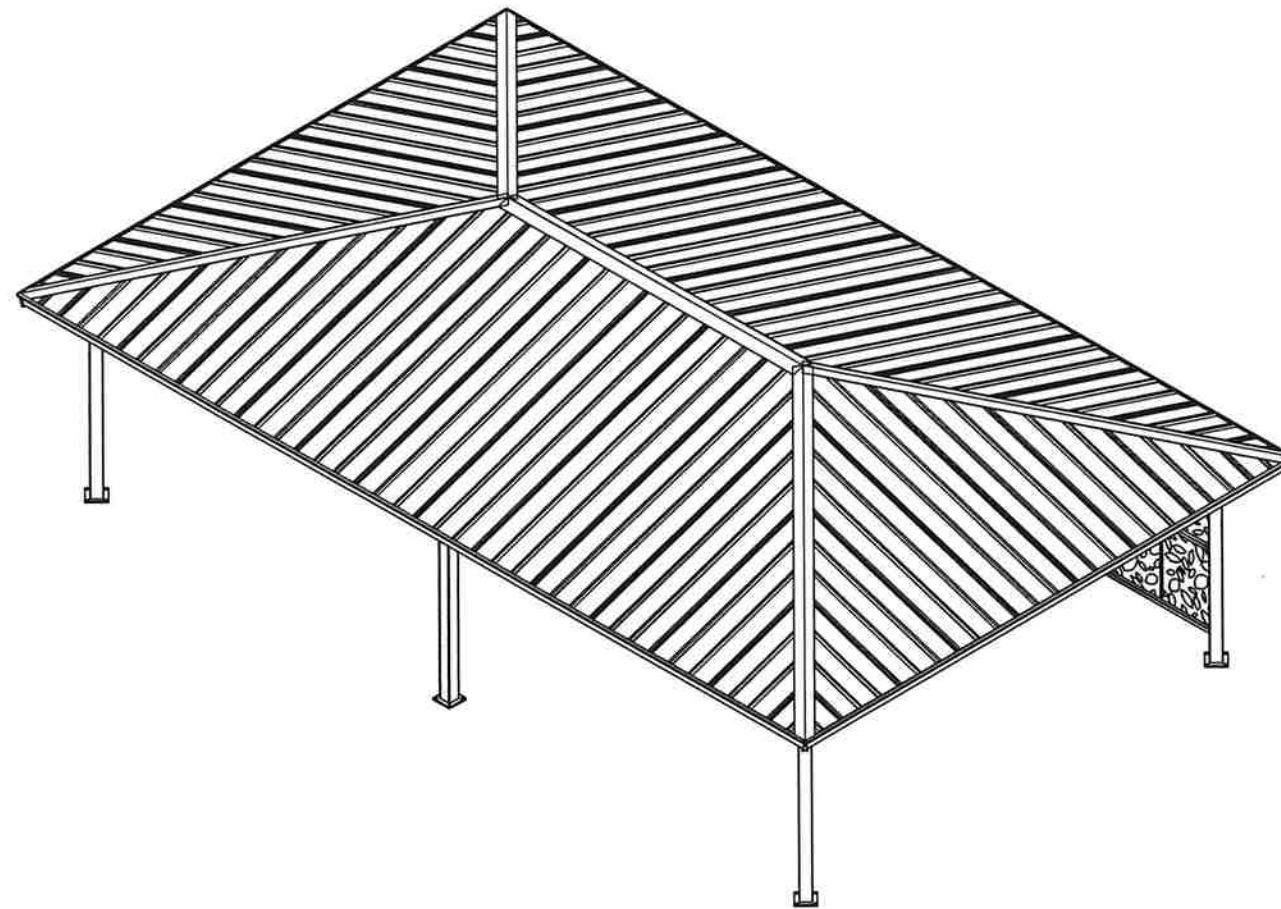
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FRONT VIEW



SIDE VIEW



ISOMETRIC VIEW

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ELEVATION

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REVISION:

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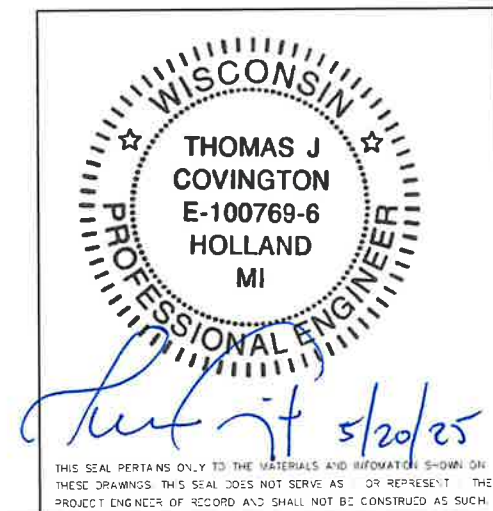
RH25X40TM-P4

PROJECT NAME:

SOAR PROJECT
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53081

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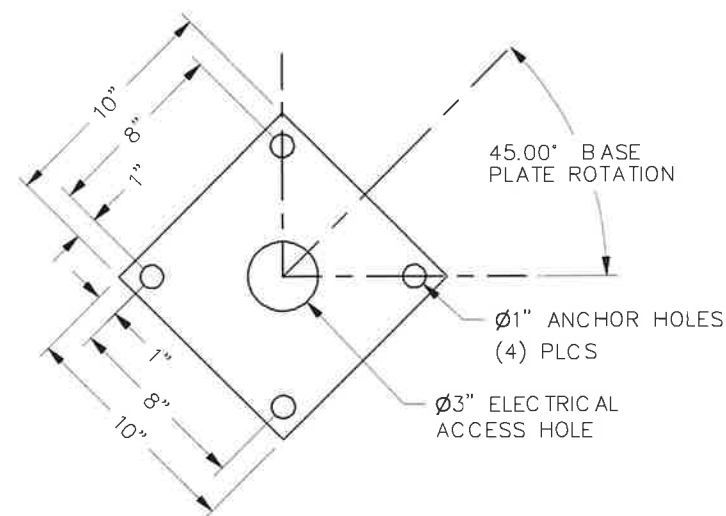
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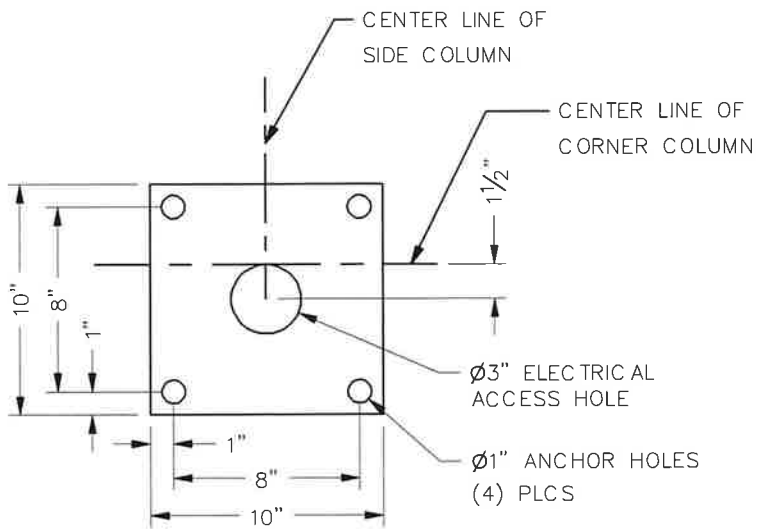
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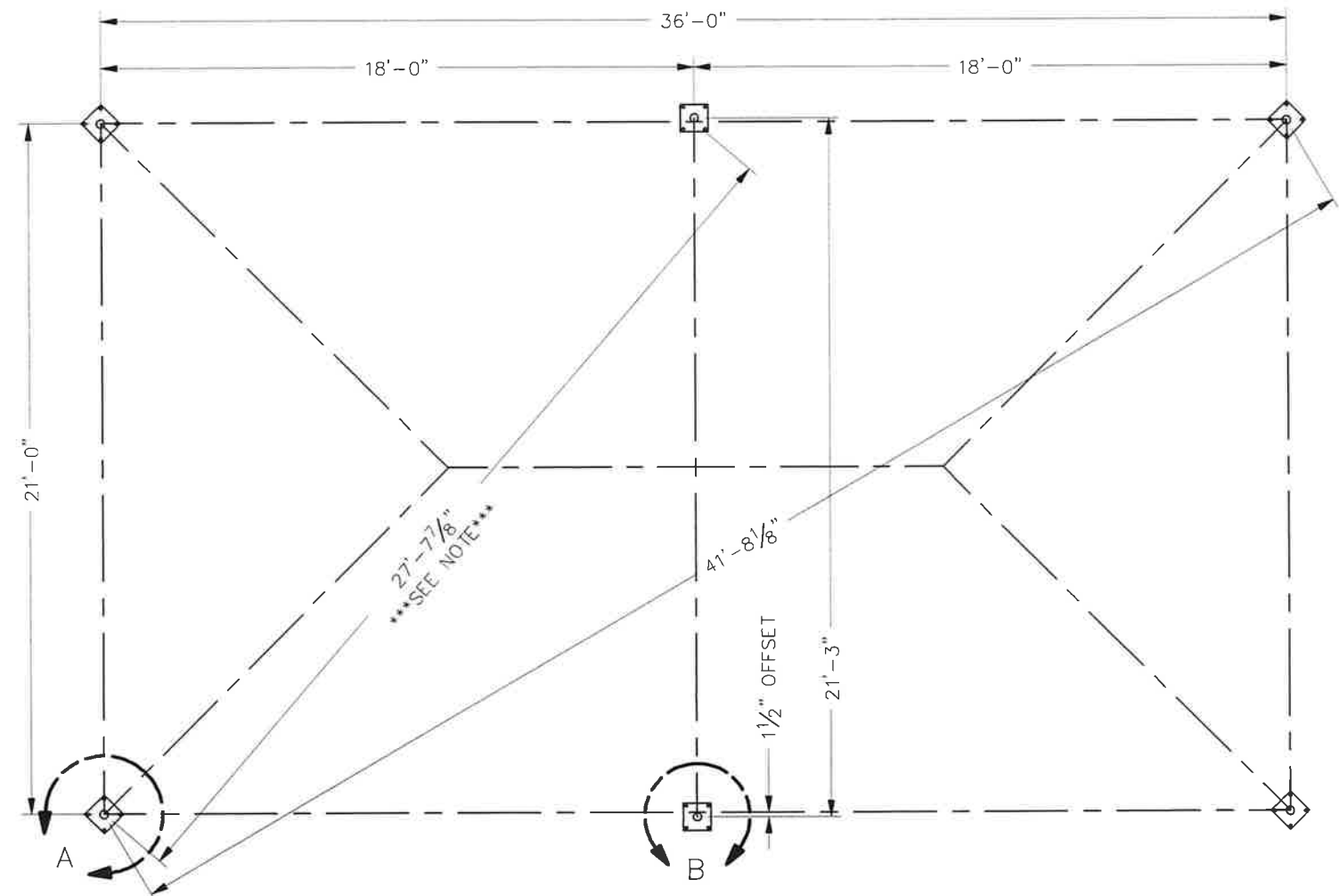
NOTE:
IT IS ESSENTIAL THAT ANCHOR BOLTS ARE PLACED ACCURATELY!
MEASUREMENTS SHOULD BE TAKEN BEFORE AND AFTER FOUNDATIONS
ARE POURED TO CONFIRM DIMENSIONS ARE MET AND COMPONENTS HAVE
NOT SHIFTED. ICON STRONGLY RECOMMENDS UTILIZING ANCHOR BOLT
TEMPLATES TO AID IN THIS PROCESS.



DETAIL A
BASE PLATE MATERIAL
5/8" THICK GR50

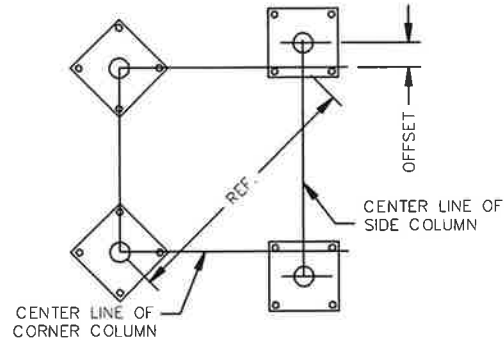


DETAIL B
BASE PLATE MATERIAL
5/8" THICK GR50



ANCHOR BOLT LAYOUT

FINISHED GRADE ASSUMED AT CONSTANT ELEVATION UNLESS NOTED OTHERWISE



NOTE: SQUARENESS REFERENCE DIMENSION
SHOWN ON THE ANCHOR BOLT LAYOUT
IS MEASURED FROM THE CENTER OF THE
CORNER COLUMN TO INTERSECTION OF THE
SIDE & CORNER COLUMN CENTER
LINES AS SHOWN ABOVE



Just it 5/20/25

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ANCHOR BOLT LAYOUT

DRAWN BY:	DTH
DATE:	5/14/2025
JOB NO.:	11117
REVISION:	A
BUILDING TYPE:	RH25X40TM-P4
PROJECT NAME:	SOAR PROJECT SHEBOYGAN, WI 53081

SHEET
3.0

ANCHOR BOLT LAYOUT

DRAWN BY:

DTH

DATE:

5/14/2025

JOB NO.:

11117

REVISION:

A

BUILDING TYPE:

RH25X40TM-P4

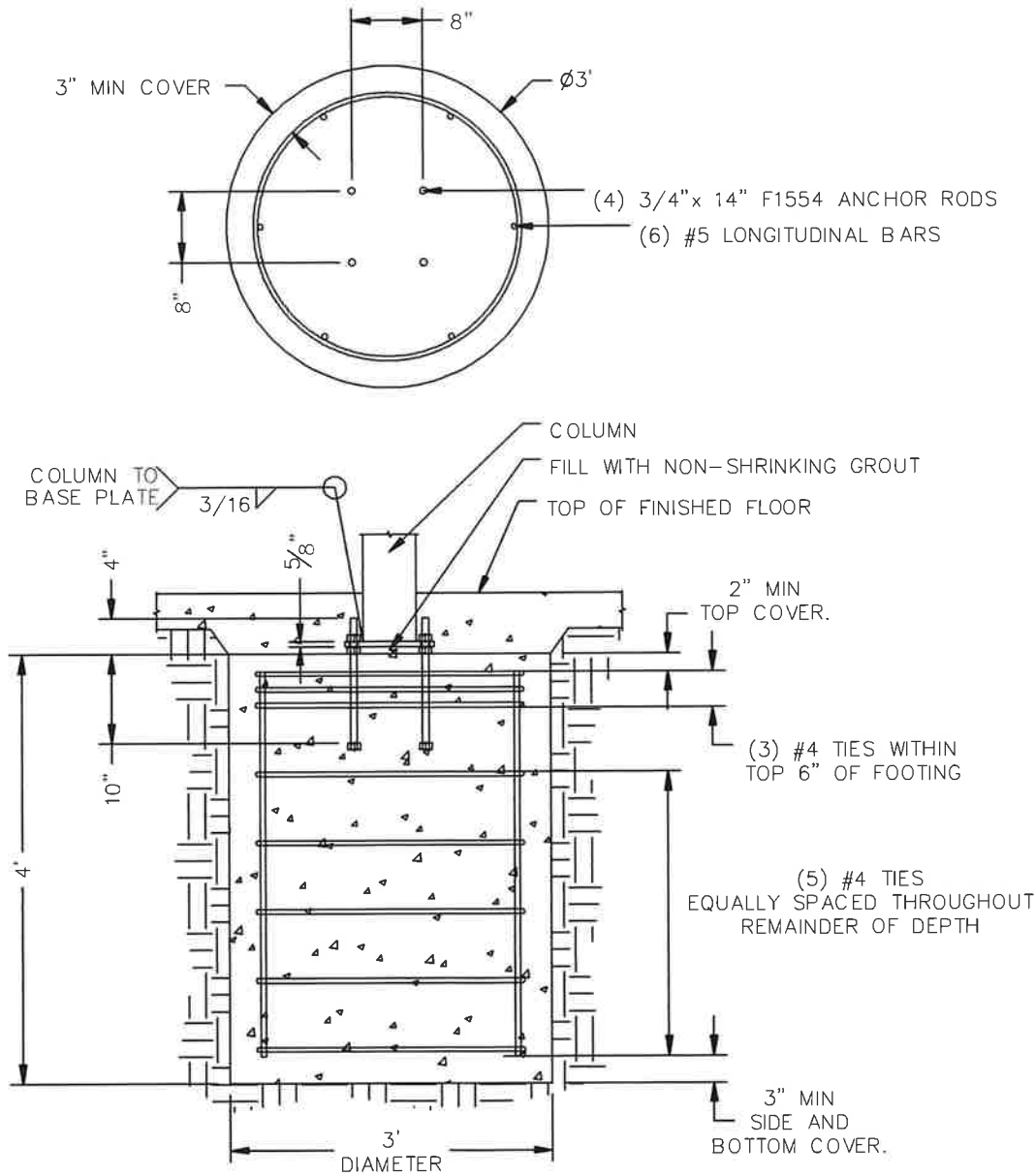
PROJECT NAME:

SOAR PROJECT
SHEBOYGAN, WI
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SHEET

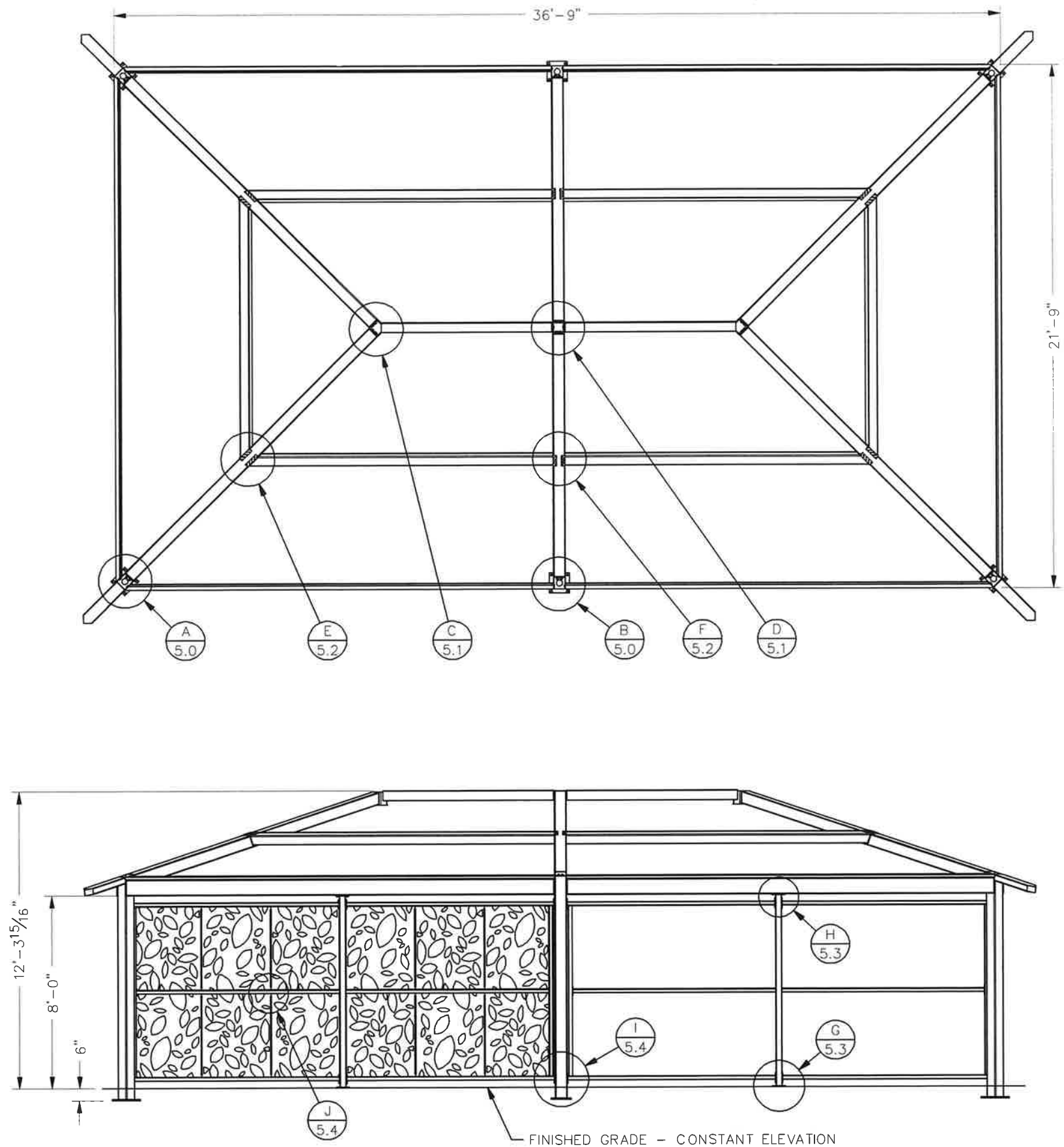
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CONCRETE STRENGTH $F'_c = 2500$ PSI
REBAR GRADE $F_y = 60$ KSI
SLAB IS REQUIRED. IF NO SLAB IS TO BE
INSTALLED, CONTACT THE ICON ENGINEERING
DEPARTMENT.



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FRAME LAYOUT

DRAWN BY:

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DATE:

5/14/2025

JOB NO.:

11117

REVISION:

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BUILDING TYPE:

RH25X40TM-P4

PROJECT NAME:

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SHEBOYGAN, WI
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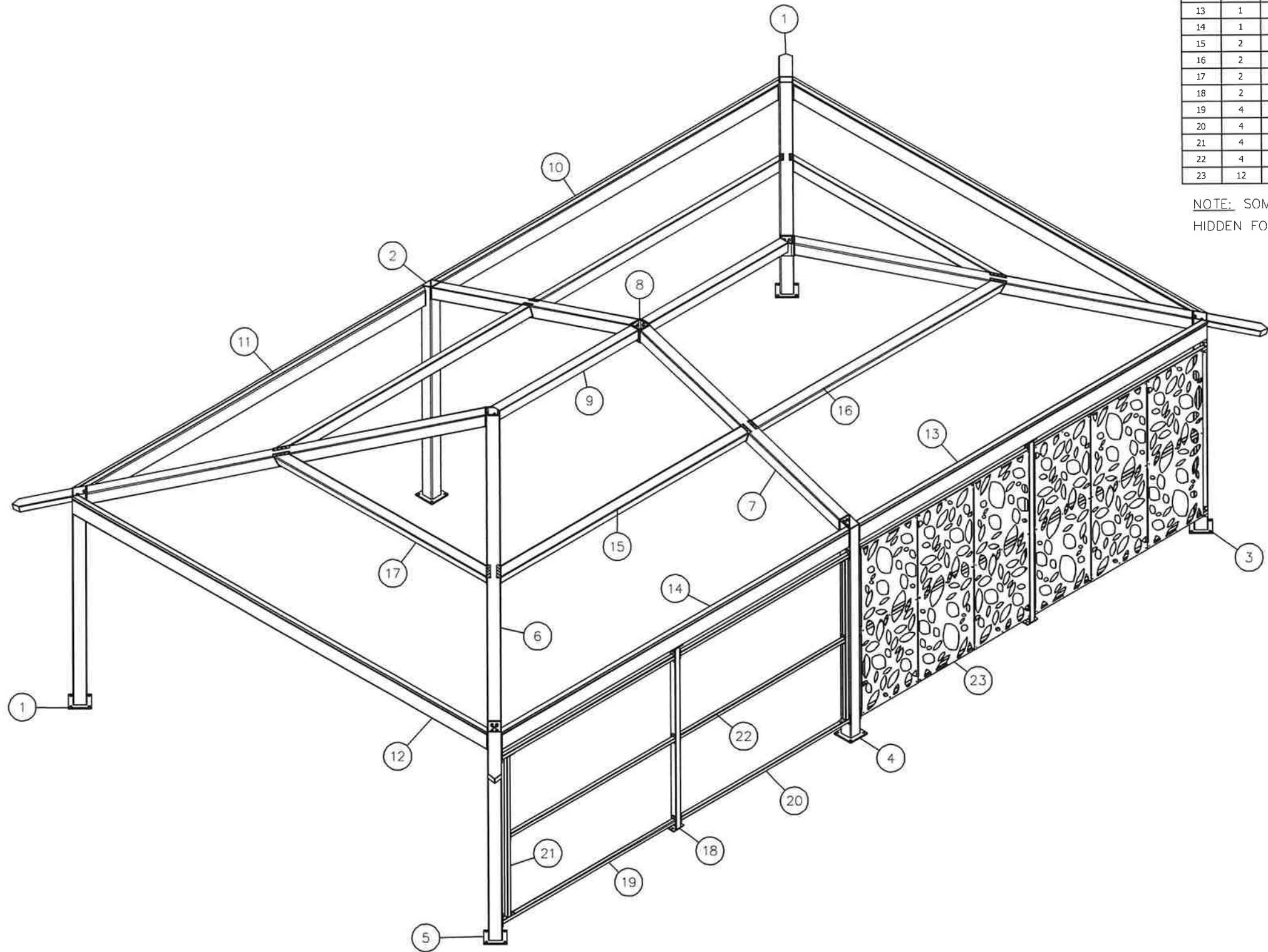
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ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	LENGTH	UNIT WEIGHT
1	2		COLUMN 1	HSS6X6X0.1875		152 lbmass
2	1		COLUMN 2	HSS6X6X0.1875		137 lbmass
3	1		COLUMN 3	HSS6X6X0.1875		152 lbmass
4	1		COLUMN 4	HSS6X6X0.1875		137 lbmass
5	1		COLUMN 5	HSS6X6X0.1875		152 lbmass
6	4		RAFTER 1	HSS6X6X0.1875		223 lbmass
7	2		RAFTER 2	HSS6X6X0.1875		163 lbmass
8	1		CONNECTOR	HSS6X6X0.500		19 lbmass
9	2		RIDGE BEAM	HSS5X5X0.125		79 lbmass
10	1		TIE BEAM 1	HSS8X3X0.1875		266 lbmass
11	1		TIE BEAM 2	HSS8X3X0.1875		266 lbmass
12	2		TIE BEAM 3	HSS8X3X0.1875		314 lbmass
13	1		TIE BEAM 4	HSS8X3X0.1875		266 lbmass
14	1		TIE BEAM 5	HSS8X3X0.1875		266 lbmass
15	2		PURLIN 1	HSS5X5X0.1875		150 lbmass
16	2		PURLIN 2	HSS5X5X0.1875		150 lbmass
17	2		PURLIN 3	HSS5X5X0.1875		125 lbmass
18	2		WINDSCREEN SUPPORT 1	HSS3X3X0.125		42 lbmass
19	4		WINDSCREEN SUPPORT 2	HSS2X2X0.125		28 lbmass
20	4		WINDSCREEN SUPPORT 3	HSS2X2X0.125		28 lbmass
21	4		WINDSCREEN SUPPORT 4	HSS2X2X0.125		22 lbmass
22	4		WINDSCREEN SUPPORT 5	HSS2X2X0.125		26 lbmass
23	12		LASER CUT PANEL	11 GA.		72 lbmass

NOTE: SOME LASER CUT PANELS
HIDDEN FOR CLARITY

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JOB NO.:

11117

REVISION:

A

BUILDING TYPE:

RH25X40TM-P4

PROJECT NAME:

SOAR PROJECT
SHEBOYGAN, WI
53081

SHEET

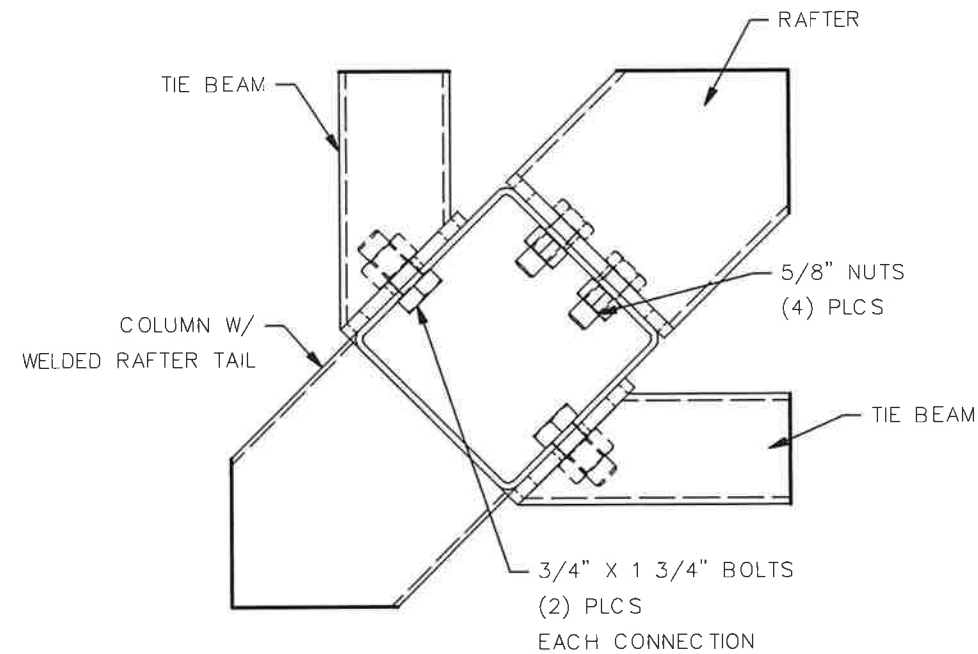
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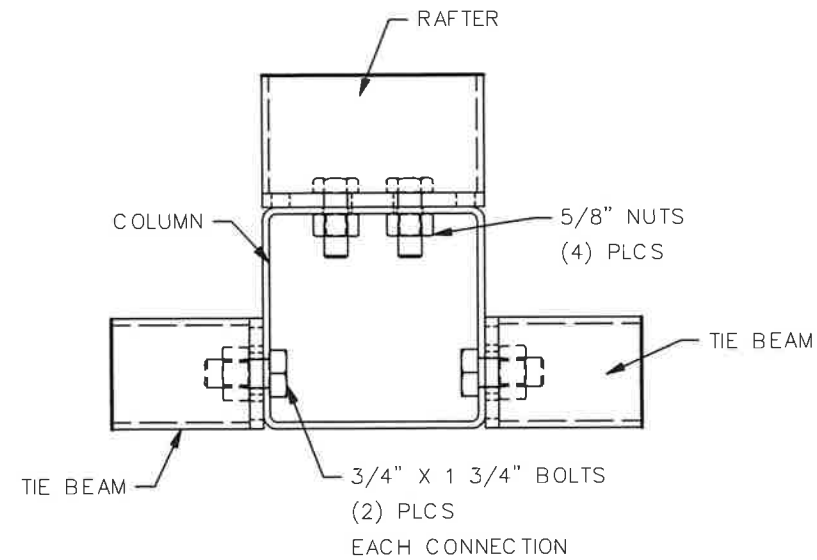
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RAFTER AND TIE BEAM CONNECTION
@ COLUMN

DETAIL A



RAFTER AND TIE BEAM CONNECTION
@ COLUMN

DETAIL B

NOTE TO INSTALLERS:
WITH FACTORY POWDERCOATED
SHELTERS, PAINT EXPOSED
FASTENERS OF COMPRESSION RINGS,
ORNAMENTATION, KNIFE PLATES, ETC.
WITH PROVIDED TOUCH UP PAINT TO
PREVENT RUSTING OF FASTENERS

PAINT EXPOSED FASTENERS



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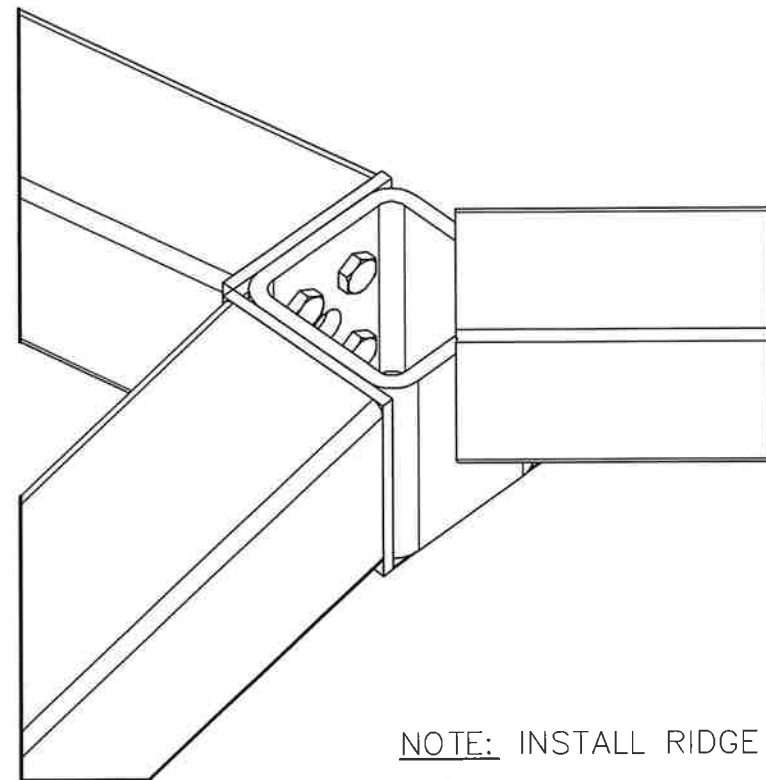
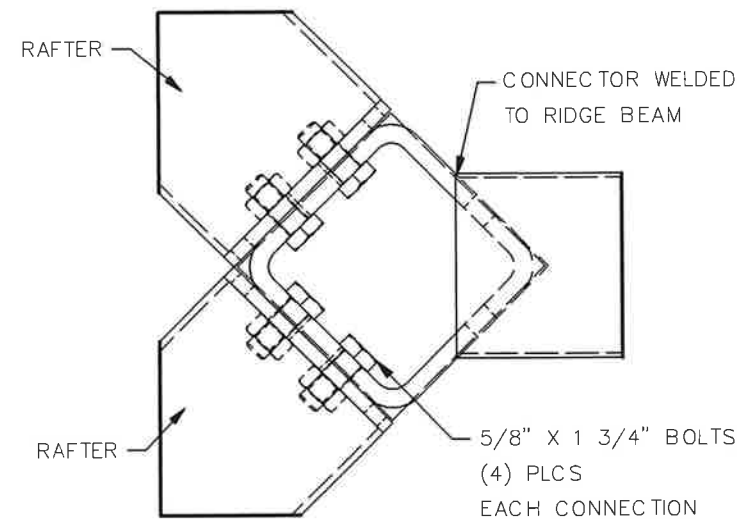
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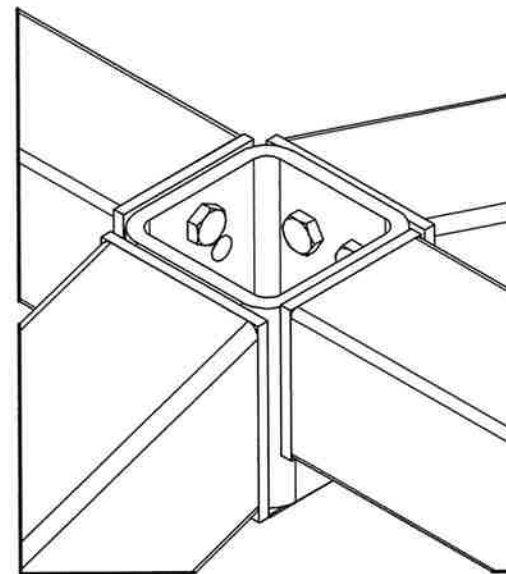
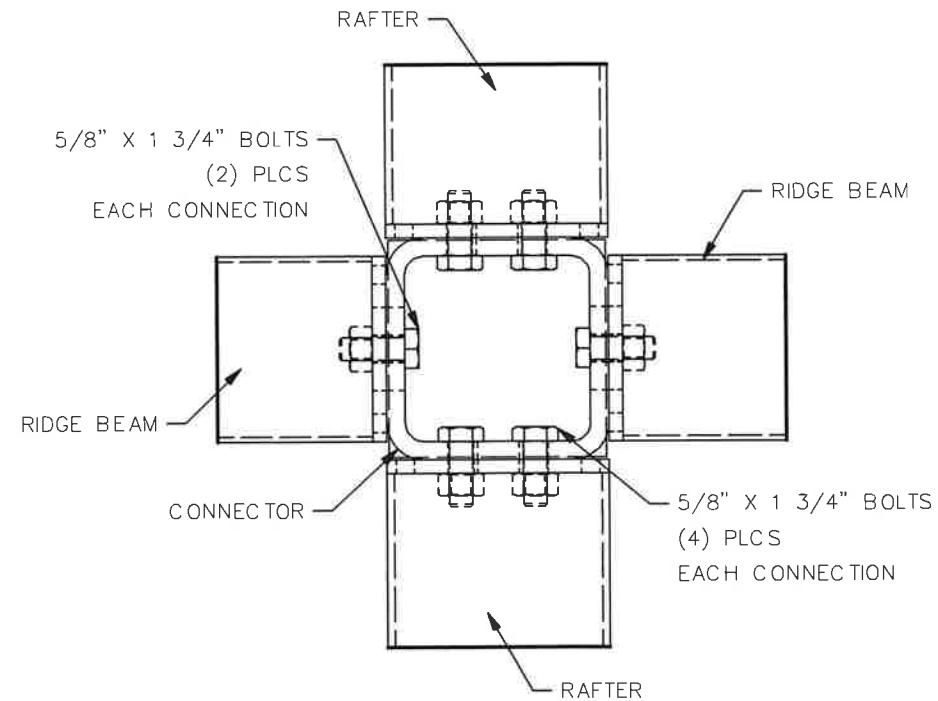
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NOTE: INSTALL RIDGE BEAM W/OPEN CONNECTOR SIDE UP

RAFTER CONNECTION
@ RIDGE BEAM

DETAIL C



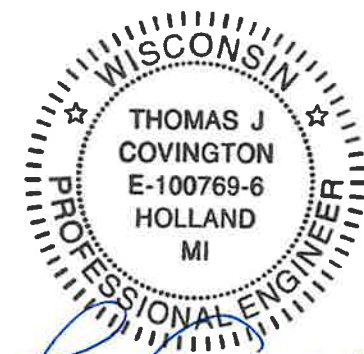
NOTE: INSTALL CONNECTOR W/OPEN SIDE UP

RAFTER AND RIDGE BEAM CONNECTION
@ CONNECTOR

DETAIL D

NOTE TO INSTALLERS:
WITH FACTORY POWDERCOATED SHELTERS, PAINT EXPOSED FASTENERS OF COMPRESSION RINGS, ORNAMENTATION, KNIFE PLATES, ETC. WITH PROVIDED TOUCH UP PAINT TO PREVENT RUSTING OF FASTENERS

PAINT EXPOSED FASTENERS



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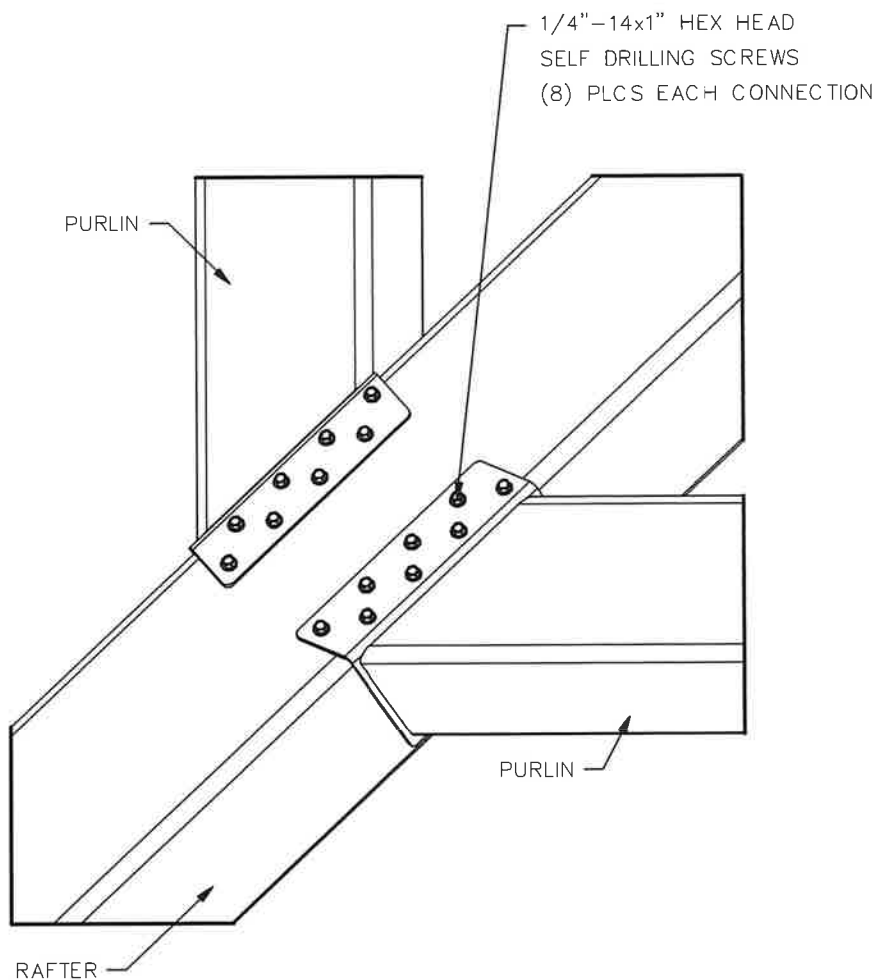
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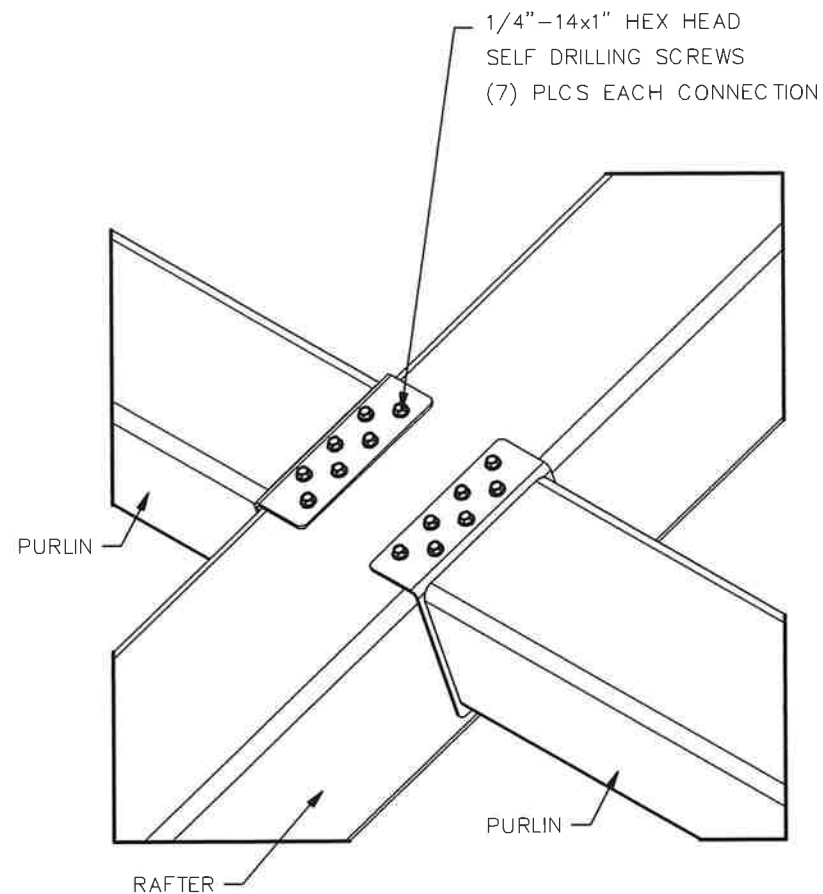
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PURLIN CONNECTION
© RAFTER

DETAIL E

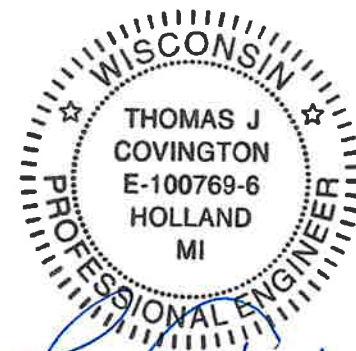


PURLIN CONNECTION
© RAFTER

DETAIL F

NOTE TO INSTALLERS:
WITH FACTORY POWDERCOATED
SHELTERS, PAINT EXPOSED
FASTENERS OF COMPRESSION RINGS,
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PAINT EXPOSED FASTENERS



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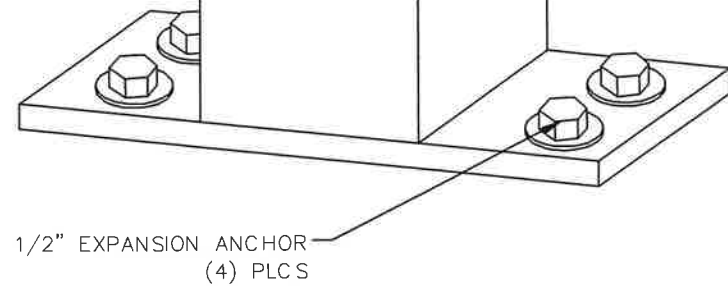
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53081

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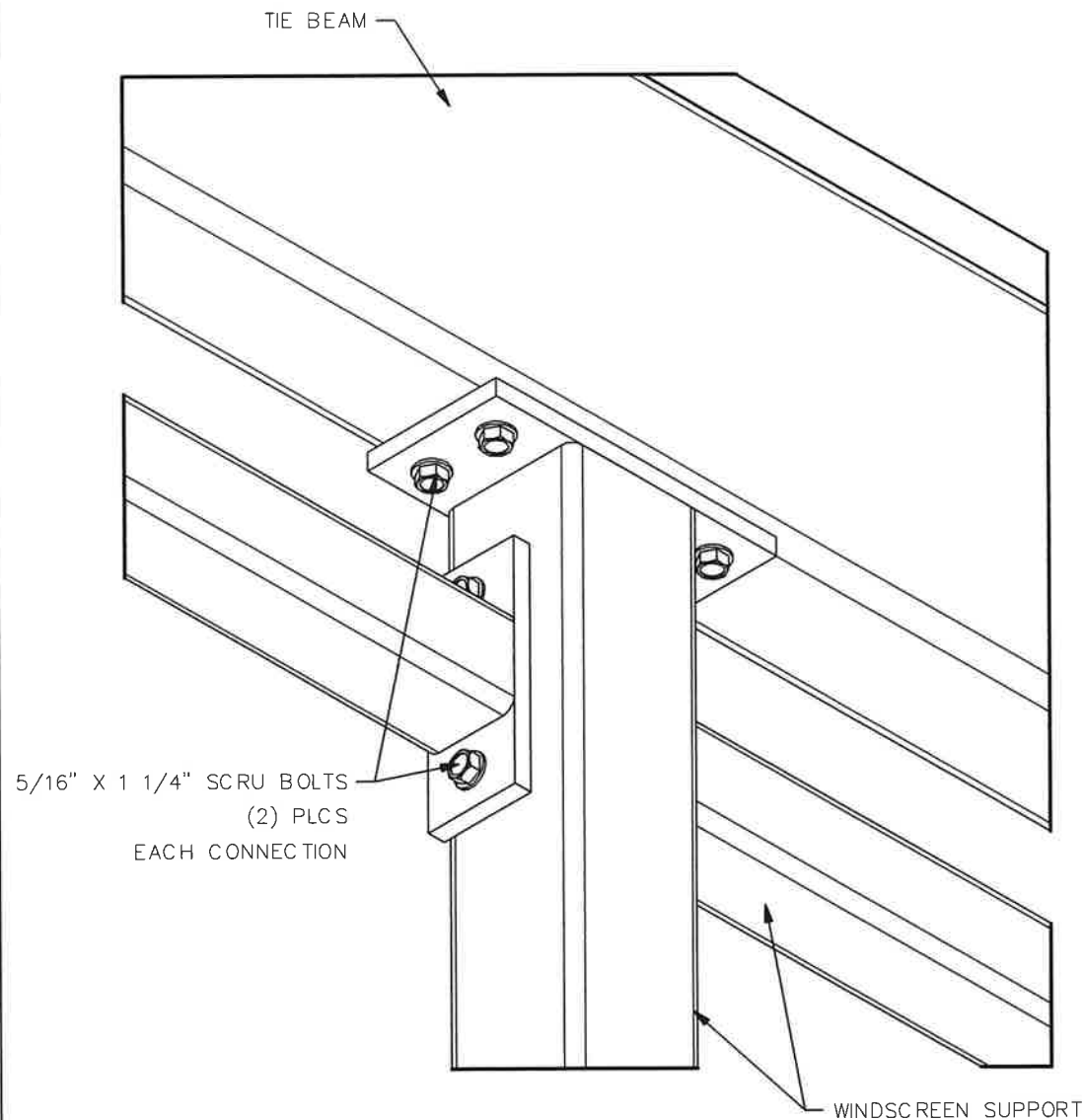
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WINDSCREEN SUPPORT CONNECTION
@ GRADE

DETAIL G



WINDSCREEN SUPPORT CONNECTION
@ TIE BEAM

DETAIL H

NOTE TO INSTALLERS:
WITH FACTORY POWDERCOATED
SHELTERS, PAINT EXPOSED
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NOTE TO INSTALLERS:
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PAINT EXPOSED FASTENERS



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WINDSCREEN SUPPORT

1/4"-14x1" HEX HEAD
SELF DRILLING SCREWS
(2) EACH END

WINDSCREEN SUPPORT

5/16" X 1 1/4" SCRU BOLTS
(2) PLCS
EACH CONNECTION

COLUMN

WINDSCREEN SUPPORT CONNECTION
© COLUMN

DETAIL I

LASER CUT PANEL

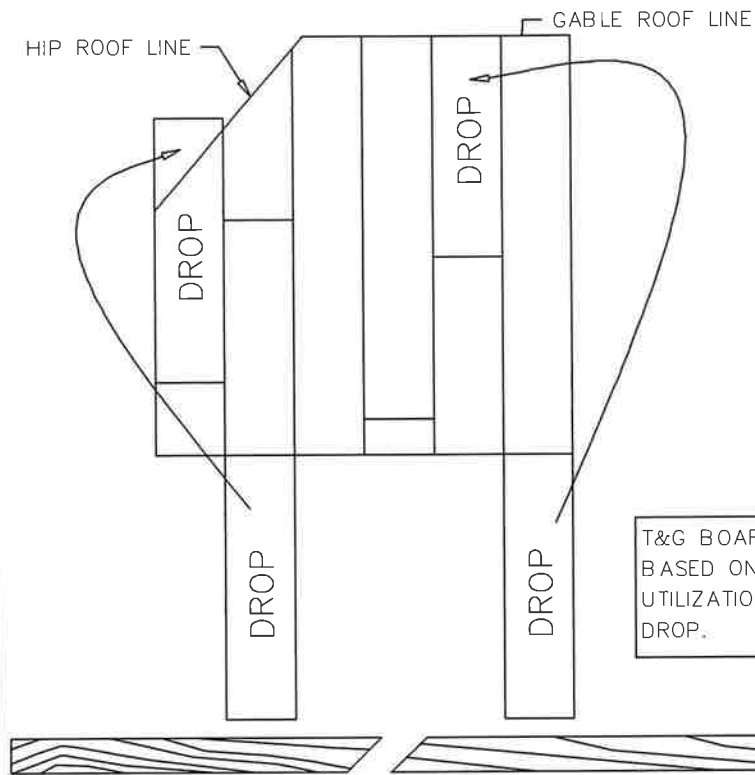
WINDSCREEN SUPPORT

#12-24 X 1 1/4" X #5
STAINLESS STEEL
SELF DRILLING SCREWS W/ WASHER
(9) PLCS EACH PANEL

LASER CUT PANEL CONNECTION
© WINDSCREEN SUPPORT

DETAIL J

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NOTES: T&G ROOF DECK:

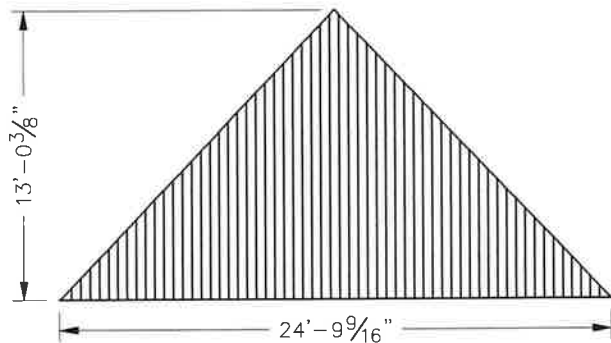
2X6 TONGUE AND GROOVE WOOD ROOF DECK, SOUTHERN YELLOW PINE (OR WHITE FIR WHEN STAINED), KILN DRIED, #2 OR BETTER, ONE EDGE V'D, ONE EDGE GROOVED. IF REQ'D, FASCIA SHALL BE PINE.

ICON REQUIRES THAT ANY ENDS OF THE T&G ROOF DECK BOARDS BE SEALED WITH AN APPROPRIATE END GRAIN SEALER BEFORE INSTALLING ADDITIONAL TRIM OR ROOFING. END GRAIN SEALER IS NOT SUPPLIED BY ICON.

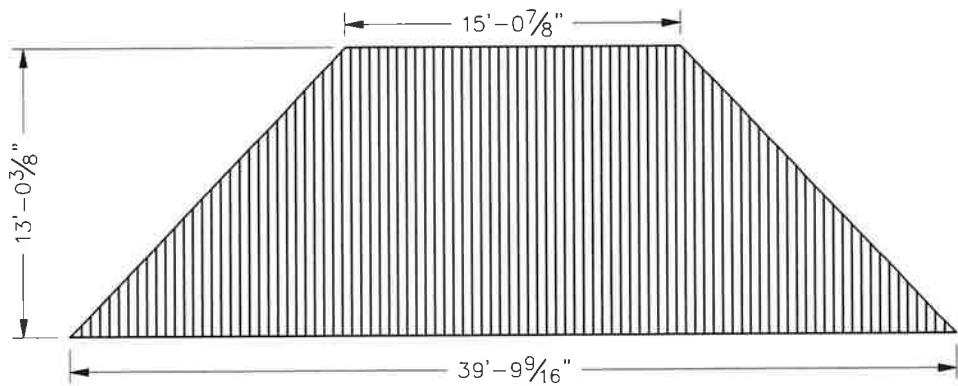
UNLESS THE T&G IS FACTORY SEALED, ALL T&G SHALL BE SEALED ON-SITE BY THE CONTRACTOR. SEALANT NOT SUPPLIED BY ICON

TONGUE AND GROOVE BOARDS SHOULD OVERHANG 1/4" MINIMUM ON ALL OUTSIDE MEMBERS ACCEPTING TRIM TO ENSURE PROPER INSTALLATION OF FASCIA CAP TRIM (IF APPLICABLE).

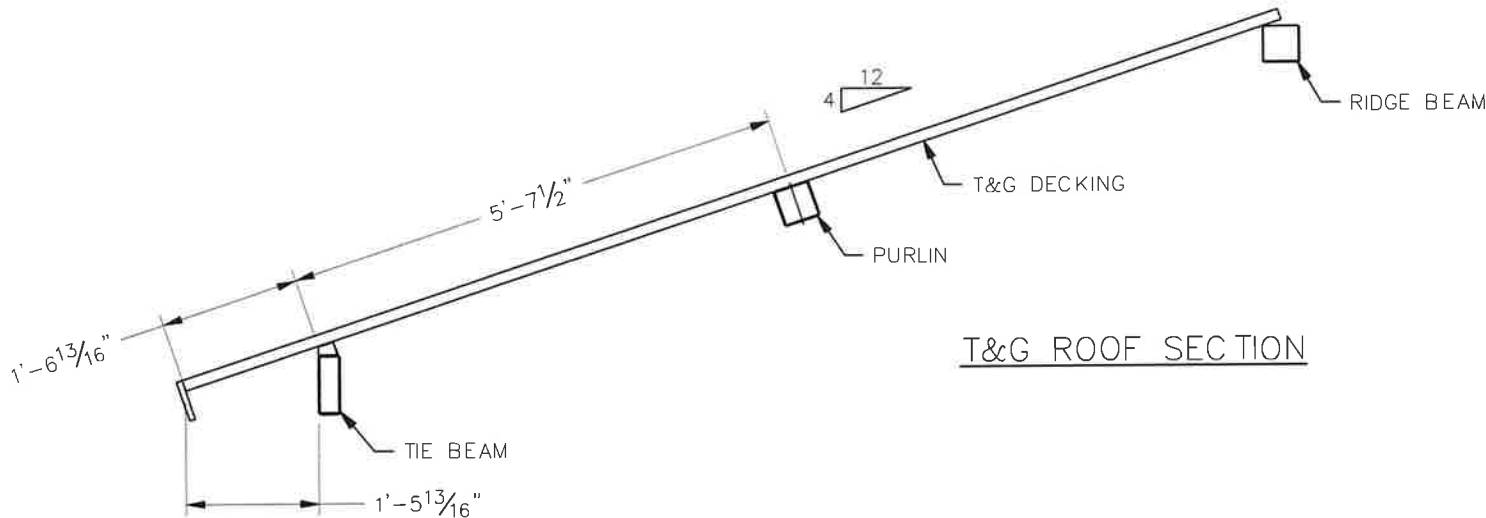
SPLICING T&G BOARD
MITER ENDS OF T&G AT 45° WHEN SPICING TWO BOARDS TOGETHER. STAGGER SPLICES ON ADJACENT BOARD AT LEAST 24" APART. SPLICES MAY OR MAY NOT FALL OVER TOP OF A PURLIN.



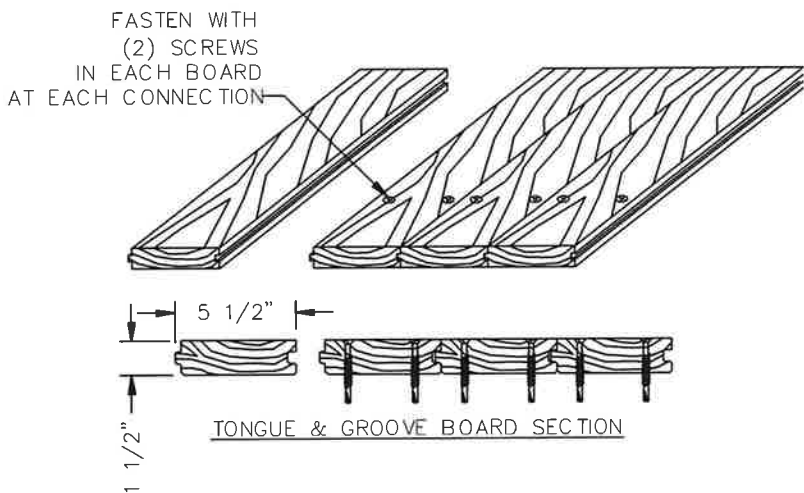
T&G ROOF LAYOUT - END



T&G ROOF LAYOUT - SIDE



T&G ROOF SECTION



WISCONSIN

THOMAS J COVINGTON

E-100769-6

HOLLAND MI

PROFESSIONAL ENGINEER

Permit 5/20/25

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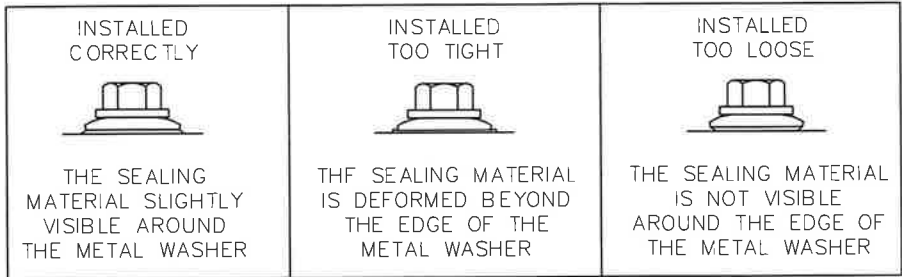
T&G ROOF LAYOUT

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THE DETAILS SHOWN ARE SUGGESTIONS OR GUIDELINES ON HOW TO ERECT THE METAL ROOFING SYSTEM. THE INFORMATION SHOWN IS ACCURATE, BUT IT IS NOT INTENDED TO COVER ALL INSTANCES, BUILDING REQUIREMENTS, DESIGNS OR CODES. CHANGES TO THE DETAILS MAY BE REQUIRED DUE TO FIELD CONDITIONS.

THE ERECTOR SHOULD THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL INSTALLATION INSTRUCTION MATERIAL BEFORE STARTING WORK.

THE PANELS SHOULD BE INSTALLED PLUMB, STRAIGHT, AND ACCURATELY TO THE ADJACENT WORK.

ERECTORS SHALL BE RESPONSIBLE TO ENSURE THAT THE DETAILS MEET PARTICULAR BUILDING REQUIREMENTS AND TO ASSURE ADEQUATE WATER TIGHTNESS.

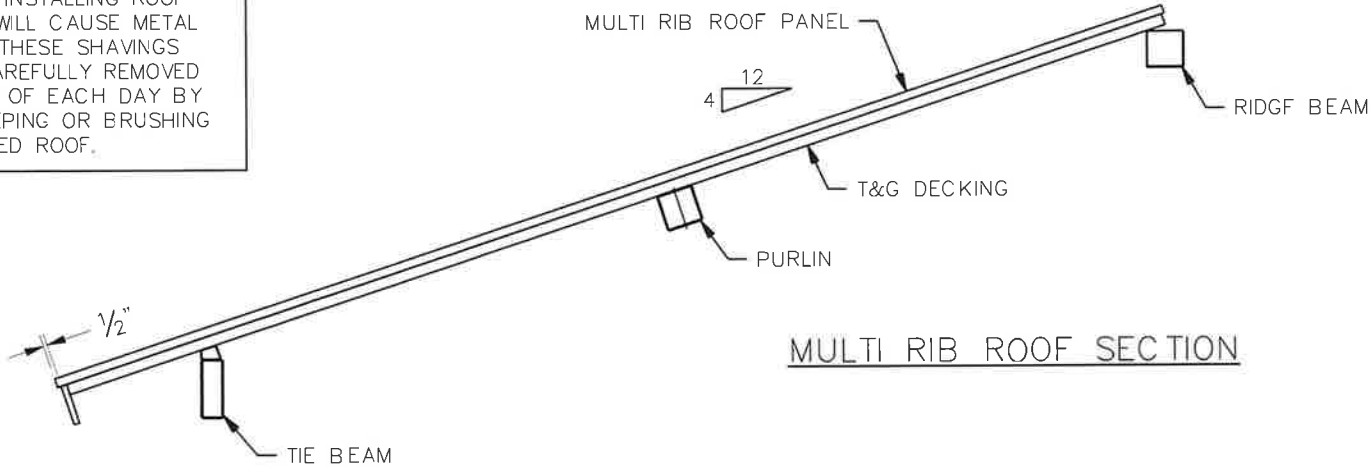
FOR THE BEST APPEARANCE ALL TRIM AND FLASHING SHALL BE INSTALLED TRUE, AND IN PROPER ALIGNMENT, WITH ALL EXPOSED FASTENERS EQUALLY SPACED.

SOME FIELD CUTTING AND/OR FITTING OF PANELS, TRIM AND FLASHING IS TO BE EXPECTED BY THE ERECTOR. MINOR FIELD CORRECTIONS ARE PART OF NORMAL ERECTION WORK.

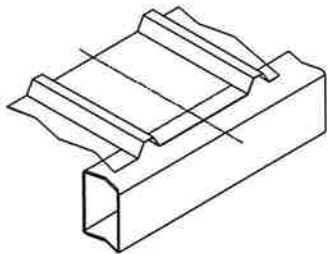
THE INSTALLATION SHALL BE PERFORMED BY EXPERIENCED METAL CRAFTSMEN AND WORKMANSHIP SHALL MEET THE BEST INDUSTRY STANDARDS.

ATTENTION INSTALLERS:
METAL SHAVINGS LEFT ON ROOF WILL QUICKLY RUST AND STAIN THE ROOF FINISH!

DRILLING OR INSTALLING ROOF FASTENERS WILL CAUSE METAL SHAVINGS. THESE SHAVINGS MUST BE CAREFULLY REMOVED AT THE END OF EACH DAY BY EITHER SWEEPING OR BRUSHING THE INSTALLED ROOF.

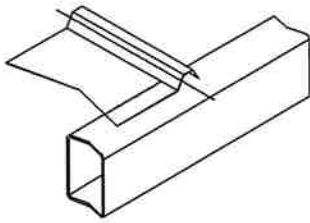


MULTI RIB ROOF SECTION



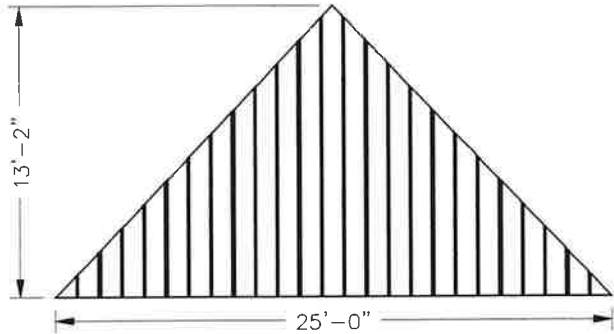
STEPS FOR PROPER PANEL INSTALLATION:

1. MARK THE CENTER OF THE TIE BEAM AND COMPRESSION RING (OR PURLIN ON MULTI TIER BUILDINGS).
2. FIND ONE OF THE LONGEST PANELS.
3. CENTER THAT PANEL ALONG THE CENTER LINE OF THE FRAME.
(SEE ROOF LAYOUT FOR THE CORRECT RIB TO CENTER)
4. INSTALL REMAINING PANELS WORKING OUT TOWARDS THE CORNERS.
5. INSTALL ALL ROOF SECTIONS USING THIS METHOD.

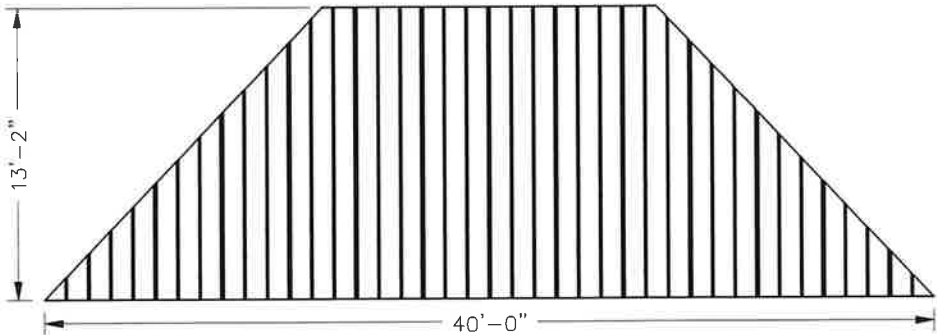


STEPS FOR PROPER PANEL INSTALLATION:

1. MARK THE CENTER OF THE TIE BEAM AND COMPRESSION RING (OR PURLIN ON MULTI TIER BUILDINGS).
2. FIND ONE OF THE LONGEST PANELS.
3. ALIGN THAT PANEL WITH THE CENTER OF THE RIB AT THE THE CENTER LINE OF FRAME.
(SEE ROOF LAYOUT FOR THE CORRECT RIB TO CENTER)
4. INSTALL REMAINING PANELS WORKING OUT TOWARDS THE CORNERS.
5. INSTALL ALL ROOF SECTIONS USING THIS METHOD.



MR ROOF LAYOUT - END



MR ROOF LAYOUT - SIDE

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MR ROOF LAYOUT

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10/10/2016

FASTENERS



2 " DECK SCREW

2 3/4" WOOD TO METAL
SCREW

2 3/4" WOOD TO METAL SCREW
(2) PER BOARD ALONG RAFTER
SEE DETAIL T-H1

2 3/4" WOOD TO
METAL SCREW
— (2) PER BOARD
ALONG TIE BEAM
SEE DETAIL T-E1

NAILER BOARD
 ATTACH WITH
 2" DECK SCREWS
 12" O.C. AT BOTTOM
 SEE DETAIL T-E1

WOOD FASCIA
ATTACH WITH
— 2" DECK SCREWS
12" O.C. STAGGERED
SEE DETAIL T-E1

T&G ROOF DECK LAYOUT

ROOF

2 3/4" WOOD TO METAL
SCREW (2) PER BOARD

2x6 T&G
ROOF DECK

2" DECK SCREW
12" O.C. STAGGER

— TIE BEAM

1x6 WOOD FASCIA

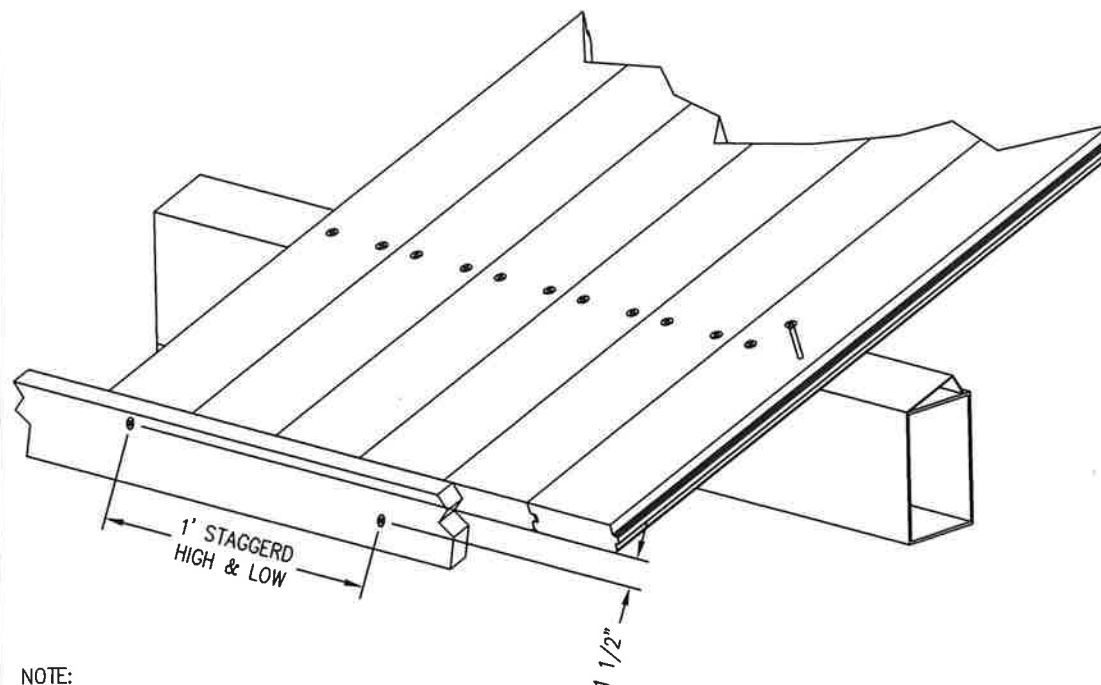
NAILER BOARD
(FIELD RIPPED DOWN 2x6 T&G)



2 " DECK SCREW



2 3/4" WOOD TO METAL
SCREW

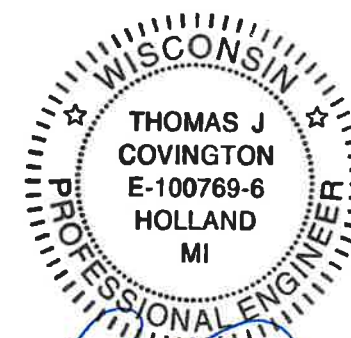


NOTE:
FASCIA CAP NOT SHOWN ON THIS VIEW

T&G ROOF DECKING

@ TIE BEAM

T-E1



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ROOF DETAILS

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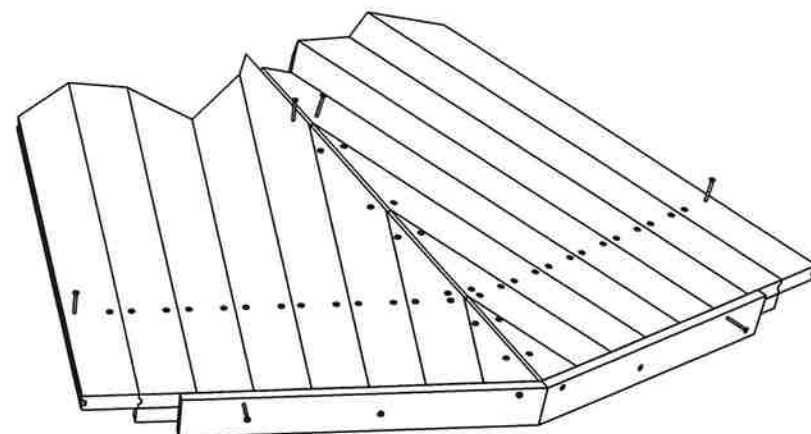
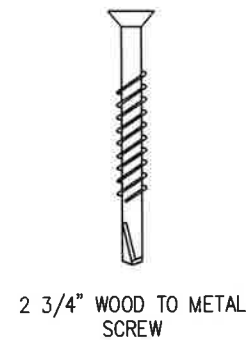
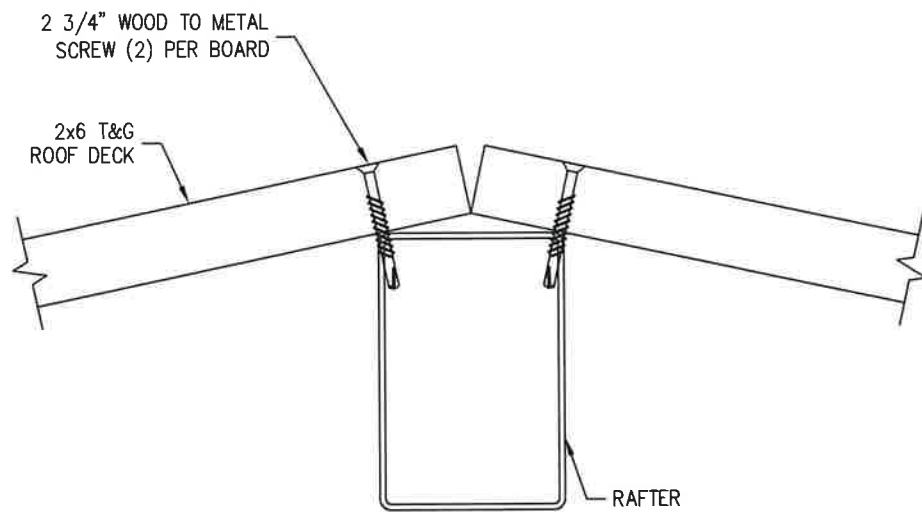
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SHEET

R1. C

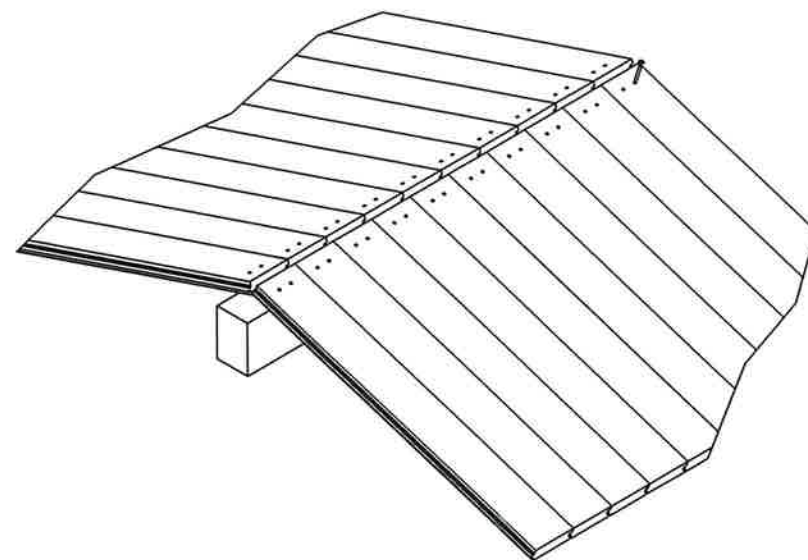
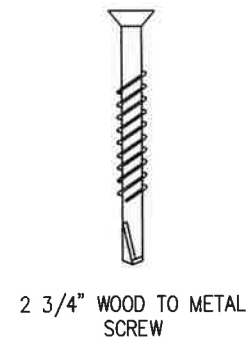
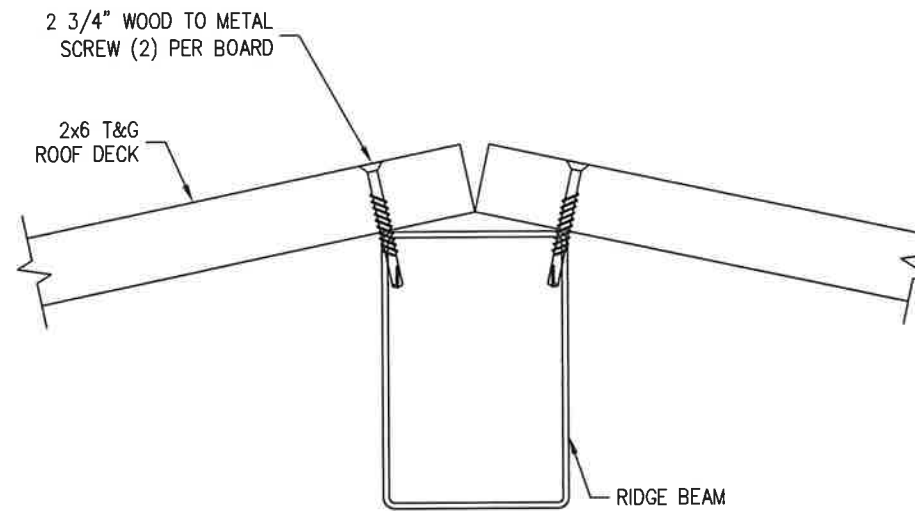
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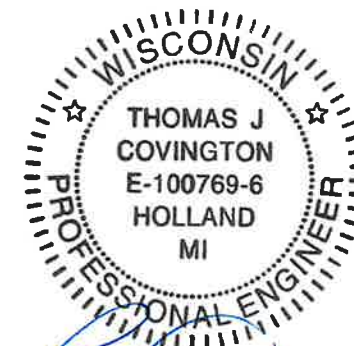
T&G ROOF DECK CONNECTION @ RAFTER

T-H1



T&G ROOF DECK CONNECTION @ RIDGE

T-G1



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800.748.0985
616.396.0944 FX

ROOF DETAILS

DRAWN BY:

DTH

DATE:

5/14/2025

JOB NO.:

11117

REVISION:

A

BUILDING TYPE:

RH25X40TM-P4

PROJECT NAME:

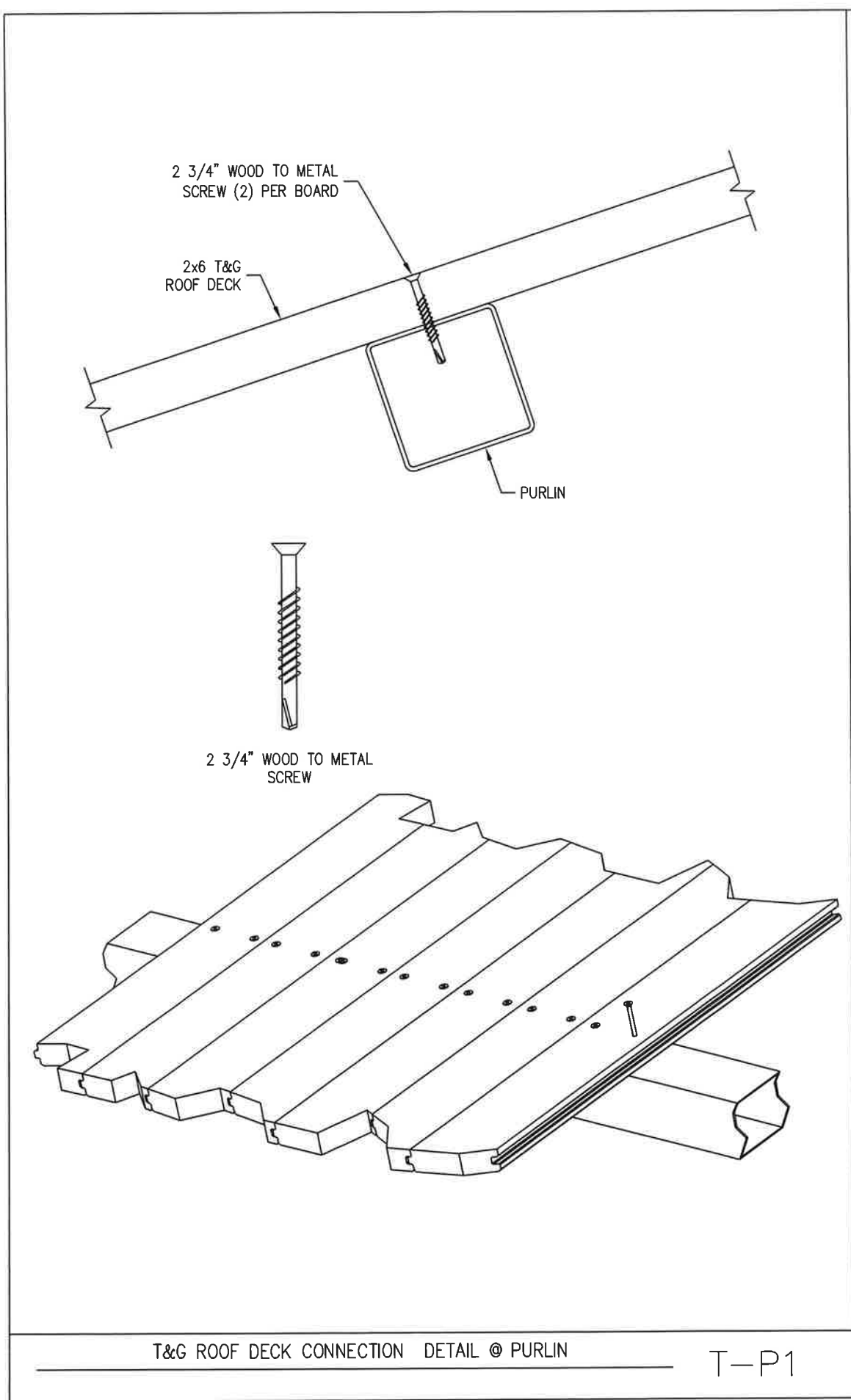
SOAR PROJECT
SHEBOYGAN, WI
53081

SHEET

R1.1

PRINTED ON: 12/28/2017

DWG: - RH25X40TM-P4 - SOAR Sheboygan\Engineering\Info Drawings\Submittals\R1-000021.dwg



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ROOF DETAILS

DRAWN BY:	DTH
DATE:	5/14/2025
JOB NO.:	11117
REVISION:	A
BUILDING TYPE:	RH25X40TM-P4
PROJECT NAME:	SOAR PROJECT SHEBOYGAN, WI 53081

WISCONSIN

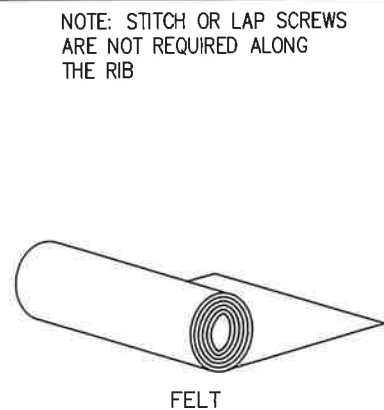
PROFESSIONAL ENGINEER

THOMAS J
COVINGTON
E-100769-6
HOLLAND
MI

5/20/25

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SHEET
R1.2



NOTE: STITCH OR LAP SCREWS
ARE NOT REQUIRED ALONG
THE RIB

ORDER OF INSTALLATION

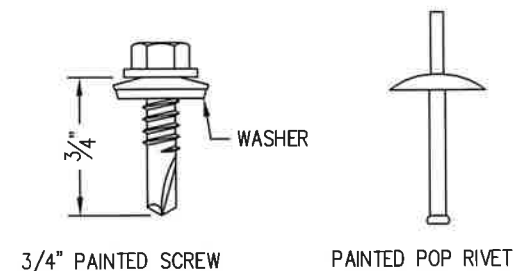
FASCIA CAP 10' LONG
SEE DETAIL TM-E1

TOP TRIM 10' LONG
W/ WEEP HOLES
SEE DETAIL TM-E1

RIDGE CAP 10' LONG
SEE DETAIL TM-H1, TM-G1

HIP CAP 10' LONG
SEE DETAIL TM-H1, TM-G1

FASTENERS



1" PAINTED WOODGRIP SCREW
(1) ON EACH SIDE OF RIB
ALONG RIDGE BEAM
SEE DETAIL TM-G1

— 1" PAINTED WOODGRIP SCREW
(1) ON EACH SIDE OF RIB
(48" O.C. MAX.)

30# FELT
- SEE DETAIL S-FP1

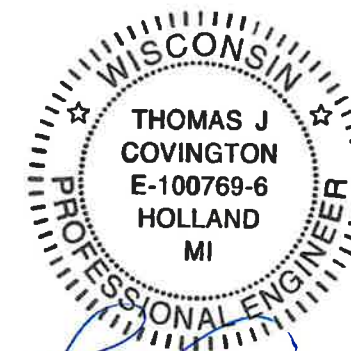
1" PAINTED WOODGRIP SCREWS
(1) ON EACH SIDE OF RIB
SEE DETAIL TM-E1.

- 1" PAINTED WOODGRIP SCREWS
(1) ON EACH SIDE OF RIB
SEE DETAIL TM-H1

— RIDGE CAP
FASTENED W/ (1)
3/4" PAINTED SCREW
AT EACH RIB
SEE DETAILS TM-G1

TOP TRIM W/ WEEP HOLES
ATTACHED W/ 3/4" PAINTED
SCREWS (1) AT EACH RIB
SEE DETAIL TM-E1

— HIP CAP
FASTENED W/ (1)
3/4" PAINTED SCREW
AT EACH RIB
SEE DETAILS TM-H1



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ROOF DETAILS

DRAWN BY:

DTH

DATE: _____

5/14/2025

JOB NO.:

11117

REVISION:

A

BUILDING TYPE:

RH25X40TM-P4

PROJECT NAME:

SOAR PROJECT

SHEBOYGAN, WI
53081

SHEET

R1.3

METAL ROOF OVER T&G ROOF DECK INSTALLATION

ROOF

TRIM INSTALLATION

TRIM

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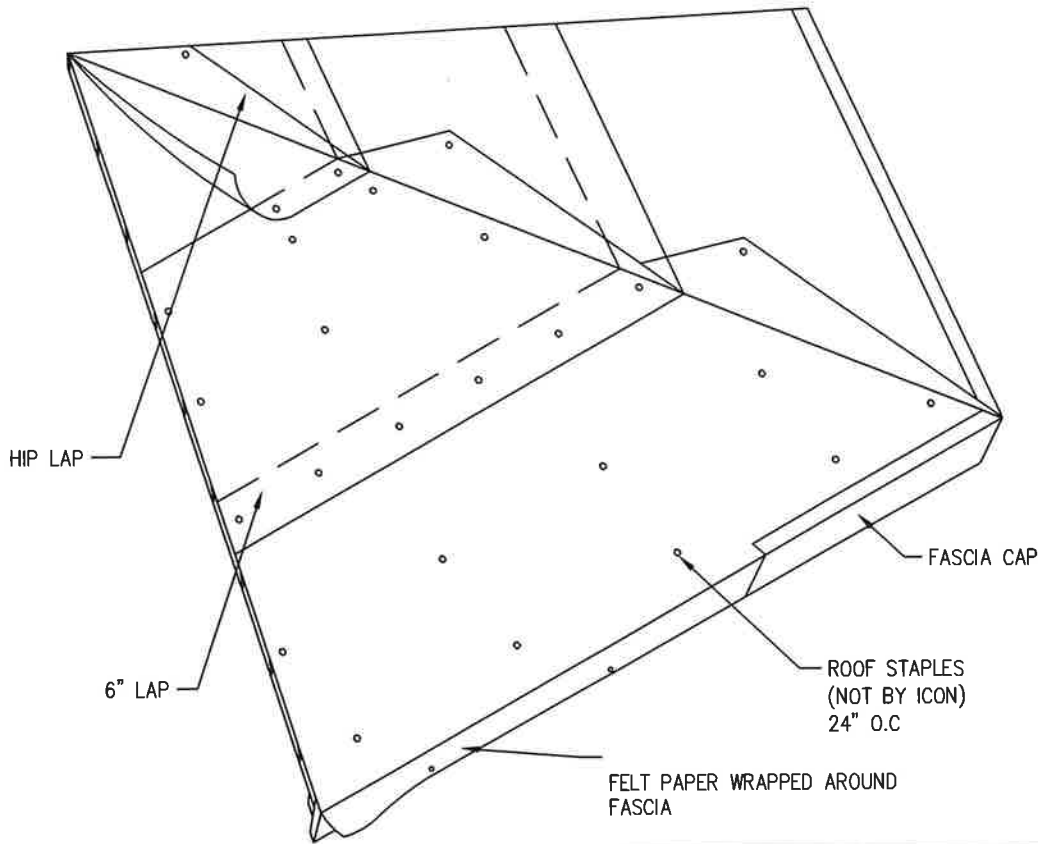
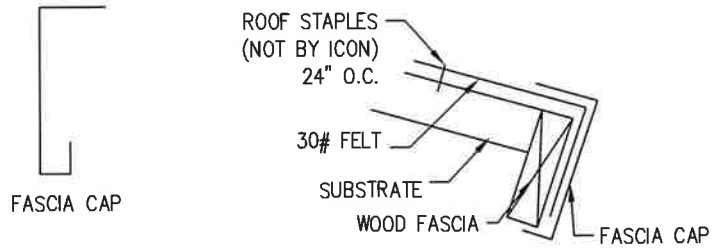
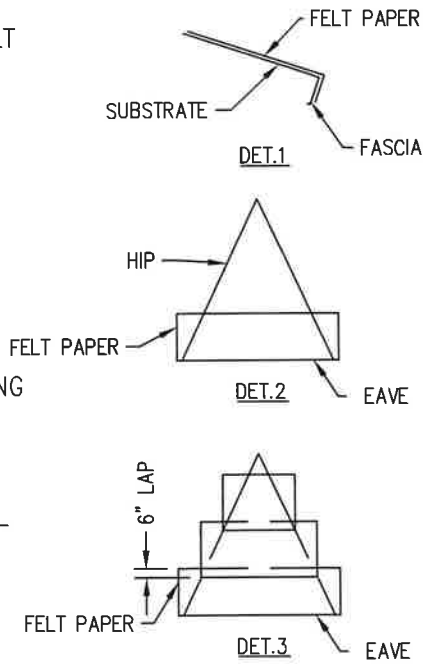
INSTALLATION OF FELT PAPER
TO START MEASURE EAVE LENGTH AND CUT THE 30# FELT PAPER TO LENGTH + 6"

PLACE FELT ON ROOF AND WRAP THE PAPER OVER THE FASCIA SEE DET.1
ALLOW THE FELT TO LAY OVER THE HIP SEE DET.2

NAIL FELT DOWN WITH ROOFING STAPLES (NOT BY ICON) 24" O.C.

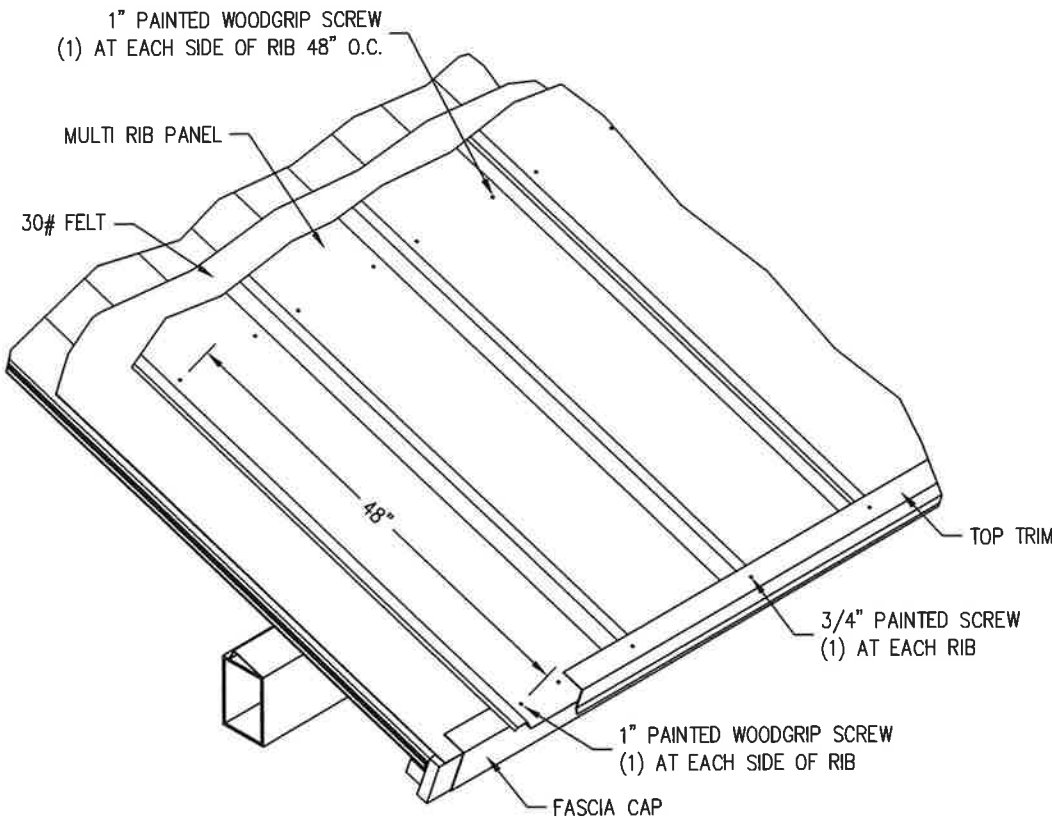
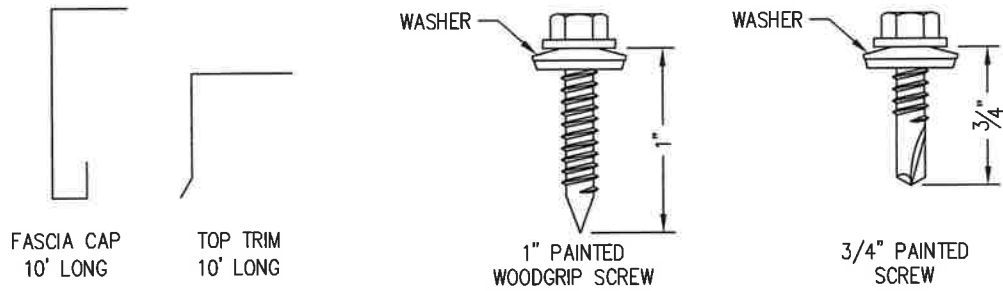
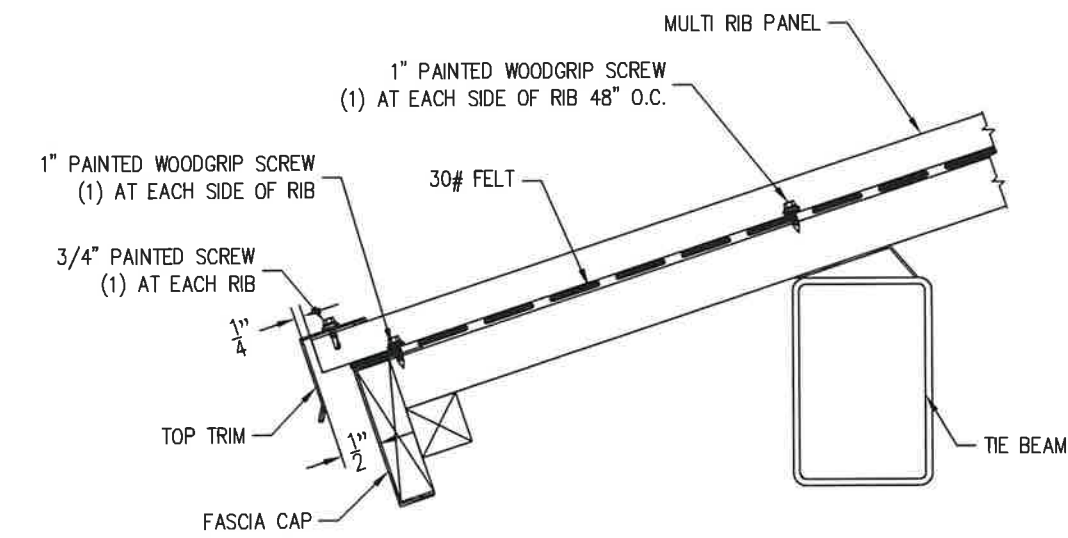
CONTINUE INSTALLING FELT UP THE ROOF SECTION LAPPING THE PREVIOUSLY INSTALLED PIECE 6" SEE DET.3

INSTALL THE FASCIA CAP BY SLIDING IT OVER THE WOOD FASCIA (FASTENERS USED TO ATTACH STARTER TRIM WILL SECURE FASCIA CAP)



FELT PAPER INSTALLATION

S-FP1



MULTI RIB OVER T&G ROOF DECKING

@ TIE BEAM

TM-E1



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ROOF DETAILS

DRAWN BY:

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5/14/2025

JOB NO.:

11117

REVISION:

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BUILDING TYPE:

RH25X40TM-P4

PROJECT NAME:

SOAR PROJECT

SHEBOYGAN, WI

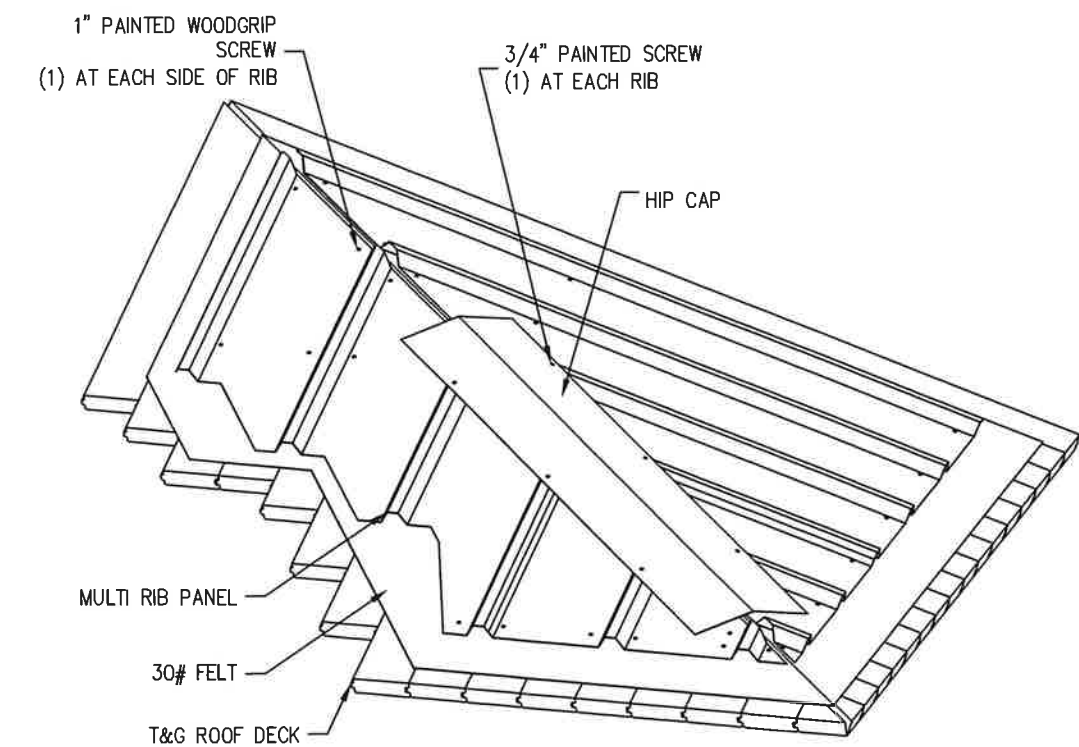
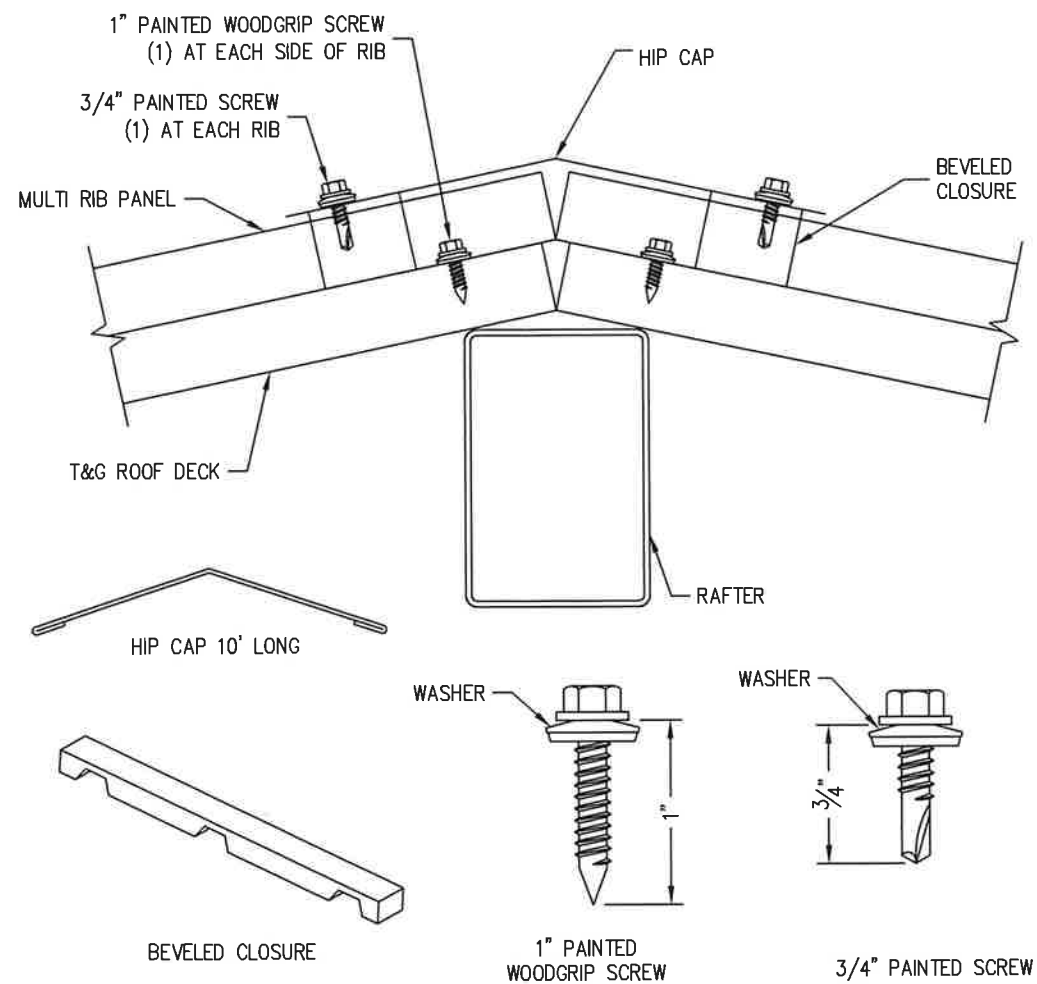
53081

SHEET

R1.4

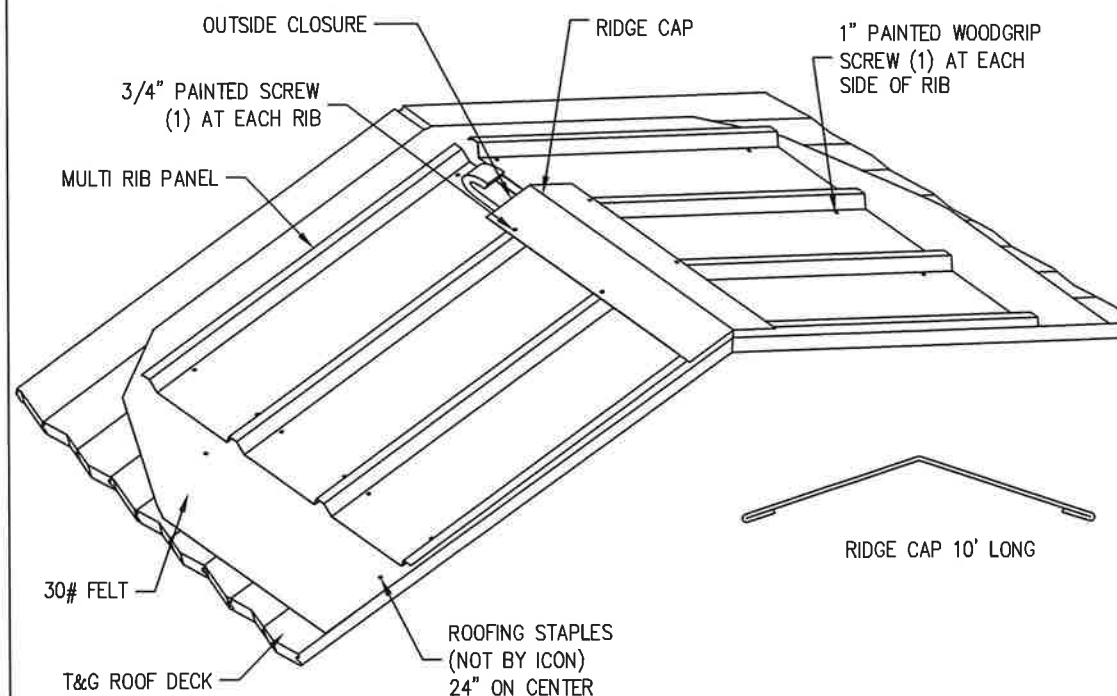
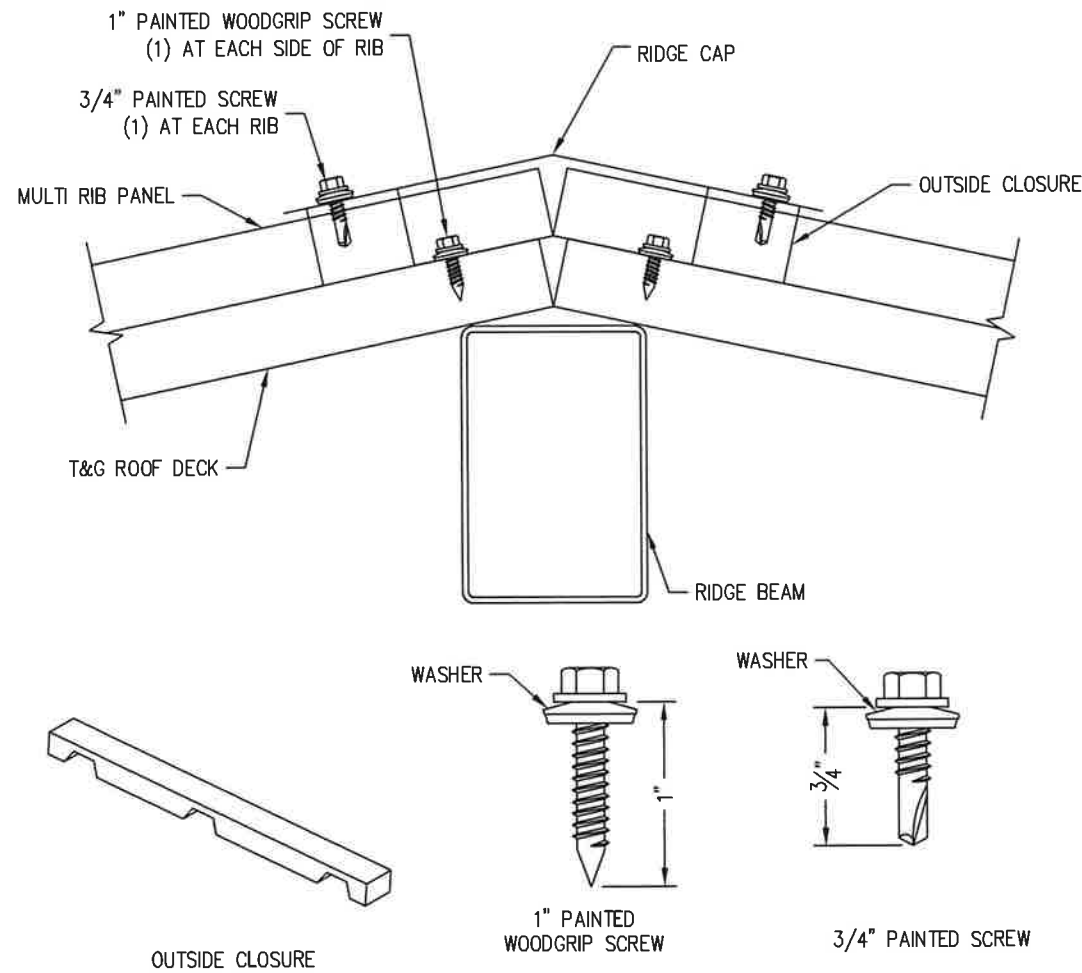
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METAL OVER T&G ROOF DECK CONNECTION @ RAFTER

TM-H1



METAL OVER T&G ROOF DECK CONNECTION @ RIDGE

TM-G1



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ROOF DETAILS

DRAWN BY:

DTH

DATE:

5/14/2025

JOB NO.:

11117

REVISION:

A

BUILDING TYPE:

RH25X40TM-P4

PROJECT NAME:

SOAR PROJECT
SHEBOYGAN, WI
53081

SHEET

R1.5

PRINTED ON: 12/28/2017

DWG: - RH25X40TM-P4 - SOAR Sheboygan\Engineering\Info\Drawings\Submittals\RI-000021.dwg

STRUCTURAL NOTES

GENERAL REQUIREMENTS

NOTES & DETAILS ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.

ALL MATERIALS AND WORK PERFORMED SHALL CONFORM TO THE REQUIREMENTS OF THE 2018 WISCONSIN COMMERCIAL BUILDING CODE INCLUDING LOCAL ORDINANCES, AMENDMENTS, AND EXCEPTIONS.

ALL MATERIAL SHALL BE FURNISHED AS SHOWN HEREIN UNLESS THE OWNER OR ENGINEER APPROVES EQUAL ALTERNATIVES.

NO CHANGES ARE TO BE MADE TO THESE PLANS WITHOUT THE KNOWLEDGE AND WRITTEN CONSENT OF UNITED GREENHOUSE SYSTEMS, INC. AND THE GREENHOUSE DESIGN ENGINEER.

THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES, INCLUDING, BUT NOT LIMITED TO BRACING AND SHORING. OBSERVATION VISITS TO THE SITE BY THE ENGINEER AND/OR THE ENGINEER'S REPRESENTATIVE(S) SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.

DESIGN LOADS

ROOF: GROUND SNOW LOAD (Pg) = 35 PSF
SNOW IMPORTANCE FACTOR (Is) = 1.0
SNOW LOAD EXPOSURE FACTOR (Ce) = 1.0
ROOF THERMAL FACTOR (Ct) = 0.85 (CONTINUOUSLY HEATED GREENHOUSE PER ASCE7)

ROOF SLOPE FACTOR (Cs) = 0.67
SLOPED ROOF/FLAT ROOF SNOW (Ps) = 14.0
LIVE LOAD = 20 PSF (REDUCIBLE PER ASCE7)
DEAD LOAD (TOP CHORD) = 3 PSF
DEAD MISC. LOAD (BOTTOM CHORD) = 5 PSF
MISC. IS UNIFORMLY DISTRIBUTED ON BOTTOM CHORDS

WIND: WIND SPEED = 115 MPH ULTIMATE (89.1 MPH NOMINAL)
WIND EXPOSURE = B
WIND RISK CATEGORY = II
ENCLOSURE CLASSIFICATION = ENCLOSED
INTERNAL PRESSURE COEFFICIENT (Cpi) = ±0.18
COMPONENT & CLADDING DESIGN PRESSURE = (SEE CHART CC)

SEISMIC: SEISMIC RISK CATEGORY = II
SEISMIC SITE CLASS = D
SEISMIC DESIGN CATEGORY = B
SEISMIC IMPORTANCE FACTOR (I) = 1.0
SPECTRA RESPONSE COEFF. Sds = 0.07 Sd1 = 0.063
FORCE RESISTING SYSTEM:
- ORD. MOMENT FRAMES OF STEEL
- STEEL CONC. BRACED FRAMES
DESIGN BASE SHEAR (W x Cs) = W x 0.023 MAX
ANALYSIS PROCEDURE = EQUIVALENT LATERAL FORCE
CHART CC

COMPONENT & CLADDING DESIGN PRESSURE (PSF)			
BUILDING AREA	TRIBUTARY AREA SQ. FT.		
	10	25	50
INTERIOR ROOF	-21.8	-21.0	-20.4
EDGE ROOF	-37.9	-33.9	-30.9
CORNER ROOF	-56.0	-51.2	-47.6
INTERIOR WALL	-25.8	-24.4	-23.3
EDGE WALL	-31.9	-29.0	-26.9
EDGE ZONE STRIP WIDTH (FT)	3.0		

LOADS ARE TO BE APPLIED IN ACCORDANCE WITH THE REQUIREMENTS OF 2018 WISCONSIN COMMERCIAL BUILDING CODE.

DESIGN CRITERIA

THE MINIMUM COMPRESSIVE STRENGTH OF CONCRETE (f'c) AT 28 DAYS SHALL BE:
FOUNDATION f'c = 3,000 PSI

STRUCTURAL STEEL (VALUE SHOWN IS MINIMUM)
TYP. STEEL TUBING U.N.O. Fy=50,000 PSI (ASTM A500, GRADE C)
Fu=65,000 PSI
STEEL TUBING (SQ. 4x4) Fy=60,000 PSI (PER ALLIED TESTS)
Fu=75,000 PSI (PER ALLIED TESTS)
4" HAT TOP CHORDS Fy=50,000 PSI (ASTM A1011, GRADE 50)
Fu=65,000 PSI
3" HAT PURLINS/GIRTS Fy=55,000 PSI (ASTM A1011, GRADE 55)
Fu=70,000 PSI
STRUCTURAL PLATE Fy=50,000 PSI (ASTM A572, GRADE 50)
Fu=70,000 PSI
WELDING ELECTRODES E70XX (AWS D1.1)
GRADE 5 BOLTS Fu=120,000 PSI
Fy=92,000 PSI

ALL BOLTS ARE TO BE GRADE 5 OR ASTM A325 (SNUG-TIGHT INSTALLATION).

NOTE: BRACING ASSEMBLIES MUST HAVE A SAFE WORKING LOAD OF HALF THE RESPECTIVE CABLE BREAKING STRENGTHS SHOWN BELOW.
3/16" DIAM. BRACING CABLE-7X19 STRAND BREAKING STR. = 4200 LBS
1/4" DIAM. BRACING CABLE-7X19 STRAND BREAKING STR. = 7000 LBS
3/8" DIAM. BRACING CABLE-7X19 STRAND BREAKING STR. = 14400 LBS
(SEE PLANS FOR BRACE CABLE SIZES AND LOCATIONS)

ALL COLD-FORMED MEMBERS ARE TO BE GALVANIZED SHEET WITH MIN. MATERIAL THICKNESSES OF: 18 GA. = .0516, 16 GA. = .0635, 14 GA. = .0785, 12 GA. = .1084

GREENHOUSE ROOF AND WALL CLADDING (PANEL) IS NOT A DESIGNED ELEMENT. ANY MAINTENANCE MUST BE PERFORMED IN A MANNER THAT DOES NOT SUBJECT CLADDING TO THE CONCENTRATED LOAD OF A MAINTENANCE WORKER.

UNITED GREENHOUSE SYSTEMS, INC. IS A COMPONENT METAL BUILDING/GREENHOUSE MANUFACTURER AND SUPPLIER, AND 4TH DIMENSION DESIGN, INC. IS THE STRUCTURAL ENGINEER FOR THE STEEL STRUCTURE. NEITHER OF WHICH ARE TO BE CONSIDERED THE PROJECT DESIGN PROFESSIONAL OF RECORD. THE DESIGN OF ANY MATERIALS NOT DIRECTLY SUPPLIED BY UNITED GREENHOUSE SYSTEMS, INC. IS NOT PROVIDED UNDER THE SCOPE OF THIS CONTRACT.

UNITED GREENHOUSE SYSTEMS AND 4TH DIMENSION DESIGN TAKE NO RESPONSIBILITY FOR THE EVALUATION OF ANY EXISTING OR ADJACENT STRUCTURES WHOSE CONDITION(S) MAY BE AFFECTED IN ANY WAY BY THE PRESENCE OF THE GREENHOUSE.

DESIGN METHOD

BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14)

MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN (AISC 360-10)

COLD FORMED STEEL DESIGN MANUAL (AIS S100-12)

STRUCTURAL STEEL

ALL STRUCTURAL STEEL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF ASTM AND SHALL BE FABRICATED AND ERECTED ACCORDING TO AISC/AISI SPECIFICATIONS.

WELDING SHALL CONFORM TO THE LATEST EDITION OF AWS D1.1. ALL WELDING SHALL BE PERFORMED BY APPROVED CERTIFIED WELDERS.

NO HOLES, OTHER THAN THOSE SPECIFICALLY DETAILED, SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS.

ERECTION OF STEEL MEMBERS SHALL NOT COMMENCE UNTIL ALL CONCRETE/MASONRY ELEMENTS HAVE ATTAINED AT LEAST 75% OF THEIR INTENDED MINIMUM COMPRESSIVE STRENGTH.

VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

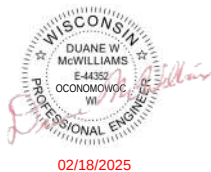
GREENHOUSE

D R A W I N G S C H E D U L E

PAGE NUMBER

DESCRIPTION

S-0.0	COVER SHEET
S-1.0	EAST/WEST END WALL ELEVATIONS
S-2.0	NORTH/SOUTH SIDE WALL ELEVATIONS
S-3.0	PLAN VIEW
S-3.1	FOOTING L/O
S-4.0	2D DETAILS
S-4.1	2D DETAILS
S-5.0	3D DETAILS
S-6.0	VENT ASSEMBLY DETAILS
S-6.1	36' SIDEWALL VENT ASSEMBLY DETAILS
S-6.2	40' ROOF VENT ASSEMBLY DETAILS
S-7.0	FRAMED OPENING DETAILS
S-7.1	DOUBLE SWING DOOR DETAILS
S-8.0	GLAZING DETAILS
S-9.0	HEATER HANGING DETAILS



02/18/2025

PAGE

S-0.0

COVER SHEET

4th DIMENSION DESIGN, INC.
877 Union Court
Sheboygan, WI 53081
PHONE: (262) 464-4600
FAX: (262) 464-4600
www.4d.com

PROJECT:

PROJECT "B"
2024

CUSTOMER:

VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

DRAWING BY:

DTC

DRAWING TITLE:

(1) 21' X 40'
AMBASSADOR CROWN
GREENHOUSE STRUCTURE

DATE:

12/1/2024

REV DATE DESCRIPTION

1	11/10/20	GENERAL REVISION

UNITED GREENHOUSE
1857 W. WISCONSIN DRIVE
EDGEMONT, WI 53534
PHONE: 1-800-433-6834
FAX: 1-808-884-6137

PAGE

S-1.0

EAST/WEST
ELEVATIONS
& TRUSS

4th DIMENSION DESIGN, INC.

877 Venture Court
Waukegan, WI 53199
PHONE: (262) 884-6000
FAX: (262) 884-6005
www.4d.com

PROJECT:

PROJECT "B"

2024

CUSTOMER:

VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

DRAWING BY:

DTC

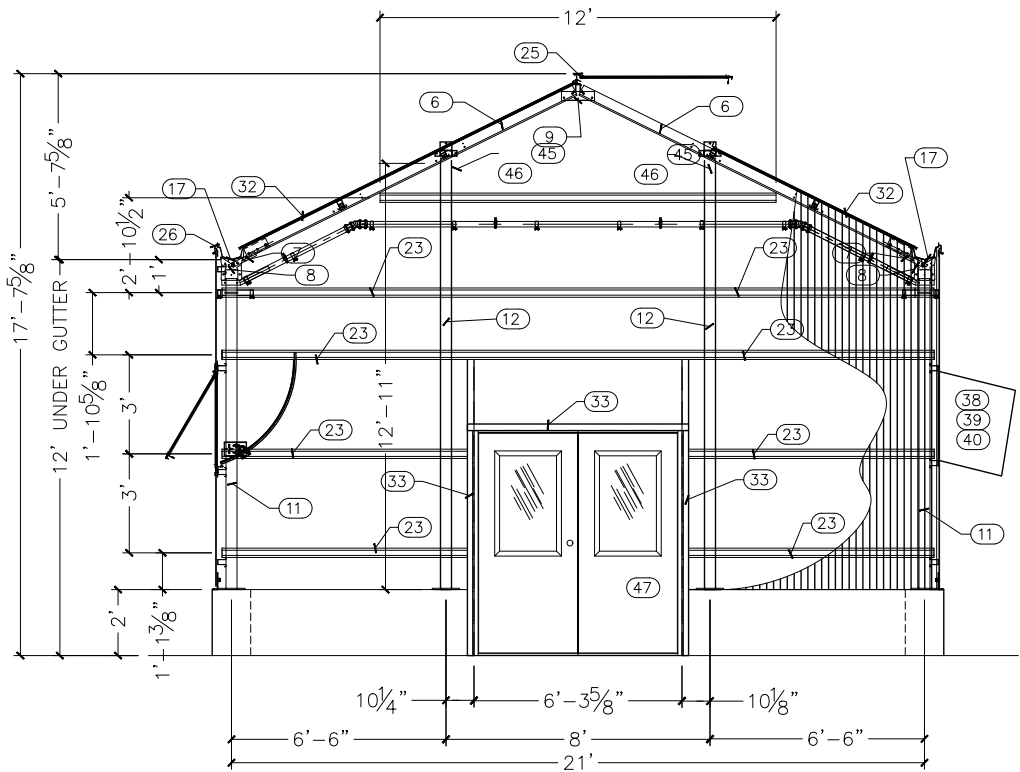
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(1) 21' X 40'
AMBASSADOR CROWN
GREENHOUSE STRUCTURE

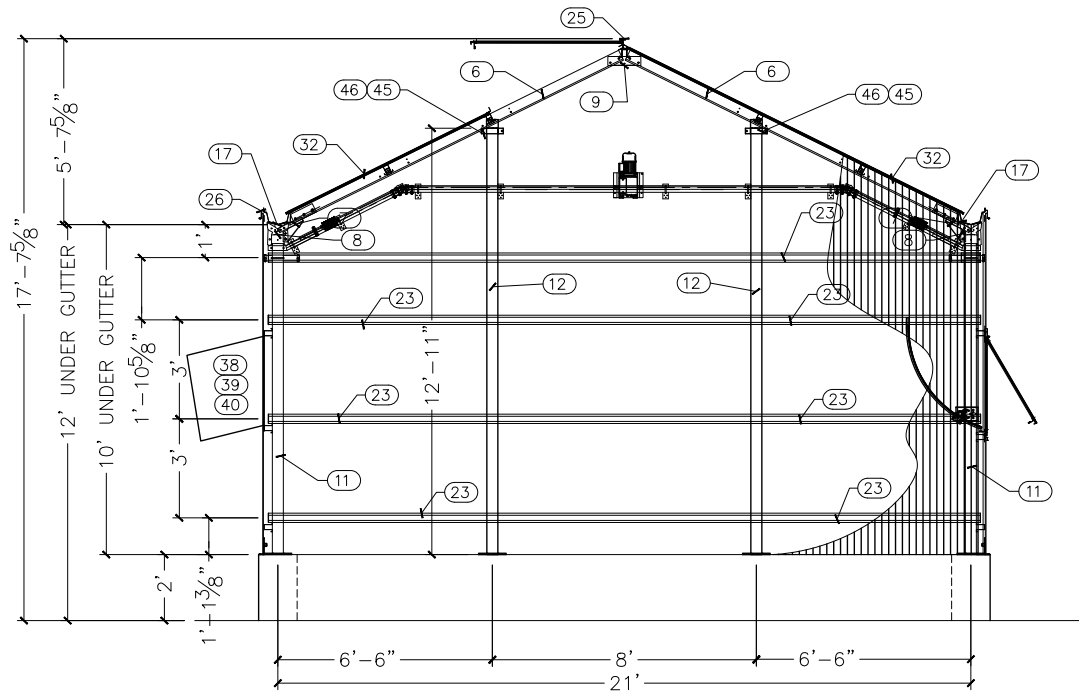
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UNITED GREENHOUSE
STRUCTURES, INC.

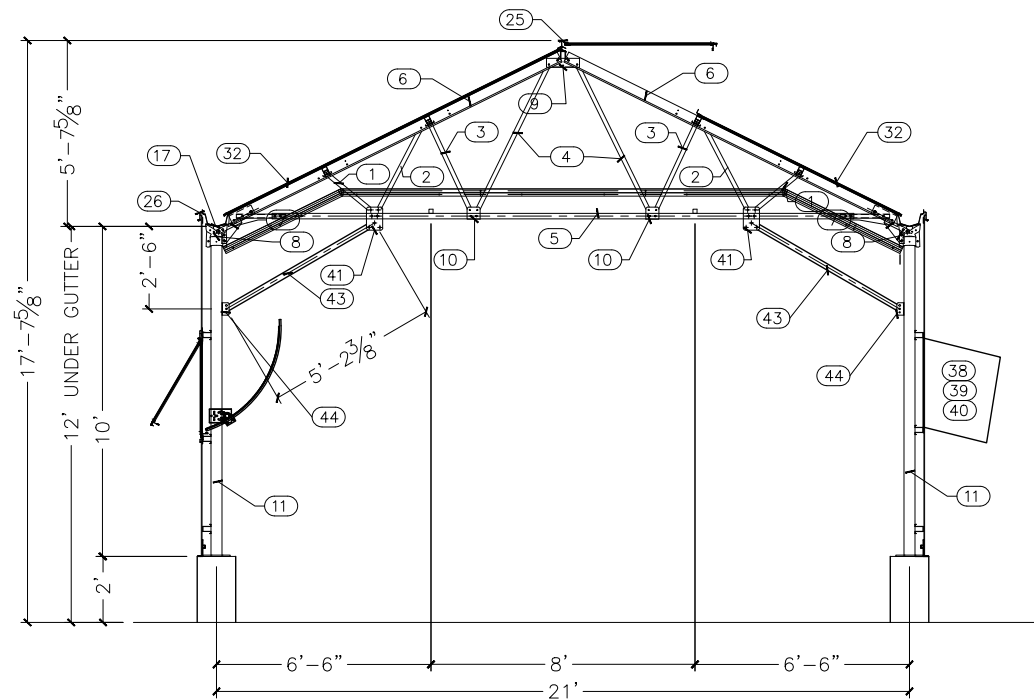
1857 TOWER DRIVE
EDGEMONT, WI 53534
PHONE: 1-800-433-6834
1-800-884-8941
FAX: 1-800-884-6137



1 EAST ENDWALL ELEVATION
S-1.0



2 WEST ENDWALL ELEVATION
S-1.0

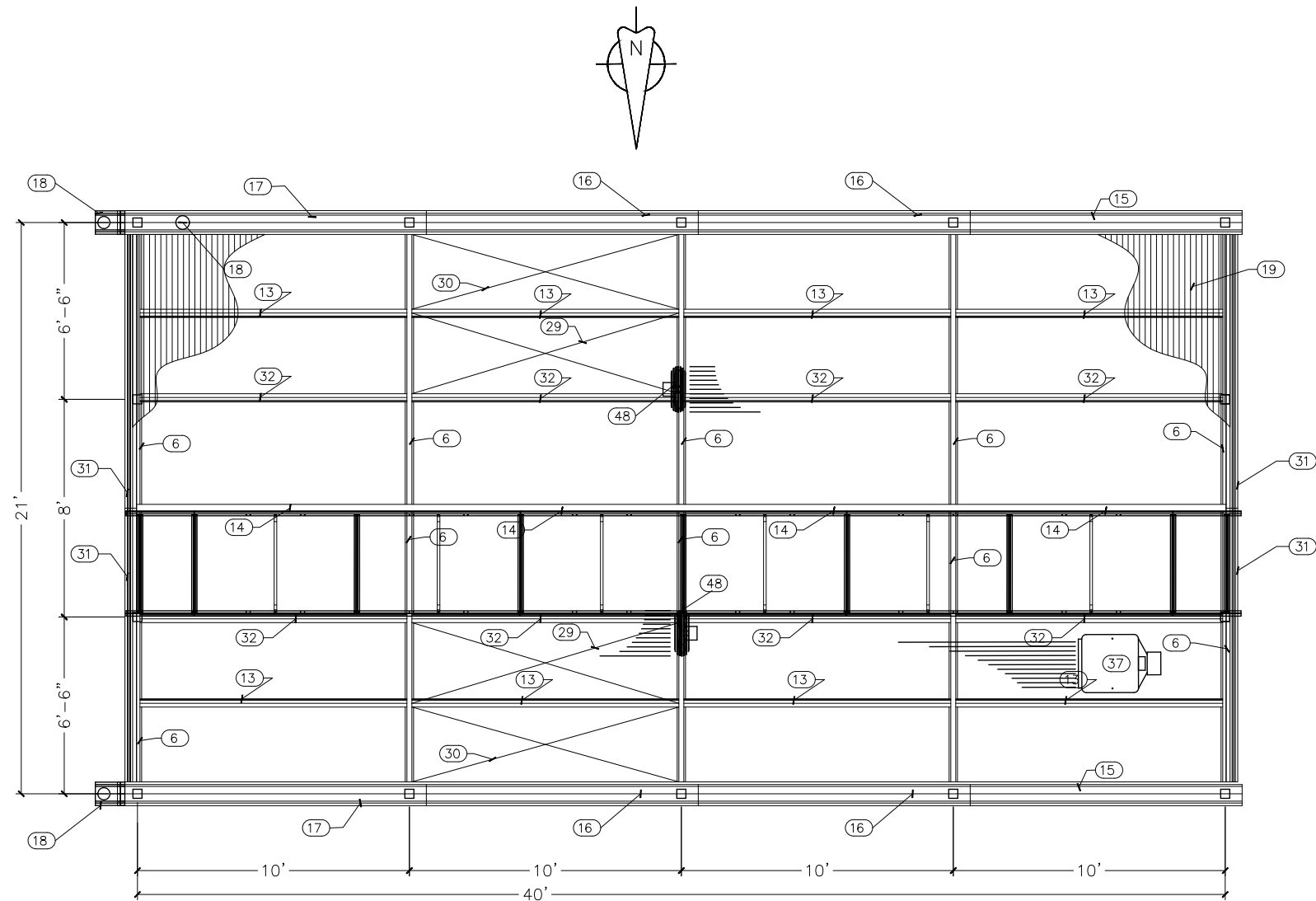


3 TRUSS SECTION
S-1.0

	PART NO.	DESCRIPTION
1	F0S2A020.4375	FILL TUBE 2"SQ. X 16GA. X 20-7/16 HC
2	F0S2A033.6688	FILL TUBE 2"SQ. X 16GA. X 33-11/16
3	F0S2A034.6225	FILL TUBE 2"SQ. X 16GA. X 34-5/8 HC
4	F4S2A058.9375	FILL TUBE 2"SQ. X 16GA. X 58-15/16
5	C0S2D211.53	BOT CHORD 2" X 16GA. X 211.53
6	C012D133.438	AC 21" TOP CHORD X 16GA. X 133.438"
7	H0000918	HEEL ASMB [3 HOLE] AC HOT DIPPED W/GUSSET
8	C0153210	CONN COL TO TRUSS 4"
9	S0000120	SPLICE CHEVRON ASSY 6/12
10	S0001920	BRACKET, LOWER CHORD 1-1/2" 4 HOLE
11	C9411120	COL TUBE 4" X 120" X 11GA
12	C9413156	COL TUBE 4" X 156" X 13GA
13	P009D117.375	PURLIN 9-1/2 X 117.375 X 16 GA
14	P009D117.375R	PURLIN RIDGE 9-1/2 X 117.375 X 16GA
15	GCR1412101.75	GUTTER CR 14 GA. STOP FOR 10"
16	GCR1412121.75	GUTTER CR 14 GA. INTER FOR 10"
17	GCR1412151.75	GUTTER CR 14 GA. START FOR 10"
18	G0092400	GUTTER OUTLET ASSY. W/ DOWNSTEP
19	LEX86_____	8 mm PCSS CLEAR
20	A8420144	ALUM RIDGE BAR 6/12 144"
21	G0091400	GUTTER END CAP ALUM
22	G0950128	GIRT 9-1/2" X 128" X 18GA.
23	G0950152	GIRT 9-1/2" X 152" X 18GA.
24	G0950240	GIRT 9-1/2" X 240" X 18GA.
25	A8420151	ALUM RIDGE BAR 6/12 151"
26	A8780151	ALUM HANG RAIL 151"

	PART NO.	DESCRIPTION
27	A8780144	ALUM HANG RAIL 144"
28	C5564196	BRACE CABLE 3/16" X 196"/TURNBUCKLE
29	C5563140	3/16" DIA. CABLE/SWAYBRACE LUG 140"
30	C5562140	3/16" ASSY OF CABLE AND 3" EYEBOLT 140"
31	A8770288	ALUM ENDBAR 288"
32	P009D117.375X	PURLIN 9-1/2 X 117.375 X 14 GA
33	J0030144	JAMB DOOR SLIDING 12"
34		
35		
36	C9413192	COL TUBE 4" X 192" X 13GA
37	PDP200AN	MODINE HEATER PDP200AN
38	NBF24H11	AMERICAN COOLAIR 24" EXHAUST FAN
39	GSHW24	SLOPEDHOUSING & GUARD 24"
40	LRW24	ALL ALUM AUTO SHUTTER 24"
41	S0001982/KR	PLATE BOTTOM CHORD KNEE
42	H0500920	HEEL PLATE FOR AC WITH SQ. BOTTOM
43	F0S2A062.375	KNEE BRACE 2"SQ. X 16GA. X 62-3/8"
44	S0001988	UNIVERSAL KNEE BRACE BRACKET
45	B0004010	4" SQ COLUMN BRACKET (1/2)
46	B0004000	4" SQ. COLUMN TO TOP CHORD ASSY
47	DS06X080R	PLYCO DOUBLE SWING DOOR 6' X 6'-8"
48	FHVS12	12" HAF 1/10 HP
49		
50		
51		
52		

SCALE: 3/8" = 1'-0"



1
S-3.0

PLAN VIEW

SCALE: 3/8" = 1'-0"

PAGE

S-3.0

PLAN VIEW

4th DIMENSION DESIGN, INC.

817 Venture Court

Waukegan, WI 53189

PHONE: (262) 884-6000

FAX: (262) 884-6000

www.4dd.com

PROJECT:

PROJECT "B"

2024

CUSTOMER:

VISIT SHEBOYGAN STEAM, INC.

JOSEPH SCHMITT

JOSEPH SCHMITT & SON

2104 UNION AVE.

SHEBOYGAN, WI 53081

DRAWING BY:

DTC

DRAWING TITLE:

(1) 21' X 40'

AMBASSADOR CROWN

GREENHOUSE STRUCTURE

DATE:

12/1/2024

REV	DATE	DESCRIPTION

UNITED GREENHOUSE

SYSTEMS, INC.

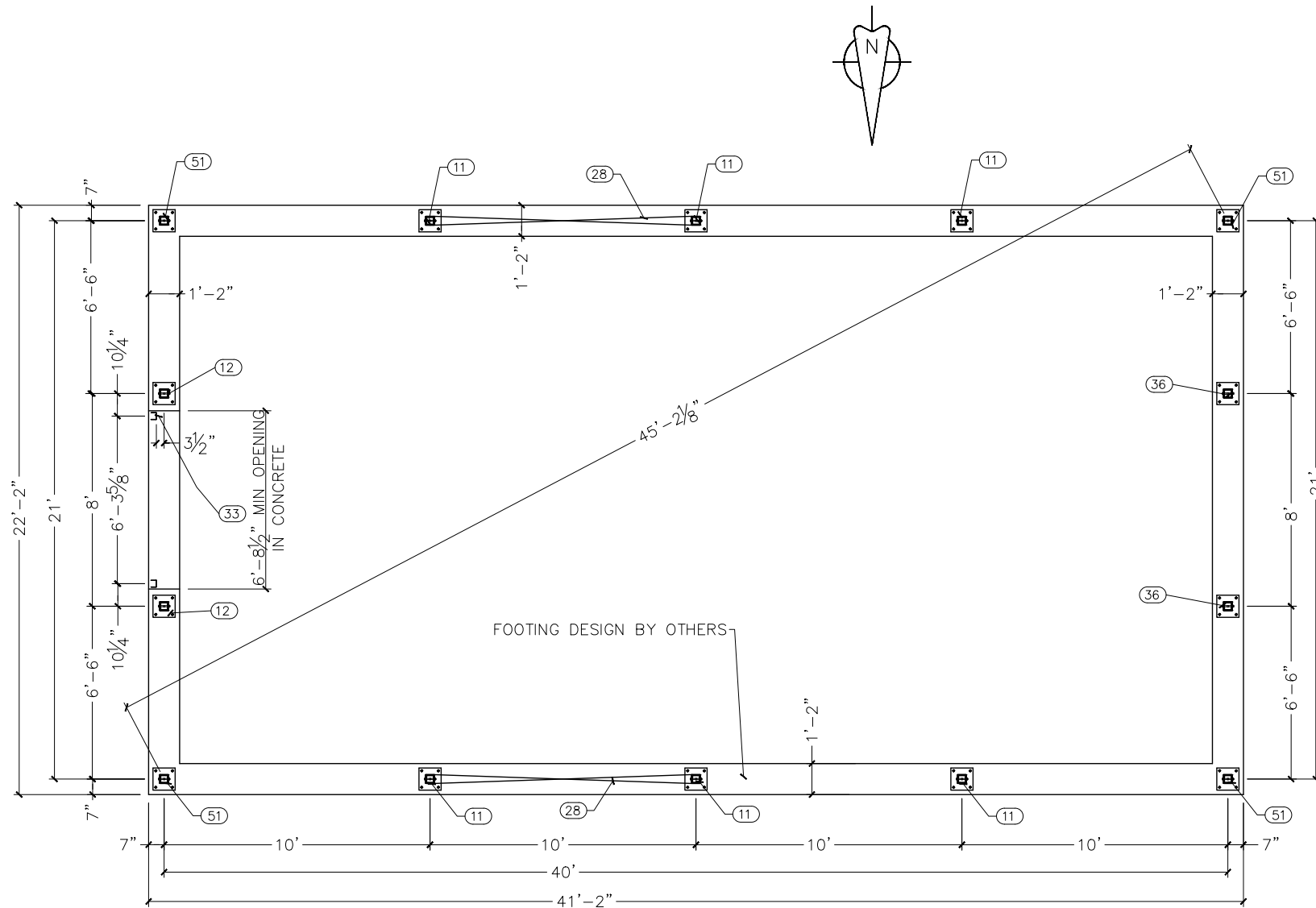
1857 TOWER DRIVE

EDGEWATER, WI 53534

PHONE: 1-800-433-6834

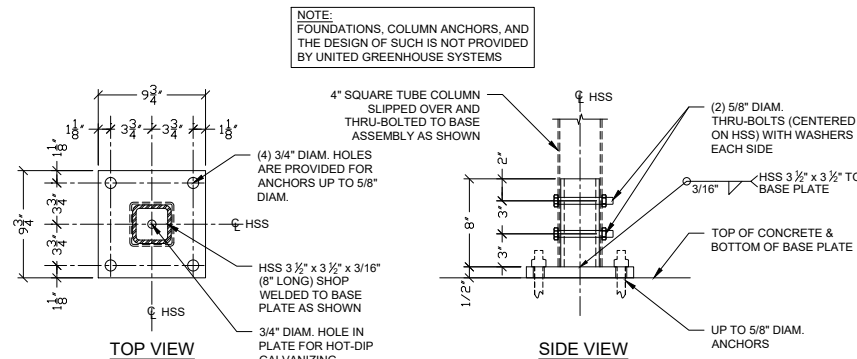
1-608-884-8941

FAX: 1-608-884-6137



2
S-3.1

FOOTING L/O



2
S-3.1

TYP. COLUMN BASE DETAIL

SCALE: 1 1/2" = 1'-0"

SCALE: 3/8" = 1'-0"

PAGE
S-3.1
FOOTING L/O

4th DIMENSION DESIGN, INC.
817 Venture Court
Waukegan, WI 53189
PHONE: (262) 884-6000
FAX: (262) 884-6005
www.4d.com

PROJECT:
PROJECT "B"
2024

CUSTOMER: VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

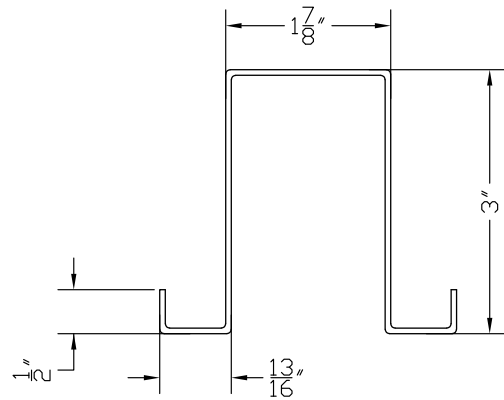
DRAWING BY: DTC

DRAWING TITLE: (1) 21' X 40'
AMBASSADOR CROWN
GREENHOUSE STRUCTURE

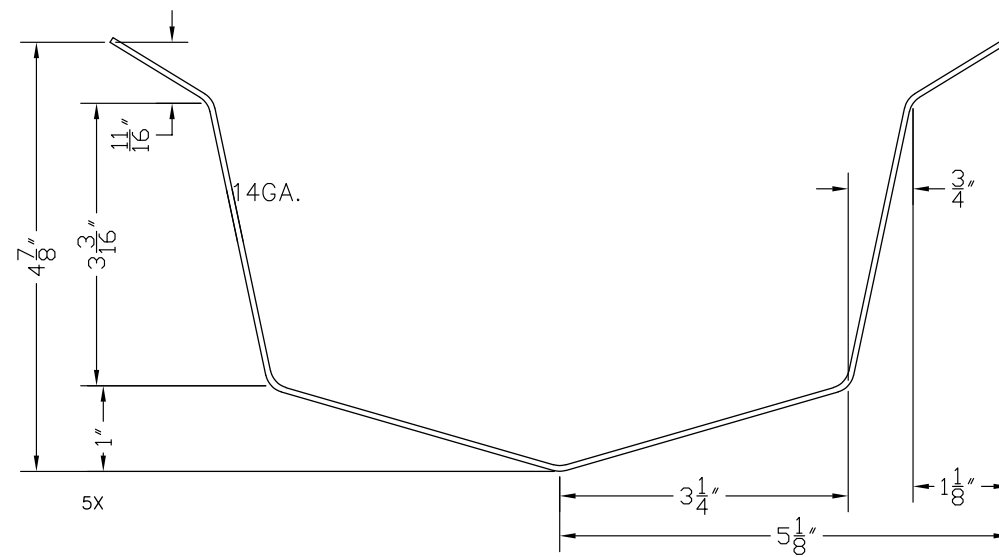
DATE: 12/1/2024

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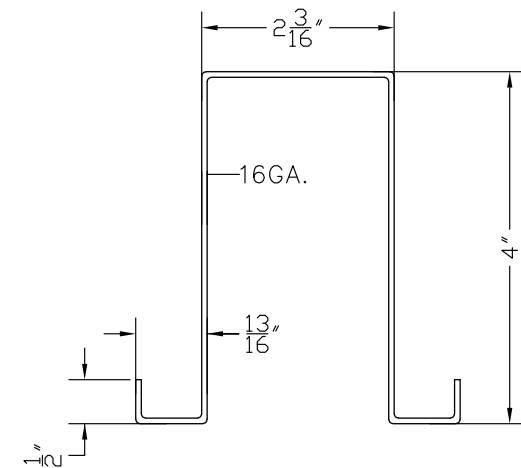
UNITED GREENHOUSE
SYSTEMS, INC.
1857 TOWER DRIVE
EDGERTON, WI 53534
PHONE: 1-800-433-6834
1-808-884-8941
FAX: 1-808-884-6157



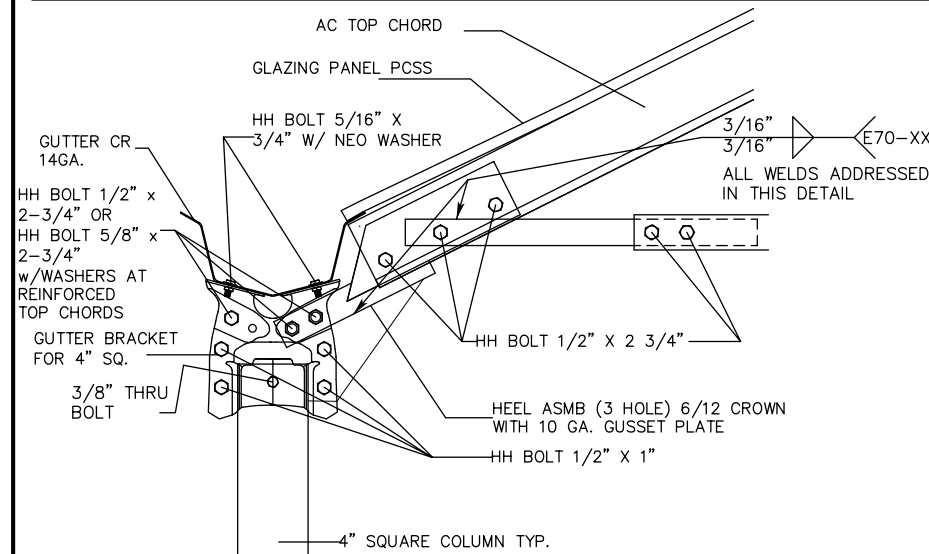
1
S-4 PURLIN / GIRT SECTION
PURLIN PER PLAN
RIDGE PURLIN PER PLAN
GIRT 18GA.



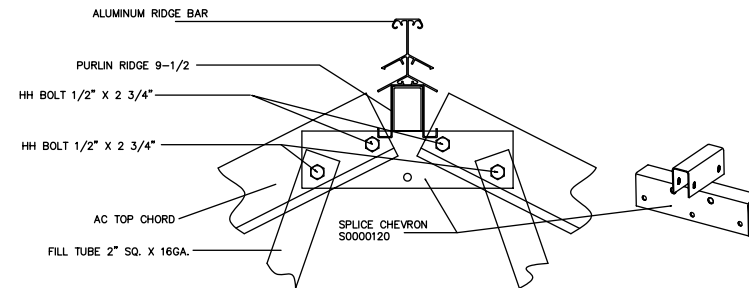
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S-4 GUTTER SECTION
GUTTER LAPS IN DIRECTION OF FLOW



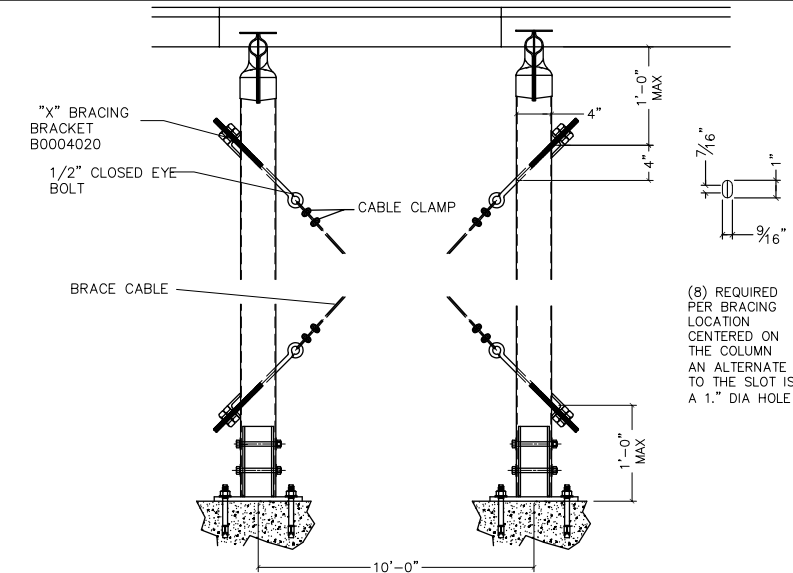
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S-4 TOP CHORD SECTION



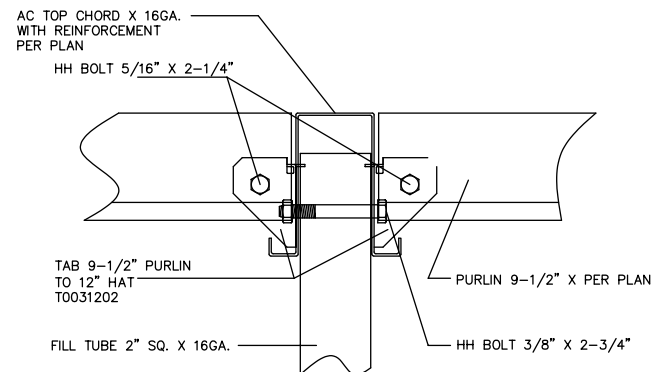
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S-4 COLUMN TO TRUSS CONNECTION



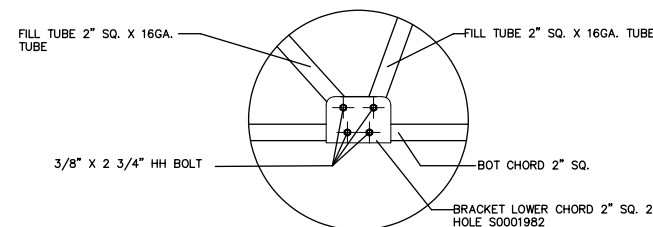
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S-4 SPLICE CHEVRON CONNECTION



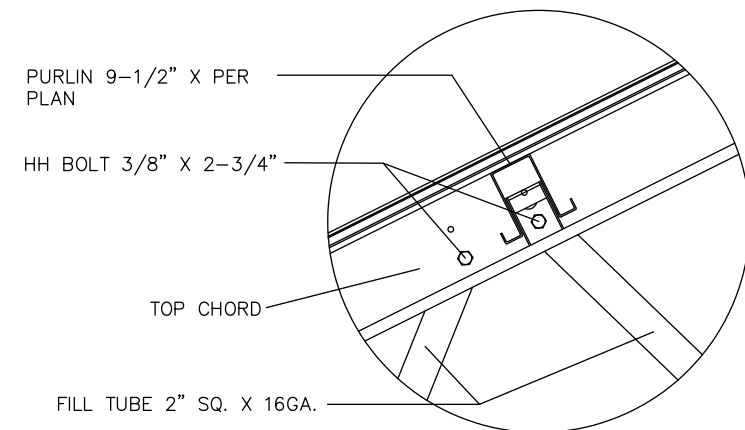
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S-4 SIDEWALL CABLE BRACING



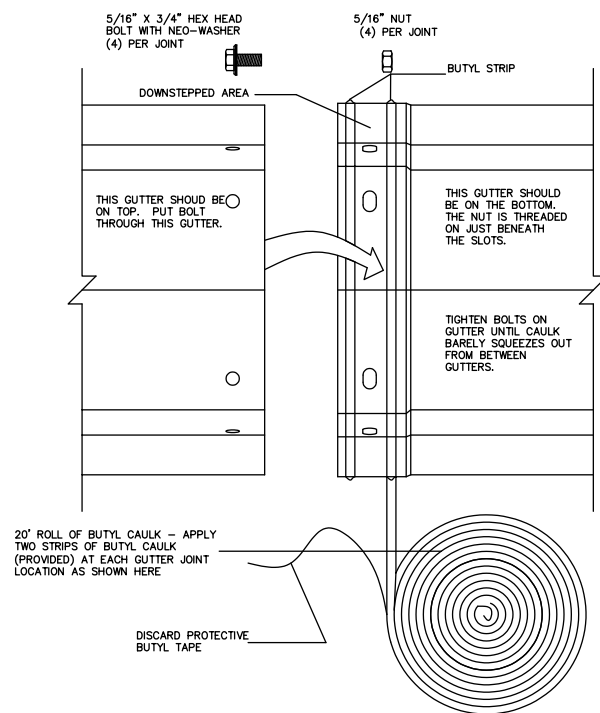
7
S-4 PURLIN TO TRUSS CONNECTION



8
S-4 BOTTOM CHORD CONNECTIONS
ALL BOLTS ADDRESSED
IN THIS DETAIL:
HH BOLT 3/8 inch x 2-3/4 inch

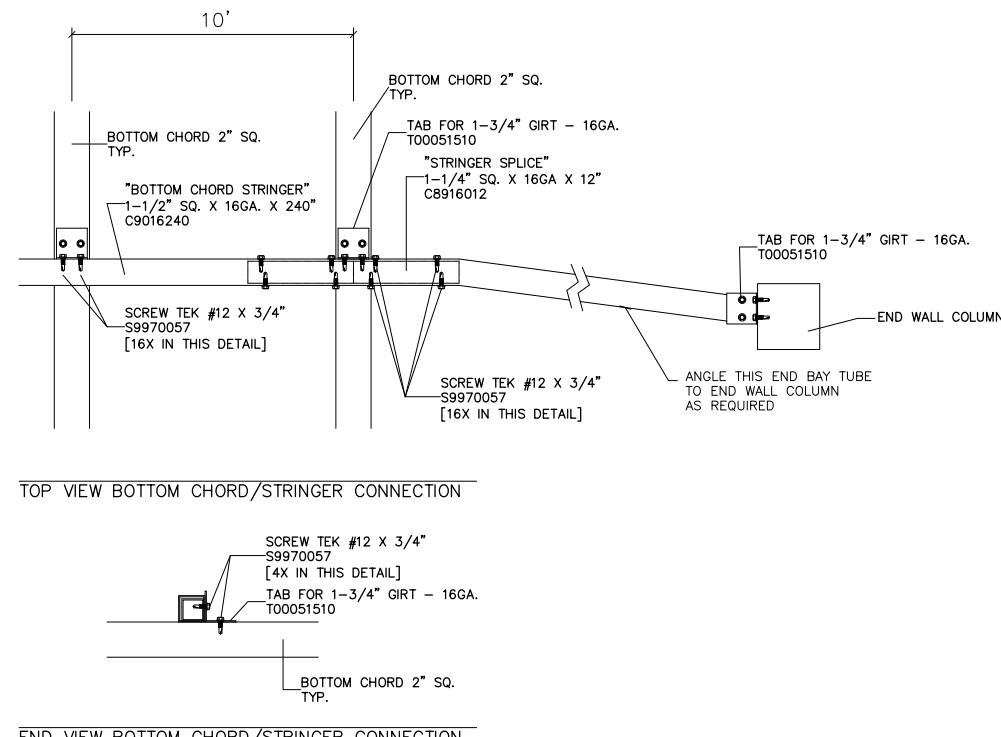


9
S-4 TOP CHORD TO FILL TUBE



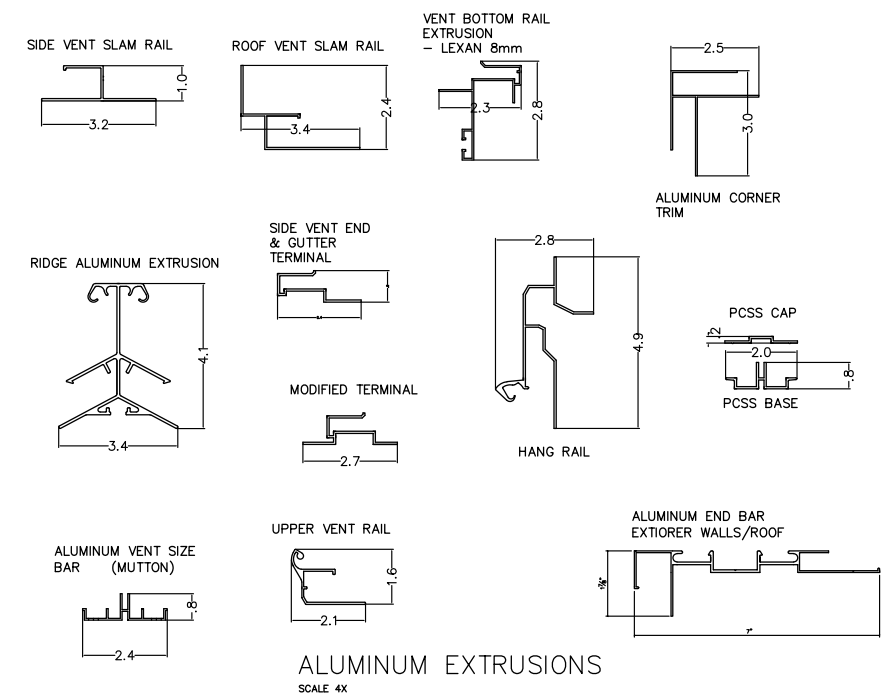
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S-4.1

GUTTER LAP CONNECTION

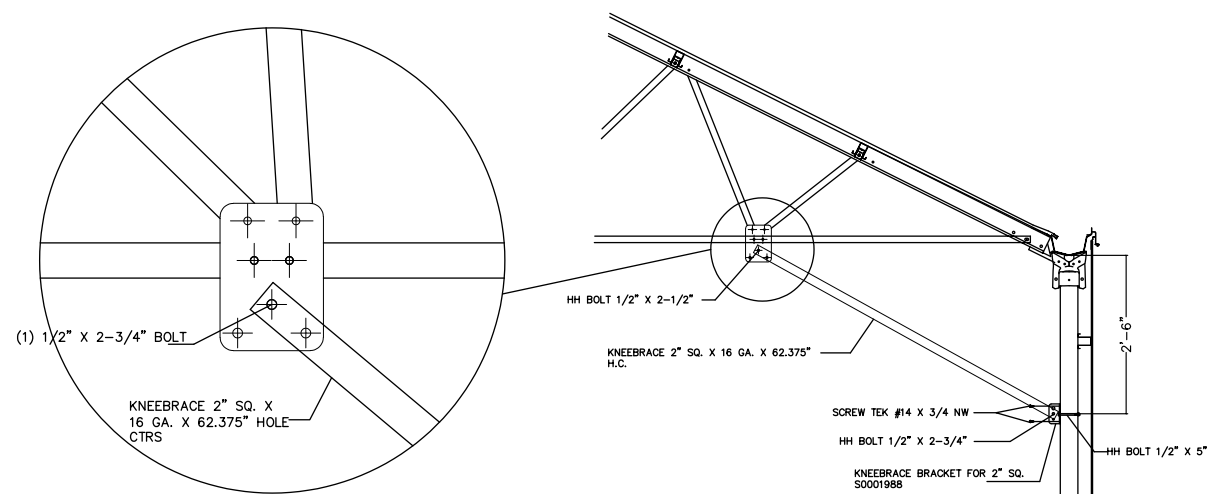


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S-4.1

STRINGER CONNECTION

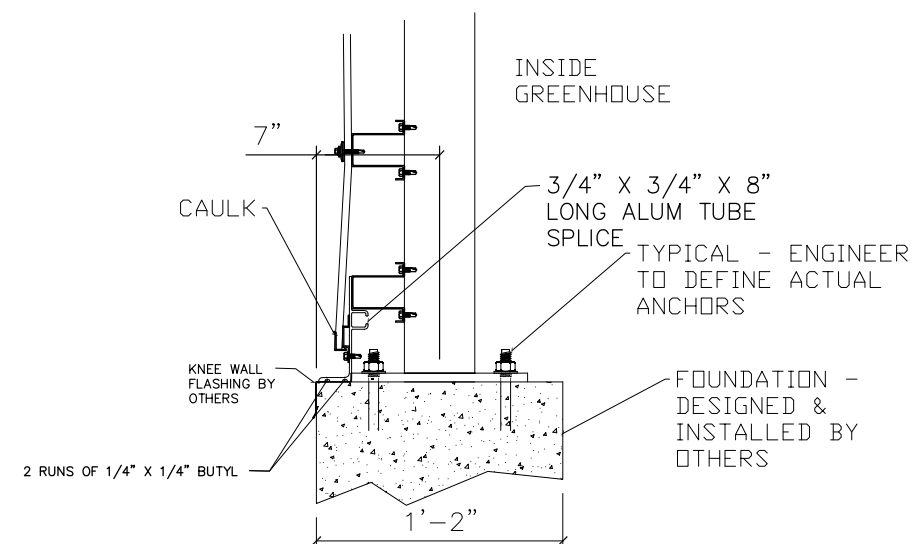


ALUMINUM EXTRUSIONS
SCALE 4X



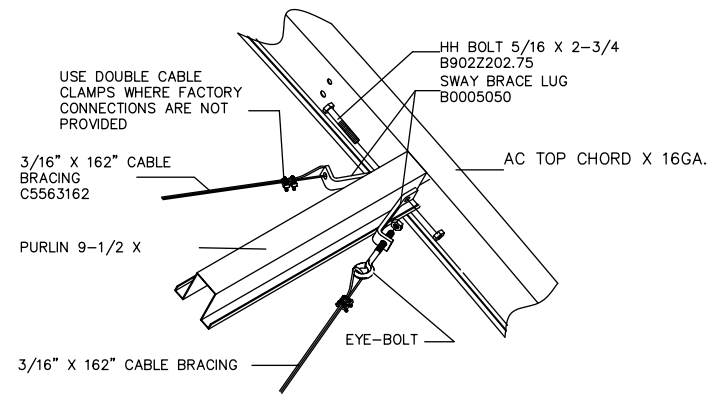
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S-4.1

KNEEBRACE INSTALLATION

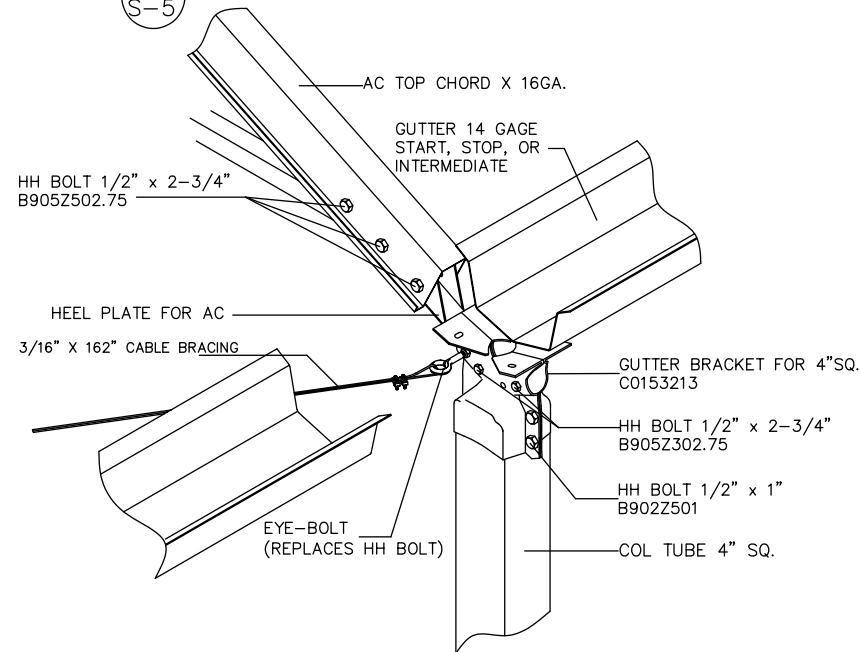


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S-4.1

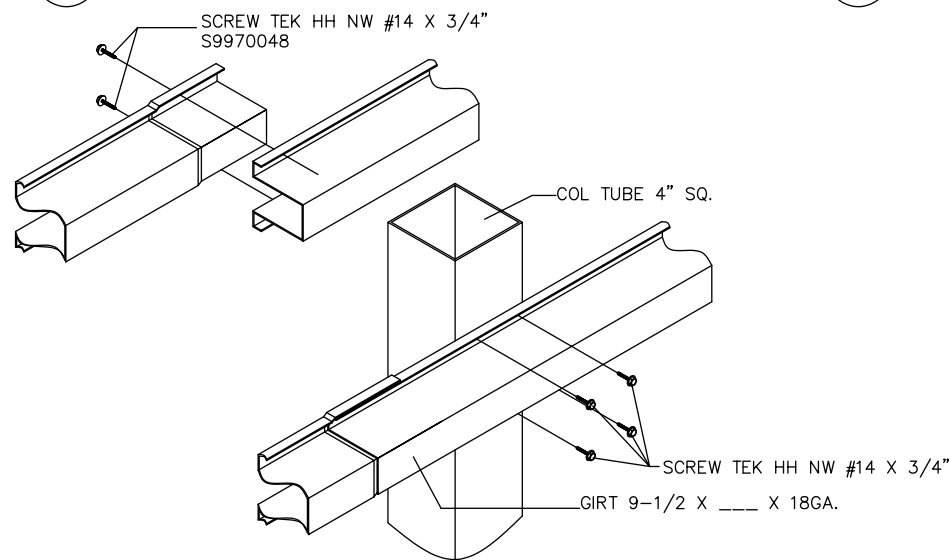
GLAZING TERMINATION AT
WALL DETAILS



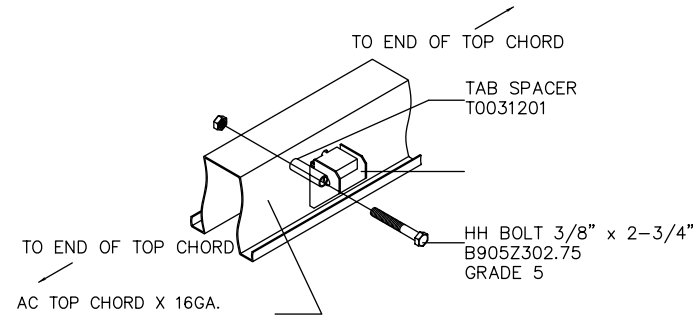
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S-5
ROOF CABLE BRACING



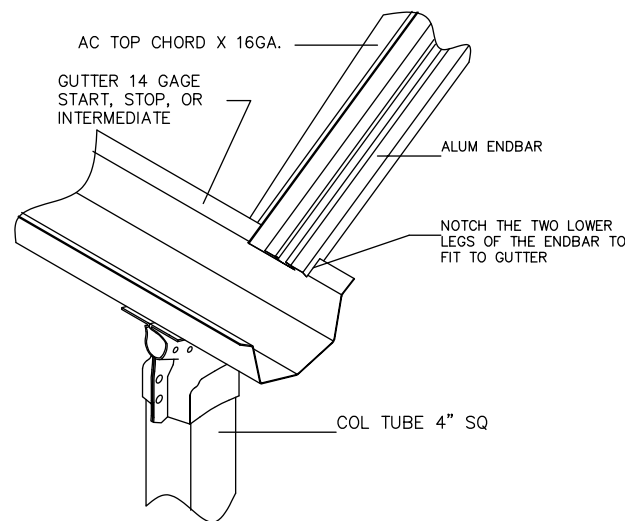
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S-5
ROOF CABLE BRACING (GUTTER)



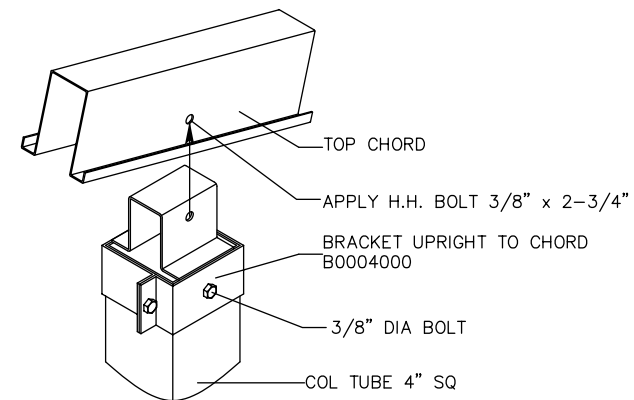
7
S-5
GIRT SPLICE AND ATTACHMENT



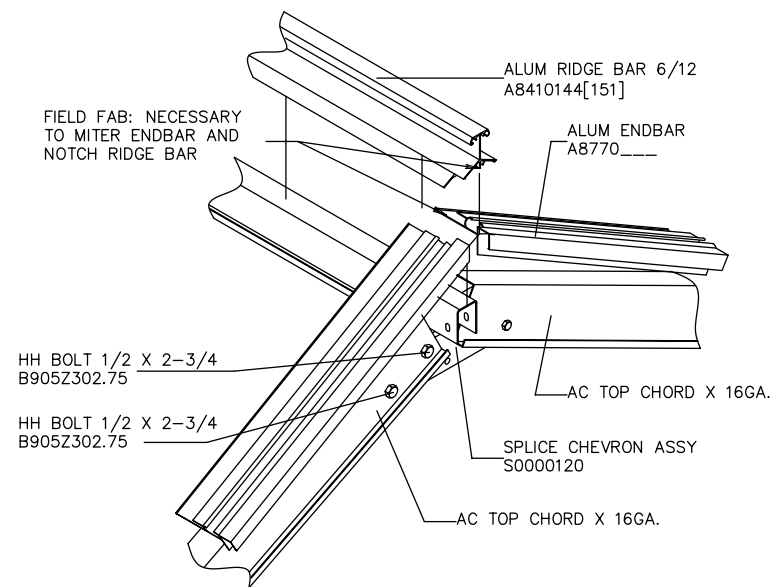
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S-5
PURLIN TAB ATTACHMENT



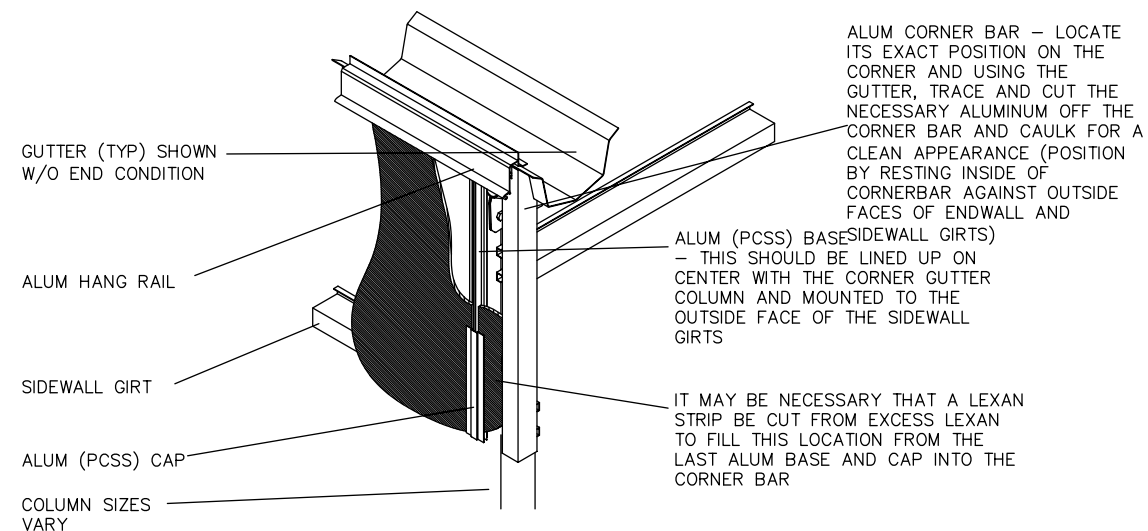
5
S-5
ALUMINUM ENDBAR ATTACHMENT



3
S-5
COLUMN TO TOP CHORD ATTACHMENT



6
S-5
RIDGE BAR/ENDBAR DETAIL



8
S-5
ALUMINUM CORNER BAR ATTACHMENT

SCALE NONE

PAGE

S-5.0

3D DETAILS



PROJECT: "B"
2024

VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

CUSTOMER: DTC

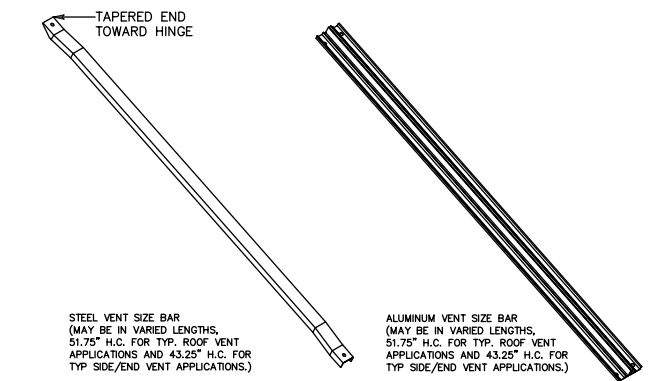
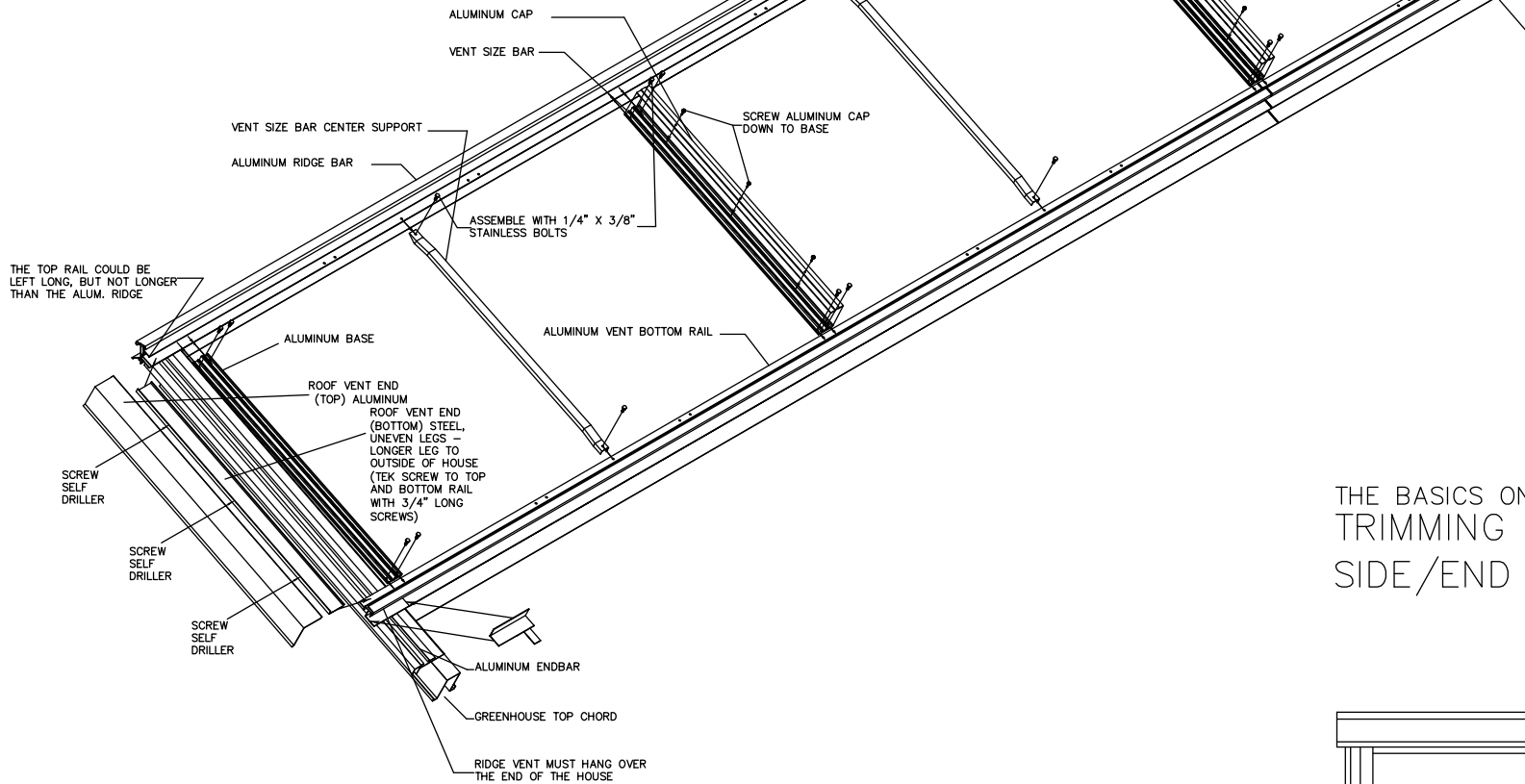
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AMBASSADOR CROWN
GREENHOUSE STRUCTURE

DRAWING TITLE: DATE: 12/1/2024

REV	DATE	DESCRIPTION

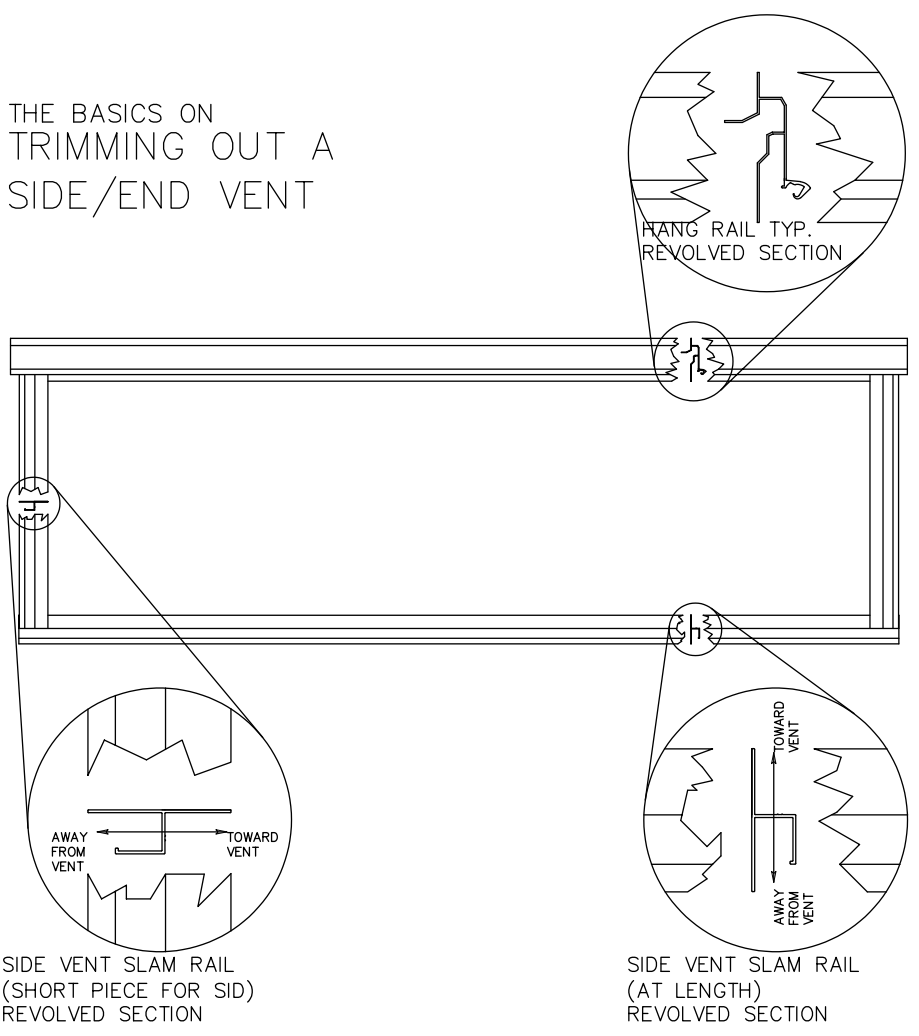
UNITED GREENHOUSE
SYSTEMS, INC.
8857 WISCONSIN DRIVE
EDGEMONT, WI 53534
PHONE: 1-800-433-6834
FAX: 1-800-884-6137

RIDGE VENT ASSEMBLY

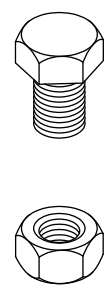


2 VENT SIZE BARS & CENTER SUPPTS
S-6.1

THE BASICS ON TRIMMING OUT A SIDE/END VENT



1 VENT FRAMEWORK ASSEMBY INSTRUCTIONS S-6.1



VENTS ARE ALWAYS ASSEMBLED WITH STAINLESS STEEL 1/4" X 3/8" HH BOLTS WITH 1/4" STAINLESS STEEL LOCK NUTS

ALUMINUM TRIM FOR SW VENT

3
S-6

PAGE
S-6.0
VENT
ASSEMBLY
DETAILS

4th DIMENSION DESIGN, INC.
877 Walnut Court
Westborough, WI 53189
PHONE: 800.884.6800
FAX: 508.884.6137
www.4d.com

PROJECT: "B"
PROJECT "B"
2024

CUSTOMER: VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

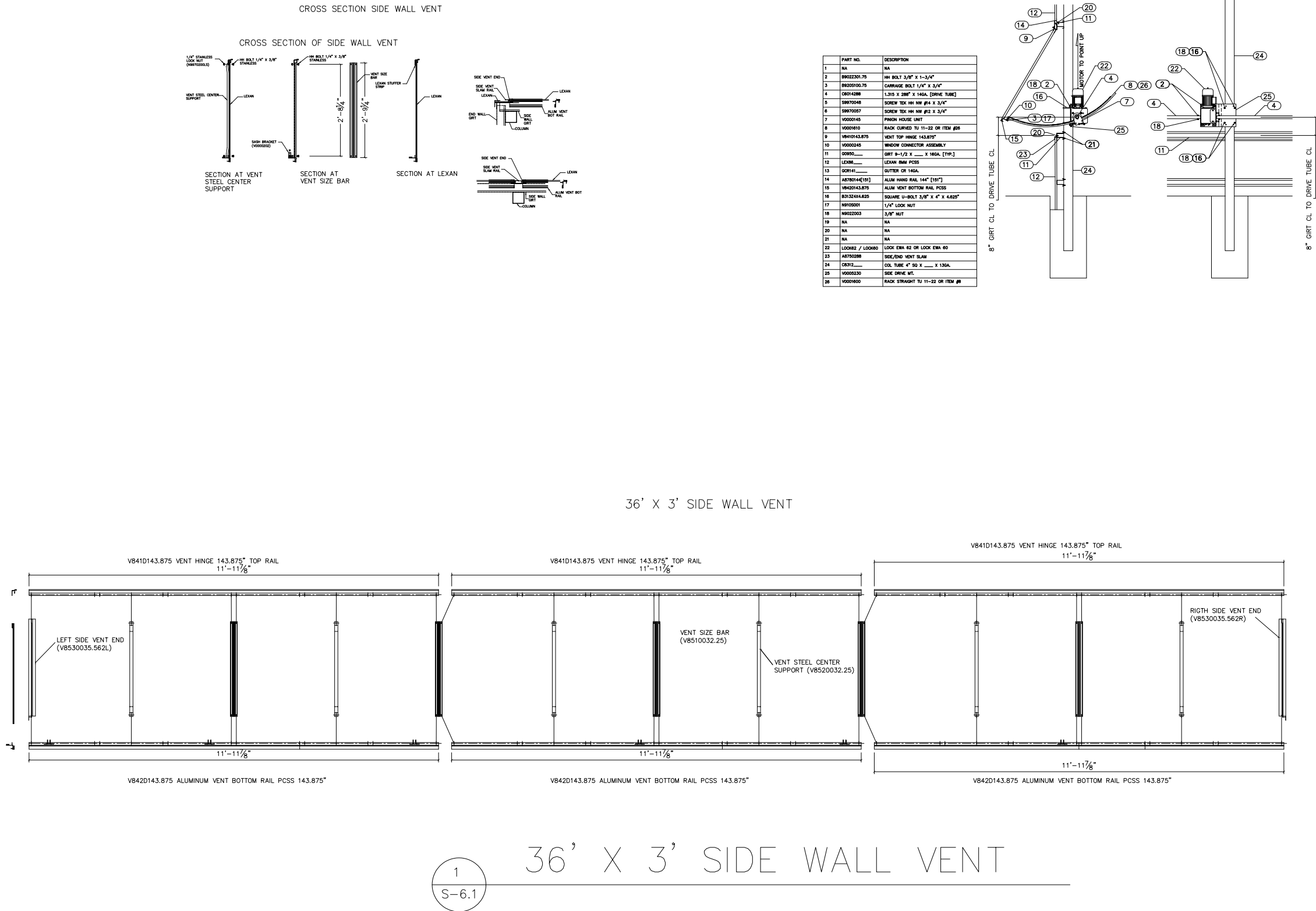
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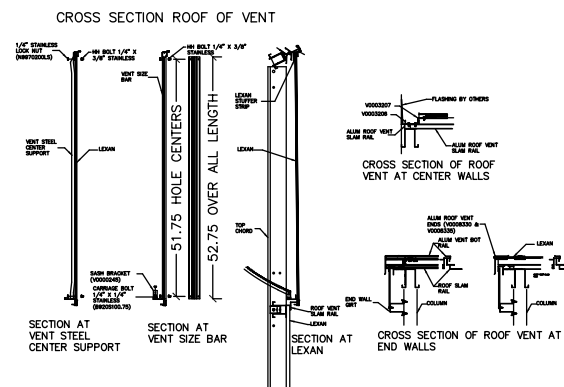
DRAWING TITLE: (1) 21' X 40'
AMBASSADOR CROWN
GREENHOUSE STRUCTURE

DATE: 12/1/2024

REV	DATE	DESCRIPTION

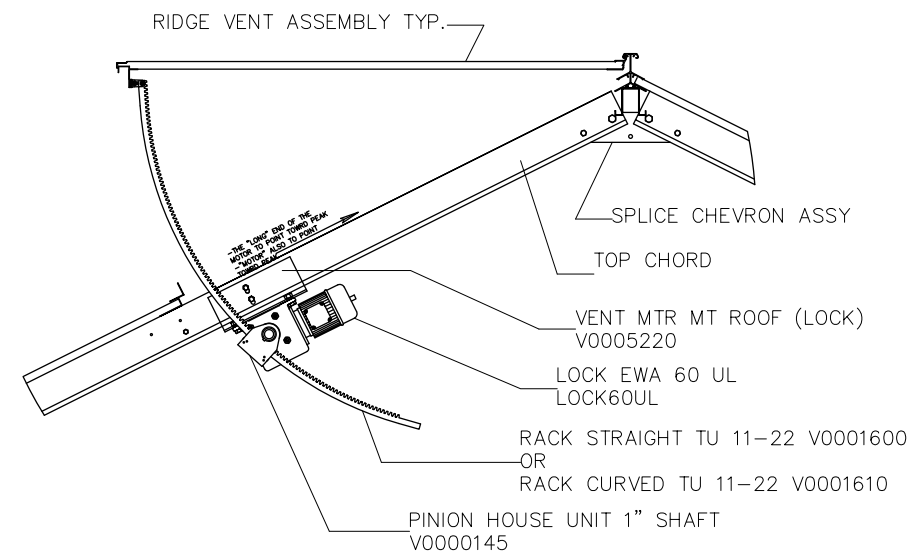
UNITED GREENHOUSE
SYSTEMS, INC.
18575 W. HUNTER DRIVE
EDGEMONT, WI 53534
PHONE: 1-800-433-6834
FAX: 1-608-884-6137





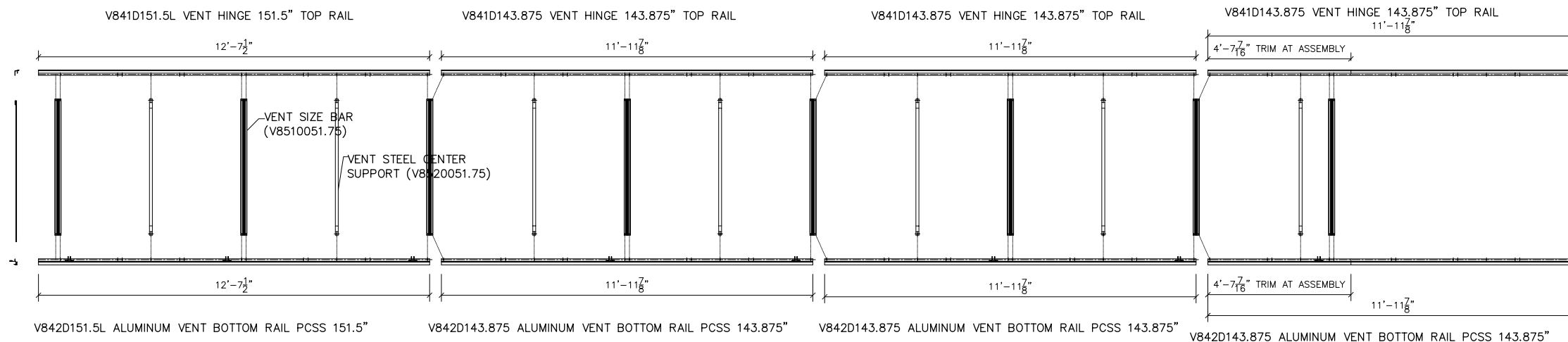
ROOF VENT SECTION

2
S-6.2



ROOF VENT SECTION AT MOTOR

3
S-6.2



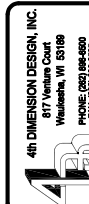
40' ROOF VENT

1
S-6.2

PAGE

S-6.2

ROOF VENT
ASSEMBLY



PROJECT: PROJECT "B"
2024

CUSTOMER: VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

DRAWING BY: DTC

DRAWING TITLE: (1) 21' X 40'
AMBASSADOR CROWN
GREENHOUSE STRUCTURE

DATE: 12/1/2024

REV	DATE	DESCRIPTION

UNITED GREENHOUSE
STRUCTURES, INC.
18571 KENNEDY DRIVE
EDGEMONT, WI 53534
PHONE: 1-800-433-6834
FAX: 1-608-884-6137

PAGE

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FRAMED
OPENING
DETAILS

4th DIMENSION DESIGN, INC.

877 Walnut Court
Walworth, WI 53190
PHONE: 262.884.8000
FAX: 262.884.8000
www.4d.com

PROJECT:

PROJECT "B"

2024

CUSTOMER:

VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

DRAWING BY:

DTC

DRAWING TITLE:

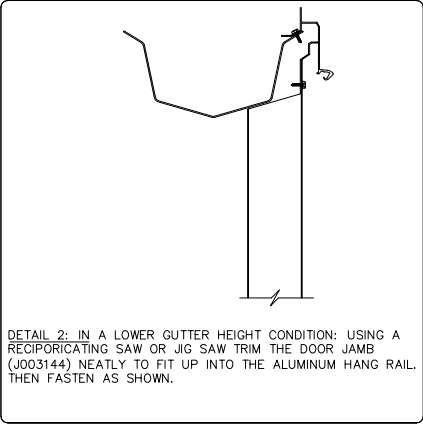
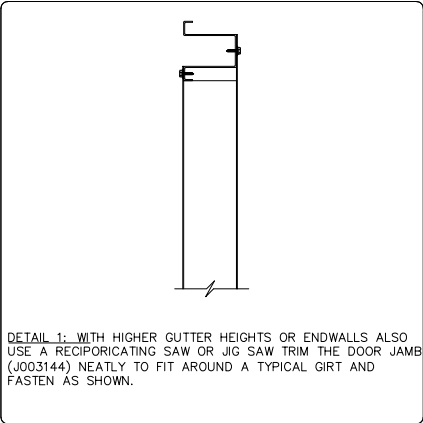
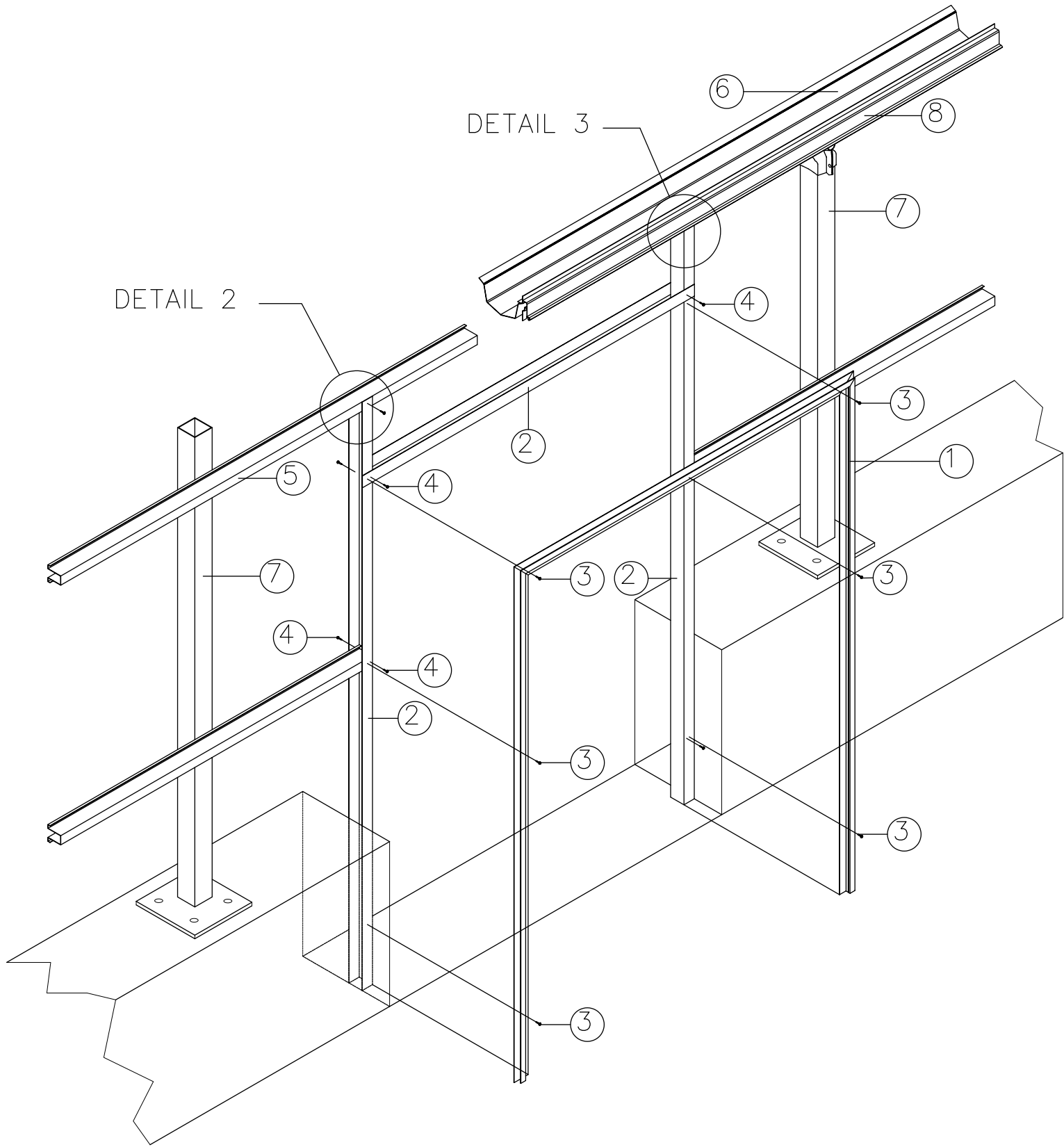
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AMBASSADOR CROWN
GREENHOUSE STRUCTURE

DATE:

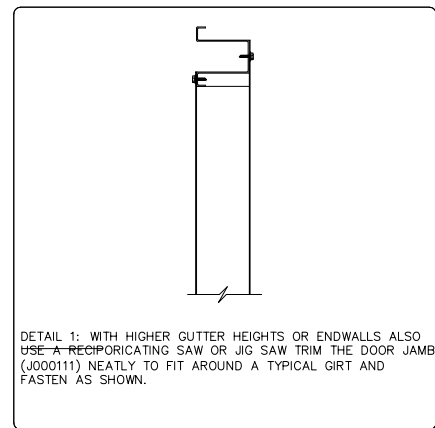
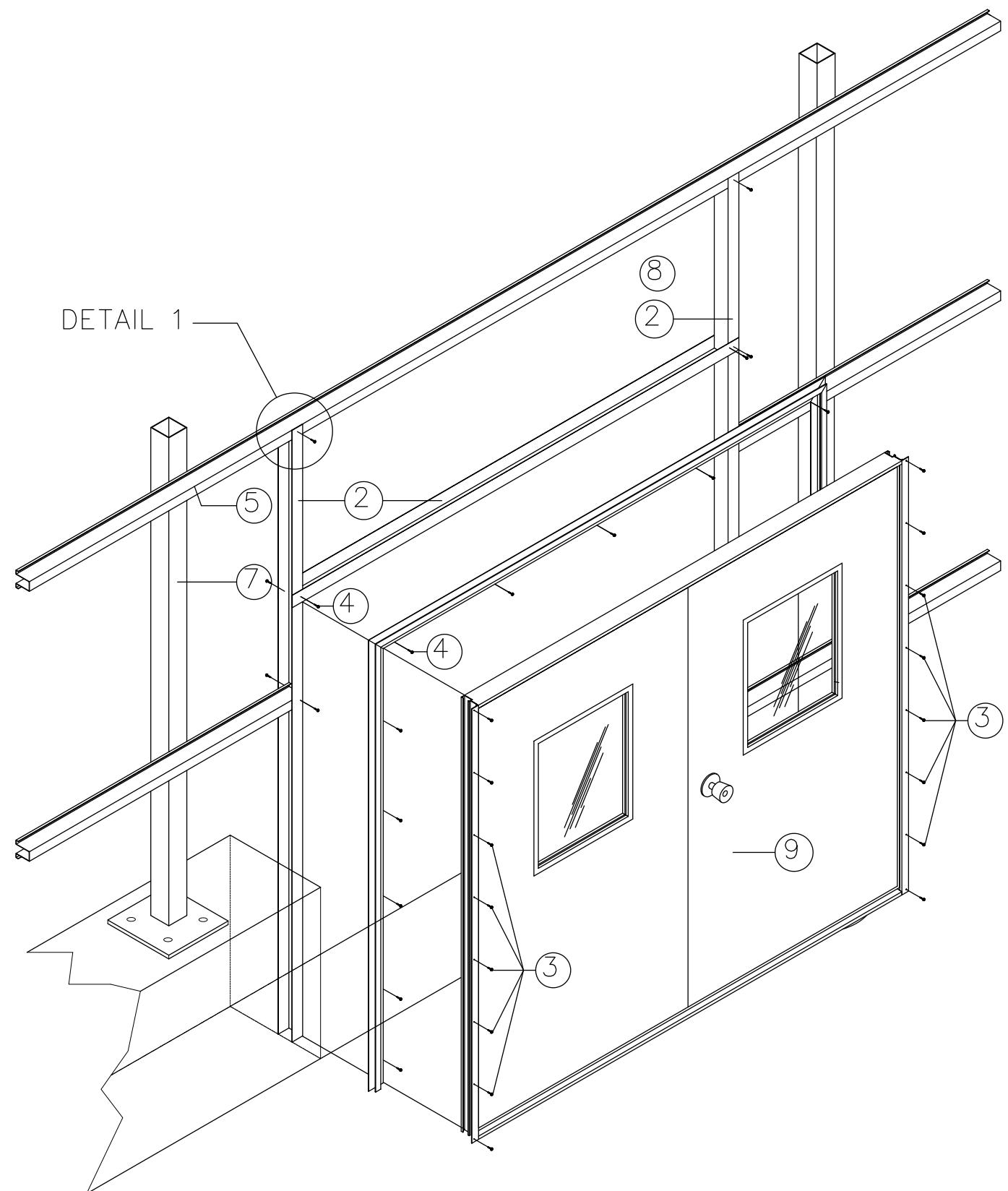
12/1/2024

REV	DATE	DESCRIPTION

UNITED GREENHOUSE
SYSTEMS, INC.
18575 KENNEDY DRIVE
EDGEMONT, WI 53534
PHONE: 1-800-433-6834
1-808-884-8941
FAX: 1-808-884-6137



	PART DESCRIPTION	PART NUMBER
1	SIDE VENT SLAM RAIL	A8750288
2	JAMB FOR SLIDING DOOR 12'	J003144
3	TEK SCREW #10 X 3/4" NW	S9970010
4	TEK SCREW #14 X 3/4" NW	S9970048
5	TYP. GIRT (3" HAT SECTION X 16GA.)	G0950____ (SIZES VARY)
6	TYP. GUTTER 14GA.	GCR141____ (SIZES VARY)
7	4" SQ. COLUMN X 13GA.	C9413168 (SIZES VARY)
8	TYP. ALUMINUM HANG RAIL	A9970____
9	PLYCO DOUBLE SWING DOOR	DS0____



	PART DESCRIPTION	PART NUMBER
1	SIDE VENT SLAM RAIL	A8750288
2	JAMB FOR SLIDING DOOR 12'	J003144
3	TEK SCREW #10 X 3/4" NW	S9970010
4	TEK SCREW #14 X 3/4" NW	S9970048
5	TYP. GIRT (3" HAT SECTION X 16GA.)	G0950____ (SIZES VARY)
6		
7	4" SQ. COLUMN X 13GA.	C9413168 (SIZES VARY)
8		
9	PLYCO DOUBLE SWING DOOR	DS0_____

PAGE

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PLYCO DOUBLE
DOOR DETAILS

4th DIMENSION DESIGN, INC.
877 N. Main Court
Westfield, WI 53189
PHONE: (202) 484-6000
FAX: (202) 484-6000
www.4d.com

PROJECT:

PROJECT "B"
2024

CUSTOMER:

VISIT SHEBOYGAN STEAM, INC.
JOSEPH SCHMITT
JOSEPH SCHMITT & SON
2104 UNION AVE.
SHEBOYGAN, WI 53081

DRAWING BY:

DTC

DRAWING TITLE:

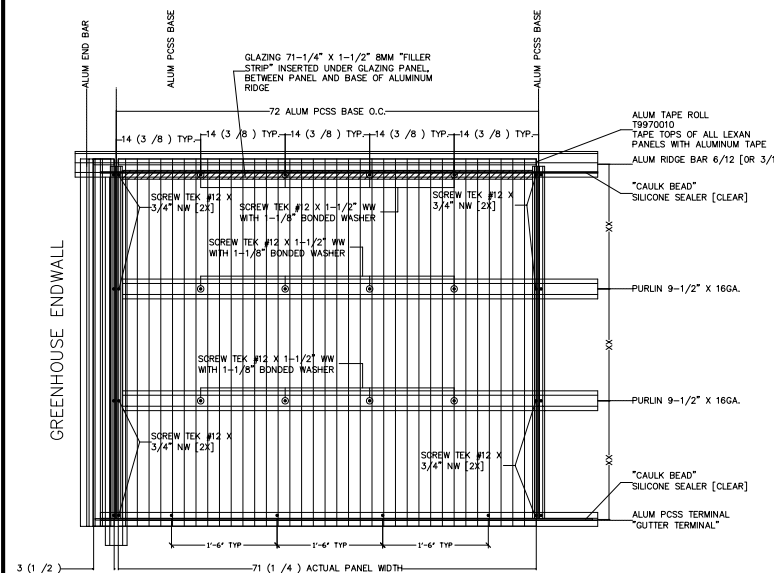
(1) 21' X 40'
AMBASSADOR CROWN
GREENHOUSE STRUCTURE

DATE:

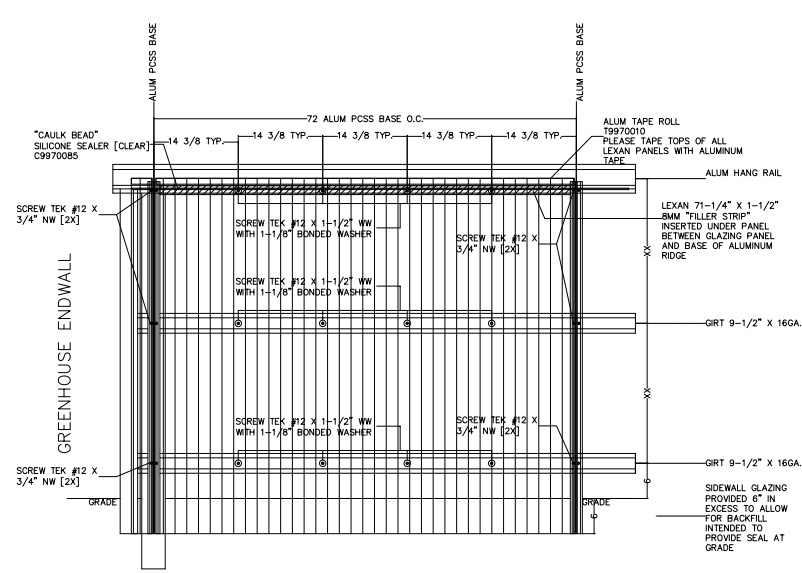
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REV	DATE	DESCRIPTION

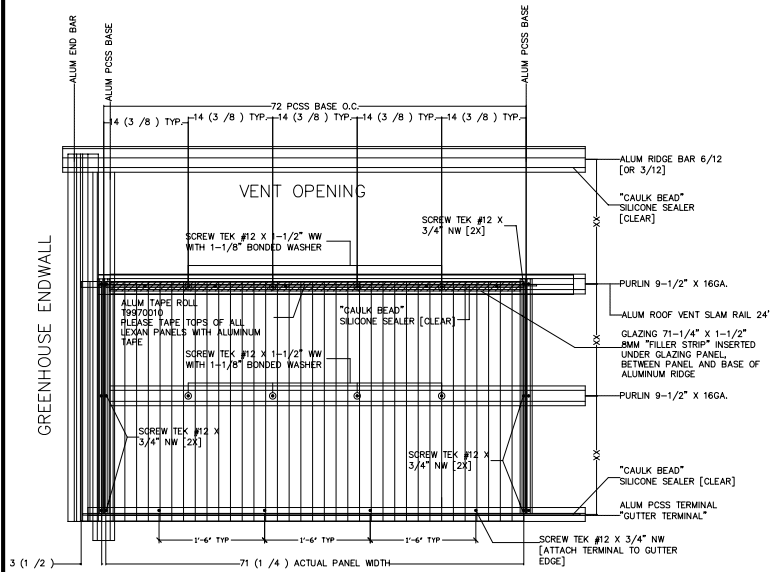
UNITED GREENHOUSE
18575 WISCONSIN DRIVE
EDGEMONT, WI 53534
PHONE: 1-800-433-6834
FAX: 1-608-884-6137



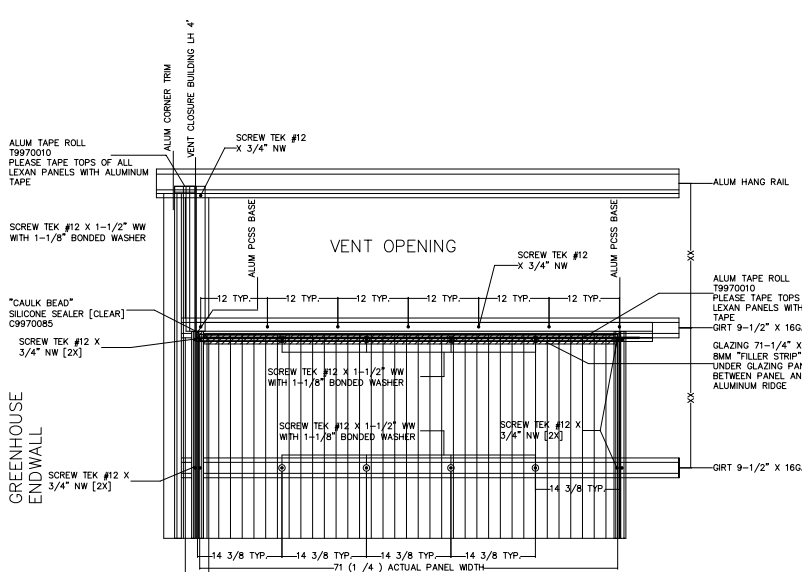
1 ATTACHMENT OF PCSS 8MM GLAZING SHEET @ ROOF SLOPE W/ NO VENT



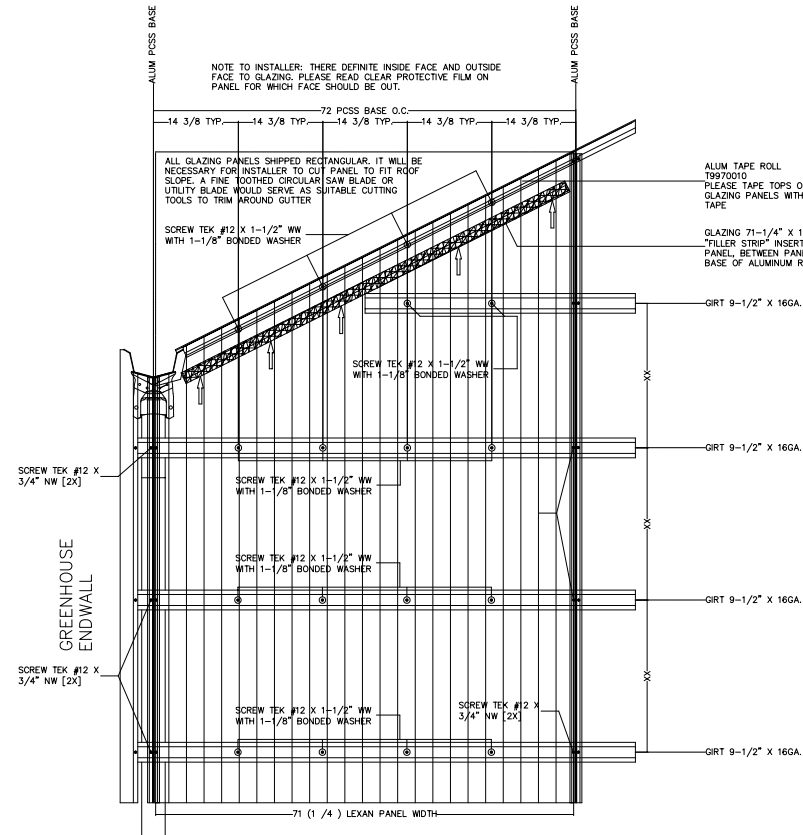
2 ATTACHMENT OF PCSS 8MM GLAZING SHEET @ SIDEWALL/ NO VENT



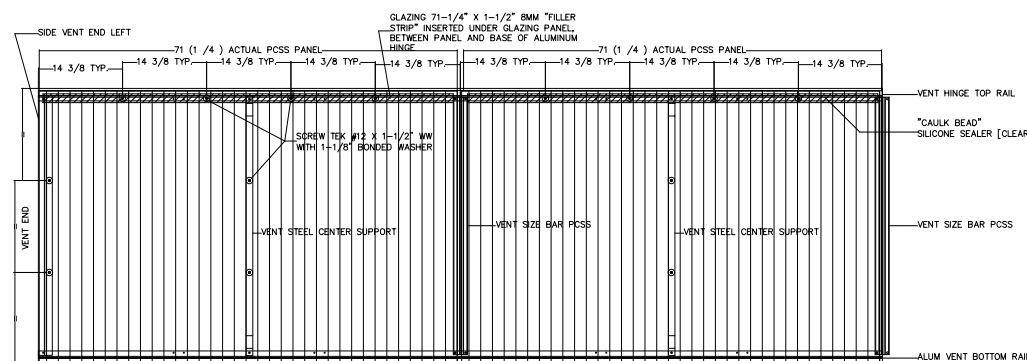
4 ATTACHMENT OF PCSS 8MM GLAZING SHEET @ ROOF SLOPE W/ VENT



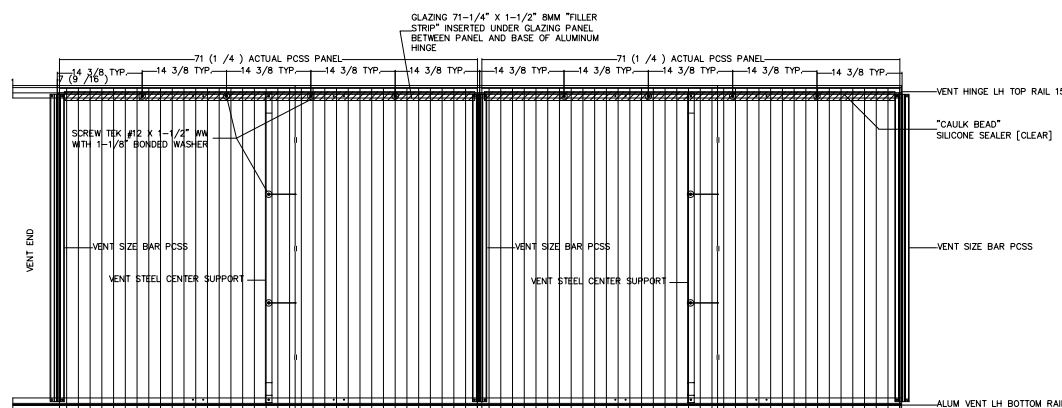
5 ATTACHMENT OF PCSS 8MM GLAZING SHEET @ SIDEWALL W/ VENT



3 ATTACHMENT OF PCSS 8MM GLAZING SHEET @ SIDEWALL/ NO VENT

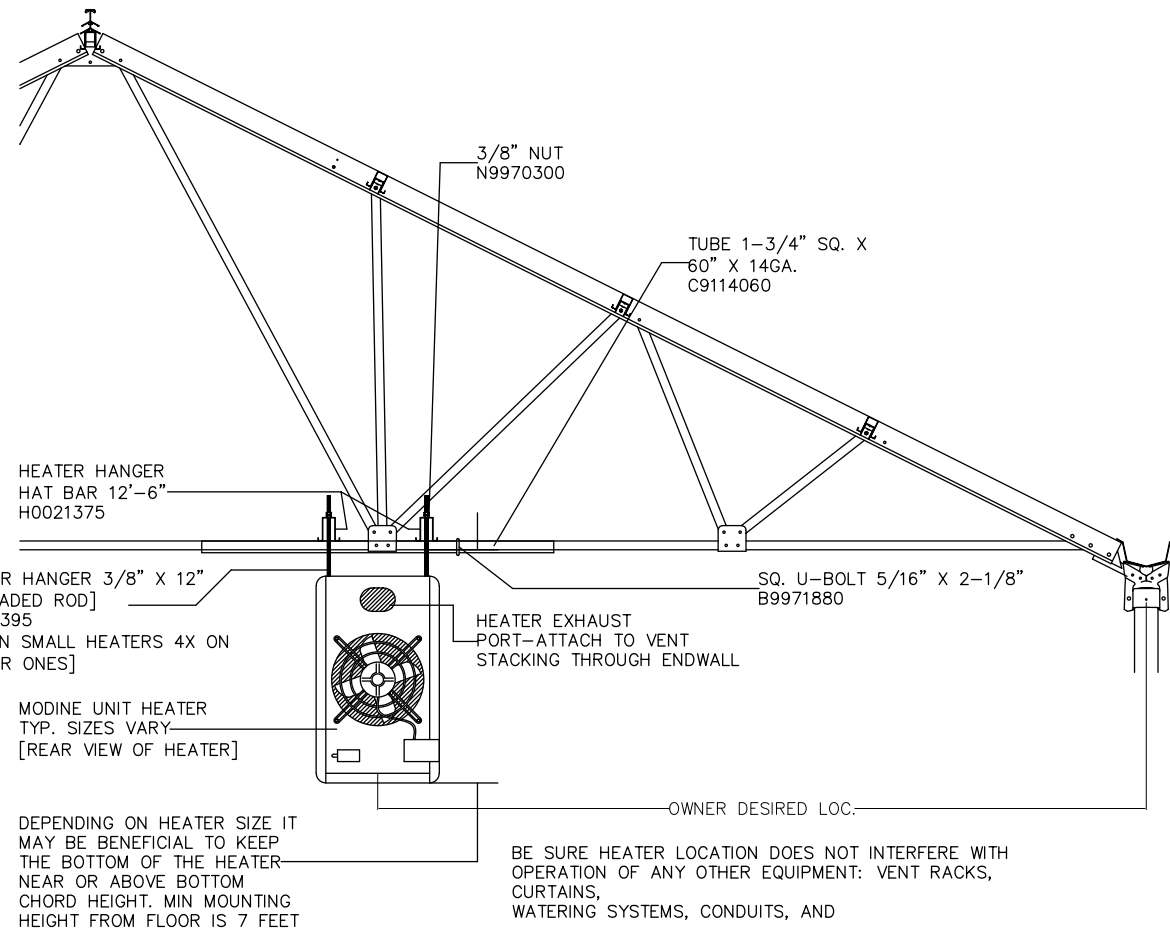


6 ATTACHMENT OF PCSS 8MM GLAZING SHEET TO SIDEWALL VENT FRAME



7 ATTACHMENT OF PCSS 8MM GLAZING SHEET TO RIDGE VENT FRAME

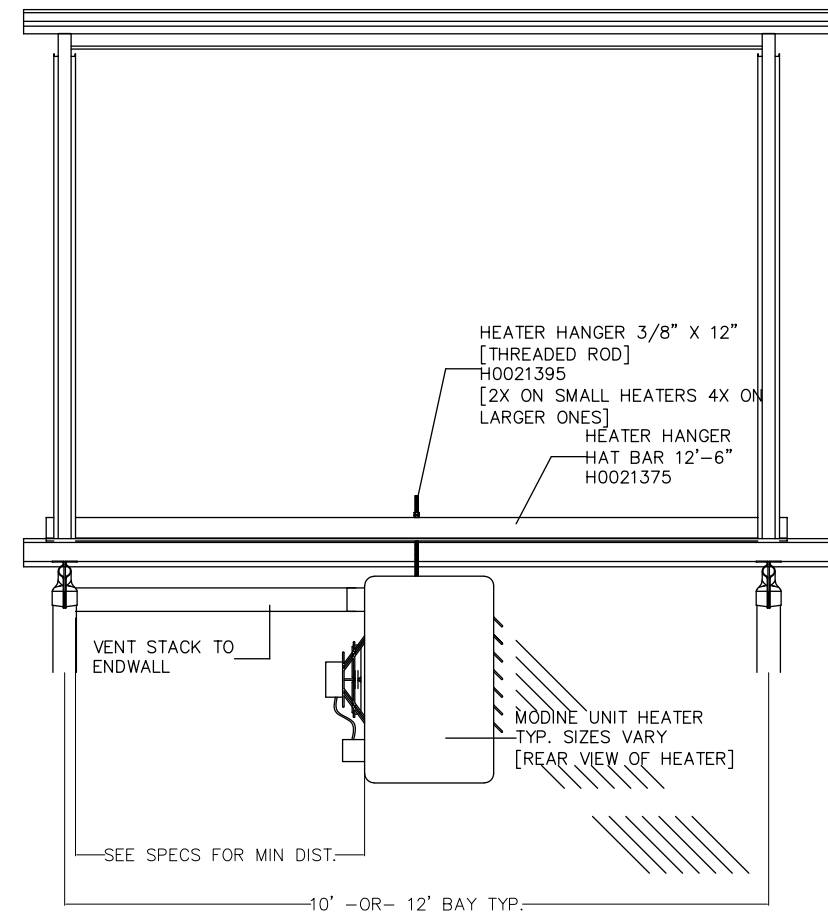
SCALE 1



1

S-9.0

HEATER HANGER END VIEW



2

S-9.0

HEATER HANGER SIDE VIEW

PAGE

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HEATER HANGING DETAILS

4th DIMENSION DESIGN, INC.

877 Walnut Court

Westborough, MA 01581

PHONE: 508-864-6000

FAX: 508-864-6000

www.4d.com

PROJECT:

PROJECT "B"

2024

CUSTOMER:

VISIT SHEBOYGAN STEAM, INC.

JOSEPH SCHMITT

JOSEPH SCHMITT & SON

2104 UNION AVE.

SHEBOYGAN, WI 53081

DRAWING BY:

DTC

DRAWING TITLE:

(1) 21' X 40'

AMBASSADOR CROWN

GREENHOUSE STRUCTURE

DATE:

12/1/2024

REV	DATE	DESCRIPTION

UNITED GREENHOUSE

18575 WISCONSIN DRIVE

EDGEMONT, WI 53534

PHONE: 1-800-433-6834

1-808-884-8941

FAX: 1-808-884-6137

4th DIMENSION DESIGN, INC.

A STRUCTURAL ENGINEERING FIRM



DESIGN CALCULATIONS

VISIT SHEBOYGAN STEAM, INC. GREENHOUSE SHEBOYGAN, WI

UNITED GREENHOUSE SYSTEMS, INC.

GREENHOUSE STRUCTURAL COMPONENT DESIGN



02/18/2025

FEBRUARY 18, 2025

Pages 1 thru 107

Prepared by:

4th DIMENSION DESIGN, INC.

817 Venture Court

Waukesha, Wisconsin 53189

262-896-6500

www.4dd.com

VISIT SHEBOYGAN STEAM, INC. GREENHOUSE

TABLE OF CONTENTS:

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BRACING	PG 17
INTERNAL FRAME	PG 20
END FRAME	PG 44
GIRTS	PG 69
PURLINS	PG 73
BASE PLATE	PG 86
BOLTS, PURLINS, & GIRTS	PG 101
REACTIONS	PG 107

4th Dimension Design, Inc.

817 Venture Ct
Waukesha, WI 53189
262.896.6500
duane.mcwilliams@4dd.com

JOB TITLE UGS - VISIT SHEBOYGAN

JOB NO.	SHEET NO.
CALCULATED BY	DATE
CHECKED BY	DATE

www.struware.com

Code Search

Code: International Building Code 2015**Occupancy:**

Occupancy Group = B Business

Risk Category & Importance Factors:

Risk Category = II

Wind factor = 1.00

Snow factor = 1.00

Seismic factor = 1.00

Type of Construction:

Fire Rating:

Roof = 0.0 hr

Floor = 0.0 hr

Building Geometry:Roof angle (θ) 6.00 / 12 26.6 deg

Building length (L) 40.0 ft

Least width (B) 21.0 ft

Mean Roof Ht (h) 14.8 ft

Parapet ht above grd 0.0 ft

Minimum parapet ht 0.0 ft

Live Loads:

Roof 0 to 200 sf: 18 psf
200 to 600 sf: 21.6 - 0.018Area, but not less than 12 psf
over 600 sf: 12 psf

Floor:

Typical Floor N/A

Partitions N/A

Partitions N/A

Partitions N/A

Partitions N/A

4th Dimension Design, Inc.

817 Venture Ct
Waukesha, WI 53189
262.896.6500
duane.mcwilliams@4dd.com

JOB TITLE UGS - VISIT SHEBOYGAN

JOB NO.	SHEET NO.
CALCULATED BY	DATE
CHECKED BY	DATE

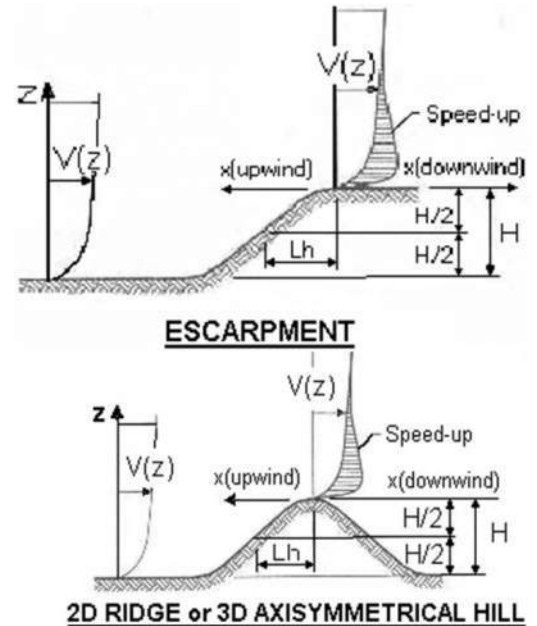
Wind Loads :

ASCE 7- 10

Ultimate Wind Speed	115 mph
Nominal Wind Speed	89.1 mph
Risk Category	II
Exposure Category	B
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	0.701
Kh case 2	0.575
Type of roof	Gable

Topographic Factor (Kzt)

Topography	Flat
Hill Height (H)	80.0 ft
Half Hill Length (Lh)	100.0 ft
Actual H/Lh =	0.80
Use H/Lh =	0.50
Modified Lh =	160.0 ft
From top of crest: x =	50.0 ft
Bldg up/down wind?	downwind
H/Lh = 0.50	K ₁ = 0.000
x/Lh = 0.31	K ₂ = 0.792
z/Lh = 0.09	K ₃ = 1.000
At Mean Roof Ht:	
	K _{zt} = (1+K ₁ K ₂ K ₃) ² = 1.00

**Gust Effect Factor**

h =	14.8 ft
B =	21.0 ft
/z (0.6h) =	30.0 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).

However, if building h/B < 4 then probably rigid structure (rule of thumb).

h/B = 0.71 Rigid structure

G = 0.85 Using rigid structure defaultRigid Structure

$\bar{e}$ =	0.33
ℓ =	320 ft
z_{min} =	30 ft
c =	0.30
g_Q, g_v =	3.4
L_z =	310.0 ft
Q =	0.93
I_z =	0.30
G =	0.88 use G = 0.85

Flexible or Dynamically Sensitive Structure

Natural Frequency (η_1) =	0.0 Hz		
Damping ratio (β) =	0		
/b =	0.45		
/α =	0.25		
Vz =	74.1		
N ₁ =	0.00		
R _n =	0.000		
R _n =	28.282	η =	0.000
R _B =	28.282	η =	0.000
R _L =	28.282	η =	0.000
g _R =	0.000		
R =	0.000		
G =	0.000		

h = 14.8 ft

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Enclosure Classification**Test for Enclosed Building:** A building that does not qualify as open or partially enclosed.

Test for Open Building: All walls are at least 80% open.
 $A_o \geq 0.8A_g$

Test for Partially Enclosed Building:

Input		Test	
Ao	100000.0 sf	$A_o \geq 1.1A_{oi}$	YES
Ag	0.0 sf	$A_o > 4' \text{ or } 0.01A_g$	YES
Aoi	0.0 sf	$A_{oi} / A_{gi} \leq 0.20$	NO
Agi	0.0 sf		

Building is NOT
Partially Enclosed

ERROR: Ag must be greater than Ao

Conditions to qualify as Partially Enclosed Building. Must satisfy all of the following:

$$A_o \geq 1.1A_{oi}$$

$$A_o > \text{smaller of } 4' \text{ or } 0.01 A_g$$

$$A_{oi} / A_{gi} \leq 0.20$$

Where:

Ao = the total area of openings in a wall that receives positive external pressure.

Ag = the gross area of that wall in which Ao is identified.

Aoi = the sum of the areas of openings in the building envelope (walls and roof) not including Ao.

Agi = the sum of the gross surface areas of the building envelope (walls and roof) not including Ag.

Reduction Factor for large volume partially enclosed buildings (Ri) :

If the partially enclosed building contains a single room that is unpartitioned , the internal pressure coefficient may be multiplied by the reduction factor Ri.

Total area of all wall & roof openings (Aog): 0 sf
Unpartitioned internal volume (Vi) : 0 cf
Ri = 1.00

Altitude adjustment to constant 0.00256 (caution - see code) :

Altitude = 0 feet
Constant = 0.00256

Average Air Density = 0.0765 lbm/ft³

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Wind Loads - MWFRS $h \leq 60'$ (Low-rise Buildings) Enclosed/partially enclosed only

$K_z = K_h$ (case 1) = 0.70
Base pressure (q_h) = **20.2 psf**
 G_{Cpi} = +/-0.18

Edge Strip (a) = 3.0 ft
End Zone (2a) = 6.0 ft
Zone 2 length = 10.5 ft

Wind Pressure Coefficients

Surface	CASE A			CASE B		
	G_{Cpf}	$\theta = 26.6 \text{ deg}$ $w/-G_{Cpi}$	$w/+G_{Cpi}$	G_{Cpf}	$w/-G_{Cpi}$	$w/+G_{Cpi}$
1	0.55	0.73	0.37	-0.45	-0.27	-0.63
2	-0.10	0.08	-0.28	-0.69	-0.51	-0.87
3	-0.45	-0.27	-0.63	-0.37	-0.19	-0.55
4	-0.39	-0.21	-0.57	-0.45	-0.27	-0.63
5				0.40	0.58	0.22
6				-0.29	-0.11	-0.47
1E	0.73	0.91	0.55	-0.48	-0.30	-0.66
2E	-0.19	-0.01	-0.37	-1.07	-0.89	-1.25
3E	-0.58	-0.40	-0.76	-0.53	-0.35	-0.71
4E	-0.53	-0.35	-0.71	-0.48	-0.30	-0.66
5E				0.61	0.79	0.43
6E				-0.43	-0.25	-0.61

Ultimate Wind Surface Pressures (psf)

1	14.7	7.5	-5.4	-12.7
2	1.6	-5.6	-10.3	-17.5
3	-5.4	-12.6	-3.8	-11.1
4	-4.2	-11.5	-5.4	-12.7
5			11.7	4.4
6			-2.2	-9.5
1E	18.3	11.0	-6.0	-13.3
2E	-0.2	-7.5	-17.9	-25.2
3E	-8.2	-15.4	-7.1	-14.3
4E	-7.2	-14.4	-6.0	-13.3
5E			15.9	8.7
6E			-5.0	-12.3

Parapet

Windward parapet = 0.0 psf ($G_{Cpn} = +1.5$)
Leeward parapet = 0.0 psf ($G_{Cpn} = -1.0$)

Windward roof overhangs = 14.1 psf (upward) add to windward roof pressure

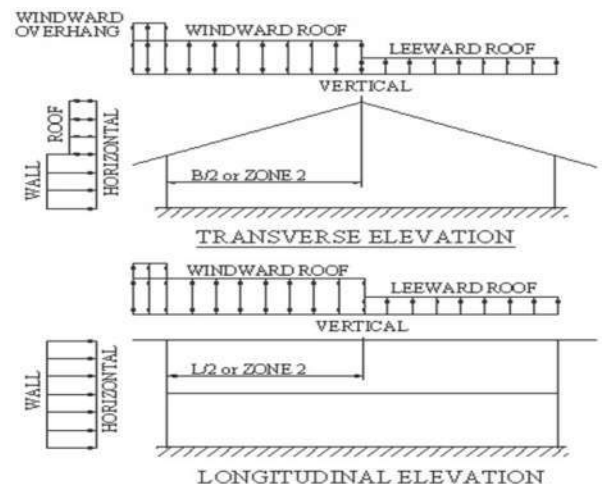
Horizontal MWFRS Simple Diaphragm Pressures (psf)**Transverse direction (normal to L)**

Interior Zone: Wall 19.0 psf
Roof 7.0 psf
End Zone: Wall 25.5 psf
Roof 8.0 psf

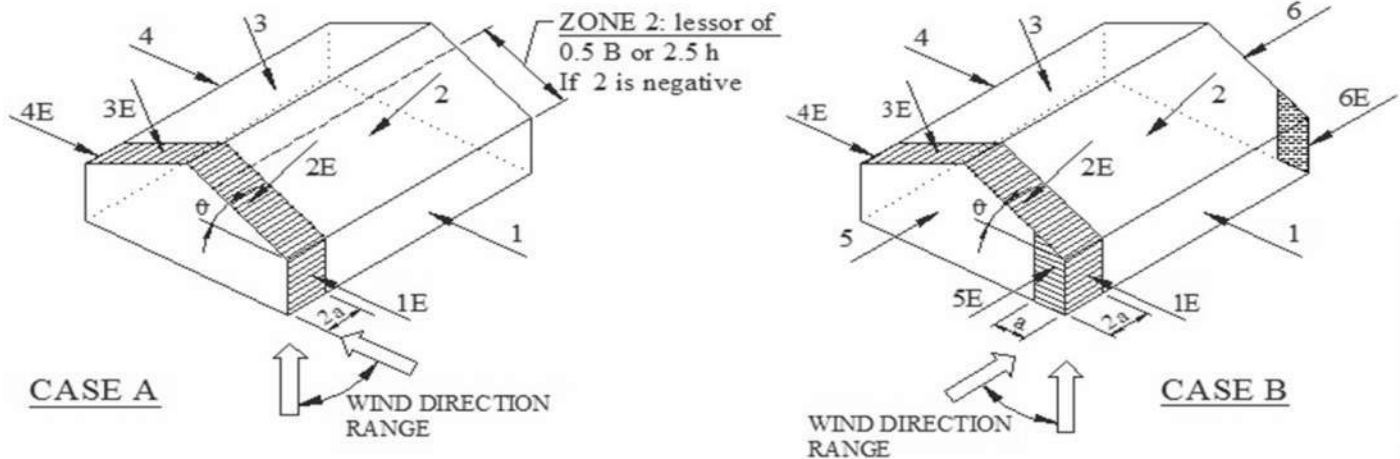
Longitudinal direction (parallel to L)

Interior Zone: Wall 13.9 psf
End Zone: Wall 21.0 psf

The code requires the MWFRS be designed for a min ultimate force of 16 psf multiplied by the wall area plus an 8 psf force applied to the vertical projection of the roof.

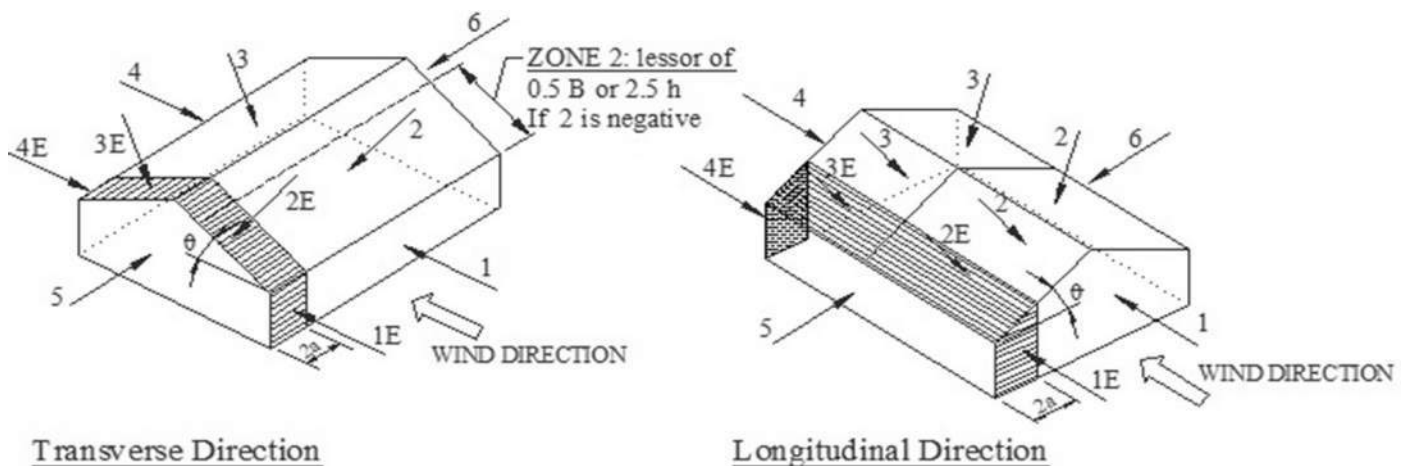


Location of MWFRS Wind Pressure Zones



NOTE: Torsional loads are 25% of zones 1 - 6. See code for loading diagram.

ASCE 7 -99 and ASCE 7-10 (& later)



NOTE: Torsional loads are 25% of zones 1 - 4. See code for loading diagram.

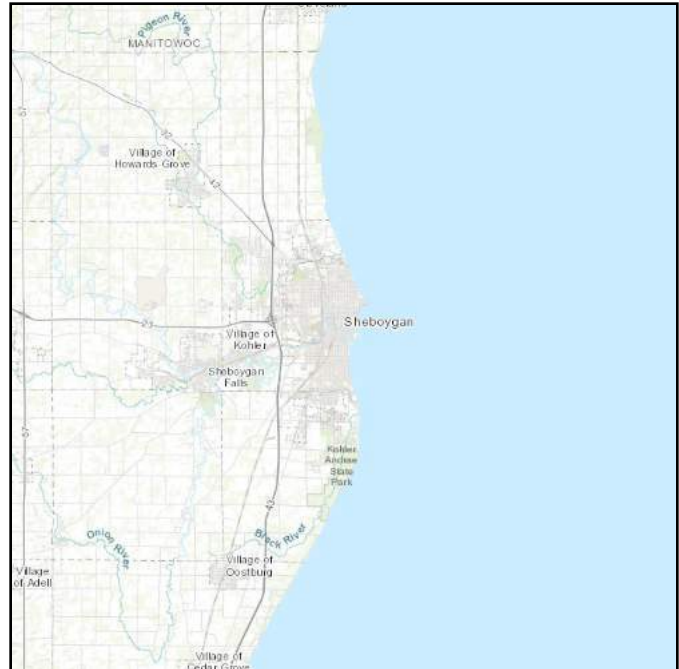
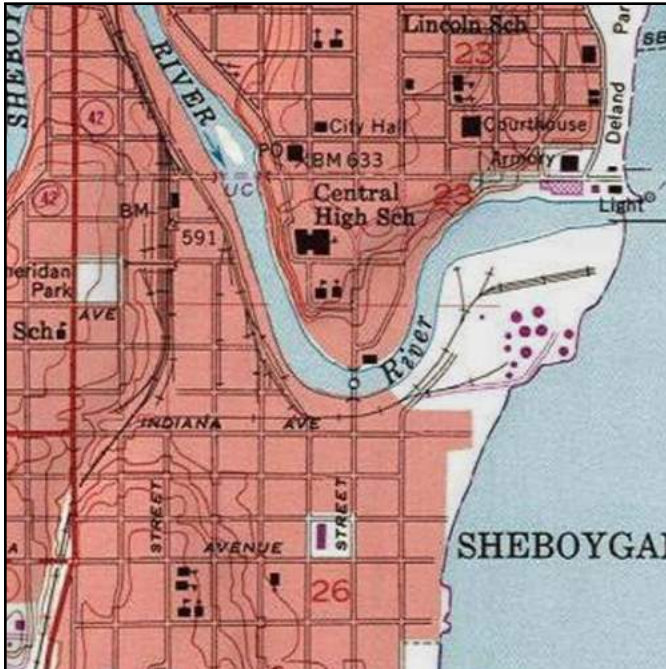
ASCE 7 -02 and ASCE 7-05

ASCE Hazards Report

Address:
824 S 8th St
Sheboygan, Wisconsin
53081

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Latitude: 43.745712
Longitude: -87.713482
Elevation: 588.1021843015527 ft
(NAVD 88)



Wind

Results:

Wind Speed	115 Vmph
10-year MRI	76 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014
Date Accessed: Thu Feb 13 2025

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2.

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Wind Loads - MWFRS $h \leq 60'$ (Low-rise Buildings) Enclosed/partially enclosed only

$K_z = K_h$ (case 1) = 0.70
Base pressure (q_h) = **20.2 psf**
 GC_{pi} = +/-0.18

Edge Strip (a) = 3.0 ft
End Zone (2a) = 6.0 ft
Zone 2 length = 10.5 ft

Wind Pressure Coefficients

Surface	CASE A			CASE B		
	$\theta = 26.6 \text{ deg}$ GCpf	w/-GCpi	w/+GCpi	GCpf	w/-GCpi	w/+GCpi
1	0.55	0.73	0.37	-0.45	-0.27	-0.63
2	-0.10	0.08	-0.28	-0.69	-0.51	-0.87
3	-0.45	-0.27	-0.63	-0.37	-0.19	-0.55
4	-0.39	-0.21	-0.57	-0.45	-0.27	-0.63
5				0.40	0.58	0.22
6				-0.29	-0.11	-0.47
1E	0.73	0.91	0.55	-0.48	-0.30	-0.66
2E	-0.19	-0.01	-0.37	-1.07	-0.89	-1.25
3E	-0.58	-0.40	-0.76	-0.53	-0.35	-0.71
4E	-0.53	-0.35	-0.71	-0.48	-0.30	-0.66
5E				0.61	0.79	0.43
6E				-0.43	-0.25	-0.61

Ultimate Wind Surface Pressures (psf)

1	14.7	7.5	-5.4	-12.7
2	1.6	-5.6	-10.3	-17.5
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4	-4.2	-11.5	-5.4	-12.7
5			11.7	4.4
6			-2.2	-9.5
1E	18.3	11.0	-6.0	-13.3
2E	-0.2	-7.5	-17.9	-25.2
3E	-8.2	-15.4	-7.1	-14.3
4E	-7.2	-14.4	-6.0	-13.3
5E			15.9	8.7
6E			-5.0	-12.3

Parapet

Windward parapet = 0.0 psf ($GC_{pn} = +1.5$)
Leeward parapet = 0.0 psf ($GC_{pn} = -1.0$)

Windward roof overhangs = 14.1 psf (upward) add to windward roof pressure

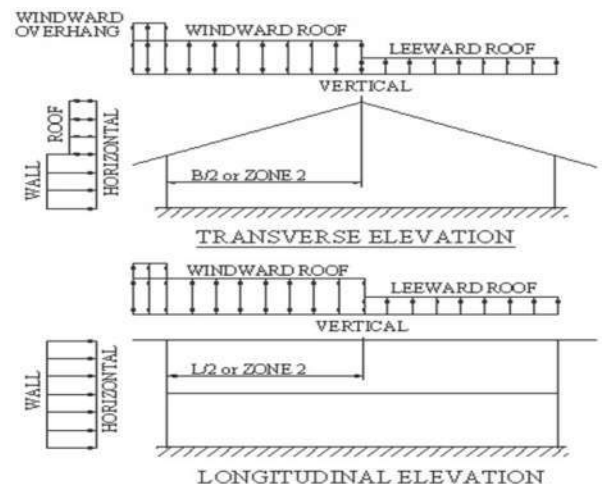
Horizontal MWFRS Simple Diaphragm Pressures (psf)**Transverse direction (normal to L)**

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Roof 7.0 psf
End Zone: Wall 25.5 psf
Roof 8.0 psf

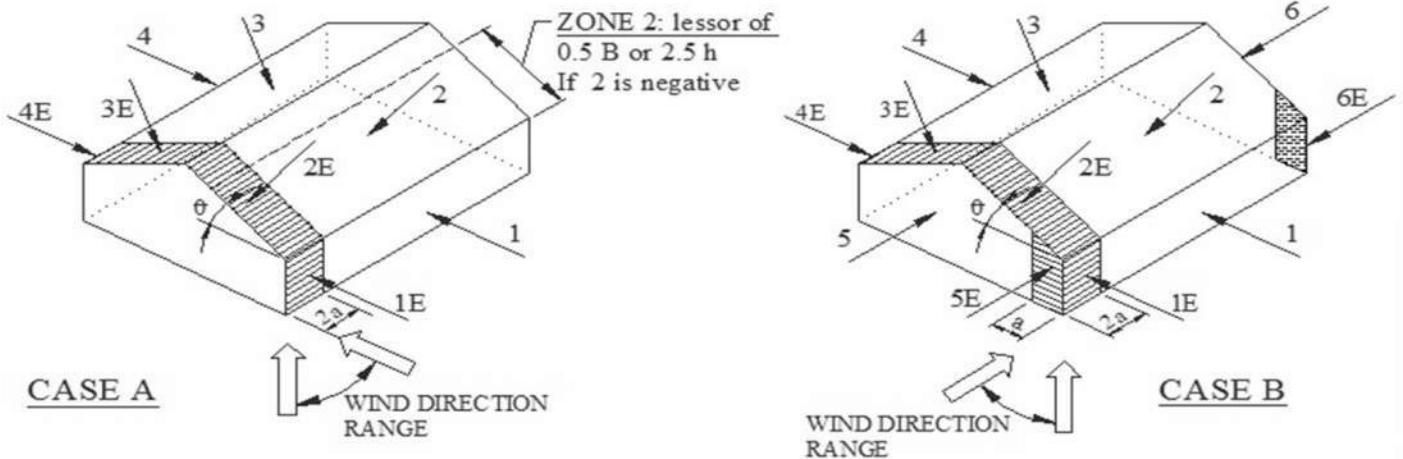
Longitudinal direction (parallel to L)

Interior Zone: Wall 13.9 psf
End Zone: Wall 21.0 psf

The code requires the MWFRS be designed for a min ultimate force of 16 psf multiplied by the wall area plus an 8 psf force applied to the vertical projection of the roof.

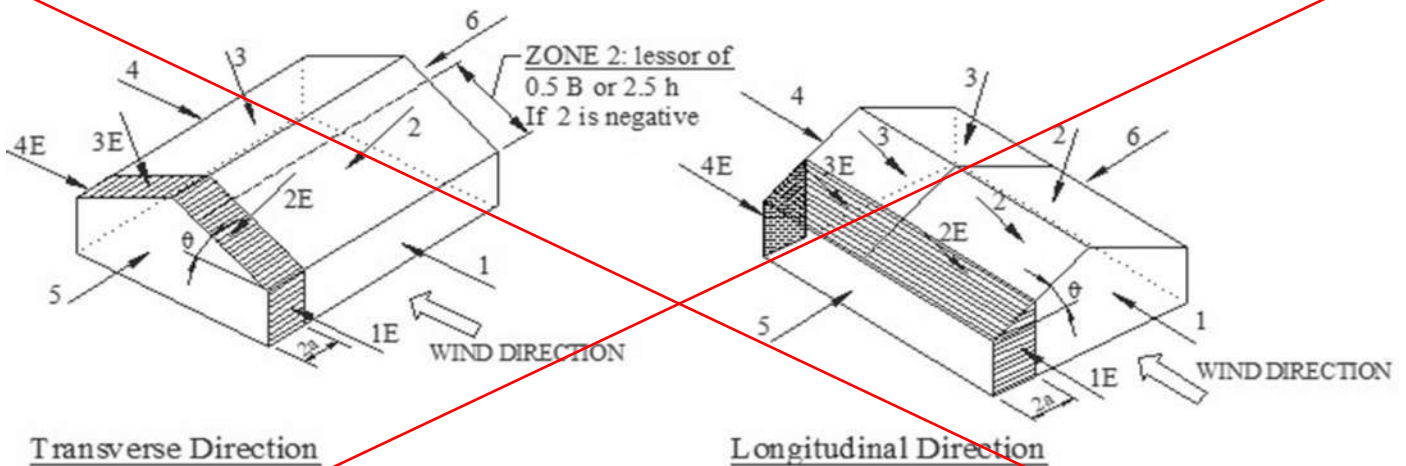


Location of MWFRS Wind Pressure Zones



NOTE: Torsional loads are 25% of zones 1 - 6. See code for loading diagram.

ASCE 7 -99 and ASCE 7-10 (& later)



NOTE: Torsional loads are 25% of zones 1 - 4. See code for loading diagram.

ASCE 7 -02 and ASCE 7-05

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JOB TITLE UGS - VISIT SHEBOYGAN

JOB NO. _____ SHEET NO. _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____

Ultimate Wind Pressures

Wind Loads - Components & Cladding : h <= 60'

Kh (case 1) = 0.70 h = 14.8 ft
Base pressure (qh) = **20.2 psf** a = 3.0 ft
Minimum parapet ht = 0.0 ft GCpi = +/-0.18
Roof Angle (θ) = 26.6 deg
Type of roof = Gable

Roof

Area	GCp +/- GCpi			Surface Pressure (psf)			User input	
	10 sf	50 sf	100 sf	10 sf	50 sf	100 sf	75 sf	500 sf
Negative Zone 1	-1.08	-1.01	-0.98	-21.8	-20.4	-19.8	-20.0	-19.8
Negative Zone 2	-1.88	-1.53	-1.38	-37.9	-30.9	-27.8	-29.1	-27.8
Negative Zone 3	-2.78	-2.36	-2.18	-56.0	-47.6	-44.0	-45.5	-44.0
Positive All Zones	0.68	0.54	0.48	16.0	16.0	16.0	16.0	16.0
Overhang Zone 2	-2.20	-2.20	-2.20	-44.4	-44.4	-44.4	-44.4	-44.4
Overhang Zone 3	-3.70	-2.86	-2.50	-74.6	-57.7	-50.4	-53.4	-50.4

Overhang pressures in the table above assume an internal pressure coefficient (Gcpi) of 0.0

Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 3.6 psf)

Parapet

qp = 0.0 psf

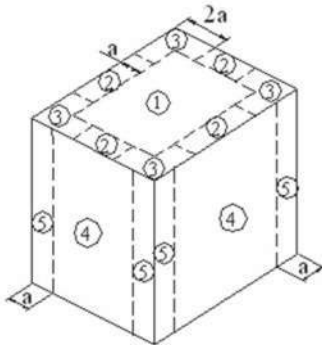
CASE A = pressure towards building (pos)
CASE B = pressure away from bldg (neg)

Solid Parapet Pressure	Surface Pressure (psf)			User input
	10 sf	100 sf	500 sf	40 sf
CASE A : Interior zone:	0.0	0.0	0.0	0.0
Corner zone:	0.0	0.0	0.0	0.0
CASE B : Interior zone:	0.0	0.0	0.0	0.0
Corner zone:	0.0	0.0	0.0	0.0

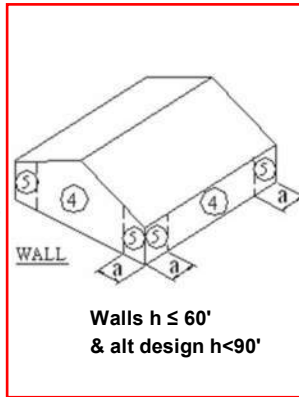
Walls

Area	GCp +/- GCpi			Surface Pressure (psf)			User input	
	10 sf	100 sf	500 sf	10 sf	100 sf	500 sf	50 sf	200 sf
Negative Zone 4	-1.28	-1.10	-0.98	-25.8	-22.2	-19.8	-23.3	-21.2
Negative Zone 5	-1.58	-1.23	-0.98	-31.9	-24.7	-19.8	-26.9	-22.6
Positive Zone 4 & 5	1.18	1.00	0.88	23.8	20.2	17.7	21.3	19.2

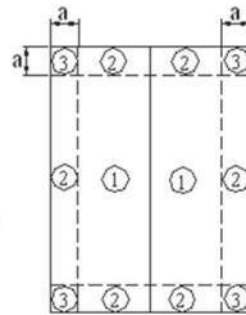
Location of C&C Wind Pressure Zones



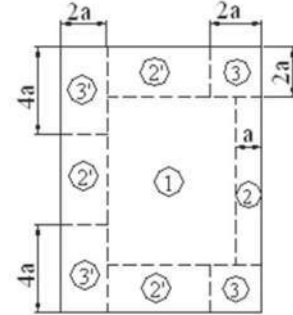
Roofs w/ $\theta \leq 10^\circ$
and all walls
 $h > 60'$



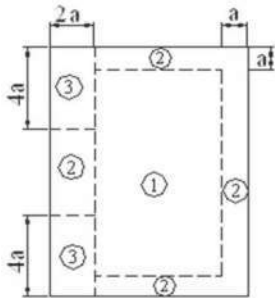
Walls $h \leq 60'$
& alt design $h < 90'$



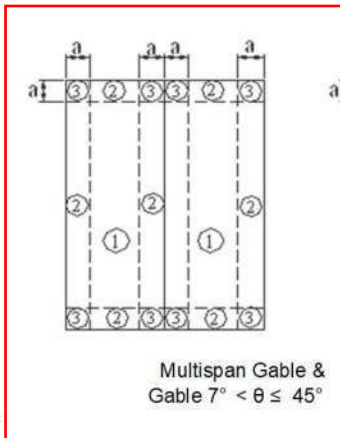
Gable, Sawtooth and
Multispan Gable $\theta \leq 7^\circ$ &
Monoslope $\leq 3^\circ$ degrees
 $h \leq 60'$ & alt design $h < 90'$



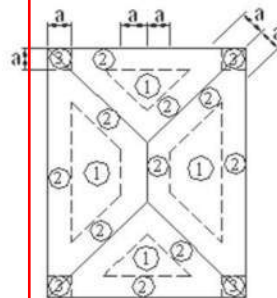
Monoslope roofs
 $3^\circ < \theta \leq 10^\circ$
 $h \leq 60'$ & alt design $h < 90'$



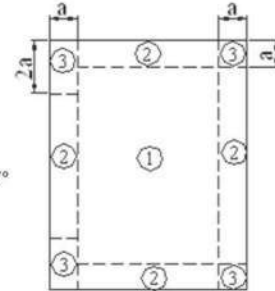
Monoslope roofs
 $10^\circ < \theta \leq 30^\circ$
 $h \leq 60'$ & alt design $h < 90'$



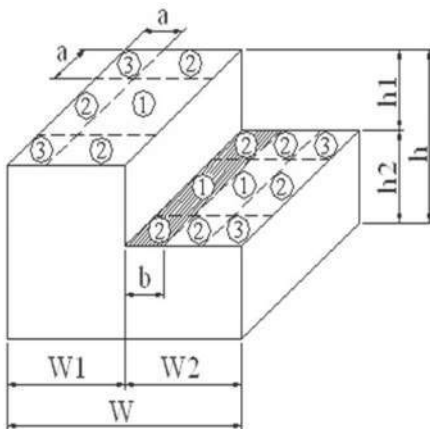
Multispan Gable &
Gable $7^\circ < \theta \leq 45^\circ$



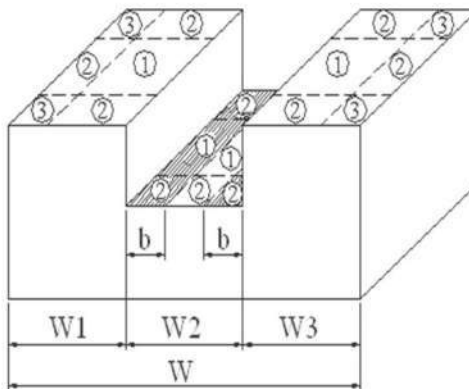
Hip $7^\circ < \theta \leq 27^\circ$



Sawtooth $10^\circ < \theta \leq 45^\circ$
 $h \leq 60'$ & alt design $h < 90'$



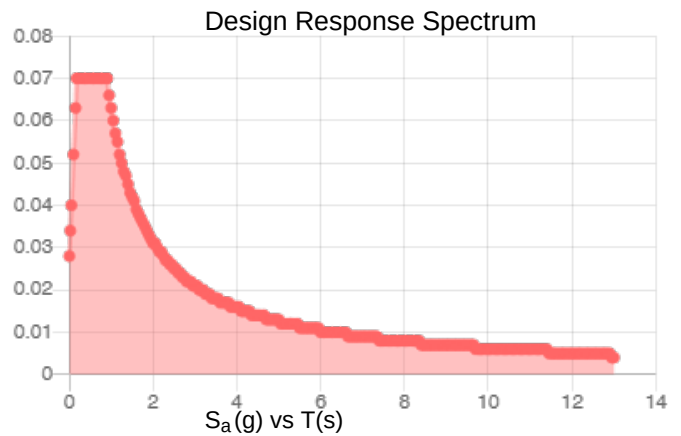
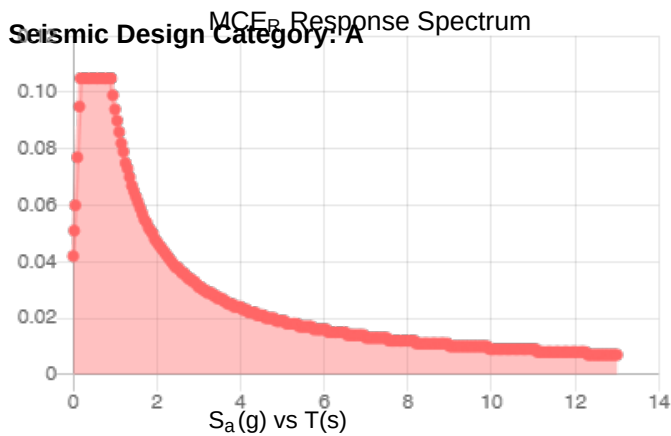
Stepped roofs $\theta \leq 3^\circ$
 $h \leq 60'$ & alt design $h < 90'$



Site Soil Class: D - Stiff Soil

Results:

S_S :	0.066	S_{D1} :	0.063
S_1 :	0.039	T_L :	12
F_a :	1.6	PGA :	0.031
F_v :	2.4	PGA _M :	0.049
S_{MS} :	0.105	F_{PGA} :	1.6
S_{M1} :	0.094	I_e :	1
S_{DS} :	0.07		



Data Accessed: Thu Feb 13 2025

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

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Seismic Loads:

IBC 2015

Strength Level Forces

Risk Category : II
Importance Factor (I) : 1.00
Site Class : D

Ss (0.2 sec) = 6.60 %g
S1 (1.0 sec) = 3.90 %g

Fa = 1.600	Sms = 0.106	S _{DS} = 0.070	Design Category = A
Fv = 2.400	Sm1 = 0.094	S _{D1} = 0.062	Design Category = A

Seismic Design Category = **A** ASCE7 Section 11.4.1 Exception Applies

Number of Stories: 1

Structure Type: All other building systems

Horizontal Struct Irregularities: No plan Irregularity

Vertical Structural Irregularities: No vertical Irregularity

Flexible Diaphragms: Yes

Building System: **Structural steel systems not specifically detailed for seismic resistance**Seismic resisting system: **Structural steel systems not specifically detailed for seismic resistance**System Structural Height Limit: **Height not limited**

Actual Structural Height (hn) = 17.5 ft

DESIGN COEFFICIENTS AND FACTORS

Response Modification Coefficient (R) = 3
Over-Strength Factor (Ω_o) = 2.5
Deflection Amplification Factor (Cd) = 3
S_{DS} = 0.070
S_{D1} = 0.062

MOMENT FRAME = 3.5
BRACED FRAME = 3.25
REPORT BASE RXN FOR 3
(SEISMIC DOES NOT CONTROL)

Seismic Load Effect (E) = $\rho Q_E \pm 0.2 S_{DS} D$ = $\rho Q_E \pm 0.014 D$
Special Seismic Load Effect (E_m) = $\Omega_o Q_E \pm 0.2 S_{DS} D$ = $2.5 Q_E \pm 0.014 D$
p = redundancy coefficient
Q_E = horizontal seismic force
D = dead load

PERMITTED ANALYTICAL PROCEDURESIndex Force Analysis (Seismic Category A only) - Minimum lateral force F_x = 0.01W_x at each floor level

Simplified Analysis - Use Equivalent Lateral Force Analysis

Equivalent Lateral-Force Analysis - Permitted

Building period coef. (C_T) = 0.020
Approx fundamental period (T_a) = $C_T h_n^x$ = 0.171 sec x = 0.75 Tmax = C_uT_a = 0.291
User calculated fundamental period (T) = sec Use T = 0.171
Long Period Transition Period (T_L) = ASCE7 map = 12
Seismic response coef. (C_s) = S_{DS}/R = 0.023
need not exceed C_s = S_{d1}/R_T = 0.122
but not less than C_s = 0.010
USE C_s = 0.023
Design Base Shear V = 0.023W

Model & Seismic Response Analysis

- Permitted (see code for procedure)

ALLOWABLE STORY DRIFT

Structure Type: Non- masonry, 4 story or less designed to accommodate the story drift

Allowable story drift = 0.025h_{sx} no limit if single story is designed to accommodate the story drift

Results:

Ground Snow Load, p_g : 35 lb/ft²
Mapped Elevation: 588.1 ft
Data Source: ASCE/SEI 7-10, Fig. 7-1.
Date Accessed: Thu Feb 13 2025

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported 'elevation' and 'mapped elevation' differ significantly from each other.

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE Hazard Tool.

4th Dimension Design, Inc.

817 Venture Ct
Waukesha, WI 53189
262.896.6500
duane.mcwilliams@4dd.com

JOB TITLE UGS - VISIT SHEBOYGAN

JOB NO.	SHEET NO.
CALCULATED BY	DATE
CHECKED BY	DATE

Snow Loads : ASCE 7-10

Nominal Snow Forces

Roof slope = 26.6 deg
Horiz. eave to ridge dist (W) = 10.5 ft
Roof length parallel to ridge (L) = 40.0 ft

Type of Roof Hip and gable w/ trussed systems
Ground Snow Load $P_g = 35.0$ psf
Risk Category = II
Importance Factor $I = 1.0$
Thermal Factor $C_t = 0.85$
Exposure Factor $C_e = 1.0$

$P_f = 0.7 \cdot C_e \cdot C_t \cdot I \cdot P_g = 20.8$ psf
Unobstructed Slippery Surface yes

Sloped-roof Factor $C_s = 0.67$ use 0.67
Balanced Snow Load **$P_s = 14.0$ psf**

Rain on Snow Surcharge Angle 0.21 deg
Code Maximum Rain Surcharge 5.0 psf
Rain on Snow Surcharge = 0.0 psf
 P_s plus rain surcharge = 14.0 psf
Minimum Snow Load $P_m = 0.0$ psf

Uniform Roof Design Snow Load = **14.0 psf** use 14.0

NOTE: Alternate spans of continuous beams and other areas shall be loaded with half the design roof snow load so as to produce the greatest possible effect - see code.

Unbalanced Snow Loads - for Hip & Gable roofs only

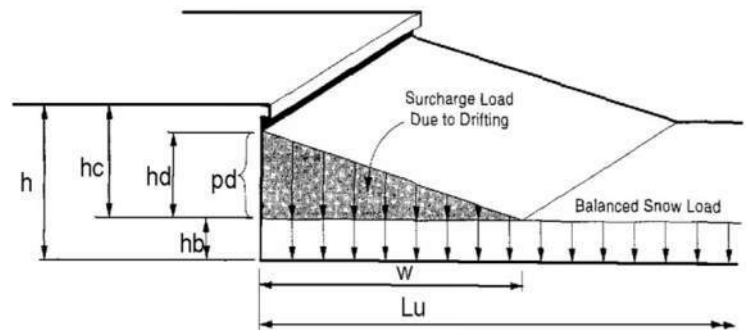
Required if slope is between 7 on 12 = 30.26 deg
and 2.38 deg = 2.38 deg **Unbalanced snow loads must be applied**
Windward snow load = 4.2 psf = 0.3 P_s
Leeward snow load from ridge to 5.74' = 33.9 psf = $h_d \gamma / \sqrt{S} + P_s$
Leeward snow load from 5.74' to the eave = 14.0 psf = P_s

Windward Snow Drifts 1 - Against walls, parapets, etc

Upwind fetch $l_u = 0.0$ ft
Projection height $h = 0.0$ ft
Snow density $g = 18.6$ pcf
Balanced snow height $h_b = 0.75$ ft
 $h_d = 1.14$ ft
 $h_c = -0.75$ ft
 $h_c/h_b < 0.2 = -1.0$ **$l_u < 15'$, drift not req'd**
Drift height (h_c) = 0.00 ft
Drift width $w = -6.94$ ft
Surcharge load: $pd = \gamma \cdot h_d = 0.0$ psf
Balanced Snow load: = 14.0 psf

Windward Snow Drifts 2 - Against walls, parapets, etc

Upwind fetch $l_u = 0.0$ ft
Projection height $h = 0.0$ ft
Snow density $g = 18.6$ pcf
Balanced snow height $h_b = 0.75$ ft
 $h_d = 1.14$ ft
 $h_c = -0.75$ ft
 $h_c/h_b < 0.2 = -1.0$ **$l_u < 15'$, drift not req'd**
Drift height (h_c) = 0.00 ft
Drift width $w = -6.94$ ft
Surcharge load: $pd = \gamma \cdot h_d = 0.0$ psf
Balanced Snow load: = 14.0 psf





14676

4th DIMENSION DESIGN, INC.

PAGE

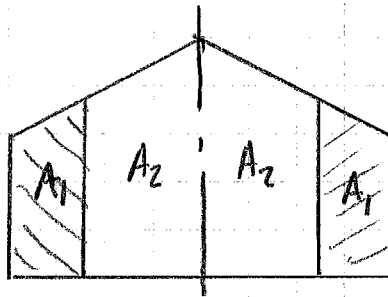
DATE

BRACING:

$$\begin{aligned} \text{END} &= 21.0 \text{ psf ULT} \\ \text{INT} &= 13.9 \text{ psf ULT} \end{aligned}$$

$$A_1 = 39 \text{ ft}^2$$

$$A_2 = 125 \text{ ft}^2$$



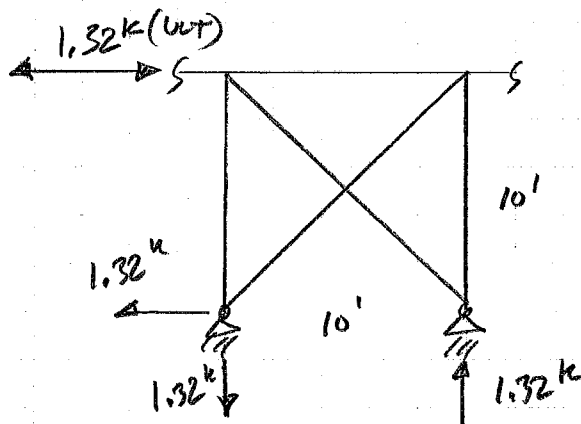
END ELEVATION
NTS

 $\therefore$ AVE MWPRS

$$= \frac{21.0(39) + 13.9(125)}{(39 + 125)} = 15.6 \text{ psf ULT}$$

 $\therefore$ 16 psf MIN GOVERNSBRACE FORCE @ EAVE:

$$16 \text{ psf} (39 \text{ ft}^2 + 125 \text{ ft}^2) / 2 = 1,312 \text{ lb (ULT)}$$



BY

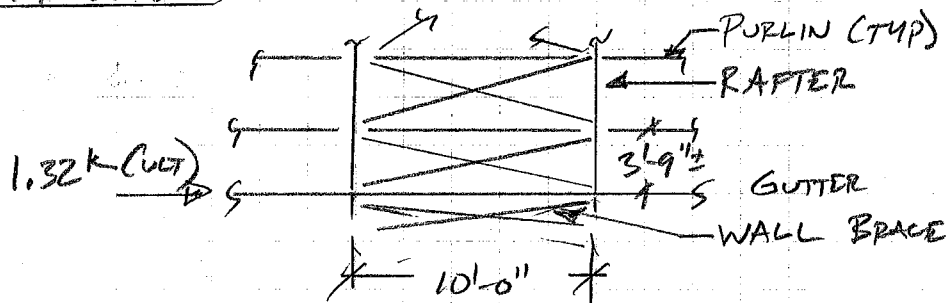
BRACING CONT'D:

$$\text{TENSION IN CABLE} = 1.414 \times 1.32 \text{ K (ULT)} = 1.9 \text{ K}$$

$$\text{ASD: } 0.6(1.9 \text{ K}) = 1.14 \text{ K}$$

$$3/16" \text{ CABLE ASSEMBLY} = \frac{4,200 \text{ LBS}}{\text{ULT}} \rightarrow 2.1 \text{ K ALLOW.}$$

$\therefore$ OK

ROOF BRACING:

PARTIAL PLAN VIEW
NIS

$$T \approx 1.32 \text{ K} \frac{\sqrt{10^2 + 3.75^2}}{10} = 1.41 \text{ K ULT}$$

$$\text{ASD: } 0.6(1.41 \text{ K}) = 0.846 \text{ K} < 2.1 \text{ K ALLOW.} \quad 3/16" \text{ CABLE ASSEMBLY} = \text{OK}$$

BY



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PAGE

DATE

BRACING CONT'D.

CHECK WIND VS. SEISMIC

MWFRS LOAD TO EAVE = 1.32^k ULT (0.8^k ASD)

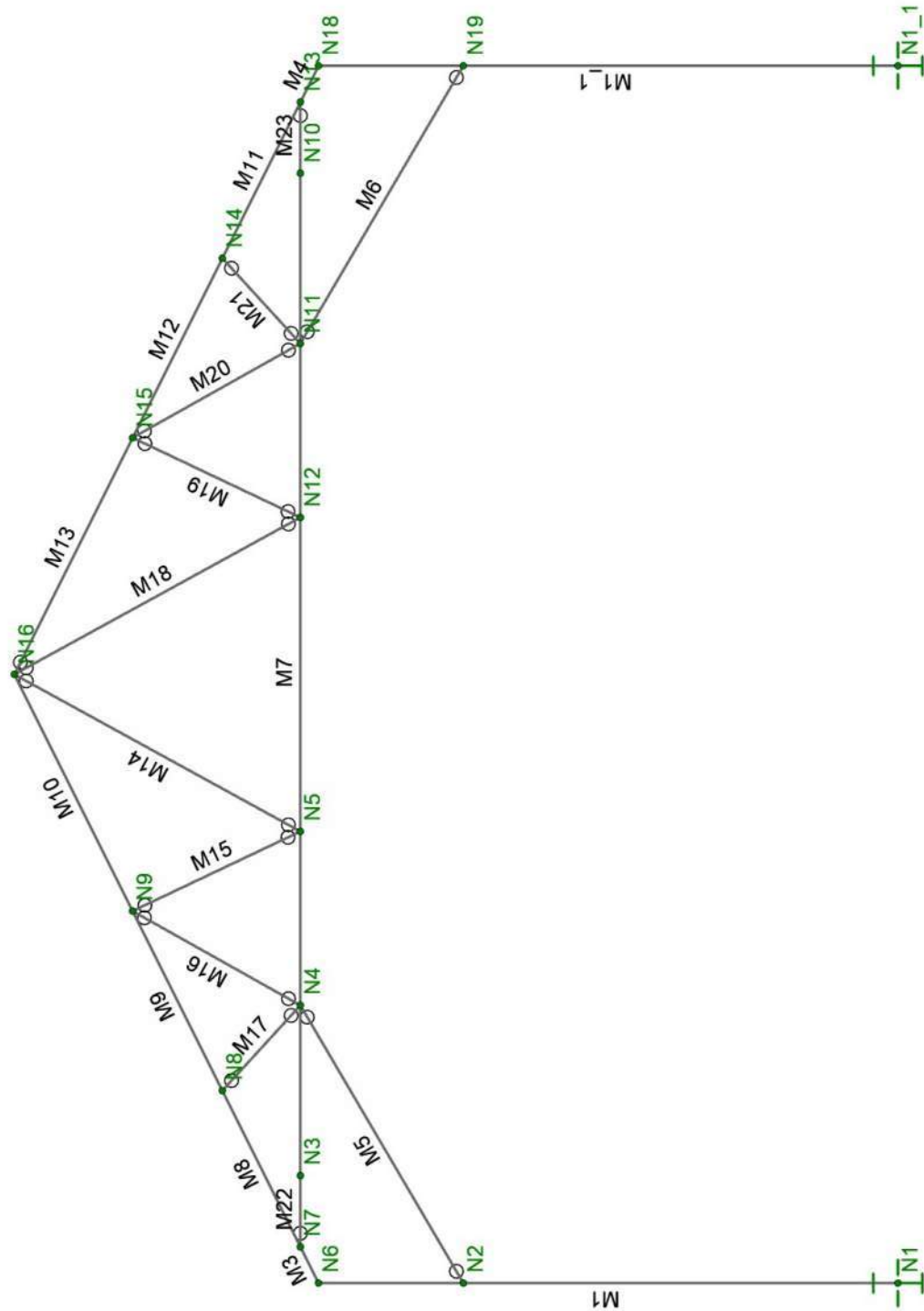
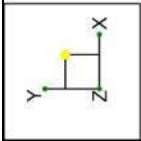
SEISMIC LOAD TO EAVE:

SAY ROOF + WALLS = 15 psf PROJECTED (CONSERVATIVE)

$$\therefore R = 15 \text{ psf} \times \frac{21'}{2} \times 40' \times 0.023 = 145^k \text{ (ULT)} \ll 1,320^k$$

$\therefore$ WIND GOVERNS

BY

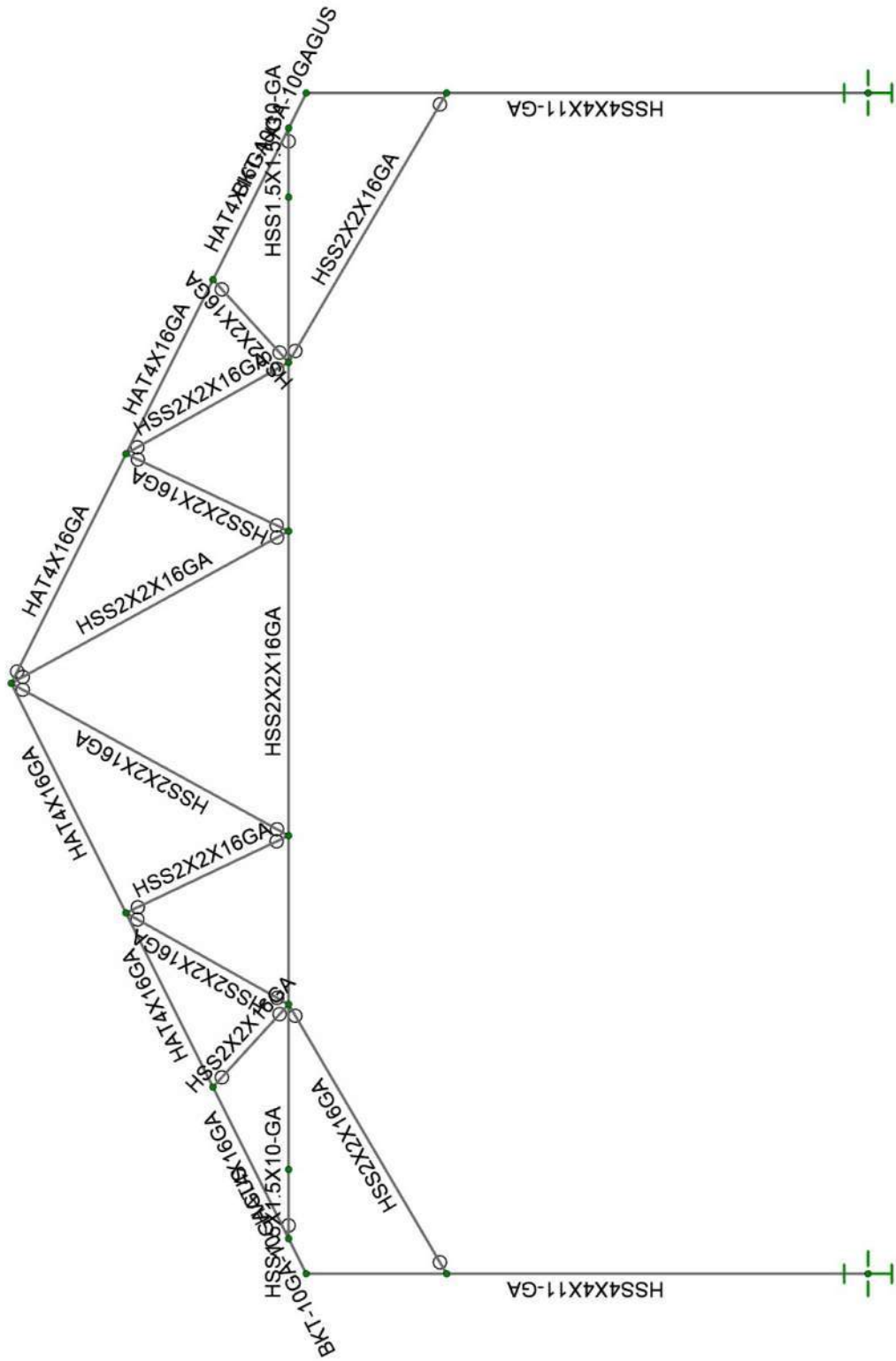
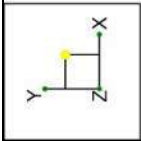


4TH DIMENSION DESIGN, INC

21' TRUSS INT

Feb 17, 2025 at 01:43 PM

21' Truss - BRACED BAY.r3d

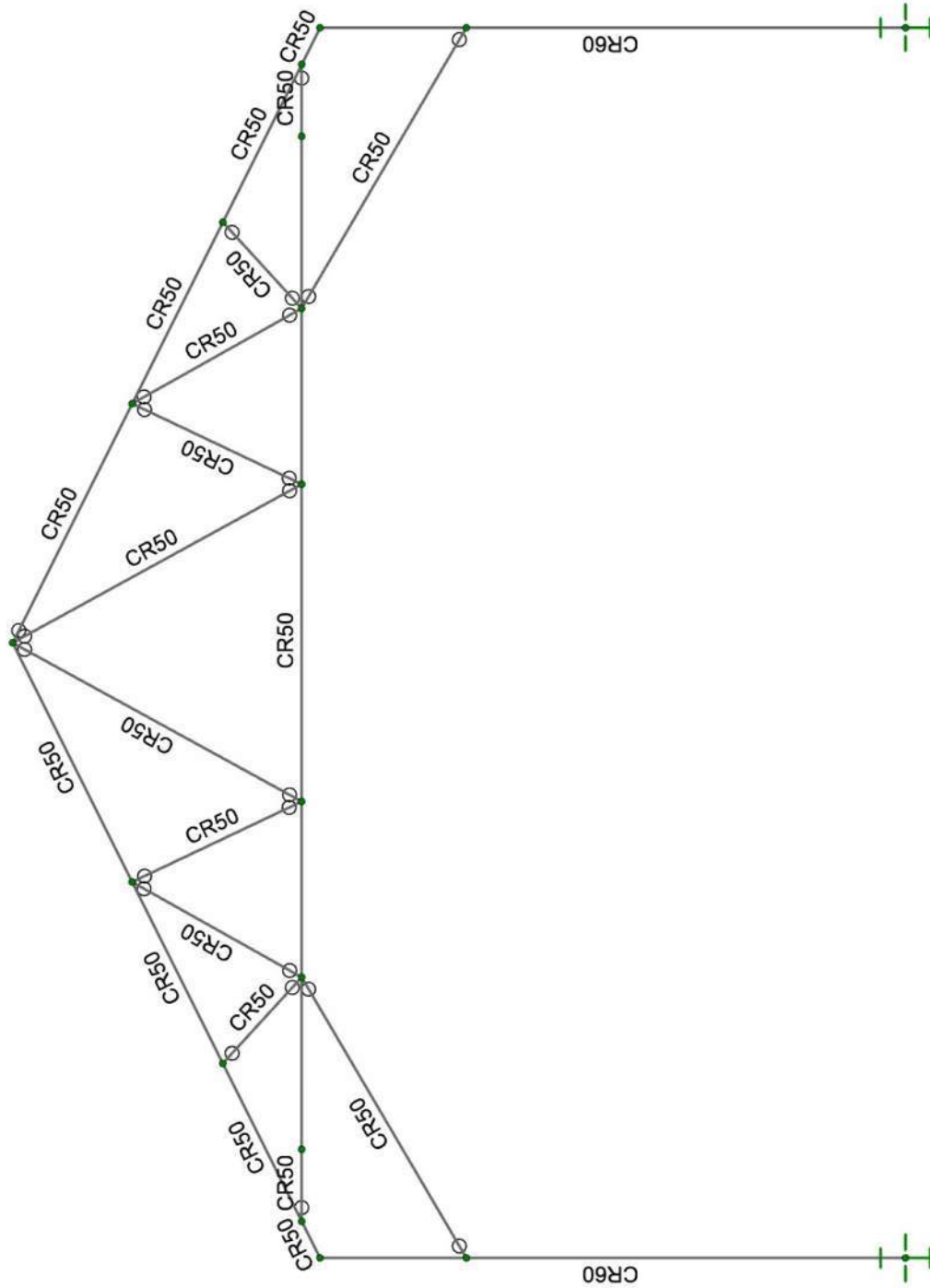
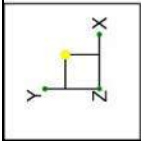


4TH DIMENSION DESIGN, INC

21' TRUSS INT

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21' Truss - BRACED BAY.r3d

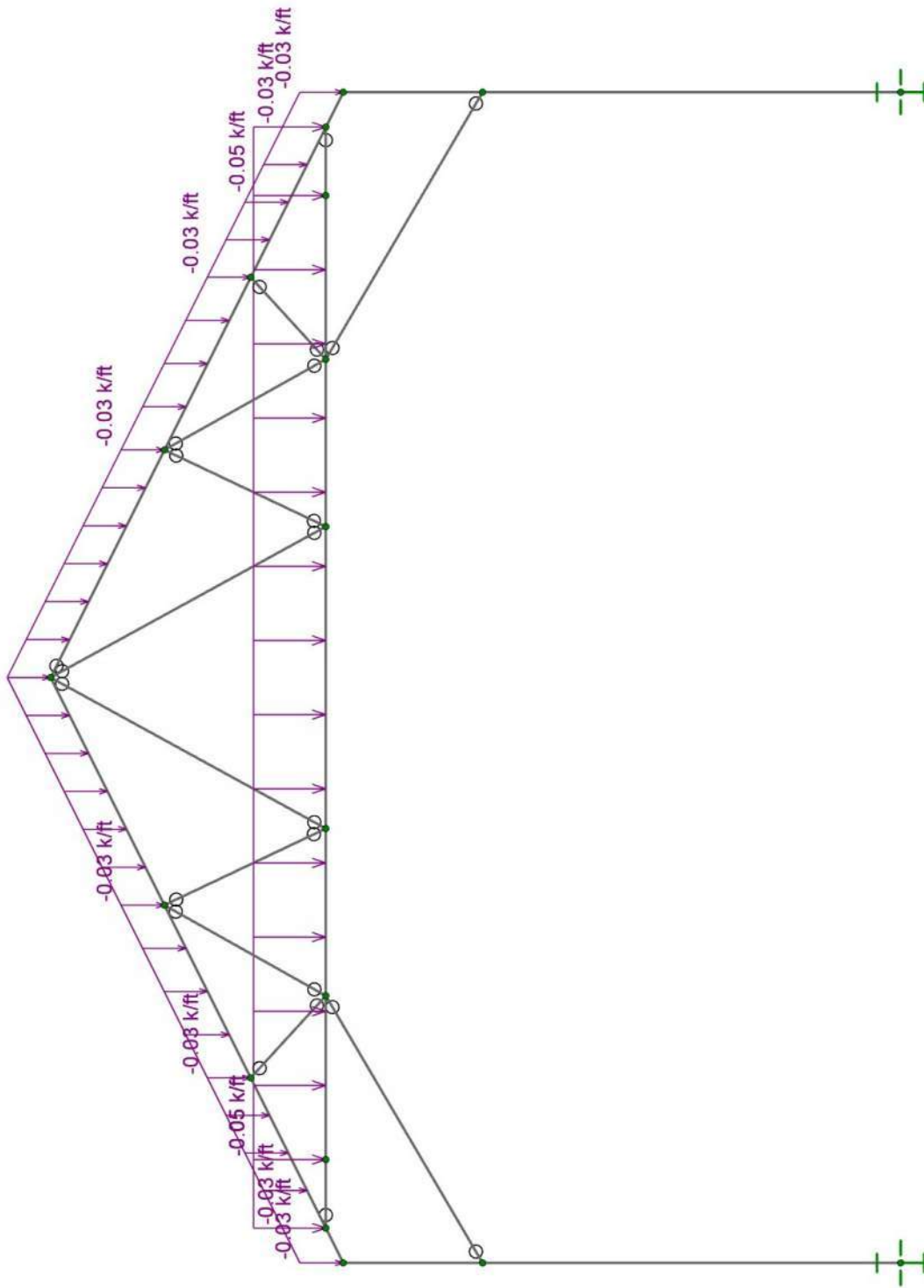
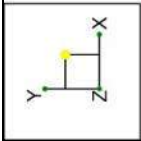


4TH DIMENSION DESIGN, INC

21' TRUSS INT

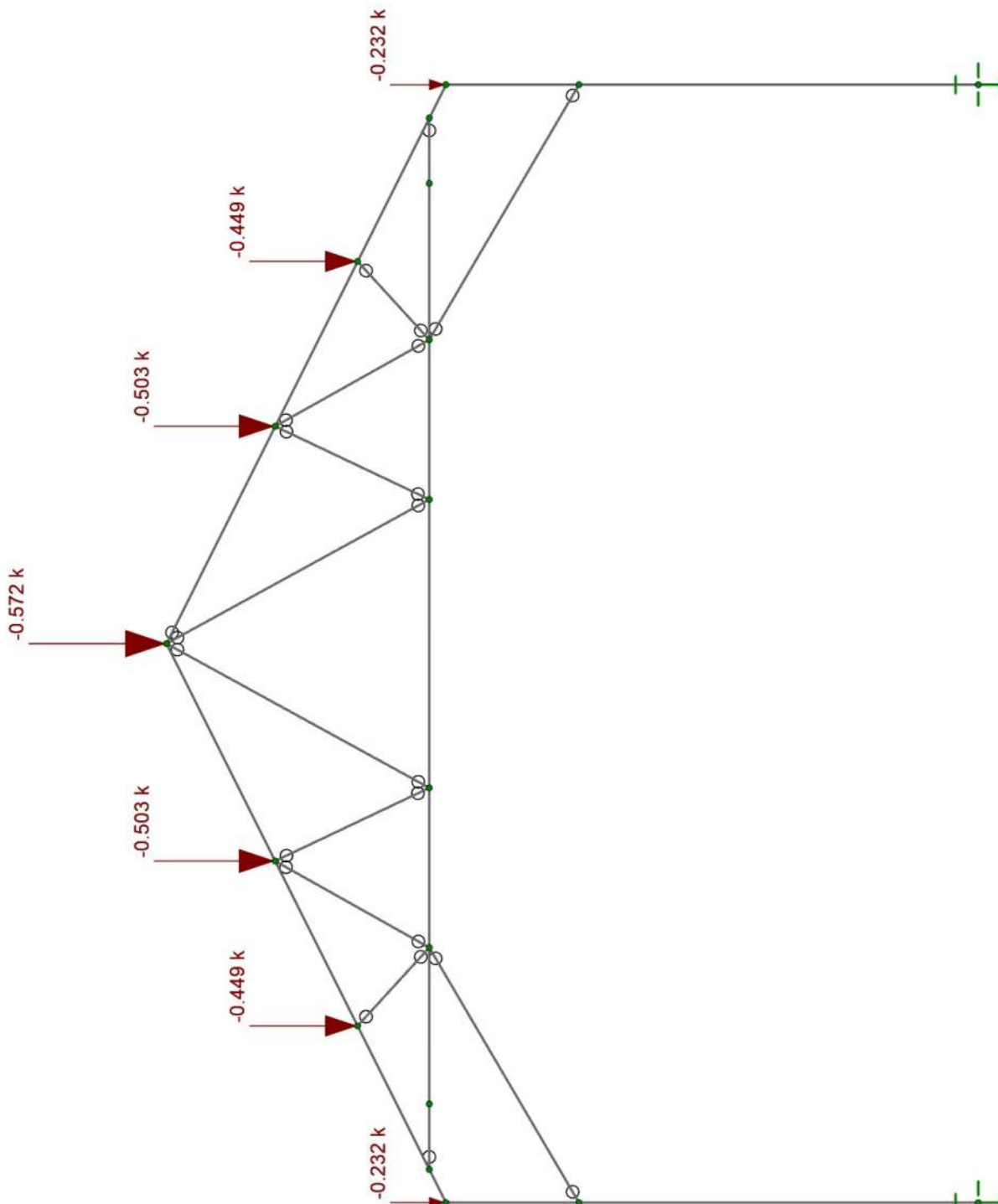
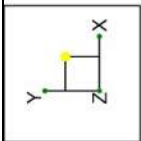
Feb 17, 2025 at 01:43 PM

21' Truss - BRACED BAY.r3d



Loads: BLC 1, D

	4TH DIMENSION DESIGN, INC	21' TRUSS INT
		Feb 17, 2025 at 01:46 PM
		21' Truss - BRACED BAY.r3d



Loads: BLC 2, S

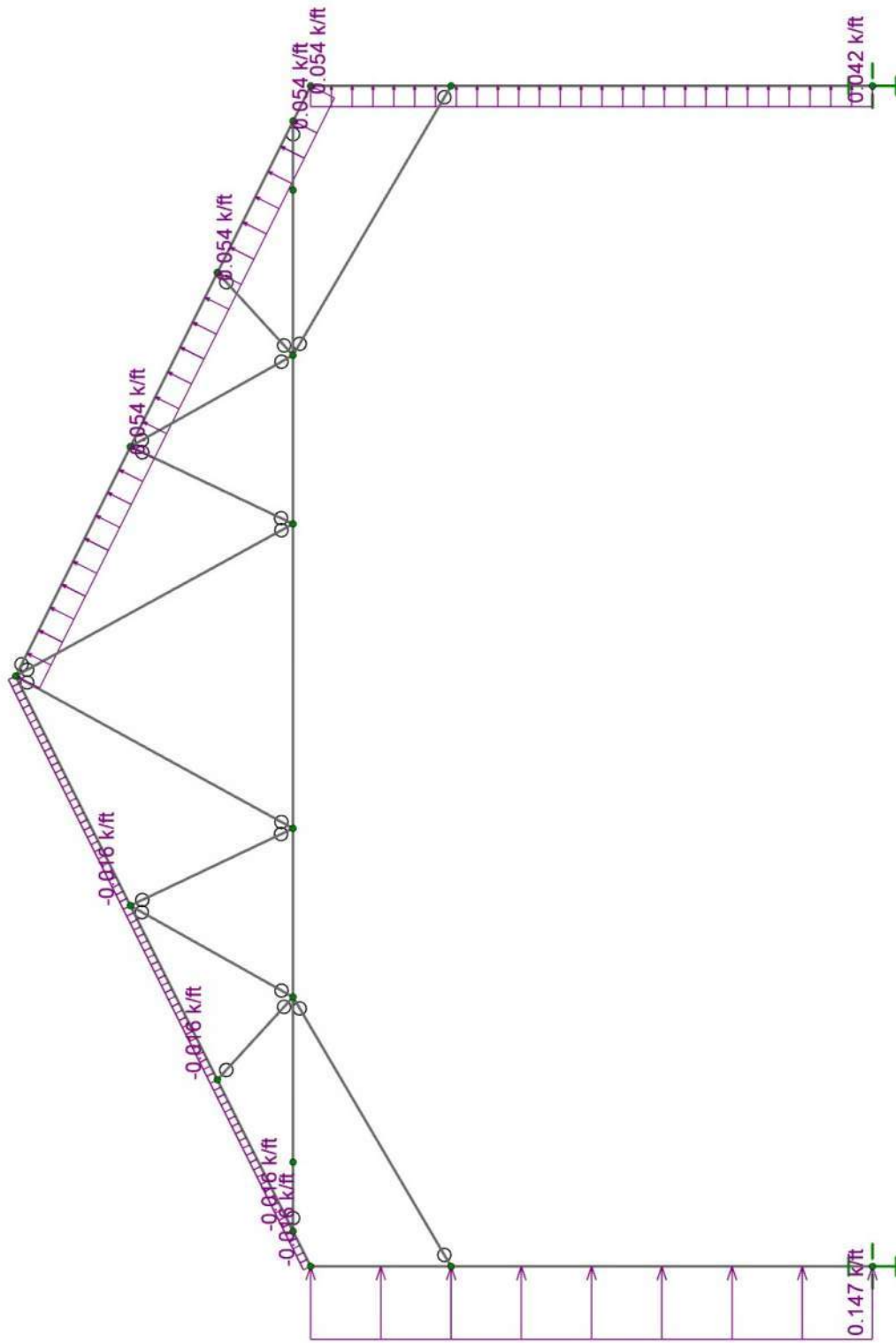
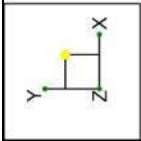


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21' TRUSS INT

Feb 17, 2025 at 01:46 PM

21' Truss - BRACED BAY.r3d



Loads: BLC 3, W1>

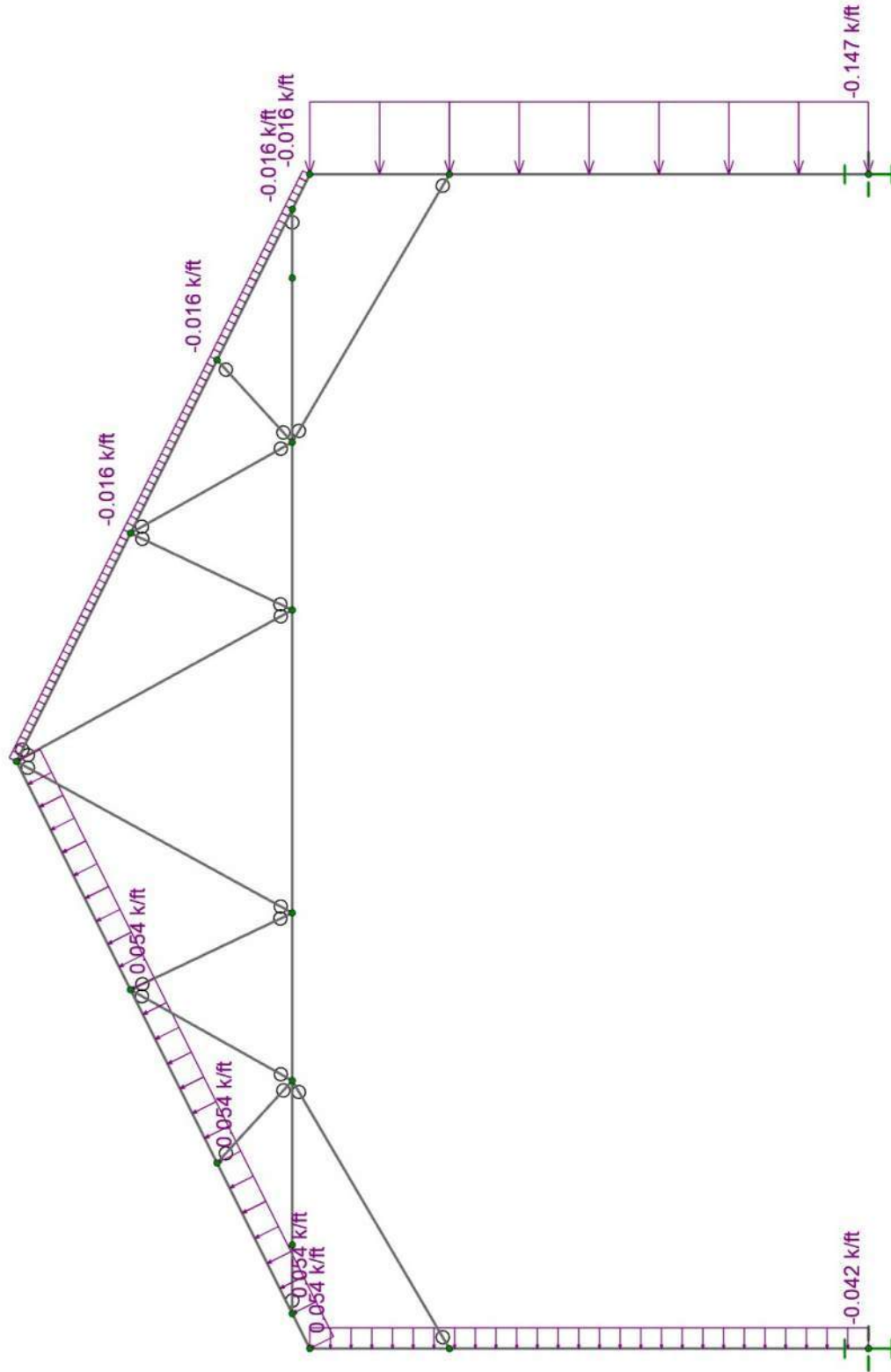
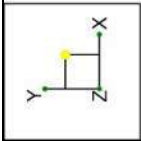
21' TRUSS INT

4TH DIMENSION DESIGN, INC



Feb 17, 2025 at 01:46 PM

21' Truss - BRACED BAY.r3d



Loads: BLC 4, W1<

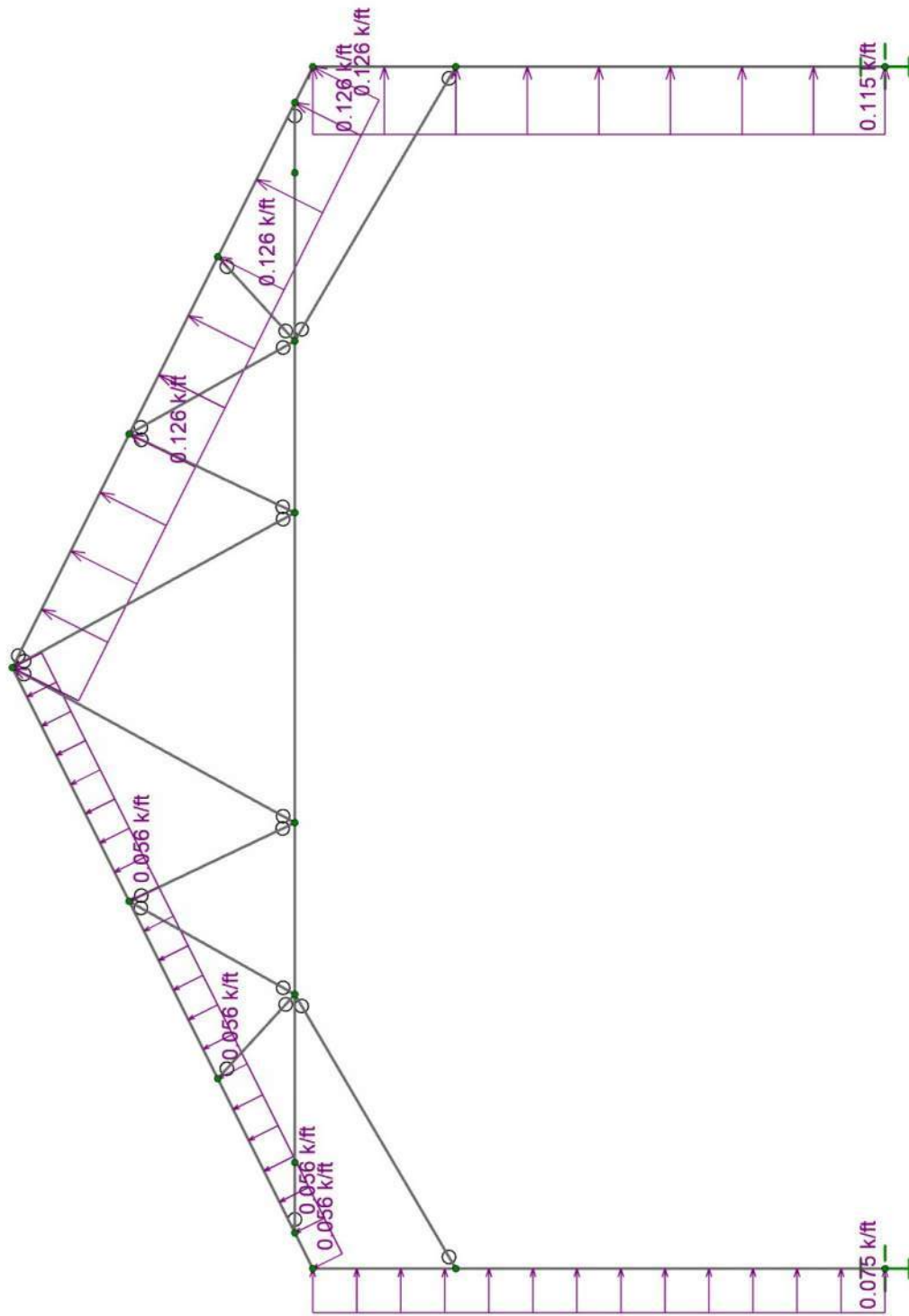
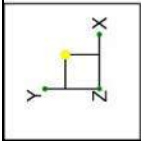


4TH DIMENSION DESIGN, INC

21' TRUSS INT

Feb 17, 2025 at 01:46 PM

21' Truss - BRACED BAY.r3d



Loads: BLC 5, W2>

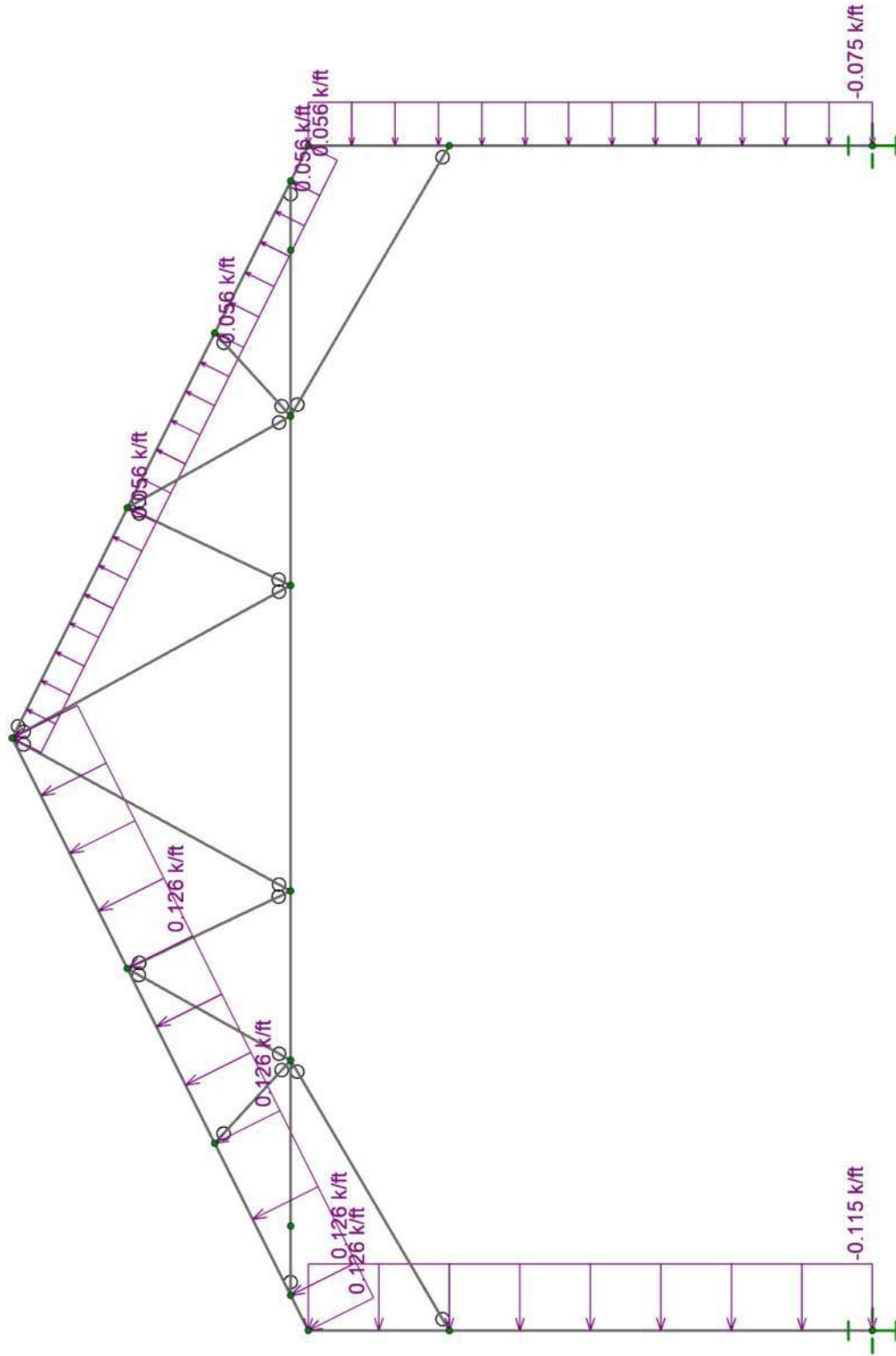
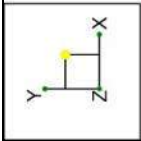


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21' TRUSS INT

Feb 17, 2025 at 01:47 PM

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Loads: BLC 6, W2<

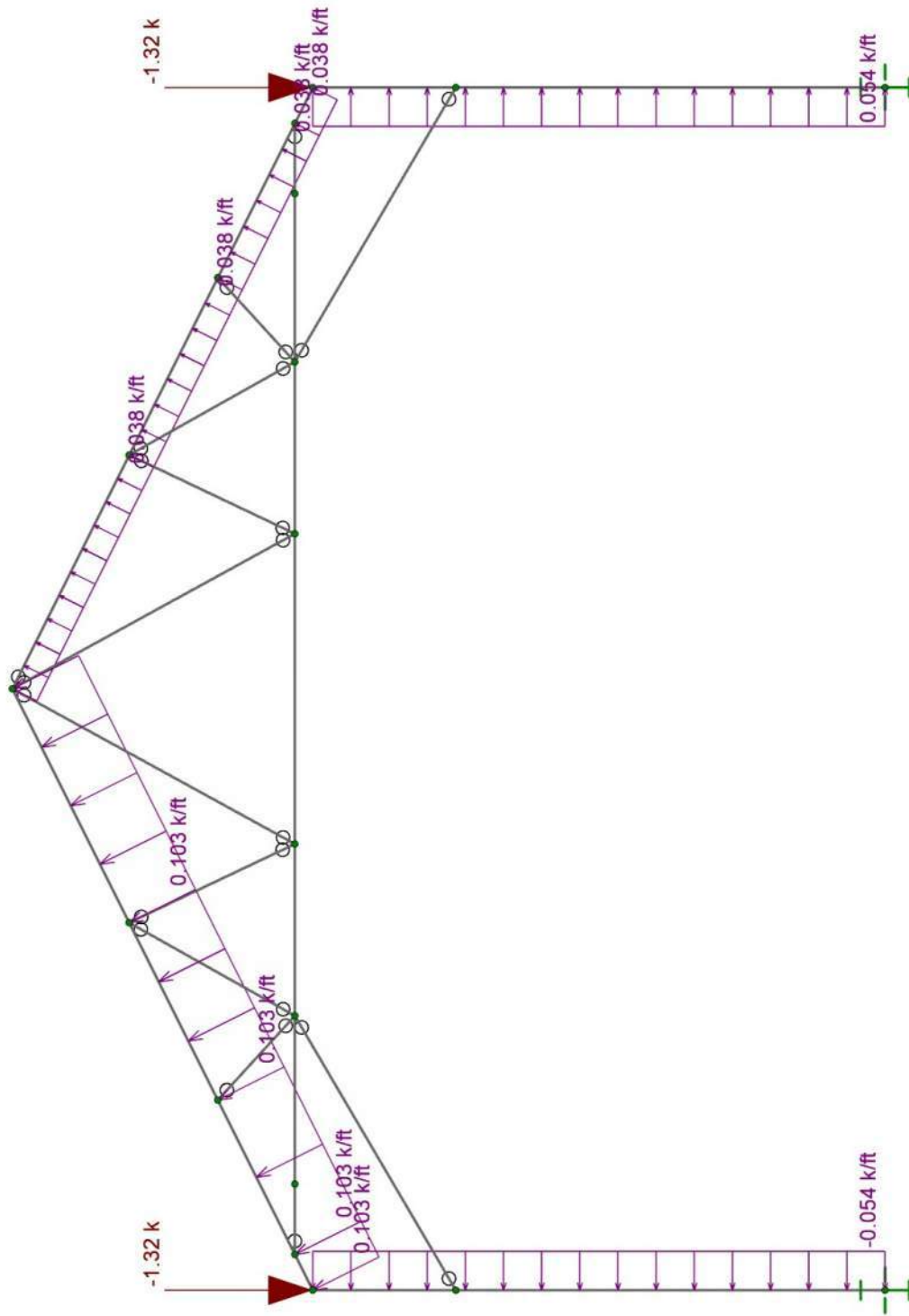
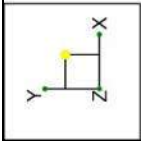


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21' Truss - BRACED BAY.r3d



Loads: BLC 7, W3[^]

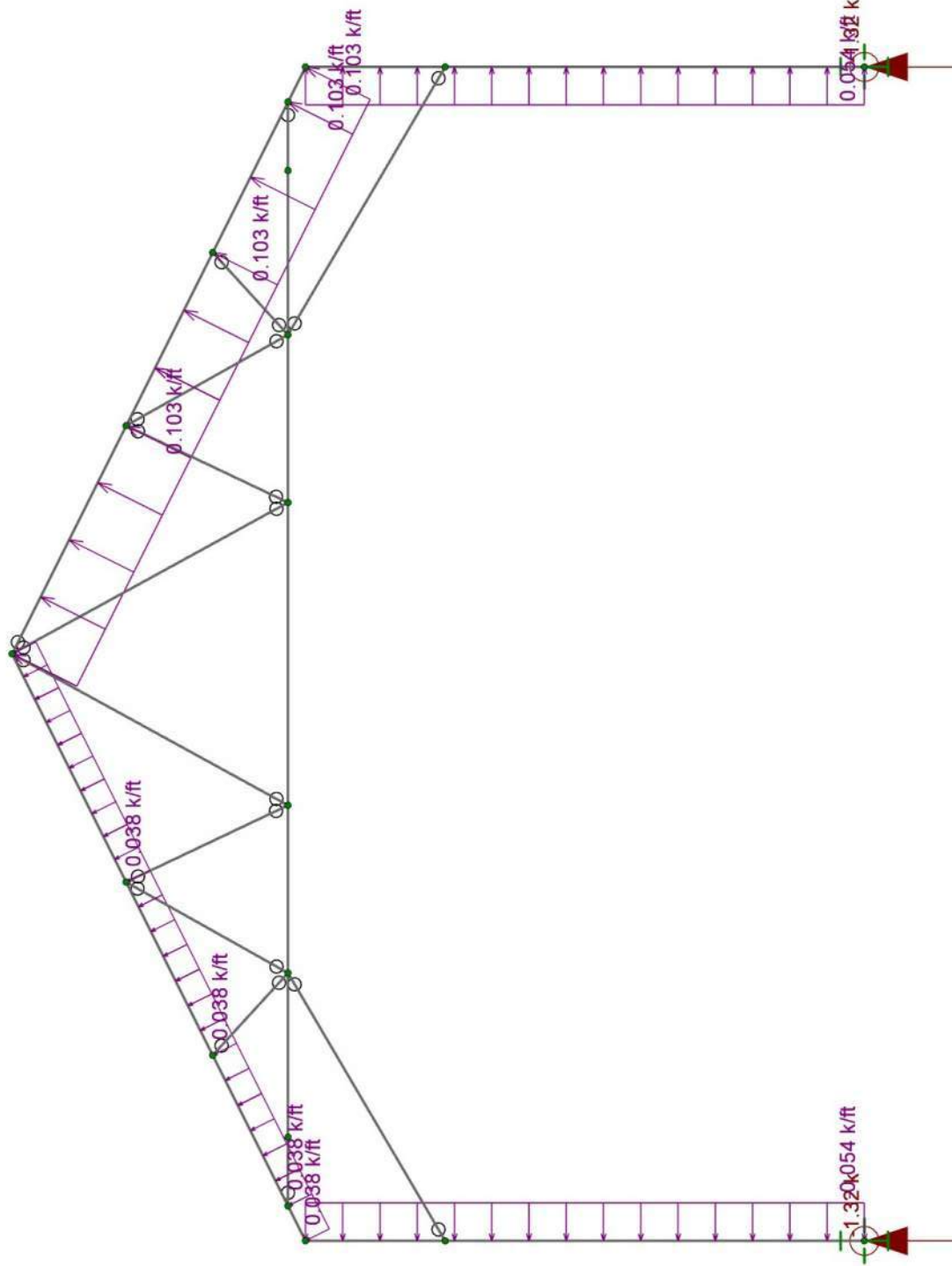
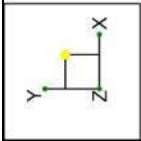


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21' TRUSS INT

Feb 17, 2025 at 01:47 PM

21' Truss - BRACED BAY.r3d



Loads: BLC 8, W3v

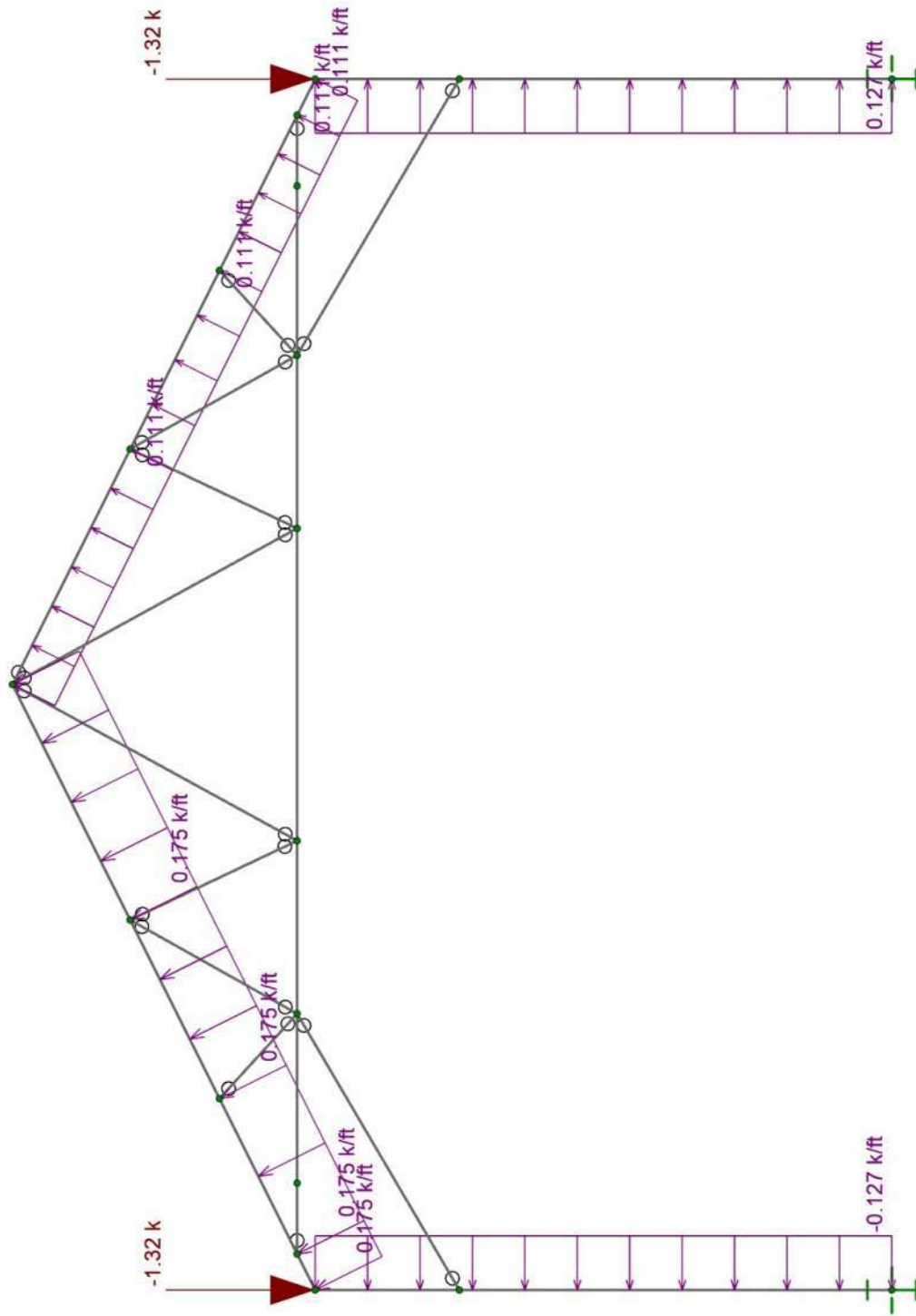
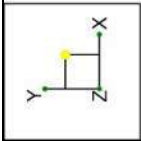


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21' TRUSS INT

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21' Truss - BRACED BAY.r3d



Loads: BLC 9, W4^

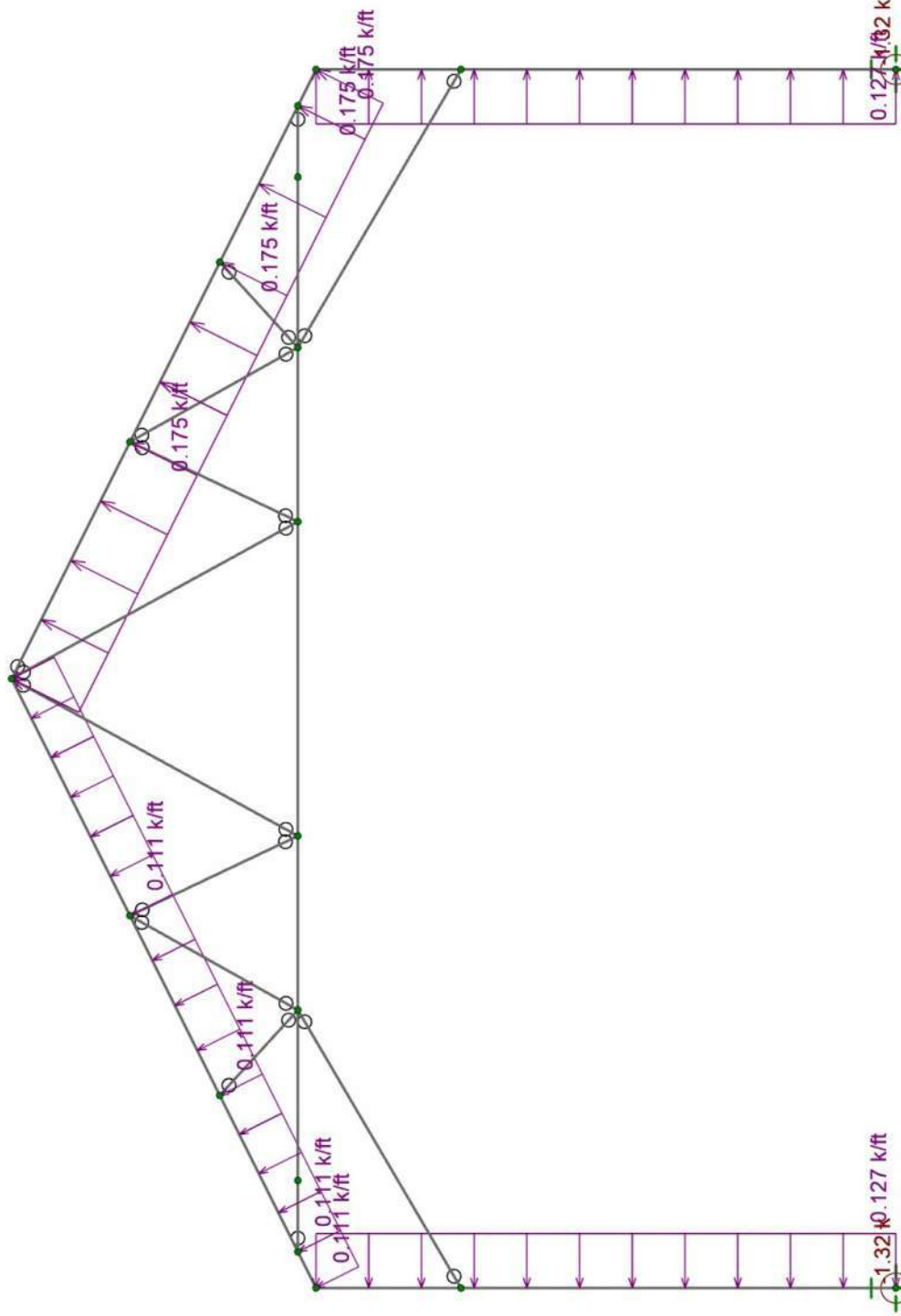
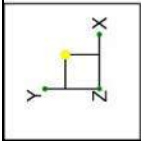


4TH DIMENSION DESIGN, INC

21' TRUSS INT

Feb 17, 2025 at 01:48 PM

21' Truss - BRACED BAY.r3d



Loads: BLC 10, W4v

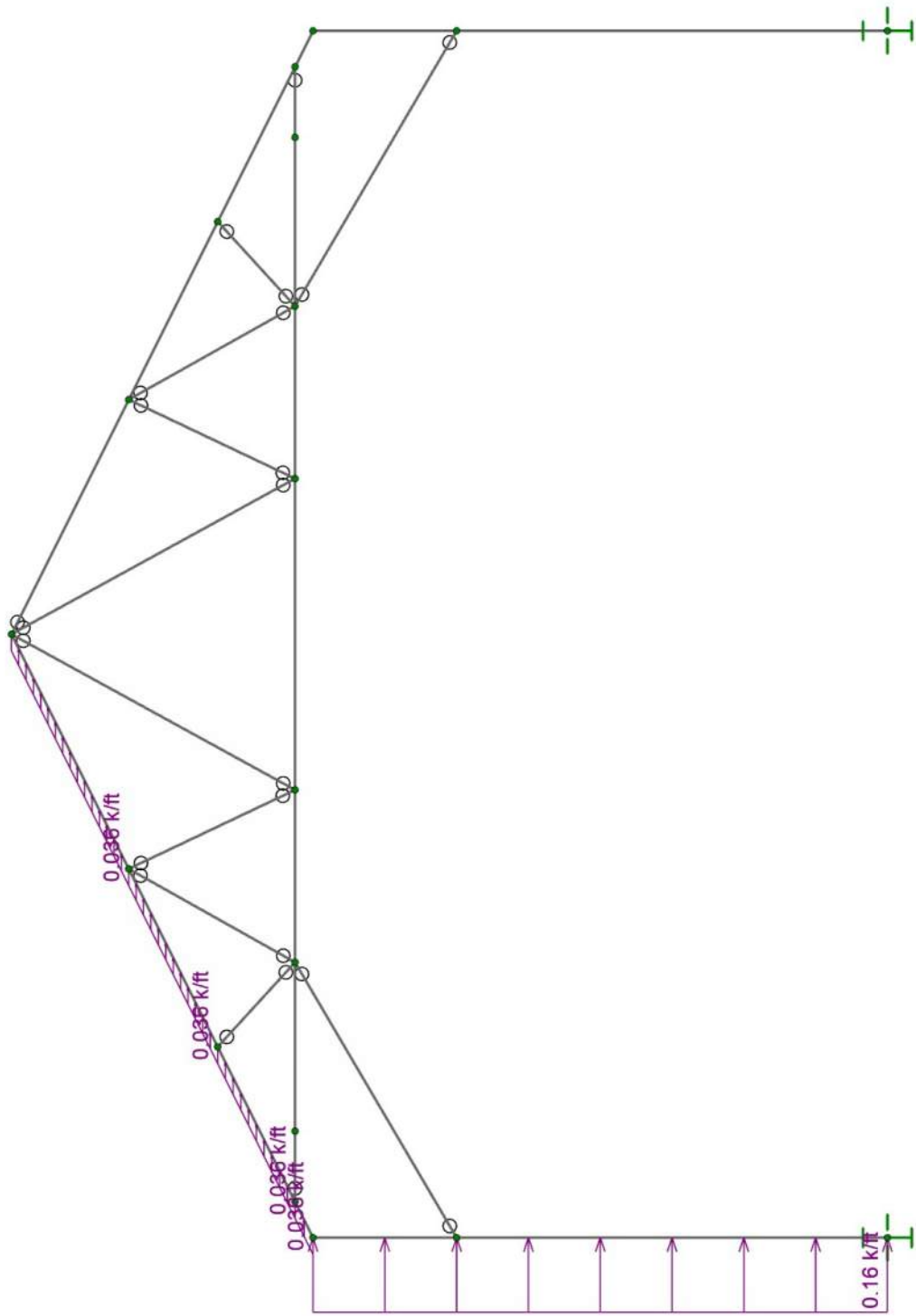
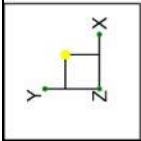


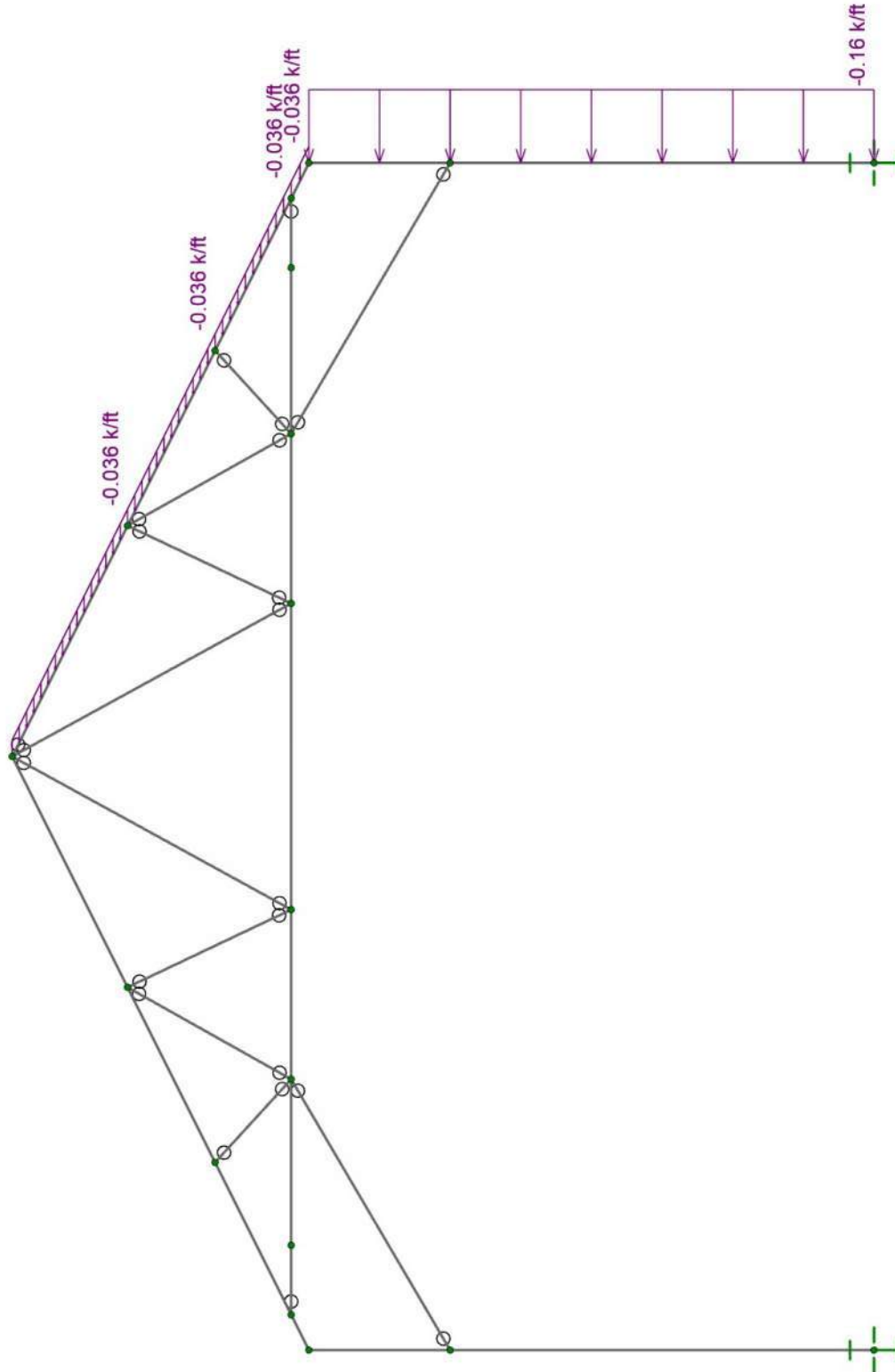
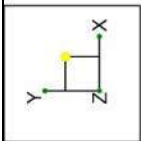
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21' TRUSS INT

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Loads: BLC 12, WMIN<

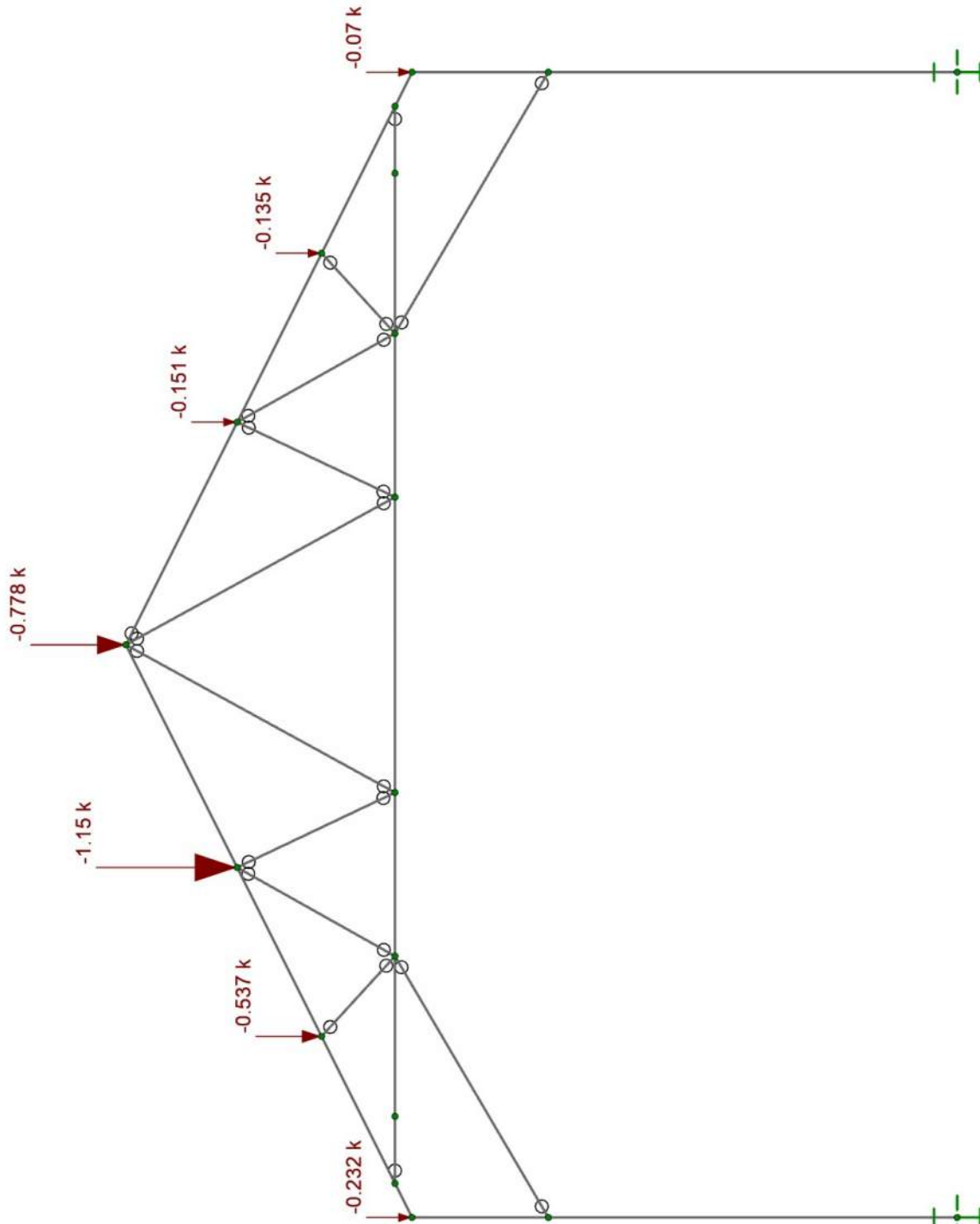
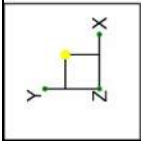


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21' TRUSS INT

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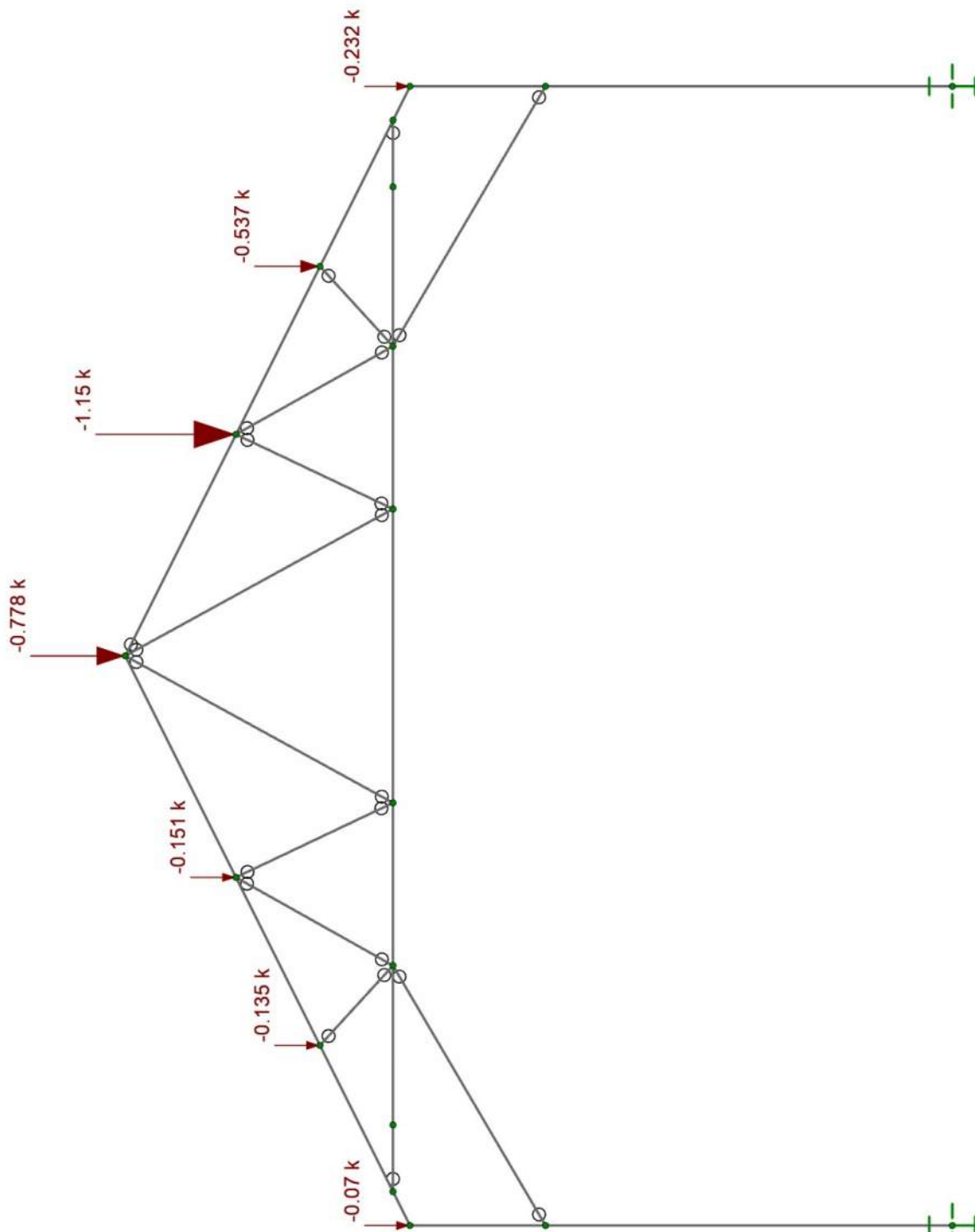
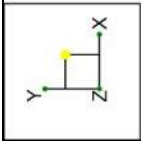
Loads: BLC 13, SUL

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21' TRUSS INT

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Loads: BLC 14, SUR

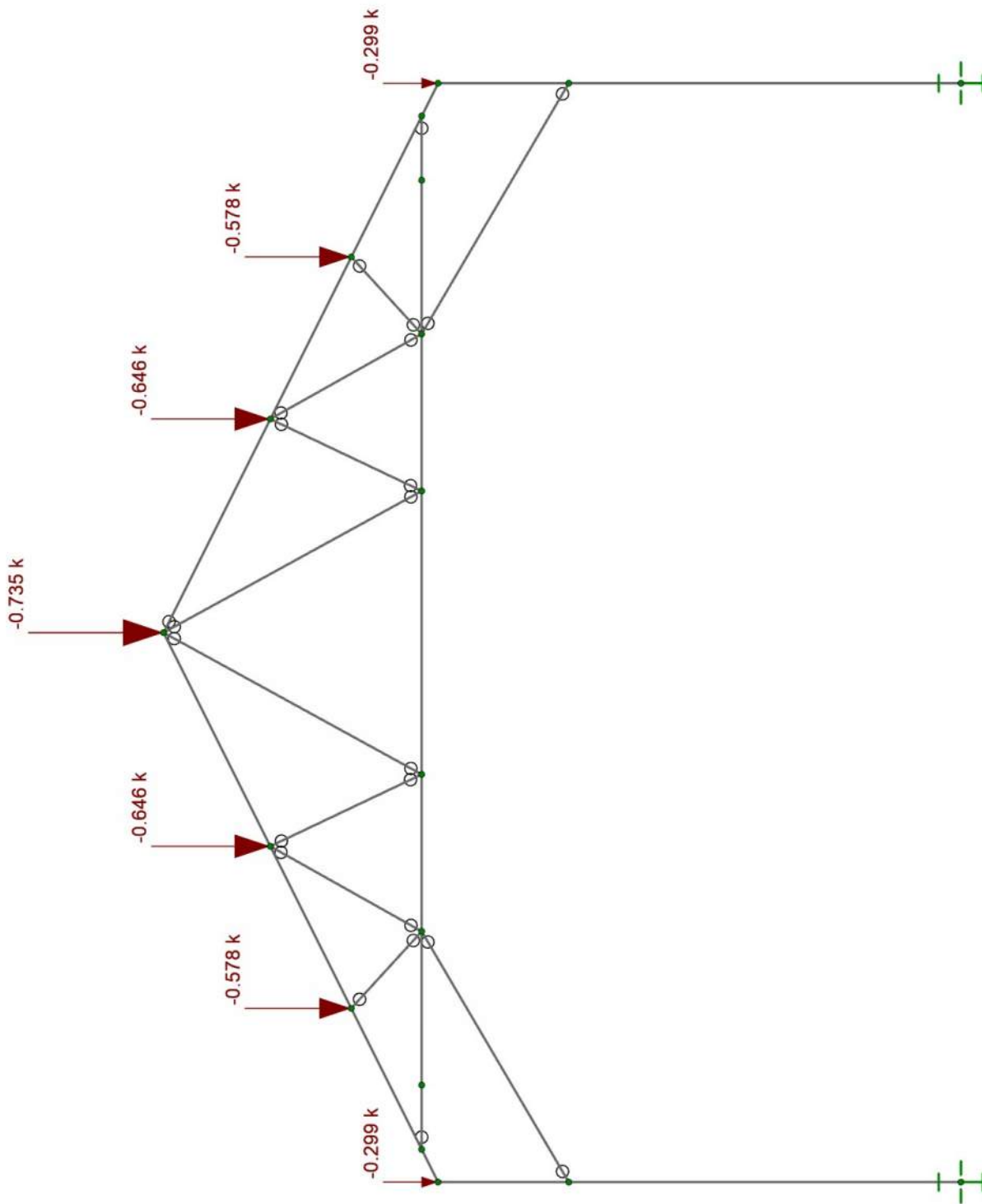
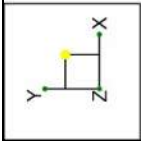


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21' TRUSS INT

Feb 17, 2025 at 01:49 PM

21' Truss - BRACED BAY.r3d



Loads: BLC 15, L

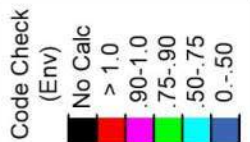


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21' TRUSS INT

Feb 17, 2025 at 01:50 PM

21' Truss - BRACED BAY.r3d

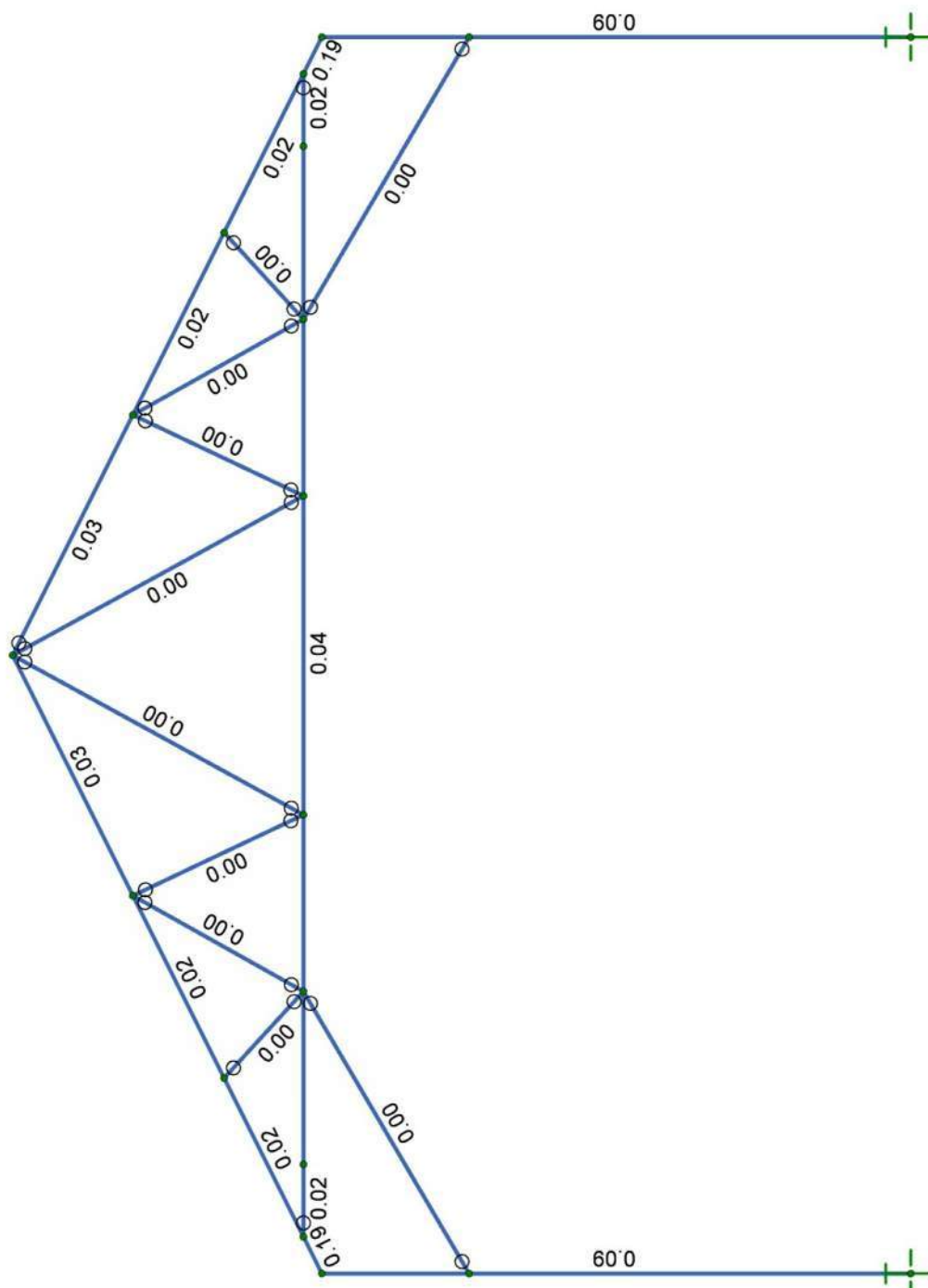
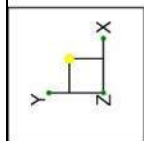


4TH DIMENSION DESIGN, INC

21' TRUSS INT

Feb 17, 2025 at 01:50 PM

21' Truss - BRACED BAY.r3d



Member Shear Checks Displayed (Enveloped)

4TH DIMENSION DESIGN, INC

21' TRUSS INT

Feb 17, 2025 at 01:51 PM

21' Truss - BRACED BAY.r3d



Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : 21' TRUSS INT

2/17/2025
1:53:07 PM
Checked By : _____

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	0	0	0	
2	N1_1	21	0	0	
3	N2	0	7.5	0	
4	N3	1.854167	10.3125	0	
5	N4	4.791667	10.3125	0	
6	N5	7.791667	10.3125	0	
7	N6	0	10	0	
8	N7	0.625001	10.3125	0	
9	N8	3.319519	11.659759	0	
10	N9	6.417371	13.208686	0	
11	N10	19.145833	10.3125	0	
12	N11	16.208333	10.3125	0	
13	N12	13.208333	10.3125	0	
14	N13	20.374999	10.3125	0	
15	N14	17.680481	11.659759	0	
16	N15	14.582629	13.208686	0	
17	N16	10.5	15.25	0	
18	N18	21	10	0	
19	N19	21	7.5	0	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	Y Rot [k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction
2	N8			Reaction	
3	N9			Reaction	
4	N15			Reaction	
5	N14			Reaction	
6	N6			Reaction	
7	N18			Reaction	
8	N16			Reaction	
9	N1_1	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$10^{-6}/^{\circ}\text{F}$]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	CR50	29000	11154	0.3	0.65	0.49	50	1.5	65	1.2
7	CR55	29000	11154	0.3	0.65	0.49	55	1.5	65	1.2
8	CR60	29000	11154	0.3	0.65	0.49	60	1.5	70	1.2
9	PIPE35	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N6	COL11	Column	None	CR60	Typical
2	M7	N3	N10	BOTCH16	Beam	None	CR50	Typical
3	M22	N3	N7	STUB	Beam	None	CR50	Typical
4	M17	N4	N8	WEB16	Beam	None	CR50	Typical
5	M16	N4	N9	WEB16	Beam	None	CR50	Typical



Company : 4TH DIMENSION DESIGN, INC
 Designer :
 Job Number :
 Model Name : 21' TRUSS INT

2/17/2025
 1:53:07 PM
 Checked By : _____

Member Primary Data (Continued)

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
6	M15	N5	N9	WEB16	Beam	None	CR50	Typical
7	M14	N5	N16	WEB16	Beam	None	CR50	Typical
8	M3	N6	N7	BRACKET10GUS	Beam	None	CR50	Typical
9	M8	N7	N8	TOPCH	Beam	None	CR50	Typical
10	M9	N8	N9	TOPCH	Beam	None	CR50	Typical
11	M10	N9	N16	TOPCH	Beam	None	CR50	Typical
12	M23	N10	N13	STUB	Beam	None	CR50	Typical
13	M21	N11	N14	WEB16	Beam	None	CR50	Typical
14	M20	N11	N15	WEB16	Beam	None	CR50	Typical
15	M19	N12	N15	WEB16	Beam	None	CR50	Typical
16	M18	N12	N16	WEB16	Beam	None	CR50	Typical
17	M4	N18	N13	BRACKET10GUS	Beam	None	CR50	Typical
18	M11	N13	N14	TOPCH	Beam	None	CR50	Typical
19	M12	N14	N15	TOPCH	Beam	None	CR50	Typical
20	M13	N15	N16	TOPCH	Beam	None	CR50	Typical
21	M5	N2	N4	KNEEBRACE16	Beam	None	CR50	Typical
22	M6	N19	N11	KNEEBRACE16	Beam	None	CR50	Typical
23	M1_1	N1_1	N18	COL11	Column	None	CR60	Typical

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	D+S	Yes	Y	1	1	2	1		
2	.6D+0.6W1>	Yes	Y	1	0.6	3	0.6		
3	.6D+0.6W1<	Yes	Y	1	0.6	4	0.6		
4	.6D+0.6W2>	Yes	Y	1	0.6	5	0.6		
5	.6D+0.6W2<	Yes	Y	1	0.6	6	0.6		
6	.6D+0.6W3^	Yes	Y	1	0.6	7	0.6		
7	.6D+0.6W3v	Yes	Y	1	0.6	8	0.6		
8	.6D+0.6W4^	Yes	Y	1	0.6	9	0.6		
9	.6D+0.6W4v	Yes	Y	1	0.6	10	0.6		
10	D+0.6W1>	Yes	Y	1	1	3	0.6		
11	D+0.6W1<	Yes	Y	1	1	4	0.6		
12	D+0.6W2>	Yes	Y	1	1	5	0.6		
13	D+0.6W2<	Yes	Y	1	1	6	0.6		
14	D+0.6W3^	Yes	Y	1	1	7	0.6		
15	D+0.6W3v	Yes	Y	1	1	8	0.6		
16	D+0.6W4^	Yes	Y	1	1	9	0.6		
17	D+0.6W4v	Yes	Y	1	1	10	0.6		
18	D+.75S+.45W1>	Yes	Y	1	1	2	0.75	3	0.45
19	D+.75S+.45W1<	Yes	Y	1	1	2	0.75	4	0.45
20	D+.75S+.45W2>	Yes	Y	1	1	2	0.75	5	0.45
21	D+.75S+.45W2<	Yes	Y	1	1	2	0.75	6	0.45
22	D+.75S+.45W3^	Yes	Y	1	1	2	0.75	7	0.45
23	D+.75S+.45W3v	Yes	Y	1	1	2	0.75	8	0.45
24	D+.75S+.45W4^	Yes	Y	1	1	2	0.75	9	0.45
25	D+.75S+.45W4v	Yes	Y	1	1	2	0.75	10	0.45
26	.6D+0.6WMIN>	Yes	Y	1	0.6	11	0.6		
27	.6D+0.6WMIN<	Yes	Y	1	0.6	12	0.6		
28	D+0.6WMIN>	Yes	Y	1	1	11	0.6		
29	D+0.6WMIN<	Yes	Y	1	1	12	0.6		
30	D+.75S+.45WMIN>	Yes	Y	1	1	2	0.75	11	0.45
31	D+.75S+.45WMIN<	Yes	Y	1	1	2	0.75	12	0.45
32	D+SUL	Yes	Y	1	1	13	1		
33	D+SUR	Yes	Y	1	1	14	1		
34	D+L	Yes	Y	1	1	15	1		

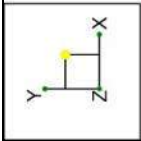


Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : 21' TRUSS INT

2/17/2025
1:53:07 PM
Checked By : _____

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
35	D+0.75L+0.45W1>	Yes	Y	1	1	15	0.75	3	0.45
36	D+0.75L+0.45W1<	Yes	Y	1	1	15	0.75	4	0.45
37	D+0.75L+0.45W2>	Yes	Y	1	1	15	0.75	5	0.45
38	D+0.75L+0.45W2<	Yes	Y	1	1	15	0.75	6	0.45
39	D+0.75L+0.45W3^	Yes	Y	1	1	15	0.75	7	0.45
40	D+0.75L+0.45W3v	Yes	Y	1	1	15	0.75	8	0.45
41	D+0.75L+0.45W4^	Yes	Y	1	1	15	0.75	9	0.45
42	D+0.75L+0.45W4v	Yes	Y	1	1	15	0.75	10	0.45
43	D+0.75L+0.45WMIN>	Yes	Y	1	1	15	0.75	11	0.45
44	D+0.75L+0.45WMIN<	Yes	Y	1	1	15	0.75	12	0.45



TOP CHORD TO BRACKET:

$$\left(\left(\frac{5.81}{3} \right)^2 + \left(0.2/3 + 0.4 \cdot \frac{12}{7} \right)^2 \right)^{0.5} = 2.1K$$

1/2-16-2-N = OK

TOP CHORD = (2)
1/2-16-2-N, OK

ALL WEB OK w/
3/8-16-2-N

5K TENSION, (2)
1/2-16-2-N = 6.996K

KNEE BRACES
1/2-16-2-N = OK

UPLIFT IN COL'S - 3/8"
THRU-BOLT = OK

KNEE BRACE BRACKET THRU COL
1/2-11-1-N = OK

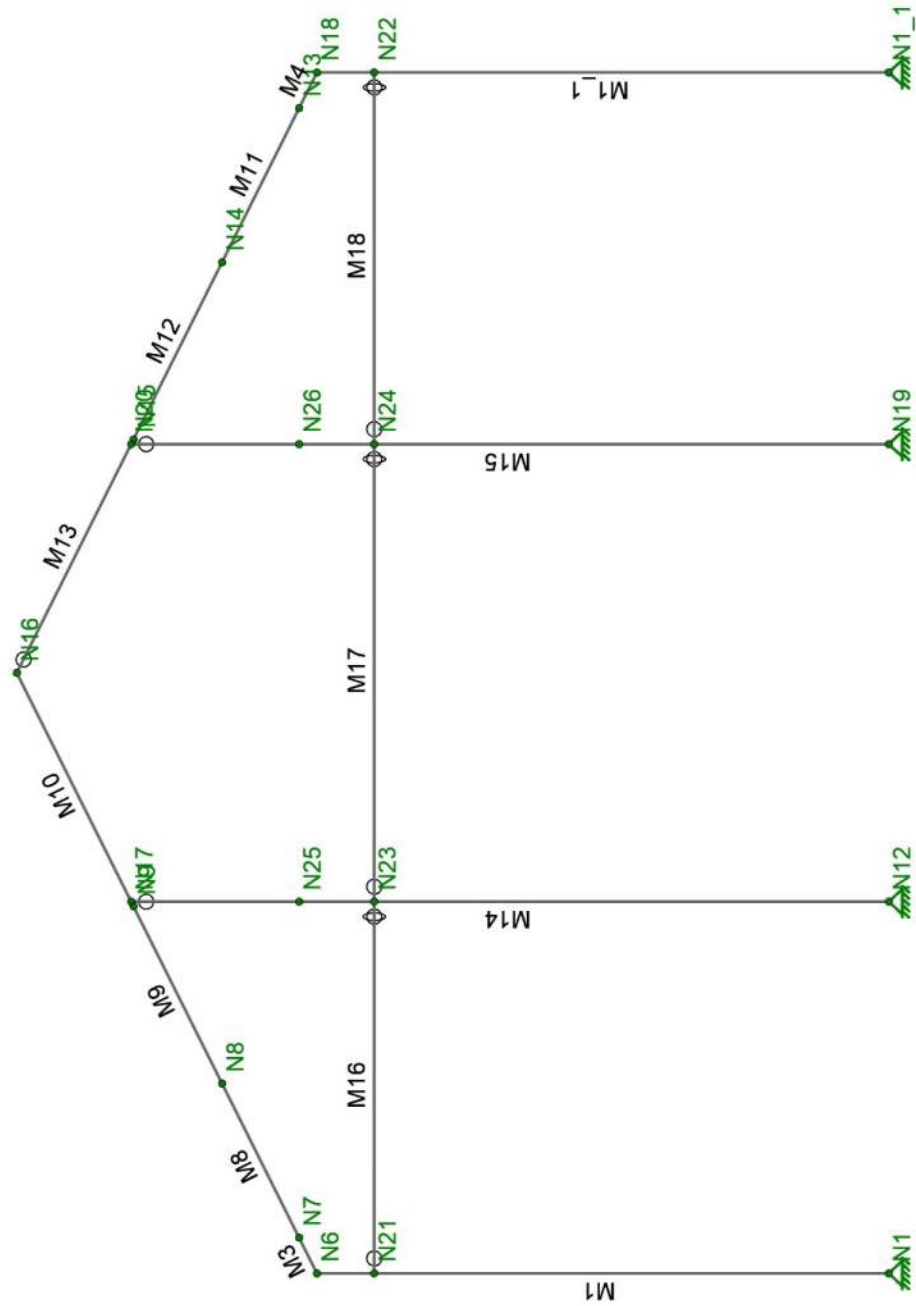
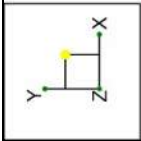
4TH DIMENSION DESIGN, INC

21' TRUSS INT

APPLIES TO BRACED BAY ALSO

Feb 13, 2025 at 04:02 PM

21' Truss.r3d

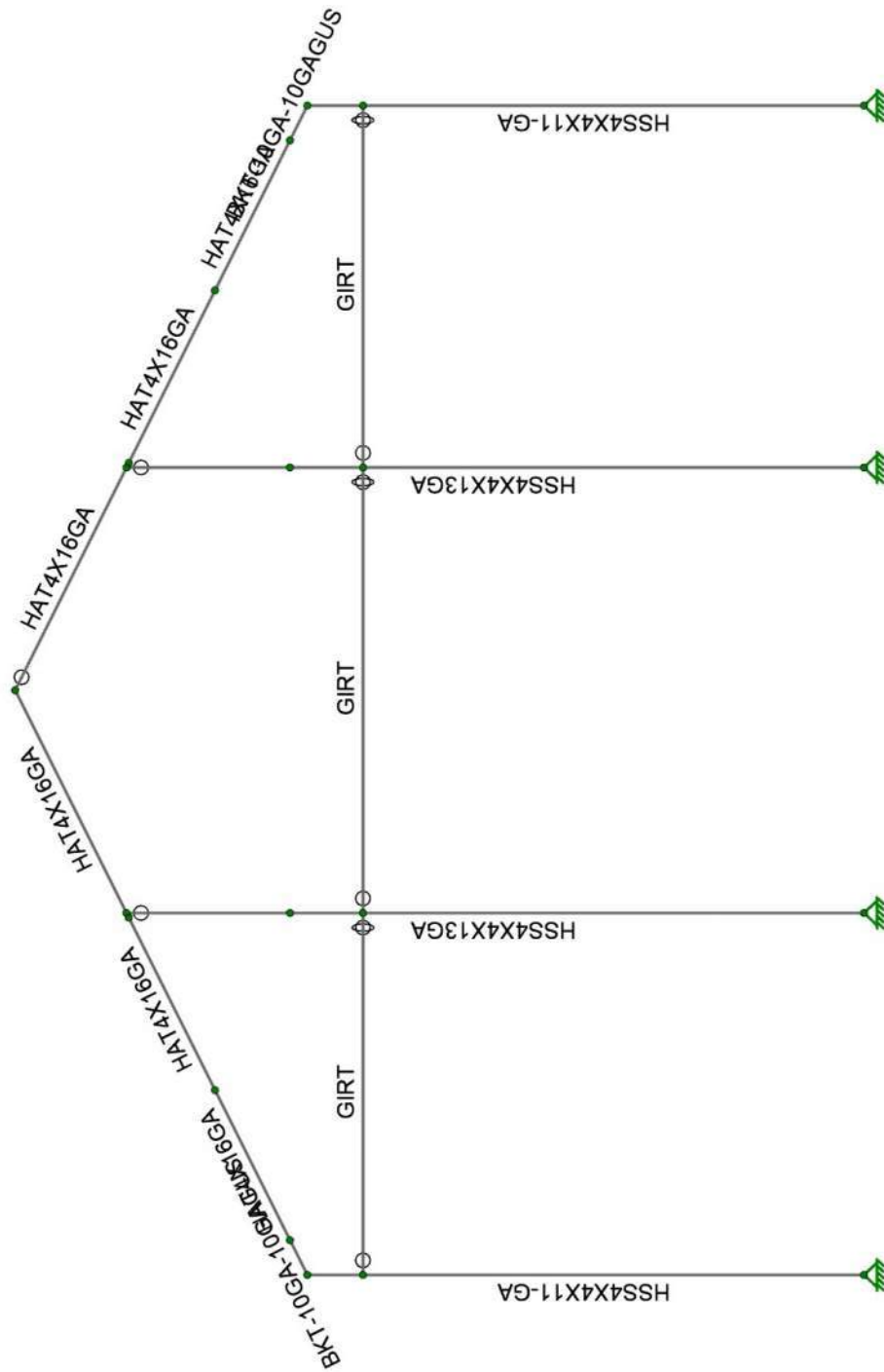
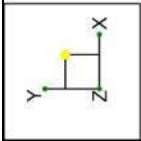


4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 08:52 AM

21' end.r3d

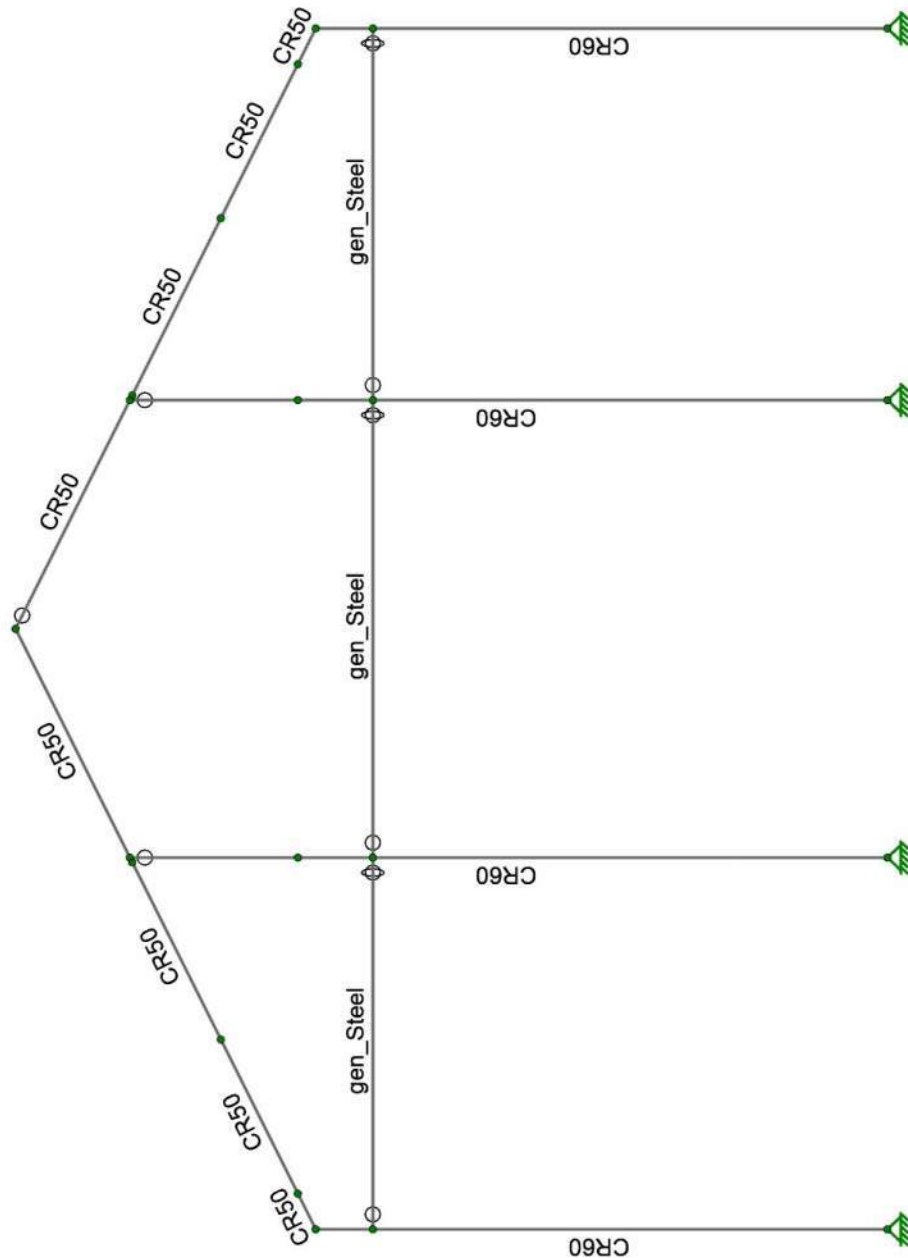
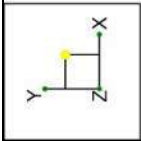


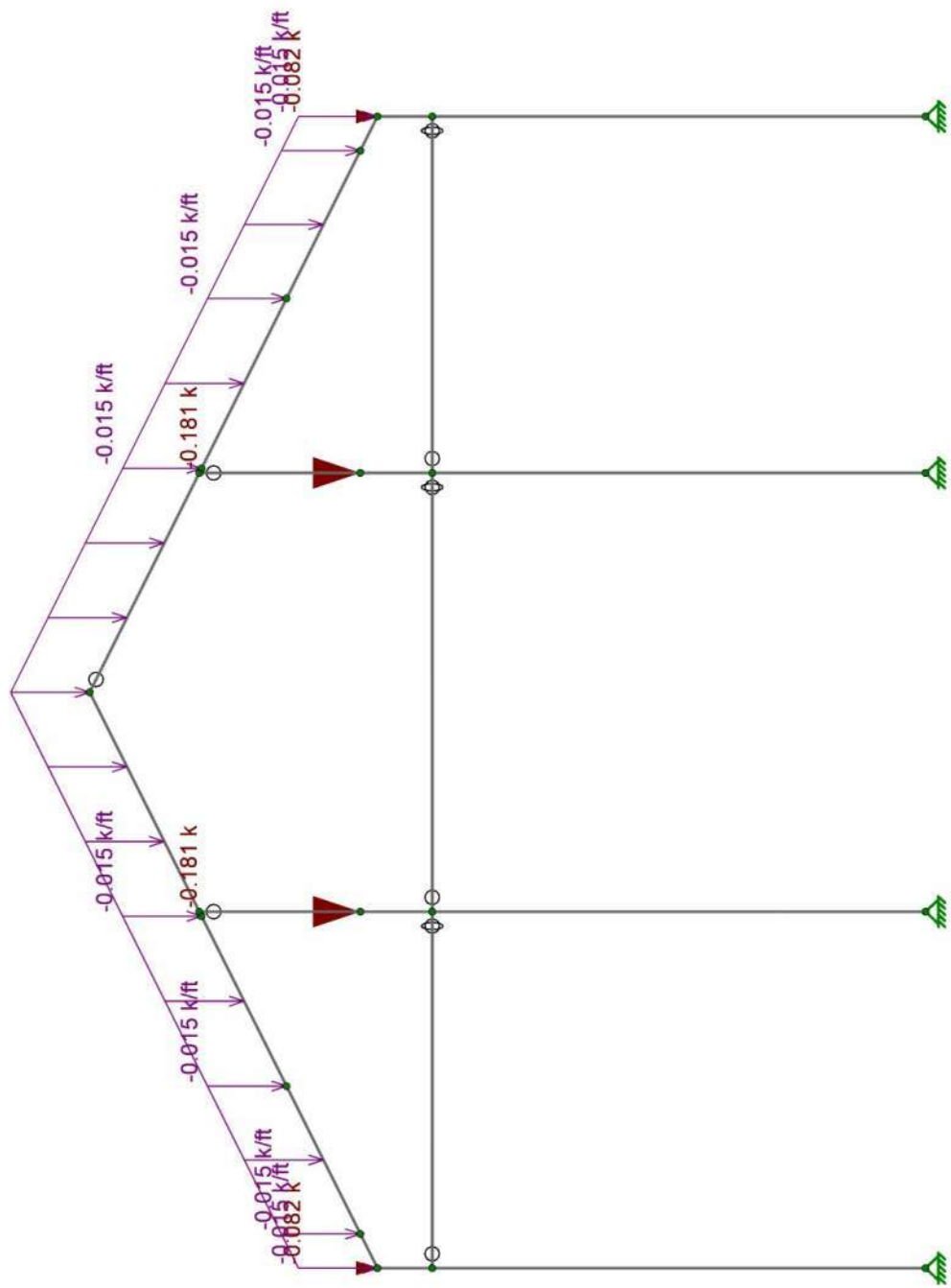
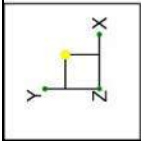
4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:22 AM

21' end.r3d





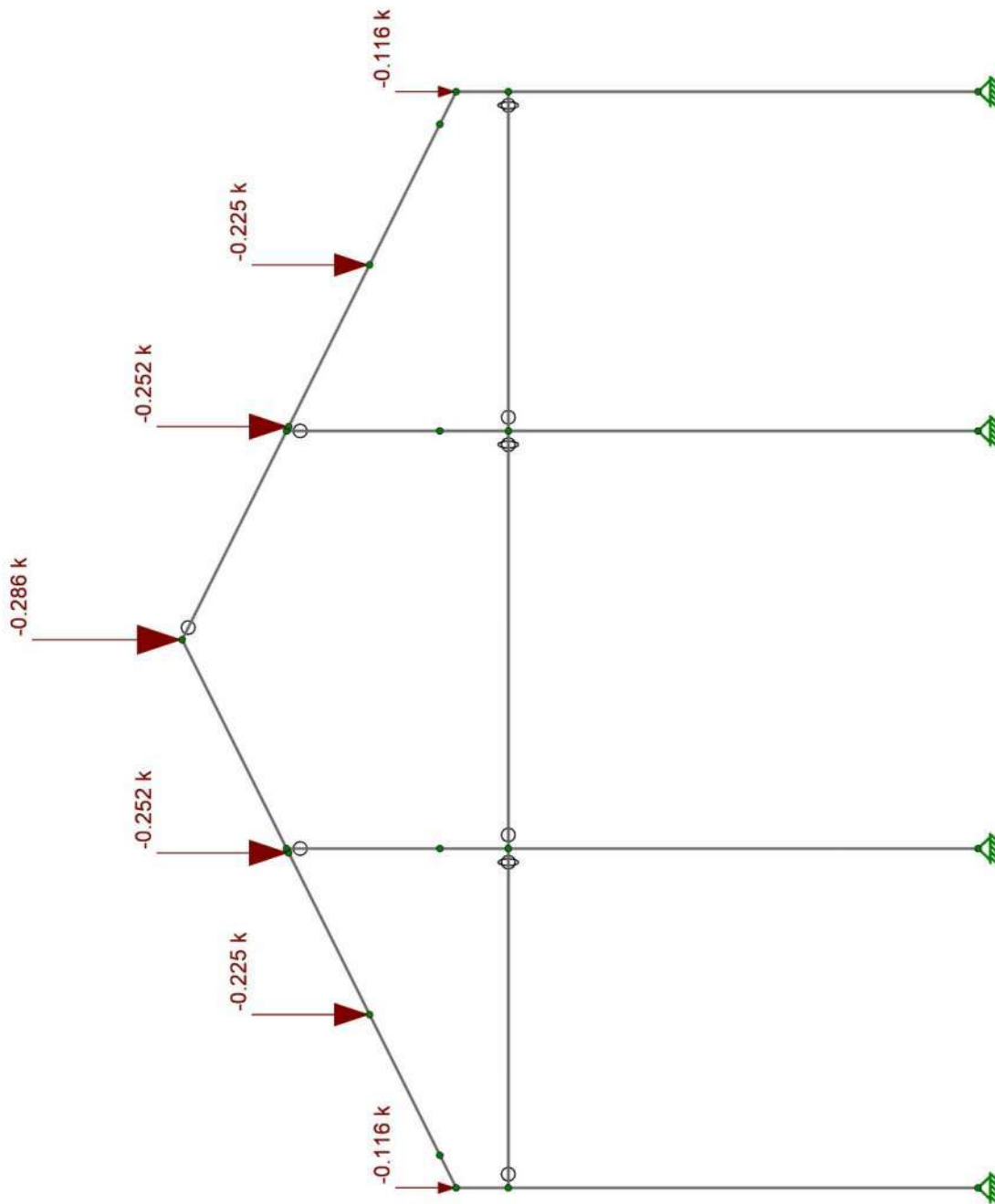
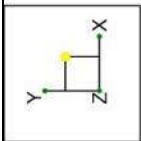
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:23 AM

21' end.r3d



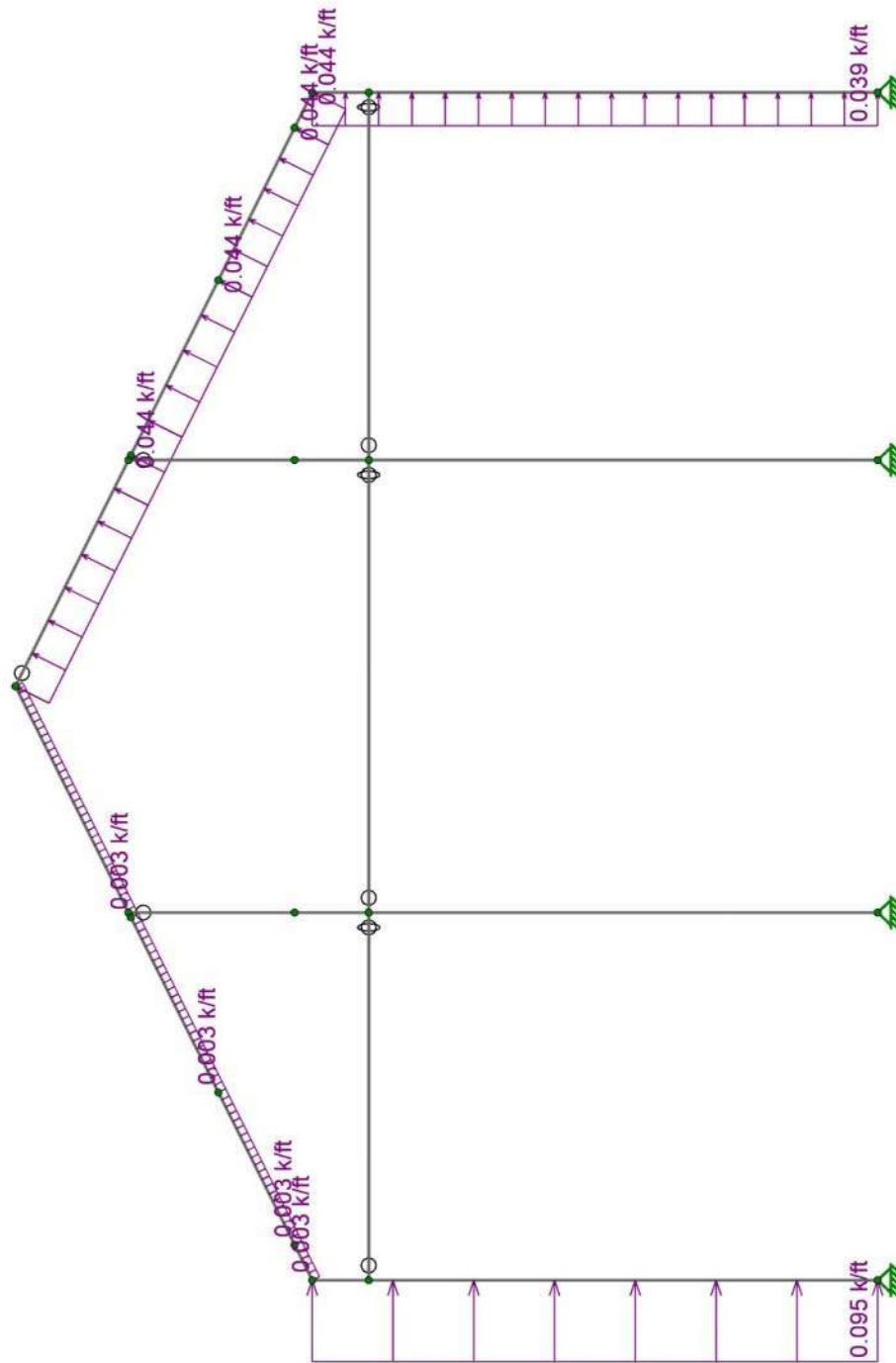
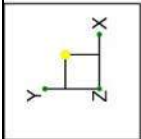
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:23 AM

21' end.r3d



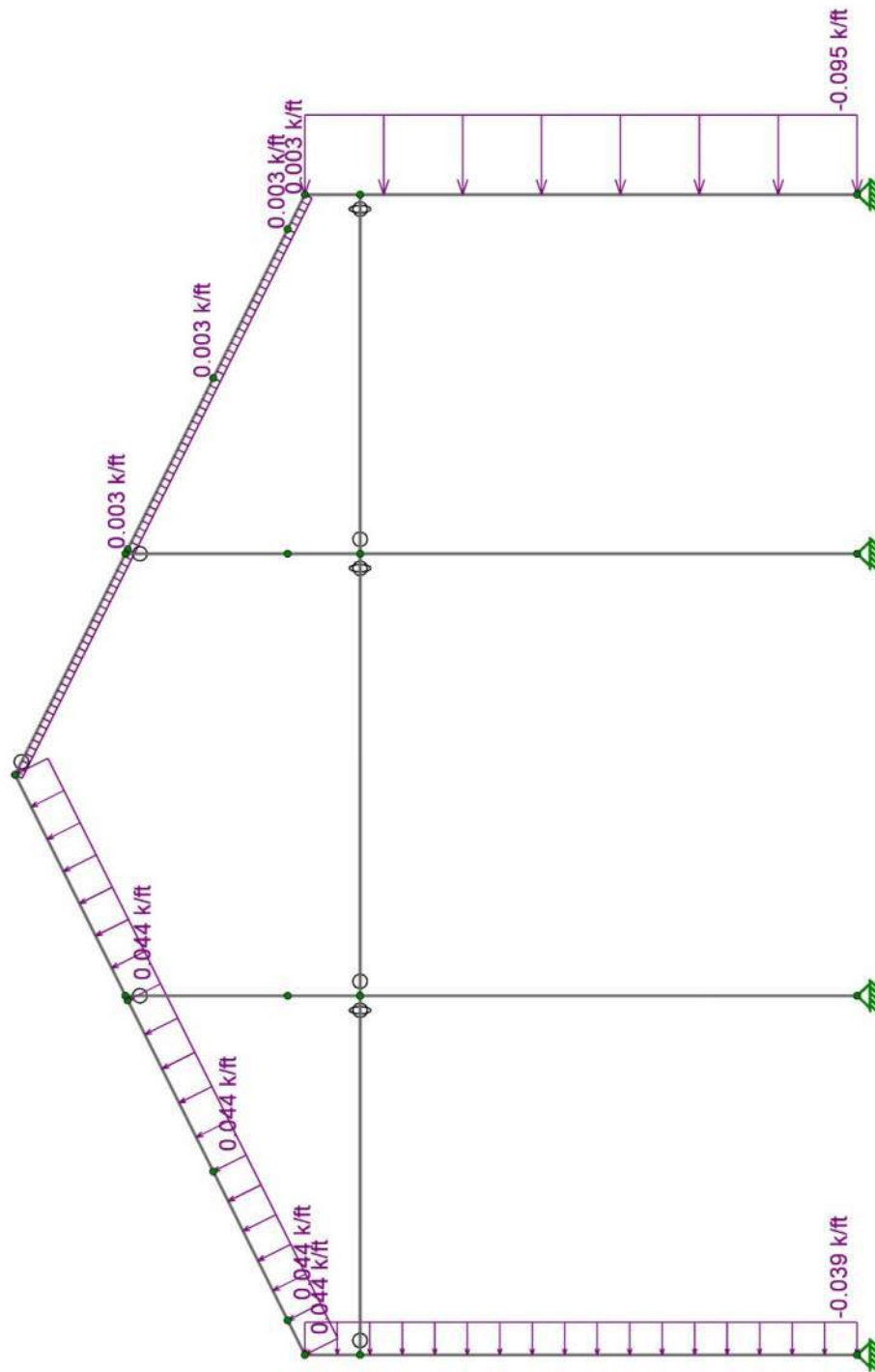
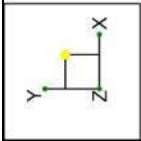
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:23 AM

21' end.r3d



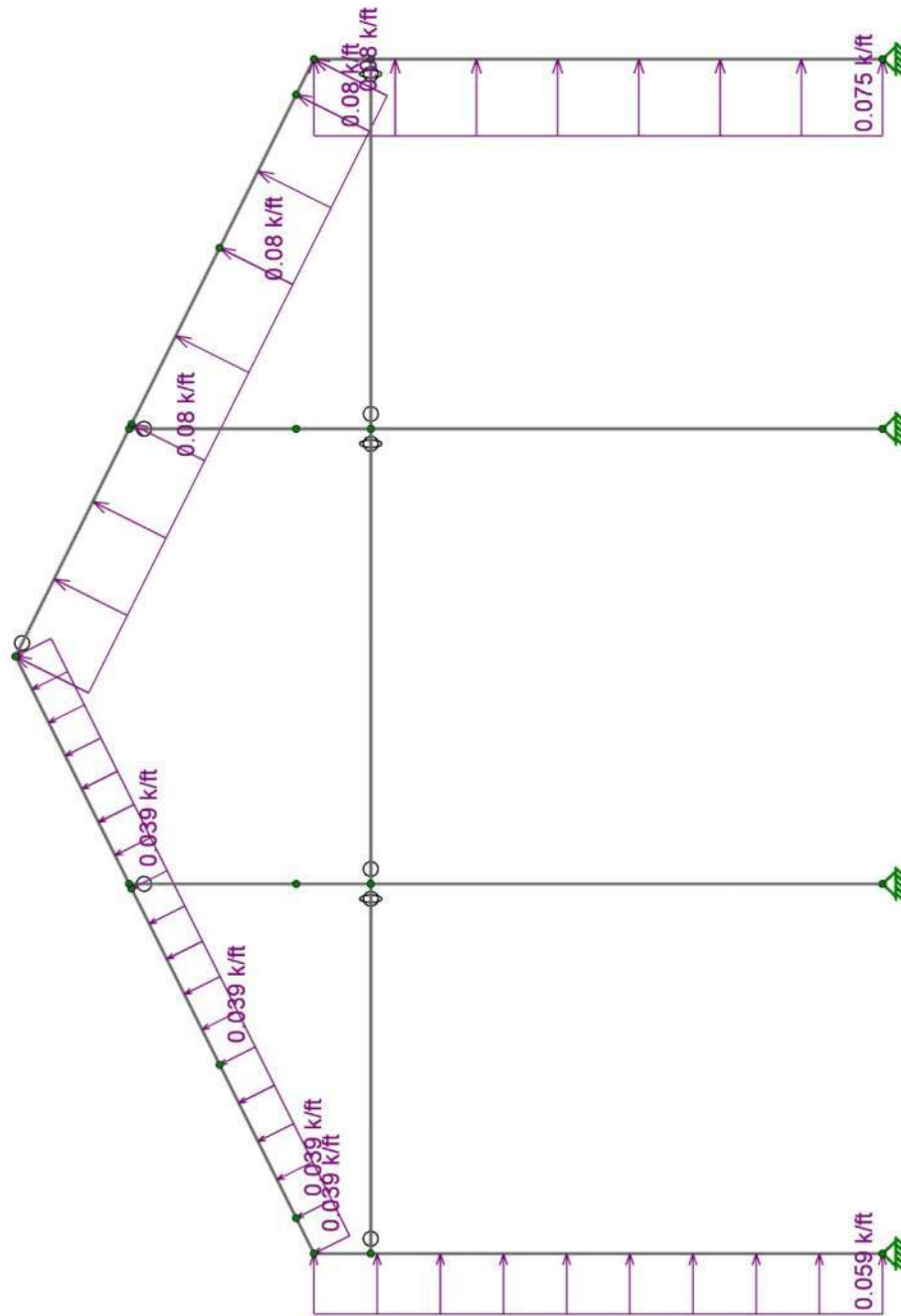
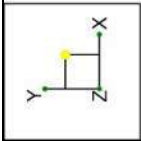
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:23 AM

21' end.r3d



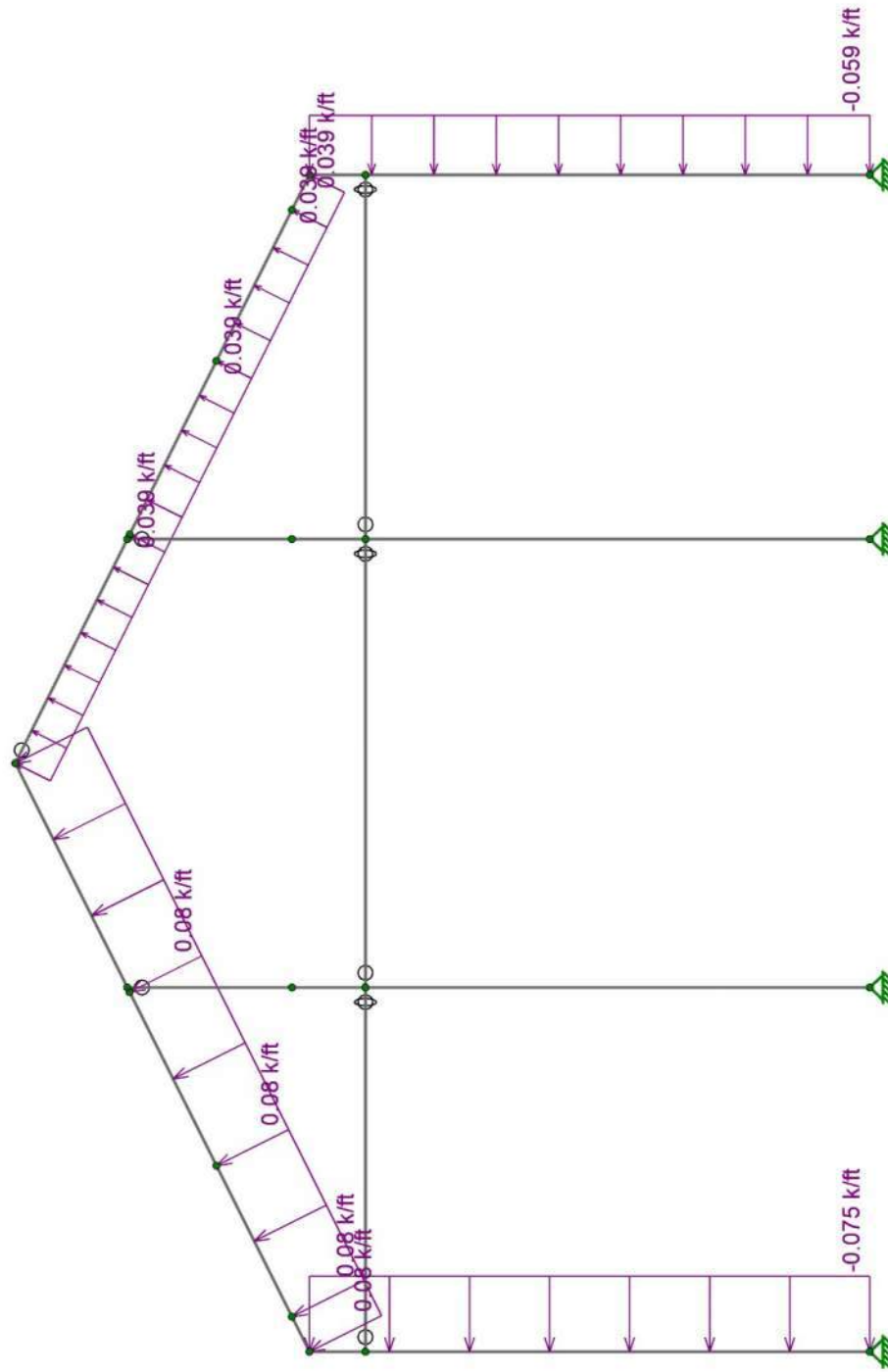
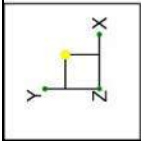
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:23 AM

21' end.r3d



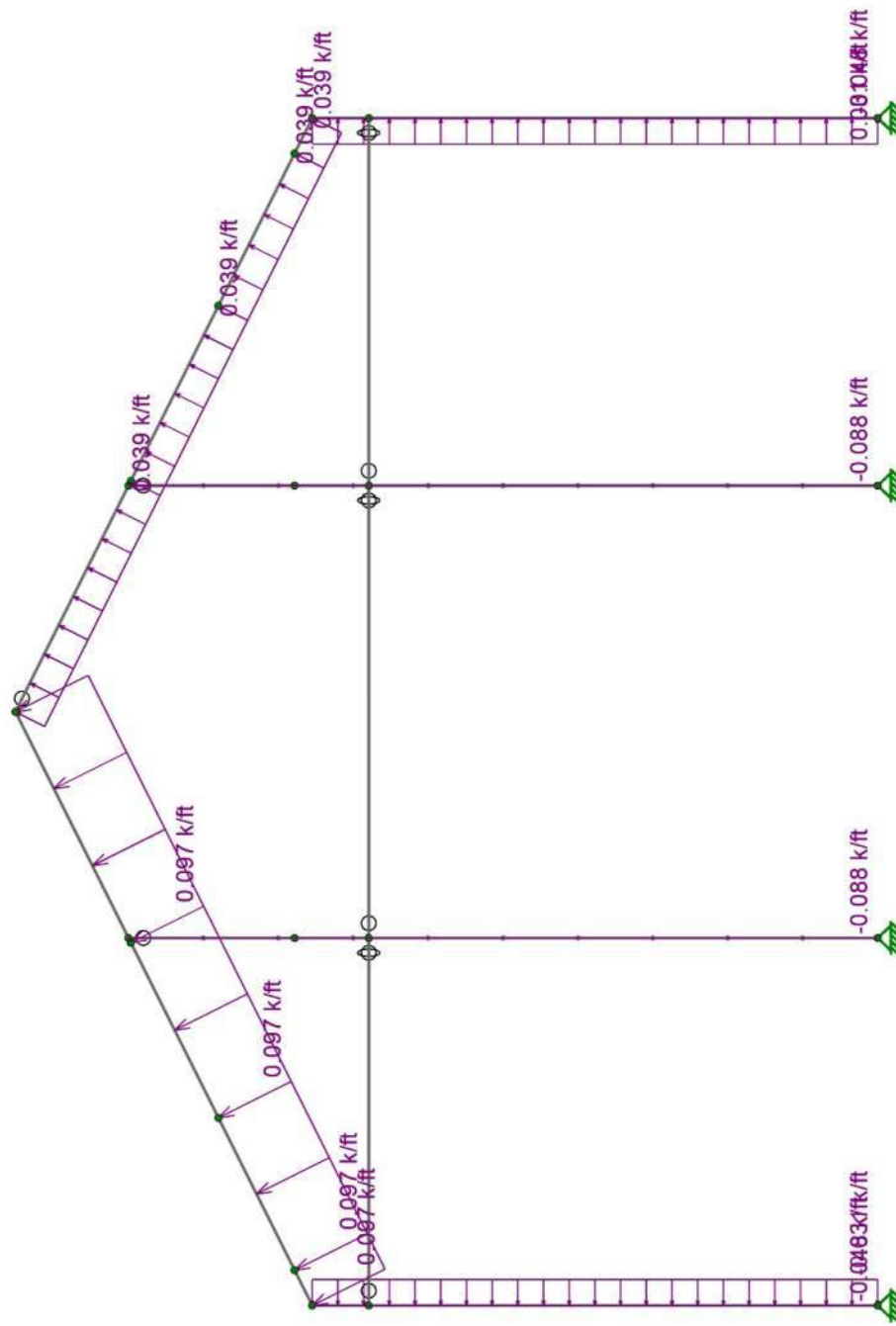
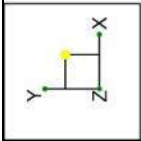
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:24 AM

21' end.r3d



Loads: BLC 7, W3^

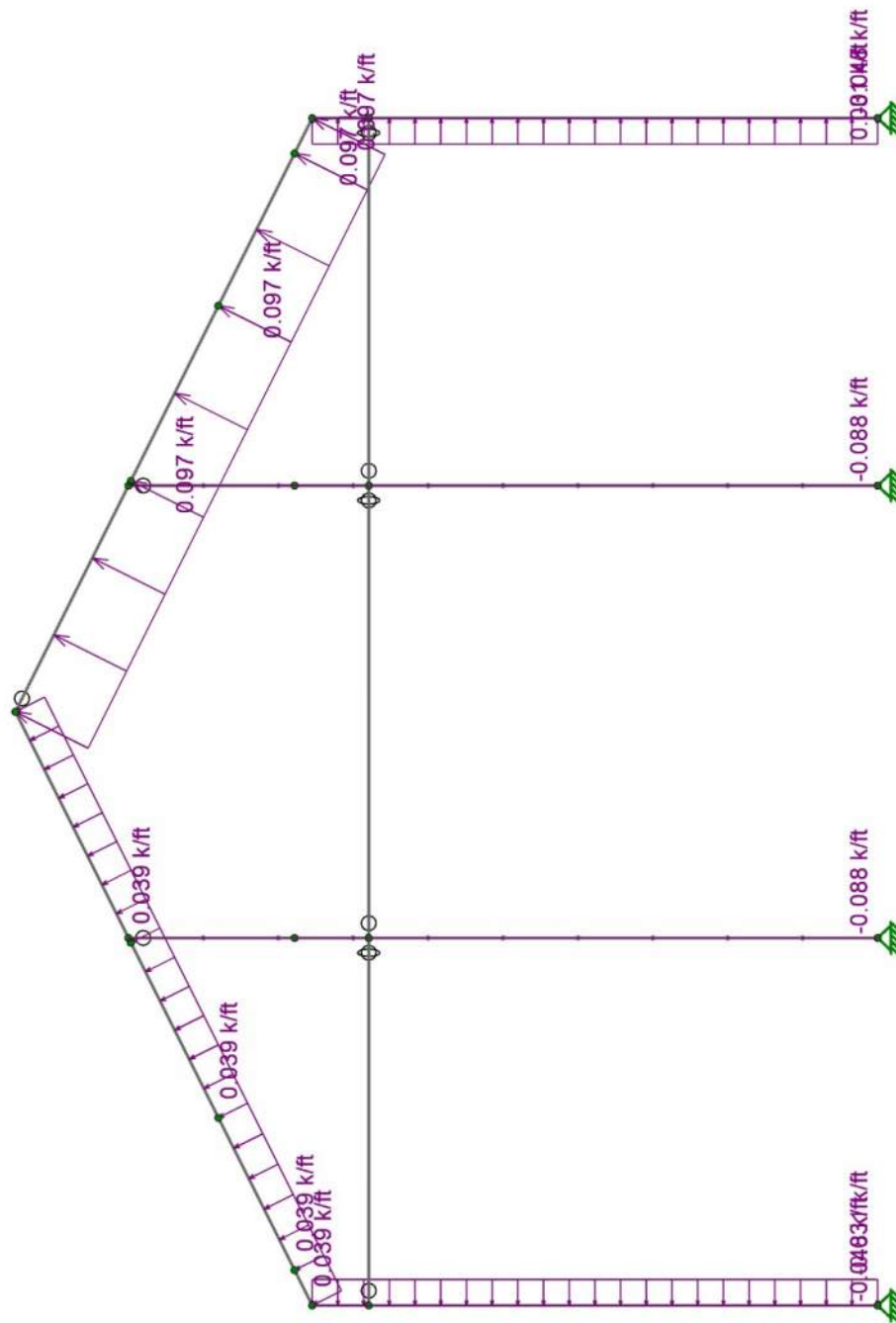
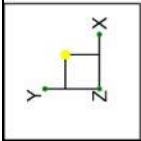


4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:24 AM

21' end.r3d



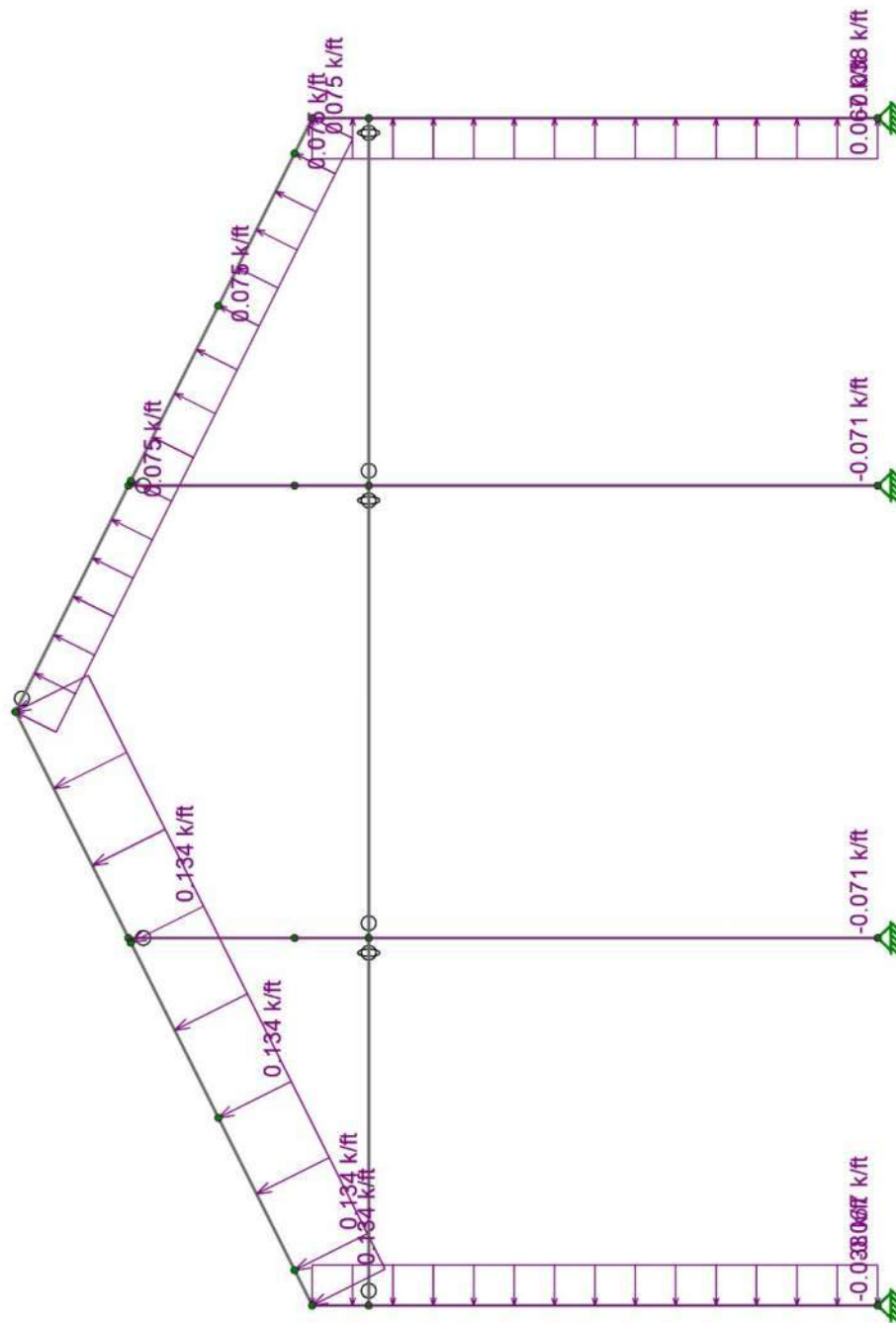
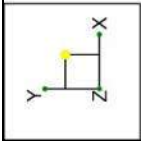
Loads: BLC 8, W3v

4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:24 AM

21' end.r3d



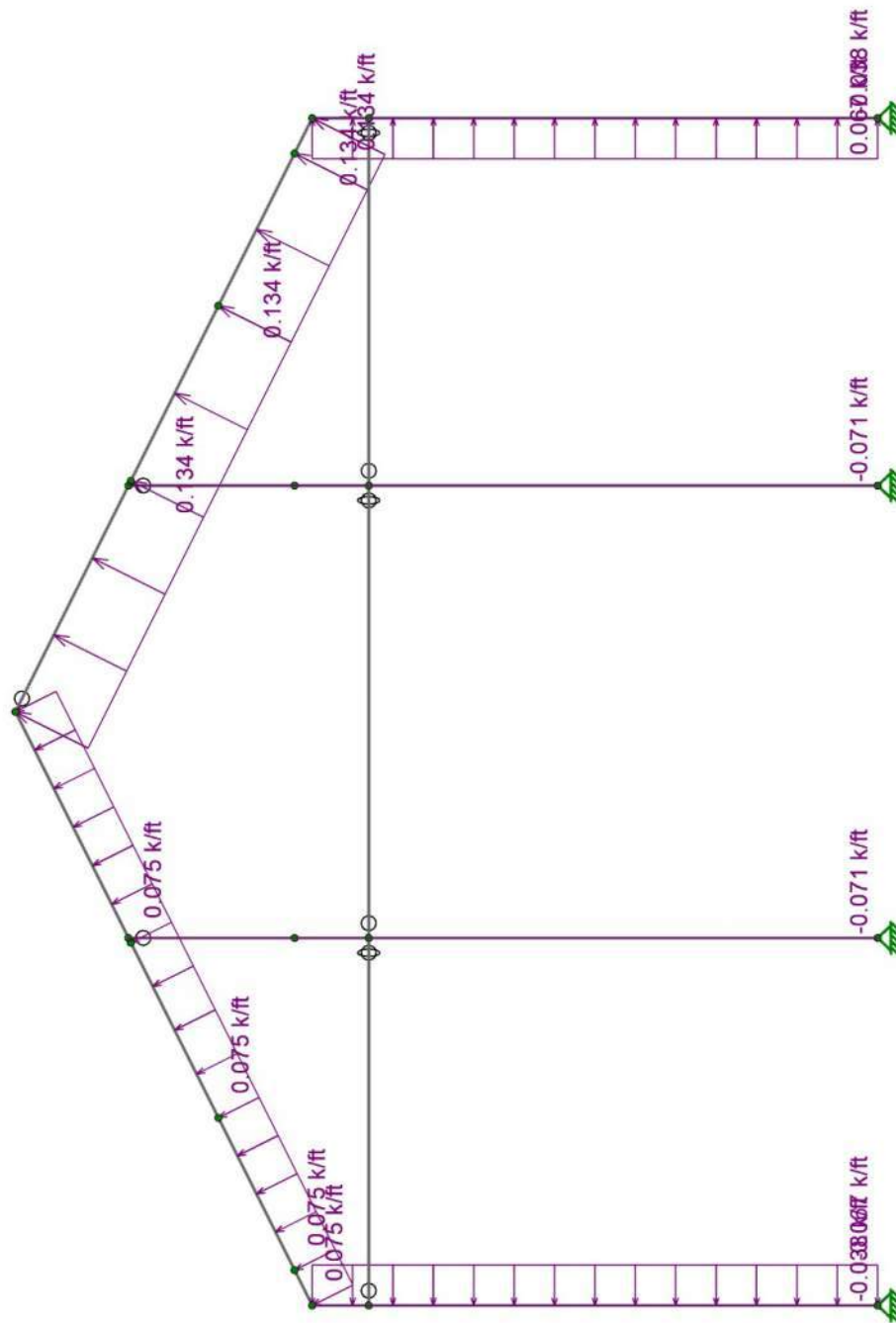
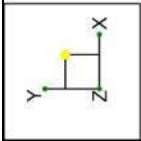
Loads: BLC 9, W4^

4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:24 AM

21' end.r3d



Loads: BLC 10, W4v

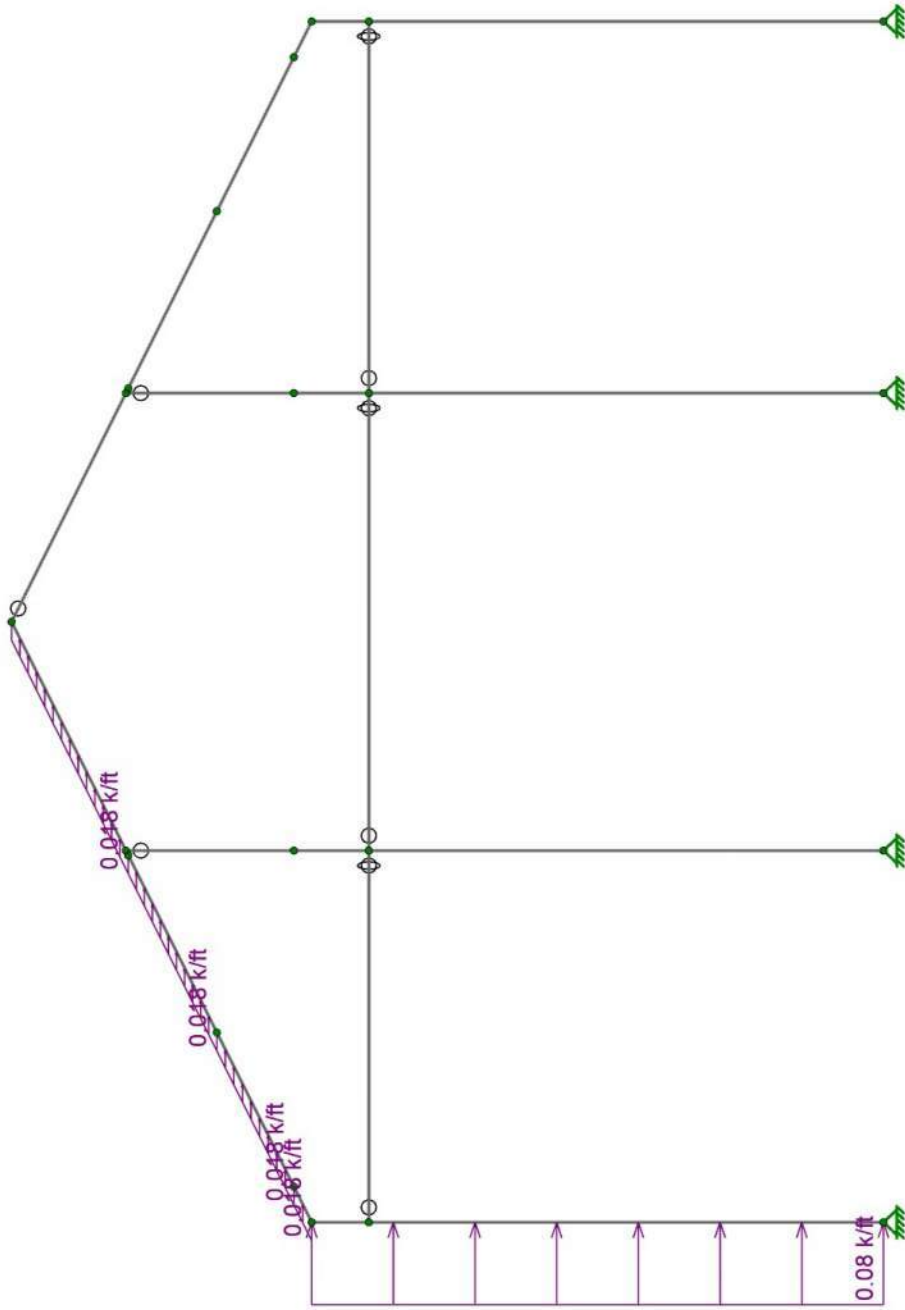
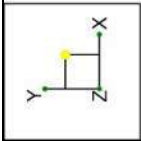


4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:24 AM

21' end.r3d



Loads: BLC 11, WMIN>

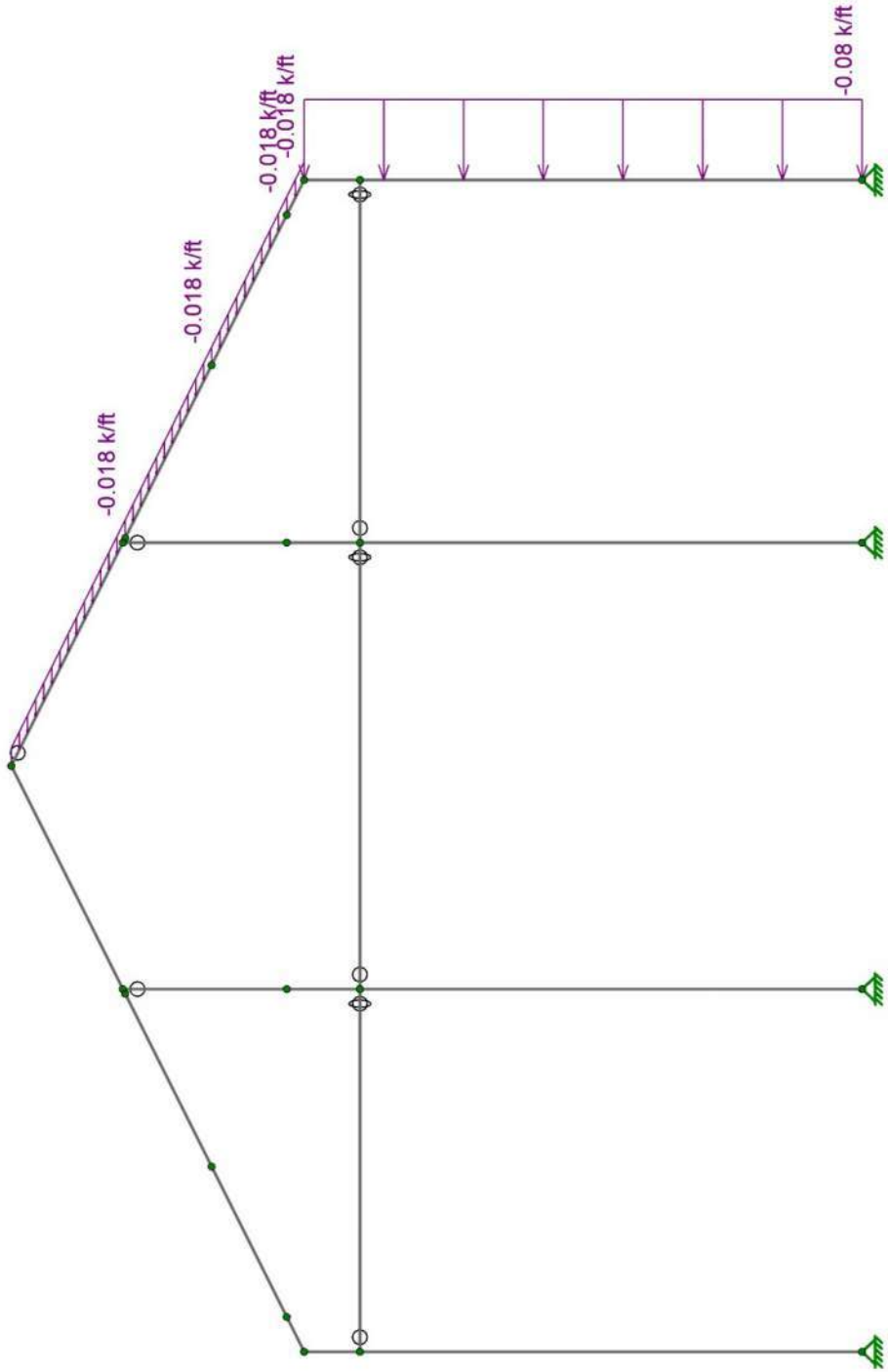
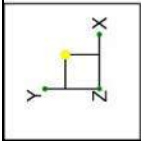


4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:25 AM

21' end.r3d



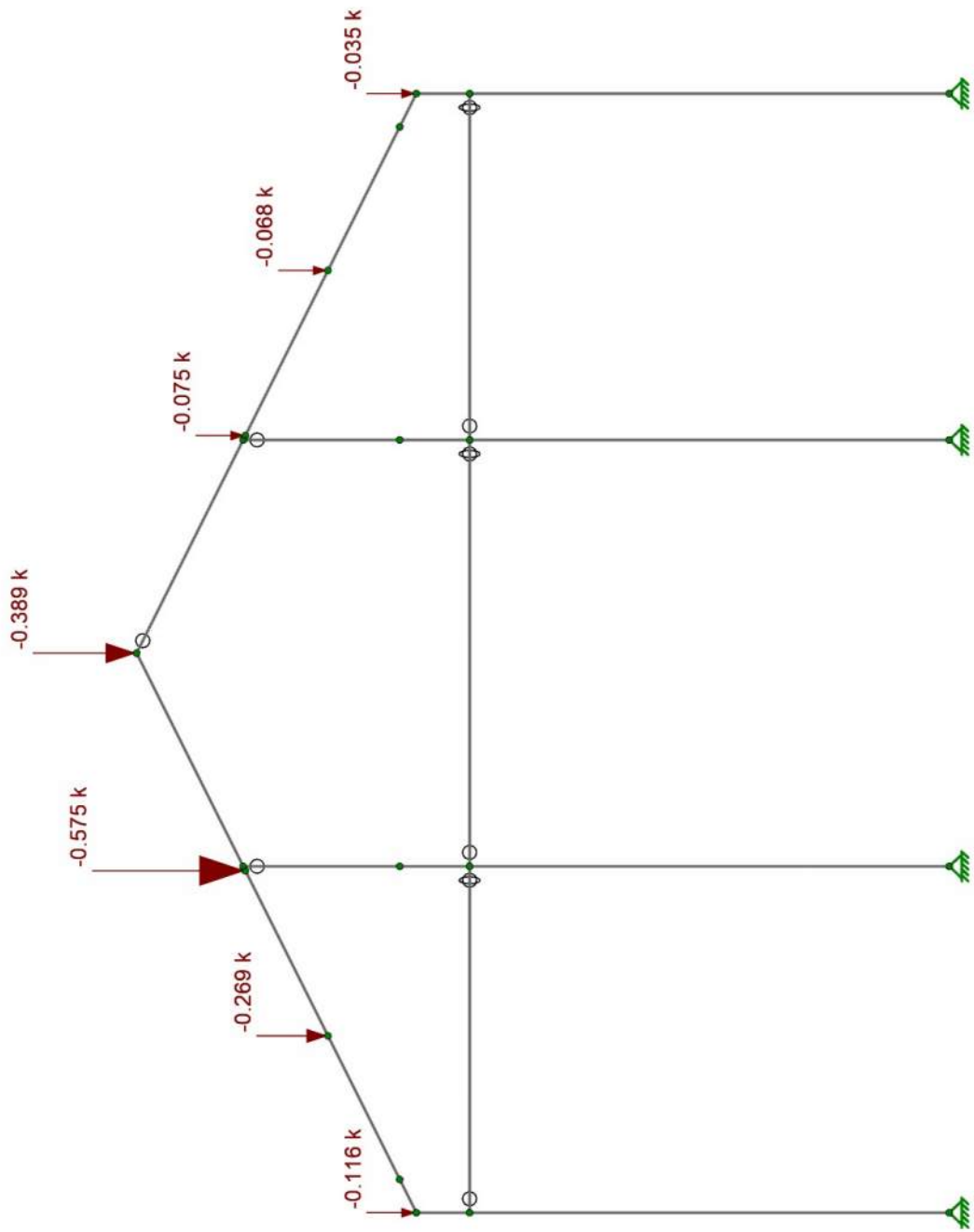
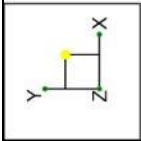
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:25 AM

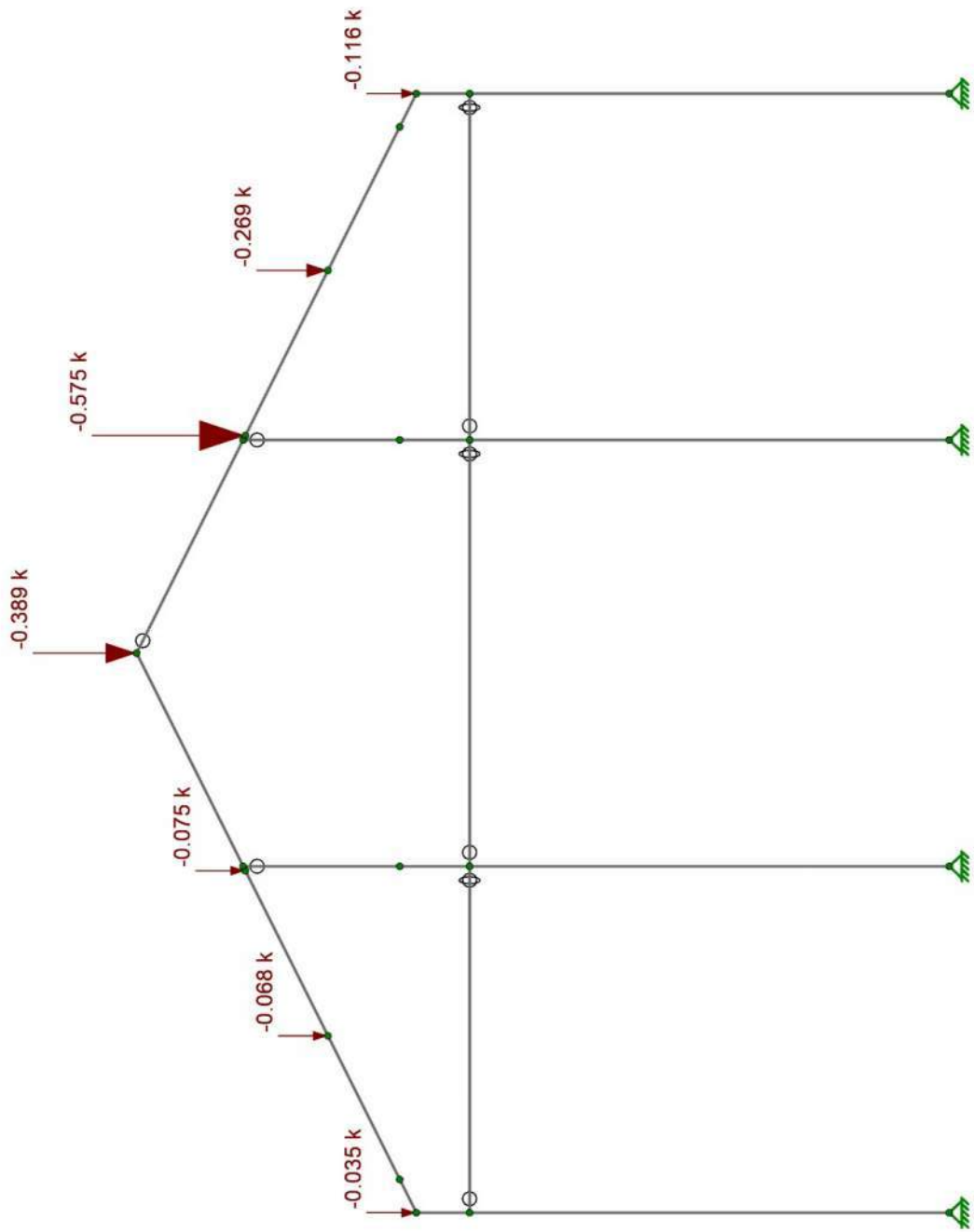
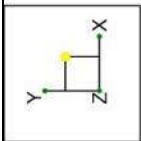
21' end.r3d



Loads: BLC 13, SUL

4TH DIMENSION DESIGN, INC

21' TRUSS END



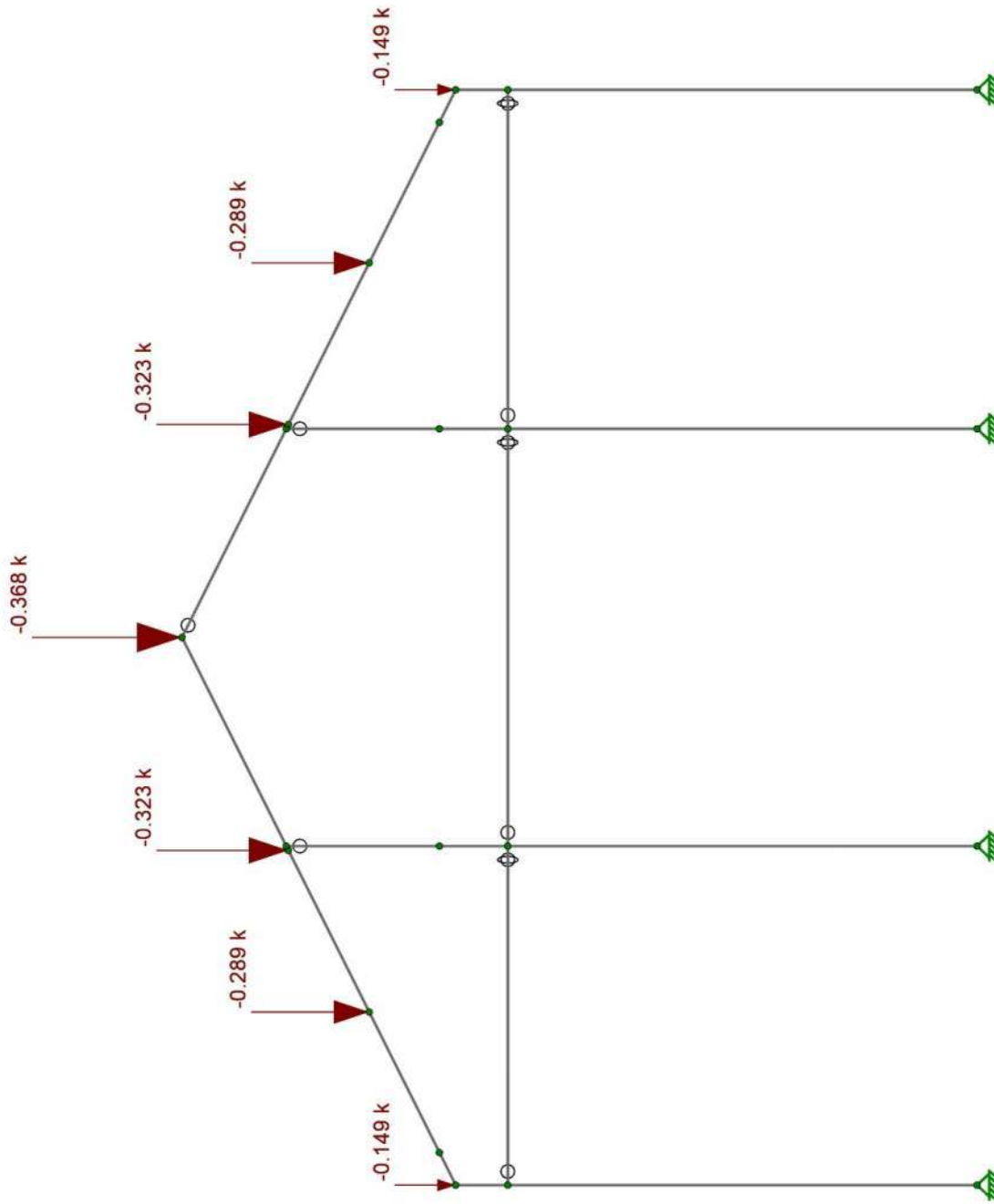
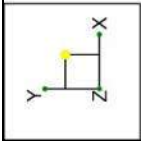
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:25 AM

21' end.r3d



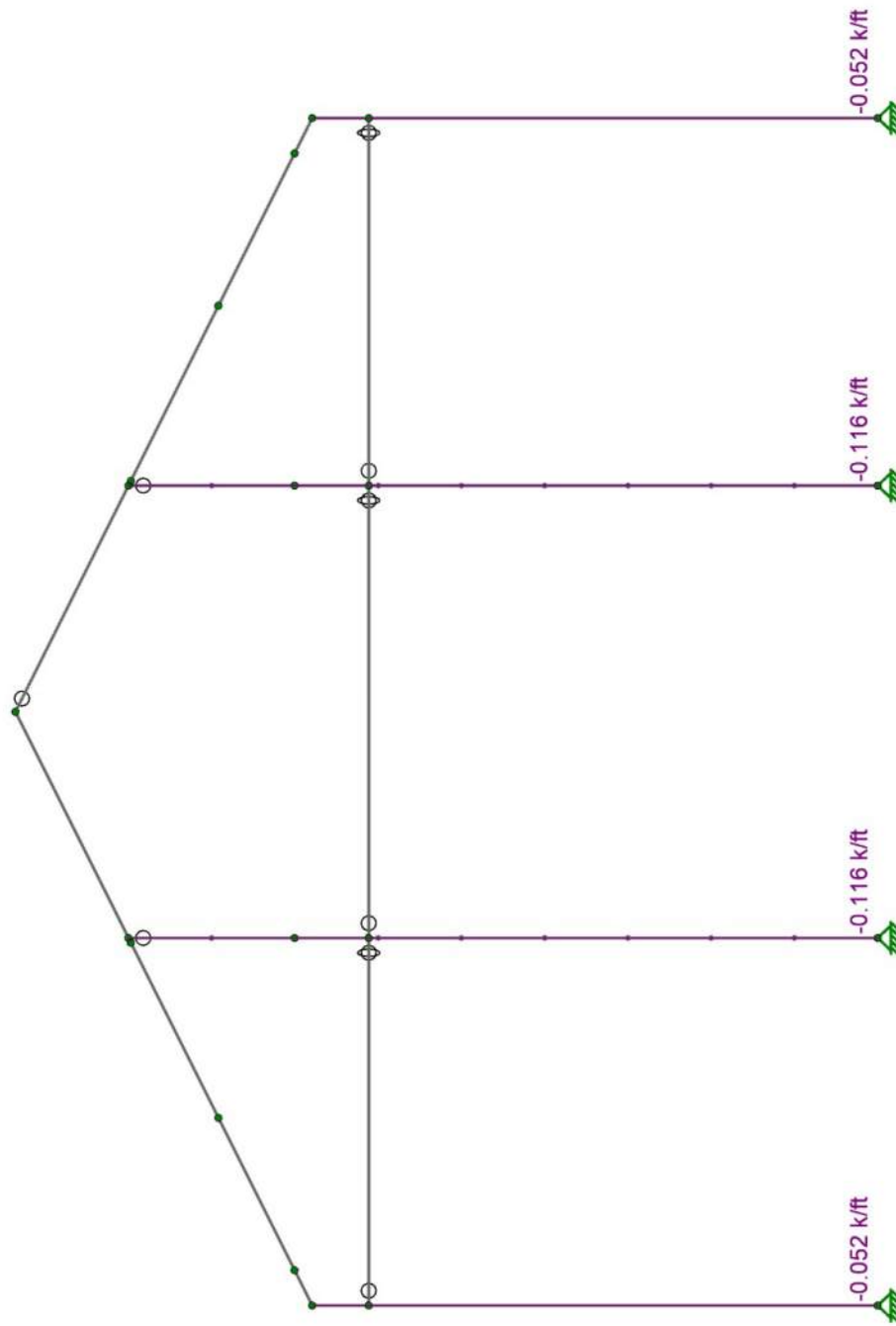
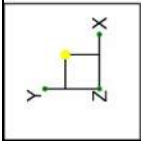
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:25 AM

21' end.r3d



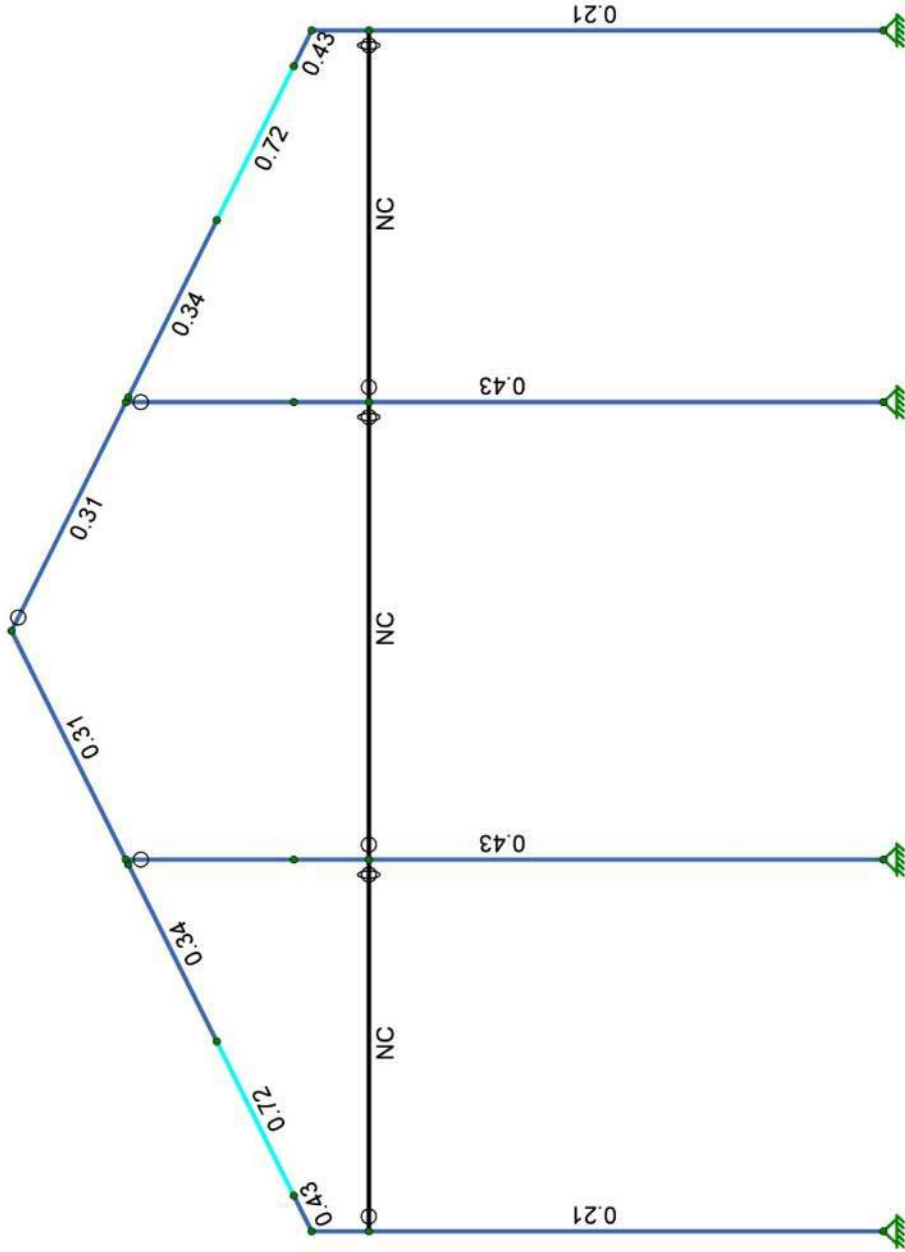
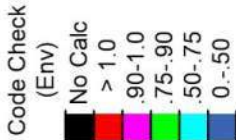
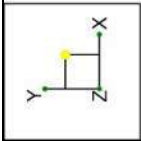
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4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:26 AM

21' end.r3d



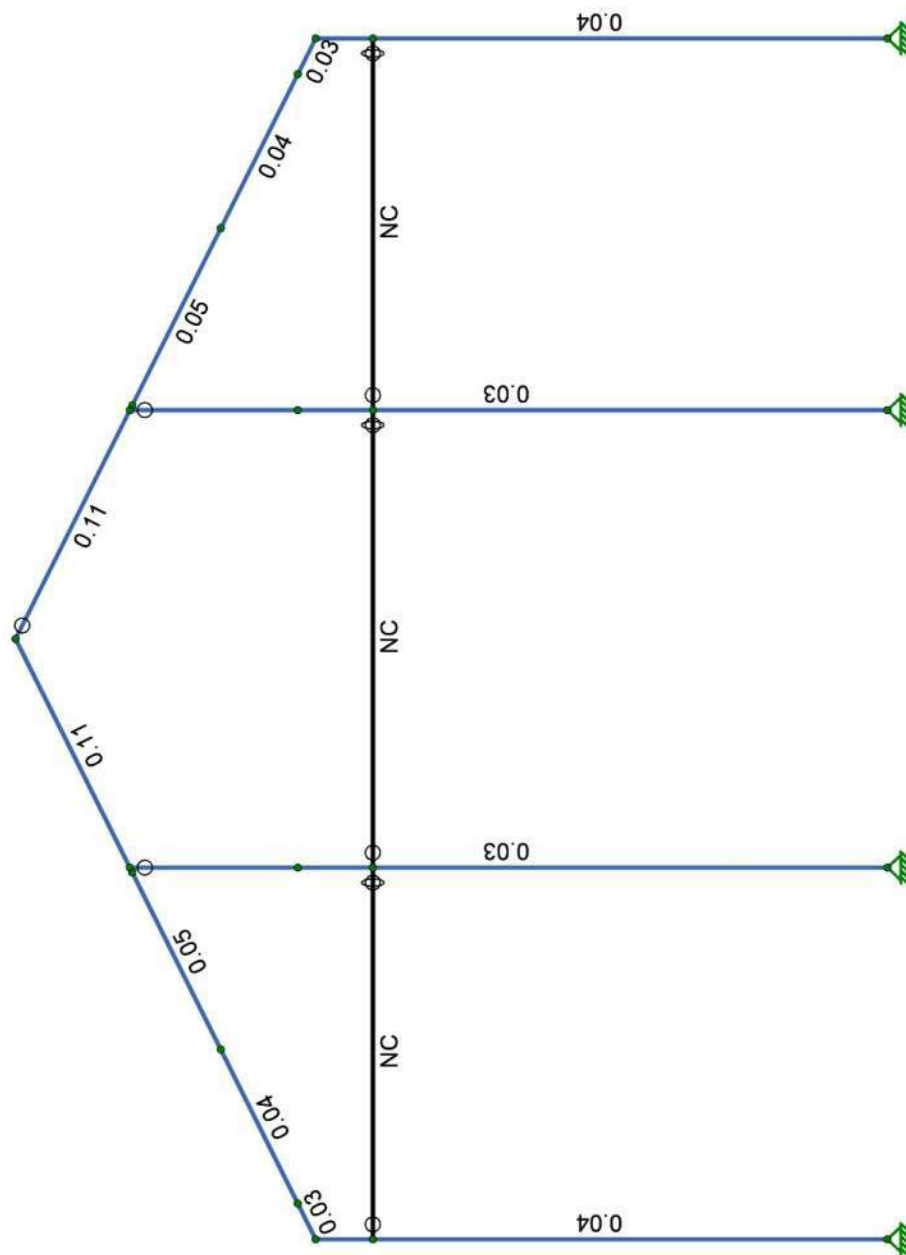
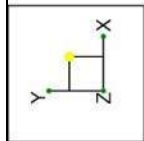
Member Code Checks Displayed (Enveloped)

4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:26 AM

21' end.r3d



Member Shear Checks Displayed (Enveloped)

4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 18, 2025 at 09:26 AM

21' end.r3d



Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : 21' TRUSS END

2/18/2025
9:28:34 AM
Checked By : _____

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N1	0	0	0	
2	N1 1	21	0	0	
3	N6	0	10	0	
4	N7	0.625001	10.3125	0	
5	N8	3.319519	11.659759	0	
6	N9	6.417371	13.208686	0	
7	N13	20.374999	10.3125	0	
8	N14	17.680481	11.659759	0	
9	N15	14.582629	13.208686	0	
10	N16	10.5	15.25	0	
11	N18	21	10	0	
12	N12	6.5	0	0	
13	N17	6.5	13.25	0	
14	N19	14.5	0	0	
15	N20	14.5	13.25	0	
16	N21	0	9	0	
17	N22	21	9	0	
18	N23	6.5	9	0	
19	N24	14.5	9	0	
20	N25	6.5	10.313	0	
21	N26	14.5	10.313	0	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]
1	N1	Reaction	Reaction	Reaction
2	N8			Reaction
3	N9			Reaction
4	N15			Reaction
5	N14			Reaction
6	N6			Reaction
7	N18			Reaction
8	N16			Reaction
9	N1 1	Reaction	Reaction	Reaction
10	N12	Reaction	Reaction	Reaction
11	N19	Reaction	Reaction	Reaction

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$10^{-6}/^{\circ}\text{F}$]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	CR50	29000	11154	0.3	0.65	0.49	50	1.5	65	1.2
7	CR55	29000	11154	0.3	0.65	0.49	55	1.5	65	1.2
8	CR60	29000	11154	0.3	0.65	0.49	60	1.5	70	1.2
9	PIPE35	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2



Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : 21' TRUSS END

2/18/2025
9:28:34 AM
Checked By : _____

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N6	COL11	Column	None	CR60	Typical
2	M3	N6	N7	BRACKET10GUS	Beam	None	CR50	Typical
3	M8	N7	N8	TOPCH	Beam	None	CR50	Typical
4	M9	N8	N9	TOPCH	Beam	None	CR50	Typical
5	M10	N9	N16	TOPCH	Beam	None	CR50	Typical
6	M4	N18	N13	BRACKET10GUS	Beam	None	CR50	Typical
7	M11	N13	N14	TOPCH	Beam	None	CR50	Typical
8	M12	N14	N15	TOPCH	Beam	None	CR50	Typical
9	M13	N15	N16	TOPCH	Beam	None	CR50	Typical
10	M1 1	N1 1	N18	COL11	Column	None	CR60	Typical
11	M14	N12	N17	COL13	Column	None	CR60	Typical
12	M15	N19	N20	COL13	Column	None	CR60	Typical
13	M16	N21	N23	GIRT	Beam	None	gen_Steel	Typical
14	M17	N23	N24	GIRT	Beam	None	gen_Steel	Typical
15	M18	N24	N22	GIRT	Beam	None	gen_Steel	Typical

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Distributed
1	D	DL	-1	4	8
2	S	SL		7	
3	W1>	WL			10
4	W1<	WL			10
5	W2>	WL			10
6	W2<	WL			10
7	W3^	WL			14
8	W3v	WL			14
9	W4^	WL			14
10	W4v	WL			14
11	WMIN>	WL			5
12	WMIN<	WL			5
13	SUL	SL		7	
14	SUR	SL		7	
15	L	LL		7	
16	WMIN^	None			4

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	W3		Y	7	1				
2	W4		Y	9	1				
3	D+S	Yes	Y	1	1	2	1		
4	.6D+0.6W1>	Yes	Y	1	0.6	3	0.6		
5	.6D+0.6W1<	Yes	Y	1	0.6	4	0.6		
6	.6D+0.6W2>	Yes	Y	1	0.6	5	0.6		
7	.6D+0.6W2<	Yes	Y	1	0.6	6	0.6		
8	.6D+0.6W3^	Yes	Y	1	0.6	7	0.6		
9	.6D+0.6W3v	Yes	Y	1	0.6	8	0.6		
10	.6D+0.6W4^	Yes	Y	1	0.6	9	0.6		
11	.6D+0.6W4v	Yes	Y	1	0.6	10	0.6		
12	D+0.6W1>	Yes	Y	1	1	3	0.6		
13	D+0.6W1<	Yes	Y	1	1	4	0.6		
14	D+0.6W2>	Yes	Y	1	1	5	0.6		
15	D+0.6W2<	Yes	Y	1	1	6	0.6		

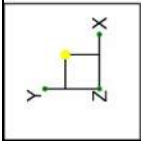


Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : 21' TRUSS END

2/18/2025
9:28:34 AM
Checked By : _____

Load Combinations (Continued)

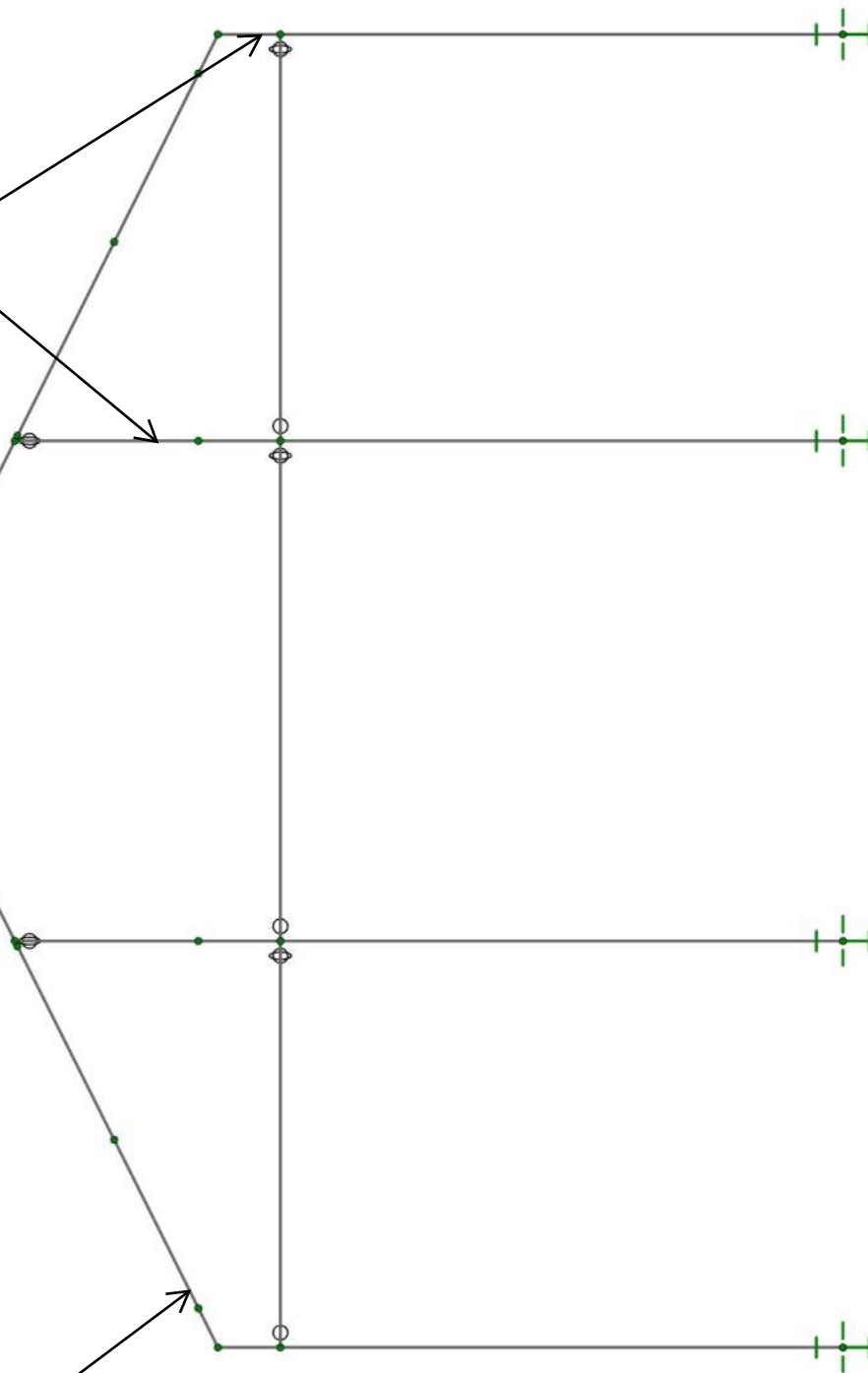
	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
16	D+0.6W3^	Yes	Y	1	1	7	0.6		
17	D+0.6W3v	Yes	Y	1	1	8	0.6		
18	D+0.6W4^	Yes	Y	1	1	9	0.6		
19	D+0.6W4v	Yes	Y	1	1	10	0.6		
20	D+.75S+.45W1>	Yes	Y	1	1	2	0.75	3	0.45
21	D+.75S+.45W1<	Yes	Y	1	1	2	0.75	4	0.45
22	D+.75S+.45W2>	Yes	Y	1	1	2	0.75	5	0.45
23	D+.75S+.45W2<	Yes	Y	1	1	2	0.75	6	0.45
24	D+.75S+.45W3^	Yes	Y	1	1	2	0.75	7	0.45
25	D+.75S+.45W3v	Yes	Y	1	1	2	0.75	8	0.45
26	D+.75S+.45W4^	Yes	Y	1	1	2	0.75	9	0.45
27	D+.75S+.45W4v	Yes	Y	1	1	2	0.75	10	0.45
28	.6D+0.6WMIN>	Yes	Y	1	0.6	11	0.6		
29	.6D+0.6WMIN<	Yes	Y	1	0.6	12	0.6		
30	.6D+0.6WMIN^	Yes	Y	1	0.6	16	0.6		
31	D+0.6WMIN>	Yes	Y	1	1	11	0.6		
32	D+0.6WMIN<	Yes	Y	1	1	12	0.6		
33	D+0.6WMIN^	Yes	Y	1	1	16	0.6		
34	D+.75S+.45WMIN>	Yes	Y	1	1	2	0.75	11	0.45
35	D+.75S+.45WMIN<	Yes	Y	1	1	2	0.75	12	0.45
36	D+.75S+.45WMIN^	Yes	Y	1	1	2	0.75	16	0.45
37	D+SUL	Yes	Y	1	1	13	1		
38	D+SUR	Yes	Y	1	1	14	1		
39	D+L	Yes	Y	1	1	15	1		
40	D+0.75L+0.45W1>	Yes	Y	1	1	15	0.75	3	0.45
41	D+0.75L+0.45W1<	Yes	Y	1	1	15	0.75	4	0.45
42	D+0.75L+0.45W2>	Yes	Y	1	1	15	0.75	5	0.45
43	D+0.75L+0.45W2<	Yes	Y	1	1	15	0.75	6	0.45
44	D+0.75L+0.45W3^	Yes	Y	1	1	15	0.75	7	0.45
45	D+0.75L+0.45W3v	Yes	Y	1	1	15	0.75	8	0.45
46	D+0.75L+0.45W4^	Yes	Y	1	1	15	0.75	9	0.45
47	D+0.75L+0.45W4v	Yes	Y	1	1	15	0.75	10	0.45
48	D+0.75L+0.45WMIN>	Yes	Y	1	1	15	0.75	11	0.45
49	D+0.75L+0.45WMIN<	Yes	Y	1	1	15	0.75	12	0.45
50	D+0.75L+0.45WMIN^	Yes	Y	1	1	15	0.75	16	0.45



TOP CHORD TO BRACKET:
 $\left(\frac{1}{3}\right)^2 + \left(0.4/3 + 1.3 \cdot 12/7\right)^2 \cdot 0.5 = 2.4K$
1/2-16-2-N = OK

TOP CHORD = (2)
1/2-16-2-N, OK

UPLIFT IN COL'S - 3/8"
THRU-BOLT = OK

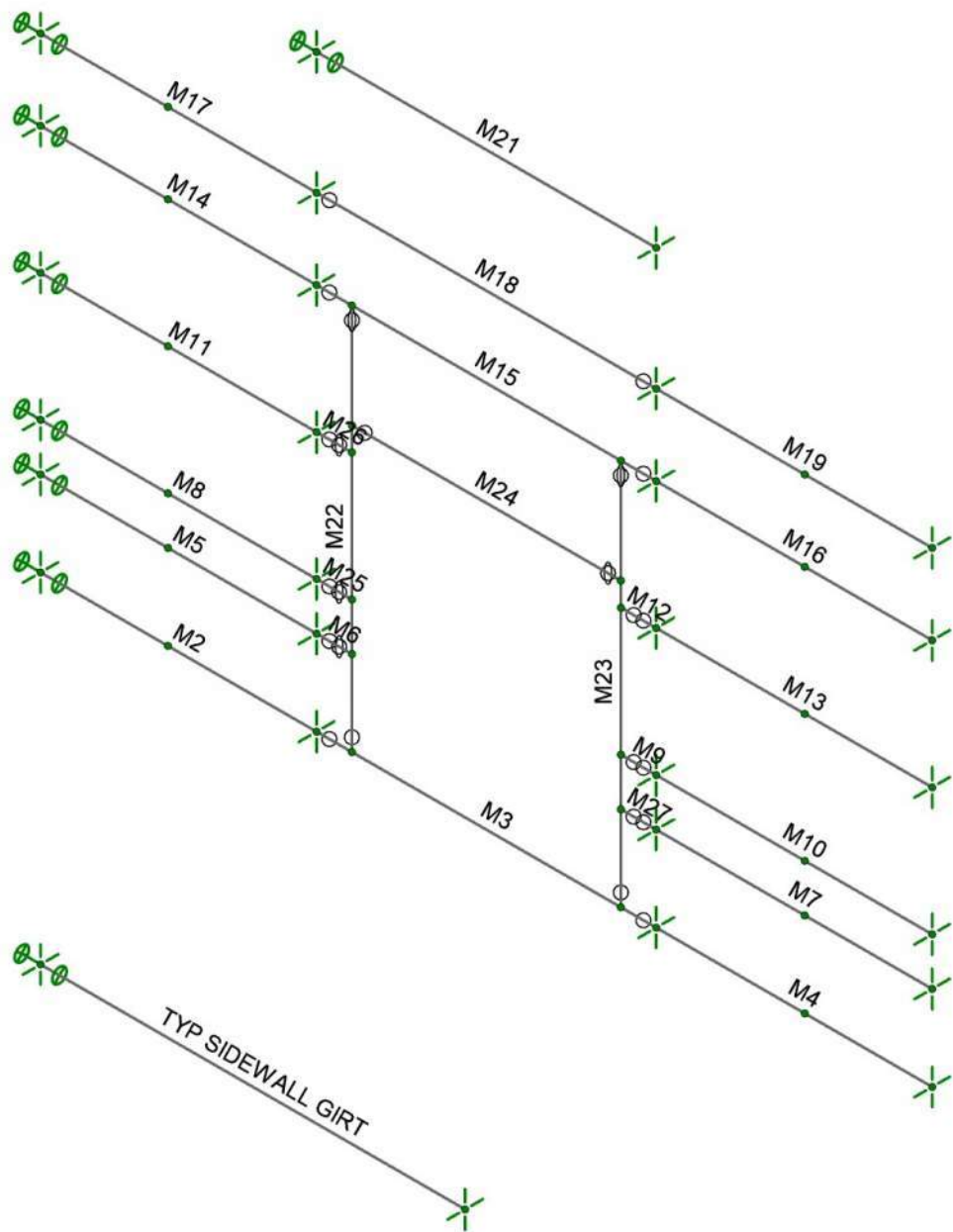
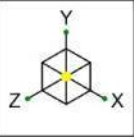


4TH DIMENSION DESIGN, INC

21' TRUSS END

Feb 17, 2025 at 11:09 AM

21' end.r3d



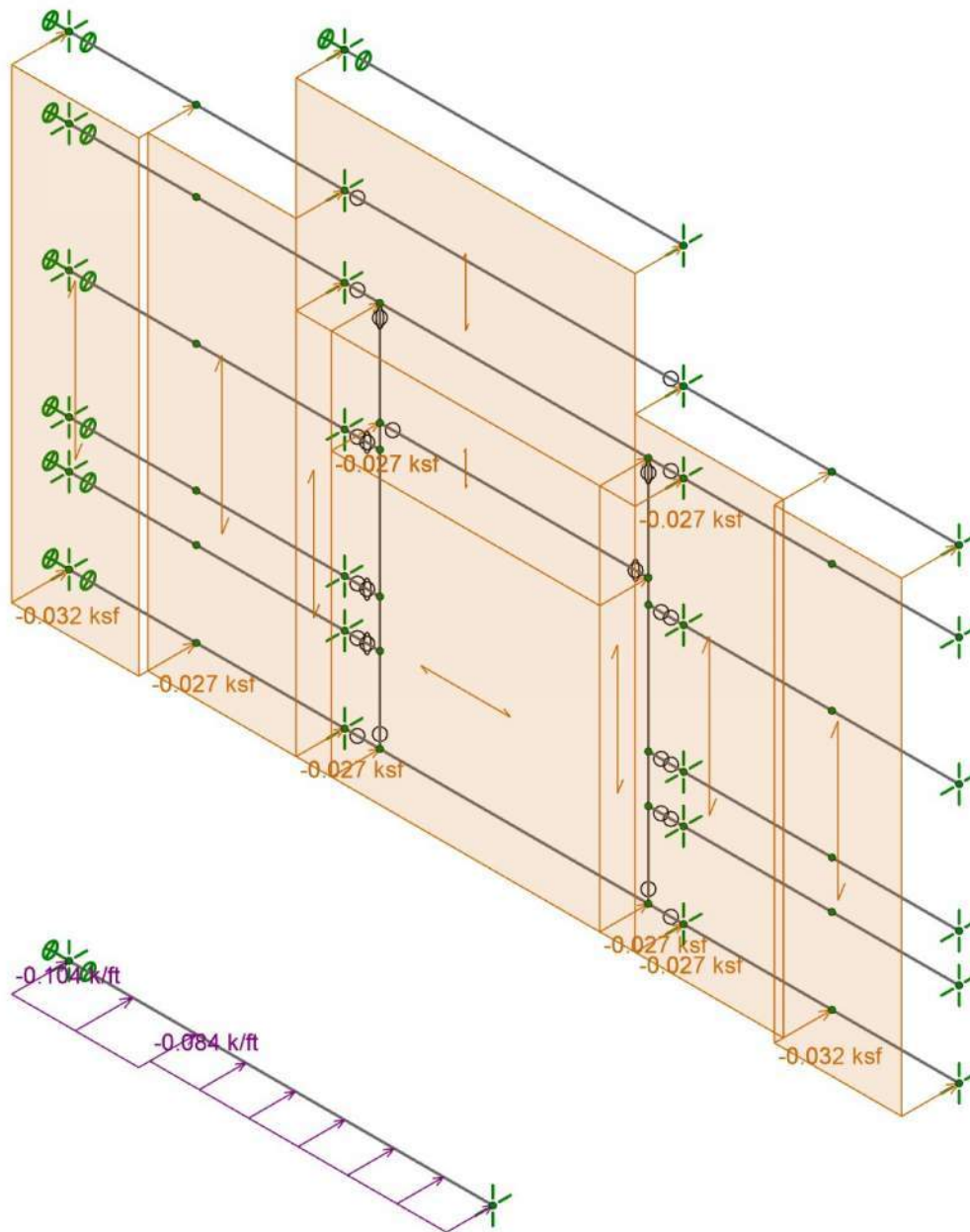
4th Dimension Design, Inc.
Duane McWilliams

GIRTS AND FRAMED OPENINGS

SK-1

Feb 18, 2025 at 09:29 AM

GIRTS AND F.O..r3d



Loads: BLC 1,



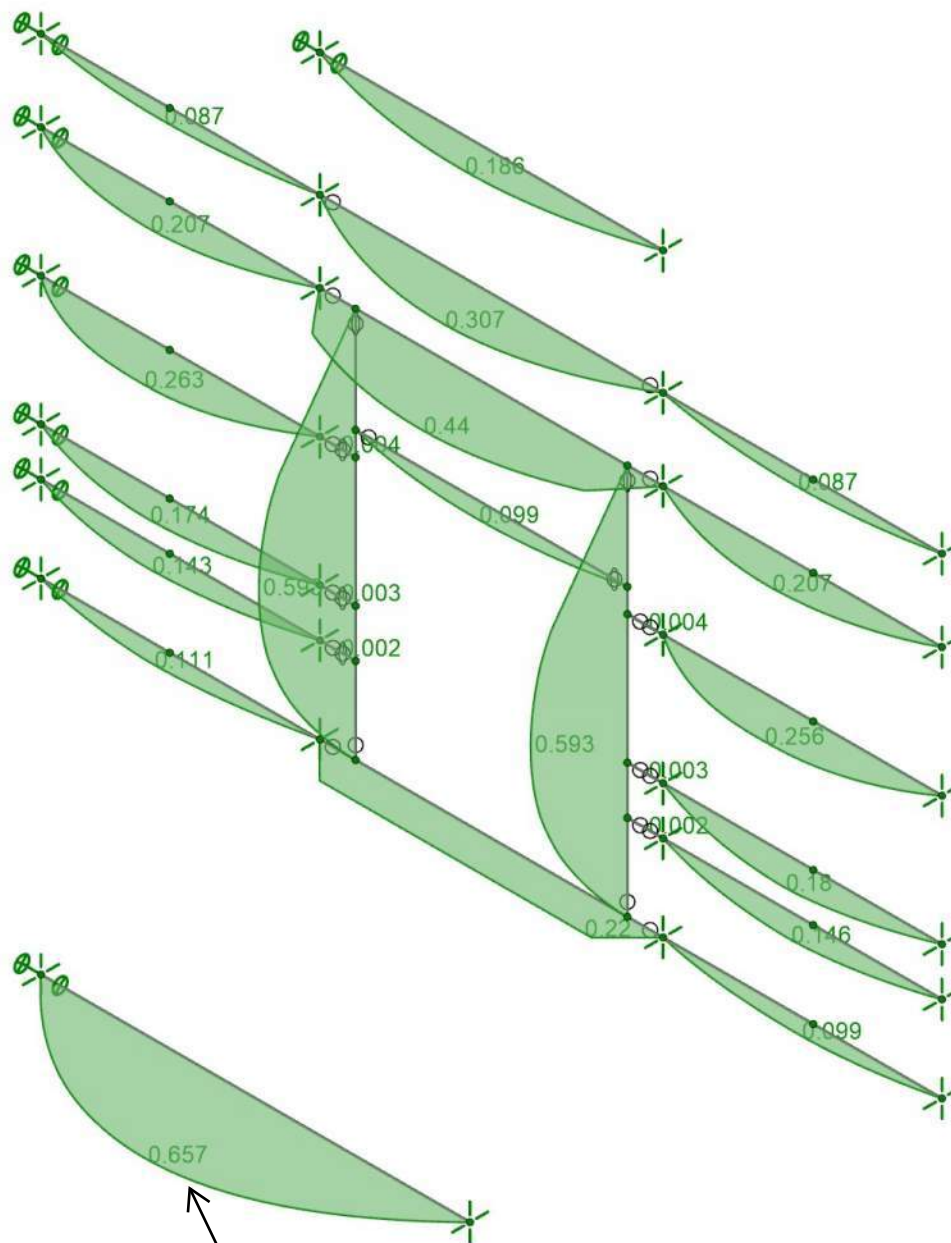
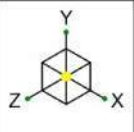
4th Dimension Design, Inc.
Duane McWilliams

GIRTS AND FRAMED OPENINGS

SK-2

Feb 18, 2025 at 09:30 AM

GIRTS AND F.O..r3d



ALL <1.154 K-FT, OK
18GA GIRT

Results for LC 1, 0.6C&C
Member y Bending Moments (kip-ft)



4th Dimension Design, Inc.
Duane McWilliams

GIRTS AND FRAMED OPENINGS

SK-3

Feb 18, 2025 at 09:31 AM

GIRTS AND F.O..r3d

E4.4.2 Pull-Over Strength

	18ga HAT	18ga HAT	18ga HAT
t1 (in)	0.0451	0.0451	0.0451
d'w (in)	0.409	0.409	0.409
Fu1 (ksi)	70	70	70
Pnov (lb)	1936.82	1936.82	1936.82
Pnov/ Ω	645	645	645

E4.4.1 Pull-Out Strength

	18ga HAT	11ga COL	13ga COL
tc (in)	0.0451	0.1196	0.0897
d (in)	0.25	0.25	0.25
Fu2 (ksi)	70	75	75
Pnot (lb)	670.8625	1906.125	1429.594
Pnot/ Ω **	223	635	476

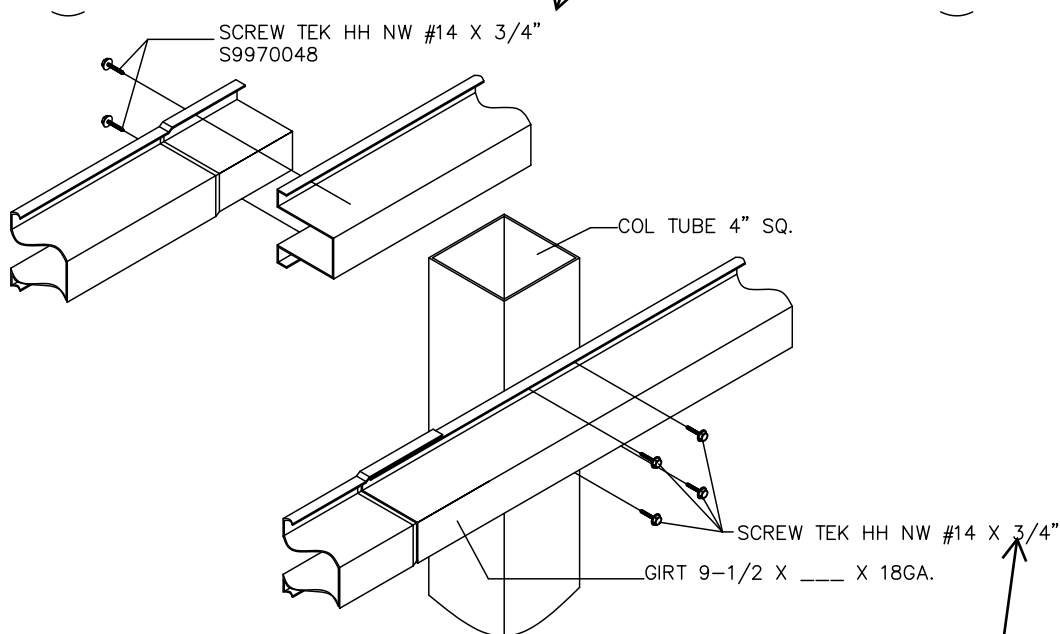
Check against max. tension for given fastener

tc = Lesser of depth of penetration and thickness t2

PULL OUT
GOVERNS

MAX = 1/2 BAY

$(2)(223\#)/(5' \times 3.25') = 27.45 \text{ PSF (ASD)}$
ALLOWABLE (45.75 PSF ULT >> MAX.)
APPLIED WALL C&C - OK

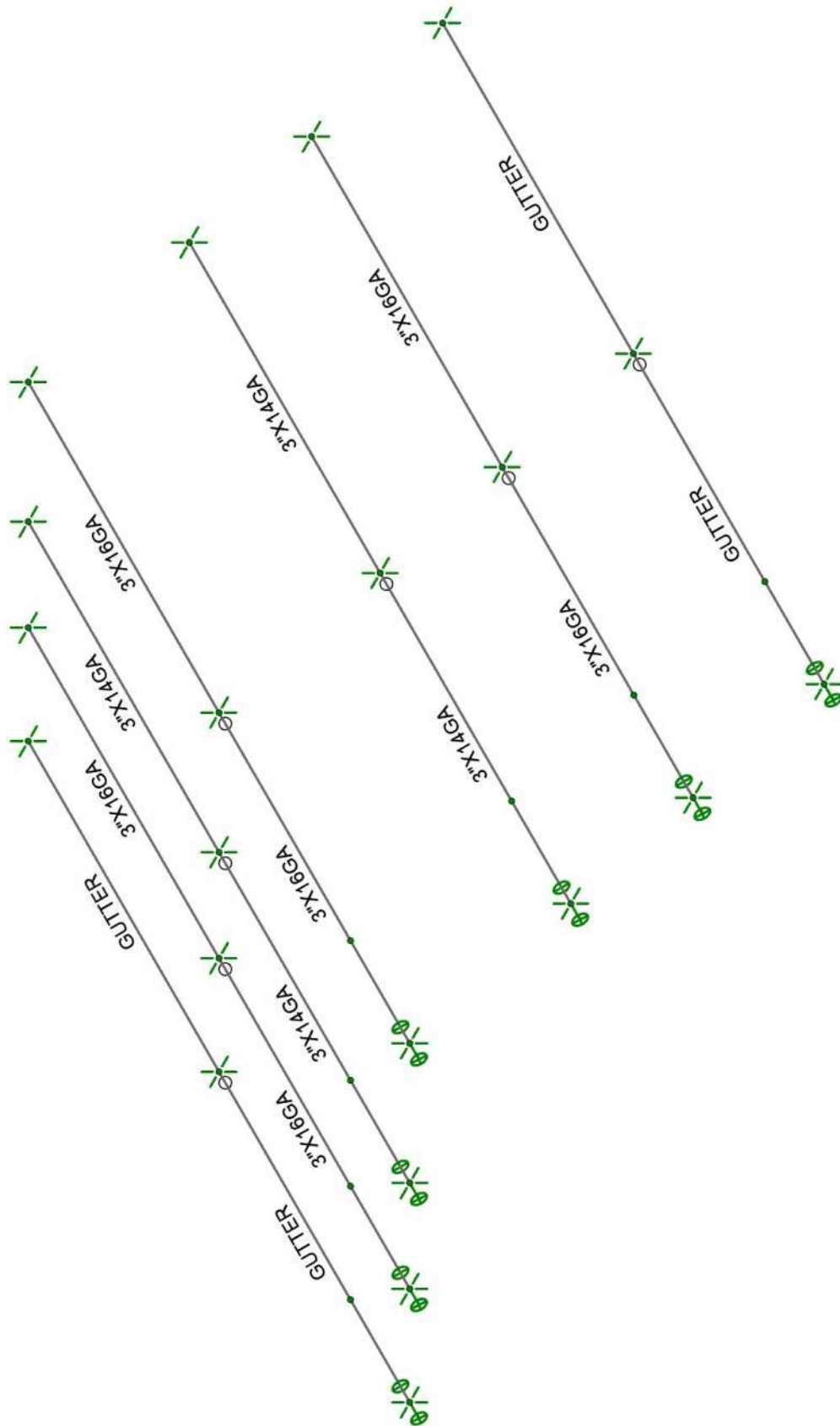
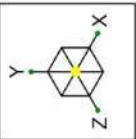


7
S-5

GIRT SPLICE AND ATTACHMENT

SIDE WALL GIRT, END WALL
CAPACITY IN 13 GA, CONSERVATIVE

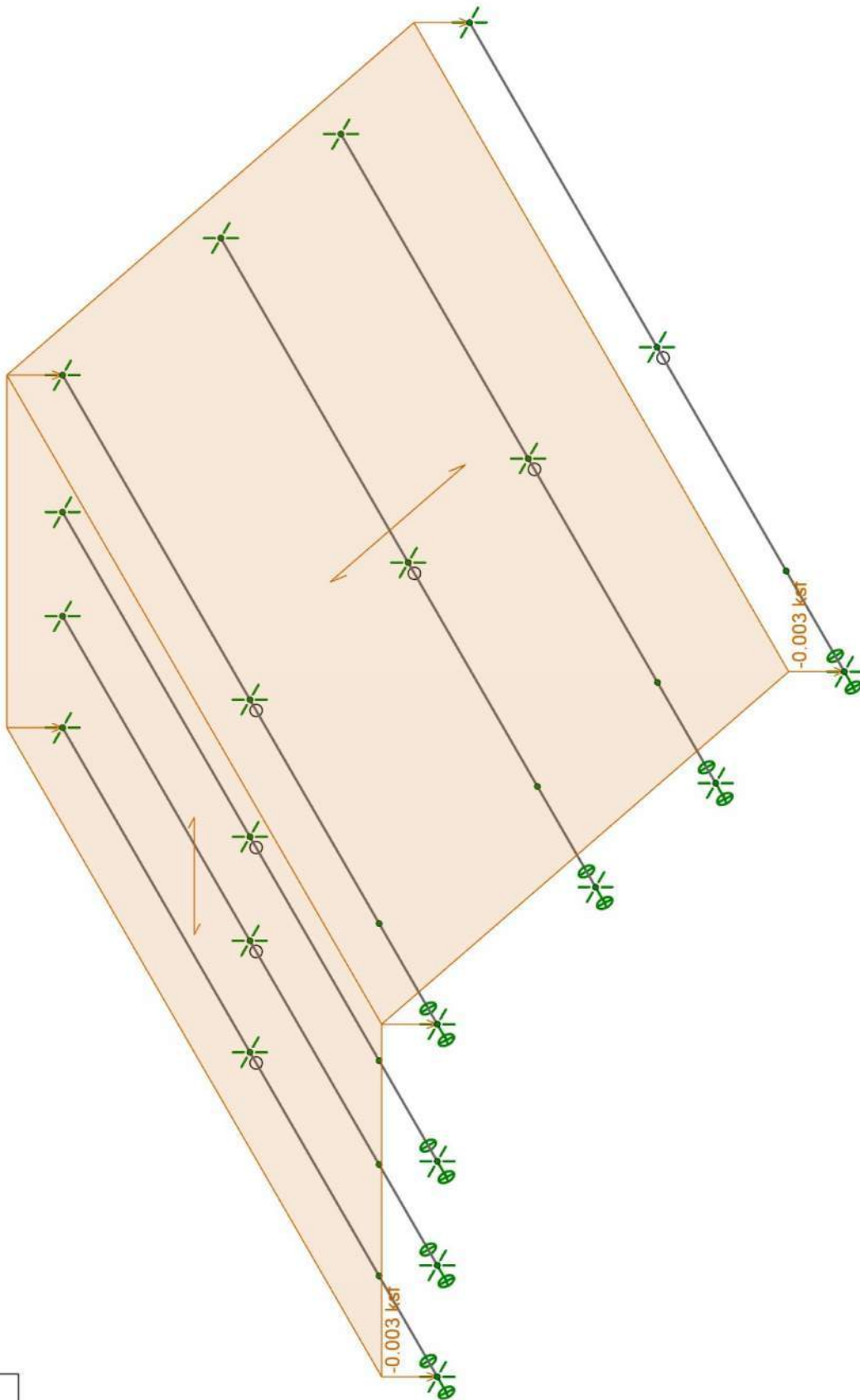
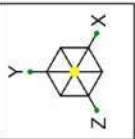
$(4)(476\#)/(10' \times 3.25') = 58.6 \text{ PSF (ASD)}$
ALLOWABLE (97.6 PSF ULT >> MAX.)
APPLIED WALL C&C - OK



4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:51 AM
PURLINS.r3d



Loads: BLC 1, D

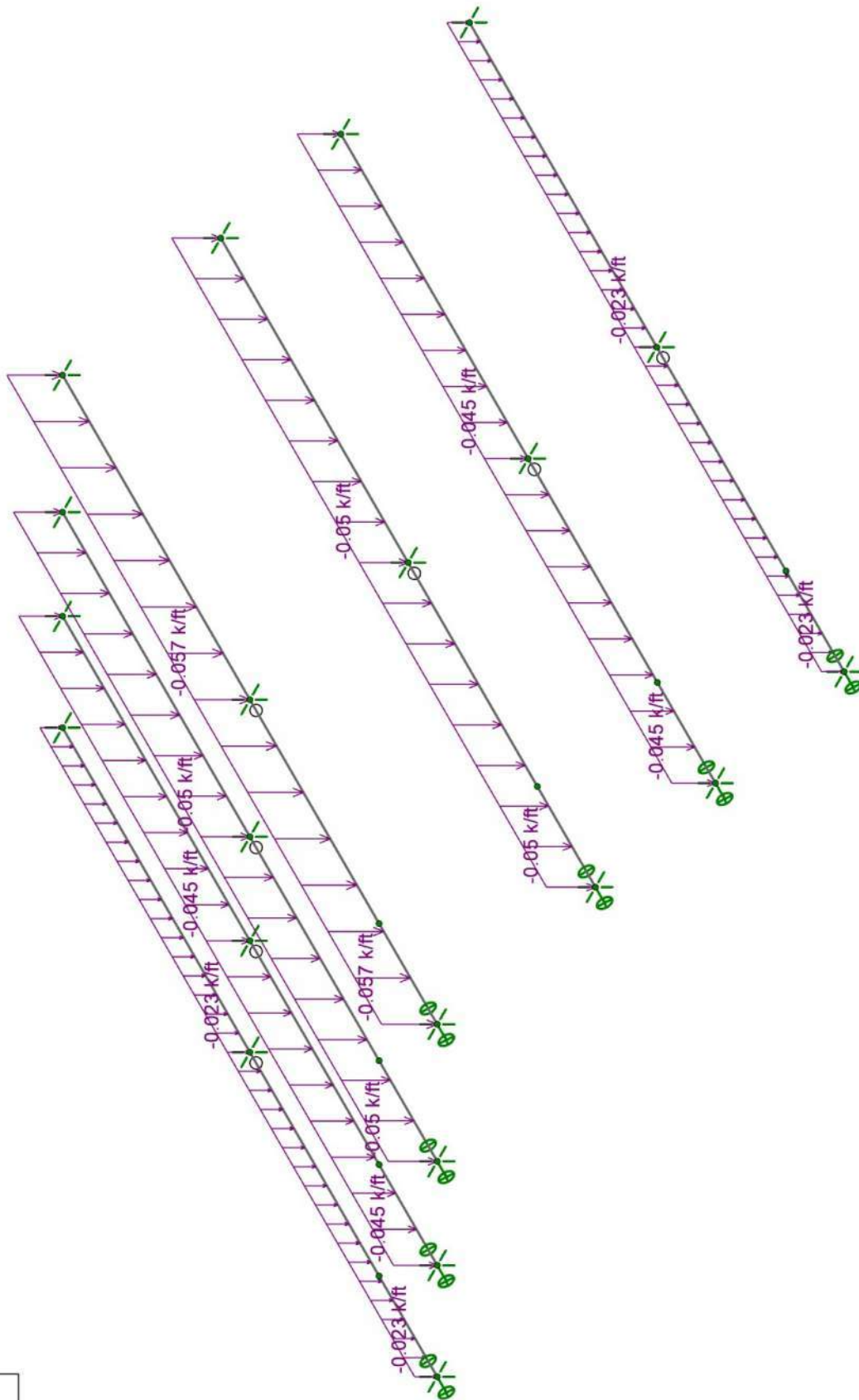
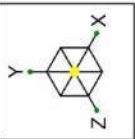


4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:51 AM

PURLINS.r3d



Loads: BLC 2, S

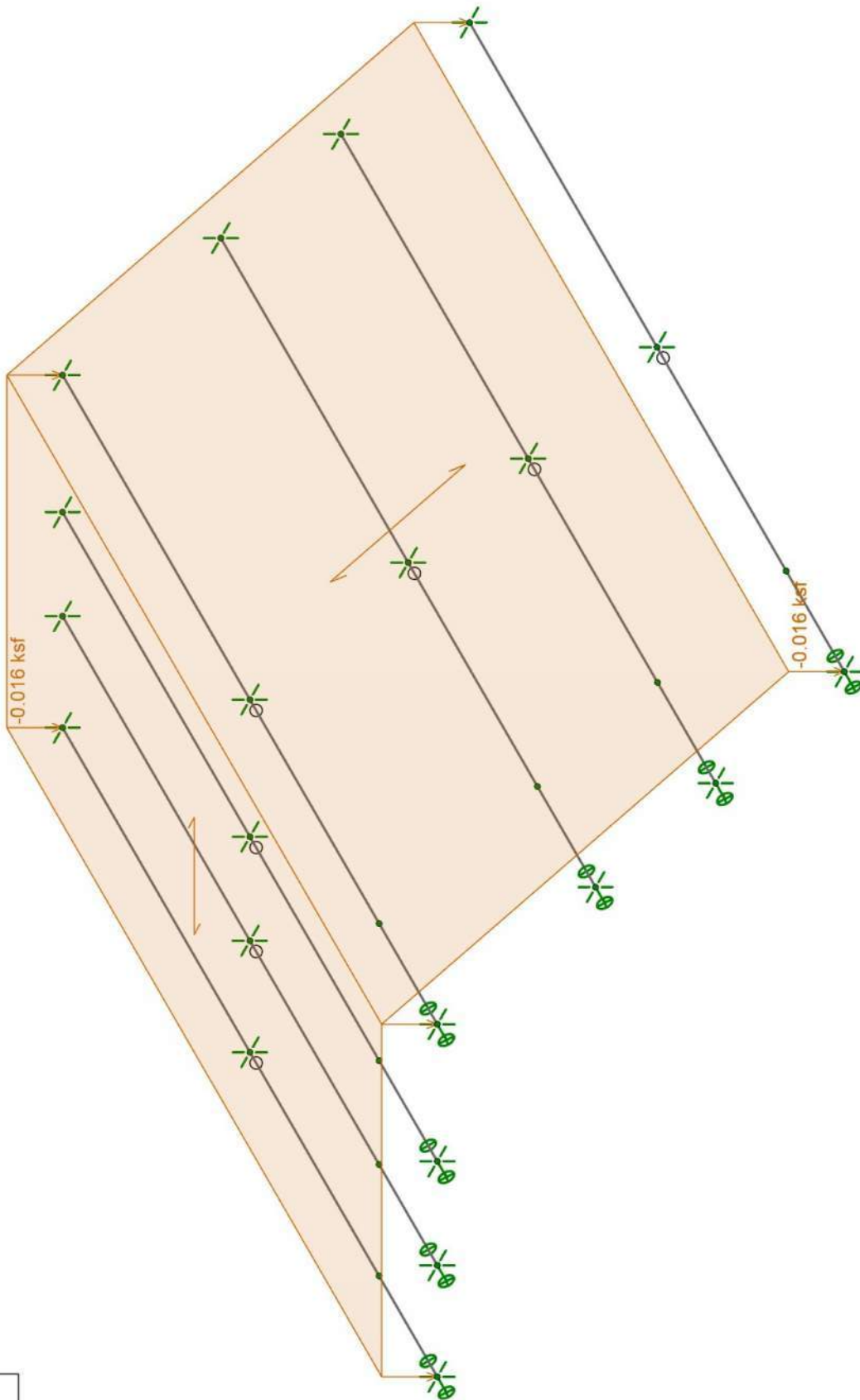
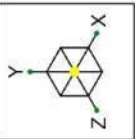


4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:51 AM

PURLINS.r3d



Loads: BLC 3, C&Cv

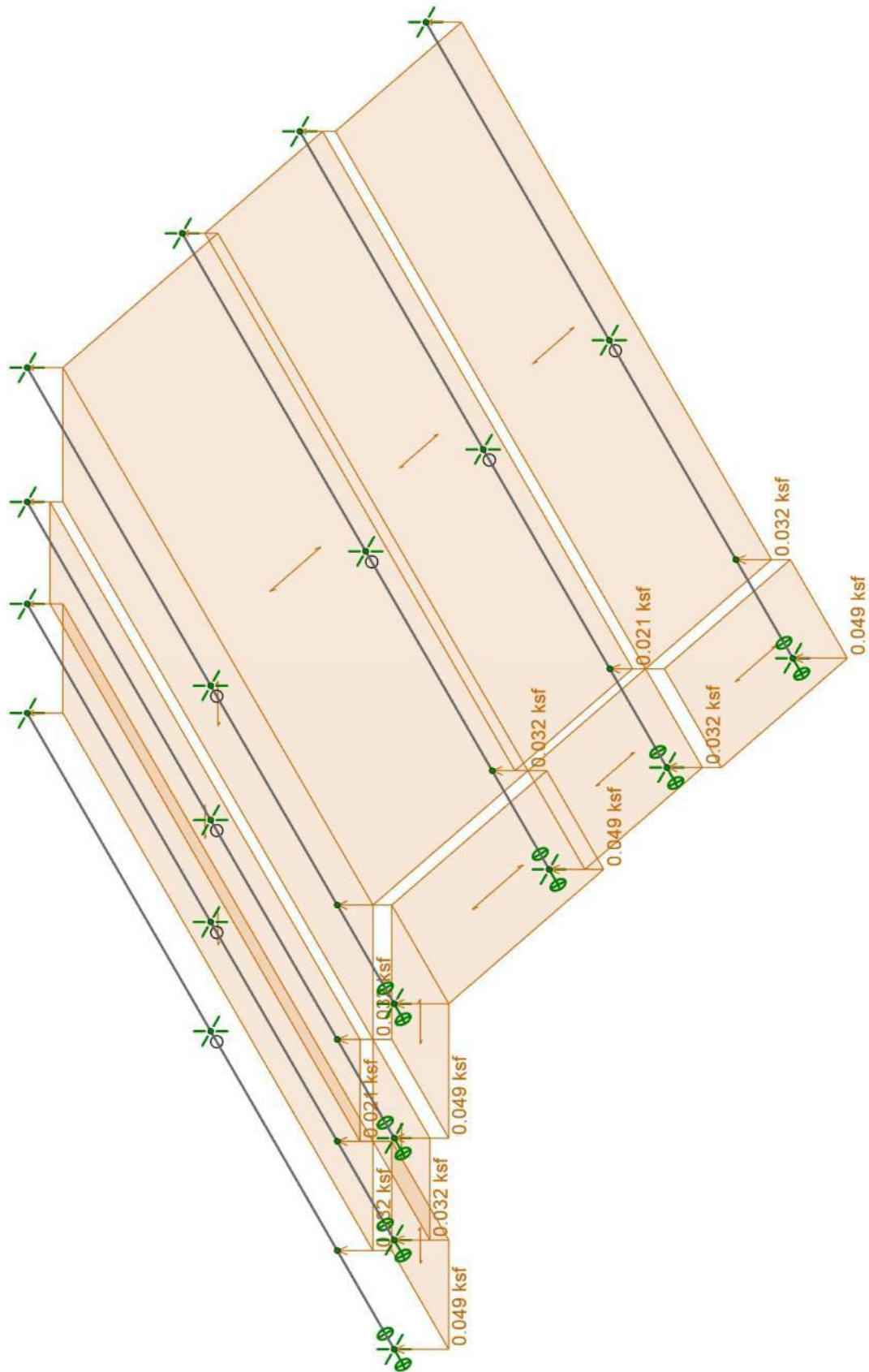
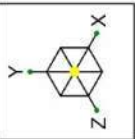


4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:51 AM

PURLINS.r3d



Loads: BLC 4, C&C^

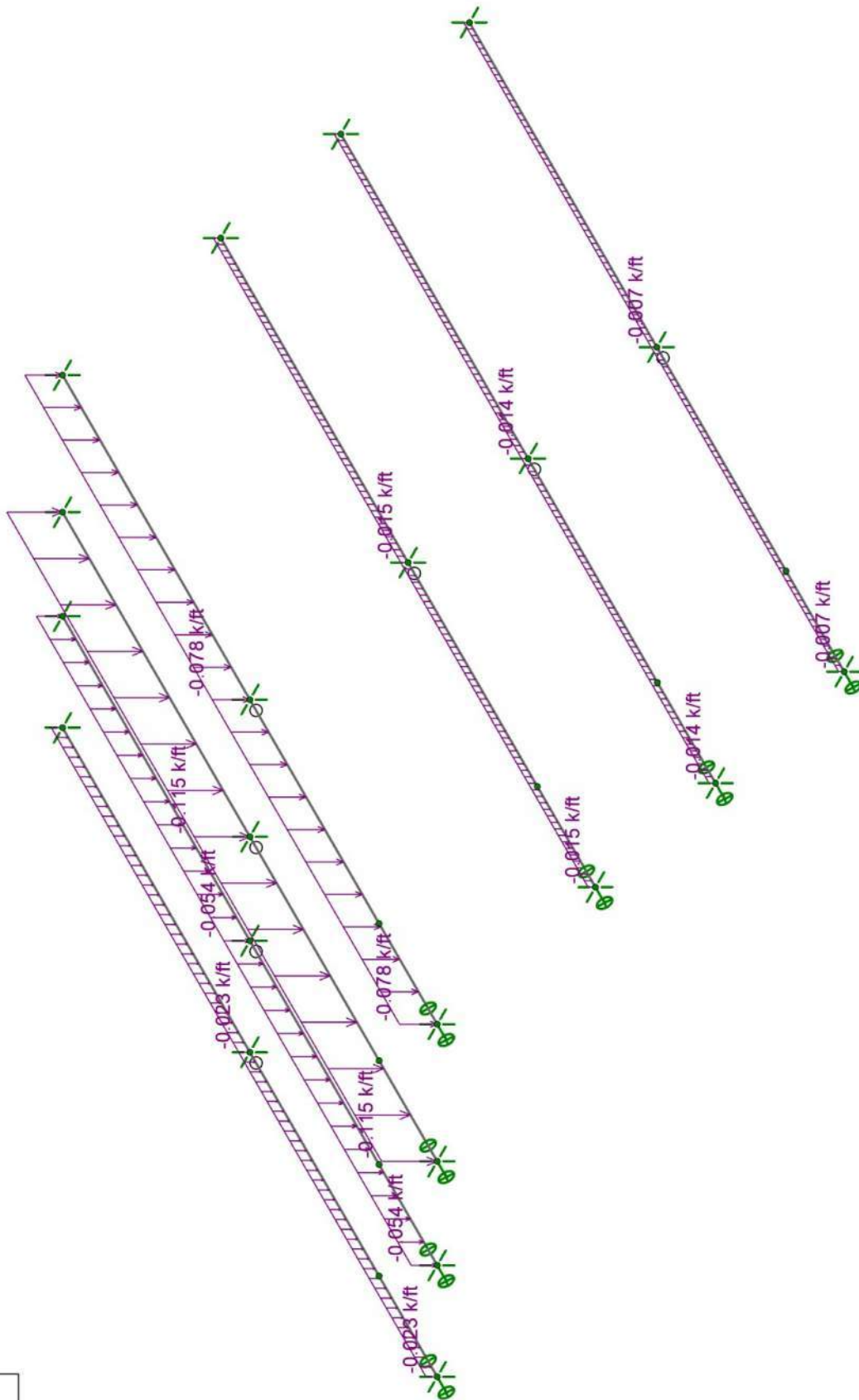
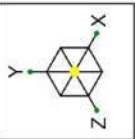


4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:52 AM

PURLINS.r3d



Loads: BLC 13, SUL

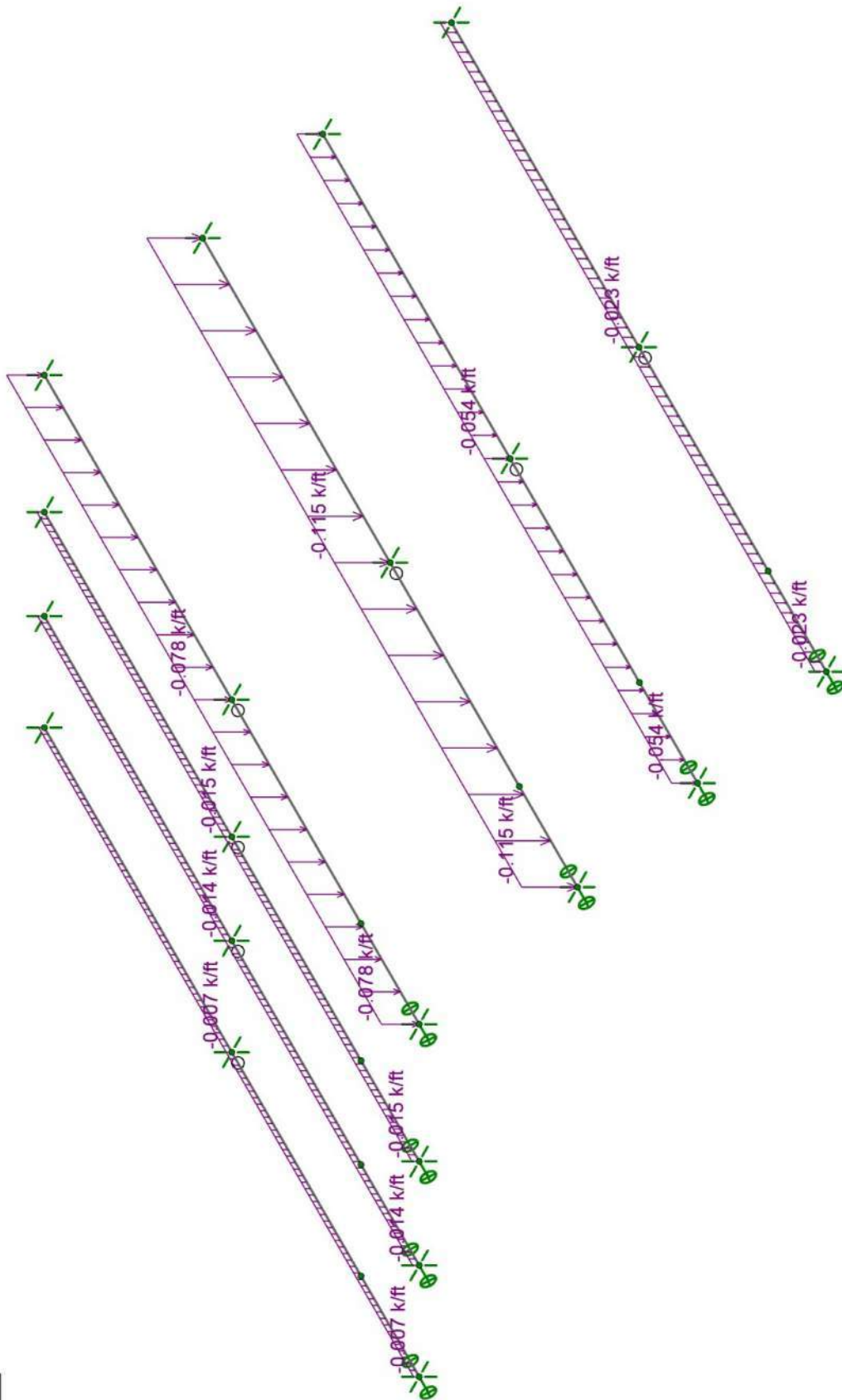
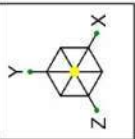


4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:52 AM

PURLINS.r3d



Loads: BLC 14, SUR

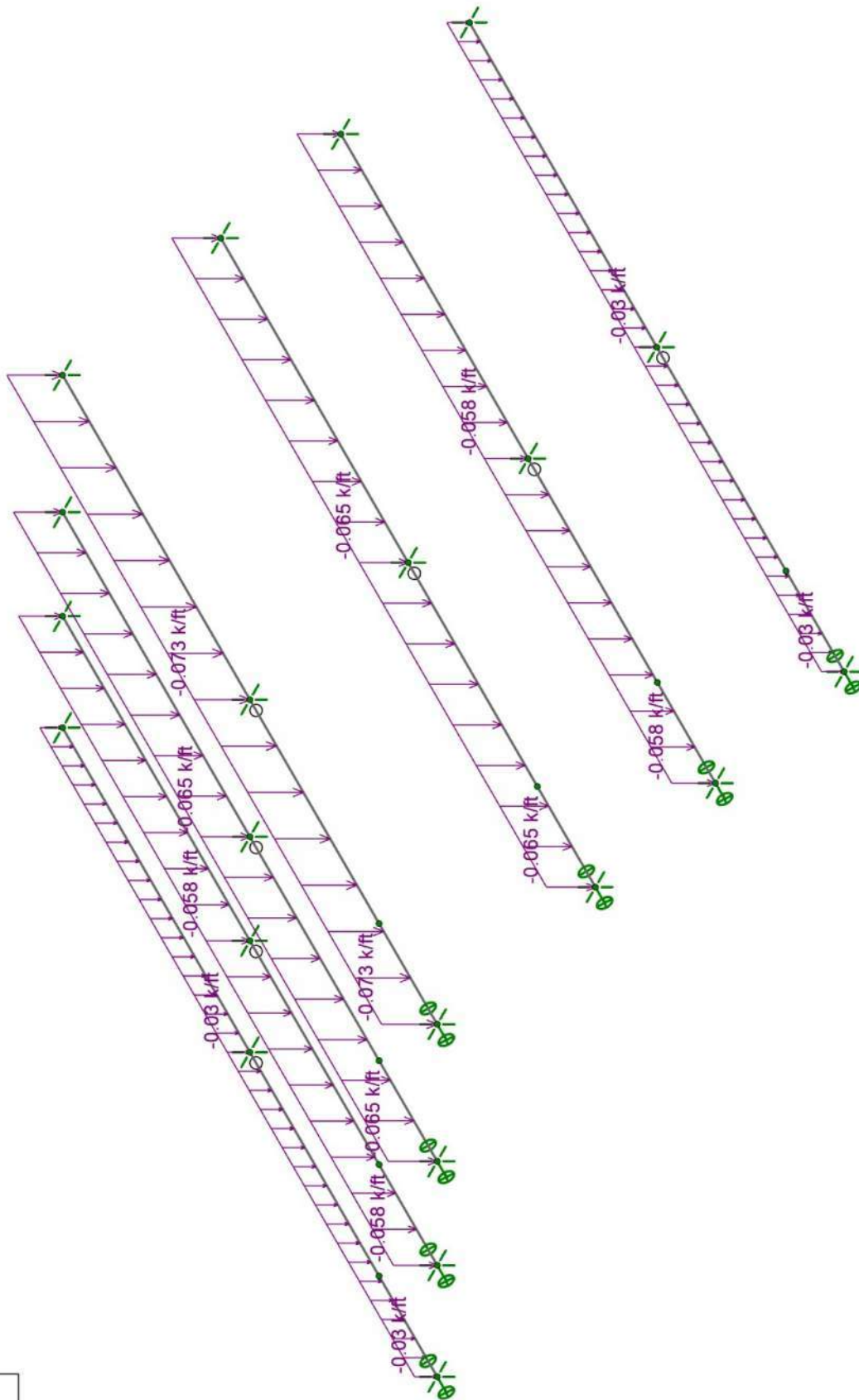
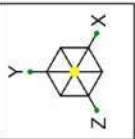


4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:52 AM

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Loads: BLC 15, L

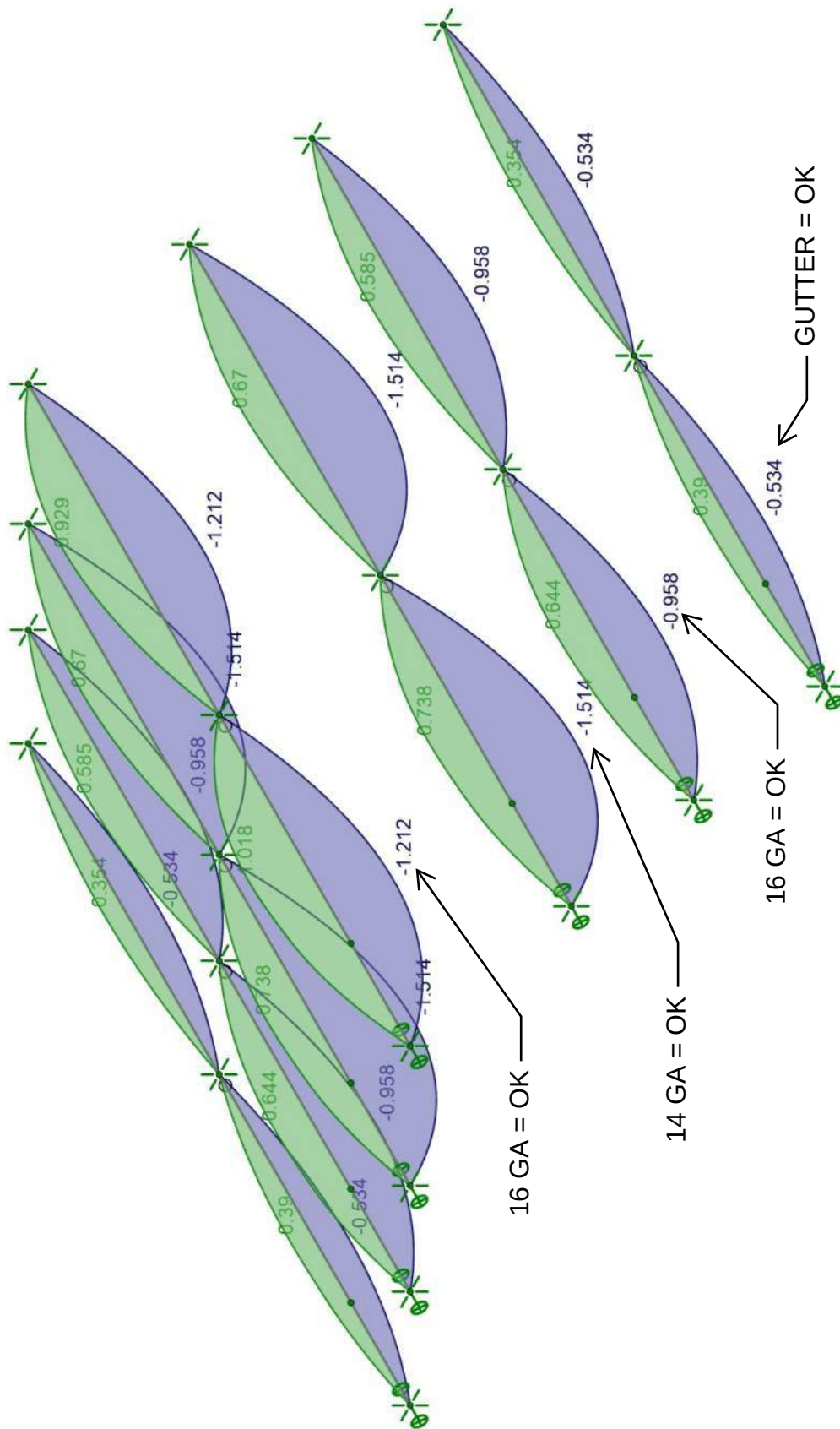
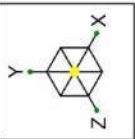


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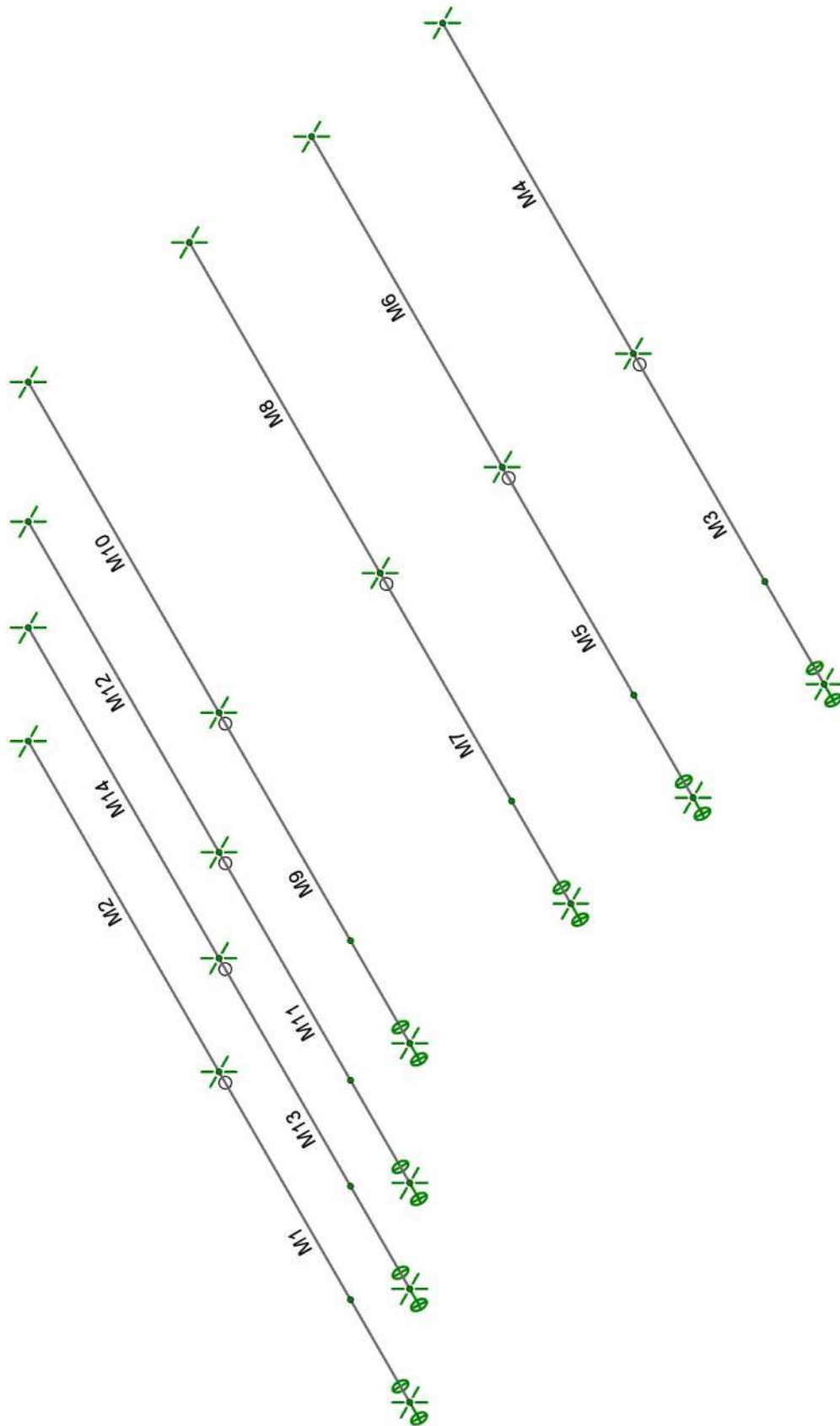
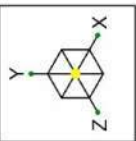
Member z Bending Moments (kip-ft) (Enveloped)

4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 09:58 AM

PURLINS.r3d



4TH DIMENSION DESIGN, INC

PURLINS

Feb 18, 2025 at 10:05 AM
PURLINS.r3d



Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : PURLINS

2/18/2025
10:07:00 AM
Checked By : _____

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	N6	0	10	0	
2	N8	3.319519	11.659759	0	
3	N9	6.417371	13.208686	0	
4	N14	17.680481	11.659759	0	
5	N15	14.582629	13.208686	0	
6	N16	10.5	15.25	0	
7	N18	21	10	0	
8	N10	0	10	-9.667	
9	N11	3.319519	11.659759	-9.667	
10	N12	6.417371	13.208686	-9.667	
11	N13	17.680481	11.659759	-9.667	
12	N17	14.582629	13.208686	-9.667	
13	N19	10.5	15.25	-9.667	
14	N20	21	10	-9.667	
15	N21	0	10	-19.334	
16	N22	3.319519	11.659759	-19.334	
17	N23	6.417371	13.208686	-19.334	
18	N24	17.680481	11.659759	-19.334	
19	N25	14.582629	13.208686	-19.334	
20	N26	10.5	15.25	-19.334	
21	N27	21	10	-19.334	
22	N28	0	10	-3	
23	N29	17.680481	11.659759	-3	
24	N30	21	10	-3	
25	N31	14.582629	13.208686	-3	
26	N32	6.417371	13.208686	-3	
27	N33	3.319519	11.659759	-3	
28	N34	10.5	15.25	-3	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	Z Rot [k-ft/rad]
1	N25	Reaction	Reaction		
2	N27	Reaction	Reaction		
3	N22	Reaction	Reaction		
4	N20	Reaction	Reaction		
5	N21	Reaction	Reaction		
6	N23	Reaction	Reaction		
7	N24	Reaction	Reaction		
8	N19	Reaction	Reaction		
9	N13	Reaction	Reaction		
10	N12	Reaction	Reaction		
11	N10	Reaction	Reaction		
12	N15	Reaction	Reaction	Reaction	Reaction
13	N14	Reaction	Reaction	Reaction	Reaction
14	N9	Reaction	Reaction	Reaction	Reaction
15	N6	Reaction	Reaction	Reaction	Reaction
16	N8	Reaction	Reaction	Reaction	Reaction
17	N26	Reaction	Reaction		
18	N17	Reaction	Reaction		
19	N11	Reaction	Reaction		
20	N16	Reaction	Reaction	Reaction	Reaction
21	N18	Reaction	Reaction	Reaction	Reaction



Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : PURLINS

2/18/2025
10:07:00 AM
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Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [$10^{-6} F^{-1}$]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	CR50	29000	11154	0.3	0.65	0.49	50	1.5	65	1.2
7	CR55	29000	11154	0.3	0.65	0.49	55	1.5	65	1.2
8	CR60	29000	11154	0.3	0.65	0.49	60	1.5	70	1.2
9	PIPE35	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N6	N10	GUTTER	Beam	None	gen Steel	Typical
2	M2	N10	N21	GUTTER	Beam	None	gen Steel	Typical
3	M3	N18	N20	GUTTER	Beam	None	gen Steel	Typical
4	M4	N20	N27	GUTTER	Beam	None	gen Steel	Typical
5	M5	N14	N13	3"X16GA	Beam	None	gen Steel	Typical
6	M6	N13	N24	3"X16GA	Beam	None	gen Steel	Typical
7	M7	N15	N17	3"X14GA	Beam	None	gen Steel	Typical
8	M8	N17	N25	3"X14GA	Beam	None	gen Steel	Typical
9	M9	N16	N19	3"X16GA	Beam	None	gen Steel	Typical
10	M10	N19	N26	3"X16GA	Beam	None	gen Steel	Typical
11	M11	N9	N12	3"X14GA	Beam	None	gen Steel	Typical
12	M12	N12	N23	3"X14GA	Beam	None	gen Steel	Typical
13	M13	N8	N11	3"X16GA	Beam	None	gen Steel	Typical
14	M14	N11	N22	3"X16GA	Beam	None	gen Steel	Typical

Basic Load Cases

	BLC Description	Category	Y Gravity	Distributed	Area(Member)
1	D	DL	-1		2
2	S	SL		14	
3	C&Cv	WL			2
4	C&C^	WL			12
5	N/A	None			
6	N/A	None			
7	N/A	None			
8	N/A	None			
9	N/A	None			
10	N/A	None			
11	N/A	None			
12	N/A	None			
13	SUL	SL		14	
14	SUR	SL		14	
15	L	LL		14	
16	BLC 1 Transient Area Loads	None		16	
17	BLC 3 Transient Area Loads	None		16	
18	BLC 4 Transient Area Loads	None		74	



Company : 4TH DIMENSION DESIGN, INC
Designer :
Job Number :
Model Name : PURLINS

2/18/2025
10:07:00 AM
Checked By : _____

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	D+S	Yes	Y	1	1	2	1		
2	.6D+0.6C&Cv	Yes	Y	1	0.6	3	0.6		
3	.6D+0.6C&C^	Yes	Y	1	0.6	4	0.6		
4	D+0.6C&Cv	Yes	Y	1	1	3	0.6		
5	D+0.6C&C^	Yes	Y	1	1	4	0.6		
6	D+.75S+.45C&Cv	Yes	Y	1	1	2	0.75	3	0.45
7	D+.75S+.45C&C^	Yes	Y	1	1	2	0.75	4	0.45
8	D+SUL	Yes	Y	1	1	13	1		
9	D+SUR	Yes	Y	1	1	14	1		
10	D+L	Yes	Y	1	1	15	1		
11	D+0.75L+0.45C&Cv	Yes	Y	1	1	15	0.75	3	0.45
12	D+0.75L+0.45C&C^	Yes	Y	1	1	15	0.75	4	0.45

Global Parameters - Description:

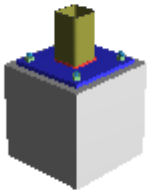
Project Title	BASE PLATE
Company	
Designer	DWM
Job Number	
Notes	

Global Parameters - Solution:

Design Method	AISC 14th (360-10): ASD
Bolt Group Analysis Method	Center of Rotation
Weld Analysis Method	Elastic
Consider Bolt Hole Deformation?	Yes
Check Rotational Ductility?	Yes
Check Weld Filler Metal Matching?	Yes
Full Shear Eccentricity Considered?	Yes
Panel-Zone Shear Deformation Considered?	No
Check Weld Base Material Thickness?	Yes
Include AISC 15th Out of Plane Web Checks?	Yes
Reduce Available Bolt Strength by Prying Effects Factor Q?	Yes

GRAVITY: Summary Report

Single Column Base Plate Connection



Material Properties:

Column	HSS3.5X3.5X3	A500 Gr.B Rect	$F_y = 46.00$ ksi	$F_u = 58.00$ ksi
Base Plate	P0.50x9.75x9.75	A36	$F_y = 36.00$ ksi	$F_u = 58.00$ ksi

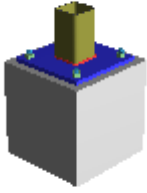
Input Data:

Axial	5.00 kips	<i>Axial load on the column</i>
Strong Axis Shear	2.00 kips	<i>Shear load on the column that causes strong axis bending</i>
Weak Axis Shear	2.00 kips	<i>Shear load on the column that causes weak axis bending</i>
Strong Axis Moment	0.00 kips-ft	<i>Column moment about the strong axis</i>
Weak Axis Moment	0.00 kips-ft	<i>Column moment about the weak axis</i>

Connection	Required	Max Unity Check	Result
Column/Base Plate connection	Anchor Bolt Shear	0.35	PASS

GRAVITY: Base Plate Report

Single Column Base Plate Connection



Material Properties:

Column	HSS3.5X3.5X3	A500 Gr.B Rect	$F_y = 46.00$ ksi	$F_u = 58.00$ ksi
Base Plate	P0.50x9.75x9.75	A36	$F_y = 36.00$ ksi	$F_u = 58.00$ ksi

Input Data:

Axial	5.00 kips	Axial load on the column
Strong Axis Shear	2.00 kips	Shear load on the column that causes strong axis bending
Weak Axis Shear	2.00 kips	Shear load on the column that causes weak axis bending
Strong Axis Moment	0.00 kips-ft	Column moment about the strong axis
Weak Axis Moment	0.00 kips-ft	Column moment about the weak axis

Note: Unless specified, all code references are from AISC 360-10

Limit State	Required	Available	Unity Check	Result
Geometry Restrictions				PASS
Check Min Bolt Spacing	Pass	Condition: $S_{min} \geq (2+2/3)d_{bolt}$ (J3.3)		
S_{min}	7.50 in	Min bolt spacing		
d_{bolt}	0.62 in	Anchor bolt diameter		
Check Min Edge Distance	Pass	Condition: $\min(e_z, e_y) \geq ED_{allow}$ (J3.4)		
e_y	1.12 in	Min edge distance y		
e_z	1.12 in	Min edge distance z		
ED_{allow}	0.94 in	Minimum allowed edge distance		
Check Max Edge Distance	Pass	Condition: $\max(d_z, d_y) \leq \min(6.00 \text{ in}, 12*t)$ (J3.5)		
d_y	1.12 in	Max edge distance y		
d_z	1.12 in	Max edge distance z		
ED_{allow}	6.00 in	Maximum allowed edge distance		
t	0.50 in	Thickness of base plate		
Check Anchor Bolt Encroachment on Column	Pass			
Concrete Bearing	0.05 ksi	1.33 ksi	0.04	PASS
$R_n = 0.85 * f'_c * \alpha$		$\Omega = 2.31$	(ACI 318-19 (22) Table 22.8.3.2)	
f'_c	3.00 ksi	Concrete compressive strength		
P_u	5.00 kips	Axial load on the column		
N	9.75 in	Plate length		
B	9.75 in	Plate width		
A_1	95.06 in ²	Plate area = $B*N$		
L	11.75 in	Concrete support length		
W	11.75 in	Concrete support width		
L'	11.75 in	Effective concrete support length		
W'	11.75 in	Effective concrete support width		
A_2	138.06 in ²	Effective concrete support area = $L' * W'$		

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GRAVITY: Base Plate Report (continued):

Limit State	Required	Available	Unity Check	Result
α	1.21	$Bearing\ stress\ increase\ factor = \min(2, (A_2 / A_1)^{0.5})$		
R_n / Ω	1.33 ksi	Allowable bearing stress		
f_p	0.05 ksi	$Required\ bearing\ stress = P_u / A_1$		
Plate Flexural Yielding(Compression)	0.02 kips-ft/in	0.11 kips-ft/in	0.20	PASS
$M_n = F_y * t_p^2 / 4$		$\Omega = 1.67$	(AISC DG1 (3.3.13))	
F_y	36.00 ksi	Minimum yield strength of base plate		
t_p	0.50 in	Thickness of base plate		
M_n/Ω	0.11 kips-ft/in	Base plate bending capacity per unit width		
N	9.75 in	Base plate length		
B	9.75 in	Base plate width		
d	3.50 in	Column depth		
b	3.50 in	Column width		
m	3.21 in	$m = (N - 0.95*d)/2$ (per AISC DG1, sect. 3.1.3)		
n	3.21 in	$n = (B - 0.95*b)/2$ (per AISC DG1, sect. 3.1.3)		
l	3.21 in	Critical cantilever dimension $l = \text{MAX}(m, n)$		
f_p	0.05 ksi	Required bearing stress (see 'Concrete Bearing' check)		
M_{pl}	0.02 kips-ft/in	Required bending moment per unit width, $M_{pl}=f_p * l^2 / 2$ (per AISC DG1, sect. 3.1.2)		
Anchor Bolt Shear	2.83 kips	8.01 kips	0.35	PASS
$R_n = F_{nv} * A_b * N_{bolt}$		$\Omega = 2.00$	(J3-1)	
V_{uy}	2.00 kips	Strong axis shear		
V_{uz}	2.00 kips	Weak axis shear		
$V_u = (V_{uy}^2 + V_{uz}^2)^{0.5}$	2.83 kips	Resultant shear force		
F_{nv}	26.10 ksi	Shear stress N type		
A_b	0.31 in ²	Area of bolt		
N_{bolt}	2	Number of bolts (per AISC DG1, Section 3.5.3)		
R_n/Ω	8.01 kips	Bolt shear rupture strength		
Anchor Bolt Bearing on Base Plate	2.83 kips	8.01 kips	0.35	PASS
$R_n = N_{bolt} * \min(1.2*L_c * t_p * F_u, 2.4*d_b * t_p * F_u, R_{n-bolt})$		$\Omega = 2.00$	(J3-6a)	
V_u	2.83 kips	Resultant shear force, see 'Anchor Bolt Shear' check		
N_{bolt}	2	Number of bolts (per AISC DG1, Section 3.5.3)		
Θ	45.00 degrees	Angle between the resultant shear force and z-axis		
e_y	1.12 in	Edge distance y		
e_z	1.12 in	Edge distance z		
d_c	0.41 in	Distance from center of bolt to the edge of hole		
L_c	1.18 in	Minimum clear distance for the weakest bolt, $L_c= \min(e_y / \sin(\Theta) , e_z / \cos(\Theta)) - d_c$		
t_p	0.50 in	Thickness of base plate		
d_b	0.62 in	Bolt diameter		
F_u	58.00 ksi	Minimum tensile stress of material		
R_{n-bolt}	8.01 kips	$Bolt\ shear\ strength, R_{n-bolt}=F_{nv} * A_{bolt}$		
F_{nv}	26.10 ksi	Nominal shear stress of bolt		
A_{bolt}	0.31 in ²	Area of bolt		
Rn/Ω	8.01 kips	Bolt bearing strength		

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GRAVITY: Base Plate Report (continued):

Limit State	Required	Available	Unity Check	Result
Column Weld Limitations				PASS
Weld Min Size			(J2.2b)	
Check Weld Min Size	Pass			
D	0.19 in	Weld size		
D _{min}	0.12 in	Min size allowed per Table J2.4		
t _{min}	0.17 in	Controlling member thickness		
Column Flange Weld Strength	0.36 kips/in	2.78 kips/in	0.13	PASS
$R_n/\Omega = C_1 * \alpha * 0.928 * D_{16}$ Single Fillet $0.928 = 0.6 * F_{E70} * 2^{0.5} / 2 * 1/16 / \Omega, \Omega=2.00$ (AISC 14 th Eqn 8-2b)				
C ₁	1.00	Electrode strength coefficient (AISC 14 th table 8-3)		
t	0.17 in	Base material thickness (column)		
α	1.00	Base material proration factor (re-arrangement of AISC 14 th Eqn 9-2)		
D ₁₆	3.00	Weld fillet size in sixteenths of an inch		
P _u	0.00 kips	Axial load		
V _{uz}	2.00 kips	Weak axis shear		
M _{uz}	0.00 kips-ft	Strong axis moment		
b	3.50 in	Column width		
d	3.50 in	Column depth		
t	0.17 in	Column wall thickness		
L _f	2.80 in	Flange weld length, L _f =b - 4 * t		
r _u	0.36 kips/in	Required strength of the weld for in-plane force, r _u = V _{uz} / (2 * L _f) (AISC 14 th , Eqn 8 - 5)		
S _z	16.33 in ²	Strong axis section modulus of weld, S _z = b * d + d ² / 3		
r ₀	-0.00 kips/in	Required strength of the weld for out-of-plane force(tensile), r ₀ = - b / (b+d) * P _u / (2 * L _f) - M _{uz} / S _z		
r _{3d}	0.36 kips/in	Resultant force r _{3d} = (r _u ² + r ₀ ²) ^{0.5}		
Rn/Ω	2.78 kips/in	Weld strength		
Column Web Weld Strength	0.36 kips/in	2.78 kips/in	0.13	PASS
$R_n/\Omega = C_1 * \alpha * 0.928 * D_{16}$ Single Fillet $0.928 = 0.6 * F_{E70} * 2^{0.5} / 2 * 1/16 / \Omega, \Omega=2.00$ (AISC 14 th Eqn 8-2b)				
C ₁	1.00	Electrode strength coefficient (AISC 14 th table 8-3)		
t	0.17 in	Base material thickness (column)		
α	1.00	Base material proration factor (re-arrangement of AISC 14 th Eqn 9-2)		
D ₁₆	3.00	Weld fillet size in sixteenths of an inch		
P _u	0.00 kips	Axial load		
V _{uy}	2.00 kips	Strong axis shear		
M _{uy}	0.00 kips-ft	Weak axis moment		
b	3.50 in	Column width		
d	3.50 in	Column depth		
t	0.17 in	Column wall thickness		
L _w	2.80 in	Web weld length, L _w = d - 4 * t		

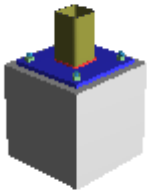
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GRAVITY: Base Plate Report (continued):

Limit State	Required	Available	Unity Check	Result
r_u	0.36 kips/in	Required strength of the weld for in-plane force, $r_u = V_{uy} / (2 * L_w) $ (AISC 14th, Eqn 8 - 5)		
S_y	16.33 in ²	Weak axis section modulus of weld, $S_y = b * d + b^2 / 3$		
r_o	-0.00 kips/in	Required strength of the weld for out-of-plane force(tensile), $r_o = - b / (b+d) * P_u / (2 * L_w) - M_{uy} / S_y $		
r_{3d}	0.36 kips/in	Resultant force $r_{3d} = (r_u^2 + r_o^2)^{0.5}$		
Rn/Ω	2.78 kips/in	Weld strength		

GRAVITY: Anchorage Design Report

Single Column Base Plate Connection



Material Properties:

Column	HSS3.5X3.5X3	A500 Gr.B Rect	$F_y = 46.00$ ksi	$F_u = 58.00$ ksi
Base Plate	P0.50x9.75x9.75	A36	$F_y = 36.00$ ksi	$F_u = 58.00$ ksi

Input Data:

Axial	5.00 kips	<i>Axial load on the column</i>
Strong Axis Shear	2.00 kips	<i>Shear load on the column that causes strong axis bending</i>
Weak Axis Shear	2.00 kips	<i>Shear load on the column that causes weak axis bending</i>
Strong Axis Moment	0.00 kips-ft	<i>Column moment about the strong axis</i>
Weak Axis Moment	0.00 kips-ft	<i>Column moment about the weak axis</i>

Note: Unless specified, all code references are from ACI 318-19 (22)

Limit State	Required	Available	Unity Check	Result
Anchorage calculation not supported when Steel Code is set to ASD				No Calc

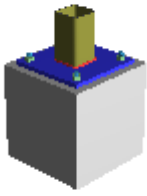
GRAVITY: Connection Properties Report

Single Column Base Plate Connection

Connection	
Connection Title	GRAVITY
Connection Type	Single Column Base Plate Connection
Anchorage	
Anchorage Type	Cast-in-place
Connection Category	
Bolt Layout	Four
Plate Washers	No
Loading (ASD)	
Axial	5.00 kips
Strong Axis Shear	2.00 kips
Weak Axis Shear	2.00 kips
Strong Axis Moment	0.00 kips-ft
Weak Axis Moment	0.00 kips-ft
Components	
Column Section	HSS3.5X3.5X3
Material	A500 Gr.B Rect
Base Plate	P0.50x9.75x9.75
Material	A36
Length	9.75 in
Width	9.75 in
Thickness	0.50 in
Static Friction Coefficient	0.45 Coeff
Hole Type	OVS
Concrete Support	C11.75x11.75x12.00
Length	11.75 in
Width	11.75 in
Thickness	12.00 in
Compressive Strength (f'c)	3.00 ksi
Concrete Weight	Normal Weight
Cracked Concrete	Yes
Edge Reinforcement	None or < no. 4 bar
Anchor Bolts	5/8" F1554 Gr.36-N
Material	F1554 Gr.36-N
Head Type	Hex Bolt
Torque Type	Untorqued Anchor
Diameter, in.	5/8"
Embedment depth	9.00 in
Bolt Spacing y	7.50 in
Bolt Spacing z	7.50 in
Column Weld	E70
Type	Fillet
Fillet Size	3.00 Sixteenths
Assembly	
Edge Distance y	1.13 in
Edge Distance z	1.13 in
Edge Distance +y	1.00 in
Edge Distance -y	1.00 in
Edge Distance +z	1.00 in
Edge Distance -z	1.00 in

UPLIFT: Summary Report

Single Column Base Plate Connection



Material Properties:

Column	HSS3.5X3.5X3	A500 Gr.B Rect	$F_y = 46.00$ ksi	$F_u = 58.00$ ksi
Base Plate	P0.50x9.75x9.75	A36	$F_y = 36.00$ ksi	$F_u = 58.00$ ksi

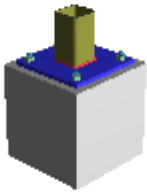
Input Data:

Axial	-5.00 kips	<i>Axial load on the column</i>
Strong Axis Shear	2.00 kips	<i>Shear load on the column that causes strong axis bending</i>
Weak Axis Shear	2.00 kips	<i>Shear load on the column that causes weak axis bending</i>
Strong Axis Moment	0.00 kips-ft	<i>Column moment about the strong axis</i>
Weak Axis Moment	0.00 kips-ft	<i>Column moment about the weak axis</i>

Connection	Required	Max Unity Check	Result
Column/Base Plate connection	Plate Flexural Yielding(Tension)	0.60	PASS

UPLIFT: Base Plate Report

Single Column Base Plate Connection



Material Properties:

Column	HSS3.5X3.5X3	A500 Gr.B Rect	$F_y = 46.00$ ksi	$F_u = 58.00$ ksi
Base Plate	P0.50x9.75x9.75	A36	$F_y = 36.00$ ksi	$F_u = 58.00$ ksi

Input Data:

Axial	-5.00 kips	Axial load on the column
Strong Axis Shear	2.00 kips	Shear load on the column that causes strong axis bending
Weak Axis Shear	2.00 kips	Shear load on the column that causes weak axis bending
Strong Axis Moment	0.00 kips-ft	Column moment about the strong axis
Weak Axis Moment	0.00 kips-ft	Column moment about the weak axis

Note: Unless specified, all code references are from AISC 360-10

Limit State	Required	Available	Unity Check	Result
Geometry Restrictions				PASS
Check Min Bolt Spacing	Pass	Condition: $S_{min} \geq (2+2/3)d_{bolt}$ (J3.3)		
S_{min}	7.50 in	Min bolt spacing		
d_{bolt}	0.62 in	Anchor bolt diameter		
Check Min Edge Distance	Pass	Condition: $\min(e_z, e_y) \geq ED_{allow}$ (J3.4)		
e_y	1.12 in	Min edge distance y		
e_z	1.12 in	Min edge distance z		
ED_{allow}	0.94 in	Minimum allowed edge distance		
Check Max Edge Distance	Pass	Condition: $\max(d_z, d_y) \leq \min(6.00 \text{ in}, 12*t)$ (J3.5)		
d_y	1.12 in	Max edge distance y		
d_z	1.12 in	Max edge distance z		
ED_{allow}	6.00 in	Maximum allowed edge distance		
t	0.50 in	Thickness of base plate		
Check Anchor Bolt Encroachment on Column	Pass			
Plate Flexural Yielding(Tension)	0.22 kips-ft	0.36 kips-ft	0.60	PASS
$M_n = b_e * F_y * t_p^2 / 4$		$\Omega = 1.67$	(AISC DG1 (3.3.13))	
b_e	3.21 in	Effective width of plate section (corner bolt)		
F_y	36.00 ksi	Minimum yield strength of base plate		
t_p	0.50 in	Thickness of base plate		
M_n/Ω	0.36 kips-ft	Base plate bending strength		
T	1.25 kips	Tension force in anchor bolt		
x	2.09 in	Moment arm for anchor bolt		
M_{pl}	0.22 kips-ft	Bending moment caused by tension at bolt, $M_{pl} = T*x$		
Anchor Bolt Tension	1.25 kips	6.67 kips	0.19	PASS
$R_n = F_{nt} * A_b$		$\Omega = 2.00$	(J3-2)	
Prying effects are ignored				

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UPLIFT: Base Plate Report (continued):

Limit State	Required	Available	Unity Check	Result
Check User Note Limit:	Pass	Condition: ($f_{rt}/F_{nt} \leq 0.3$) or ($f_{rv}/F_{nv} \leq 0.3$)		
f_{rt}	4.07 ksi	Required tensile stress, $f_{rt} = T_{bolt} / A_b$		
F_{nt}	43.50 ksi	Available tensile stress, per Table J3.2		
f_{rv}	4.61 ksi	Required shear stress: $f_{rv} = (V_u / N_{bolt}) / A_b$		
F_{nv}	26.10 ksi	Available shear stress, per Table J3.2		
Because $f_{rt}/F_{nt} \leq 0.3$ and $f_{rv}/F_{nv} \leq 0.3$, effects of combined tension and shear stress need not be investigated				
T_{bolt}	1.25 kips	Tension at bolts		
V_u	2.83 kips	Resultant shear force, see 'Anchor Bolt Shear' check		
N_{bolt}	2	Number of bolts (DG-1, Section 3.5.3)		
A_b	0.31 in ²	Bolt cross sectional area		
R_n/Ω	6.67 kips	Bolt tensile strength		
Anchor Bolt Shear	2.83 kips	8.01 kips	0.35	PASS
$R_n = F_{nv} * A_b * N_{bolt}$		$\Omega = 2.00$	(J3-1)	
V_{uy}	2.00 kips	Strong axis shear		
V_{uz}	2.00 kips	Weak axis shear		
$V_u = (V_{uy}^2 + V_{uz}^2)^{0.5}$	2.83 kips	Resultant shear force		
F_{nv}	26.10 ksi	Shear stress N type		
A_b	0.31 in ²	Area of bolt		
N_{bolt}	2	Number of bolts (per AISC DG1, Section 3.5.3)		
R_n/Ω	8.01 kips	Bolt shear rupture strength		
Anchor Bolt Bearing on Base Plate	2.83 kips	8.01 kips	0.35	PASS
$R_n = N_{bolt} * \min(1.2*L_c*t_p*F_u, 2.4*d_b*t_p*F_u, R_{n-bolt})$		$\Omega = 2.00$	(J3-6a)	
V_u	2.83 kips	Resultant shear force, see 'Anchor Bolt Shear' check		
N_{bolt}	2	Number of bolts (per AISC DG1, Section 3.5.3)		
Θ	45.00 degrees	Angle between the resultant shear force and z-axis		
e_y	1.12 in	Edge distance y		
e_z	1.12 in	Edge distance z		
d_c	0.41 in	Distance from center of bolt to the edge of hole		
L_c	1.18 in	Minimum clear distance for the weakest bolt, $L_c = \min(e_y / \sin(\Theta) , e_z / \cos(\Theta)) - d_c$		
t_p	0.50 in	Thickness of base plate		
d_b	0.62 in	Bolt diameter		
F_u	58.00 ksi	Minimum tensile stress of material		
R_{n-bolt}	8.01 kips	Bolt shear strength, $R_{n-bolt} = F_{nv} * A_{bolt}$		
F_{nv}	26.10 ksi	Nominal shear stress of bolt		
A_{bolt}	0.31 in ²	Area of bolt		
Rn/Ω	8.01 kips	Bolt bearing strength		
Column Weld Limitations				PASS
Weld Min Size		(J2.2b)		
Check Weld Min Size	Pass			
D	0.19 in	Weld size		
D _{min}	0.12 in	Min size allowed per Table J2.4		

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UPLIFT: Base Plate Report (continued):

Limit State	Required	Available	Unity Check	Result
t_{min}	0.17 in	Controlling member thickness		
Column Flange Weld Strength	0.57 kips/in	2.78 kips/in	0.21	PASS
$Rn/\Omega = C_1 * \alpha * 0.928 * D_{16}$ Single Fillet $0.928 = 0.6 * F_{E70} * 2^{0.5} / 2 * 1/16 / \Omega, \Omega=2.00$ (AISC 14 th Eqn 8-2b)				
C_1	1.00	Electrode strength coefficient (AISC 14 th table 8-3)		
t	0.17 in	Base material thickness (column)		
α	1.00	Base material proration factor (re-arrangement of AISC 14 th Eqn 9-2)		
D_{16}	3.00	Weld fillet size in sixteenths of an inch		
P_u	-5.00 kips	Axial load		
V_{uz}	2.00 kips	Weak axis shear		
M_{uz}	0.00 kips-ft	Strong axis moment		
b	3.50 in	Column width		
d	3.50 in	Column depth		
t	0.17 in	Column wall thickness		
L_f	2.80 in	Flange weld length, $L_f = b - 4 * t$		
r_u	0.36 kips/in	Required strength of the weld for in-plane force, $r_u = V_{uz} / (2 * L_f) $ (AISC 14th, Eqn 8 - 5)		
S_z	16.33 in ²	Strong axis section modulus of weld, $S_z = b * d + d^2 / 3$		
r_o	-0.45 kips/in	Required strength of the weld for out-of-plane force(tensile), $r_o = - b / (b+d) * P_u / (2 * L_f) - M_{uz} / S_z $		
r_{3d}	0.57 kips/in	Resultant force $r_{3d} = (r_u^2 + r_o^2)^{0.5}$		
Rn/Ω	2.78 kips/in	Weld strength		
Column Web Weld Strength	0.57 kips/in	2.78 kips/in	0.21	PASS
$Rn/\Omega = C_1 * \alpha * 0.928 * D_{16}$ Single Fillet $0.928 = 0.6 * F_{E70} * 2^{0.5} / 2 * 1/16 / \Omega, \Omega=2.00$ (AISC 14 th Eqn 8-2b)				
C_1	1.00	Electrode strength coefficient (AISC 14 th table 8-3)		
t	0.17 in	Base material thickness (column)		
α	1.00	Base material proration factor (re-arrangement of AISC 14 th Eqn 9-2)		
D_{16}	3.00	Weld fillet size in sixteenths of an inch		
P_u	-5.00 kips	Axial load		
V_{uy}	2.00 kips	Strong axis shear		
M_{uy}	0.00 kips-ft	Weak axis moment		
b	3.50 in	Column width		
d	3.50 in	Column depth		
t	0.17 in	Column wall thickness		
L_w	2.80 in	Web weld length, $L_w = d - 4 * t$		
r_u	0.36 kips/in	Required strength of the weld for in-plane force, $r_u = V_{uy} / (2 * L_w) $ (AISC 14th, Eqn 8 - 5)		
S_y	16.33 in ²	Weak axis section modulus of weld, $S_y = b * d + b^2 / 3$		
r_o	-0.45 kips/in	Required strength of the weld for out-of-plane force(tensile), $r_o = - b / (b+d) * P_u / (2 * L_w) - M_{uy} / S_y $		

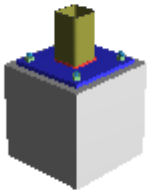
continued on next page...

UPLIFT: Base Plate Report (continued):

Limit State	Required	Available	Unity Check	Result
r_{3d}	0.57 kips/in	Resultant force $r_{3d} = (r_u^2 + r_o^2)^{0.5}$		
Rn/Ω	2.78 kips/in	Weld strength		

UPLIFT: Anchorage Design Report

Single Column Base Plate Connection



Material Properties:

Column	HSS3.5X3.5X3	A500 Gr.B Rect	$F_y = 46.00$ ksi	$F_u = 58.00$ ksi
Base Plate	P0.50x9.75x9.75	A36	$F_y = 36.00$ ksi	$F_u = 58.00$ ksi

Input Data:

Axial	-5.00 kips	<i>Axial load on the column</i>
Strong Axis Shear	2.00 kips	<i>Shear load on the column that causes strong axis bending</i>
Weak Axis Shear	2.00 kips	<i>Shear load on the column that causes weak axis bending</i>
Strong Axis Moment	0.00 kips-ft	<i>Column moment about the strong axis</i>
Weak Axis Moment	0.00 kips-ft	<i>Column moment about the weak axis</i>

Note: Unless specified, all code references are from ACI 318-19 (22)

Limit State	Required	Available	Unity Check	Result
Anchorage calculation not supported when Steel Code is set to ASD				No Calc

UPLIFT: Connection Properties Report

Single Column Base Plate Connection

Connection		
Connection Title		UPLIFT
Connection Type		Single Column Base Plate Connection
Anchorage		
Anchorage Type		Cast-in-place
Connection Category		
Bolt Layout		Four
Plate Washers		No
Loading (ASD)		
Axial		-5.00 kips
Strong Axis Shear		2.00 kips
Weak Axis Shear		2.00 kips
Strong Axis Moment		0.00 kips-ft
Weak Axis Moment		0.00 kips-ft
Components		
Column Section		HSS3.5X3.5X3
Material		A500 Gr.B Rect
Base Plate		P0.50x9.75x9.75
Material		A36
Length		9.75 in
Width		9.75 in
Thickness		0.50 in
Static Friction Coefficient		0.45 Coeff
Hole Type		OVS
Concrete Support		C11.75x11.75x12.00
Length		11.75 in
Width		11.75 in
Thickness		12.00 in
Compressive Strength (f'c)		3.00 ksi
Concrete Weight		Normal Weight
Cracked Concrete		Yes
Edge Reinforcement		None or < no. 4 bar
Anchor Bolts		5/8" F1554 Gr.36-N
Material		F1554 Gr.36-N
Head Type		Hex Bolt
Torque Type		Untorqued Anchor
Diameter, in.		5/8"
Embedment depth		9.00 in
Bolt Spacing y		7.50 in
Bolt Spacing z		7.50 in
Column Weld		E70
Type		Fillet
Fillet Size		3.00 Sixteenths
Assembly		
Edge Distance y		1.13 in
Edge Distance z		1.13 in
Edge Distance +y		1.00 in
Edge Distance -y		1.00 in
Edge Distance +z		1.00 in
Edge Distance -z		1.00 in

A325/A449 CONNECTION ALLOWABLE LOADS (KIPS PER BOLT) 5/16" DIAM. BOLTED CONNECTIONS

BOLT DIAM(IN)	BOLT AREA(IN ²)	MAT. GAGE	MAT. THICK(IN)	SHEAR PLANES	WASHER OR OUTSIDE MEMB.	WASHER FACTOR	BRG. ALLOW (KIPS)	SHEAR ALLOW(KIPS)	CONN. ALLOW (KIPS PER BOLT)	CASE
5/16	0.077	8	0.1644	2	N	0.750	6.011	3.682	3.682	5/16 - 8 - 2 - N
5/16	0.077	8	0.1644	2	Y	1.000	8.015	3.682	3.682	5/16 - 8 - 2 - Y
5/16	0.077	8	0.1644	1	N	0.750	3.005	1.841	1.841	5/16 - 8 - 1 - N
5/16	0.077	8	0.1644	1	Y	1.000	4.007	1.841	1.841	5/16 - 8 - 1 - Y
5/16	0.077	10	0.1345	2	N	0.750	4.918	3.682	3.682	5/16 - 10 - 2 - N
5/16	0.077	10	0.1345	2	Y	1.000	6.557	3.682	3.682	5/16 - 10 - 2 - Y
5/16	0.077	10	0.1345	1	N	0.750	2.459	1.841	1.841	5/16 - 10 - 1 - N
5/16	0.077	10	0.1345	1	Y	1.000	3.278	1.841	1.841	5/16 - 10 - 1 - Y
5/16	0.077	11	0.1196	2	N	0.750	4.373	3.682	3.682	5/16 - 11 - 2 - N
5/16	0.077	11	0.1196	2	Y	1.000	5.831	3.682	3.682	5/16 - 11 - 2 - Y
5/16	0.077	11	0.1196	1	N	0.750	2.186	1.841	1.841	5/16 - 11 - 1 - N
5/16	0.077	11	0.1196	1	Y	1.000	2.915	1.841	1.841	5/16 - 11 - 1 - Y
5/16	0.077	12	0.1046	2	N	0.750	3.824	3.682	3.682	5/16 - 12 - 2 - N
5/16	0.077	12	0.1046	2	Y	1.000	5.099	3.682	3.682	5/16 - 12 - 2 - Y
5/16	0.077	12	0.1046	1	N	0.750	1.912	1.841	1.841	5/16 - 12 - 1 - N
5/16	0.077	12	0.1046	1	Y	1.000	2.550	1.841	1.841	5/16 - 12 - 1 - Y
5/16	0.077	13	0.0897	2	N	0.750	3.280	3.682	3.280	5/16 - 13 - 2 - N
5/16	0.077	13	0.0897	2	Y	1.000	4.373	3.682	3.682	5/16 - 13 - 2 - Y
5/16	0.077	13	0.0897	1	N	0.750	1.640	1.841	1.640	5/16 - 13 - 1 - N
5/16	0.077	13	0.0897	1	Y	1.000	2.186	1.841	1.841	5/16 - 13 - 1 - Y
5/16	0.077	14	0.0747	2	N	0.750	2.731	3.682	2.731	5/16 - 14 - 2 - N
5/16	0.077	14	0.0747	2	Y	1.000	3.642	3.682	3.642	5/16 - 14 - 2 - Y
5/16	0.077	14	0.0747	1	N	0.750	1.366	1.841	1.366	5/16 - 14 - 1 - N
5/16	0.077	14	0.0747	1	Y	1.000	1.821	1.841	1.821	5/16 - 14 - 1 - Y
5/16	0.077	16	0.0598	2	N	0.750	2.186	3.682	2.186	5/16 - 16 - 2 - N
5/16	0.077	16	0.0598	2	Y	1.000	2.915	3.682	2.915	5/16 - 16 - 2 - Y
5/16	0.077	16	0.0598	1	N	0.750	1.093	1.841	1.093	5/16 - 16 - 1 - N
5/16	0.077	16	0.0598	1	Y	1.000	1.458	1.841	1.458	5/16 - 16 - 1 - Y
5/16	0.077	18	0.0478	2	N	0.750	1.748	3.682	1.748	5/16 - 18 - 2 - N
5/16	0.077	18	0.0478	2	Y	1.000	2.330	3.682	2.330	5/16 - 18 - 2 - Y
5/16	0.077	18	0.0478	1	N	0.750	0.874	1.841	0.874	5/16 - 18 - 1 - N
5/16	0.077	18	0.0478	1	Y	1.000	1.165	1.841	1.165	5/16 - 18 - 1 - Y

GRADE 5 CONNECTION ALLOWABLE LOADS (KIPS PER BOLT) 3/8" DIAM. BOLTED CONNECTIONS

BOLT DIAM(IN)	BOLT AREA(IN^2)	MAT. GAGE	MAT. THICK(IN)	SHEAR PLANES	WASHER OR OUTSIDE MEMB.	WASHER FACTOR	BRG. ALLOW (KIPS)	SHEAR ALLOW(KIPS)	CONN. ALLOW (KIPS PER BOLT)	CASE
3/8	0.110	8	0.1644	2	N	0.750	7.213	5.301	5.301	3/8 - 8 - 2 - N
3/8	0.110	8	0.1644	2	Y	1.000	9.617	5.301	5.301	3/8 - 8 - 2 - Y
3/8	0.110	8	0.1644	1	N	0.750	3.607	2.651	2.651	3/8 - 8 - 1 - N
3/8	0.110	8	0.1644	1	Y	1.000	4.809	2.651	2.651	3/8 - 8 - 1 - Y
3/8	0.110	10	0.1345	2	N	0.750	5.901	5.301	5.301	3/8 - 10 - 2 - N
3/8	0.110	10	0.1345	2	Y	1.000	7.868	5.301	5.301	3/8 - 10 - 2 - Y
3/8	0.110	10	0.1345	1	N	0.750	2.951	2.651	2.651	3/8 - 10 - 1 - N
3/8	0.110	10	0.1345	1	Y	1.000	3.934	2.651	2.651	3/8 - 10 - 1 - Y
3/8	0.110	11	0.1196	2	N	0.750	5.247	5.301	5.247	3/8 - 11 - 2 - N
3/8	0.110	11	0.1196	2	Y	1.000	6.997	5.301	5.301	3/8 - 11 - 2 - Y
3/8	0.110	11	0.1196	1	N	0.750	2.624	2.651	2.624	3/8 - 11 - 1 - N
3/8	0.110	11	0.1196	1	Y	1.000	3.498	2.651	2.651	3/8 - 11 - 1 - Y
3/8	0.110	12	0.1046	2	N	0.750	4.589	5.301	4.589	3/8 - 12 - 2 - N
3/8	0.110	12	0.1046	2	Y	1.000	6.119	5.301	5.301	3/8 - 12 - 2 - Y
3/8	0.110	12	0.1046	1	N	0.750	2.295	2.651	2.295	3/8 - 12 - 1 - N
3/8	0.110	12	0.1046	1	Y	1.000	3.060	2.651	2.651	3/8 - 12 - 1 - Y
3/8	0.110	13	0.0897	2	N	0.750	3.936	5.301	3.936	3/8 - 13 - 2 - N
3/8	0.110	13	0.0897	2	Y	1.000	5.247	5.301	5.247	3/8 - 13 - 2 - Y
3/8	0.110	13	0.0897	1	N	0.750	1.968	2.651	1.968	3/8 - 13 - 1 - N
3/8	0.110	13	0.0897	1	Y	1.000	2.624	2.651	2.624	3/8 - 13 - 1 - Y
3/8	0.110	14	0.0747	2	N	0.750	3.277	5.301	3.277	3/8 - 14 - 2 - N
3/8	0.110	14	0.0747	2	Y	1.000	4.370	5.301	4.370	3/8 - 14 - 2 - Y
3/8	0.110	14	0.0747	1	N	0.750	1.639	2.651	1.639	3/8 - 14 - 1 - N
3/8	0.110	14	0.0747	1	Y	1.000	2.185	2.651	2.185	3/8 - 14 - 1 - Y
3/8	0.110	16	0.0598	2	N	0.750	2.624	5.301	2.624	3/8 - 16 - 2 - N
3/8	0.110	16	0.0598	2	Y	1.000	3.498	5.301	3.498	3/8 - 16 - 2 - Y
3/8	0.110	16	0.0598	1	N	0.750	1.312	2.651	1.312	3/8 - 16 - 1 - N
3/8	0.110	16	0.0598	1	Y	1.000	1.749	2.651	1.749	3/8 - 16 - 1 - Y
3/8	0.110	18	0.0478	2	N	0.750	2.097	5.301	2.097	3/8 - 18 - 2 - N
3/8	0.110	18	0.0478	2	Y	1.000	2.796	5.301	2.796	3/8 - 18 - 2 - Y
3/8	0.110	18	0.0478	1	N	0.750	1.049	2.651	1.049	3/8 - 18 - 1 - N
3/8	0.110	18	0.0478	1	Y	1.000	1.398	2.651	1.398	3/8 - 18 - 1 - Y

GRADE 5/A325 CONNECTION ALLOWABLE LOADS (KIPS PER BOLT) 1/2" DIAM. BOLTED CONNECTIONS

BOLT DIAM(IN)	BOLT AREA(IN^2)	MAT. GAGE	MAT. THICK(IN)	SHEAR PLANES	WASHER OR OUTSIDE MEMB.	WASHER FACTOR	BRG. ALLOW (KIPS)	SHEAR ALLOW(KIPS)	CONN. ALLOW (KIPS PER BOLT)	CASE
1/2	0.196	8	0.1644	2	N	0.750	9.617	9.425	9.425	1/2 - 8 - 2 - N
1/2	0.196	8	0.1644	2	Y	1.000	12.823	9.425	9.425	1/2 - 8 - 2 - Y
1/2	0.196	8	0.1644	1	N	0.750	4.809	4.712	4.712	1/2 - 8 - 1 - N
1/2	0.196	8	0.1644	1	Y	1.000	6.412	4.712	4.712	1/2 - 8 - 1 - Y
1/2	0.196	10	0.1345	2	N	0.750	7.868	9.425	7.868	1/2 - 10 - 2 - N
1/2	0.196	10	0.1345	2	Y	1.000	10.491	9.425	9.425	1/2 - 10 - 2 - Y
1/2	0.196	10	0.1345	1	N	0.750	3.934	4.712	3.934	1/2 - 10 - 1 - N
1/2	0.196	10	0.1345	1	Y	1.000	5.246	4.712	4.712	1/2 - 10 - 1 - Y
1/2	0.196	11	0.1196	2	N	0.750	6.997	9.425	6.997	1/2 - 11 - 2 - N
1/2	0.196	11	0.1196	2	Y	1.000	9.329	9.425	9.329	1/2 - 11 - 2 - Y
1/2	0.196	11	0.1196	1	N	0.750	3.498	4.712	3.498	1/2 - 11 - 1 - N
1/2	0.196	11	0.1196	1	Y	1.000	4.664	4.712	4.664	1/2 - 11 - 1 - Y
1/2	0.196	12	0.1046	2	N	0.750	6.119	9.425	6.119	1/2 - 12 - 2 - N
1/2	0.196	12	0.1046	2	Y	1.000	8.159	9.425	8.159	1/2 - 12 - 2 - Y
1/2	0.196	12	0.1046	1	N	0.750	3.060	4.712	3.060	1/2 - 12 - 1 - N
1/2	0.196	12	0.1046	1	Y	1.000	4.079	4.712	4.079	1/2 - 12 - 1 - Y
1/2	0.196	13	0.0897	2	N	0.750	5.247	9.425	5.247	1/2 - 13 - 2 - N
1/2	0.196	13	0.0897	2	Y	1.000	6.997	9.425	6.997	1/2 - 13 - 2 - Y
1/2	0.196	13	0.0897	1	N	0.750	2.624	4.712	2.624	1/2 - 13 - 1 - N
1/2	0.196	13	0.0897	1	Y	1.000	3.498	4.712	3.498	1/2 - 13 - 1 - Y
1/2	0.196	14	0.0747	2	N	0.750	4.370	9.425	4.370	1/2 - 14 - 2 - N
1/2	0.196	14	0.0747	2	Y	1.000	5.827	9.425	5.827	1/2 - 14 - 2 - Y
1/2	0.196	14	0.0747	1	N	0.750	2.185	4.712	2.185	1/2 - 14 - 1 - N
1/2	0.196	14	0.0747	1	Y	1.000	2.913	4.712	2.913	1/2 - 14 - 1 - Y
1/2	0.196	16	0.0598	2	N	0.750	3.498	9.425	3.498	1/2 - 16 - 2 - N
1/2	0.196	16	0.0598	2	Y	1.000	4.664	9.425	4.664	1/2 - 16 - 2 - Y
1/2	0.196	16	0.0598	1	N	0.750	1.749	4.712	1.749	1/2 - 16 - 1 - N
1/2	0.196	16	0.0598	1	Y	1.000	2.332	4.712	2.332	1/2 - 16 - 1 - Y
1/2	0.196	18	0.0478	2	N	0.750	2.796	9.425	2.796	1/2 - 18 - 2 - N
1/2	0.196	18	0.0478	2	Y	1.000	3.728	9.425	3.728	1/2 - 18 - 2 - Y
1/2	0.196	18	0.0478	1	N	0.750	1.398	4.712	1.398	1/2 - 18 - 1 - N
1/2	0.196	18	0.0478	1	Y	1.000	1.864	4.712	1.864	1/2 - 18 - 1 - Y

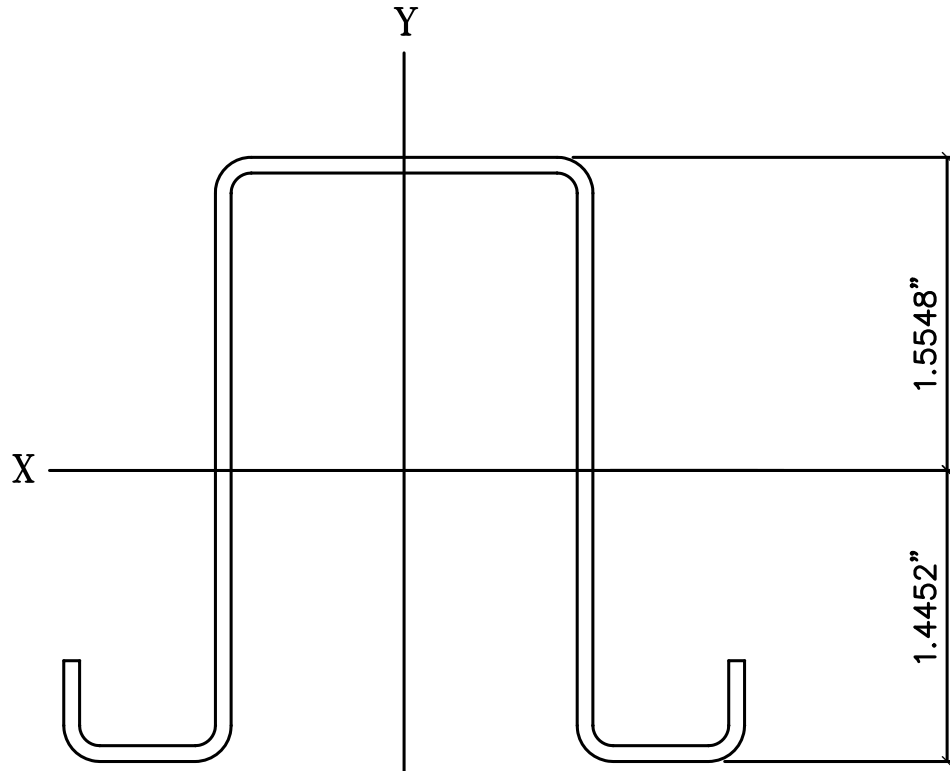


4th DIMENSION DESIGN, INC.

3"HAT x 14GA PURLINS

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3" HAT - 14 GA. (0.0785)

Area: 0.7620

Moments of inertia: X: 0.9266

Y: 0.7617

Radii of gyration: X: 1.1027

Y: 0.9998

Fy = 55 KSI

ASD

$$S_x = \frac{0.9266}{1.5548} = 0.5960 \text{ IN}^3$$

$$\text{ALLOW. MOMENT} \left(\frac{M_n}{\Omega} \right) = \left(\frac{0.5960(55)}{1.67} \right) / 12 = 1.635 \text{ K-FT}$$

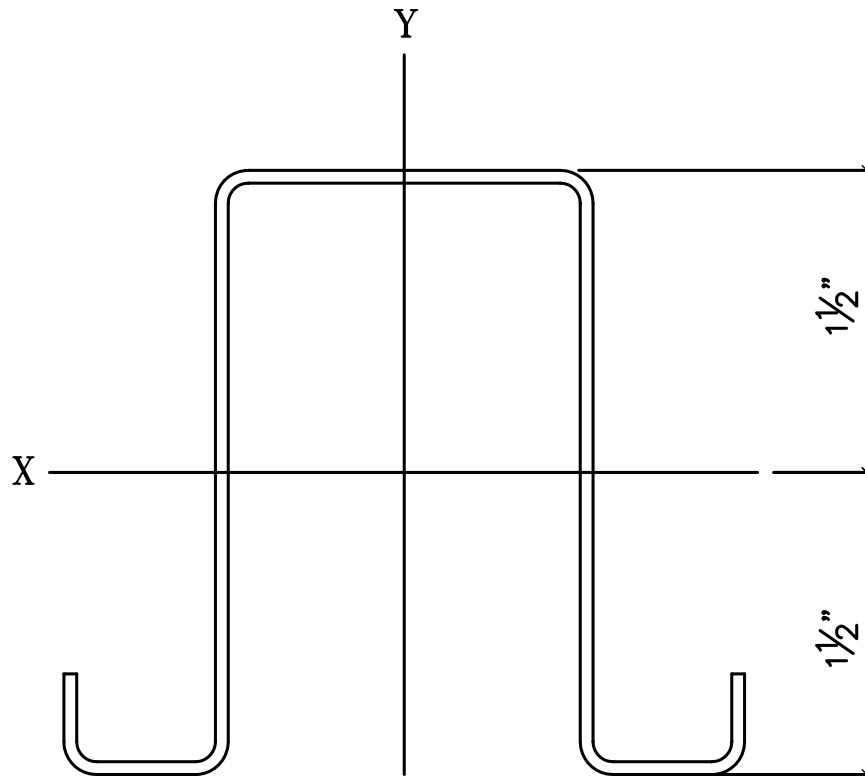


4th DIMENSION DESIGN, INC.

3"HAT x 16GA

PAGE

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3" HAT - 16 GA. (0.0635)

Area: 0.6215

Moments of inertia: X: 0.7644

Y: 0.6308

Radii of gyration: X: 1.1091

Y: 1.0075

Fy = 55 KSI

ASD

$$S_x = \frac{0.7644}{1.5} = 0.5096 \text{ IN}^3$$

$$\text{ALLOW. MOMENT} \left(\frac{M_n}{\Omega} \right) = \left(\frac{0.5096(55)}{1.67} \right) / 12 = 1.400 \text{ K-FT}$$

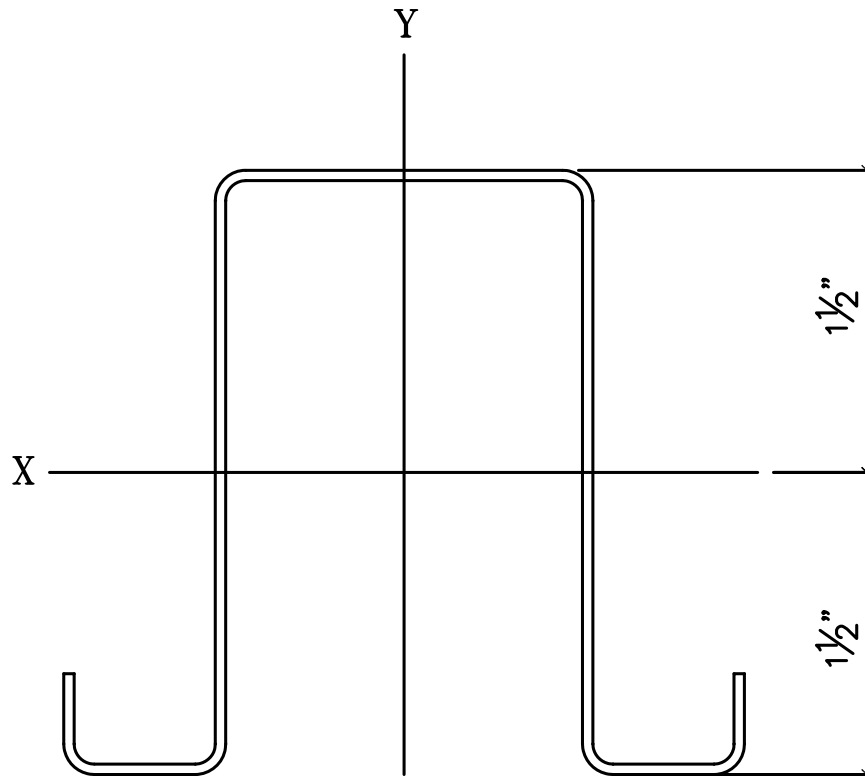


4th DIMENSION DESIGN, INC.

3"HAT x 18GA

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3" HAT - 18 GA. (0.0516)

Area: 0.5082

Moments of inertia: X: 0.6308

Y: 0.5221

Radii of gyration: X: 1.1141

Y: 1.0135

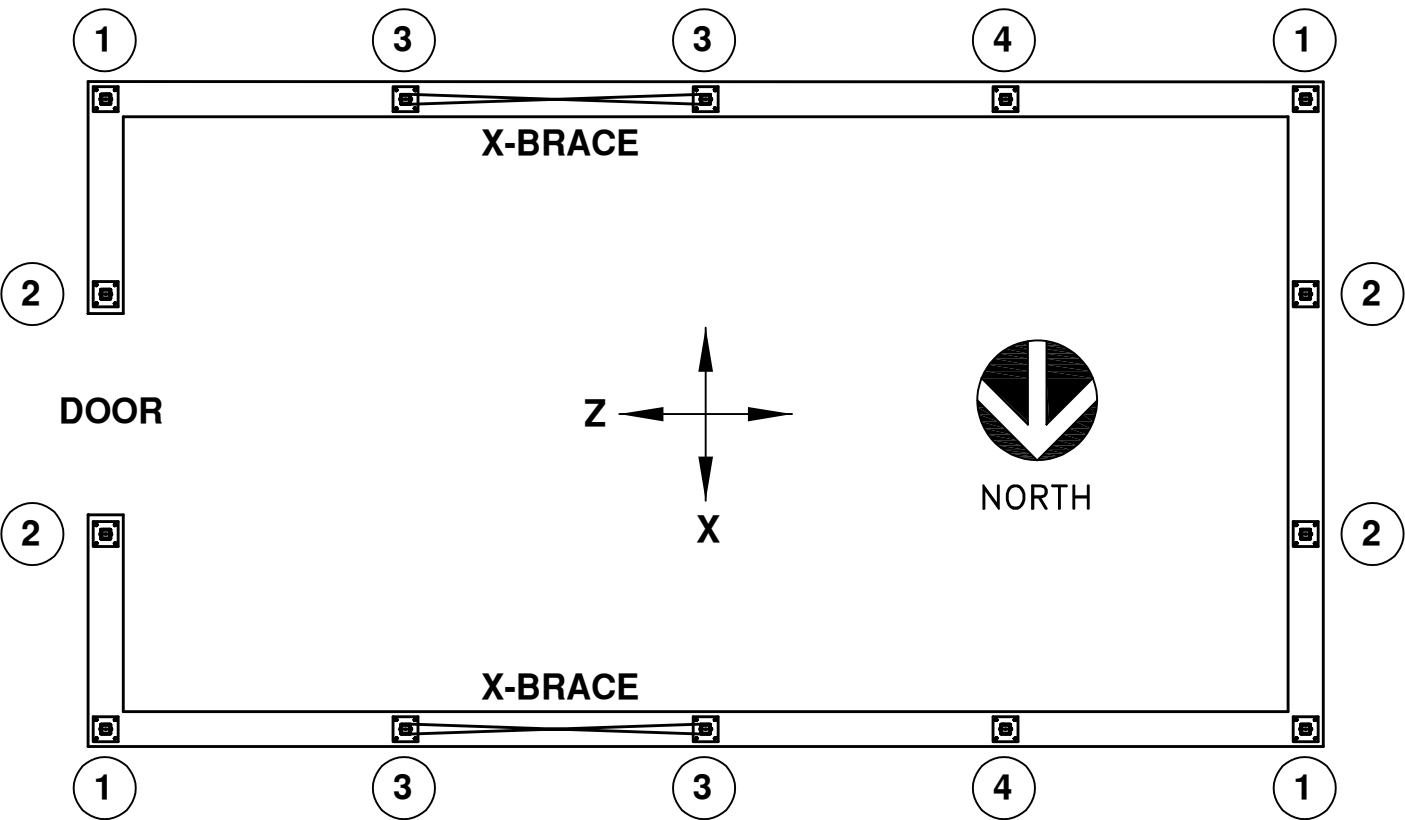
Fy = 55 KSI

ASD

$$S_x = \frac{0.6308}{1.5} = 0.4205 \text{ IN}^3$$

$$\text{ALLOW. MOMENT} \left(\frac{M_n}{\Omega} \right) = \left(\frac{0.4205(55)}{1.67} \right) / 12 = 1.154 \text{ K-FT}$$

COLUMN LOADS ON FOUNDATION



COLUMN PLAN

LOADS SHOWN ARE IN KIPS.
ALL LOADS ARE SERVICE LEVEL (ASD) AND ARE
THE MAXIMUM ENVELOPE RESULT OF THE ASD
LOAD COMBINATIONS AS REQUIRED BY CODE.
BASES ARE DESIGNED AS "PINNED."

LOCATION	X-DIR	Z-DIR	MAX. DOWN	MAX. NET UPLIFT
1	±0.4	±0.2	1.1	-0.5
2	±0.3	±0.6	1.4	-0.8
3	±0.9	±0.9	3.3	-1.2
4	±0.9	±0	3.3	-0.4

LANDSCAPE PLAN

