YOROK TRIBE

REQUEST FOR PROPOSAL
Morekwon Park N Ride

Yurok Tribe
190 Klamath Blvd.
Klamath, CA 95548

Dear Prospective Bidder:

The Yurok Tribe (the "Tribe") is seeking ***a Contractor to install a park n ride to include a bus shelter and parking lot.*** Technical questions or requests for clarification shall be directed, in writing, to the email address below. The Tribe's responses to a proposer's question(s) will be provided via return email only to the proposer asking the question(s), and not shared with other respondents.

- Name: Brandi Natt
- Company: Yurok Tribe
- Address: 190 Klamath Blvd
- City, State, Zip: Klamath, CA 95548
- Telephone: 707-482-1350 ext 1355
- Email Address: bnatt@yuroktribe.nsn.us

1. General Information

Key Dates:

The following table outlines the Tribe's key dates and events in this RFP process:

Date	Event
2/3/25	RFP is available
2/14/25	Questions and Answer Period
3/3/25	Deadline for Submission of Proposal
3/4/25	Bid Opening at Yurok Tribe Office, 190 Klamath Blvd, Klamath, CA at 1pm
3/3/25	Final Selection
4/11/25	Contract approval by Tribal Council
6/2/25-8/30/25	Project Construction Period
9/30/25	Project Completion

2. Rules Governing Proposals

All proposals must be submitted in a sealed envelope to ensure confidentiality during the bidding process. The sealed envelope should include the bidders name, address and the project title on the outside.

All bids must be received by March 3, 2025 by 5:00 pm.

The sealed envelope must include the completed proposal package including all required forms, documents and cost breakdown.

Confidentiality:

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Klamath, CA 95548

The content of all proposals will be kept confidential throughout the selection process and afterward. Copies of any proposal will not be shared with other respondents.

Late Submissions:

Proposals not received prior to the date and time specified will not be considered and will be returned to the proposer unopened.

Acceptance / Rejection of Submittal:

The Tribe reserves the right to reject any or all responses to this RFP, to waive minor irregularities in any proposal or in the RFP procedures, and to accept any proposal presented which meets or exceeds these specifications and which is deemed to be in the best interests of the Tribe. However, the requirements for timelines shall not be waived.

Proposal Evaluation:

A committee of individuals representing the Tribe will perform the evaluation of all proposals. Following this evaluation process, the committee may elect to ask certain respondents to complete an oral interview before the committee. The purpose of the interview is to allow those further selected firms expansion and discussion of their written responses.

Final Selection:

The final selection of the successful respondent(s) is scheduled to be completed by **4/11/25.** The successful respondent will assume their responsibilities on **5/1/25**

Insurance Requirements:

Include Proof of Insurance furnished by the respondent's carrier to guarantee the respondent is properly insured. The respondent, once awarded, must file with the Tribe certificates of insurance prior to the commencement of work as additionally insured with Liability Insurance, Comprehensive General Liability insurance, and Professional Liability insurance.

Respondent shall require and verify all subcontractors, if applicable, maintain insurance, including workers' compensation insurance, subject to all of the requirements stated herein prior to work.

Bonding:

The successful team will be required to furnish Performance and Payment bonds in the amount of 100% of the total contract price before construction.

3. Selection Criteria

Yurok Tribe
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Klamath, CA 95548

- Specialized experience, capabilities, and technical competence, which the organization may demonstrate with the organization's proposed approach and methodology to meet the project requirements.
- Specialized and qualified project team members with an extensive list of qualifications, education, and relevant experience for each.
- Resources committed to perform the work and the proportion of the time that the organization's staff would spend on the project, including time for specialized services, within the applicable time limits.
- Records from previous projects, quality of work, ability to meet schedules, cost control and contract administration.

4. Response Format (pages are maximum allowed)

a) Letter of Interest (1 page)
b) Qualifications of the Respondent (2 pages)
c) Presentation of the Respondent's Team (2 pages)
d) Specific Project Expertise that relates to the Project Description (5 pages)
e) Quality Control (1 page)
f) Any claims / disputes / litigation (1 page)
g) Statement of Assurance that the firm is not in violation of any regulatory statues (1 page)
h) Fee Schedule (1 page)
i) Signatures of Representatives

5. Project Description

The Morekwon Park & Ride Project is designed to enhance public transportation infrastructure and provide convenient, safe and accessible facility for commuters. This project involves construction of a dedicated parking spaces and the installation of a modern bus shelter, aimed at improving connectivity and encouraging the use of public transit.

Scope of Work

- Parking area construction:
  - Development of a designated parking lot with a capacity to accommodate 12 vehicles
  - Inclusion of accessible parking spaces in compliance with ADA standards
  - Installation of proper signage, lighting and striping for enhanced safety.
- Bus Shelter Installation:
  - Placement of a pre-purchased bus shelter to provide protection and comfort for passengers.

- Installation of Trash Bins with Bear locks.

Permits:

Yurok Water Quality Permit

Yurok Transportation staff will complete the Water Quality Permit application, but it will be up to the Contractor to sign, submit and pay the $1,000.00 fee before construction.

Yurok Cultural Resource Management Permit

The Yurok planning staff will complete the Cultural Resource Permit application, but it will be up to the Contractor to sign and submit it before construction. All ground disturbing activities will require an approved Cultural Monitor to be on-site. The Yurok Tribal Historic Preservation Officer will assign Cultural Monitors. (THPO) Cultural Monitors will be paid $35.00 an hour with a 4-hour minimum workday by the contractor.

Tribal Employment Rights Ordinance (TERO) Permit

The contractor will be responsible for obtaining the TERO Permit. The contractor must submit an Indian Preference Plant to the TERO Officer before a permit will be issued. Upon commending work, the contractor will be required to submit weekly Labor Force Reports to the TERO Officer. The contractor will be required to pay a TERO Fee of 1% for all invoiced design work and 5% for all invoiced all other construction work.

6. Evaluation of Criteria

The proposals will be evaluated based on the following criteria and point ranges:

Evaluation Criteria	Points
Cost Effectiveness	0-20
Demonstrated Expertise and Proof of Previous Work	0-20
Qualified or Specialized Team Members	0-20
Resource and Time Efficiency	0-20
Native American Preference (TERO)	0-10
Met all proposal requirements in Request for proposal	0-10
Total:	**0-100**

Native American Preference:

If a qualified Native American-owned company comes within 5% of the lowest qualified bidder's total bid, that company may match the lowest bid and receive the award unless the original lowest bidder is a Native American-owned business, A Native American-owned business must be a non-profit or for-profit entity where and Indian or Indians owned at least 51% interest and where such Indian or Indians have managerial and operational control of the business

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Klamath, CA 95548

operations. Other factors can be found in section 4403 of the Tribal Employment Rights of the Yurok Tribe. The ordinance and other TERO documents can be found at the following https://www.yuroktribe.org/tero Any contractor claiming Native American preference shall fill out and submit the Application for Contractor/Business Certification.

BID SCHEDULE

Item	Description		Amount
1	Parking Area Construction • Site Preparation • Clearing and grading the site to prepare for construction: • Soil compaction and base preparation for parking lot foundation: • Parking Lot Development • Asphalt paving for 12 parking spaces, including subbase installation: • Accessible parking spaces with ADA-compliant design and striping: • Line striping, signage installation, and curbing:	Lump Sum	$
2	Bus Shelter Installation: • Site Preparation and Foundation • Excavation and preparation of the site for shelter placement: • Foundation installation (concrete pad): • Shelter Placement • Assembly and installation of pre-purchased shelter:	Lump Sum. ·	$
3	Trash Bins with Bear Locks • Purchase and Installation • Procurement of trash bins with bear locks Belson Mode ;TB Grizzly (2 units): • Installation of secured trash bins:	Lump Sum	$
4	Project Management and Contingency • Project Management • Coordination, oversight, and administrative tasks:	Lump Sum	$
5	Contingency	Lump Sum	$
15	TERO 5%	Lump Sum	$
The undersigned hereby agrees to perform the foregoing for the lump sum bid			S
( ) **DAYS**	**<u>Estimate number of calendar days needed to complete construction</u>**		

(The above numbers are for purposes of the Owner's evaluation, only, and do not bind the Owner for such particular payments.)

1. The undersigned has attached the required Contractor Questionnaire, TERO pre-award labor projection form, and Yurok Tribe Indian Preference Certification form – in claiming Indian preference.

2. In submitting this bid, it is understood that the right to reject any and all bids and to waive irregularities in the bidding has been reserved by the Owner.

Bidder Name ____

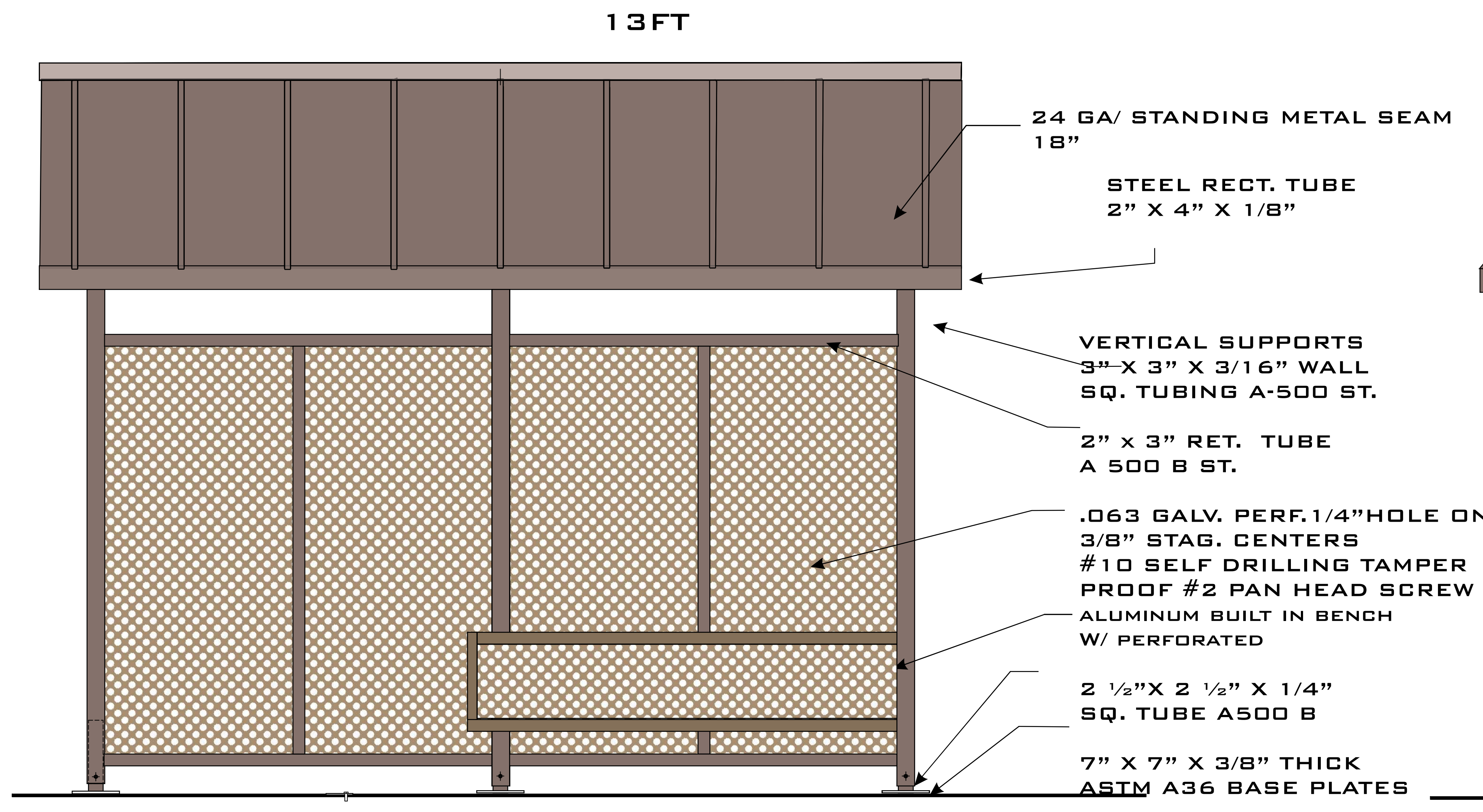
Date ______________________ Phone ______________________

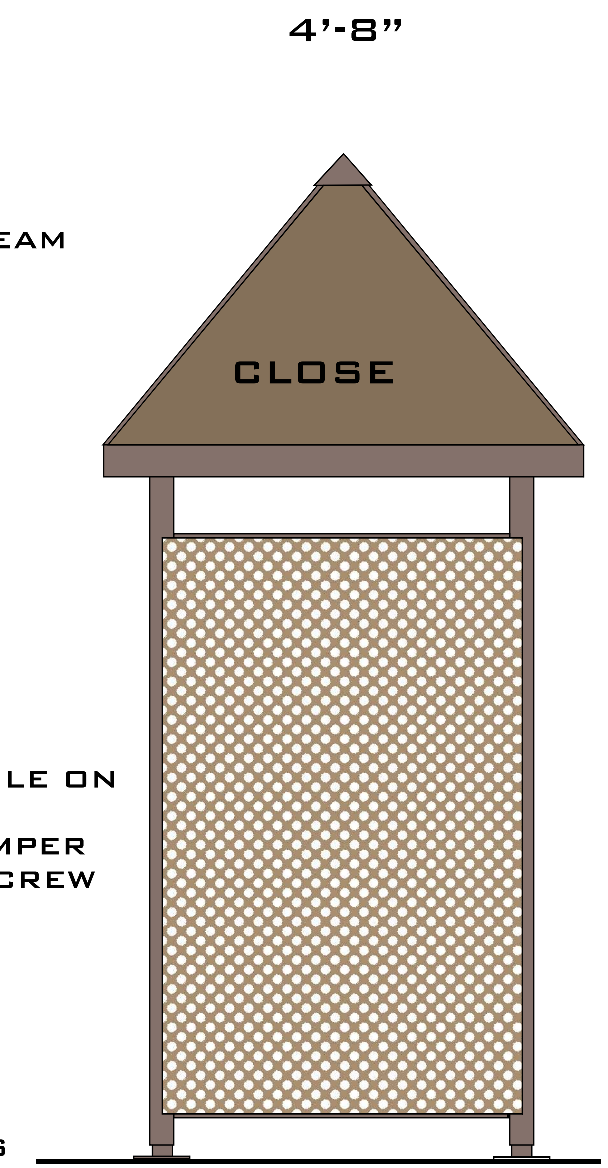
Bidder Address ______________________ City ______________________

____

Print Name and Title of Authorized Officer **Authorized Officer Signature**

13' x 5' HP PEAK ROOF SHELTER





MINIMUM 4" THICK CONCRETE BASE

POWDER COAT RAL 8002

1.

APMFG
FABRICATORS INC.

APMFG
FABRICATORS Inc.

906 Boardwalk#B
San Marcos, CA. 92078
Ph 760.967.8464
mgmt@apmfg.net
www.apmfg.net

Complete Manufacturing & Fabrication

STRUCTURAL CALCULATIONS

junker
engineering group

Bus Stop Shelter Structural Design
13’ x 5’ HP Peak Roof Shelter
Yurok Tribe Reservation, Klamath, CA

Revision 0
JEG Document: 2021-252-CALC-01-00
Submitted: 11/01/2021

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S 6178
EXP. 09-30-25
STRUCTURAL
STATE OF CALIFORNIA

Document History

Document/ Revision #	Revision Date	Reason for Revision	Approved by
2021-252-CALC-01-00	11/01/2021	Initial Release	DJ

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Section 1: Introduction & Objectives

Introduction

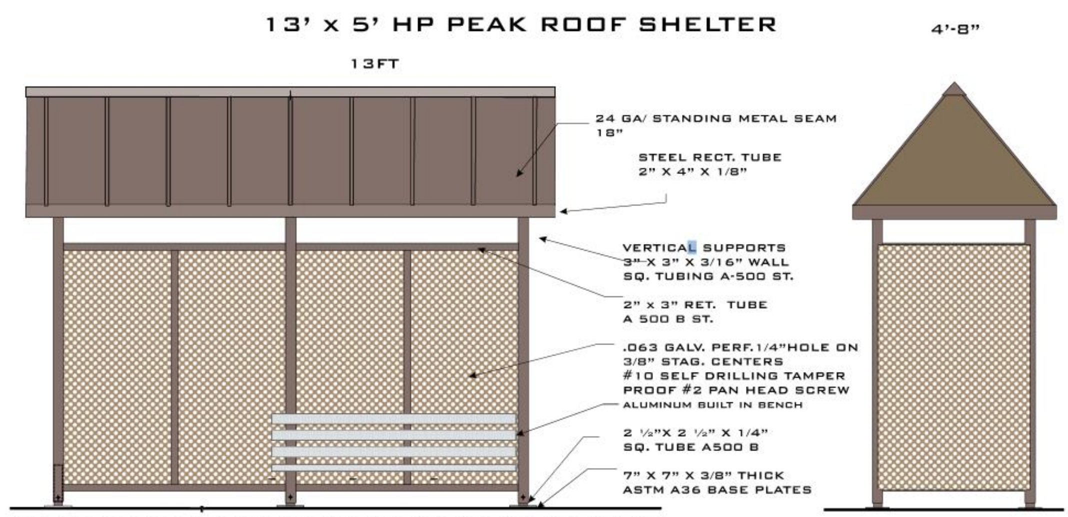
Scope of Work

This report is the basis for the structural design of one type of prefabricated bus shelter provided by APMFG Fabricators, Inc. to be installed at the three locations listed below in Klamath, CA:

- 231 Redwood Rd, Klamath, CA 95548
- 151 Salmon Ave, Klamath, CA 95548
- 4100 CA-169, Klamath, CA 95548

The structure is to be a free-standing steel and aluminum structure composed of rectangular HSS columns and beams. Also included herein is an evaluation of shelter anchorage to foundation elements and design of foundations.

For reference, an elevation of the shelter is presented below:



The basis of design for this report is governed by the provisions of ASCE 7-16 & the 2019 California Building Code. Through this report, it is shown that the proposed structure and anchorage to foundation elements establish a complete load path to resist the design loads prescribed by the governing codes and meet the requirements of the appropriate material specifications.

Section 2: Usage Limitations

Limitations

The limitations of this engineering report are as follows:

- This report is only valid for the site described in this report and does not include wind and seismic loading valid for other locations.
- The re-use of this report, other than outline in this project scope, is though the consent of Junker Engineering Group.
- This calculation report is intended to be used in conjunction with structural drawings provided by Junker Engineering Group or APMFG Fabricators, Inc. as a part of this project. Calculations presented herein are invalid for other means of construction, unless approval is expressly given by Junker Engineering Group.

Section 3: Inputs and References

This section outlines the various inputs and references that were used in the development of this engineering report.

Applicable Codes, Standards, & References

1. Codes and Standards:
    - 1.1. 2019 CBC, "California Building Code"
    - 1.2. ASCE 7-16: "Minimum Design Loads for Buildings and Other Structures"
    - 1.3. ACI 318-14: "Building Code Requirements for Structural Concrete"
    - 1.4. 2020 Aluminum Design Manual
2. Reference Data/Drawings:
    - 2.1. Shop drawings provided by project fabricator, APMFG Fabricators, Inc., Dated 09/20/16.

Inputs

The following are inputs to the engineering report:

Gravity Loads

a) Sloped roof design dead load	See the following pages
b) Roof design live load	See the following pages
c) Snow Load	0 psf

Lateral Loads

Seismic Loading Criteria

Risk Category	II
Method	Equivalent Lateral Force Procedure
S_S (g)	1.853
S_1 (g)	0.884

Wind Loading Criteria

Risk Category:	II
Method:	Analytical Procedure
Basic Wind Speed (mph)	92
Exposure	C
Topographic Factor, Kzt	1.0

Material Properties

Structural Steel

Rectangular Tubes (ASTM A500 Gr B)	f_y = 46 ksi
Channels, Angles & Plates (ASTM A36, or as Indicated)	f_y = 36 ksi
Welded connections are SMAW with E70XX electrodes	f_y = 70 ksi
High Strength Bolts	
Bearing Type (A325N, 0.5" to 1" DIA)	f_y = 120 ksi

Concrete

Design compressive strength at 28 days shall be as follows:

All new concrete (minimum): f_c’ = 2,500 psi

Aluminum

T6061-T6 Min

Detailed Structural Calculations

Roof Dead Load

Member self-weight considered in RISA-3D analysis. Nonstructural elements (standing seam roofing, etc.) conservatively assumed not to exceed 10psf, by inspection.

Siding Dead Load

Nonstructural elements (standing seam roofing, etc.) conservatively assumed not to exceed 10psf, by inspection.

Roof live load

CHAPTER 4 LIVE LOADS

Table 4-1 (*Continued*)

Occupancy or Use	Uniform psf (kN/m²)	Conc. lb (kN)
Roofs		
Ordinary flat, pitched, and curved roofs	20 (0.96)[n]	
Roofs used for roof gardens	100 (4.79)	
Roofs used for assembly purposes	Same as occupancy served	
Roofs used for other occupancies	[o]	[o]
Awnings and canopies		
Fabric construction supported by a skeleton structure	5 (0.24) nonreducible	300 (1.33) applied to skeleton structure

Seismic Parameters

Search Information

Address: Klamath, CA 95548, USA

Coordinates: 41.5863265, -124.0391342

Elevation: 221 ft

Timestamp: 2021-11-01T18:39:58.450Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D-default

Basic Parameters

Name	Value	Description
S_S	1.853	MCE_R ground motion (period=0.2s)
S_1	0.884	MCE_R ground motion (period=1.0s)
S_{MS}	2.223	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.482	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

Seismic Load Development

Table 15.4-1 Seismic Coefficients for Nonbuilding Structures Similar to Buildings

					Structural System and Structural Height, h_n, Limits (ft)[a]				
					Seismic Design Category				
Nonbuilding Structure Type	Detailing Requirements	R	Ω_0	C_d	B	C	D[b]	E[b]	F[c]
Steel storage racks	Sec. 15.5.3.1	4	2	3.5	NL	NL	NL	NL	NL
Steel cantilever storage racks hot-rolled steel									
Ordinary moment frame (cross-aisle)	15.5.3.2 and AISC 360	3	3	3	NL	NL	NP	NP	NP
Ordinary moment frame (cross-aisle)[d]	15.5.3.2 and AISC 341	2.5	2	2.5	NL	NL	NL	NL	NL

Lateral System: Non-building structures similar to buildings Steel Ordinary Moment Frames, ASCE7-16 Table 15.4-1, Overstrength Coefficient for anchorage = 2.0

Calculation	Description	Reference
Seismic Parameters		
$S_{DS} := 1.5$	Short Period Design Acceleration	USGS Seismic Design Map
$S_{D1} := 0.9$	One Second Period Design Acceleration	USGS Seismic Design Map
$S_1 := 0.9$	One Second Period Design Acceleration	USGS Seismic Design Map
$R := 2.5$	Response Modification Factor	ASCE 7-16 (Table 15.4-1 Steel Ordinary Frames)
$I_e := 1.0$	Seismic Importance Factor	ASCE 7-16 (Table 1.5-2)
$C_t := 0.028$	Period Parameter	ASCE 7-16 (Table 12.8-2)
$x := 0.8$	Period Parameter	ASCE 7-16 (Table 12.8-2)
$h_n := 8$ ft	Building Height	
$T := C_t \cdot h_n^{\ x} = 0.148$ s	Approximate Fundamental Period	ASCE 7-16 (EQ 12.8-7)

CALCULATIONS (GLOBAL)

Calculation for Base Shear (V)

$C_{s'} := \dfrac{S_{DS}}{\left(\dfrac{R}{I_e}\right)} = 0.6$	Seismic Response Coefficient	ASCE 7-16 (EQ 12.8-2)
$C_{s.max} := \dfrac{S_{D1}}{T \cdot \left(\dfrac{R}{I_e}\right)} = 2.436$	Max. Seismic Response Coefficient	ASCE 7-16 (EQ 12.8-3)
$C_{s.min} := 0.044 \cdot S_{DS} \cdot I_e = 0.066$	Min. Seismic Response Coefficient	ASCE 7-16 (EQ 12.8-5)
$C_{s.min1} := 0.5 \cdot \dfrac{S_1}{\left(\dfrac{R}{I_e}\right)} = 0.18$	Min. Seismic Response Coefficient for S1 > 0.6	ASCE 7-16 (EQ 12.8-6)
$C_s := \max\left(C_{s.min}, min\left(C_{s'}, C_{s.max}\right)\right) = 0.6$	Design Seismic Response Coefficient	
$V := C_s \cdot \boldsymbol{W} = 0.6\ \boldsymbol{W}$	Seismic Base Shear	

Wind Load Development

MWFRS - ASCE 7-16 Section 27.3.2 - Open Buildings with Monoslope, Pitched or Troughed Free Roofs

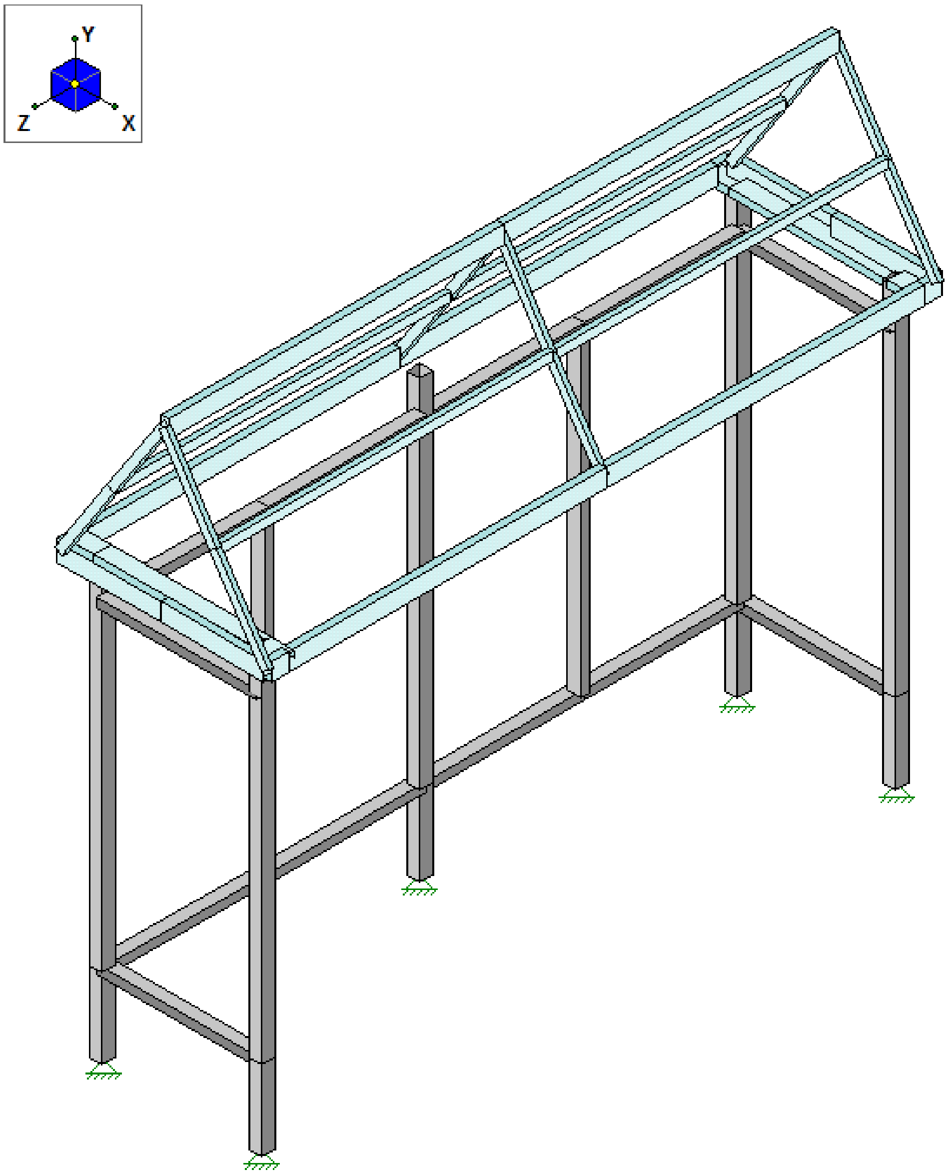
Risk Category II

Exposure Category C

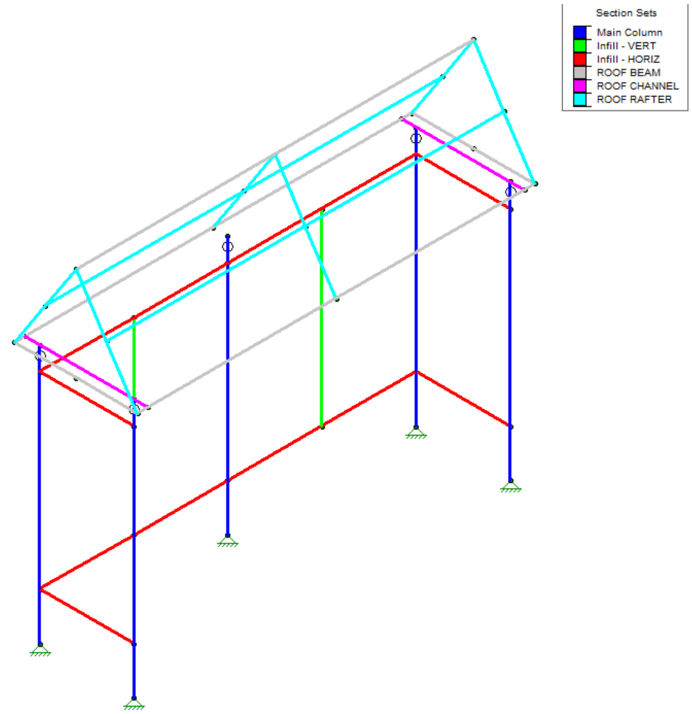
Calculation	Description	Reference
$V := 92$	Base Winds Speed	ASCE 7-16 Figure 26.5-1B
$K_d := 0.85$	Directionality Factor	ASCE 7-16 Table 26.6-1
$K_{zt} := 1.0$	Topographic Factor	ASCE 7-16 Formula 26.8.1
$K_z := 0.85$	Velocity Pressure Expsoure Coefficient 0-15ft	ASCE 7-16 Table 26.10-1
$K_e := 1$	Ground elevation Factor	ASCE 7-16 SS 26.9
$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot K_e \cdot V^2 \cdot \boldsymbol{psf}$ $q_z = 15.655\ \boldsymbol{psf}$	Velocity Pressure	ASCE 7-16 Formula 26.10.1
$G := 0.85$	Gust Effect Factor	ASCE 7-16 SS 26.11
$C_{NW} := 1.6$	Windward Force Coeff	ASCE 7-16 Figure 27.3-4
$C_{NL} := 0.3$	Leeward Force Coeff	ASCE 7-16 Figure 27.3-4
$F_w := q_z \cdot G \cdot C_{NW} = 21.291\ \boldsymbol{psf}$	Windward Air Pressure	
$F_L := q_z \cdot G \cdot C_{NL} = 3.992\ \boldsymbol{psf}$	Leeward Air Pressure	

Shelter Structure Analysis

Rendering

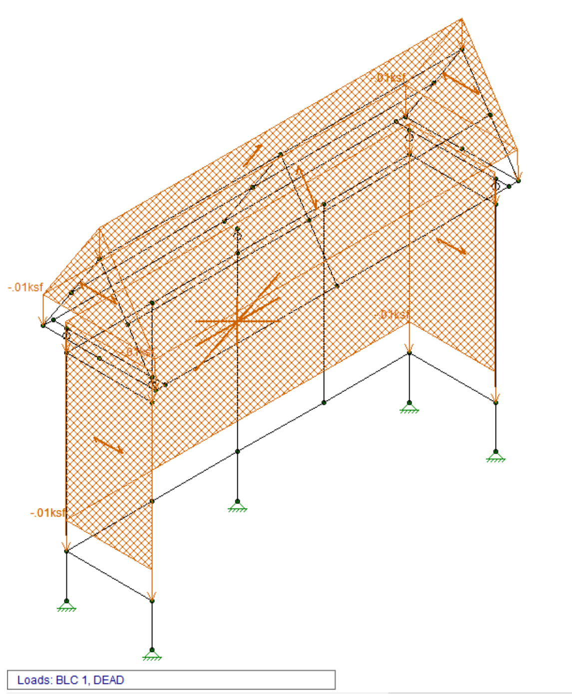


Section Sets



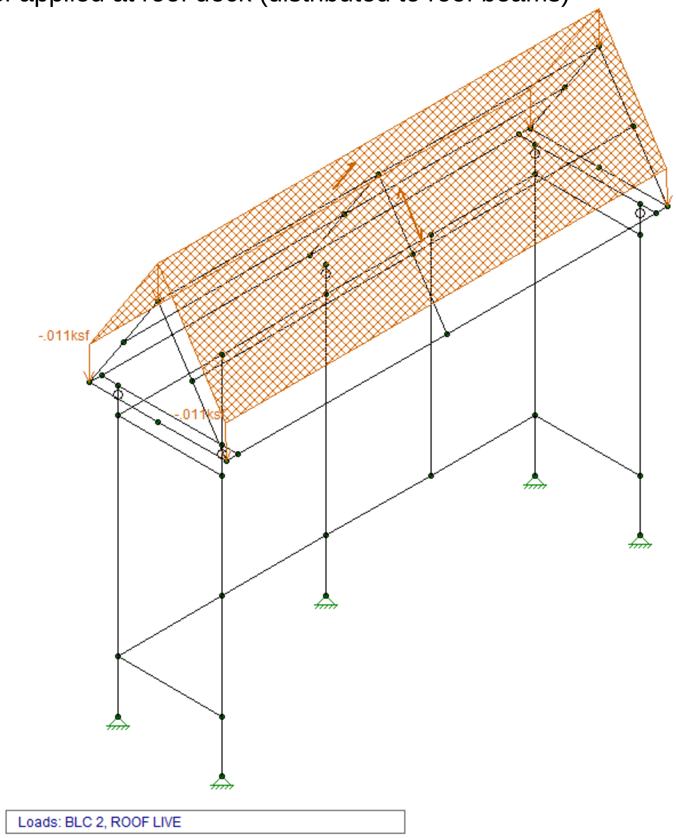
Dead Load

- Self-weight of framing elements is included in model.
- 10 psf applied at roof deck (distributed to roof beams)
- 10 psf applied at walls (distributed to columns)



Roof Live Load

- Vertical Projection, 20 psf applied at roof deck (distributed to roof beams)

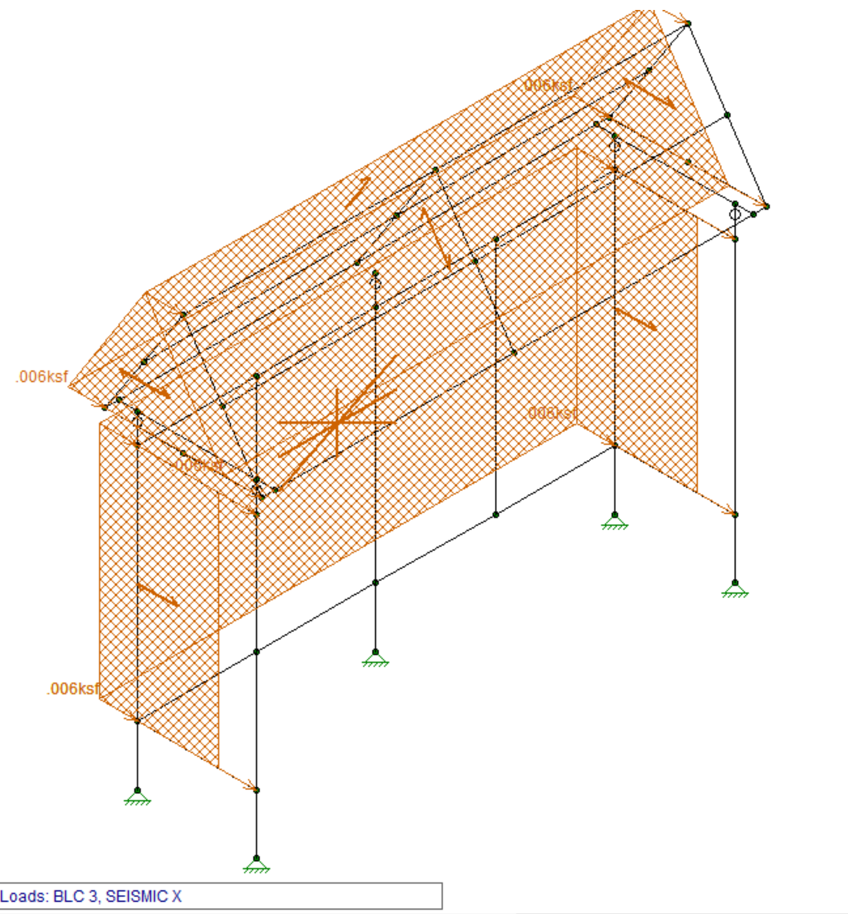


Seismic Load in X Direction

1. Seismic Coefficient (Cs) x Self-weight of steel framing elements is included in model.

BLC Description	Category	X Gravity	Y Gravity	Z Gravity
DEAD	DL		-1	
ROOF LIVE	RLL			
SEISMIC X	ELX	.6		
SEISMIC Z	ELZ			.6
WIND X	WLX			
WIND Z	WLZ			

2. 0.6 * 10psf applied at roof deck (distributed to roof beams)
3. 0.6 * 10psf applied at aluminum perforated panels (distributed to columns)

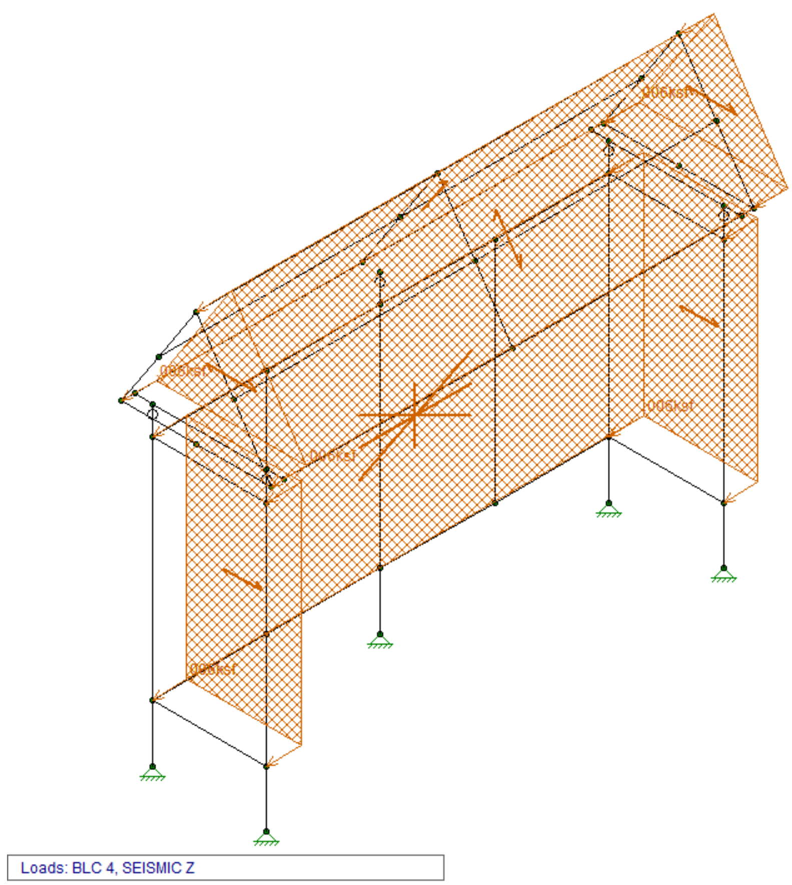


Seismic load in Z Direction

1. Seismic Coefficient (Cs) x Self-weight of steel framing elements is included in model.

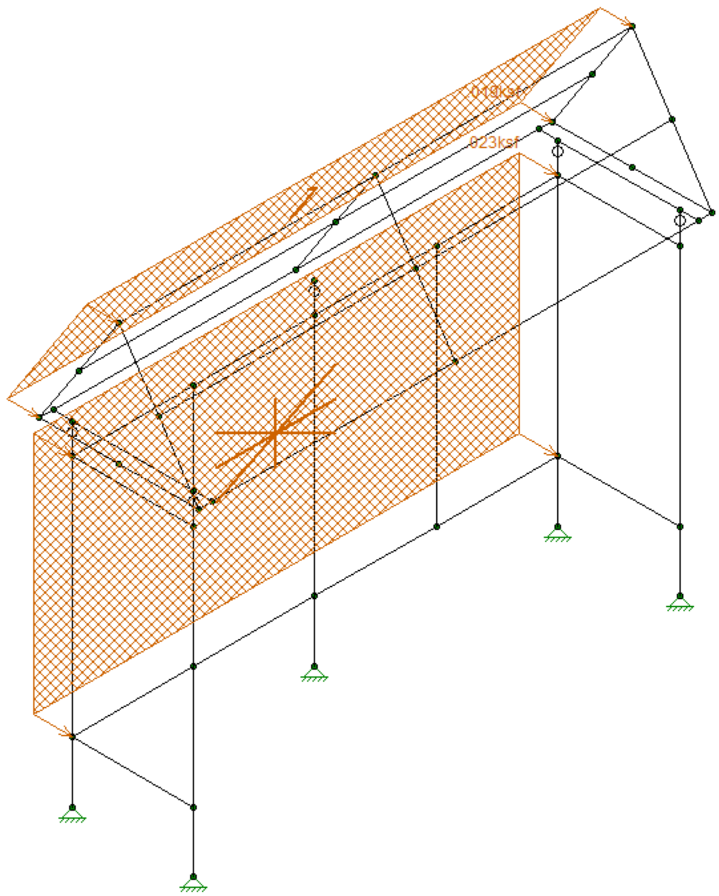
BLC Description	Category	X Gravity	Y Gravity	Z Gravity
DEAD	DL		-1	
ROOF LIVE	RLL			
SEISMIC X	ELX	.6		
SEISMIC Z	ELZ			.6
WIND X	WLX			
WIND Z	WLZ			

1. 0.6 * 10psf applied at roof deck (distributed to roof beams)
2. 0.6 * 10psf applied at aluminum perforated panels (distributed to columns)



Wind load in X Direction

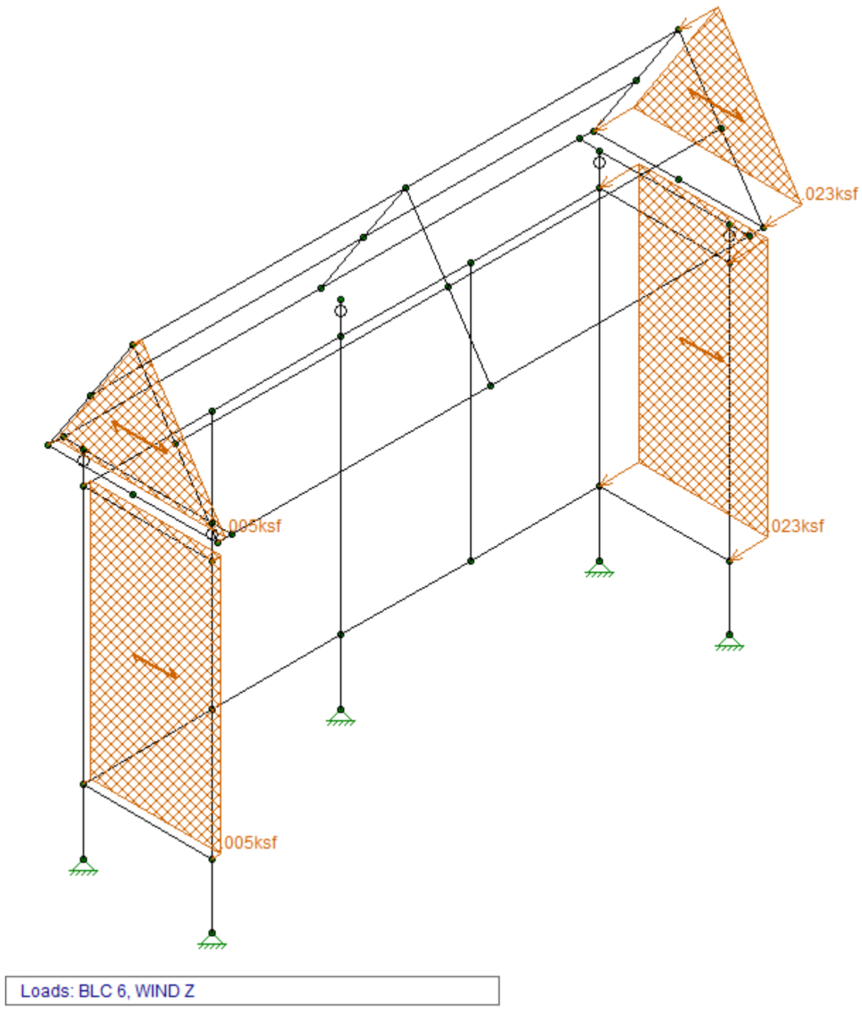
1. 23 psf applied in all projected surfaces in X direction (windward)
2. 23 psf applied on the roof



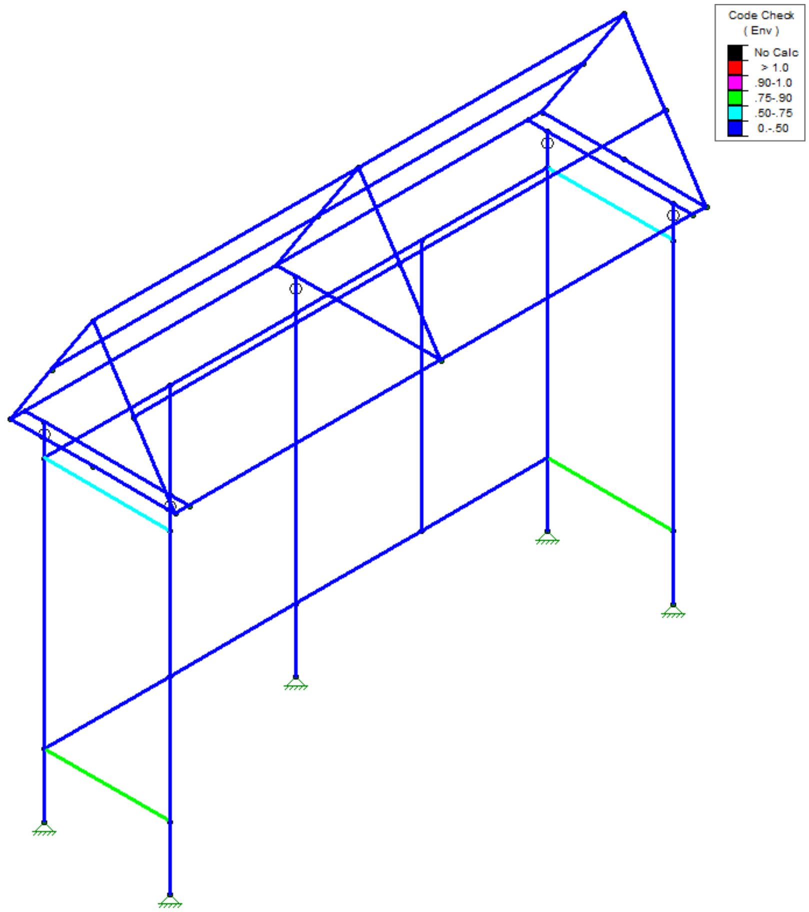
Loads: BLC 5, WIND X

Wind load in Z Direction

1. 23 psf applied in all projected surfaces in X direction (windward)
2. 23 psf applied on the roof



Member Framing Results



RISA A NEMETSCHEK COMPANY

Company :
Designer :
Job Number :
Model Name :

Nov 1, 2021
1:17 PM
Checked By:_____

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: ASD
Wood Code	AWC NDS-18: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	TMS 402-16: ASD
Aluminum Code	AA ADM1-15: LRFD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-16
Seismic Base Elevation (in)	8
Add Base Weight?	Yes
Ct X	.028
Ct Z	.028
T X (sec)	.148
T Z (sec)	.148
R X	2.5
R Z	2.5
Ct Exp. X	0
Ct Exp. Z	0
SD1	.533
SDS	.811
S1	.427
TL (sec)	8
Risk Cat	I or II
Drift Cat	Other
Om Z	2
Om X	2
Cd Z	2.5
Cd X	2.5
Rho Z	1.3
Rho X	1.3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E..	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Aluminum Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (...	Density[...	Table B.4	kt	Ftu[ksi]	Fty[ksi]	Fcy[ksi]	Fsu[ksi]	Ct
1	3003-H14	10100	3787.5	.33	1.3	.173	Table B...	1	19	16	13	12	141
2	6061-T6	10100	3787.5	.33	1.3	.173	Table B...	1	38	35	35	24	141
3	6063-T5	10100	3787.5	.33	1.3	.173	Table B...	1	22	16	16	13	141
4	6063-T6	10100	3787.5	.33	1.3	.173	Table B...	1	30	25	25	19	141
5	5052-H34	10200	3787.5	.33	1.3	.173	Table B...	1	34	26	24	20	141
6	6061-T6 W	10100	3787.5	.33	1.3	.173	Table B...	1	24	15	15	15	141

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N78	Reaction	Reaction	Reaction			
2	N74	Reaction	Reaction	Reaction			
3	N76	Reaction	Reaction	Reaction			

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
4	N16	Reaction	Reaction	Reaction			
5	N21	Reaction	Reaction	Reaction			

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M92	Main Column	81			Lbyy						Lateral
2	M93	Main Column	81			Lbyy						Lateral
3	M94	Main Column	81			Lbyy						Lateral
4	M103	Main Column	18			Lbyy						Lateral
5	M104	Main Column	18			Lbyy						Lateral
6	M105	Main Column	18			Lbyy						Lateral
7	M109	Infill - HORIZ	36			Lbyy						Lateral
8	M14	Main Column	81			Lbyy						Lateral
9	M15	Main Column	81			Lbyy						Lateral
10	M17	Main Column	18			Lbyy						Lateral
11	M18	Main Column	18			Lbyy						Lateral
12	M19	Infill - HORIZ	36			Lbyy						Lateral
13	M15A	Infill - HORIZ	36			Lbyy						Lateral
14	M17A	Infill - HORIZ	36			Lbyy						Lateral
15	M18A	Infill - HORIZ	36			Lbyy						Lateral
16	M19A	Infill - HORIZ	36			Lbyy						Lateral
17	M17B	Main Column	81			Lbyy						Lateral
18	M19B	Main Column	18			Lbyy						Lateral
19	M19C	Infill - HORIZ	36			Lbyy						Lateral
20	M20	Infill - HORIZ	36			Lbyy						Lateral
21	M21	Infill - HORIZ	36			Lbyy						Lateral
22	M22	Infill - HORIZ	36			Lbyy						Lateral
23	M23	Infill - HORIZ	36			Lbyy						Lateral
24	M24	Infill - HORIZ	36			Lbyy						Lateral
25	M25	Infill - VERT	72			Lbyy						Lateral
26	M26	Infill - VERT	72			Lbyy						Lateral

Aluminum Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M27	ROOF CHA...	36			Lbyy						Lateral
2	M28	ROOF CHA...	36			Lbyy						Lateral
3	M29	ROOF CHA...	5.5			Lbyy						Lateral
4	M30	ROOF CHA...	5.5			Lbyy						Lateral
5	M31	ROOF CHA...	5.5			Lbyy						Lateral
6	M32	ROOF CHA...	5.5			Lbyy						Lateral
7	M33	ROOF BEAM	72			Lbyy						Lateral
8	M34	ROOF BEAM	72			Lbyy						Lateral
9	M35	ROOF BEAM	23.5			Lbyy						Lateral
10	M36	ROOF BEAM	4			Lbyy						Lateral
11	M37	ROOF BEAM	4			Lbyy						Lateral
12	M38	ROOF BEAM	4			Lbyy						Lateral
13	M39	ROOF BEAM	23.5			Lbyy						Lateral
14	M40	ROOF BEAM	4			Lbyy						Lateral
15	M41	ROOF BEAM	23.5			Lbyy						Lateral

Aluminum Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
16	M42	ROOF BEAM	23.5			Lbyy						Lateral
17	M43	ROOF BEAM	76			Lbyy						Lateral
18	M44	ROOF BEAM	76			Lbyy						Lateral
19	M45	ROOF RAF...	21.496			Lbyy						Lateral
20	M46	ROOF RAF...	21.496			Lbyy						Lateral
21	M47	ROOF RAF...	21.496			Lbyy						Lateral
22	M48	ROOF RAF...	21.496			Lbyy						Lateral
23	M49	ROOF BEAM	72			Lbyy						Lateral
24	M50	ROOF BEAM	72			Lbyy						Lateral
25	M51	ROOF RAF...	21.496			Lbyy						Lateral
26	M52	ROOF RAF...	21.496			Lbyy						Lateral
27	M53	ROOF RAF...	21.496			Lbyy						Lateral
28	M54	ROOF RAF...	21.496			Lbyy						Lateral
29	M55	ROOF RAF...	21.496			Lbyy						Lateral
30	M56	ROOF RAF...	21.496			Lbyy						Lateral
31	M57	ROOF RAF...	21.496			Lbyy						Lateral
32	M58	ROOF RAF...	21.496			Lbyy						Lateral
33	M59	ROOF RAF...	76			Lbyy						Lateral
34	M60	ROOF RAF...	76			Lbyy						Lateral
35	M61	ROOF RAF...	76			Lbyy						Lateral
36	M62	ROOF RAF...	76			Lbyy						Lateral
37	M63	ROOF CHA...	47			Lbyy						Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Main Column	HSS3X3...	Column	Tube	A500 Gr.B Rect	Typical	1.89	2.46	2.46	4.03
2	Infill - VERT	HSS3X2...	Beam	Tube	A500 Gr.B Rect	Typical	1.07	.692	1.3	1.47
3	Infill - HORIZ	HSS3X2...	Beam	Tube	A500 Gr.B Rect	Typical	1.07	.692	1.3	1.47

Aluminum Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	ROOF B...	RT2X4X0.125	Beam	Rectangular Tubes	6061-T6	Typical	1.44	.992	2.98	2.3
2	ROOF C...	USC4X1.85	Beam	C Channel	6061-T6	Typical	1.57	.32	3.83	.031
3	ROOF R...	RT1X2X0.125	Beam	Rectangular Tubes	6061-T6	Typical	.688	.105	.332	.245
4	RIDGE	RT6X6X0.125	Beam	Rectangular Tubes	6061-T6	Typical	2.94	16.9	16.9	25.3

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/i...
No Data to Print ...			

Member Point Loads

Member Label	Direction	Magnitude[k,k-ft]	Location[in,%]
No Data to Print ...			

Member Area Loads (BLC 1 : DEAD)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N72	N29A	N32A	N15	Y	Two Way	-.01
2	N29A	N68	N13	N32A	Y	A-B	-.01

Member Area Loads (BLC 1 : DEAD) (Continued)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
3	N72	N14	N16A	N15	Y	A-B	-.01
4	N31	N36	N35	N29	Y	A-B	-.01
5	N30A	N35	N36	N32	Y	A-B	-.01
6	N31	N32	N36		Y	A-B	-.01
7	N29	N30A	N35		Y	A-B	-.01

Member Area Loads (BLC 2 : ROOF LIVE)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N30A	N35	N36	N32	PY	A-B	-.02
2	N29	N35	N36	N31	PY	A-B	-.02

Member Area Loads (BLC 3 : SEISMIC X)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N72	N29A	N32A	N15	X	Two Way	.006
2	N29A	N68	N13	N32A	X	A-B	.006
3	N72	N14	N16A	N15	X	A-B	.006
4	N31	N36	N35	N29	X	A-B	.006
5	N30A	N35	N36	N32	X	A-B	.006
6	N31	N32	N36		X	A-B	.006
7	N29	N30A	N35		X	A-B	.006

Member Area Loads (BLC 4 : SEISMIC Z)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N72	N29A	N32A	N15	Z	Two Way	.006
2	N29A	N68	N13	N32A	Z	A-B	.006
3	N72	N14	N16A	N15	Z	A-B	.006
4	N31	N36	N35	N29	Z	A-B	.006
5	N30A	N35	N36	N32	Z	A-B	.006
6	N31	N32	N36		Z	A-B	.006
7	N29	N30A	N35		Z	A-B	.006

Member Area Loads (BLC 5 : WIND X)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N32A	N15	N72	N29A	X	Two Way	.023
2	N31	N36	N35	N29	PX	A-B	.023

Member Area Loads (BLC 6 : WIND Z)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N14	N72	N15	N16A	Z	A-B	.005
2	N68	N29A	N32A	N13	Z	A-B	.023
3	N32	N31	N36		Z	A-B	.023
4	N30A	N29	N35		Z	A-B	.005

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Di...	Area(Member)	Surface(P...
1	DEAD	DL		-1					7	
2	ROOF LIVE	RLL							2	
3	SEISMIC X	ELX	.6						7	

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Di...	Area(Member)	Surface(P...
4	SEISMIC Z	ELZ			.6				7	
5	WIND X	WLX							2	
6	WIND Z	WLZ							4	
7	BLC 1 Transient Area...	None						89		
8	BLC 2 Transient Area...	None						60		
9	BLC 5 Transient Area...	None						47		
10	BLC 6 Transient Area...	None						16		
11	BLC 3 Transient Area...	None						89		
12	BLC 4 Transient Area...	None						89		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	IBC 16-1	Yes	Y		DL	1.4																		
2	IBC 16-2 (a)	Yes	Y		DL	1.2	LL	1.6	LLS	1.6	RLL	.5												
3	IBC 16-2 (b)	Yes	Y		DL	1.2	LL	1.6	LLS	1.6														
4	IBC 16-3 (a)	Yes	Y		DL	1.2	RLL	1.6	LL	.5	LLS	1												
5	IBC 16-3 (b) (a)	Yes	Y		DL	1.2	RLL	1.6	W...	.5														
6	IBC 16-3 (b) (b)	Yes	Y		DL	1.2	RLL	1.6	W...	.5														
7	IBC 16-3 (b) (c)	Yes	Y		DL	1.2	RLL	1.6	W...	-.5														
8	IBC 16-3 (b) (d)	Yes	Y		DL	1.2	RLL	1.6	W...	-.5														
9	IBC 16-3 (d) (a)	Yes	Y		DL	1.2	W...	.5																
10	IBC 16-3 (d) (b)	Yes	Y		DL	1.2	W...	.5																
11	IBC 16-3 (d) (c)	Yes	Y		DL	1.2	W...	-.5																
12	IBC 16-3 (d) (d)	Yes	Y		DL	1.2	W...	-.5																
13	IBC 16-4 (a) (a)	Yes	Y		DL	1.2	W...	1	LL	.5	LLS	1	RLL	.5										
14	IBC 16-4 (a) (b)	Yes	Y		DL	1.2	W...	1	LL	.5	LLS	1	RLL	.5										
15	IBC 16-4 (a) (c)	Yes	Y		DL	1.2	W...	-1	LL	.5	LLS	1	RLL	.5										
16	IBC 16-4 (a) (d)	Yes	Y		DL	1.2	W...	-1	LL	.5	LLS	1	RLL	.5										
17	IBC 16-4 (b) (a)	Yes	Y		DL	1.2	W...	1	LL	.5	LLS	1												
18	IBC 16-4 (b) (b)	Yes	Y		DL	1.2	W...	1	LL	.5	LLS	1												
19	IBC 16-4 (b) (c)	Yes	Y		DL	1.2	W...	-1	LL	.5	LLS	1												
20	IBC 16-4 (b) (d)	Yes	Y		DL	1.2	W...	-1	LL	.5	LLS	1												
21	IBC 16-6 (a)	Yes	Y		DL	.9	W...	1																
22	IBC 16-6 (b)	Yes	Y		DL	.9	W...	1																
23	IBC 16-6 (c)	Yes	Y		DL	.9	W...	-1																
24	IBC 16-6 (d)	Yes	Y		DL	.9	W...	-1																
25	IBC 16-5 (a)	Yes	Y		DL	1.2	Sd...	.2	ELX	1	LL	.5	LLS	1										
26	IBC 16-5 (b)	Yes	Y		DL	1.2	Sd...	.2	ELZ	1	LL	.5	LLS	1										
27	IBC 16-5 (c)	Yes	Y		DL	1.2	Sd...	.2	ELX	-1	LL	.5	LLS	1										
28	IBC 16-5 (d)	Yes	Y		DL	1.2	Sd...	.2	ELZ	-1	LL	.5	LLS	1										
29	IBC 16-7 (a)	Yes	Y		DL	.9	Sd...	-.2	ELX	1														
30	IBC 16-7 (b)	Yes	Y		DL	.9	Sd...	-.2	ELZ	1														
31	IBC 16-7 (c)	Yes	Y		DL	.9	Sd...	-.2	ELX	-1														
32	IBC 16-7 (d)	Yes	Y		DL	.9	Sd...	-.2	ELZ	-1														
33	IBC 16-5 (os-a)		Y		DL	1.2	Sd...	.2	O...	1	LL	.5	LLS	1										
34	IBC 16-5 (os-b)		Y		DL	1.2	Sd...	.2	O...	1	LL	.5	LLS	1										
35	IBC 16-5 (os-c)		Y		DL	1.2	Sd...	.2	O...	-1	LL	.5	LLS	1										
36	IBC 16-5 (os-d)		Y		DL	1.2	Sd...	.2	O...	-1	LL	.5	LLS	1										
37	IBC 16-7 (os-a)		Y		DL	.9	Sd...	-.2	O...	1														
38	IBC 16-7 (os-b)		Y		DL	.9	Sd...	-.2	O...	1														

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
39	IBC 16-7 (os-c)		Y		DL	.9	Sd..	-.2	O...	-1														
40	IBC 16-7 (os-d)		Y		DL	.9	Sd..	-.2	O...	-1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N78	max	.365	15	3.396	15	.342	32	0	32	0	32	0	32
2		min	-.457	13	-2.224	21	-.39	26	0	1	0	1	0	1
3	N74	max	.667	15	3.396	13	.094	24	0	32	0	32	0	32
4		min	-.57	17	-2.291	23	-.095	14	0	1	0	1	0	1
5	N76	max	.449	15	3.289	15	.386	28	0	32	0	32	0	32
6		min	-.543	13	-2.24	21	-.335	30	0	1	0	1	0	1
7	N16	max	.758	15	3.432	13	.101	15	0	32	0	32	0	32
8		min	-.662	13	-2.33	23	-.095	17	0	1	0	1	0	1
9	N21	max	.301	23	1.684	7	.789	28	0	32	0	32	0	32
10		min	-.308	21	.575	29	-.791	26	0	1	0	1	0	1
11	Totals:	max	2.53	23	4.918	8	1.665	32						
12		min	-2.53	13	2.048	29	-1.665	26						

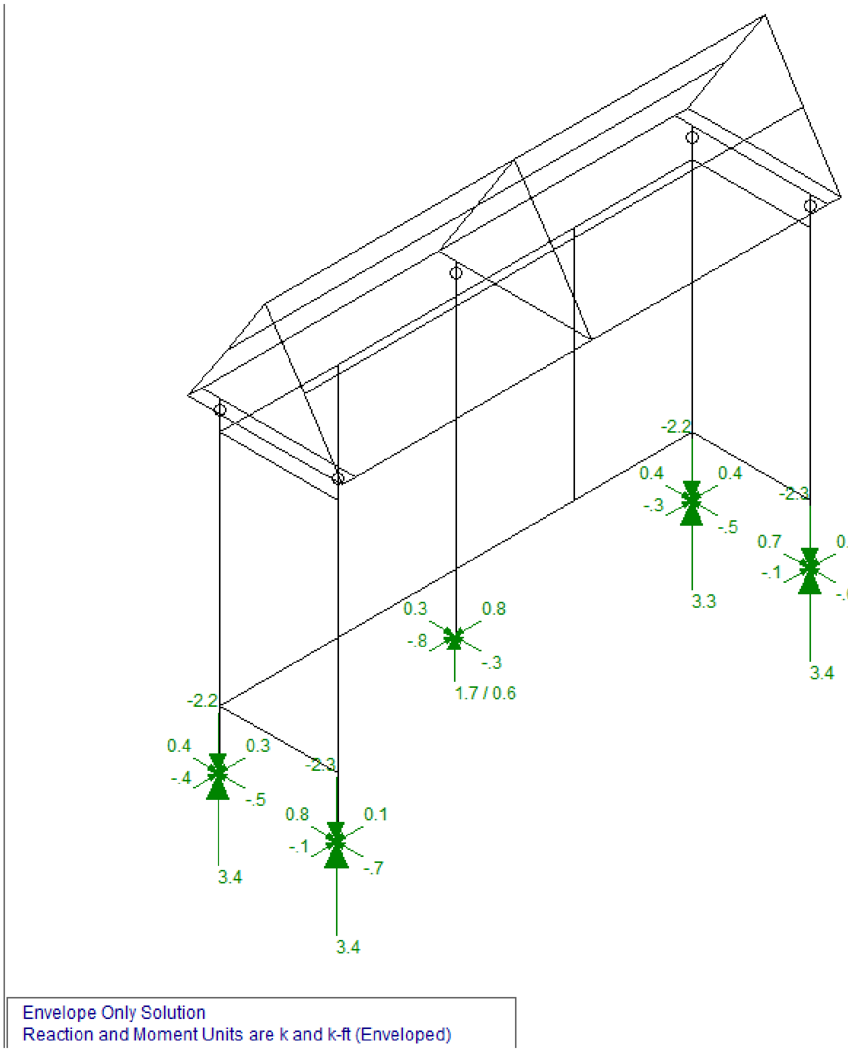
Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	M92	HSS3X3X3	.145	71.719	15	.046	72.563	y	15	55.744	78.246	6.796	6.796	1....	H1-1b
2	M93	HSS3X3X3	.230	71.719	15	.076	72.563	y	15	55.744	78.246	6.796	6.796	1....	H1-1b
3	M94	HSS3X3X3	.241	71.719	13	.024	0	y	13	55.744	78.246	6.796	6.796	1....	H1-1b
4	M103	HSS3X3X3	.063	18	15	.010	0	y	15	76.947	78.246	6.796	6.796	1....	H1-1b
5	M104	HSS3X3X3	.142	18	15	.024	0	y	15	76.947	78.246	6.796	6.796	1....	H1-1b
6	M105	HSS3X3X3	.179	18	13	.029	0	y	15	76.947	78.246	6.796	6.796	1....	H1-1b
7	M109	HSS3X2X2	.860	0	15	.158	36	z	13	38.712	44.298	2.77	3.657	1....	H1-1b
8	M14	HSS3X3X3	.159	71.719	15	.047	72.563	y	13	55.744	78.246	6.796	6.796	1....	H1-1b
9	M15	HSS3X3X3	.208	71.719	13	.033	72.563	y	15	55.744	78.246	6.796	6.796	1....	H1-1b
10	M17	HSS3X3X3	.063	18	15	.010	0	y	15	76.947	78.246	6.796	6.796	1....	H1-1b
11	M18	HSS3X3X3	.204	18	13	.034	0	y	15	76.947	78.246	6.796	6.796	1....	H1-1b
12	M19	HSS3X2X2	.863	0	15	.161	36	z	13	38.712	44.298	2.77	3.657	1.7	H1-1b
13	M15A	HSS3X2X2	.442	0	26	.077	0	y	15	38.712	44.298	2.77	3.657	1....	H1-1b
14	M17A	HSS3X2X2	.706	0	15	.134	0	z	15	38.712	44.298	2.77	3.657	1....	H1-1b
15	M18A	HSS3X2X2	.702	0	15	.128	0	z	15	38.712	44.298	2.77	3.657	1....	H1-1b
16	M19A	HSS3X2X2	.377	0	26	.062	0	y	15	38.712	44.298	2.77	3.657	1....	H1-1b
17	M17B	HSS3X3X3	.145	71.719	28	.062	72.563	z	26	55.744	78.246	6.796	6.796	2....	H1-1b
18	M19B	HSS3X3X3	.186	18	26	.038	0	z	26	76.947	78.246	6.796	6.796	1....	H1-1b
19	M19C	HSS3X2X2	.316	36	28	.058	36	z	28	38.712	44.298	2.77	3.657	2....	H1-1b
20	M20	HSS3X2X2	.307	0	26	.058	0	z	26	38.712	44.298	2.77	3.657	2....	H1-1b
21	M21	HSS3X2X2	.360	36	28	.069	36	y	15	38.712	44.298	2.77	3.657	1....	H1-1b
22	M22	HSS3X2X2	.419	36	28	.071	36	z	28	38.712	44.298	2.77	3.657	2....	H1-1b
23	M23	HSS3X2X2	.409	0	26	.069	0	z	26	38.712	44.298	2.77	3.657	2....	H1-1b
24	M24	HSS3X2X2	.427	36	28	.086	36	y	15	38.712	44.298	2.77	3.657	1....	H1-1b
25	M25	HSS3X2X2	.331	0	28	.042	0	y	15	25.835	44.298	2.77	3.657	1....	H1-1b
26	M26	HSS3X2X2	.328	0	28	.041	0	z	26	25.835	44.298	2.77	3.657	2....	H1-1b

Envelope AA ADM1-15: LRFD - Building Aluminum Code Checks

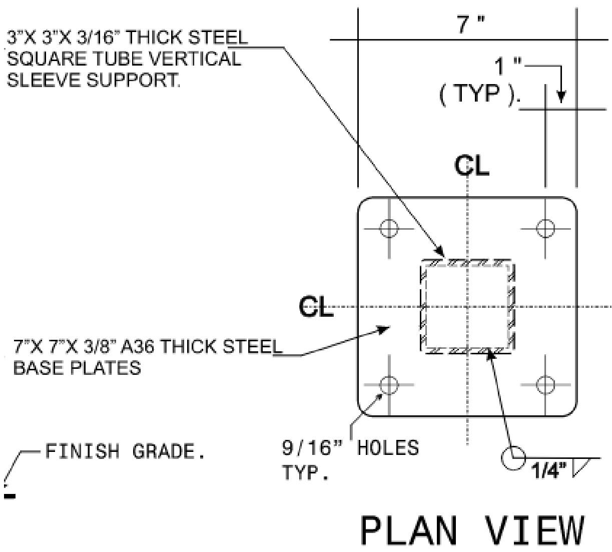
	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc...	phi*Pnt[...	phi*Mn...	phi*Mn...	phi*Vny...	phi*Vnz...	Cb	Eqn
1	M27	USC4X1....	.264	0	13	.022	0	y	26	18.829	44.745	1.125	5.027	12.96	16.893	1...	H.1-1
2	M28	USC4X1....	.115	36	13	.018	0	y	7	18.829	44.745	1.125	5.027	12.96	16.893	2...	H.1-1
3	M29	USC4X1....	.233	0	15	.071	5.5	z	26	49.455	44.745	1.125	5.027	12.96	16.893	2...	H.1-1
4	M30	USC4X1....	.237	5.5	7	.065	0	z	5	49.455	44.745	1.125	5.027	12.96	16.893	1...	H.1-1
5	M31	USC4X1....	.128	0	15	.040	0	y	13	49.455	44.745	1.125	5.027	12.96	16.893	1...	H.1-1
6	M32	USC4X1....	.254	5.5	5	.060	0	z	5	49.455	44.745	1.125	5.027	12.96	16.893	1...	H.1-1
7	M33	RT2X4X0...	.268	72	13	.051	0	y	5	14.592	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
8	M34	RT2X4X0...	.171	0	13	.037	0	z	13	14.592	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
9	M35	RT2X4X0...	.095	0	13	.054	23.5	y	5	40.612	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
10	M36	RT2X4X0...	.115	4	5	.167	4	y	5	41.633	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
11	M37	RT2X4X0...	.090	4	19	.152	4	z	13	41.633	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
12	M38	RT2X4X0...	.115	0	5	.176	0	y	5	41.633	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
13	M39	RT2X4X0...	.074	0	5	.056	0	z	5	40.612	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
14	M40	RT2X4X0...	.088	4	19	.094	4	z	15	41.633	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
15	M41	RT2X4X0...	.071	23.5	5	.054	23.5	y	5	40.612	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
16	M42	RT2X4X0...	.055	23.5	13	.056	0	z	5	40.612	41.04	2.275	3.911	16.313	7.313	2...	H.1-1
17	M43	RT2X4X0...	.159	59.375	5	.053	0	z	5	13.097	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
18	M44	RT2X4X0...	.160	16.625	5	.054	76	z	5	13.097	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
19	M45	RT1X2X0...	.359	0	6	.113	0	z	7	14.135	19.608	.551	.872	7.313	2.813	2...	H.1-1
20	M46	RT1X2X0...	.223	0	7	.086	0	z	13	14.135	19.608	.551	.872	7.313	2.813	1...	H.1-1
21	M47	RT1X2X0...	.370	0	8	.112	0	z	7	14.135	19.608	.551	.872	7.313	2.813	2...	H.1-1
22	M48	RT1X2X0...	.224	0	7	.086	0	z	13	14.135	19.608	.551	.872	7.313	2.813	1...	H.1-1
23	M49	RT2X4X0...	.265	0	13	.050	72	y	5	14.592	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
24	M50	RT2X4X0...	.169	72	13	.049	72	z	13	14.592	41.04	2.275	3.911	16.313	7.313	1...	H.1-1
25	M51	RT1X2X0...	.194	0	28	.058	0	z	26	14.135	19.608	.551	.872	7.313	2.813	1...	H.1-1
26	M52	RT1X2X0...	.171	21.496	13	.037	21.496	z	26	14.135	19.608	.551	.872	7.313	2.813	1...	H.1-1
27	M53	RT1X2X0...	.326	21.496	5	.196	0	z	5	14.135	19.608	.551	.872	7.313	2.813	1...	H.1-1
28	M54	RT1X2X0...	.227	21.496	26	.177	0	z	13	14.135	19.608	.551	.872	7.313	2.813	2...	H.1-1
29	M55	RT1X2X0...	.218	21.496	5	.027	0	z	28	14.135	19.608	.551	.872	7.313	2.813	2...	H.1-1
30	M56	RT1X2X0...	.428	21.496	5	.060	21.496	z	28	14.135	19.608	.551	.872	7.313	2.813	2...	H.1-1
31	M57	RT1X2X0...	.327	21.496	5	.197	0	z	5	14.135	19.608	.551	.872	7.313	2.813	1...	H.1-1
32	M58	RT1X2X0...	.233	21.496	28	.179	0	z	13	14.135	19.608	.551	.872	7.313	2.813	2...	H.1-1
33	M59	RT1X2X0...	.336	0	5	.057	0	y	5	1.386	19.608	.551	.872	7.313	2.813	1...	H.1-1
34	M60	RT1X2X0...	.337	76	5	.058	76	y	5	1.386	19.608	.551	.872	7.313	2.813	1...	H.1-1
35	M61	RT1X2X0...	.412	76	13	.071	76	z	13	1.386	19.608	.551	.872	7.313	2.813	1...	H.1-1
36	M62	RT1X2X0...	.412	0	13	.070	0	z	13	1.386	19.608	.551	.872	7.313	2.813	1...	H.1-1
37	M63	USC4X1....	.220	5.875	6	.057	5.385	z	7	11.047	44.745	1.125	4.824	12.96	16.893	1...	H.1-1

Envelope LRFD Reactions Considering Overstrength



Per results above, the envelope reactions with overstrength factor.
The worst case is Node16:
Uplift Load = 2,300 lbs.
Shear x = 100 lbs.
Shear y = 800 lbs.

Anchorage Check



See following calculations for anchor.

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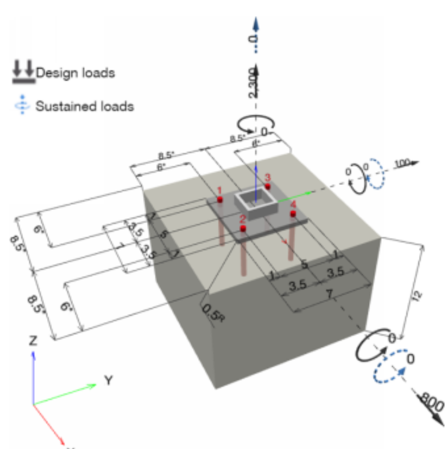
Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200 + HAS-V-36 (ASTM F1554 Gr.36) 1/2**
Item number:	2198022 HAS-V-36 1/2"x6-1/2" (element) / 2022791 HIT-HY 200-A (adhesive)
Effective embedment depth:	$h_{ef,act}$ = 4.724 in. ($h_{ef,limit}$ = - in.)
Material:	ASTM F1554 Grade 36
Evaluation Service Report:	ESR-3187
Issued I Valid:	5/1/2021 | 3/1/2022
Proof:	Design Method ACI 318-14 / Chem
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate^R :	l_x x l_y x t = 7.000 in. x 7.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS3X3X.3125; (L x W x T) = 3.000 in. x 3.000 in. x 0.312 in.
Base material:	cracked concrete, 2500, f_c' = 2,500 psi; h = 12.000 in., Temp. short/long: 32/32 °F
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present
	edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	Tension load: yes (17.2.3.4.3 (d))
	Shear load: yes (17.2.3.5.3 (c))

^{R} - The anchor calculation is based on a rigid anchor plate assumption.

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



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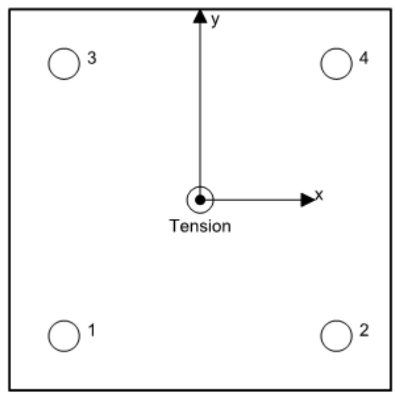
1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	$N = 2{,}300$; $V_x = 800$; $V_y = 100$; $M_x = 0$; $M_y = 0$; $M_z = 0$; $N_{sus} = 0$; $M_{x,sus} = 0$; $M_{y,sus} = 0$;	yes	42

2 Load case/Resulting anchor forces



Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	575	202	200	25
2	575	202	200	25
3	575	202	200	25
4	575	202	200	25

max. concrete compressive strain: - [‰]
max. concrete compressive stress: - [psi]
resulting tension force in (x/y)=(0.000/-0.000): 2,300 [lb]
resulting compression force in (x/y)=(0.000/0.000): 0 [lb]

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

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi$ N_n	Status
Steel Strength*	575	6,172	10	OK
Bond Strength**	2,300	5,607	42	OK
Sustained Tension Load Bond Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Failure**	2,300	6,653	35	OK

* highest loaded anchor **anchor group (anchors in tension)

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3.1 Steel Strength

N_{sa} = ESR value refer to ICC-ES ESR-3187

$\phi\ N_{sa} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.14	58,000

Calculations

N_{sa} [lb]
8,230

Results

N_{sa} [lb]	ϕ_{steel}	$\phi\ N_{sa}$ [lb]	N_{ua} [lb]
8,230	0.750	6,172	575

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3.2 Bond Strength

$N_{ag} = \left(\frac{A_{Na}}{A_{Na0}}\right) \psi_{ec1,Na}\ \psi_{ec2,Na}\ \psi_{ed,Na}\ \psi_{cp,Na}\ N_{ba}$ ACI 318-14 Eq. (17.4.5.1b)

$\phi\ N_{ag} \geq N_{ua}$ ACI 318-14 Table 17.3.1.1

A_{Na} see ACI 318-14, Section 17.4.5.1, Fig. R 17.4.5.1(b)

$A_{Na0} = (2\ c_{Na})^2$ ACI 318-14 Eq. (17.4.5.1c)

$c_{Na} = 10\ d_a \sqrt{\frac{\tau_{uncr}}{1100}}$ ACI 318-14 Eq. (17.4.5.1d)

$\psi_{ec,Na} = \left(\frac{1}{1 + \frac{e_N}{c_{Na}}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.5.3)

$\psi_{ed,Na} = 0.7 + 0.3 \left(\frac{c_{a,min}}{c_{Na}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.5.4b)

$\psi_{cp,Na} = \mathrm{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{c_{Na}}{c_{ac}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.5.5b)

$N_{ba} = \lambda_a \cdot \tau_{k,c} \cdot \alpha_{N,seis} \cdot \pi \cdot d_a \cdot h_{ef}$ ACI 318-14 Eq. (17.4.5.2)

Variables

$\tau_{k,c,uncr}$ [psi]	d_a [in.]	h_{ef} [in.]	$c_{a,min}$ [in.]	$\alpha_{overhead}$	$\tau_{k,c}$ [psi]
2,220	0.500	4.724	6.000	1.000	1,135

$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	c_{ac} [in.]	λ_a	$\alpha_{N,seis}$
0.000	0.000	7.635	1.000	0.990

Calculations

c_{Na} [in.]	A_{Na} [in.^{2}]	A_{Na0} [in.^{2}]	$\psi_{ed,Na}$
7.071	289.00	200.00	0.955

$\psi_{ec1,Na}$	$\psi_{ec2,Na}$	$\psi_{cp,Na}$	N_{ba} [lb]
1.000	1.000	1.000	8,339

Results

N_{ag} [lb]	ϕ_{bond}	$\phi_{seismic}$	$\phi_{nonductile}$	$\phi\ N_{ag}$ [lb]	N_{ua} [lb]
11,502	0.650	0.750	1.000	5,607	2,300

3.3 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$ — ACI 318-14 Eq. (17.4.2.1b)

$\phi\ N_{cbg} \geq N_{ua}$ — ACI 318-14 Table 17.3.1.1

A_{Nc} see ACI 318-14, Section 17.4.2.1, Fig. R 17.4.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ — ACI 318-14 Eq. (17.4.2.1c)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N}{3\ h_{ef}}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.4)

$\psi_{ed,N} = 0.7 + 0.3\left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.5b)

$\psi_{cp,N} = \mathrm{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.4.2.7b)

$N_b = k_c\ \lambda_a\ \sqrt{f'_c}\ h_{ef}^{1.5}$ — ACI 318-14 Eq. (17.4.2.2a)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$
4.000	0.000	0.000	6.000	1.000

c_{ac} [in.]	k_c	λ_a	f'_c [psi]
7.635	17	1.000	2,500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
289.00	144.00	1.000	1.000	1.000	1.000	6,800

Results

N_{cbg} [lb]	$\phi_{concrete}$	$\phi_{seismic}$	$\phi_{nonductile}$	$\phi\ N_{cbg}$ [lb]	N_{ua} [lb]
13,647	0.650	0.750	1.000	6,653	2,300

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4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi$ V_n	Status
Steel Strength*	202	1,927	11	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength (Bond Strength controls)**	806	16,103	6	OK
Concrete edge failure in direction y+**	806	3,280	25	OK

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

4.1 Steel Strength

$V_{sa,eq}$ = ESR value refer to ICC-ES ESR-3187

$\phi\ V_{steel} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]	$\alpha_{V,seis}$
0.14	58,000	0.600

Calculations

$V_{sa,eq}$ [lb]
2,964

Results

$V_{sa,eq}$ [lb]	ϕ_{steel}	$\phi\ V_{sa,eq}$ [lb]	V_{ua} [lb]
2,964	0.650	1,927	202

4.2 Pryout Strength (Bond Strength controls)

$V_{cpg} = k_{cp}\left[\left(\frac{A_{Na}}{A_{Na0}}\right) \psi_{ec1,Na}\ \psi_{ec2,Na}\ \psi_{ed,Na}\ \psi_{cp,Na}\ N_{ba}\right]$ ACI 318-14 Eq. (17.5.3.1b)

$\phi\ V_{cpg} \geq V_{ua}$ ACI 318-14 Table 17.3.1.1

A_{Na} see ACI 318-14, Section 17.4.5.1, Fig. R 17.4.5.1(b)

$A_{Na0} = (2\ c_{Na})^2$ ACI 318-14 Eq. (17.4.5.1c)

$c_{Na} = 10\ d_a \sqrt{\frac{\tau_{uncr}}{1100}}$ ACI 318-14 Eq. (17.4.5.1d)

$\psi_{ec,Na} = \left(\frac{1}{1 + \frac{e_N}{c_{Na}}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.5.3)

$\psi_{ed,Na} = 0.7 + 0.3\left(\frac{c_{a,min}}{c_{Na}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.5.4b)

$\psi_{cp,Na} = \mathrm{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{c_{Na}}{c_{ac}}\right) \leq 1.0$ ACI 318-14 Eq. (17.4.5.5b)

$N_{ba} = \lambda_a \cdot \tau_{k,c} \cdot \alpha_{N,seis} \cdot \pi \cdot d_a \cdot h_{ef}$ ACI 318-14 Eq. (17.4.5.2)

Variables

k_{cp}	$\alpha_{overhead}$	$\tau_{k,c,uncr}$ [psi]	d_a [in.]	h_{ef} [in.]	$c_{a,min}$ [in.]	$\tau_{k,c}$ [psi]
2	1.000	2,220	0.500	4.724	6.000	1,135

$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	c_{ac} [in.]	λ_a	$\alpha_{N,seis}$
0.000	0.000	7.635	1.000	0.990

Calculations

c_{Na} [in.]	A_{Na} [in.^{2}]	A_{Na0} [in.^{2}]	$\psi_{ed,Na}$
7.071	289.00	200.00	0.955

$\psi_{ec1,Na}$	$\psi_{ec2,Na}$	$\psi_{cp,Na}$	N_{ba} [lb]
1.000	1.000	1.000	8,339

Results

V_{cpg} [lb]	$\phi_{concrete}$	$\phi_{seismic}$	$\phi_{nonductile}$	$\phi\ V_{cpg}$ [lb]	V_{ua} [lb]
23,004	0.700	1.000	1.000	16,103	806

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4.3 Concrete edge failure in direction y+

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \psi_{ec,V}\ \psi_{ed,V}\ \psi_{c,V}\ \psi_{h,V}\ \psi_{parallel,V}\ V_b$ — ACI 318-14 Eq. (17.5.2.1b)

$\phi\ V_{cbg} \geq V_{ua}$ — ACI 318-14 Table 17.3.1.1

A_{Vc} see ACI 318-14, Section 17.5.2.1, Fig. R 17.5.2.1(b)

$A_{Vc0} = 4.5\ c_{a1}^2$ — ACI 318-14 Eq. (17.5.2.1c)

$\psi_{ec,V} = \left(\frac{1}{1 + \frac{2e_V'}{3c_{a1}}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.5.2.5)

$\psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ — ACI 318-14 Eq. (17.5.2.6b)

$\psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ — ACI 318-14 Eq. (17.5.2.8)

$V_b = \left(7\left(\frac{l_e}{d_a}\right)^{0.2} \sqrt{d_a}\right) \lambda_a \sqrt{f_c'}\ c_{a1}^{1.5}$ — ACI 318-14 Eq. (17.5.2.2a)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\psi_{c,V}$	h_a [in.]
6.000	6.000	0.000	1.000	12.000

l_e [in.]	λ_a	d_a [in.]	f_c' [psi]	$\psi_{parallel,V}$
4.000	1.000	0.500	2,500	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\psi_{ec,V}$	$\psi_{ed,V}$	$\psi_{h,V}$	V_b [lb]
153.00	162.00	1.000	0.900	1.000	5,513

Results

V_{cbg} [lb]	$\phi_{concrete}$	$\phi_{seismic}$	$\phi_{nonductile}$	$\phi\ V_{cbg}$ [lb]	V_{ua} [lb]
4,686	0.700	1.000	1.000	3,280	806

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.410	0.246	5/3	33	OK

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

Hilti PROFIS Engineering 3.0.73

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Design:	Concrete - Nov 1, 2021	Date:	11/1/2021
Fastening point:			

6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- Design Strengths of adhesive anchor systems are influenced by the cleaning method. Refer to the INSTRUCTIONS FOR USE given in the Evaluation Service Report for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- An anchor design approach for structures assigned to Seismic Design Category C, D, E or F is given in ACI 318-14, Chapter 17, Section 17.2.3.4.3 (a) that requires the governing design strength of an anchor or group of anchors be limited by ductile steel failure. If this is NOT the case, the connection design (tension) shall satisfy the provisions of Section 17.2.3.4.3 (b), Section 17.2.3.4.3 (c), or Section 17.2.3.4.3 (d). The connection design (shear) shall satisfy the provisions of Section 17.2.3.5.3 (a), Section 17.2.3.5.3 (b), or Section 17.2.3.5.3 (c).
- Section 17.2.3.4.3 (b) / Section 17.2.3.5.3 (a) require the attachment the anchors are connecting to the structure be designed to undergo ductile yielding at a load level corresponding to anchor forces no greater than the controlling design strength. Section 17.2.3.4.3 (c) / Section 17.2.3.5.3 (b) waive the ductility requirements and require the anchors to be designed for the maximum tension / shear that can be transmitted to the anchors by a non-yielding attachment. Section 17.2.3.4.3 (d) / Section 17.2.3.5.3 (c) waive the ductility requirements and require the design strength of the anchors to equal or exceed the maximum tension / shear obtained from design load combinations that include E, with E increased by ω_0.
- Installation of Hilti adhesive anchor systems shall be performed by personnel trained to install Hilti adhesive anchors. Reference ACI 318-14, Section 17.8.1.

Fastening meets the design criteria!

Hilti PROFIS Engineering 3.0.73

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Design:	Concrete - Nov 1, 2021	Date:	11/1/2021
Fastening point:			

7 Installation data

Profile: Square HSS (AISC), HSS3X3X.3125; (L x W x T) = 3.000 in. x 3.000 in. x 0.312 in.

Hole diameter in the fixture: d_f = 0.562 in.

Plate thickness (input): 0.500 in.

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Compressed air cleaning of the drilled hole according to instructions for use is required

Anchor type and diameter: HIT-HY 200 + HAS-V-36 (ASTM F1554 Gr.36) 1/2

Item number: 2198022 HAS-V-36 1/2"x6-1/2" (element) / 2022791 HIT-HY 200-A (adhesive)

Maximum installation torque: 360 in.lb

Hole diameter in the base material: 0.562 in.

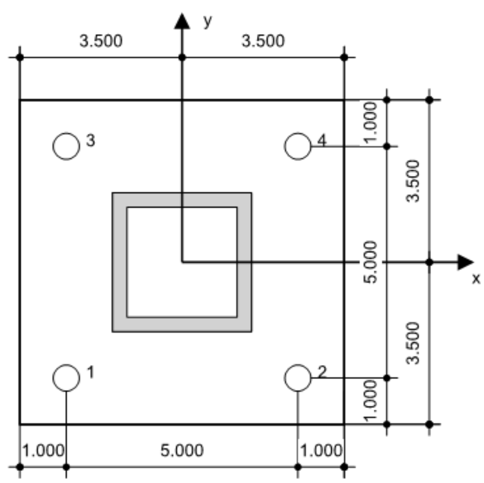
Hole depth in the base material: 4.724 in.

Minimum thickness of the base material: 5.974 in.

1/2 Hilti HAS Carbon steel threaded rod with Hilti HIT-HY 200 Safe Set System

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Compressed air with required accessories to blow from the bottom of the hole • Proper diameter wire brush	• Dispenser including cassette and mixer • Torque wrench



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-2.500	-2.500	6.000	11.000	6.000	11.000
2	2.500	-2.500	11.000	6.000	6.000	11.000
3	-2.500	2.500	6.000	11.000	11.000	6.000
4	2.500	2.500	11.000	6.000	11.000	6.000

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Fastening point:			

8 Remarks; Your Cooperation Duties

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- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

Footing Check

Load case reactions are shown below. Uplift governs design of footing. See following.

	NODE	RX (KIP)	RY (KIP)	RZ (KIP)
DL	N78	0	0.528	-0.036
	N74	0	0.451	-0.001
	N76	0	0.471	0.037
	N16	0	0.451	0
	N21	0	0.875	0
RLL	N78	0	0.059	0
	N74	0	0.248	-0.002
	N76	0	0.06	0.001
	N16	0	0.249	0.001
	N21	0	0.376	0
EX	N78	-0.336	-1.833	0.002
	N74	-0.381	1.804	0.034
	N76	-0.374	-1.769	0.003
	N16	-0.456	1.868	-0.04
	N21	-0.118	-0.07	0.002
EZ	N78	0.04	1.084	-0.34
	N74	-0.04	0.152	-0.086
	N76	-0.046	-1.06	-0.361
	N16	0.052	-0.156	-0.095
	N21	-0.005	-0.02	-0.783
WX	N78	-0.452	-2.65	0.004
	N74	-0.566	2.647	0.082
	N76	-0.535	-2.614	0.005
	N16	-0.655	2.684	-0.095
	N21	-0.322	-0.067	0.004
WZ	N78	0.02	0.415	-0.143
	N74	-0.024	0.094	-0.095
	N76	-0.027	-0.407	-0.082
	N16	0.026	-0.095	-0.045
	N21	0.004	-0.007	-0.303

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project Filename: 2021-252.ec6

LIC# : KW-06014109, Build:20.21.6.6 Junker Engineering Group (c) ENERCALC INC 1983-2021

DESCRIPTION: Footing - Uplift Controls

Code References

Calculations per ACI 318-11, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : IBC 2018

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	1.50 ksf
Soil Density	=	110.0 pcf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

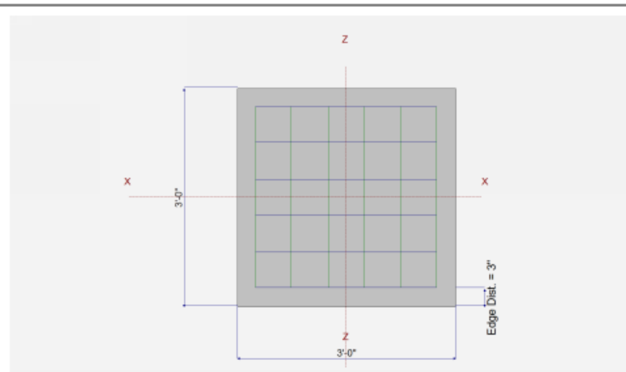
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	3.0 ft
Length parallel to Z-Z Axis	=	3.0 ft
Footing Thickness	=	24.0 in



Pedestal dimensions...

px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in

Rebar Centerline to Edge of Concrete...

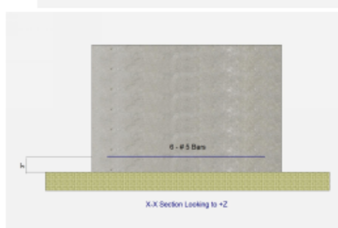
at Bottom of footing	=	3.0 in

Reinforcing

Bars parallel to X-X Axis		
Number of Bars	=	6
Reinforcing Bar Size	= #	5
Bars parallel to Z-Z Axis		
Number of Bars	=	6
Reinforcing Bar Size	= #	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a



Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	0.4510	0.2480			-2.647	1.804		k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=						-0.5660		k
V-z	=	-0.0010	-0.0020				0.0820		k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project Filename: 2021-252.ec6

DESCRIPTION: Footing - Uplift Controls

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4365	Soil Bearing	0.6548 ksf	1.50 ksf	+D+0.70E about Z-Z axis
PASS	1.156	Overturning - X-X	2.384 k-ft	2.755 k-ft	+0.60D+0.60W
PASS	5.867	Overturning - Z-Z	0.7924 k-ft	4.649 k-ft	+0.60D+0.70E
PASS	2.347	Sliding - X-X	0.3962 k	0.9298 k	+0.60D+0.70E
PASS	16.370	Sliding - Z-Z	0.05680 k	0.9298 k	+0.60D+0.70E
PASS	1.156	Uplift	-1.588 k	1.837 k	+0.60D+0.60W
PASS	0.004953	Z Flexure (+X)	0.2801 k-ft/ft	56.555 k-ft/ft	+0.90D+W
PASS	0.008519	Z Flexure (-X)	0.4818 k-ft/ft	56.555 k-ft/ft	+1.20D+E
PASS	0.005660	X Flexure (+Z)	0.3201 k-ft/ft	56.555 k-ft/ft	+1.20D+E
PASS	0.004948	X Flexure (-Z)	0.2798 k-ft/ft	56.555 k-ft/ft	+0.90D+W
PASS	n/a	1-way Shear (+X)	0.0 psi	75.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a
PASS	n/a	1-way Shear (+Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	2-way Punching	0.8822 psi	75.0 psi	+1.20D+E

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	1.50	n/a	-0.007841	0.3406	0.3397	n/a	n/a	0.227
X-X, +D+Lr	1.50	n/a	-0.02176	0.3690	0.3663	n/a	n/a	0.246
X-X, +D+0.750Lr	1.50	n/a	-0.01848	0.3619	0.3597	n/a	n/a	0.241
X-X, +D+0.60W	1.50	n/a	-0.01630	0.1641	0.1632	n/a	n/a	0.109
X-X, +D+0.70E	1.50	n/a	0.3131	0.4556	0.5052	n/a	n/a	0.337
X-X, +D+0.750Lr+0.450W	1.50	n/a	-0.02919	0.2295	0.2273	n/a	n/a	0.153
X-X, +D+0.450W	1.50	n/a	-0.01284	0.2082	0.2073	n/a	n/a	0.139
X-X, +D+0.5250E	1.50	n/a	0.2518	0.4268	0.4638	n/a	n/a	0.309
X-X, +0.60D+0.60W	1.50	n/a	-0.05797	0.02786	0.02734	n/a	n/a	0.019
X-X, +0.60D+0.70E	1.50	n/a	0.4398	0.3194	0.3694	n/a	n/a	0.246
Z-Z, D Only	1.50	0.0	n/a	n/a	n/a	0.3401	0.3401	0.227
Z-Z, +D+Lr	1.50	0.0	n/a	n/a	n/a	0.3677	0.3677	0.245
Z-Z, +D+0.750Lr	1.50	0.0	n/a	n/a	n/a	0.3608	0.3608	0.241
Z-Z, +D+0.60W	1.50	0.0	n/a	n/a	n/a	0.1636	0.1636	0.109
Z-Z, +D+0.70E	1.50	-2.199	n/a	n/a	n/a	0.6548	0.3061	0.437
Z-Z, +D+0.750Lr+0.450W	1.50	0.0	n/a	n/a	n/a	0.2284	0.2284	0.152
Z-Z, +D+0.450W	1.50	0.0	n/a	n/a	n/a	0.2078	0.2078	0.139
Z-Z, +D+0.5250E	1.50	-1.779	n/a	n/a	n/a	0.5761	0.3146	0.384
Z-Z, +0.60D+0.60W	1.50	0.0	n/a	n/a	n/a	0.02760	0.02760	0.018
Z-Z, +0.60D+0.70E	1.50	-3.068	n/a	n/a	n/a	0.5187	0.1701	0.346

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
X-X, D Only	0.0020 k-ft	4.592 k-ft	2,295.75	OK
X-X, +D+Lr	0.0060 k-ft	4.964 k-ft	827.25	OK
X-X, +D+0.750Lr	0.0050 k-ft	4.871 k-ft	974.10	OK
X-X, +D+0.60W	2.384 k-ft	4.592 k-ft	1.926	OK
X-X, +D+0.70E	0.1148 k-ft	6.488 k-ft	56.513	OK
X-X, +D+0.750Lr+0.450W	1.792 k-ft	4.871 k-ft	2.718	OK
X-X, +D+0.450W	1.789 k-ft	4.592 k-ft	2.567	OK
X-X, +D+0.5250E	0.08610 k-ft	6.014 k-ft	69.851	OK
X-X, +0.60D+0.60W	2.384 k-ft	2.755 k-ft	1.156	OK
X-X, +0.60D+0.70E	0.1148 k-ft	4.650 k-ft	40.508	OK
Z-Z, D Only	None	0.0 k-ft	Infinity	OK
Z-Z, +D+Lr	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.750Lr	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.70E	0.7924 k-ft	6.486 k-ft	8.185	OK
Z-Z, +D+0.750Lr+0.450W	None	0.0 k-ft	Infinity	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project Filename: 2021-252.ec6

LIC# : KW-06014109, Build:20.21.6.6 Junker Engineering Group

DESCRIPTION: Footing - Uplift Controls

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Z-Z, +D+0.450W	None	0.0 k-ft	Infinity	OK
Z-Z, +D+0.5250E	0.5943 k-ft	6.012 k-ft	10.116	OK
Z-Z, +0.60D+0.60W	None	0.0 k-ft	Infinity	OK
Z-Z, +0.60D+0.70E	0.7924 k-ft	4.649 k-ft	5.867	OK

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
X-X, D Only	0.0 k	0.9183 k	No Sliding	OK
X-X, +D+Lr	0.0 k	0.9927 k	No Sliding	OK
X-X, +D+0.750Lr	0.0 k	0.9741 k	No Sliding	OK
X-X, +D+0.60W	0.0 k	0.4418 k	No Sliding	OK
X-X, +D+0.70E	-0.3962 k	1.297 k	3.274	OK
X-X, +D+0.750Lr+0.450W	0.0 k	0.6168 k	No Sliding	OK
X-X, +D+0.450W	0.0 k	0.5610 k	No Sliding	OK
X-X, +D+0.5250E	-0.2972 k	1.202 k	4.047	OK
X-X, +0.60D+0.60W	0.0 k	0.07452 k	No Sliding	OK
X-X, +0.60D+0.70E	-0.3962 k	0.9298 k	2.347	OK
Z-Z, D Only	-0.0010 k	0.9183 k	918.30	OK
Z-Z, +D+Lr	-0.0030 k	0.9927 k	330.90	OK
Z-Z, +D+0.750Lr	-0.00250 k	0.9741 k	389.640	OK
Z-Z, +D+0.60W	-0.0010 k	0.4418 k	441.840	OK
Z-Z, +D+0.5250E	0.04205 k	1.202 k	28.595	OK
Z-Z, +0.60D+0.60W	-0.00060 k	0.07452 k	124.20	OK
Z-Z, +0.60D+0.70E	0.05680 k	0.9298 k	16.370	OK
Z-Z, +D+0.70E	0.05640 k	1.297 k	22.999	OK
Z-Z, +D+0.750Lr+0.450W	-0.00250 k	0.6168 k	246.702	OK
Z-Z, +D+0.450W	-0.0010 k	0.5610 k	560.96	OK

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	0.07846	+Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.40D	0.07939	-Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+0.50Lr	0.08242	+Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+0.50Lr	0.08388	-Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D	0.06725	+Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D	0.06805	-Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+1.60Lr	0.1158	+Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+1.60Lr	0.1187	-Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+1.60Lr+0.50W	0.04965	+Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+1.60Lr+0.50W	0.04672	-Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+0.50W	0.09819	+Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+0.50W	0.09739	-Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+0.50Lr+W	0.2485	+Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+0.50Lr+W	0.2470	-Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+W	0.2636	+Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+W	0.2628	-Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+E	0.3201	+Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +1.20D+E	0.2662	-Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +0.90D+W	0.2804	+Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +0.90D+W	0.2798	-Z	Top	0.5184	AsMin	0.620	56.555	OK
X-X, +0.90D+E	0.3033	+Z	Bottom	0.5184	AsMin	0.620	56.555	OK
X-X, +0.90D+E	0.2492	-Z	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.40D	0.07893	-X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.40D	0.07893	+X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+0.50Lr	0.08315	-X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+0.50Lr	0.08315	+X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D	0.06765	-X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D	0.06765	+X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+1.60Lr	0.1173	-X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+1.60Lr	0.1173	+X	Bottom	0.5184	AsMin	0.620	56.555	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project Filename: 2021-252.ec6

DESCRIPTION: Footing - Uplift Controls

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
Z-Z, +1.20D+1.60Lr+0.50W	0.04819	-X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+1.60Lr+0.50W	0.04819	+X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+0.50W	0.09779	-X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+0.50W	0.09779	+X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+0.50Lr+W	0.2477	-X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+0.50Lr+W	0.2477	+X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+W	0.2632	-X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+W	0.2632	+X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+E	0.4818	-X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +1.20D+E	0.1045	+X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +0.90D+W	0.2801	-X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +0.90D+W	0.2801	+X	Top	0.5184	AsMin	0.620	56.555	OK
Z-Z, +0.90D+E	0.4649	-X	Bottom	0.5184	AsMin	0.620	56.555	OK
Z-Z, +0.90D+E	0.08759	+X	Bottom	0.5184	AsMin	0.620	56.555	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+1.60Lr	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+1.60Lr+0.50W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+E	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D+W	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D+E	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	0.24 psi	150.00psi	0.001584	OK
+1.20D+0.50Lr	0.25 psi	150.00psi	0.001668	OK
+1.20D	0.20 psi	150.00psi	0.001357	OK
+1.20D+1.60Lr	0.35 psi	150.00psi	0.002352	OK
+1.20D+1.60Lr+0.50W	0.15 psi	150.00psi	0.000967	OK
+1.20D+0.50W	0.29 psi	150.00psi	0.001962	OK
+1.20D+0.50Lr+W	0.75 psi	150.00psi	0.00497	OK
+1.20D+W	0.79 psi	150.00psi	0.005281	OK
+1.20D+E	0.88 psi	150.00psi	0.005882	OK
+0.90D+W	0.84 psi	150.00psi	0.005621	OK
+0.90D+E	0.83 psi	150.00psi	0.005542	OK