



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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E-Mail: siting.council@ct.gov

Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

July 15, 2020

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-146-200409** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 60 Industrial Park Road, Vernon, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated July 14, 2020 regarding the minor project changes to the above-referenced exempt modification that was acknowledged by the Council on April 27, 2020.

The request to change the originally proposed six (6) model LNX-6512DS-VTM antennas, which are no longer available having been discontinued by the manufacturer, to six (6) model LNX-6513DS-A1M antennas is approved with the following conditions:

1. Prior to Verizon's antenna installation, the antenna mount modifications shall be installed in accordance with the Mount Analysis prepared by Hudson Design Group, LLC, dated June 22, 2020 (Rev.1) and stamped and signed by Daniel Hamm;
2. Within 45 days following completion of equipment installation, Verizon shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the Mount Analysis.

This approval applies only to the minor project changes dated July 14, 2020. Any significant changes to the project require advance Council notification and approval.

Thank you for your attention and cooperation.

Sincerely,

s/Melanie Bachman

Melanie Bachman
Executive Director

MAB/in/laf

KENNETH C. BALDWIN

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Also admitted in Massachusetts
and New York

July 14, 2020

Via Electronic Mail

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

Re: **EM-VER-146-200409 – 60 Industrial Park Road, Vernon, Connecticut**
Request for Approval of Immaterial Change

Dear Attorney Bachman:

On April 27, 2020, the Siting Council acknowledged the above referenced Exempt Modification, filed on behalf of Cellco Partnership d/b/a Verizon Wireless (“Cellco”), for certain modifications to its existing telecommunications facility at 60 Industrial Park Road in Vernon.

The modifications to the facility included, among other things, replacement of six (6) existing antennas with six (6) model LNX-6512DS-VTM antennas. Cellco recently learned that the LNX-6512DS-VTM antenna has been discontinued by the manufacturer and is no longer available. The purpose of this letter is to inform the Council that Cellco will now install six (6) model LNX-6513DS-A1M antennas at this site.

Attached please find the LNX-6513DS-A1M antenna specification sheet; an updated Structural Report and an updated Mount Analysis Report for the site.

Please feel free to contact me if you have any questions or need any additional information. Thank you in advance for your cooperation.

Sincerely,



Kenneth C. Baldwin

LNx-6513DS-A1M



2-port sector antenna, 2x 698–896 MHz, 65° HPBW, factory attached actuator

- Extended tilt range offers better coverage
- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

General Specifications

Antenna Type	Sector
Band	Single band
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, low band	2
RF Connector Quantity, total	2

Dimensions

Width	301 mm 11.85 in
Length	1390 mm 54.724 in
Length, with installed actuator	1553 mm 61.142 in
Depth	181 mm 7.126 in

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	698 – 896 MHz
Polarization	±45°

LNx-6513DS-A1M

Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	14.6	15.1
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Vertical, degrees	16	14.5
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	20	20
Front-to-Back Ratio at 180°, dB	30	30
CPR at Boresight, dB	12	12
CPR at Sector, dB	10	10
Isolation, Cross Polarization, dB	30	30
VSWR Return loss, dB	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-150	-150
Input Power per Port, maximum, watts	400	400

Electrical Specifications, BASTA

Frequency Band, MHz	698–806	806–896
Beamwidth, Horizontal Tolerance, degrees	±3	±3

Mechanical Specifications

Wind Loading at Velocity, frontal	202.0 N @ 150 km/h 46.1 lbf @ 150 km/h
Wind Loading at Velocity, lateral	166.0 N @ 150 km/h 37.3 lbf @ 150 km/h
Wind Loading at Velocity, maximum	390.0 N @ 150 km/h 87.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 149.75 mph

Packaging and Weights

Width, packed	411 mm 16.181 in
Depth, packed	284 mm 11.181 in
Length, packed	1706 mm 67.165 in
Net Weight, without mounting kit	14.8 kg 32.628 lb
Weight, gross	30.9 kg 68.123 lb

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

LNx-6513DS-A1M

ROHS

Compliant



Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

STRUCTURAL ANALYSIS REPORT

For

VERNON 2 CT

60 INDUSTRIAL PARK ROAD
VERNON, CT 06066

Antennas Mounted to the Monopole



Prepared for:

verizon✓

20 Alexander Drive
Wallingford, CT 06492

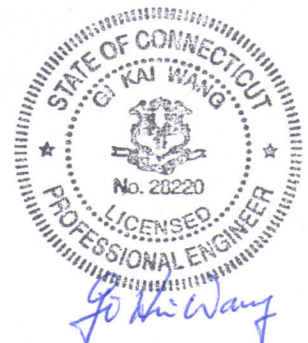
Dated: June 26, 2020

Prepared by:



HUDSON
Design Group LLC

45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586
www.hudsondesigngroupllc.com





HUDSON
Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the 175' monopole supporting the existing and proposed Verizon's antennas located at elevation 153' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of Verizon's existing and proposed antennas listed below.

Record drawings of the existing monopole prepared by Pirod Inc., dated January 28, 2000, were available for our use. The previous structural analysis report prepared by Vertical Solutions, Inc., dated August 25, 2015, was available for our use. The previous structural analysis report prepared by Maser Consulting, dated December 4, 2017, was also available and obtained for our use.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole and foundation **ARE IN CONFORMANCE** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **98.0%** - (Base Plate at EL.0' Controlling).



APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	(6) LNX-6514DS Antennas	178'	Steel Platform
	(3) APX16DWV-16DWVS-C Antennas	178'	Steel Platform
	(3) ATSBT-TOP-MF-4G	178'	Steel Platform
	(6) TMA	178'	Steel Platform
	(3) 800 10121 Antennas	168'	Steel Platform
	(3) Quintel QS66512-2 Antennas	168'	Steel Platform
	(3) OPA-65R-LCUU-H6 Antennas	168'	Steel Platform
	(6) RRUS-32	168'	Steel Platform
	(3) RRUS-11	168'	Steel Platform
	(3) B14 4478	168'	Steel Platform
	(6) TMA	168'	Steel Platform
	(2) DC6-48-60-18-8F	168'	Steel Platform
VERIZON	(6) NHH-65B-R2B Antennas	153'	Steel Platform w/Handrail & Reinf.
VERIZON	(3) LNX-6513DS-A1M Antennas	153'	Steel Platform w/Handrail & Reinf.
VERIZON	(3) XXDWMM Antennas	153'	Steel Platform w/Handrail & Reinf.
VERIZON	(3) B5/B13 RRH-BR04C	153'	Steel Platform w/Handrail & Reinf.
VERIZON	(3) B2/B66A RRH-BR049	153'	Steel Platform w/Handrail & Reinf.
VERIZON	(3) CBRS RRH-RT4401	153'	Steel Platform w/Handrail & Reinf.
VERIZON	(1) OVP Box	153'	Steel Platform w/Handrail & Reinf.
	(12) Mount Pipes	145'	Steel Platform

***Proposed VERIZON Appurtenances shown in Bold.**

VERIZON EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
VERIZON	(6) 1 5/8" Cables	153'	Inside Monopole
VERIZON	(2) Fiber Cables	153'	Inside Monopole

***Proposed VERIZON Coax Cables shown in Bold.**



HUDSON
Design Group LLC

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	20.9 %	160 – 175	PASS	
Pole Section-L2	49.1 %	140 – 160	PASS	
Pole Section-L3	70.4 %	120 – 140	PASS	
Pole Section-L4	82.7 %	100 – 120	PASS	
Pole Section-L5	89.1 %	80 – 100	PASS	
Pole Section-L6	92.3 %	60 – 80	PASS	
Pole Section-L7	93.7 %	40 – 60	PASS	
Pole Section-L8	82.8 %	20 – 40	PASS	
Pole Section-L9	76.4 %	0 – 20	PASS	
Base Plate & Anchor Bolts	98.0 %	0	PASS	Controlling
Foundation	94.7 %	-	PASS	



HUDSON
Design Group LLC

DESIGN CRITERIA:

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
2. 2018 Connecticut State Building Code
 - County: Tolland
 - City/Town: Vernon
 - Wind Load: 97 mph (3 second gust)
 - Structural Class: II
 - Exposure Category: B
 - Topographic Category: 1
 - Ice Thickness: 1.0 inch
3. Approximate height above grade to proposed antennas: 153'

ASSUMPTIONS:

1. The monopole dimensions, member sizes and material strength are as indicated in the previous structural analysis report prepared by Maser Consulting, dated December 4, 2017.
2. The appurtenances configuration is as stated in the previous structural analysis reports. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
3. The monopole and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

SUPPORT RECOMMENDATIONS:

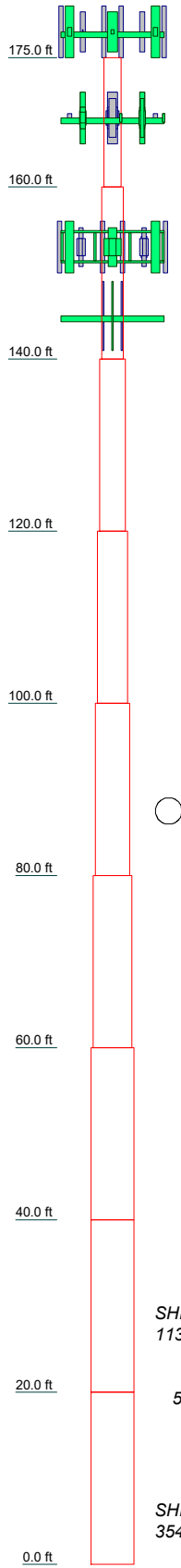
HDG recommends that the proposed antennas and RRUs be mounted on the existing steel platform supported by the monopole.



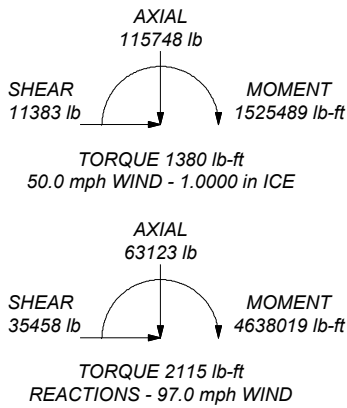
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Design Group LLC

TNX INPUT/OUTPUT

Section	1	2	3	4	5	6	7	8	9	
Size	P24x3/8	P30x3/8	P36x3/8	P42x3/8	P48x3/8	P54x3/8	P60x3/8	P60x1/2	P60x5/8	
Length (ft)	15.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	
Grade	A53-B-42									
Weight (lb)	1420.6	2375.2	2856.3	3337.3	3818.4	4299.5	4780.5	6360.7	7934.1	37182.6



ALL REACTIONS
ARE FACTORED



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PIROD 15' Low Profile Platform	178	B14 4478	168
(2) LNX-6514DS-A1M w/ Mount Pipe	178	B14 4478	168
(2) LNX-6514DS-A1M w/ Mount Pipe	178	(2) Gen. TMA	168
(2) LNX-6514DS-A1M w/ Mount Pipe	178	(2) Gen. TMA	168
APX16DWV-16DWVS-C w/mount pipe	178	(2) Gen. TMA	168
APX16DWV-16DWVS-C w/mount pipe	178	DC6-48-60-18-8F	168
APX16DWV-16DWVS-C w/mount pipe	178	DC6-48-60-18-8F	168
ATSBT-TOP-MF-4G	178	PIROD 15' Platform w/handrail ,reinf. (VERIZON - existing)	153
ATSBT-TOP-MF-4G	178	(2) NHH-65B-R2B w/ Mount Pipe	153
ATSBT-TOP-MF-4G	178	(2) NHH-65B-R2B w/ Mount Pipe	153
(2) Ericsson KRY 112 71/2	178	(2) NHH-65B-R2B w/ Mount Pipe	153
(2) Ericsson KRY 112 71/2	178	B5/B13 RRH-BR04C	153
(2) Ericsson KRY 112 71/2	178	B5/B13 RRH-BR04C	153
PIROD 15' Low Profile Platform (ATI)	168	B5/B13 RRH-BR04C	153
Kathrein 800 10121 w/mount pipe	168	B2/B66A RRH-BR049	153
Kathrein 800 10121 w/mount pipe	168	B2/B66A RRH-BR049	153
Kathrein 800 10121 w/mount pipe	168	B2/B66A RRH-BR049	153
Quintel QS66512-2 w/mpount pipe	168	DB-C1-12C-24AB-0Z	153
Quintel QS66512-2 w/mpount pipe	168	LNX-6513DS-A1M w/ Mount Pipe (VERIZON - proposed)	153
Quintel QS66512-2 w/mpount pipe	168	LNX-6513DS-A1M w/ Mount Pipe	153
OPA-65R-LCUU-H6 w/mount pipe	168	LNX-6513DS-A1M w/ Mount Pipe	153
OPA-65R-LCUU-H6 w/mount pipe	168	XXDWMM	153
OPA-65R-LCUU-H6 w/mount pipe	168	XXDWMM	153
Ericsson RRUS-32	168	XXDWMM	153
Ericsson RRUS-32	168	CBRS RRH-RT4401	153
Ericsson RRUS-32	168	CBRS RRH-RT4401	153
Ericsson RRUS-11	168	CBRS RRH-RT4401	153
Ericsson RRUS-11	168	PIROD 15' Low Profile Platform	145
Ericsson RRUS-11	168	(4) 2"x8' pipe	145
Ericsson RRUS-32	168	(4) 2"x8' pipe	145
Ericsson RRUS-32	168	(4) 2"x8' pipe	145
Ericsson RRUS-32	168	(4) 2"x8' pipe	145
B14 4478	168		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 93.7%

Hudson Design Group LLC
45 Beechwood Drive
North Andover, MA 01845
Phone: (P) 978.557.5553
FAX: (F) 978.336.5586

Job: **VERNON 2 CT**

Project: **81 ft Monopole**

Client: **VERIZON**

Code: **TIA-222-G**

Path:

Drawn by: **kw**

Date: **06/25/20**

Scale: **NTS**

App'd:

Scale: **NTS**

Dwg No. **E-1**

C:\Users\Kenny\Documents\KENDRY WORK 2020\HUDSON DESIGN GROUP 2020\VERNON 2 CT - MP (Verizon) 6-2020\VERNON 2 CT\VERNON 2 CT.dwg

tnxTower Hudson Design Group LLC 45 Beechwood Drive North Andover, MA 01845 Phone: (P) 978.557.5553 FAX: (F) 978.336.5586	Job VERNON 2 CT	Page 1 of 12
	Project 81 ft Monopole	Date 15:37:20 06/25/20
	Client VERIZON	Designed by kw

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Tolland County, Connecticut.

Basic wind speed of 97.0 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56.0 pcf.

A wind speed of 50.0 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 60.0 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	175.00-160.00	15.00	P24x3/8	A53-B-42 (42 ksi)	
L2	160.00-140.00	20.00	P30x3/8	A53-B-42 (42 ksi)	
L3	140.00-120.00	20.00	P36x3/8	A53-B-42 (42 ksi)	
L4	120.00-100.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L5	100.00-80.00	20.00	P48x3/8	A53-B-42 (42 ksi)	
L6	80.00-60.00	20.00	P54x3/8	A53-B-42 (42 ksi)	
L7	60.00-40.00	20.00	P60x3/8	A53-B-42 (42 ksi)	
L8	40.00-20.00	20.00	P60x1/2	A53-B-42 (42 ksi)	
L9	20.00-0.00	20.00	P60x5/8	A53-B-42 (42 ksi)	

Feed Line/Linear Appurtenances - Entered As Area

tnxTower Hudson Design Group LLC 45 Beechwood Drive North Andover, MA 01845 Phone: (P) 978.557.5553 FAX: (F) 978.336.5586	Job	VERNON 2 CT	Page	2 of 12
	Project	81 ft Monopole	Date	15:37:20 06/25/20
	Client	VERIZON	Designed by	kw

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	175.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	124.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	No	CaAa (Out Of Face)	145.00 - 124.00	2	No Ice	0.20	0.82
							1/2" Ice	0.30	2.33
							1" Ice	0.40	4.46
LDF7-50A (1-5/8 FOAM)	C	No	No	CaAa (Out Of Face)	145.00 - 124.00	10	No Ice	0.20	0.82
							1/2" Ice	0.30	2.33
							1" Ice	0.40	4.46
1 5/8 Fiber Cable	C	No	No	Inside Pole	165.00 - 0.00	1	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04

1 5/8	B	No	No	Inside Pole	153.00 - 0.00	6	No Ice	0.00	1.04
(VERIZON - existing)							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
1 5/8 Fiber Cable	B	No	No	Inside Pole	153.00 - 0.00	2	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
PiROD 15' Low Profile Platform	A	None		0.0000	178.00	No Ice	17.30	17.30	1500.00
						1/2" Ice	22.10	22.10	2030.00
						1" Ice	26.90	26.90	2560.00
(2) LNX-6514DS-A1M w/ Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice	8.42	7.09	56.85
						1/2" Ice	8.98	8.27	125.98
						1" Ice	9.50	9.17	203.14
(2) LNX-6514DS-A1M w/ Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice	8.42	7.09	56.85
						1/2" Ice	8.98	8.27	125.98
						1" Ice	9.50	9.17	203.14
(2) LNX-6514DS-A1M w/ Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice	8.42	7.09	56.85
						1/2" Ice	8.98	8.27	125.98
						1" Ice	9.50	9.17	203.14
APX16DWV-16DWVS-C w/mount pipe	A	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice	6.91	3.60	62.60
						1/2" Ice	7.39	4.44	112.14
						1" Ice	7.86	5.15	168.24
APX16DWV-16DWVS-C w/mount pipe	B	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice	6.91	3.60	62.60
						1/2" Ice	7.39	4.44	112.14
						1" Ice	7.86	5.15	168.24
APX16DWV-16DWVS-C w/mount pipe	C	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice	6.91	3.60	62.60
						1/2" Ice	7.39	4.44	112.14
						1" Ice	7.86	5.15	168.24
ATSBT-TOP-MF-4G	A	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice	0.17	0.09	2.00
						1/2" Ice	0.23	0.14	3.67
						1" Ice	0.29	0.19	6.27

tnxTower Hudson Design Group LLC 45 Beechwood Drive North Andover, MA 01845 Phone: (P) 978.557.5553 FAX: (F) 978.336.5586	Job	VERNON 2 CT	Page	3 of 12
	Project	81 ft Monopole	Date	15:37:20 06/25/20
	Client	VERIZON	Designed by	kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
ATSBT-TOP-MF-4G	B	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	0.17 0.23 0.29	0.09 0.14 0.19	2.00 3.67 6.27
ATSBT-TOP-MF-4G	C	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	0.17 0.23 0.29	0.09 0.14 0.19	2.00 3.67 6.27
(2) Ericsson KRY 112 71/2	A	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.40 0.49 0.59	13.20 18.38 25.16
(2) Ericsson KRY 112 71/2	B	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.40 0.49 0.59	13.20 18.38 25.16
(2) Ericsson KRY 112 71/2	C	From Face	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.40 0.49 0.59	13.20 18.38 25.16

PiROD 15' Low Profile Platform (AT&T)	A	None		0.0000	168.00	No Ice 1/2" Ice 1" Ice	17.30 22.10 26.90	17.30 22.10 26.90	1500.00 2030.00 2560.00
Kathrein 800 10121 w/mount pipe	A	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	5.40 5.78 6.17	4.77 5.43 6.10	64.55 112.69 167.17
Kathrein 800 10121 w/mount pipe	B	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	5.40 5.78 6.17	4.77 5.43 6.10	64.55 112.69 167.17
Kathrein 800 10121 w/mount pipe	C	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	5.40 5.78 6.17	4.77 5.43 6.10	64.55 112.69 167.17
Quintel QS66512-2 w/mpount pipe	A	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	8.61 9.27 9.90	8.70 9.99 11.12	140.20 218.50 305.14
Quintel QS66512-2 w/mpount pipe	B	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	8.61 9.27 9.90	8.70 9.99 11.12	140.20 218.50 305.14
Quintel QS66512-2 w/mpount pipe	C	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	8.61 9.27 9.90	8.70 9.99 11.12	140.20 218.50 305.14
OPA-65R-LCUU-H6 w/mount pipe	A	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	9.95 10.50 11.04	7.53 8.56 9.45	112.53 192.76 282.09
OPA-65R-LCUU-H6 w/mount pipe	B	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	9.95 10.50 11.04	7.53 8.56 9.45	112.53 192.76 282.09
OPA-65R-LCUU-H6 w/mount pipe	C	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	9.95 10.50 11.04	7.53 8.56 9.45	112.53 192.76 282.09
Ericsson RRUS-32	A	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
Ericsson RRUS-32	B	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
Ericsson RRUS-32	C	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
Ericsson RRUS-11	A	From Leg	3.00 0.00	0.0000	168.00	No Ice 1/2" Ice	2.79 3.00	1.19 1.34	50.70 71.57

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
Ericsson RRUS-11	B	From Leg	0.00	0.0000	168.00	1" Ice	3.21	1.50	95.48
			3.00			No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
Ericsson RRUS-11	C	From Leg	0.00	0.0000	168.00	1" Ice	3.21	1.50	95.48
			3.00			No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
Ericsson RRUS-32	A	From Leg	0.00	0.0000	168.00	1" Ice	3.21	1.50	95.48
			3.00			No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
Ericsson RRUS-32	B	From Leg	0.00	0.0000	168.00	1" Ice	3.81	2.86	136.47
			3.00			No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
Ericsson RRUS-32	C	From Leg	0.00	0.0000	168.00	1" Ice	3.81	2.86	136.47
			3.00			No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
B14 4478	A	From Leg	0.00	0.0000	168.00	1" Ice	3.81	2.86	136.47
			3.00			No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
B14 4478	B	From Leg	0.00	0.0000	168.00	1" Ice	1.98	1.19	91.23
			3.00			No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
B14 4478	C	From Leg	0.00	0.0000	168.00	1" Ice	1.98	1.19	91.23
			3.00			No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
(2) Gen. TMA	A	From Leg	0.00	0.0000	168.00	1" Ice	1.98	1.19	91.23
			3.00			No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
(2) Gen. TMA	B	From Leg	0.00	0.0000	168.00	1" Ice	0.80	0.59	25.16
			3.00			No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
(2) Gen. TMA	B	From Leg	0.00	0.0000	168.00	1" Ice	0.80	0.59	25.16
			3.00			No Ice	0.58	0.40	13.20
			0.00			1/2" Ice	0.69	0.49	18.38
DC6-48-60-18-8F	A	From Leg	0.00	0.0000	168.00	1" Ice	0.80	0.59	25.16
			3.00			No Ice	0.79	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
DC6-48-60-18-8F	B	From Leg	0.00	0.0000	168.00	1" Ice	1.45	1.45	52.57
			3.00			No Ice	0.79	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
*****			0.00			1" Ice	1.45	1.45	52.57
PiROD 15' Platform w/handrail & reinf. (VERIZON - existing)	A	None		0.0000	153.00	No Ice	35.80	35.80	2150.00
						1/2" Ice	46.60	46.60	2900.00
(2) NHH-65B-R2B w/ Mount Pipe	A	From Face	3.00	0.0000	153.00	1" Ice	57.40	57.40	3650.00
			0.00			No Ice	8.32	7.00	69.25
			0.00			1/2" Ice	8.88	8.19	137.80
(2) NHH-65B-R2B w/ Mount Pipe	B	From Face	0.00	0.0000	153.00	1" Ice	9.40	9.08	214.31
			3.00			No Ice	8.32	7.00	69.25
			0.00			1/2" Ice	8.88	8.19	137.80
(2) NHH-65B-R2B w/ Mount Pipe	C	From Face	0.00	0.0000	153.00	1" Ice	9.40	9.08	214.31
			3.00			No Ice	8.32	7.00	69.25
			0.00			1/2" Ice	8.88	8.19	137.80
B5/B13 RRH-BR04C	A	From Face	0.00	0.0000	153.00	1" Ice	9.40	9.08	214.31
			3.00			No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
B5/B13 RRH-BR04C	B	From Face	0.00	0.0000	153.00	1" Ice	2.22	1.28	117.53
			3.00			No Ice	1.88	1.01	82.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B5/B13 RRH-BR04C	C	From Face	3.00	0.0000	153.00	No Ice	1.88	1.01	82.00
			0.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B2/B66A RRH-BR049	A	From Face	3.00	0.0000	153.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH-BR049	B	From Face	3.00	0.0000	153.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH-BR049	C	From Face	3.00	0.0000	153.00	No Ice	1.88	1.25	97.50
			0.00			1/2" Ice	2.05	1.39	115.84
			0.00			1" Ice	2.22	1.54	136.97
DB-C1-12C-24AB-0Z	B	From Face	3.00	0.0000	153.00	No Ice	4.06	3.10	32.00
			0.00			1/2" Ice	4.32	3.34	68.49
			0.00			1" Ice	4.58	3.58	108.97

LNx-6513DS-A1M w/ Mount Pipe	A	From Face	3.00	0.0000	153.00	No Ice	6.19	5.26	53.00
			0.00			1/2" Ice	6.67	6.12	107.73
(VERIZON - proposed)			0.00			1" Ice	7.13	6.84	169.10
LNx-6513DS-A1M w/ Mount Pipe	B	From Face	3.00	0.0000	153.00	No Ice	6.19	5.26	53.00
			0.00			1/2" Ice	6.67	6.12	107.73
			0.00			1" Ice	7.13	6.84	169.10
LNx-6513DS-A1M w/ Mount Pipe	C	From Face	3.00	0.0000	153.00	No Ice	6.19	5.26	53.00
			0.00			1/2" Ice	6.67	6.12	107.73
			0.00			1" Ice	7.13	6.84	169.10
XXDWMM	A	From Face	3.00	0.0000	153.00	No Ice	4.80	2.40	20.00
			0.00			1/2" Ice	5.07	2.60	59.31
			0.00			1" Ice	5.35	2.81	102.70
XXDWMM	B	From Face	3.00	0.0000	153.00	No Ice	4.80	2.40	20.00
			0.00			1/2" Ice	5.07	2.60	59.31
			0.00			1" Ice	5.35	2.81	102.70
XXDWMM	C	From Face	3.00	0.0000	153.00	No Ice	4.80	2.40	20.00
			0.00			1/2" Ice	5.07	2.60	59.31
			0.00			1" Ice	5.35	2.81	102.70
CBRS RRH-RT4401	A	From Face	3.00	0.0000	153.00	No Ice	2.16	1.42	44.00
			0.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
CBRS RRH-RT4401	B	From Face	3.00	0.0000	153.00	No Ice	2.16	1.42	44.00
			0.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
CBRS RRH-RT4401	C	From Face	3.00	0.0000	153.00	No Ice	2.16	1.42	44.00
			0.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69

PiROD 15' Low Profile Platform	A	None		0.0000	145.00	No Ice	17.30	17.30	1500.00
						1/2" Ice	22.10	22.10	2030.00
						1" Ice	26.90	26.90	2560.00
(4) 2"x8' pipe	A	From Face	0.00	0.0000	145.00	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.37
			0.00			1" Ice	3.40	3.40	64.01
(4) 2"x8' pipe	B	From Face	0.00	0.0000	145.00	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.37
			0.00			1" Ice	3.40	3.40	64.01
(4) 2"x8' pipe	C	From Face	0.00	0.0000	145.00	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.37

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
*****			0.00		1" Ice	3.40	3.40	64.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service

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Comb. No.	Description
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	115747.74	0.00	0.00
	Max. H _x	21	47342.02	35457.57	-3.84
	Max. H _z	2	63122.69	-3.84	35436.02
	Max. M _x	2	4634410.15	-3.84	35436.02
	Max. M _z	8	4638019.14	-35457.57	3.84
	Max. Torsion	25	2114.30	17725.46	30686.58
	Min. Vert	13	47342.02	-17725.46	-30686.58
	Min. H _x	9	47342.02	-35457.57	3.84
	Min. H _z	14	63122.69	3.84	-35436.02
	Min. M _x	14	-4634511.61	3.84	-35436.02
	Min. M _z	20	-4637725.10	35457.57	-3.84
	Min. Torsion	13	-2114.90	-17725.46	-30686.58

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	52602.24	0.00	0.00	40.83	-112.18	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	63122.69	3.84	-35436.02	-4634410.15	-528.06	-1756.10
0.9 Dead+1.6 Wind 0 deg - No Ice	47342.02	3.84	-35436.02	-4593170.77	-484.59	-1765.01
1.2 Dead+1.6 Wind 30 deg - No Ice	63122.69	17732.10	-30690.41	-4013691.54	-2319411.61	-936.45
0.9 Dead+1.6 Wind 30 deg - No Ice	47342.02	17732.10	-30690.41	-3977978.59	-2298727.29	-942.82
1.2 Dead+1.6 Wind 60 deg - No Ice	63122.69	30709.07	-17721.33	-2317498.87	-4016848.93	134.29
0.9 Dead+1.6 Wind 60 deg - No Ice	47342.02	30709.07	-17721.33	-2296884.20	-3981055.29	132.16
1.2 Dead+1.6 Wind 90 deg - No Ice	63122.69	35457.57	-3.84	-326.38	-4638019.14	1169.28
0.9 Dead+1.6 Wind 90 deg - No Ice	47342.02	35457.57	-3.84	-336.24	-4596692.01	1171.98
1.2 Dead+1.6 Wind 120 deg - No Ice	63122.69	30705.23	17714.69	2316948.75	-4016484.16	1891.00
0.9 Dead+1.6 Wind 120 deg - No Ice	47342.02	30705.23	17714.69	2296313.06	-3980690.48	1897.79
1.2 Dead+1.6 Wind 150 deg - No Ice	63122.69	17725.46	30686.58	4013419.29	-2318775.52	2105.85
0.9 Dead+1.6 Wind 150 deg - No Ice	47342.02	17725.46	30686.58	3977682.49	-2298092.24	2114.90
1.2 Dead+1.6 Wind 180 deg -	63122.69	-3.84	35436.02	4634511.61	213.06	1756.20

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Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
No Ice						
0.9 Dead+1.6 Wind 180 deg - No Ice	47342.02	-3.84	35436.02	4593246.03	253.59	1765.12
1.2 Dead+1.6 Wind 210 deg - No Ice	63122.69	-17732.10	30690.41	4013798.81	2319107.51	935.94
0.9 Dead+1.6 Wind 210 deg - No Ice	47342.02	-17732.10	30690.41	3978058.10	2298504.28	942.33
1.2 Dead+1.6 Wind 240 deg - No Ice	63122.69	-30709.07	17721.33	2317599.59	4016555.31	-134.92
0.9 Dead+1.6 Wind 240 deg - No Ice	47342.02	-30709.07	17721.33	2296958.92	3980839.95	-132.80
1.2 Dead+1.6 Wind 270 deg - No Ice	63122.69	-35457.57	3.84	414.74	4637725.10	-1169.39
0.9 Dead+1.6 Wind 270 deg - No Ice	47342.02	-35457.57	3.84	401.93	4596476.37	-1172.09
1.2 Dead+1.6 Wind 300 deg - No Ice	63122.69	-30705.23	-17714.69	-2316866.20	4016179.21	-1890.49
0.9 Dead+1.6 Wind 300 deg - No Ice	47342.02	-30705.23	-17714.69	-2296251.65	3980466.85	-1897.26
1.2 Dead+1.6 Wind 330 deg - No Ice	63122.69	-17725.46	-30686.58	-4013330.19	2318460.10	-2105.23
0.9 Dead+1.6 Wind 330 deg - No Ice	47342.02	-17725.46	-30686.58	-3977616.28	2297860.93	-2114.30
1.2 Dead+1.0 Ice+1.0 Temp	115747.74	0.00	0.00	1705.03	2140.24	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	115747.74	0.14	-11379.08	-1519905.29	2494.51	-1166.46
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	115747.74	5691.64	-9854.65	-1315990.55	-758786.76	-640.06
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	115747.74	9858.07	-5689.66	-758927.08	-1316092.30	57.83
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	115747.74	11383.04	-0.14	2021.52	-1520094.55	740.21
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	115747.74	9857.93	5689.42	762962.02	-1316131.32	1224.24
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	115747.74	5691.40	9854.51	1320002.22	-758852.33	1380.20
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	115747.74	-0.14	11379.09	1523882.41	2422.04	1166.30
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	115747.74	-5691.64	9854.65	1319970.69	763708.82	639.85
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	115747.74	-9858.07	5689.66	762903.96	1321019.73	-58.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	115747.74	-11383.04	0.14	1949.06	1525021.84	-740.41
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	115747.74	-9857.93	-5689.42	-758994.47	1321053.10	-1224.39
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	115747.74	-5691.40	-9854.51	-1316031.39	763768.73	-1380.34
Dead+Wind 0 deg - Service	52602.24	0.82	-7581.93	-986438.24	-200.26	-379.04
Dead+Wind 30 deg - Service	52602.24	3793.98	-6566.55	-854314.31	-493793.39	-202.28
Dead+Wind 60 deg - Service	52602.24	6570.54	-3791.67	-493266.40	-855107.37	28.68
Dead+Wind 90 deg - Service	52602.24	7586.54	-0.82	-36.95	-987328.60	251.97
Dead+Wind 120 deg - Service	52602.24	6569.72	3790.25	493213.82	-855028.53	407.75
Dead+Wind 150 deg - Service	52602.24	3792.56	6565.73	854319.84	-493656.67	454.26
Dead+Wind 180 deg - Service	52602.24	-0.82	7581.93	986522.95	-42.15	379.04
Dead+Wind 210 deg - Service	52602.24	-3793.98	6566.55	854399.24	493551.39	202.26
Dead+Wind 240 deg - Service	52602.24	-6570.54	3791.67	493351.09	854865.76	-28.71
Dead+Wind 270 deg - Service	52602.24	-7586.54	0.82	121.16	987086.98	-251.98
Dead+Wind 300 deg - Service	52602.24	-6569.72	-3790.25	-493129.82	854786.50	-407.72
Dead+Wind 330 deg - Service	52602.24	-3792.56	-6565.73	-854235.60	493414.25	-454.23

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Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-52602.24	0.00	0.00	52602.24	0.00	0.000%
2	3.84	-63122.69	-35436.02	-3.84	63122.69	35436.02	0.000%
3	3.84	-47342.02	-35436.02	-3.84	47342.02	35436.02	0.000%
4	17732.10	-63122.69	-30690.41	-17732.10	63122.69	30690.41	0.000%
5	17732.10	-47342.02	-30690.41	-17732.10	47342.02	30690.41	0.000%
6	30709.07	-63122.69	-17721.33	-30709.07	63122.69	17721.33	0.000%
7	30709.07	-47342.02	-17721.33	-30709.07	47342.02	17721.33	0.000%
8	35457.56	-63122.69	-3.84	-35457.56	63122.69	3.84	0.000%
9	35457.56	-47342.02	-3.84	-35457.56	47342.02	3.84	0.000%
10	30705.23	-63122.69	17714.69	-30705.23	63122.69	-17714.69	0.000%
11	30705.23	-47342.02	17714.69	-30705.23	47342.02	-17714.69	0.000%
12	17725.46	-63122.69	30686.58	-17725.46	63122.69	-30686.58	0.000%
13	17725.46	-47342.02	30686.58	-17725.46	47342.02	-30686.58	0.000%
14	-3.84	-63122.69	35436.02	3.84	63122.69	-35436.02	0.000%
15	-3.84	-47342.02	35436.02	3.84	47342.02	-35436.02	0.000%
16	-17732.10	-63122.69	30690.41	17732.10	63122.69	-30690.41	0.000%
17	-17732.10	-47342.02	30690.41	17732.10	47342.02	-30690.41	0.000%
18	-30709.07	-63122.69	17721.33	30709.07	63122.69	-17721.33	0.000%
19	-30709.07	-47342.02	17721.33	30709.07	47342.02	-17721.33	0.000%
20	-35457.56	-63122.69	3.84	35457.56	63122.69	-3.84	0.000%
21	-35457.56	-47342.02	3.84	35457.56	47342.02	-3.84	0.000%
22	-30705.23	-63122.69	-17714.69	30705.23	63122.69	17714.69	0.000%
23	-30705.23	-47342.02	-17714.69	30705.23	47342.02	17714.69	0.000%
24	-17725.46	-63122.69	-30686.58	17725.46	63122.69	-30686.58	0.000%
25	-17725.46	-47342.02	-30686.58	17725.46	47342.02	-30686.58	0.000%
26	0.00	-115747.74	0.00	0.00	115747.74	0.00	0.000%
27	0.14	-115747.74	-11379.04	-0.14	115747.74	11379.08	0.000%
28	5691.62	-115747.74	-9854.61	-5691.64	115747.74	9854.65	0.000%
29	9858.03	-115747.74	-5689.64	-9858.07	115747.74	5689.66	0.000%
30	11382.99	-115747.74	-0.14	-11383.04	115747.74	0.14	0.000%
31	9857.89	-115747.74	5689.40	-9857.93	115747.74	-5689.42	0.000%
32	5691.38	-115747.74	9854.47	-5691.40	115747.74	-9854.51	0.000%
33	-0.14	-115747.74	11379.04	0.14	115747.74	-11379.09	0.000%
34	-5691.62	-115747.74	9854.61	5691.64	115747.74	-9854.65	0.000%
35	-9858.03	-115747.74	5689.64	9858.07	115747.74	-5689.66	0.000%
36	-11382.99	-115747.74	0.14	11383.04	115747.74	-0.14	0.000%
37	-9857.89	-115747.74	-5689.40	9857.93	115747.74	5689.42	0.000%
38	-5691.38	-115747.74	-9854.47	5691.40	115747.74	9854.51	0.000%
39	0.82	-52602.24	-7581.92	-0.82	52602.24	7581.93	0.000%
40	3793.98	-52602.24	-6566.55	-3793.98	52602.24	6566.55	0.000%
41	6570.54	-52602.24	-3791.67	-6570.54	52602.24	3791.67	0.000%
42	7586.53	-52602.24	-0.82	-7586.54	52602.24	0.82	0.000%
43	6569.72	-52602.24	3790.25	-6569.72	52602.24	-3790.25	0.000%
44	3792.55	-52602.24	6565.73	-3792.56	52602.24	-6565.73	0.000%
45	-0.82	-52602.24	7581.92	0.82	52602.24	-7581.93	0.000%
46	-3793.98	-52602.24	6566.55	3793.98	52602.24	-6566.55	0.000%
47	-6570.54	-52602.24	3791.67	6570.54	52602.24	-3791.67	0.000%
48	-7586.53	-52602.24	0.82	7586.54	52602.24	-0.82	0.000%
49	-6569.72	-52602.24	-3790.25	6569.72	52602.24	3790.25	0.000%
50	-3792.55	-52602.24	-6565.73	3792.56	52602.24	6565.73	0.000%

Maximum Tower Deflections - Service Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 160	18.3933	42	0.9466	0.0008
L2	160 - 140	15.4474	42	0.9198	0.0010
L3	140 - 120	11.7359	42	0.8350	0.0011
L4	120 - 100	8.4672	42	0.7116	0.0009
L5	100 - 80	5.7482	42	0.5766	0.0006
L6	80 - 60	3.5946	42	0.4445	0.0004
L7	60 - 40	1.9809	42	0.3207	0.0003
L8	40 - 20	0.8683	42	0.2065	0.0001
L9	20 - 0	0.2174	42	0.1010	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.00	PiROD 15' Low Profile Platform	42	18.3933	0.9466	0.0008	60397
168.00	PiROD 15' Low Profile Platform	42	17.0104	0.9366	0.0009	43141
153.00	PiROD 15' Platform w/handrail & reinf.	42	14.1097	0.8966	0.0010	15139
145.00	PiROD 15' Low Profile Platform	42	12.6291	0.8611	0.0011	11796

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	175 - 160 (1)	P24x3/8	15.00	0.00	0.0	27.8325	-7675.54	1052070.00	0.007
L2	160 - 140 (2)	P30x3/8	20.00	0.00	0.0	34.9011	-16769.00	1311060.00	0.013
L3	140 - 120 (3)	P36x3/8	20.00	0.00	0.0	41.9697	-20820.80	1490100.00	0.014
L4	120 - 100 (4)	P42x3/8	20.00	0.00	0.0	49.0383	-25721.10	1668870.00	0.015
L5	100 - 80 (5)	P48x3/8	20.00	0.00	0.0	56.1069	-31226.80	1847490.00	0.017
L6	80 - 60 (6)	P54x3/8	20.00	0.00	0.0	63.1755	-37326.90	2026000.00	0.018
L7	60 - 40 (7)	P60x3/8	20.00	0.00	0.0	70.2440	-44016.90	2204430.00	0.020
L8	40 - 20 (8)	P60x1/2	20.00	0.00	0.0	93.4624	-52615.10	3125690.00	0.017
L9	20 - 0 (9)	P60x5/8	20.00	0.00	0.0	116.583	-63114.80	4139150.00	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} lb-ft	φM _{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} lb-ft	φM _{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	175 - 160 (1)	P24x3/8	125715.00	623716.67	0.202	0.00	623716.67	0.000
L2	160 - 140 (2)	P30x3/8	452373.33	947858.33	0.477	0.00	947858.33	0.000

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Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L3	140 - 120 (3)	P36x3/8	921916.67	1338808.33	0.689	0.00	1338808.33	0.000
L4	120 - 100 (4)	P42x3/8	1456583.33	1796558.33	0.811	0.00	1796558.33	0.000
L5	100 - 80 (5)	P48x3/8	2025950.00	2321108.33	0.873	0.00	2321108.33	0.000
L6	80 - 60 (6)	P54x3/8	2630700.00	2912458.33	0.903	0.00	2912458.33	0.000
L7	60 - 40 (7)	P60x3/8	3270350.00	3570608.33	0.916	0.00	3570608.33	0.000
L8	40 - 20 (8)	P60x1/2	3940991.67	4860408.33	0.811	0.00	4860408.33	0.000
L9	20 - 0 (9)	P60x5/8	4638016.67	6198183.33	0.748	0.00	6198183.33	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	175 - 160 (1)	P24x3/8	10713.40	526035.00	0.020	267.43	1019708.33	0.000
L2	160 - 140 (2)	P30x3/8	21086.00	655528.00	0.032	63.32	1598366.67	0.000
L3	140 - 120 (3)	P36x3/8	25869.50	745048.00	0.035	1173.08	2189066.67	0.001
L4	120 - 100 (4)	P42x3/8	27576.70	834437.00	0.033	1171.97	2868841.67	0.000
L5	100 - 80 (5)	P48x3/8	29342.10	923745.00	0.032	1170.98	3637700.00	0.000
L6	80 - 60 (6)	P54x3/8	31118.20	1013000.00	0.031	1170.22	4495625.00	0.000
L7	60 - 40 (7)	P60x3/8	32835.00	1102210.00	0.030	1169.69	5442616.67	0.000
L8	40 - 20 (8)	P60x1/2	34215.80	1562840.00	0.022	1169.38	7685066.67	0.000
L9	20 - 0 (9)	P60x5/8	35471.70	2069580.00	0.017	1169.28	10134583.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 160 (1)	0.007	0.202	0.000	0.020	0.000	0.209	1.000	4.8.2 ✓
L2	160 - 140 (2)	0.013	0.477	0.000	0.032	0.000	0.491	1.000	4.8.2 ✓
L3	140 - 120 (3)	0.014	0.689	0.000	0.035	0.001	0.704	1.000	4.8.2 ✓
L4	120 - 100 (4)	0.015	0.811	0.000	0.033	0.000	0.827	1.000	4.8.2 ✓
L5	100 - 80 (5)	0.017	0.873	0.000	0.032	0.000	0.891	1.000	4.8.2 ✓
L6	80 - 60 (6)	0.018	0.903	0.000	0.031	0.000	0.923	1.000	4.8.2 ✓
L7	60 - 40 (7)	0.020	0.916	0.000	0.030	0.000	0.937	1.000	4.8.2 ✓
L8	40 - 20 (8)	0.017	0.811	0.000	0.022	0.000	0.828	1.000	4.8.2 ✓
L9	20 - 0 (9)	0.015	0.748	0.000	0.017	0.000	0.764	1.000	4.8.2 ✓

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Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	175 - 160	Pole	P24x3/8	1	-7675.54	1052070.00	20.9	Pass
L2	160 - 140	Pole	P30x3/8	2	-16769.00	1311060.00	49.1	Pass
L3	140 - 120	Pole	P36x3/8	3	-20820.80	1490100.00	70.4	Pass
L4	120 - 100	Pole	P42x3/8	4	-25721.10	1668870.00	82.7	Pass
L5	100 - 80	Pole	P48x3/8	5	-31226.80	1847490.00	89.1	Pass
L6	80 - 60	Pole	P54x3/8	6	-37326.90	2026000.00	92.3	Pass
L7	60 - 40	Pole	P60x3/8	7	-44016.90	2204430.00	93.7	Pass
L8	40 - 20	Pole	P60x1/2	8	-52615.10	3125690.00	82.8	Pass
L9	20 - 0	Pole	P60x5/8	9	-63114.80	4139150.00	76.4	Pass
							Summary	
							Pole (L7)	93.7 Pass
							RATING =	93.7 Pass



HUDSON
Design Group LLC

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev G

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#:	0
Site Name:	VERNON 2 CT
App #:	0
Pole Manufacturer:	Other

Anchor Rod Data

Qty:	52	
Diam:	1.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	67	in

Plate Data

Diam:	73	in
Thick:	1.5	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Stiffener Data (Welding at both sides)

Config:	1	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6.5	in
Thick:	0.375	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data

Diam:	60	in
Thick:	0.625	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu:	4638	ft-kips
Axial, Pu:	63	kips
Shear, Vu:	35	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results

Max Rod ($C_u + V_u/\eta$): 66.5 Kips
 Allowable Axial, $\Phi \cdot F_u \cdot A_{net}$: 77.5 Kips
 Anchor Rod Stress Ratio: 85.8% **Pass**

Stiffened

AISC LRFD

$\phi \cdot T_n$

Base Plate Results

Base Plate Stress: 7.2 ksi
 Allowable Plate Stress: 19.4 ksi
 Base Plate Stress Ratio: 37.2% **Pass**

Shear Check Only

Stiffened

AISC LRFD

$\phi \cdot F_y$

Y.L. Length:

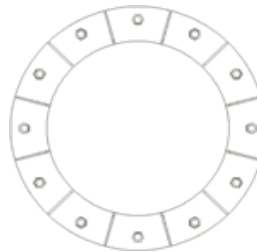
N/A, Roark

Stiffener Results

Horizontal Weld : 68.6% **Pass**
 Vertical Weld: 33.1% **Pass**
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: 48.4% **Pass**
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: 96.8% **Pass**
 Plate Comp. (AISC Bracket): 98.0% **Pass**

Pole Results

Pole Punching Shear Check: 9.7% **Pass**



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Monopole Pier and Pad Foundation

BU # :

Site Name: VERNON 2 CT

App. Number:

TIA-222 Revision: G

Design Reactions		
Shear, S:	35.5	kips
Moment, M:	4638	ft-kips
Tower Height, H:	175	ft
Tower Weight, Wt:	63.1	kips
Base Diameter, BD:	5.00	ft

Foundation Dimensions		
Depth, D:	10	ft
Pad Width, W:	20	ft
Neglected Depth, N:	0	ft
Thickness, T:	3.00	ft
Pier Diameter, Pd:	7.00	ft
Ext. Above Grade, E:	0.50	ft
BP Dist. Above Pier:	3	in.
Clear Cover, Cc:	3.0	in

Soil Properties		
Soil Unit Weight, γ:	0.120	kcf
Ult. Bearing Capacity, Bc:	10.0	ksf
Angle of Friction, Φ:	34	deg
Cohesion, Co:	0.000	ksf
Passive Pressure, Pp:	0.000	ksf
Base Friction, μ:	0.30	

Material Properties		
Rebar Yield Strength, Fy:	60000	psi
Concrete Strength, F'c:	3000	psi
Concrete Unit Weight, δc:	0.150	kcf
Seismic Zone, z:		

Rebar Properties		
Pier Rebar Size, Sp:	9	
Pier Rebar Quantity, mp:	34	28
Pad Rebar Size, Spad:	8	
Pad Rebar Quantity, mpad:	23	14
Pier Tie Size, St:	4	3
Tie Quantity, mt:	12	7

Design Checks			
	Capacity/ Availability	Demand/ Limits	Check
<i>Req'd Pier Diam.(ft)</i>	7	7	OK
<i>Overturning (ft-kips)</i>	5084.02	4638.00	91.2%
<i>Shear Capacity (kips)</i>	174.08	35.50	20.4%
<i>Bearing (ksf)</i>	7.50	7.10	94.7%
<i>Pad Shear - 1-way (kips)</i>	640.84	455.50	71.1%
<i>Pad Shear - 2-way (kips)</i>	1954.52	123.71	6.3%
<i>Pad Moment Capacity (k-ft)</i>	2584.54	1707.98	66.1%
<i>Pier Moment Capacity (k-ft)</i>	9815.92	4904.25	50.0%



November 15, 2019
June 22, 2020 (Rev. 1)



20 Alexander Drive
Wallingford, CT 06492

RE: Site Name: VERNON 2 CT (CAOLE)
 Site Address: 60 Industrial Park Road
 Vernon, CT 06066

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Verizon to perform a mount analysis on the existing Verizon antenna mount to determine their capability of supporting the following equipment loading:

- (6) NHH-65B-R2B Antennas (72.0"x11.9"x7.1" – Wt. = 44 lbs. /each)
- (3) B2/B66A RRH-BR049 RRH's (15.0"x15.0"x10.0" – Wt. = 98 lbs. /each)
- (3) B5/B13 RRH-BR04C RRH's (15.0"x15.0"x8.1" – Wt. = 82 lbs. /each)
- (1) Junction Box (28.9"x15.7"x10.3" – Wt. = 32 lbs.)
- **(3) LNX-6513DS-A1M Antennas (54.7"x11.9"x7.1" – Wt. = 31 lbs. /each)**
- **(3) XXDWM-12.5 Antennas w/ CBR5 RRH Clip on (16.2"x11.4"x5.5" – Wt. = 24 lbs. /each)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mount. HDG's subconsultant, ProVertic LLC, conducted a survey climb of the existing Verizon antenna mount on November 4, 2019.

Based on our analysis, we have determined that the existing antenna mount **IS CAPABLE** of supporting the proposed installation with the following modifications:

- **Install new platform reinforcement kit, SitePro1 P/N PRK-1245L (or approved equal).**
- **Install a new handrail kit, SitePro1 P/N HRK14-3HD (or approved equal).**
- **Reinforce existing angles with new L1-1/2x2-1/2x1/4 steel angles (typ. of 2 per sector, total of 6).**

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	54	LC3	474%	FAIL
Modified Mount Rating	12	LC1	85%	PASS

This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the International Building Code 2015. (See the attached analysis).

This determination was based on the following limitations and assumptions:

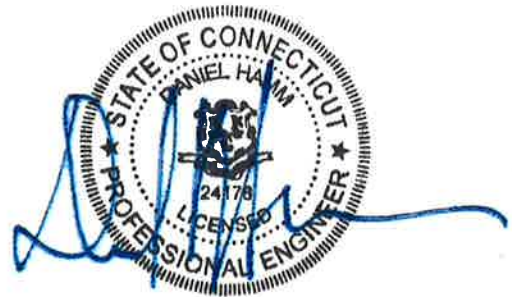
1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to Verizon's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC

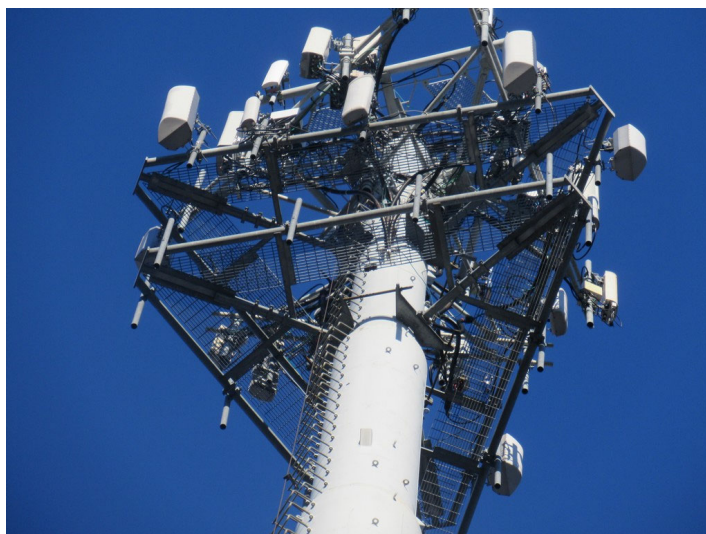


Michael Cabral
Vice President



Daniel P. Hamm, PE
Principal

FIELD PHOTOS:





HUDSON
Design Group LLC

Wind & Ice Calculations

Date: 6/19/2020
 Project Name: VERNON 2 CT
 Designed By: LBW Checked By: MSC



HUDSON
 Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$$K_z = 2.01 (z/z_g)^{2/\alpha}$$

K_z= 1.116

z= 153 (ft)

z_g= 1200 (ft)

α= 7.0

$$K_{zmin} \leq K_z \leq 2.01$$

Table 2-4

Exposure	Z _g	α	K _{zmin}	K _e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K _t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$$K_{zt} = [1 + (K_e K_t / K_h)]^2$$

$$K_h = e^{(f * z / H)}$$

K_{zt}= #DIV/0!

K_h= #DIV/0!

K_e= 0.9 (from Table 2-4)

K_t= 0 (from Table 2-5)

f= 0 (from Table 2-5)

z= 153

H= 0 (Ht. of the crest above surrounding terrain)

K_{zt}= 1.00

K_{iz}= 1.17 (from Sec. 2.6.8)

(If Category 1 then K_{zt}=1.0)

Category= 1

2.6.8 Design Ice Thickness

Max Ice Thickness =

t_i= 1.00 in

Importance Factor, I_{ice} =

I_{ice}= 1.00 (from Table 2-3)

$$t_{iz} = 2.0 * t_i * I_{ice} * K_{iz} * (K_{zt})^{0.35}$$

t_{iz}= 2.33 in

2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0]

h= ht. of structure

h= 175

Gh= 0.85

2.6.7.2 Guyed Masts

Gh= 0.85

2.6.7.3 Pole Structures

Gh= 1.1

2.6.9 Appurtenances

Gh= 1.0

2.6.7.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh= 1.35

Gh= 1.00

2.6.9.2 Design Wind Force on Appurtenances

$$F = q_z * Gh * (EPA)_A$$

$$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$$

$q_z = 29.92$

$q_{z(ice)} = 6.78$

$K_z = 1.116$

$K_{zt} = 1.0$

$K_d = 0.95$ (from Table 2-2)

$V_{max} = 105$

$V_{max(ice)} = 50$

$I = 1.0$ (from Table 2-3)

$I_{wice} = 1.0$ (from Table 2-3)

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
 (Aspect ratio is independent of the spacing between support points of a linear appurtenance, and the section length considered to have uniform wind load).

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 2.33 in

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ice)
NHH-65B-R2B Antenna	72.0	11.9	7.1	5.95	6.05	1.36	242	81
LNH-6513DS-A1M Antenna	54.7	11.9	7.1	4.52	4.60	1.29	175	60
XXDWM-12.5 Antennas w/ CBRS RRH Clip On	16.2	11.4	5.5	1.28	1.42	1.20	46	19
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.00	1.20	56	22
B2/B66A RRH-BR049 RRH (Shielded)	15.0	3.1	10.0	0.32	4.84	1.30	13	9
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	1.00	1.20	56	22
Junction Box	28.9	15.7	10.3	3.15	1.84	1.20	113	39
2" Pipe	2.4	12.0		0.20	0.20	1.20	7	7
3" Pipe	3.5	12.0		0.29	0.29	1.20	10	8
1-1/2x2-1/2 Angle	1.5	12.0		0.13	0.13	2.00	7	10
3x3 HSS	3.0	12.0		0.25	0.25	1.25	9	8
6x3/8 Plate	6.0	12.0		0.50	0.50	2.00	30	17

WIND LOADS

Angle = **60** (deg)

Ice Thickness = **2.33** in.

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area	Flat Area	Ratio	Ratio	Ca	Ca	Force (lbs)	Force (lbs)	Force (lbs)
NHH-65B-R2B Antenna	72.0	11.9	7.1	5.95	3.55	6.05	10.14	1.36	1.50	242	160	180
LNx-6513DS-A1M Antenna	54.7	11.9	7.1	4.52	2.70	4.60	7.70	1.29	1.42	175	115	130
XXDWM-12.5 Antennas w/ CBRS RRH C	16.2	11.4	5.5	1.28	0.62	1.42	2.95	1.20	1.22	46	23	28
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	56	37	42
B2/B66A RRH-BR049 RRH (Shielded)	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	37	35
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	56	30	37
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	113	75	85

WIND LOADS WITH ICE:

NHH-65B-R2B Antenna	76.7	16.6	11.8	8.82	6.26	4.63	6.52	1.29	1.38	77	59	63
LNx-6513DS-A1M Antenna	59.4	16.6	11.8	6.83	4.85	3.58	5.05	1.25	1.31	58	43	47
XXDWM-12.5 Antennas w/ CBRS RRH C	20.9	16.1	10.2	2.33	1.47	1.30	2.05	1.20	1.20	19	12	14
B2/B66A RRH-BR049 RRH	19.7	19.7	14.7	2.68	2.00	1.00	1.34	1.20	1.20	22	16	18
B2/B66A RRH-BR049 RRH (Shielded)	19.7	9.8	14.7	1.34	2.00	2.00	1.34	1.20	1.20	11	16	15
B5/B13 RRH-BR04C RRH	19.7	19.7	12.8	2.68	1.74	1.00	1.54	1.20	1.20	22	14	16
Junction Box	33.6	20.4	15.0	4.75	3.49	1.65	2.24	1.20	1.20	39	28	31

Date: 6/19/2020

Project Name: VERNON 2 CT

Designed By: LBW Checked By: MSC



HUDSON
Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 2.33 in.

Density of ice: 56 pcf

NHH-65B-R2B Antenna

Weight of ice based on total radial SF area:

Height (in): 72.0

Width (in): 11.9

Depth (in): 7.1

Total weight of ice on object: 276 lbs

Weight of object: 44.0 lbs

Combined weight of ice and object: 320 lbs

LNx-6513DS-A1M Antenna

Weight of ice based on total radial SF area:

Height (in): 54.7

Width (in): 11.9

Depth (in): 7.1

Total weight of ice on object: 210 lbs

Weight of object: 31.0 lbs

Combined weight of ice and object: 241 lbs

XXDWM-12.5 Antennas w/ CBRS RRH Clip On

Weight of ice based on total radial SF area:

Height (in): 16.2

Width (in): 11.4

Depth (in): 5.5

Total weight of ice on object: 58 lbs

Weight of object: 24.0 lbs

Combined weight of ice and object: 82 lbs

B2/B66A RRH-BR049 RRH

Weight of ice based on total radial SF area:

Height (in): 15.0

Width (in): 15.0

Depth (in): 10.0

Total weight of ice on object: 72 lbs

Weight of object: 98.0 lbs

Combined weight of ice and object: 170 lbs

B5/B13 RRH-BR04C RRH

Weight of ice based on total radial SF area:

Height (in): 15.0

Width (in): 15.0

Depth (in): 8.1

Total weight of ice on object: 69 lbs

Weight of object: 82.0 lbs

Combined weight of ice and object: 151 lbs

Junction Box

Weight of ice based on total radial SF area:

Height (in): 28.9

Width (in): 15.7

Depth (in): 10.3

Total weight of ice on object: 145 lbs

Weight of object: 32.0 lbs

Combined weight of ice and object: 177 lbs

2" pipe

Per foot weight of ice:

diameter (in): 2.38

Per foot weight of ice on object: 13 plf

3" Pipe

Per foot weight of ice:

diameter (in): 3.5

Per foot weight of ice on object: 17 plf

L 1-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:

Height (in): 1.5

Width (in): 2.5

Per foot weight of ice on object: 15 plf

HSS 3x3

Weight of ice based on total radial SF area:

Height (in): 3

Width (in): 3

Per foot weight of ice on object: 19 plf

PL 6x3/8

Weight of ice based on total radial SF area:

Height (in): 6

Width (in): 0.375

Per foot weight of ice on object: 24 plf

L 2-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:

Height (in): 2.5

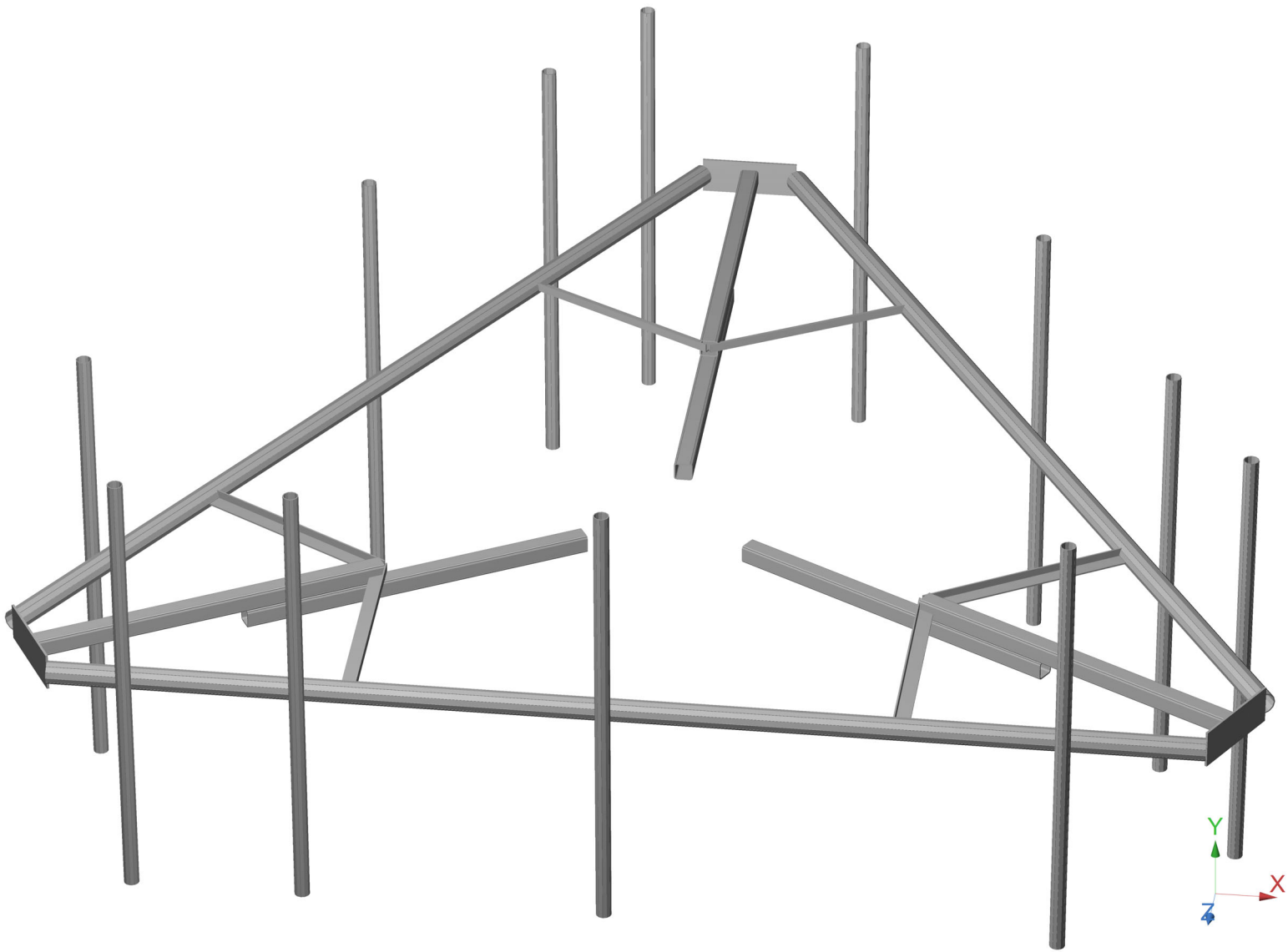
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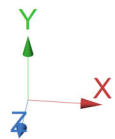
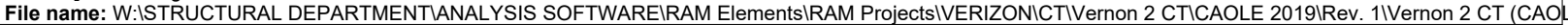
Per foot weight of ice on object: 17 plf

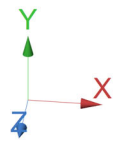
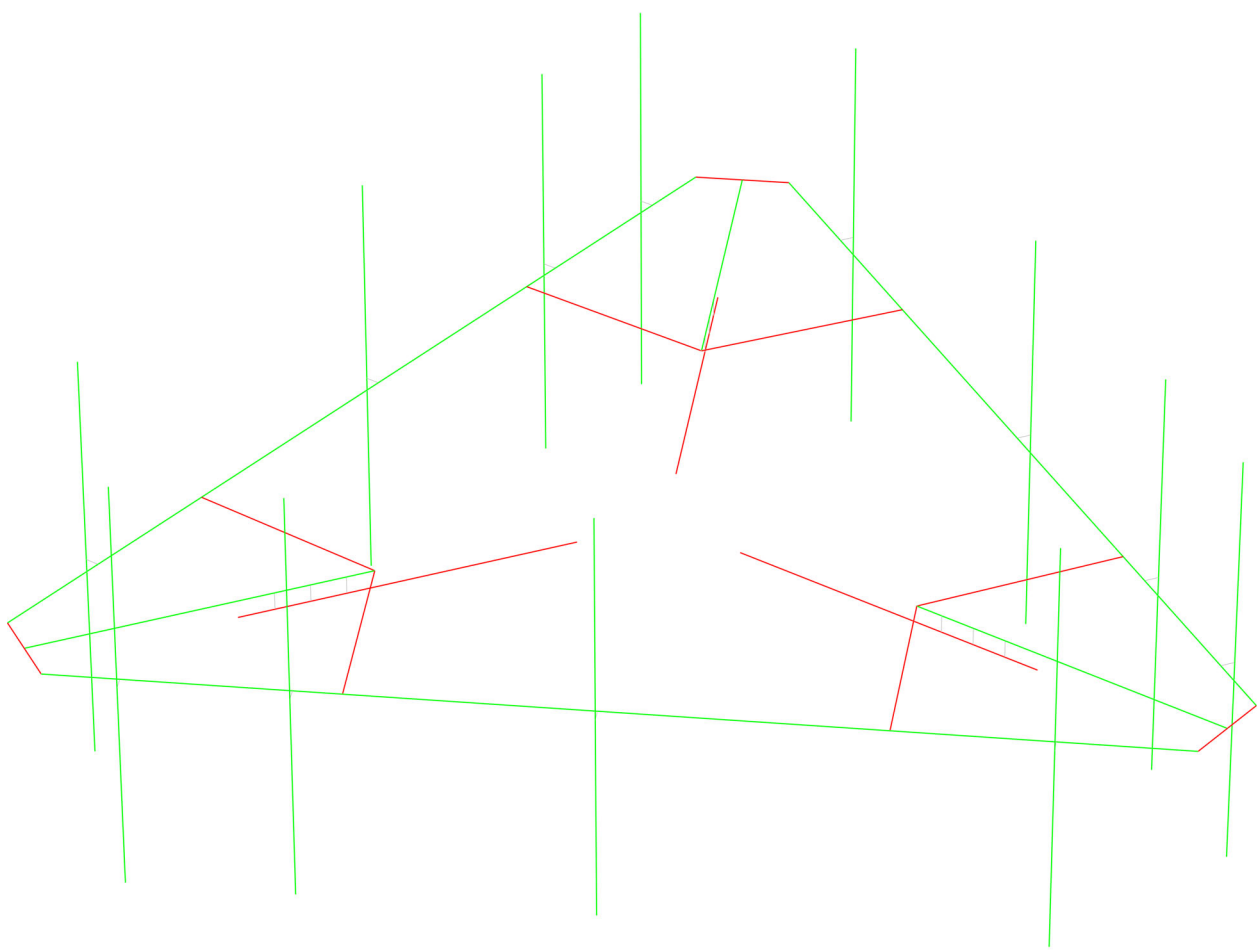


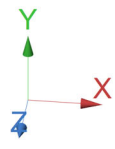
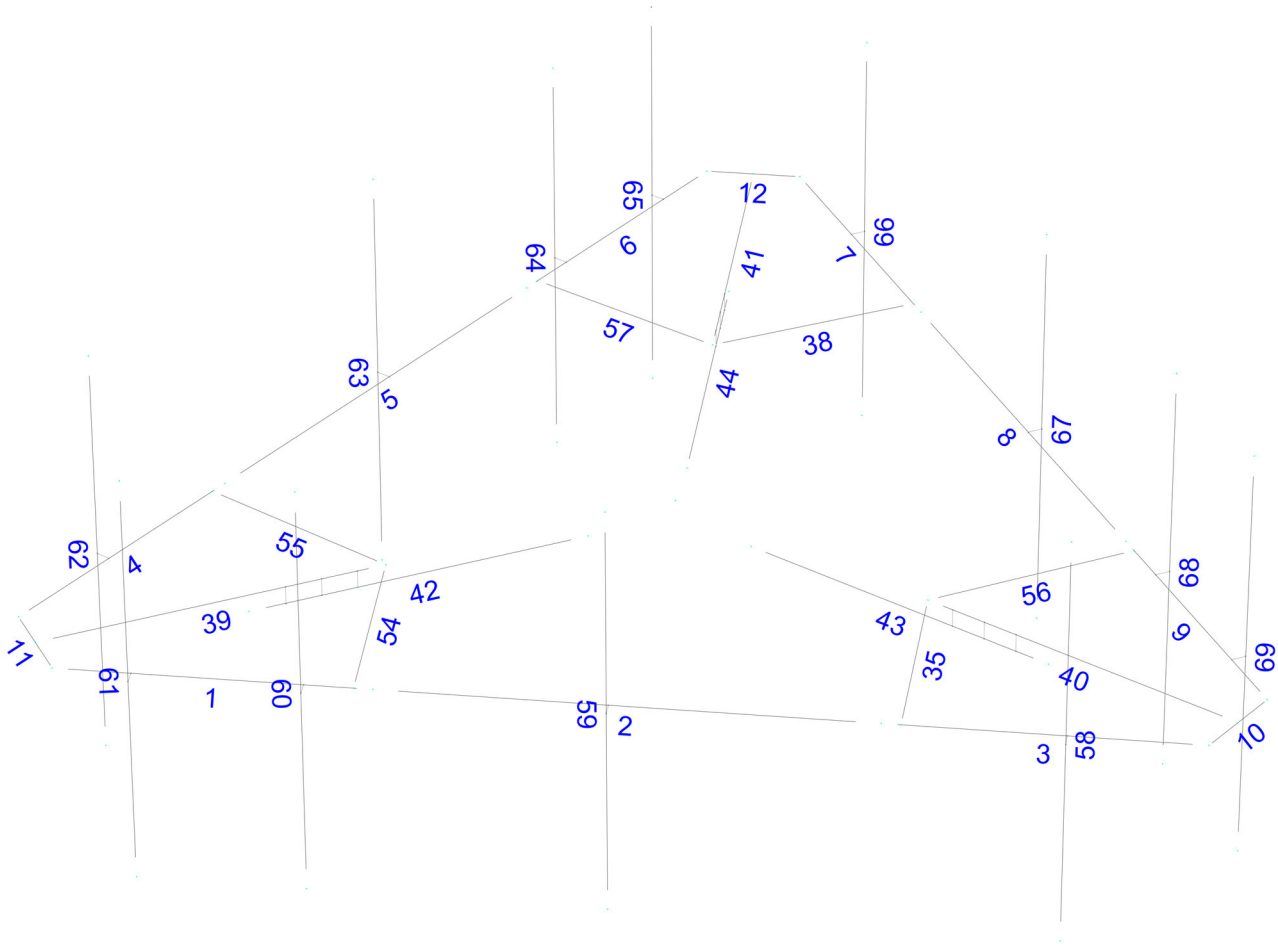
HUDSON
Design Group LLC

**Mount Calculations
(Existing Conditions)**









Current Date: 6/19/2020 4:24 PM

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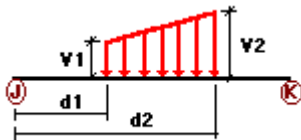
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

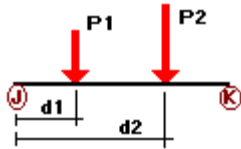
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	35	y	-0.01	0.00	0.00	No	0.00	No
	38	y	-0.01	0.00	0.00	No	0.00	No
	39	y	-0.01	0.00	0.00	No	0.00	No
	40	y	-0.01	0.00	0.00	No	0.00	No
	41	y	-0.01	0.00	0.00	No	0.00	No
	54	y	-0.01	0.00	0.00	No	0.00	No
	55	y	-0.01	0.00	0.00	No	0.00	No
	56	y	-0.01	0.00	0.00	No	0.00	No
	57	y	-0.01	0.00	0.00	No	0.00	No
Wo	1	z	-0.01	0.00	0.00	No	0.00	No
	2	z	-0.01	0.00	0.00	No	0.00	No
	3	z	-0.01	0.00	0.00	No	0.00	No
	4	z	-0.01	0.00	0.00	No	0.00	No
	5	z	-0.01	0.00	0.00	No	0.00	No
	6	z	-0.01	0.00	0.00	No	0.00	No
	7	z	-0.01	0.00	0.00	No	0.00	No
	8	z	-0.01	0.00	0.00	No	0.00	No
	9	z	-0.01	0.00	0.00	No	0.00	No
	10	z	-0.03	0.00	0.00	No	0.00	No
	11	z	-0.03	0.00	0.00	No	0.00	No
	12	z	-0.03	0.00	0.00	No	0.00	No
	35	z	-0.007	0.00	0.00	No	0.00	No
	38	z	-0.007	0.00	0.00	No	0.00	No
	39	z	-0.009	0.00	0.00	No	0.00	No

Di	40	z	-0.009	0.00	0.00	No	0.00	No
	41	z	-0.009	0.00	0.00	No	0.00	No
	42	z	-0.009	0.00	0.00	No	0.00	No
	43	z	-0.009	0.00	0.00	No	0.00	No
	44	z	-0.009	0.00	0.00	No	0.00	No
	54	z	-0.007	0.00	0.00	No	0.00	No
	55	z	-0.007	0.00	0.00	No	0.00	No
	56	z	-0.007	0.00	0.00	No	0.00	No
	57	z	-0.007	0.00	0.00	No	0.00	No
	62	z	-0.007	0.00	0.00	No	0.00	No
	63	z	-0.007	0.00	0.00	No	0.00	No
	64	z	-0.007	0.00	0.00	No	0.00	No
	65	z	-0.007	0.00	0.00	No	0.00	No
	66	z	-0.007	0.00	0.00	No	0.00	No
	67	z	-0.007	0.00	0.00	No	0.00	No
	68	z	-0.007	0.00	0.00	No	0.00	No
	69	z	-0.007	0.00	0.00	No	0.00	No
	1	y	-0.017	0.00	0.00	No	0.00	No
	2	y	-0.017	0.00	0.00	No	0.00	No
	3	y	-0.017	0.00	0.00	No	0.00	No
	4	y	-0.017	0.00	0.00	No	0.00	No
	5	y	-0.017	0.00	0.00	No	0.00	No
	6	y	-0.017	0.00	0.00	No	0.00	No
	7	y	-0.017	0.00	0.00	No	0.00	No
	8	y	-0.017	0.00	0.00	No	0.00	No
	9	y	-0.017	0.00	0.00	No	0.00	No
	10	y	-0.024	0.00	0.00	No	0.00	No
	11	y	-0.024	0.00	0.00	No	0.00	No
	12	y	-0.024	0.00	0.00	No	0.00	No
	35	y	-0.015	0.00	0.00	No	0.00	No
	38	y	-0.015	0.00	0.00	No	0.00	No
	39	y	-0.019	0.00	0.00	No	0.00	No
	40	y	-0.019	0.00	0.00	No	0.00	No
	41	y	-0.019	0.00	0.00	No	0.00	No
	42	y	-0.019	0.00	0.00	No	0.00	No
	43	y	-0.019	0.00	0.00	No	0.00	No
	44	y	-0.019	0.00	0.00	No	0.00	No
	54	y	-0.015	0.00	0.00	No	0.00	No
	55	y	-0.015	0.00	0.00	No	0.00	No
	56	y	-0.015	0.00	0.00	No	0.00	No
	57	y	-0.015	0.00	0.00	No	0.00	No
	58	y	-0.013	0.00	0.00	No	0.00	No
	59	y	-0.013	0.00	0.00	No	0.00	No
	60	y	-0.013	0.00	0.00	No	0.00	No
	61	y	-0.013	0.00	0.00	No	0.00	No
	62	y	-0.013	0.00	0.00	No	0.00	No
	63	y	-0.013	0.00	0.00	No	0.00	No
	64	y	-0.013	0.00	0.00	No	0.00	No
	65	y	-0.013	0.00	0.00	No	0.00	No
	66	y	-0.013	0.00	0.00	No	0.00	No
	67	y	-0.013	0.00	0.00	No	0.00	No
	68	y	-0.013	0.00	0.00	No	0.00	No
	69	y	-0.013	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	58	y	-0.012	2.50	No
		y	-0.012	3.50	No
	59	y	-0.044	0.50	No
		y	-0.044	5.50	No
	60	y	-0.098	2.00	No
		y	-0.032	1.50	No
	61	y	-0.082	4.00	No
		y	-0.016	1.50	No
	62	y	-0.016	5.00	No
		y	-0.012	2.50	No
	63	y	-0.012	3.50	No
		y	-0.044	0.50	No
	64	y	-0.044	5.50	No
		y	-0.098	2.00	No
	65	y	-0.082	1.50	No
		y	-0.016	1.50	No
	66	y	-0.016	5.00	No
		y	-0.012	2.50	No
	67	y	-0.012	3.50	No
		y	-0.044	0.50	No
	68	y	-0.044	5.50	No
		y	-0.098	2.00	No
Wo	58	z	-0.023	2.50	No
		z	-0.023	3.50	No
	59	z	-0.242	0.50	No
		z	-0.242	5.50	No
	60	z	-0.013	2.00	No
		z	-0.113	1.50	No
	61	z	-0.056	4.00	No
		z	-0.087	1.50	No
	62	z	-0.087	5.00	No
		z	-0.014	2.50	No
	63	z	-0.014	3.50	No
		z	-0.18	0.50	No
	64	z	-0.18	5.50	No
		z	-0.035	2.00	No
	65	z	-0.037	1.50	No
		z	-0.065	1.50	No
	66	z	-0.065	5.00	No
		z	-0.014	2.50	No
	67	z	-0.014	3.50	No
		z	-0.18	0.50	No
	68	z	-0.18	5.50	No
		z	-0.035	2.00	No
Wi	58	z	-0.037	1.50	No
		z	-0.065	1.50	No
	59	z	-0.065	5.00	No
		z	-0.01	2.50	No
	58	z	-0.01	3.50	No
		z	-0.081	0.50	No
Wi	59	z	-0.081	5.50	No
		z	-0.081	0.50	No

		z	-0.009	2.00	No
	60	z	-0.039	1.50	No
		z	-0.022	4.00	No
	61	z	-0.03	1.50	No
		z	-0.03	5.00	No
	62	z	-0.007	2.50	No
		z	-0.007	3.50	No
	63	z	-0.063	0.50	No
		z	-0.063	5.50	No
		z	-0.015	2.00	No
	64	z	-0.016	1.50	No
	65	z	-0.023	1.50	No
		z	-0.023	5.00	No
	66	z	-0.007	2.50	No
		z	-0.007	3.50	No
	67	z	-0.063	0.50	No
		z	-0.063	5.50	No
		z	-0.015	2.00	No
	68	z	-0.016	1.50	No
	69	z	-0.023	1.50	No
		z	-0.023	5.00	No
Di	58	y	-0.029	2.50	No
		y	-0.029	3.50	No
	59	y	-0.276	0.50	No
		y	-0.276	5.50	No
		y	-0.072	2.00	No
	60	y	-0.145	1.50	No
		y	-0.069	4.00	No
	61	y	-0.105	1.50	No
		y	-0.105	5.00	No
	62	y	-0.029	2.50	No
		y	-0.029	3.50	No
	63	y	-0.276	0.50	No
		y	-0.276	5.50	No
		y	-0.072	2.00	No
	64	y	-0.069	1.50	No
	65	y	-0.105	1.50	No
		y	-0.105	5.00	No
	66	y	-0.029	2.50	No
		y	-0.029	3.50	No
	67	y	-0.276	0.50	No
		y	-0.276	5.50	No
		y	-0.072	2.00	No
	68	y	-0.069	1.50	No
	69	y	-0.105	1.50	No
		y	-0.105	5.00	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Wi+Di
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>HSS_SQR 3X3X1_4</i>		39	LC3 at 0.00%	0.25	OK	Eq. H1-1b
		40	LC3 at 100.00%	0.24	OK	Eq. H1-1b
		41	LC3 at 100.00%	0.24	OK	Eq. H1-1b
		42	LC3 at 0.00%	1.78	N.G.	Eq. H1-1b
		43	LC3 at 100.00%	1.63	N.G.	Eq. H1-1b
		44	LC3 at 0.00%	1.58	N.G.	Eq. H1-1b
<i>LU 1-1/2x2-1/2x1/4</i>		35	LC3 at 100.00%	4.48	N.G.	Eq. H2-1
		38	LC3 at 100.00%	4.30	N.G.	Eq. H2-1
		54	LC3 at 0.00%	4.74	N.G.	Eq. H2-1
		55	LC3 at 100.00%	4.48	N.G.	Eq. H2-1
		56	LC3 at 0.00%	4.38	N.G.	Eq. H2-1
		57	LC3 at 0.00%	4.39	N.G.	Eq. H2-1
<i>PIPE 2x0.154</i>		58	LC1 at 50.00%	0.02	OK	Eq. H1-1b
		59	LC1 at 50.00%	0.78	OK	Eq. H1-1b
		60	LC1 at 46.88%	0.19	OK	Eq. H1-1b
		61	LC1 at 50.00%	0.22	OK	Eq. H1-1b
		62	LC1 at 50.00%	0.05	OK	Eq. H1-1b
		63	LC1 at 50.00%	0.62	OK	Eq. H1-1b
		64	LC1 at 46.88%	0.10	OK	Eq. H1-1b
		65	LC1 at 50.00%	0.21	OK	Eq. H1-1b
		66	LC1 at 50.00%	0.05	OK	Eq. H1-1b
		67	LC1 at 50.00%	0.62	OK	Eq. H1-1b
		68	LC1 at 46.88%	0.10	OK	Eq. H1-1b
		69	LC1 at 50.00%	0.21	OK	Eq. H1-1b
<i>PIPE 3x0.216</i>		1	LC3 at 0.00%	0.50	OK	Eq. H3-6
		2	LC3 at 100.00%	0.50	OK	Eq. H1-1b
		3	LC3 at 6.25%	0.63	OK	Eq. H3-6
		4	LC3 at 93.75%	0.66	OK	Eq. H3-6
		5	LC3 at 0.00%	0.51	OK	Eq. H1-1b
		6	LC3 at 6.25%	0.49	OK	Eq. H3-6
		7	LC3 at 93.75%	0.60	OK	Eq. H3-6
		8	LC3 at 0.00%	0.45	OK	Eq. H1-1b
		9	LC3 at 100.00%	0.48	OK	Eq. H3-6
<i>PL 6x3/8</i>		10	LC3 at 50.00%	1.66	N.G.	Eq. H1-1b
		11	LC3 at 50.00%	1.72	N.G.	Eq. H1-1b
		12	LC3 at 50.00%	1.49	N.G.	Eq. H1-1b

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
4	8.0593	0.00	3.8871	0
5	0.6633	0.00	-8.9231	0
13	-0.6633	0.00	-8.9231	0
14	-8.0593	0.00	3.8871	0
16	-7.396	0.00	5.036	0
17	7.396	0.00	5.036	0
24	2.7363	0.00	-5.3326	0
25	5.9863	0.00	0.2966	0
30	-5.9863	0.00	0.2966	0
31	-2.7363	0.00	-5.3326	0
32	3.25	0.00	5.036	0
33	-3.25	0.00	5.036	0
74	-7.7277	0.00	4.4616	0
75	7.7277	0.00	4.4616	0
76	0.00	0.00	-8.9231	0
77	2.6113	0.00	-5.5491	0
78	6.1113	0.00	0.5131	0
83	-6.1113	0.00	0.5131	0
84	-2.6113	0.00	-5.5491	0
85	3.50	0.00	5.036	0

86	-3.50	0.00	5.036	0
87	3.5507	0.00	2.0498	0
90	-0.0001	0.00	-4.0999	0
91	-3.5506	0.00	2.0501	0
92	-1.0825	-0.25	0.625	0
93	0.00	-0.25	-1.25	0
94	1.0825	-0.25	0.625	0
95	5.2036	-0.25	3.0029	0
98	-0.0012	-0.25	-6.0079	0
99	-5.2023	-0.25	3.005	0
115	-3.8943	-0.25	2.248	0
124	5.604	3.00	5.236	0
125	-0.229	3.00	5.236	0
126	-4.146	3.00	5.236	0
127	-6.376	3.00	5.236	0
128	-7.3365	3.00	2.2352	0
129	-4.42	3.00	-2.8163	0
130	-2.4615	3.00	-6.2085	0
132	1.7325	3.00	-7.4712	0
133	4.649	3.00	-2.4197	0
134	6.6075	3.00	0.9725	0
135	7.7225	3.00	2.9038	0
136	5.604	-3.00	5.236	0
137	-0.229	-3.00	5.236	0
138	-4.146	-3.00	5.236	0
139	-6.376	-3.00	5.236	0
140	-7.3365	-3.00	2.2352	0
141	-4.42	-3.00	-2.8163	0
142	-2.4615	-3.00	-6.2085	0
143	-1.3465	-3.00	-8.1398	0
144	1.7325	-3.00	-7.4712	0
145	4.649	-3.00	-2.4197	0
146	6.6075	-3.00	0.9725	0
147	7.7225	-3.00	2.9038	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
92	1	1	1	1	1	1
93	1	1	1	1	1	1
94	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	16	33		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
2	33	32		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
3	32	17		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
4	14	30		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
5	30	31		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00

6	31	13	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
7	5	24	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
8	24	25	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
9	25	4	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
10	4	17	PL 6x3/8	A36	0.00	0.00	0.00
11	14	16	PL 6x3/8	A36	0.00	0.00	0.00
12	5	13	PL 6x3/8	A36	0.00	0.00	0.00
35	85	87	LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
38	77	90	LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
39	91	74	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
40	75	87	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
41	76	90	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
42	92	99	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
43	95	94	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
44	93	98	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
54	91	86	LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
55	83	91	LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
56	87	78	LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
57	90	84	LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
58	124	136	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
59	125	137	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
60	126	138	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
61	127	139	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
62	128	140	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
63	129	141	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
64	130	142	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
65	131	143	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
66	132	144	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
67	133	145	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
68	134	146	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
69	135	147	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

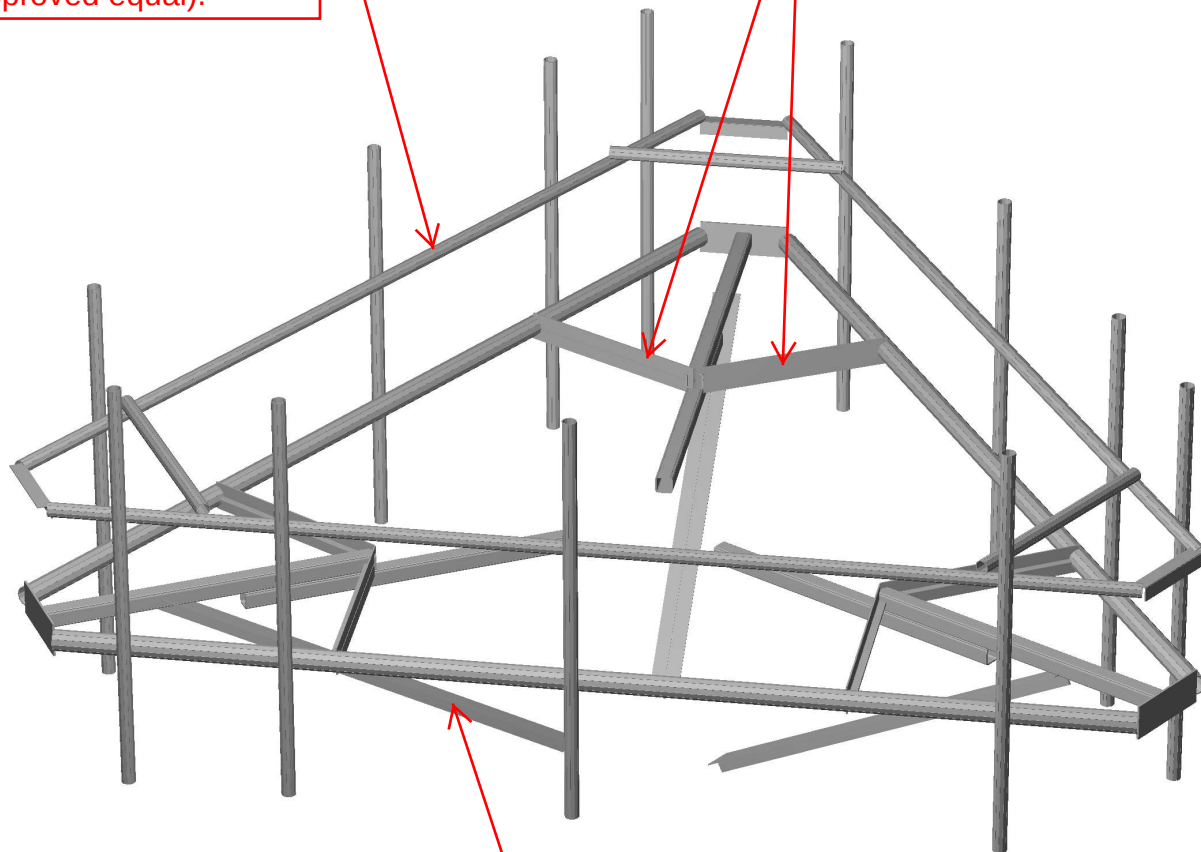


HUDSON
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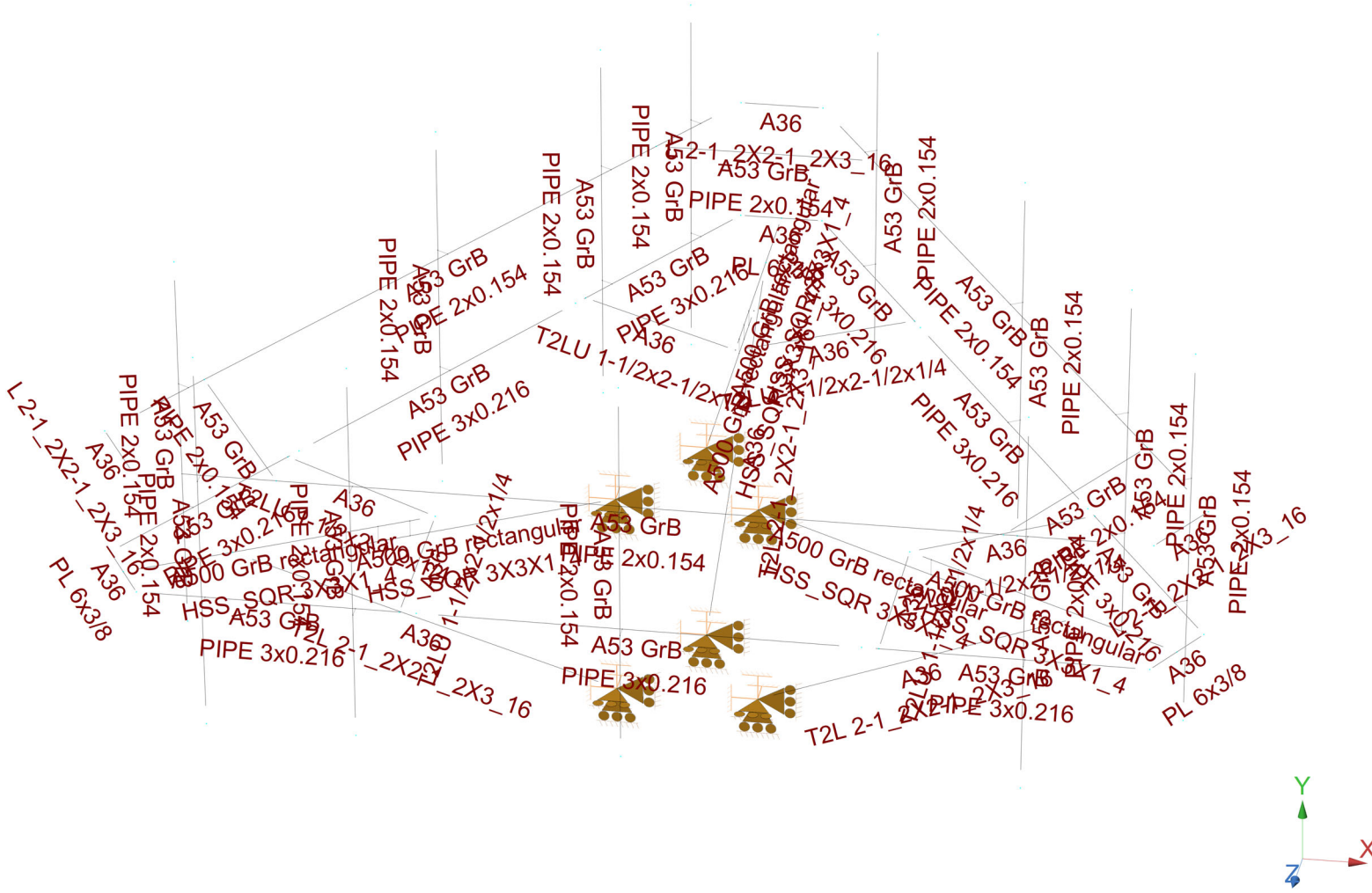
**Mount Calculations
(Modified Conditions)**

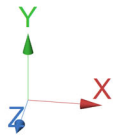
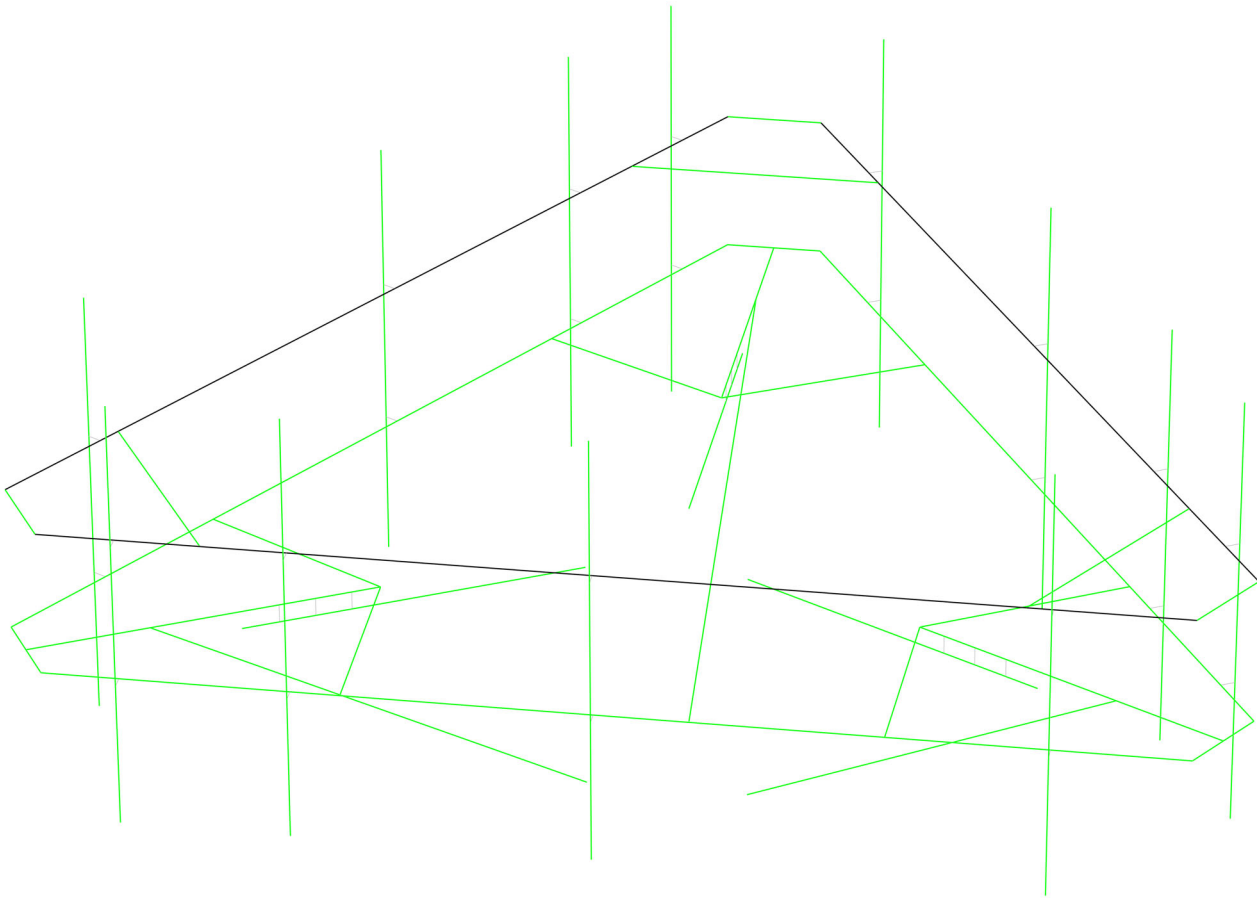
Reinforce existing angles with new
L2-1/2x1-1/2x1/4 steel angles (typ.
of 2 per sector, total of 6).

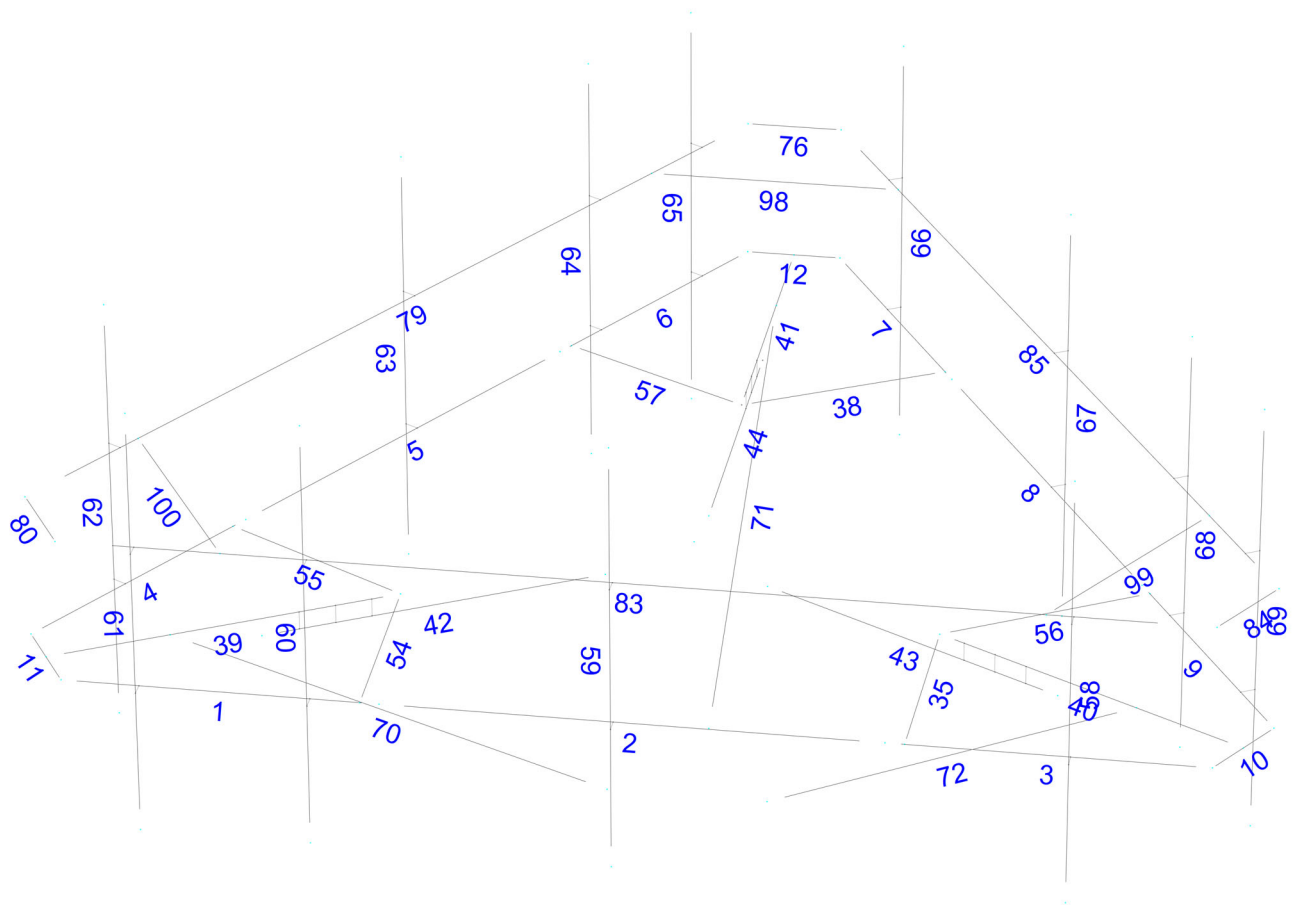
Install new handrail kit,
SitePro1 P/N HRK14-3HD
(or approved equal).



Install new platform reinforcement
kit, SitePro1 P/N PRK-1245L (or
approved equal).







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Load data

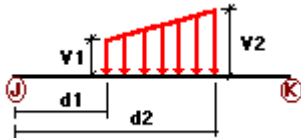
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

Distributed force on members



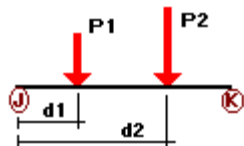
Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	35	y	-0.01	0.00	0.00	No	0.00	No
	38	y	-0.01	0.00	0.00	No	0.00	No
	39	y	-0.01	0.00	0.00	No	0.00	No
	40	y	-0.01	0.00	0.00	No	0.00	No
	41	y	-0.01	0.00	0.00	No	0.00	No
	54	y	-0.01	0.00	0.00	No	0.00	No
	55	y	-0.01	0.00	0.00	No	0.00	No
	56	y	-0.01	0.00	0.00	No	0.00	No
	57	y	-0.01	0.00	0.00	No	0.00	No
Wo	1	z	-0.01	0.00	0.00	No	0.00	No
	2	z	-0.01	0.00	0.00	No	0.00	No
	3	z	-0.01	0.00	0.00	No	0.00	No
	4	z	-0.01	0.00	0.00	No	0.00	No
	5	z	-0.01	0.00	0.00	No	0.00	No
	6	z	-0.01	0.00	0.00	No	0.00	No
	7	z	-0.01	0.00	0.00	No	0.00	No
	8	z	-0.01	0.00	0.00	No	0.00	No
	9	z	-0.01	0.00	0.00	No	0.00	No
	10	z	-0.03	0.00	0.00	No	0.00	No
	11	z	-0.03	0.00	0.00	No	0.00	No
	12	z	-0.03	0.00	0.00	No	0.00	No
	35	z	-0.007	0.00	0.00	No	0.00	No
	38	z	-0.007	0.00	0.00	No	0.00	No
	39	z	-0.009	0.00	0.00	No	0.00	No

Di

40	z	-0.009	0.00	0.00	No	0.00	No
41	z	-0.009	0.00	0.00	No	0.00	No
42	z	-0.009	0.00	0.00	No	0.00	No
43	z	-0.009	0.00	0.00	No	0.00	No
44	z	-0.009	0.00	0.00	No	0.00	No
54	z	-0.007	0.00	0.00	No	0.00	No
55	z	-0.007	0.00	0.00	No	0.00	No
56	z	-0.007	0.00	0.00	No	0.00	No
57	z	-0.007	0.00	0.00	No	0.00	No
62	z	-0.007	0.00	0.00	No	0.00	No
63	z	-0.007	0.00	0.00	No	0.00	No
64	z	-0.007	0.00	0.00	No	0.00	No
65	z	-0.007	0.00	0.00	No	0.00	No
66	z	-0.007	0.00	0.00	No	0.00	No
67	z	-0.007	0.00	0.00	No	0.00	No
68	z	-0.007	0.00	0.00	No	0.00	No
69	z	-0.007	0.00	0.00	No	0.00	No
70	z	-0.012	0.00	0.00	No	0.00	No
71	z	-0.012	0.00	0.00	No	0.00	No
72	z	-0.012	0.00	0.00	No	0.00	No
76	z	-0.012	0.00	0.00	No	0.00	No
79	z	-0.007	0.00	0.00	No	0.00	No
80	z	-0.012	0.00	0.00	No	0.00	No
83	z	-0.007	0.00	0.00	No	0.00	No
84	z	-0.012	0.00	0.00	No	0.00	No
85	z	-0.007	0.00	0.00	No	0.00	No
1	y	-0.017	0.00	0.00	No	0.00	No
2	y	-0.017	0.00	0.00	No	0.00	No
3	y	-0.017	0.00	0.00	No	0.00	No
4	y	-0.017	0.00	0.00	No	0.00	No
5	y	-0.017	0.00	0.00	No	0.00	No
6	y	-0.017	0.00	0.00	No	0.00	No
7	y	-0.017	0.00	0.00	No	0.00	No
8	y	-0.017	0.00	0.00	No	0.00	No
9	y	-0.017	0.00	0.00	No	0.00	No
10	y	-0.024	0.00	0.00	No	0.00	No
11	y	-0.024	0.00	0.00	No	0.00	No
12	y	-0.024	0.00	0.00	No	0.00	No
35	y	-0.015	0.00	0.00	No	0.00	No
38	y	-0.015	0.00	0.00	No	0.00	No
39	y	-0.019	0.00	0.00	No	0.00	No
40	y	-0.019	0.00	0.00	No	0.00	No
41	y	-0.019	0.00	0.00	No	0.00	No
42	y	-0.019	0.00	0.00	No	0.00	No
43	y	-0.019	0.00	0.00	No	0.00	No
44	y	-0.019	0.00	0.00	No	0.00	No
54	y	-0.015	0.00	0.00	No	0.00	No
55	y	-0.015	0.00	0.00	No	0.00	No
56	y	-0.015	0.00	0.00	No	0.00	No
57	y	-0.015	0.00	0.00	No	0.00	No
58	y	-0.013	0.00	0.00	No	0.00	No
59	y	-0.013	0.00	0.00	No	0.00	No
60	y	-0.013	0.00	0.00	No	0.00	No
61	y	-0.013	0.00	0.00	No	0.00	No
62	y	-0.013	0.00	0.00	No	0.00	No
63	y	-0.013	0.00	0.00	No	0.00	No
64	y	-0.013	0.00	0.00	No	0.00	No
65	y	-0.013	0.00	0.00	No	0.00	No
66	y	-0.013	0.00	0.00	No	0.00	No
67	y	-0.013	0.00	0.00	No	0.00	No

68	y	-0.013	0.00	0.00	No	0.00	No
69	y	-0.013	0.00	0.00	No	0.00	No
70	y	-0.017	0.00	0.00	No	0.00	No
71	y	-0.017	0.00	0.00	No	0.00	No
72	y	-0.017	0.00	0.00	No	0.00	No
76	y	-0.017	0.00	0.00	No	0.00	No
79	y	-0.013	0.00	0.00	No	0.00	No
80	y	-0.017	0.00	0.00	No	0.00	No
83	y	-0.013	0.00	0.00	No	0.00	No
84	y	-0.017	0.00	0.00	No	0.00	No
85	y	-0.013	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	58	y	-0.012	2.50	No
		y	-0.012	3.50	No
	59	y	-0.044	0.50	No
		y	-0.044	5.50	No
		y	-0.098	2.00	No
		y	-0.032	1.50	No
	60	y	-0.082	4.00	No
		y	-0.016	1.50	No
	61	y	-0.016	5.00	No
		y	-0.012	2.50	No
	62	y	-0.012	3.50	No
		y	-0.044	0.50	No
	63	y	-0.044	5.50	No
		y	-0.098	2.00	No
	64	y	-0.082	1.50	No
		y	-0.016	1.50	No
	65	y	-0.016	5.00	No
		y	-0.012	2.50	No
	66	y	-0.012	3.50	No
		y	-0.044	0.50	No
	67	y	-0.044	5.50	No
		y	-0.098	2.00	No
Wo	68	y	-0.082	1.50	No
		y	-0.016	1.50	No
	69	y	-0.016	5.00	No
		y	-0.023	2.50	No
	58	z	-0.023	3.50	No
		z	-0.242	0.50	No
	59	z	-0.242	5.50	No
		z	-0.013	2.00	No
	60	z	-0.113	1.50	No
		z	-0.056	4.00	No
	61	z	-0.087	1.50	No
		z	-0.087	5.00	No

Wi	62	z	-0.014	2.50	No
		z	-0.014	3.50	No
	63	z	-0.18	0.50	No
		z	-0.18	5.50	No
		z	-0.035	2.00	No
	64	z	-0.037	1.50	No
	65	z	-0.065	1.50	No
		z	-0.065	5.00	No
	66	z	-0.014	2.50	No
		z	-0.014	3.50	No
	67	z	-0.18	0.50	No
		z	-0.18	5.50	No
		z	-0.035	2.00	No
	68	z	-0.037	1.50	No
	69	z	-0.065	1.50	No
		z	-0.065	5.00	No
	58	z	-0.01	2.50	No
		z	-0.01	3.50	No
	59	z	-0.081	0.50	No
		z	-0.081	5.50	No
		z	-0.009	2.00	No
	60	z	-0.039	1.50	No
		z	-0.022	4.00	No
	61	z	-0.03	1.50	No
		z	-0.03	5.00	No
	62	z	-0.007	2.50	No
		z	-0.007	3.50	No
	63	z	-0.063	0.50	No
		z	-0.063	5.50	No
		z	-0.015	2.00	No
	64	z	-0.016	1.50	No
	65	z	-0.023	1.50	No
		z	-0.023	5.00	No
	66	z	-0.007	2.50	No
		z	-0.007	3.50	No
	67	z	-0.063	0.50	No
		z	-0.063	5.50	No
		z	-0.015	2.00	No
	68	z	-0.016	1.50	No
	69	z	-0.023	1.50	No
		z	-0.023	5.00	No
Di	58	y	-0.029	2.50	No
		y	-0.029	3.50	No
	59	y	-0.276	0.50	No
		y	-0.276	5.50	No
		y	-0.072	2.00	No
	60	y	-0.145	1.50	No
		y	-0.069	4.00	No
	61	y	-0.105	1.50	No
		y	-0.105	5.00	No
	62	y	-0.029	2.50	No
		y	-0.029	3.50	No
	63	y	-0.276	0.50	No
		y	-0.276	5.50	No
		y	-0.072	2.00	No
	64	y	-0.069	1.50	No
	65	y	-0.105	1.50	No
		y	-0.105	5.00	No
	66	y	-0.029	2.50	No
		y	-0.029	3.50	No

67	y	-0.276	0.50	No
	y	-0.276	5.50	No
	y	-0.072	2.00	No
68	y	-0.069	1.50	No
69	y	-0.105	1.50	No
	y	-0.105	5.00	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo

LC2=0.9DL+1.6Wo

LC3=1.2DL+Wi+Di

LC4=1.2DL

LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>HSS_SQR 3X3X1_4</i>		39	LC3 at 0.00%	0.28	OK	Eq. H1-1b
		40	LC3 at 100.00%	0.26	OK	Eq. H1-1b
		41	LC3 at 33.75%	0.27	OK	Eq. H1-1b
		42	LC1 at 0.00%	0.42	OK	Eq. H1-1b
		43	LC1 at 100.00%	0.32	OK	Eq. H1-1b
		44	LC3 at 0.00%	0.17	OK	Eq. H1-1b
<i>L 2-1_2X2-1_2X3_16</i>		76	LC1 at 100.00%	0.07	OK	Sec. F1
		80	LC2 at 100.00%	0.10	OK	Eq. H2-1
		84	LC2 at 100.00%	0.09	OK	Eq. H2-1
<i>PIPE 2x0.154</i>		58	LC3 at 64.58%	0.45	OK	Eq. H1-1b
		59	LC1 at 64.58%	0.74	OK	Eq. H1-1b
		60	LC1 at 64.58%	0.45	OK	Eq. H1-1b
		61	LC3 at 64.58%	0.29	OK	Eq. H1-1b
		62	LC3 at 64.58%	0.30	OK	Eq. H1-1b
		63	LC2 at 64.58%	0.48	OK	Eq. H1-1b
		64	LC1 at 33.33%	0.40	OK	Eq. H1-1b
		65	LC1 at 64.58%	0.36	OK	Eq. H1-1b
		66	LC3 at 64.58%	0.50	OK	Eq. H1-1b
		67	LC2 at 64.58%	0.48	OK	Eq. H1-1b
		68	LC3 at 64.58%	0.28	OK	Eq. H1-1b
		69	LC3 at 64.58%	0.26	OK	Eq. H1-1b
		79	LC1 at 51.79%	0.41	With warnings	Eq. H1-1b
		83	LC3 at 87.50%	0.35	With warnings	Eq. H1-1b
		85	LC1 at 15.18%	0.44	With warnings	Eq. H1-1b
		98	LC1 at 0.00%	0.11	OK	Eq. H1-1b
		99	LC1 at 0.00%	0.17	OK	Eq. H1-1b
		100	LC2 at 0.00%	0.26	OK	Eq. H1-1b
<i>PIPE 3x0.216</i>		1	LC1 at 93.75%	0.24	OK	Eq. H1-1b
		2	LC3 at 46.88%	0.38	OK	Eq. H1-1b
		3	LC1 at 6.25%	0.24	OK	Eq. H1-1b
		4	LC3 at 43.75%	0.16	OK	Eq. H3-1
		5	LC3 at 53.13%	0.33	OK	Eq. H1-1b
		6	LC1 at 6.25%	0.23	OK	Eq. H1-1b
		7	LC1 at 93.75%	0.25	OK	Eq. H1-1b
		8	LC3 at 53.13%	0.33	OK	Eq. H1-1b
		9	LC3 at 6.25%	0.13	OK	Eq. H3-1
<i>PL 6x3/8</i>		10	LC1 at 100.00%	0.52	OK	Eq. H1-1b
		11	LC1 at 100.00%	0.58	OK	Eq. H1-1b
		12	LC1 at 50.00%	0.85	OK	Eq. H1-1b

<i>T2L 2-1_2X2-1_2X3_16</i>	70	LC3 at 0.00%	0.81	OK	Eq. H2-1
	71	LC3 at 0.00%	0.79	OK	Eq. H2-1
	72	LC3 at 0.00%	0.76	OK	Eq. H2-1
<i>T2LU 1-1/2x2-1/2x1/4</i>	35	LC3 at 100.00%	0.56	OK	Eq. H2-1
	38	LC3 at 100.00%	0.52	OK	Eq. H2-1
	54	LC3 at 0.00%	0.63	OK	Eq. H2-1
	55	LC3 at 100.00%	0.57	OK	Eq. H2-1
	56	LC3 at 0.00%	0.52	OK	Eq. H2-1
	57	LC3 at 0.00%	0.54	OK	Eq. H2-1

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
4	8.0593	0.00	3.8871	0
5	0.6633	0.00	-8.9231	0
13	-0.6633	0.00	-8.9231	0
14	-8.0593	0.00	3.8871	0
16	-7.396	0.00	5.036	0
17	7.396	0.00	5.036	0
24	2.7363	0.00	-5.3326	0
25	5.9863	0.00	0.2966	0
30	-5.9863	0.00	0.2966	0
31	-2.7363	0.00	-5.3326	0
32	3.25	0.00	5.036	0
33	-3.25	0.00	5.036	0
74	-7.7277	0.00	4.4616	0
75	7.7277	0.00	4.4616	0
76	0.00	0.00	-8.9231	0
77	2.6113	0.00	-5.5491	0
78	6.1113	0.00	0.5131	0
83	-6.1113	0.00	0.5131	0
84	-2.6113	0.00	-5.5491	0
85	3.50	0.00	5.036	0

86	-3.50	0.00	5.036	0
87	3.5507	0.00	2.0498	0
91	-3.5506	0.00	2.0501	0
92	-1.0825	-0.25	0.625	0
93	0.00	-0.25	-1.25	0
94	1.0825	-0.25	0.625	0
95	5.2036	-0.25	3.0029	0
99	-5.2023	-0.25	3.005	0
124	5.604	4.00	5.236	0
125	-0.229	4.00	5.236	0
126	-4.146	4.00	5.236	0
127	-6.376	4.00	5.236	0
128	-7.3365	4.00	2.2352	0
129	-4.42	4.00	-2.8163	0
130	-2.4615	4.00	-6.2085	0
131	-1.3465	4.00	-8.1398	0
132	1.7325	4.00	-7.4712	0
133	4.649	4.00	-2.4197	0
134	6.6075	4.00	0.9725	0
135	7.7225	4.00	2.9038	0
136	5.604	-2.00	5.236	0
137	-0.229	-2.00	5.236	0
138	-4.146	-2.00	5.236	0
139	-6.376	-2.00	5.236	0
140	-7.3365	-2.00	2.2352	0
141	-4.42	-2.00	-2.8163	0
142	-2.4615	-2.00	-6.2085	0
143	-1.3465	-2.00	-8.1398	0
144	1.7325	-2.00	-7.4712	0
145	4.649	-2.00	-2.4197	0
146	6.6075	-2.00	0.9725	0
147	7.7225	-2.00	2.9038	0
148	-1.0825	-3.50	0.625	0
149	0.00	-3.50	-1.25	0
150	1.0825	-3.50	0.625	0
152	8.0593	2.00	3.8871	0
154	0.6633	2.00	-8.9231	0
155	-0.6633	2.00	-8.9231	0
158	-8.0593	2.00	3.8871	0
159	-7.396	2.00	5.036	0
162	7.396	2.00	5.036	0
187	0.00	0.00	-7.25	0
188	6.2787	0.00	3.625	0
189	-6.2787	0.00	3.625	0
190	-5.261	2.00	5.036	0
191	-1.7308	2.00	-7.0742	0
192	1.7308	2.00	-7.0742	0
193	6.9918	2.00	2.0382	0
194	5.261	2.00	5.036	0
195	-6.9918	2.00	2.0382	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
92	1	1	1	1	1	1
93	1	1	1	1	1	1
94	1	1	1	1	1	1
148	1	1	1	1	1	1
149	1	1	1	1	1	1
150	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	16	33		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
2	33	32		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
3	32	17		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
4	14	30		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
5	30	31		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
6	31	13		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
7	5	24		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
8	24	25		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
9	25	4		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
10	4	17		PL 6x3/8	A36	0.00	0.00	0.00
11	14	16		PL 6x3/8	A36	0.00	0.00	0.00
12	5	13		PL 6x3/8	A36	0.00	0.00	0.00
35	85	87		T2LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
38	77	90		T2LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
39	91	74		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
40	75	87		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
41	76	90		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
42	92	99		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
43	95	94		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
44	93	98		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
54	91	86		T2LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
55	83	91		T2LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
56	87	78		T2LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
57	90	84		T2LU 1-1/2x2-1/2x1/4	A36	0.00	0.00	0.00
58	124	136		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
59	125	137		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
60	126	138		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
61	127	139		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
62	128	140		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
63	129	141		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
64	130	142		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
65	131	143		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
66	132	144		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
67	133	145		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
68	134	146		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
69	135	147		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
70	148	189		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
71	149	187		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
72	150	188		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
76	154	155		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
79	158	155		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
80	158	159		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
83	159	162		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
84	152	162		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
85	154	152		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

98	191	192	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
99	193	194	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
100	190	195	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
35	270.00	0	0.00	0.00	0.00
38	270.00	0	0.00	0.00	0.00
54	270.00	0	0.00	0.00	0.00
55	270.00	0	0.00	0.00	0.00
56	270.00	0	0.00	0.00	0.00
57	270.00	0	0.00	0.00	0.00
58	0.00	2	1.00	0.00	0.00
59	0.00	2	1.00	0.00	0.00
60	0.00	2	1.00	0.00	0.00
61	0.00	2	1.00	0.00	0.00
62	0.00	2	1.00	0.00	0.00
63	0.00	2	1.00	0.00	0.00
64	0.00	2	1.00	0.00	0.00
65	0.00	2	1.00	0.00	0.00
66	0.00	2	1.00	0.00	0.00
67	0.00	2	1.00	0.00	0.00
68	0.00	2	1.00	0.00	0.00
69	0.00	2	1.00	0.00	0.00
76	90.00	0	0.00	0.00	0.00
80	90.00	0	0.00	0.00	0.00
84	90.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
71	0.00	-1.50	0.00	0.00	-1.50	0.00
72	0.00	-1.50	0.00	0.00	-1.50	0.00
76	0.00	-1.50	0.00	0.00	-1.50	0.00
98	0.00	2.00	0.00	0.00	2.00	0.00
99	0.00	2.00	0.00	0.00	2.00	0.00
100	0.00	2.00	0.00	0.00	2.00	0.00
