



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Web Site: www.ct.gov/csc

VIA ELECTRONIC MAIL

April 27, 2020

Patricia Nowak
Site Acquisition Consultant
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379

RE: **EM-CING-052-200415** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 82 Lovely Street, Farmington, Connecticut.

Dear Ms. Nowak:

The Connecticut Siting Council (Council) is in receipt of your correspondence of April 27, 2020 submitted in response to the Council's April 23, 2020 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

s/ Melanie A. Bachman

Melanie A. Bachman
Executive Director

MAB/emr

From: Patricia Nowak <pnowak@clinellc.com>

Sent: Monday, April 27, 2020 8:51 AM

To: Robidoux, Evan <Evan.Robidoux@ct.gov>; CSC-DL Siting Council <Siting.Council@ct.gov>

Subject: RE: Council Incomplete Letter for EM-CING-052-200415 (Lovely Street, Farmington) - Response Letter

Good morning,

In response to the Council's letter dated April 23, 2020 regarding the above referenced EM identification number, please find attached a response letter and copy of the Mount Analysis prepared by Hudson Design Group, LLC dated February 3, 2020.

Please let me know if the attached documents are sufficient to complete the exempt modification request for the above referenced site.

Thank you,
Trish



Patricia Nowak | Site Acquisition Consultant - NE
750 W Center St, Floor 3
West Bridgewater, MA 02379 | Phone: 508.265.5599
pnowak@clinellc.com | www.centerlinecommunications.com

April 27, 2020

VIA ELECTRONIC MAIL

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

Regarding: EM-CING-052-200415 -Notice of Exempt Modification
AT&T Site: CT1061
Address: 82 Lovely Street, Farmington, Connecticut

Dear Ms. Bachman:

In response to your letter dated April 23, 2020 regarding the Council's above referenced EM identification number, please find enclosed a Mount Analysis prepared by Hudson Design Group, LLC dated February 3, 2020.

Please let me know if the enclosed document is sufficient to complete the exempt modification request for the above referenced AT&T site.

Thank you for your time and consideration.

Sincerely,

s/ Patricia Nowak

Patricia Nowak
Site Acquisition Consultant
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379
pnowak@clinellc.com

Enclosures: Mount Analysis dated February 3, 2020

January 16, 2020
February 3, 2020 (Rev.1)



Centerline Communications
 750 West Center Street, Suite #301
 West Bridgewater, MA 02379

RE: Site Number: CT1061 (LTE 3C/BWE/5G)
 FA Number: 10035037
 PACE Number: MRCTB043989
 PT Number: 2051A0RWZF
 Site Name: UNIONVILLE SBC CO
 Site Address: 82 Lovely Street
 Unionville, CT 06085

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Centerline Communications to perform a mount analysis on the proposed AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (3) P65-15-XLH-RR Antennas (51.0"x12.0"x6.0" – Wt. = 30 lbs. /each)
- (2) HPA-65R-BUU-H8 Antennas (92.4"x14.8"x7.4" – Wt. = 68 lbs. /each)
- (1) HPA-65R-BUU-H6 Antennas (72.0"x14.8"x7.4" – Wt. = 51 lbs. /each)
- (3) TT19-08BP111-001 TMA's (9.9"x6.7"x5.4" - Wt. = 16 lbs. /each)
- (1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each)
- **(2) DMP65R-BU8DA Antennas (96.0"x20.7"x7.7" – Wt. = 96 lbs. /each)**
- **(1) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)**
- **(3) B5/B12 4449 RRH's (17.9"x13.2"x9.5" – Wt. = 71 lbs. /each)**
- **(3) B2/B66A 8843 RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each)**
- **(1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each)**

**Proposed equipment shown in bold*

Assembly drawings prepared by Sabre Industries Towers and Poles, P/N C10855721C, dated February 12, 2018 were available for the proposed mount. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mounts on November 19, 2019.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R13.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.67 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- The mount has been analyzed with load combinations consisting of 250 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.

Based on our evaluation, we have determined that the new Sabre Industries Towers and Poles, P/N C10855721C mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Proposed (LTE 3C/BWE/5G) Mount Rating	74	LC10	63%	PASS

Reference Documents:

- Mount mapping report prepared by ProVertic LLC.
- Assembly drawings prepared by Sabre Industries Towers and Poles, P/N C10855721C, dated February 12, 2018.

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 AT&T'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 tower structure.

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

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Vice President

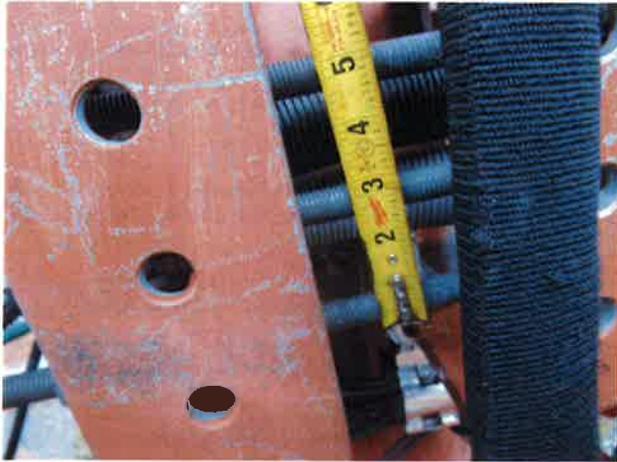


Daniel P. Hamm, PE
Principal

FIELD PHOTOS:

(Existing mounts to be removed)







HUDSON
Design Group LLC

**Wind & Ice
Calculations**

Date: 2/3/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT1061
 Designed By: ISD Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01 (z/z_g)^{2/\alpha}$
 $K_z =$ **0.983**
 $z =$ 98 (ft)
 $z_g =$ 1200 (ft)
 $\alpha =$ 7.0

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

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
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

2.6.6.2 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

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

$K_h = e^{(fz/H)}$

$K_{zt} =$ **#DIV/0!**

$K_h =$ **#DIV/0!**

$K_c =$ (from Table 2-4)

$K_t =$ (from Table 2-5)

f = (from Table 2-5)

z = 98

$z_s =$ 260 (Mean elevation of base of structure above sea level)

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

$K_{zt} =$ **1.00** (from 2.6.6.2.1)

$K_e =$ **0.99** (from 2.6.8)

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

Category = **1**

2.6.10 Design Ice Thickness

Max Ice Thickness =

$t_i =$ 1.50 in

Importance Factor =

l = 1.0 (from Table 2-3)

$K_{iz} =$ **1.11** (from Sec. 2.6.10)

$t_{iz} = t_i * l * K_{iz} * (K_{zt})^{0.35}$

$t_{iz} =$ **1.67** in

Date: 2/3/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT11061
 Designed By: ISD Checked By: MSC



2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

$G_h = 1.0$ Latticed Structures > 600 ft

$G_h = 0.85$ Latticed Structures 450 ft or less

$G_h = 0.85 + 0.15 [h/150 - 3.0]$ $h =$ ht. of structure

$h =$ 101 $G_h =$ 0.85

2.6.9.2 Guyed Masts

$G_h =$ 0.85

2.6.9.3 Pole Structures

$G_h =$ 1.1

2.6.9 Appurtenances

$G_h =$ 1.0

2.6.9.4 Structures Supported on Other Structures

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

$G_h =$ 1.35 $G_h =$ 1.00

2.6.11.2 Design Wind Force on Appurtenances

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

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

- $K_z =$ 0.983 (from 2.6.5.2)
- $K_{zt} =$ 1.0 (from 2.6.6.2.1)
- $K_s =$ 1.0 (from 2.6.7)
- $K_e =$ 0.99 (from 2.6.8)
- $K_d =$ 0.95 (from Table 2-2)
- $V_{max} =$ 125 mph (Ultimate Wind Speed)
- $V_{max(ice)} =$ 50 mph
- $V_{30} =$ 30 mph

$q_z =$ 36.99
 $q_z(ice) =$ 5.92
 $q_z(30) =$ 2.13

Table 2-2

Structure Type	Wind Direction Probability Factor, K_d
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

Date: 2/5/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT1061
 Designed By: ISD Checked By: MSC



Determine Ca:

Table 2-9

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
Square/Rectangular HSS		1.2 - 2.8(r _s) ≥ 0.85	1.4 - 4.0(r _s) ≥ 0.90	2.0 - 6.0(r _s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	4.14/(C ^{0.485})	3.66/(C ^{0.415})	46.8/(C ^{1.0})
	C > 78 (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,
 Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.67 in** Angle = **0 (deg)** Equivalent Angle = **180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	4.25	1.28	201	44	12
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	6.24	1.37	480	98	28
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	4.86	1.31	357	73	21
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	4.64	1.30	661	127	38
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	470	91	27
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.88	1.20	52	13	3
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.20	50	13	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	1.83	1.20	16	6	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	1.20	72	18	4
2-1/2" pipe	2.9	12.0		0.24	0.24	2.00	18	8	1
PL 2X1/8	0.1	12.0		0.01	0.01	1.25	0	3	0
L 2x2 Angles	2.0	12.0		0.17	0.17	1.25	8	4	0
HSS 6x3	3.0	12.0		0.25	0.25	1.25	12	5	1
HSS 3x3	3.0	12.0		0.25	0.25	1.25	12	5	1

Date: 2/5/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT1061
 Designed By: ISD Checked By: MSC



WIND LOADS

Angle = 30 (deg) Ice Thickness = 1.67 in. Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	201	114	179
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	480	278	429
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	357	204	319
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	661	300	571
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	470	208	404
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	52	73	58
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	50	61	53
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	16	20	17
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	72	72	72

WIND LOADS WITH ICE:

P65-15-XLH-RR Antenna	54.3	15.3	9.3	5.79	3.53	3.54	5.82	1.25	1.35	43	28	39
HPA-65R-BUU-H8 Antenna	95.7	18.1	10.7	12.06	7.14	5.28	8.91	1.32	1.46	94	62	86
HPA-65R-BUU-H6 Antenna	75.3	18.1	10.7	9.49	5.62	4.15	7.01	1.27	1.40	72	47	65
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.59	7.62	4.13	8.99	1.27	1.47	125	66	110
DMP65R-BU6DA Antenna	74.5	24.0	11.0	12.45	5.72	3.10	6.75	1.23	1.39	90	47	80
B5/B12 4449 RRH	21.2	12.8	16.5	1.90	2.44	1.65	1.28	1.20	1.20	13	17	14
B2/B66A 8843 RRH	18.2	14.2	16.5	1.80	2.10	1.28	1.10	1.20	1.20	13	15	13
TT19-08BP111-001 TMA	13.2	8.7	10.0	0.80	0.92	1.51	1.32	1.20	1.20	6	7	6
Surge Arrestor	27.3	13.0	13.0	2.48	2.48	2.10	2.10	1.20	1.20	18	18	18

WIND LOADS AT 30 MPH:

P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	12	7	10
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	28	16	25
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	21	12	18
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	38	17	33
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	27	12	23
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	4	3
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	1	1
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	4	4	4

Date: 2/5/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT1061
 Designed By: ISD Checked By: MSC



WIND LOADS

Angle = 60 (deg) Ice Thickness = 1.67 in. Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	201	114	136
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	480	278	328
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	357	204	242
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	661	300	391
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	470	208	273
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	52	73	68
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	50	61	58
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	16	20	19
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	72	72	72

WIND LOADS WITH ICE:

P65-15-XLH-RR Antenna	54.3	15.3	9.3	5.79	3.53	3.54	5.82	1.25	1.35	43	28	32
HPA-65R-BUU-H8 Antenna	95.7	18.1	10.7	12.06	7.14	5.28	8.91	1.32	1.46	94	62	70
HPA-65R-BUU-H6 Antenna	75.3	18.1	10.7	9.49	5.62	4.15	7.01	1.27	1.40	72	47	53
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.59	7.62	4.13	8.99	1.27	1.47	125	66	81
DMP65R-BU6DA Antenna	74.5	24.0	11.0	12.45	5.72	3.10	6.75	1.23	1.39	90	47	58
B5/B12 4449 RRH	21.2	12.8	16.5	1.90	2.44	1.65	1.28	1.20	1.20	13	17	16
B2/B66A 8843 RRH	18.2	14.2	16.5	1.80	2.10	1.28	1.10	1.20	1.20	13	15	14
TT19-08BP111-001 TMA	13.2	8.7	10.0	0.80	0.92	1.51	1.32	1.20	1.20	6	7	6
Surge Arrestor	27.3	13.0	13.0	2.48	2.48	2.10	2.10	1.20	1.20	18	18	18

WIND LOADS AT 30 MPH:

P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	12	7	8
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	28	16	19
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	21	12	14
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	38	17	22
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	27	12	16
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	4	4
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	1	1
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	4	4	4

Date: 2/5/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT1061
 Designed By: ISD Checked By: MSC



WIND LOADS

Angle = 90 (deg) Ice Thickness = 1.67 in. Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	201	114	114
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	480	278	278
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	357	204	204
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	661	300	300
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	470	208	208
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	52	73	73
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	50	61	61
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	16	20	20
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	72	72	72

WIND LOADS WITH ICE:

P65-15-XLH-RR Antenna	54.3	15.3	9.3	5.79	3.53	3.54	5.82	1.25	1.35	43	28	28
HPA-65R-BUU-H8 Antenna	95.7	18.1	10.7	12.06	7.14	5.28	8.91	1.32	1.46	94	62	62
HPA-65R-BUU-H6 Antenna	75.3	18.1	10.7	9.49	5.62	4.15	7.01	1.27	1.40	72	47	47
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.59	7.62	4.13	8.99	1.27	1.47	125	66	66
DMP65R-BU6DA Antenna	74.5	24.0	11.0	12.45	5.72	3.10	6.75	1.23	1.39	90	47	47
B5/B12 4449 RRH	21.2	12.8	16.5	1.90	2.44	1.65	1.28	1.20	1.20	13	17	17
B2/B66A 8843 RRH	18.2	14.2	16.5	1.80	2.10	1.28	1.10	1.20	1.20	13	15	15
TT19-08BP111-001 TMA	13.2	8.7	10.0	0.80	0.92	1.51	1.32	1.20	1.20	6	7	7
Surge Arrestor	27.3	13.0	13.0	2.48	2.48	2.10	2.10	1.20	1.20	18	18	18

WIND LOADS AT 30 MPH:

P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	12	7	7
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	28	16	16
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	21	12	12
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	38	17	17
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	27	12	12
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	4	4
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	1	1
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	4	4	4

Date: 2/5/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT1061
 Designed By: ISD Checked By: MSC



WIND LOADS

Angle = 120 (deg) Ice Thickness = 1.67 in. Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	201	114	136
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	480	278	328
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	357	204	242
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	661	300	391
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	470	208	273
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	52	73	68
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	50	61	58
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	16	20	19
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	72	72	72

WIND LOADS WITH ICE:

P65-15-XLH-RR Antenna	54.3	15.3	9.3	5.79	3.53	3.54	5.82	1.25	1.35	43	28	32
HPA-65R-BUU-H8 Antenna	95.7	18.1	10.7	12.06	7.14	5.28	8.91	1.32	1.46	94	62	70
HPA-65R-BUU-H6 Antenna	75.3	18.1	10.7	9.49	5.62	4.15	7.01	1.27	1.40	72	47	53
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.59	7.62	4.13	8.99	1.27	1.47	125	66	81
DMP65R-BU6DA Antenna	74.5	24.0	11.0	12.45	5.72	3.10	6.75	1.23	1.39	90	47	58
B5/B12 4449 RRH	21.2	12.8	16.5	1.90	2.44	1.65	1.28	1.20	1.20	13	17	16
B2/B66A 8843 RRH	18.2	14.2	16.5	1.80	2.10	1.28	1.10	1.20	1.20	13	15	14
TT19-08BP111-001 TMA	13.2	8.7	10.0	0.80	0.92	1.51	1.32	1.20	1.20	6	7	6
Surge Arrestor	27.3	13.0	13.0	2.48	2.48	2.10	2.10	1.20	1.20	18	18	18

WIND LOADS AT 30 MPH:

P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	12	7	8
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	28	16	19
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	21	12	14
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	38	17	22
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	27	12	16
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	4	4
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	1	1
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	4	4	4

Date: 2/5/2020
 Project Name: UNIONVILLE SBC CO
 Project No.: CT1061
 Designed By: ISD Checked By: MSC



WIND LOADS

Angle = 150 (deg) Ice Thickness = 1.67 in. Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	201	114	179
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	480	278	429
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	357	204	319
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	661	300	571
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	470	208	404
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	52	73	58
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	50	61	53
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	16	20	17
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	72	72	72

WIND LOADS WITH ICE:

P65-15-XLH-RR Antenna	54.3	15.3	9.3	5.79	3.53	3.54	5.82	1.25	1.35	43	28	39
HPA-65R-BUU-H8 Antenna	95.7	18.1	10.7	12.06	7.14	5.28	8.91	1.32	1.46	94	62	86
HPA-65R-BUU-H6 Antenna	75.3	18.1	10.7	9.49	5.62	4.15	7.01	1.27	1.40	72	47	65
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.59	7.62	4.13	8.99	1.27	1.47	125	66	110
DMP65R-BU6DA Antenna	74.5	24.0	11.0	12.45	5.72	3.10	6.75	1.23	1.39	90	47	80
B5/B12 4449 RRH	21.2	12.8	16.5	1.90	2.44	1.65	1.28	1.20	1.20	13	17	14
B2/B66A 8843 RRH	18.2	14.2	16.5	1.80	2.10	1.28	1.10	1.20	1.20	13	15	13
TT19-08BP111-001 TMA	13.2	8.7	10.0	0.80	0.92	1.51	1.32	1.20	1.20	6	7	6
Surge Arrestor	27.3	13.0	13.0	2.48	2.48	2.10	2.10	1.20	1.20	18	18	18

WIND LOADS AT 30 MPH:

P65-15-XLH-RR Antenna	51.0	12.0	6.0	4.25	2.13	4.25	8.50	1.28	1.45	12	7	10
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	28	16	25
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	21	12	18
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	38	17	33
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	27	12	23
B5/B12 4449 RRH	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	4	3
B2/B66A 8843 RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
TT19-08BP111-001 TMA	9.9	5.4	6.7	0.37	0.46	1.83	1.48	1.20	1.20	1	1	1
Surge Arrestor	24.0	9.7	9.7	1.62	1.62	2.47	2.47	1.20	1.20	4	4	4

Date: 2/3/2020

Project Name: UNIONVILLE SBC CO

Project No.: CT1061

Designed By: ISD Checked By: MSC



HUDSON
Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.67 in.
Density of ice: 56 pcf

P65-15-XLH-RR Antenna

Weight of ice based on total radial SF area:
Height (in): 51.0
Width (in): 12.0
Depth (in): 6.0
Total weight of ice on object: 131 lbs
Weight of object: 30.0 lbs
Combined weight of ice and object: 161 lbs

HPA-65R-BUU-H8 Antenna

Weight of ice based on total radial SF area:
Height (in): 92.4
Width (in): 14.8
Depth (in): 7.4
Total weight of ice on object: 286 lbs
Weight of object: 68.0 lbs
Combined weight of ice and object: 354 lbs

HPA-65R-BUU-H6 Antenna

Weight of ice based on total radial SF area:
Height (in): 72.0
Width (in): 14.8
Depth (in): 7.4
Total weight of ice on object: 223 lbs
Weight of object: 51.0 lbs
Combined weight of ice and object: 274 lbs

DMP65R-BU8DA Antenna

Weight of ice based on total radial SF area:
Height (in): 96.0
Width (in): 20.7
Depth (in): 7.7
Total weight of ice on object: 388 lbs
Weight of object: 96.0 lbs
Combined weight of ice and object: 484 lbs

DMP65R-BU6DA Antenna

Weight of ice based on total radial SF area:
Height (in): 71.2
Width (in): 20.7
Depth (in): 7.7
Total weight of ice on object: 288 lbs
Weight of object: 80.0 lbs
Combined weight of ice and object: 368 lbs

B5/B12 4449 RRH

Weight of ice based on total radial SF area:
Height (in): 17.9
Width (in): 13.2
Depth (in): 9.5
Total weight of ice on object: 55 lbs
Weight of object: 71.0 lbs
Combined weight of ice and object: 126 lbs

B2/B66A 8843 RRH

Weight of ice based on total radial SF area:
Height (in): 14.9
Width (in): 13.2
Depth (in): 10.9
Total weight of ice on object: 48 lbs
Weight of object: 72.0 lbs
Combined weight of ice and object: 120 lbs

TT19-08BP111-001 TMA

Weight of ice based on total radial SF area:
Height (in): 9.9
Width (in): 5.4
Depth (in): 6.7
Total weight of ice on object: 17 lbs
Weight of object: 16.0 lbs
Combined weight of ice and object: 33 lbs

Squid Surge Arrestor

Weight of ice based on total radial SF area:
Depth (in): 24.0
Diameter(in): 9.7
Total weight of ice on object: 46 lbs
Weight of object: 33 lbs
Combined weight of ice and object: 79 lbs

L 2x2 Angles

Weight of ice based on total radial SF area:
Height (in): 2
Width (in): 2
Per foot weight of ice on object: 9 plf

2-1/2" Pipe

Per foot weight of ice:
diameter (in): 2.91
Per foot weight of ice on object: 9 plf

HSS 6x3

Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 6
Per foot weight of ice on object: 17 plf

PL 2X1/8

Weight of ice based on total radial SF area:
Height (in): 2
Width (in): 0.13
Per foot weight of ice on object: 7 plf

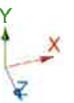
HSS 3x3

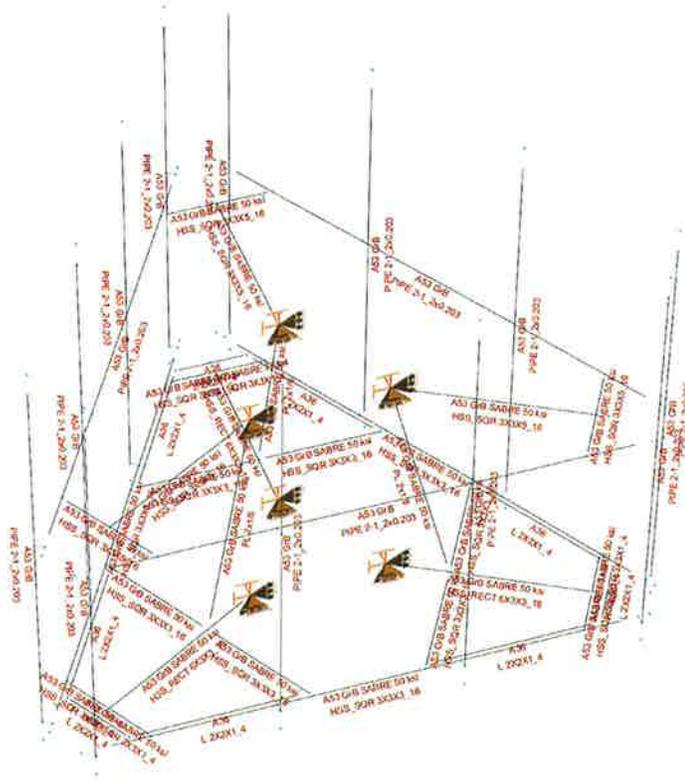
Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 3
Per foot weight of ice on object: 12 plf



HUDSON
Design Group LLC

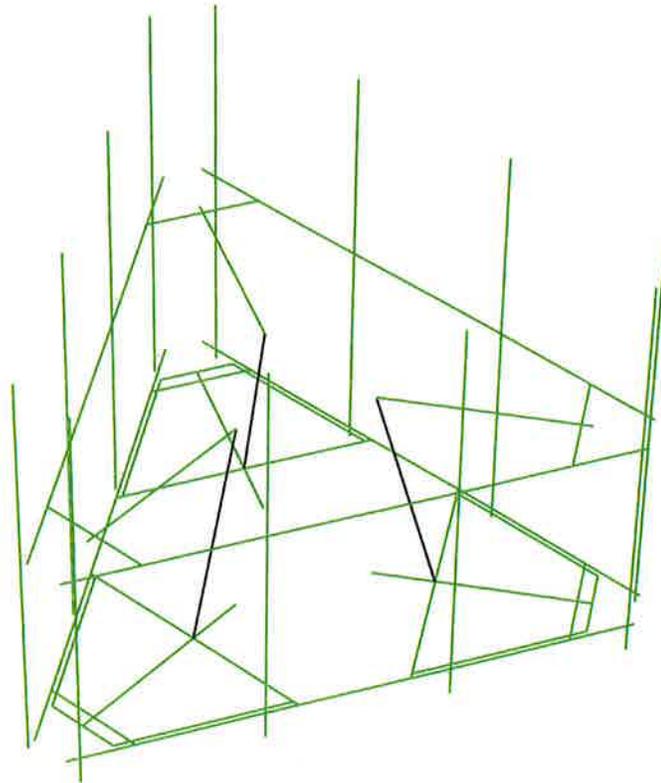
**Mount Calculations
(Proposed Conditions)**

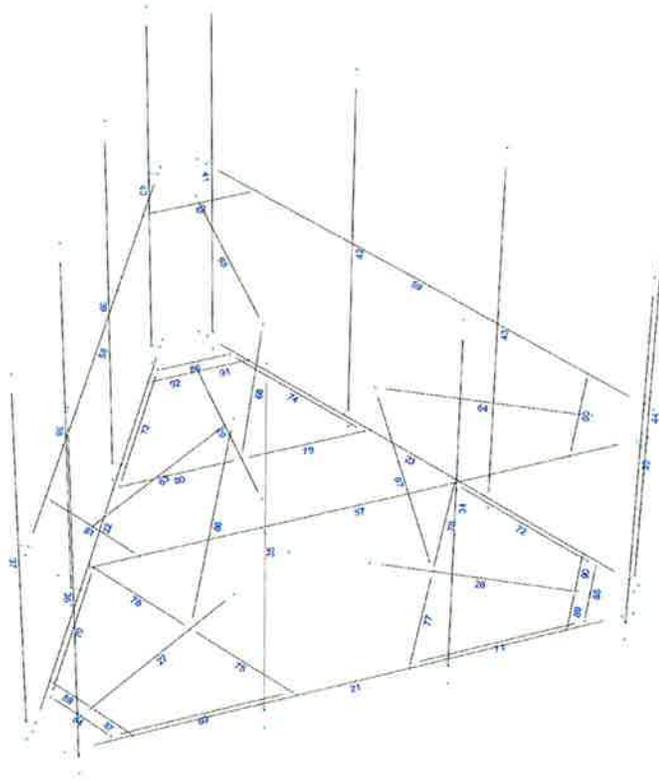




Design status

-  Not designed
-  Error on design
-  Design O.K.
-  With warnings





Load data

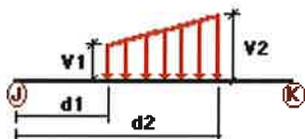
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No </td <td>LL</td>	LL
LLa4	250 lb Live Load Antenna 4	No	LL

Distributed force on members



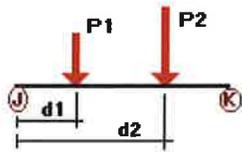
Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	69	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	70	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	71	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	72	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	73	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	74	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	75	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	76	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	77	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	78	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	79	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	80	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	84	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	85	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	86	Y	-0.01	-0.01	0.00	Yes	100.00	Yes

W0	21	z	-0.012	0.00	0.00	No	0.00	No
	22	z	-0.012	0.00	0.00	No	0.00	No
	23	z	-0.012	0.00	0.00	No	0.00	No
	27	z	-0.012	0.00	0.00	No	0.00	No
	28	z	-0.012	0.00	0.00	No	0.00	No
	29	z	-0.012	0.00	0.00	No	0.00	No
	35	z	-0.018	0.00	0.00	No	0.00	No
	37	z	-0.018	0.00	0.00	No	0.00	No
	38	z	-0.018	0.00	0.00	No	0.00	No
	39	z	-0.018	0.00	0.00	No	0.00	No
	40	z	-0.018	0.00	0.00	No	0.00	No
	41	z	-0.018	0.00	0.00	No	0.00	No
	42	z	-0.018	0.00	0.00	No	0.00	No
	43	z	-0.018	0.00	0.00	No	0.00	No
	44	z	-0.018	0.00	0.00	No	0.00	No
	57	z	-0.018	0.00	0.00	No	0.00	No
	58	z	-0.018	0.00	0.00	No	0.00	No
	59	z	-0.018	0.00	0.00	No	0.00	No
	60	z	-0.012	0.00	0.00	No	0.00	No
	61	z	-0.012	0.00	0.00	No	0.00	No
	62	z	-0.012	0.00	0.00	No	0.00	No
	63	z	-0.012	0.00	0.00	No	0.00	No
	64	z	-0.012	0.00	0.00	No	0.00	No
	65	z	-0.012	0.00	0.00	No	0.00	No
	69	z	-0.008	0.00	0.00	No	0.00	No
	70	z	-0.008	0.00	0.00	No	0.00	No
	71	z	-0.008	0.00	0.00	No	0.00	No
	72	z	-0.008	0.00	0.00	No	0.00	No
	73	z	-0.008	0.00	0.00	No	0.00	No
	74	z	-0.008	0.00	0.00	No	0.00	No
	75	z	-0.012	0.00	0.00	No	0.00	No
	76	z	-0.012	0.00	0.00	No	0.00	No
	77	z	-0.012	0.00	0.00	No	0.00	No
	78	z	-0.012	0.00	0.00	No	0.00	No
	79	z	-0.012	0.00	0.00	No	0.00	No
	80	z	-0.012	0.00	0.00	No	0.00	No
	84	z	-0.008	0.00	0.00	No	0.00	No
	85	z	-0.008	0.00	0.00	No	0.00	No
	86	z	-0.008	0.00	0.00	No	0.00	No
	89	z	-0.012	0.00	0.00	No	0.00	No
	90	z	-0.012	0.00	0.00	No	0.00	No
	91	z	-0.012	0.00	0.00	No	0.00	No
	92	z	-0.012	0.00	0.00	No	0.00	No
W30	22	x	-0.012	0.00	0.00	No	0.00	No
	23	x	-0.012	0.00	0.00	No	0.00	No
	27	x	-0.012	0.00	0.00	No	0.00	No
	28	x	-0.012	0.00	0.00	No	0.00	No
	29	x	-0.012	0.00	0.00	No	0.00	No
	33	x	-0.018	0.00	0.00	No	0.00	No
	34	x	-0.018	0.00	0.00	No	0.00	No
	35	x	-0.018	0.00	0.00	No	0.00	No
	36	x	-0.018	0.00	0.00	No	0.00	No
	37	x	-0.018	0.00	0.00	No	0.00	No
	38	x	-0.018	0.00	0.00	No	0.00	No
	39	x	-0.018	0.00	0.00	No	0.00	No
	40	x	-0.018	0.00	0.00	No	0.00	No
	42	x	-0.018	0.00	0.00	No	0.00	No
	43	x	-0.018	0.00	0.00	No	0.00	No
	44	x	-0.018	0.00	0.00	No	0.00	No
	58	x	-0.018	0.00	0.00	No	0.00	No

	59	x	-0.018	0.00	0.00	No	0.00	No
	60	x	-0.012	0.00	0.00	No	0.00	No
	61	x	-0.012	0.00	0.00	No	0.00	No
	62	x	-0.012	0.00	0.00	No	0.00	No
	63	x	-0.012	0.00	0.00	No	0.00	No
	64	x	-0.012	0.00	0.00	No	0.00	No
	65	x	-0.012	0.00	0.00	No	0.00	No
	69	x	-0.008	0.00	0.00	No	0.00	No
	70	x	-0.008	0.00	0.00	No	0.00	No
	71	x	-0.008	0.00	0.00	No	0.00	No
	72	x	-0.008	0.00	0.00	No	0.00	No
	73	x	-0.008	0.00	0.00	No	0.00	No
	74	x	-0.008	0.00	0.00	No	0.00	No
	75	x	-0.012	0.00	0.00	No	0.00	No
	76	x	-0.012	0.00	0.00	No	0.00	No
	77	x	-0.012	0.00	0.00	No	0.00	No
	78	x	-0.012	0.00	0.00	No	0.00	No
	79	x	-0.012	0.00	0.00	No	0.00	No
	80	x	-0.012	0.00	0.00	No	0.00	No
	84	x	-0.008	0.00	0.00	No	0.00	No
	85	x	-0.008	0.00	0.00	No	0.00	No
	86	x	-0.008	0.00	0.00	No	0.00	No
	89	x	-0.012	0.00	0.00	No	0.00	No
	90	x	-0.012	0.00	0.00	No	0.00	No
	91	x	-0.012	0.00	0.00	No	0.00	No
	92	x	-0.012	0.00	0.00	No	0.00	No
Di	21	y	-0.012	0.00	0.00	No	0.00	No
	22	y	-0.012	0.00	0.00	No	0.00	No
	23	y	-0.012	0.00	0.00	No	0.00	No
	27	y	-0.017	0.00	0.00	No	0.00	No
	28	y	-0.017	0.00	0.00	No	0.00	No
	29	y	-0.017	0.00	0.00	No	0.00	No
	33	y	-0.009	0.00	0.00	No	0.00	No
	34	y	-0.009	0.00	0.00	No	0.00	No
	35	y	-0.009	0.00	0.00	No	0.00	No
	36	y	-0.009	0.00	0.00	No	0.00	No
	37	y	-0.009	0.00	0.00	No	0.00	No
	38	y	-0.009	0.00	0.00	No	0.00	No
	39	y	-0.009	0.00	0.00	No	0.00	No
	40	y	-0.009	0.00	0.00	No	0.00	No
	41	y	-0.009	0.00	0.00	No	0.00	No
	42	y	-0.009	0.00	0.00	No	0.00	No
	43	y	-0.009	0.00	0.00	No	0.00	No
	44	y	-0.009	0.00	0.00	No	0.00	No
	57	y	-0.009	0.00	0.00	No	0.00	No
	58	y	-0.009	0.00	0.00	No	0.00	No
	59	y	-0.009	0.00	0.00	No	0.00	No
	60	y	-0.012	0.00	0.00	No	0.00	No
	61	y	-0.012	0.00	0.00	No	0.00	No
	62	y	-0.012	0.00	0.00	No	0.00	No
	63	y	-0.012	0.00	0.00	No	0.00	No
	64	y	-0.012	0.00	0.00	No	0.00	No
	65	y	-0.012	0.00	0.00	No	0.00	No
	66	y	-0.007	0.00	0.00	No	0.00	No
	67	y	-0.007	0.00	0.00	No	0.00	No
	68	y	-0.007	0.00	0.00	No	0.00	No
	69	y	-0.009	0.00	0.00	No	0.00	No
	70	y	-0.009	0.00	0.00	No	0.00	No
	71	y	-0.009	0.00	0.00	No	0.00	No
	72	y	-0.009	0.00	0.00	No	0.00	No

73	y	-0.009	0.00	0.00	No	0.00	No
74	y	-0.009	0.00	0.00	No	0.00	No
75	y	-0.012	0.00	0.00	No	0.00	No
76	y	-0.012	0.00	0.00	No	0.00	No
77	y	-0.012	0.00	0.00	No	0.00	No
78	y	-0.012	0.00	0.00	No	0.00	No
79	y	-0.012	0.00	0.00	No	0.00	No
80	y	-0.012	0.00	0.00	No	0.00	No
84	y	-0.009	0.00	0.00	No	0.00	No
85	y	-0.009	0.00	0.00	No	0.00	No
86	y	-0.009	0.00	0.00	No	0.00	No
87	y	-0.012	0.00	0.00	No	0.00	No
88	y	-0.012	0.00	0.00	No	0.00	No
89	y	-0.012	0.00	0.00	No	0.00	No
90	y	-0.012	0.00	0.00	No	0.00	No
91	y	-0.012	0.00	0.00	No	0.00	No
92	y	-0.012	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	33	y	-0.015	3.00	No
		y	-0.015	7.00	No
		y	-0.016	50.00	Yes
	34	y	-0.034	2.00	No
		y	-0.034	8.00	No
	35	y	-0.143	2.00	No
		y	-0.033	50.00	Yes
	36	y	-0.048	1.50	No
		y	-0.048	8.50	No
	37	y	-0.015	3.00	No
		y	-0.015	7.00	No
		y	-0.016	50.00	Yes
	38	y	-0.034	2.00	No
		y	-0.034	8.00	No
	39	y	-0.143	2.00	No
		y	-0.033	50.00	Yes
	40	y	-0.048	1.50	No
		y	-0.048	8.50	No
	41	y	-0.015	3.00	No
		y	-0.015	7.00	No
		y	-0.016	50.00	Yes
42	y	-0.034	2.00	No	
	y	-0.034	8.00	No	
43	y	-0.143	2.00	No	
44	y	-0.048	1.50	No	
	y	-0.048	8.50	No	
W0	33	z	-0.101	3.00	No
		z	-0.101	7.00	No

	34	z	-0.24	2.00	No
		z	-0.24	8.00	No
	35	z	-0.052	2.00	No
		z	-0.05	2.00	No
		z	-0.072	50.00	Yes
	36	z	-0.331	1.50	No
		z	-0.331	8.50	No
	37	z	-0.068	3.00	No
		z	-0.068	7.00	No
		z	-0.019	50.00	Yes
	38	z	-0.165	2.00	No
		z	-0.165	8.00	No
	39	z	-0.068	2.00	No
		z	-0.072	50.00	Yes
	40	z	-0.196	1.50	No
		z	-0.196	8.50	No
	41	z	-0.068	3.00	No
		z	-0.068	7.00	No
		z	-0.019	50.00	Yes
	42	z	-0.165	2.00	No
		z	-0.165	8.00	No
	43	z	-0.068	2.00	No
	44	z	-0.196	1.50	No
		z	-0.196	8.50	No
W30	33	x	-0.057	3.00	No
		x	-0.057	7.00	No
		x	-0.02	50.00	Yes
	34	x	-0.139	2.00	No
		x	-0.139	8.00	No
	35	x	-0.073	2.00	No
		x	-0.072	50.00	Yes
	36	x	-0.151	1.50	No
		x	-0.151	8.50	No
	37	x	-0.09	3.00	No
		x	-0.09	7.00	No
		x	-0.017	50.00	Yes
	38	x	-0.215	2.00	No
		x	-0.215	8.00	No
	39	x	-0.058	2.00	No
		x	-0.072	50.00	Yes
	40	x	-0.286	1.50	No
		x	-0.286	8.50	No
	41	x	-0.09	3.00	No
		x	-0.09	7.00	No
		x	-0.017	50.00	Yes
	42	x	-0.215	2.00	No
		x	-0.215	8.00	No
	43	x	-0.058	2.00	No
	44	x	-0.286	1.50	No
		x	-0.286	8.50	No
Di	33	y	-0.066	3.00	No
		y	-0.066	7.00	No
		y	-0.017	50.00	Yes
	34	y	-0.143	2.00	No
		y	-0.143	8.00	No
	35	y	-0.103	2.00	No
		y	-0.046	50.00	Yes
	36	y	-0.194	1.50	No
		y	-0.194	8.50	No
	37	y	-0.066	3.00	No

		y	-0.066	7.00	No
		y	-0.017	50.00	Yes
38		y	-0.143	2.00	No
		y	-0.143	8.00	No
39		y	-0.103	2.00	No
		y	-0.046	50.00	Yes
40		y	-0.194	1.50	No
		y	-0.194	8.50	No
41		y	-0.066	3.00	No
		y	-0.066	7.00	No
		y	-0.017	50.00	Yes
42		y	-0.143	2.00	No
		y	-0.143	8.00	No
43		y	-0.103	2.00	No
44		y	-0.194	1.50	No
		y	-0.194	8.50	No
Wi0	33	z	-0.022	3.00	No
		z	-0.022	7.00	No
	34	z	-0.049	2.00	No
		z	-0.049	8.00	No
35		z	-0.013	2.00	No
		z	-0.013	2.00	No
		z	-0.018	50.00	Yes
36		z	-0.064	1.50	No
		z	-0.064	8.50	No
37		z	-0.016	3.00	No
		z	-0.016	7.00	No
		z	-0.006	50.00	Yes
38		z	-0.036	2.00	No
		z	-0.036	8.00	No
39		z	-0.016	2.00	No
		z	-0.018	50.00	Yes
40		z	-0.041	1.50	No
		z	-0.041	8.50	No
41		z	-0.016	3.00	No
		z	-0.016	7.00	No
		z	-0.006	50.00	Yes
42		z	-0.036	2.00	No
		z	-0.036	8.00	No
43		z	-0.016	2.00	No
44		z	-0.041	1.50	No
		z	-0.041	8.50	No
Wi30	33	x	-0.015	3.00	No
		x	-0.015	7.00	No
		x	-0.007	50.00	Yes
34		x	-0.031	2.00	No
		x	-0.031	8.00	No
35		x	-0.017	2.00	No
		x	-0.018	50.00	Yes
36		x	-0.034	1.50	No
		x	-0.034	8.50	No
37		x	-0.02	3.00	No
		x	-0.02	7.00	No
		x	-0.006	50.00	Yes
38		x	-0.044	2.00	No
		x	-0.044	8.00	No
39		x	-0.014	2.00	No
		x	-0.018	50.00	Yes
40		x	-0.056	1.50	No
		x	-0.056	8.50	No

	41	x	-0.02	3.00	No
		x	-0.02	7.00	No
		x	-0.006	50.00	Yes
	42	x	-0.044	2.00	No
		x	-0.044	8.00	No
	43	x	-0.014	2.00	No
	44	x	-0.056	1.50	No
		x	-0.056	8.50	No
WLO	33	z	-0.006	3.00	No
		z	-0.006	7.00	No
		z	-0.001	50.00	Yes
	34	z	-0.014	2.00	No
		z	-0.014	8.00	No
	35	z	-0.003	2.00	No
		z	-0.003	2.00	No
		z	-0.004	50.00	Yes
	36	z	-0.02	1.50	No
		z	-0.02	8.50	No
	37	z	-0.004	3.00	No
		z	-0.004	7.00	No
		z	-0.001	50.00	Yes
	38	z	-0.01	2.00	No
		z	-0.01	8.00	No
	39	z	-0.004	2.00	No
		z	-0.004	50.00	Yes
	40	z	-0.012	1.50	No
		z	-0.012	8.50	No
	41	z	-0.004	3.00	No
		z	-0.004	7.00	No
		z	-0.001	50.00	Yes
	42	z	-0.01	2.00	No
		z	-0.01	8.00	No
	43	z	-0.004	2.00	No
	44	z	-0.012	1.50	No
		z	-0.012	8.50	No
WL30	33	x	-0.004	3.00	No
		x	-0.004	7.00	No
		x	-0.001	50.00	Yes
	34	x	-0.009	2.00	No
		x	-0.009	8.00	No
	35	x	-0.004	2.00	No
		x	-0.004	50.00	Yes
	36	x	-0.009	1.50	No
		x	-0.009	8.50	No
	37	x	-0.006	3.00	No
		x	-0.006	7.00	No
		x	-0.001	50.00	Yes
	38	x	-0.013	2.00	No
		x	-0.013	8.00	No
	39	x	-0.003	2.00	No
		x	-0.004	50.00	Yes
	40	x	-0.017	1.50	No
		x	-0.017	8.50	No
	41	x	-0.006	3.00	No
		x	-0.006	7.00	No
		x	-0.001	50.00	Yes
	42	x	-0.013	2.00	No
		x	-0.013	8.00	No
	43	x	-0.003	2.00	No
	44	x	-0.017	1.50	No

		x	-0.017	8.50	No
LL1	57	y	-0.25	50.00	Yes
LL2	57	y	-0.25	100.00	Yes
LLa1	33	y	-0.25	50.00	Yes
LLa2	34	y	-0.25	50.00	Yes
LLa3	36	y	-0.25	50.00	Yes

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
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

Steel Code Check

Report: Summary - Group by member
Load conditions to be included in design :

LC1=1.2DL+W0
 LC2=1.2DL+W30
 LC3=1.2DL-W0
 LC4=1.2DL-W30
 LC5=0.9DL+W0
 LC6=0.9DL+W30
 LC7=0.9DL-W0
 LC8=0.9DL-W30
 LC9=1.2DL+Di+Wi0
 LC10=1.2DL+Di+Wi30
 LC11=1.2DL+Di-Wi0
 LC12=1.2DL+Di-Wi30
 LC13=1.2DL
 LC15=1.2DL+1.5LL1
 LC16=1.2DL+1.5LL2
 LC17=1.2DL+W0+1.5LLa1
 LC18=1.2DL+W30+1.5LLa1
 LC19=1.2DL-W0+1.5LLa1
 LC20=1.2DL-W30+1.5LLa1
 LC21=1.2DL+W0+1.5LLa2
 LC22=1.2DL+W30+1.5LLa2
 LC23=1.2DL-W0+1.5LLa2
 LC24=1.2DL-W30+1.5LLa2
 LC25=1.2DL+W0+1.5LLa3
 LC26=1.2DL+W30+1.5LLa3
 LC27=1.2DL-W0+1.5LLa3
 LC28=1.2DL-W30+1.5LLa3
 LC29=1.2DL+W0+1.5LLa4
 LC30=1.2DL+W30+1.5LLa4
 LC31=1.2DL-W0+1.5LLa4
 LC32=1.2DL-W30+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	<i>HSS_RECT 6X3X3_16</i>	27	LC11 at 0.00%	0.24	OK	Eq. H1-1b
		28	LC12 at 0.00%	0.23	OK	Eq. H1-1b
		29	LC9 at 0.00%	0.24	OK	Eq. H1-1b
	<i>HSS_SQR 3X3X1_4</i>	87	LC11 at 100.00%	0.16	OK	Eq. H1-1b
		88	LC10 at 0.00%	0.14	OK	Eq. H1-1b
		89	LC11 at 100.00%	0.14	OK	Eq. H1-1b
		90	LC12 at 0.00%	0.15	OK	Eq. H1-1b
		91	LC9 at 100.00%	0.14	OK	Eq. H1-1b
		92	LC10 at 0.00%	0.15	OK	Eq. H1-1b
	<i>HSS_SQR 3X3X3_16</i>	21	LC12 at 59.72%	0.12	OK	Eq. H1-1b
		22	LC11 at 40.28%	0.13	OK	Eq. H1-1b
		23	LC10 at 40.28%	0.12	OK	Eq. H1-1b
		75	LC11 at 100.00%	0.31	OK	Eq. H1-1b
		76	LC10 at 0.00%	0.31	OK	Eq. H1-1b
		77	LC12 at 100.00%	0.30	OK	Eq. H1-1b
		78	LC12 at 0.00%	0.29	OK	Eq. H1-1b

	79	LC9 at 100.00%	0.30	OK	Eq. H1-1b
	80	LC9 at 100.00%	0.30	OK	Eq. H1-1b
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HSS_SQR 3X3X5_16	60	LC2 at 50.00%	0.31	OK	Eq. H1-1b
	61	LC4 at 50.00%	0.35	OK	Eq. H1-1b
	62	LC3 at 50.00%	0.30	OK	Eq. H1-1b
	63	LC3 at 0.00%	0.35	OK	Eq. H1-1b
	64	LC9 at 0.00%	0.30	OK	Eq. H1-1b
	65	LC4 at 0.00%	0.37	OK	Eq. H1-1b
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L 2X2X1_4	69	LC11 at 90.63%	0.59	OK	Eq. H3-8
	70	LC12 at 90.63%	0.33	OK	Eq. H2-1
	71	LC12 at 90.63%	0.33	OK	Eq. H2-1
	72	LC12 at 9.38%	0.32	OK	Eq. H2-1
	73	LC10 at 90.63%	0.58	OK	Eq. H3-8
	74	LC10 at 9.38%	0.63	OK	Eq. H3-8
	84	LC12 at 50.00%	0.33	OK	Eq. H2-1
	85	LC10 at 50.00%	0.33	OK	Eq. H2-1
	86	LC11 at 50.00%	0.33	OK	Eq. H2-1
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PIPE 2-1_2x0.203	33	LC4 at 45.83%	0.15	OK	Eq. H1-1b
	34	LC3 at 43.75%	0.24	OK	Eq. H1-1b
	35	LC10 at 93.75%	0.20	OK	Eq. H1-1b
	36	LC1 at 43.75%	0.40	OK	Eq. H1-1b
	37	LC2 at 45.83%	0.15	OK	Eq. H1-1b
	38	LC2 at 43.75%	0.29	OK	Eq. H1-1b
	39	LC12 at 93.75%	0.22	OK	Eq. H1-1b
	40	LC4 at 43.75%	0.42	OK	Eq. H1-1b
	41	LC1 at 45.83%	0.15	OK	Eq. H1-1b
	42	LC4 at 43.75%	0.29	OK	Eq. H1-1b
	43	LC11 at 93.75%	0.18	OK	Eq. H1-1b
	44	LC2 at 43.75%	0.42	OK	Eq. H1-1b
	57	LC1 at 13.39%	0.48	OK	Eq. H1-1b
	58	LC4 at 86.61%	0.47	OK	Eq. H1-1b
	59	LC2 at 86.61%	0.45	OK	Eq. H1-1b
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PL 2x1/8	66	LC10 at 100.00%	0.37	With warnings	Eq. H1-1a
	67	LC12 at 100.00%	0.36	With warnings	Eq. H1-1a
	68	LC9 at 100.00%	0.37	With warnings	Eq. H1-1a

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

- LC1=1.2DL+W0
- LC2=1.2DL+W30
- LC3=1.2DL-W0
- LC4=1.2DL-W30
- LC5=0.9DL+W0
- LC6=0.9DL+W30
- LC7=0.9DL-W0
- LC8=0.9DL-W30
- LC9=1.2DL+Di+Wi0
- LC10=1.2DL+Di+Wi30
- LC11=1.2DL+Di-Wi0
- LC12=1.2DL+Di-Wi30
- LC13=1.2DL
- LC15=1.2DL+1.5LL1
- LC16=1.2DL+1.5LL2
- LC17=1.2DL+W0+1.5LLa1
- LC18=1.2DL+W30+1.5LLa1
- LC19=1.2DL-W0+1.5LLa1
- LC20=1.2DL-W30+1.5LLa1
- LC21=1.2DL+W0+1.5LLa2
- LC22=1.2DL+W30+1.5LLa2
- LC23=1.2DL-W0+1.5LLa2
- LC24=1.2DL-W30+1.5LLa2
- LC25=1.2DL+W0+1.5LLa3
- LC26=1.2DL+W30+1.5LLa3
- LC27=1.2DL-W0+1.5LLa3
- LC28=1.2DL-W30+1.5LLa3
- LC29=1.2DL+W0+1.5LLa4
- LC30=1.2DL+W30+1.5LLa4
- LC31=1.2DL-W0+1.5LLa4
- LC32=1.2DL-W30+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	<i>HSS_RECT 6X3X3_16</i>	27	LC11 at 0.00%	0.24	OK	Eq. H1-1b
		28	LC12 at 0.00%	0.23	OK	Eq. H1-1b
		29	LC9 at 0.00%	0.24	OK	Eq. H1-1b
	<i>HSS_SQR 3X3X1_4</i>	87	LC11 at 100.00%	0.16	OK	Eq. H1-1b
		88	LC10 at 0.00%	0.14	OK	Eq. H1-1b
		89	LC11 at 100.00%	0.14	OK	Eq. H1-1b
		90	LC12 at 0.00%	0.15	OK	Eq. H1-1b
		91	LC9 at 100.00%	0.14	OK	Eq. H1-1b
		92	LC10 at 0.00%	0.15	OK	Eq. H1-1b
	<i>HSS_SQR 3X3X3_16</i>	21	LC12 at 59.72%	0.12	OK	Eq. H1-1b
		22	LC11 at 40.28%	0.13	OK	Eq. H1-1b
		23	LC10 at 40.28%	0.12	OK	Eq. H1-1b
		75	LC11 at 100.00%	0.31	OK	Eq. H1-1b
		76	LC10 at 0.00%	0.31	OK	Eq. H1-1b
		77	LC12 at 100.00%	0.30	OK	Eq. H1-1b
		78	LC12 at 0.00%	0.29	OK	Eq. H1-1b

	79	LC9 at 100.00%	0.30	OK	Eq. H1-1b
	80	LC9 at 100.00%	0.30	OK	Eq. H1-1b
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<i>HSS_SQR 3X3X5_16</i>	60	LC2 at 50.00%	0.31	OK	Eq. H1-1b
	61	LC4 at 50.00%	0.35	OK	Eq. H1-1b
	62	LC3 at 50.00%	0.30	OK	Eq. H1-1b
	63	LC3 at 0.00%	0.35	OK	Eq. H1-1b
	64	LC9 at 0.00%	0.30	OK	Eq. H1-1b
	65	LC4 at 0.00%	0.37	OK	Eq. H1-1b
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<i>L 2X2X1_4</i>	69	LC11 at 90.63%	0.59	OK	Eq. H3-8
	70	LC12 at 90.63%	0.33	OK	Eq. H2-1
	71	LC12 at 90.63%	0.33	OK	Eq. H2-1
	72	LC12 at 9.38%	0.32	OK	Eq. H2-1
	73	LC10 at 90.63%	0.58	OK	Eq. H3-8
	74	LC10 at 9.38%	0.63	OK	Eq. H3-8
	84	LC12 at 50.00%	0.33	OK	Eq. H2-1
	85	LC10 at 50.00%	0.33	OK	Eq. H2-1
	86	LC11 at 50.00%	0.33	OK	Eq. H2-1
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<i>PIPE 2-1_2x0.203</i>	33	LC4 at 45.83%	0.15	OK	Eq. H1-1b
	34	LC1 at 43.75%	0.24	OK	Eq. H1-1b
	35	LC10 at 93.75%	0.20	OK	Eq. H1-1b
	36	LC1 at 43.75%	0.40	OK	Eq. H1-1b
	37	LC2 at 45.83%	0.15	OK	Eq. H1-1b
	38	LC4 at 43.75%	0.29	OK	Eq. H1-1b
	39	LC12 at 93.75%	0.22	OK	Eq. H1-1b
	40	LC2 at 43.75%	0.42	OK	Eq. H1-1b
	41	LC1 at 45.83%	0.15	OK	Eq. H1-1b
	42	LC2 at 43.75%	0.29	OK	Eq. H1-1b
	43	LC11 at 93.75%	0.18	OK	Eq. H1-1b
	44	LC4 at 43.75%	0.42	OK	Eq. H1-1b
	57	LC1 at 13.39%	0.48	OK	Eq. H1-1b
	58	LC4 at 86.61%	0.47	OK	Eq. H1-1b
	59	LC2 at 86.61%	0.45	OK	Eq. H1-1b
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<i>PL 2x1/8</i>	66	LC10 at 100.00%	0.37	With warnings	Eq. H1-1a
	67	LC12 at 100.00%	0.36	With warnings	Eq. H1-1a
	68	LC9 at 100.00%	0.37	With warnings	Eq. H1-1a