May 2, 2022
December 6, 2022 (Rev.1)

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

RE:	AT&T Site Number:	CT5322
	FA Number:	10071101
	PACE Number:	MRCTB050992
	PT Number:	2051A0Z79T
	TEP Project Number:	N/A
	AT&T Site Name:	MANCHESTER SOUTH CENTRAL
	Site Address:	63 Elm Street Manchester, CT 06040

To Whom It May Concern:

TEP Northeast (TEP NE) has been authorized by Centerline Communications to perform a mount analysis on the existing AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (3) 800-10798 Antennas (78.5"x14.8"x6.7"– Wt. = 87 lbs. /each)
- (3) 800-10965 Antennas (78.7"x20.0"x6.9"– Wt. = 109 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)
- (3) 4426 B66 RRH's (14.9"x13.2"x5.8" – Wt. = 49 lbs. /each)
- (3) 4415 B25 RRH's (16.5"x13.4"x5.9" – Wt. = 46 lbs. /each)
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – Wt. 82 lbs. /each)**
- **(3) AIR6419 Antennas (31.1"x16.1"x7.3" – Wt. = 66 lbs. /each)**
- **(3) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)**
- **(3) RRUS-2012 B29 RRH's (16.5"x13.5"x4.9" – Wt. = 43 lbs. /each)**
- **(3) B5/B12 4449 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(3) DC9-48-60-24-8C-EV Surge Arrestors (31.4"x10.2"Ø – Wt. = 29 lbs.)**

**Proposed equipment shown in bold*

No original structural design documents or fabrication drawings were available for the existing mounts. TEP NE conducted a ground audit of the existing AT&T antenna mounts on March 23, 2021. Construction drawings prepared by Hudson Design group, LLC. dated August 14, 2012 were used in this analysis.

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 2021 with 2022 Connecticut State Building Code, and AT&T Mount Technical Directive – R22.

- TEP NE 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 P of the Connecticut State Building Code, the max basic wind speed for this site is equal to 120 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 1.77 in was used for this analysis.

- TEP NE considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.

- TEP NE considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.

- TEP NE considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.190 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.055.

- The existing mounts are secured to the existing smokestack with steel bands and threaded rods. TEP NE considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that the existing mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	3	LC1	55%	**PASS**

This determination was based on the following limitations and assumptions:

1. TEP NE is not responsible for any modifications completed prior to and hereafter which TEP NE 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 smokestack 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. TEP NE performed a localized analysis on the mount itself and not on the supporting smokestack structure.

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

Respectfully Submitted,
TEP Northeast

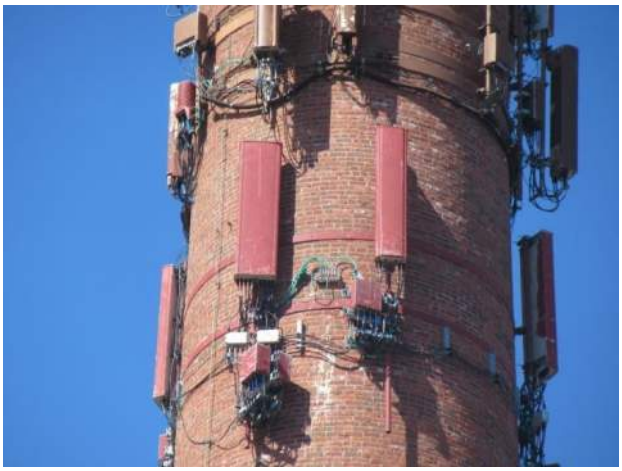
Michael Cabral
Director

Daniel P. Hamm, PE
Vice President

FIELD PHOTOS:

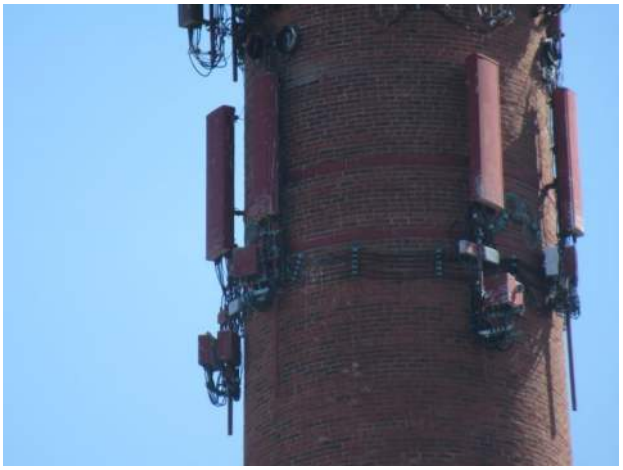


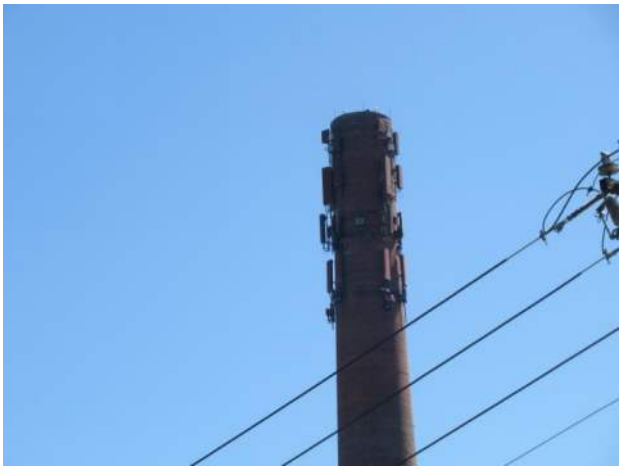












Wind & Ice
Calculations

Date: 12/6/2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM **Checked By:** MSC

TEP NORTHEAST

2.6.5.2 Velocity Pressure Coeff:

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

z=	175	(ft)
z_g=	1200	(ft)
α=	7.0	

K_z= 1.160

Kzmin ≤ Kz ≤ 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

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

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

K_{zt}= 1

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

Category= **1**

K_h=	1	
K_c=	0.9	(from Table 2-4)
K_t=		(from Table 2-5)
f=		(from Table 2-5)
z=	175	
z_s=	206	(Mean elevation of base of structure above se
H=		(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)

2.6.10 Design Ice Thickness

Max Ice Thickness =	t_i =	1.50	in
Importance Factor =	I=	1.00	(from Table 2-3)
	K_{iz} =	1.18	(from Sec. 2.6.10)

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

t_{iz} = 1.77 in

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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=	200.75	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
(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**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=	1.160	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**40.31**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**7.00**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.52**	V_{max}=	120	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

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
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

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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 = **1.77** **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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	**163**	**39**	**10**
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.93	1.20	**168**	**40**	**11**
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	**512**	**109**	**32**
800-10798 Antenna	78.5	14.8	6.7	8.07	5.30	1.32	**431**	**97**	**27**
800-10965 Antenna	78.7	20.0	6.9	10.93	3.94	1.26	**557**	**119**	**35**
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**79**	**21**	**5**
4415 B25 RRH	16.5	13.5	6.3	1.55	1.22	1.20	**75**	**20**	**5**
B14 4478 RRH	18.1	13.4	8.3	1.68	1.35	1.20	**81**	**21**	**5**
4426 B66 RRH	14.9	13.2	5.8	1.37	1.13	1.20	**66**	**18**	**4**
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	1.23	1.20	**74**	**20**	**5**
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	**111**	**28**	**7**
DC9-48-60-24-8C-EV Surge Arrestor	31.4	10.2	10.2	2.22	3.08	0.70	**63**	**16**	**4**
2" Pipe	2.4	12.0	-	0.20	0.20	1.20	**10**		

Date: 12/6/2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM Checked By: MSC

WIND LOADS

Angle = 30 (deg) | Ice Thickness = 1.77 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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	163	111	150
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	168	81	146
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	512	226	441
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	431	229	380
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	557	235	476
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	79	57	74
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	75	35	65
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	81	50	74
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	66	29	57
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	74	36	65
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	100

WIND LOADS WITH ICE:

AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.41	1.20	1.20	39	28	36
AIR6419 Antenna	34.6	19.6	10.8	4.73	2.61	1.76	3.19	1.20	1.23	40	22	35
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.58	5.84	3.08	6.65	1.23	1.38	108	57	95
800-10798 Antenna	82.0	18.3	10.2	10.45	5.84	4.47	8.01	1.29	1.43	94	59	85
800-10965 Antenna	82.2	23.5	10.4	13.45	5.97	3.49	7.87	1.24	1.43	117	60	103
B5/B12 4449 RRH	21.4	16.7	12.9	2.49	1.93	1.28	1.66	1.20	1.20	21	16	20
4415 B25 RRH	20.0	17.0	9.8	2.37	1.37	1.18	2.04	1.20	1.20	20	12	18
B14 4478 RRH	21.6	16.9	11.8	2.55	1.78	1.28	1.83	1.20	1.20	21	15	20
4426 B66 RRH	18.4	16.7	9.3	2.14	1.20	1.10	1.97	1.20	1.20	18	10	16
RRUS-2012 B29 RRH	20.0	16.9	9.9	2.36	1.38	1.18	2.02	1.20	1.20	20	12	18
RRUS-32 B30 RRH	30.7	15.6	10.5	3.34	2.25	1.97	2.92	1.20	1.22	28	19	26

WIND LOADS AT 30 MPH:

AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	9
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	11	5	9
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	32	14	28
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	27	14	24
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	35	15	30
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	5
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	5	2	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	5
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	4
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	5	2	4
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	7	4	6

Date: 12/6/2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM Checked By: MSC

WIND LOADS

Angle = 60 (deg) | Ice Thickness = 1.77 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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	163	111	124
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	168	81	103
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	512	226	298
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	431	229	280
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	557	235	316
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	79	57	62
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	75	35	45
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	81	50	58
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	66	29	38
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	74	36	45
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	78

WIND LOADS WITH ICE:

AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.41	1.20	1.20	39	28	31
AIR6419 Antenna	34.6	19.6	10.8	4.73	2.61	1.76	3.19	1.20	1.23	40	22	27
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.58	5.84	3.08	6.65	1.23	1.38	108	57	69
800-10798 Antenna	82.0	18.3	10.2	10.45	5.84	4.47	8.01	1.29	1.43	94	59	67
800-10965 Antenna	82.2	23.5	10.4	13.45	5.97	3.49	7.87	1.24	1.43	117	60	74
B5/B12 4449 RRH	21.4	16.7	12.9	2.49	1.93	1.28	1.66	1.20	1.20	21	16	17
4415 B25 RRH	20.0	17.0	9.8	2.37	1.37	1.18	2.04	1.20	1.20	20	12	14
B14 4478 RRH	21.6	16.9	11.8	2.55	1.78	1.28	1.83	1.20	1.20	21	15	17
4426 B66 RRH	18.4	16.7	9.3	2.14	1.20	1.10	1.97	1.20	1.20	18	10	12
RRUS-2012 B29 RRH	20.0	16.9	9.9	2.36	1.38	1.18	2.02	1.20	1.20	20	12	14
RRUS-32 B30 RRH	30.7	15.6	10.5	3.34	2.25	1.97	2.92	1.20	1.22	28	19	21

WIND LOADS AT 30 MPH:

AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	8
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	11	5	6
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	32	14	19
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	27	14	17
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	35	15	20
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	4
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	5	2	3
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	2
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	5	2	3
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	7	4	5

Date: 12/6/2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM Checked By: MSC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.77	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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	163	111	111
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	168	81	81
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	512	226	226
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	431	229	229
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	557	235	235
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	79	57	57
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	75	35	35
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	81	50	50
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	66	29	29
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	74	36	36
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	67

WIND LOADS WITH ICE:

AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.41	1.20	1.20	39	28	28
AIR6419 Antenna	34.6	19.6	10.8	4.73	2.61	1.76	3.19	1.20	1.23	40	22	22
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.58	5.84	3.08	6.65	1.23	1.38	108	57	57
800-10798 Antenna	82.0	18.3	10.2	10.45	5.84	4.47	8.01	1.29	1.43	94	59	59
800-10965 Antenna	82.2	23.5	10.4	13.45	5.97	3.49	7.87	1.24	1.43	117	60	60
B5/B12 4449 RRH	21.4	16.7	12.9	2.49	1.93	1.28	1.66	1.20	1.20	21	16	16
4415 B25 RRH	20.0	17.0	9.8	2.37	1.37	1.18	2.04	1.20	1.20	20	12	12
B14 4478 RRH	21.6	16.9	11.8	2.55	1.78	1.28	1.83	1.20	1.20	21	15	15
4426 B66 RRH	18.4	16.7	9.3	2.14	1.20	1.10	1.97	1.20	1.20	18	10	10
RRUS-2012 B29 RRH	20.0	16.9	9.9	2.36	1.38	1.18	2.02	1.20	1.20	20	12	12
RRUS-32 B30 RRH	30.7	15.6	10.5	3.34	2.25	1.97	2.92	1.20	1.22	28	19	19

WIND LOADS AT 30 MPH:

AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	7
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	11	5	5
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	32	14	14
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	27	14	14
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	35	15	15
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	4
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	5	2	2
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	2
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	5	2	2
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	7	4	4

Date: 12/6/2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM Checked By: MSC

WIND LOADS

Angle = 120 (deg) | Ice Thickness = 1.77 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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	163	111	124
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	168	81	103
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	512	226	298
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	431	229	280
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	557	235	316
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	79	57	62
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	75	35	45
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	81	50	58
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	66	29	38
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	74	36	45
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	78

WIND LOADS WITH 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)
AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.41	1.20	1.20	39	28	31
AIR6419 Antenna	34.6	19.6	10.8	4.73	2.61	1.76	3.19	1.20	1.23	40	22	27
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.58	5.84	3.08	6.65	1.23	1.38	108	57	69
800-10798 Antenna	82.0	18.3	10.2	10.45	5.84	4.47	8.01	1.29	1.43	94	59	67
800-10965 Antenna	82.2	23.5	10.4	13.45	5.97	3.49	7.87	1.24	1.43	117	60	74
B5/B12 4449 RRH	21.4	16.7	12.9	2.49	1.93	1.28	1.66	1.20	1.20	21	16	17
4415 B25 RRH	20.0	17.0	9.8	2.37	1.37	1.18	2.04	1.20	1.20	20	12	14
B14 4478 RRH	21.6	16.9	11.8	2.55	1.78	1.28	1.83	1.20	1.20	21	15	17
4426 B66 RRH	18.4	16.7	9.3	2.14	1.20	1.10	1.97	1.20	1.20	18	10	12
RRUS-2012 B29 RRH	20.0	16.9	9.9	2.36	1.38	1.18	2.02	1.20	1.20	20	12	14
RRUS-32 B30 RRH	30.7	15.6	10.5	3.34	2.25	1.97	2.92	1.20	1.22	28	19	21

WIND LOADS AT 30 MPH:

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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	8
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	11	5	6
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	32	14	19
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	27	14	17
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	35	15	20
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	4
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	5	2	3
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	2
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	5	2	3
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	7	4	5

Date: 12/6/2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM Checked By: MSC

WIND LOADS

Angle = 150 (deg) | Ice Thickness = 1.77 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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	163	111	150
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	168	81	146
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	512	226	441
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	431	229	380
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	557	235	476
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	79	57	74
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	75	35	65
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	81	50	74
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	66	29	57
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	74	36	65
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	111	67	100

WIND LOADS WITH 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)
AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.41	1.20	1.20	39	28	36
AIR6419 Antenna	34.6	19.6	10.8	4.73	2.61	1.76	3.19	1.20	1.23	40	22	35
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.58	5.84	3.08	6.65	1.23	1.38	108	57	95
800-10798 Antenna	82.0	18.3	10.2	10.45	5.84	4.47	8.01	1.29	1.43	94	59	85
800-10965 Antenna	82.2	23.5	10.4	13.45	5.97	3.49	7.87	1.24	1.43	117	60	103
B5/B12 4449 RRH	21.4	16.7	12.9	2.49	1.93	1.28	1.66	1.20	1.20	21	16	20
4415 B25 RRH	20.0	17.0	9.8	2.37	1.37	1.18	2.04	1.20	1.20	20	12	18
B14 4478 RRH	21.6	16.9	11.8	2.55	1.78	1.28	1.83	1.20	1.20	21	15	20
4426 B66 RRH	18.4	16.7	9.3	2.14	1.20	1.10	1.97	1.20	1.20	18	10	16
RRUS-2012 B29 RRH	20.0	16.9	9.9	2.36	1.38	1.18	2.02	1.20	1.20	20	12	18
RRUS-32 B30 RRH	30.7	15.6	10.5	3.34	2.25	1.97	2.92	1.20	1.22	28	19	26

WIND LOADS AT 30 MPH:

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)
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	9
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	11	5	9
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	32	14	28
800-10798 Antenna	78.5	14.8	6.7	8.07	3.65	5.30	11.72	1.32	1.56	27	14	24
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	35	15	30
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	5
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	5	2	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	5
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	4
RRUS-2012 B29 RRH	16.5	13.4	6.4	1.54	0.73	1.23	2.58	1.20	1.20	5	2	4
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	7	4	6

Date: 12/6/2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM **Checked By:** MSC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.77 in.
Density of ice: 56 pcf

AIR6449 Antenna

Weight of ice based on total radial SF area:

Height (in):	30.6	
Width (in):	15.9	
Depth (in):	10.6	
Total weight of ice on object:		115 lbs
Weight of object:	82.0	lbs
Combined weight of ice and object:		197 lbs

AIR6419 Antenna

Weight of ice based on total radial SF area:

Height (in):	31.1	
Width (in):	16.1	
Depth (in):	7.3	
Total weight of ice on object:		109 lbs
Weight of object:	66.0	lbs
Combined weight of ice and object:		175 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:		306 lbs
Weight of object:	96.0	lbs
Combined weight of ice and object:		402 lbs

800-10798 Antenna

Weight of ice based on total radial SF area:

Height (in):	78.5	
Width (in):	14.8	
Depth (in):	6.7	
Total weight of ice on object:		255 lbs
Weight of object:	87.0	lbs
Combined weight of ice and object:		342 lbs

800-10965 Antenna

Weight of ice based on total radial SF area:

Height (in):	78.7	
Width (in):	20.0	
Depth (in):	6.9	
Total weight of ice on object:		325 lbs
Weight of object:	109.0	lbs
Combined weight of ice and object:		434 lbs

B5/B12 4449 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:		58 lbs
Weight of object:	73.0	lbs
Combined weight of ice and object:		131 lbs

4415 B25 RRH

Weight of ice based on total radial SF area:

Height (in):	16.5	
Width (in):	13.5	
Depth (in):	6.3	
Total weight of ice on object:		50 lbs
Weight of object:	50.0	lbs
Combined weight of ice and object:		100 lbs

B14 4478 RRH

Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:		57 lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:		117 lbs

4426 B66 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	5.8	
Total weight of ice on object:		43 lbs
Weight of object:	49.0	lbs
Combined weight of ice and object:		92 lbs

RRUS-2012 B29 RRH

Weight of ice based on total radial SF area:

Height (in):	16.5	
Width (in):	13.4	
Depth (in):	6.4	
Total weight of ice on object:		49 lbs
Weight of object:	46.0	lbs
Combined weight of ice and object:		95 lbs

RRUS-32 B30 RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		77 lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:		137 lbs

DC9-48-60-24-8C-EV Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	31.4	
Diameter(in):	10.2	
Total weight of ice on object:		68 lbs
Weight of object:	29	lbs
Combined weight of ice and object:		97 lbs

2" Pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		9 plf

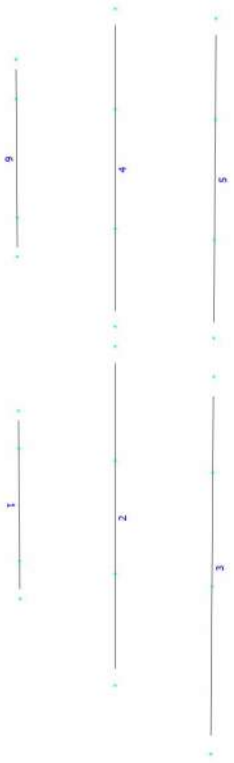
Mount Calculations
(Existing Conditions)


Y
X
Z


A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154


Y
X
Z


Design status
Not designed
Error on design
Design O.K.
With warnings
Y
X
Z


6
4
5
1
2
3


Y
X
Z

RAM® Elements
CONNECT Edition

Current Date: 12/6/2022 9:15 AM
Units system: English

Load data

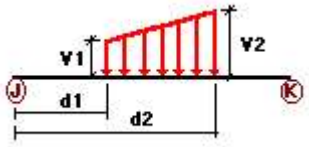
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND

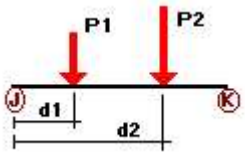
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
W30	1	z	-0.01	-0.01	0.00	No	100.00	Yes
	2	z	-0.01	-0.01	0.00	No	100.00	Yes
	3	z	-0.01	-0.01	0.00	No	100.00	Yes
	4	z	-0.01	-0.01	0.00	No	100.00	Yes
	6	z	-0.01	-0.01	0.00	No	100.00	Yes
	5	z	-0.01	-0.01	0.00	No	100.00	Yes
W60	1	x	-0.01	-0.01	0.00	No	100.00	Yes
	2	x	-0.01	-0.01	0.00	No	100.00	Yes
	3	x	-0.01	-0.01	0.00	No	100.00	Yes
	4	x	-0.01	-0.01	0.00	No	100.00	Yes

	6	x	-0.01	-0.01	0.00	No	100.00	Yes
	5	x	-0.01	-0.01	0.00	No	100.00	Yes
W90	1	x	-0.01	-0.01	0.00	No	100.00	Yes
	2	x	-0.01	-0.01	0.00	No	100.00	Yes
	3	x	-0.01	-0.01	0.00	No	100.00	Yes
	4	x	-0.01	-0.01	0.00	No	100.00	Yes
	6	x	-0.01	-0.01	0.00	No	100.00	Yes
	5	x	-0.01	-0.01	0.00	No	100.00	Yes
W120	1	x	-0.01	-0.01	0.00	No	100.00	Yes
	2	x	-0.01	-0.01	0.00	No	100.00	Yes
	3	x	-0.01	-0.01	0.00	No	100.00	Yes
	4	x	-0.01	-0.01	0.00	No	100.00	Yes
	6	x	-0.01	-0.01	0.00	No	100.00	Yes
	5	x	-0.01	-0.01	0.00	No	100.00	Yes
W150	1	z	0.01	0.01	0.00	No	100.00	Yes
	2	z	0.01	0.01	0.00	No	100.00	Yes
	3	z	0.01	0.01	0.00	No	100.00	Yes
	4	z	0.01	0.01	0.00	No	100.00	Yes
	6	z	0.01	0.01	0.00	No	100.00	Yes
	5	z	0.01	0.01	0.00	No	100.00	Yes
Di	1	y	-0.009	-0.009	0.00	No	100.00	Yes
	2	y	-0.009	-0.009	0.00	No	100.00	Yes
	3	y	-0.009	-0.009	0.00	No	100.00	Yes
	4	y	-0.009	-0.009	0.00	No	100.00	Yes
	6	y	-0.009	-0.009	0.00	No	100.00	Yes
	5	y	-0.009	-0.009	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	2	y	-0.055	1.50	No
		y	-0.055	7.50	No
		y	-0.06	8.50	No
		y	-0.049	8.50	No
	3	y	-0.044	1.50	No
		y	-0.044	7.50	No
		y	-0.043	8.50	No
		y	-0.06	8.50	No
	4	y	-0.04	1.50	No
		y	-0.04	6.50	No
		y	-0.073	7.50	No
	6	y	-0.046	2.00	No
		y	-0.029	3.50	No
	5	y	-0.033	1.00	No
		y	-0.033	3.00	No
		y	-0.041	5.00	No
		y	-0.041	7.00	No
Wo	2	z	-0.279	1.50	No
		z	-0.279	7.50	No

		z	-0.081	8.50	No
	3	z	-0.216	1.50	No
		z	-0.216	7.50	No
		z	-0.111	8.50	No
	4	z	-0.256	1.50	No
		z	-0.256	6.50	No
		z	-0.079	7.50	No
	6	z	-0.075	2.00	No
		z	-0.063	3.50	No
	5	z	-0.084	1.00	No
		z	-0.084	3.00	No
		z	-0.082	5.00	No
		z	-0.082	7.00	No
W30	2	3	-0.238	1.50	No
		3	-0.238	7.50	No
		3	-0.074	8.50	No
	3	3	-0.19	1.50	No
		3	-0.19	7.50	No
		3	-0.10	8.50	No
	4	3	-0.221	1.50	No
		3	-0.221	6.50	No
		3	-0.074	7.50	No
	6	3	-0.065	2.00	No
		3	-0.063	3.50	No
	5	3	-0.073	1.00	No
		3	-0.073	3.00	No
		3	-0.075	5.00	No
		3	-0.075	7.00	No
W60	2	3	-0.158	1.50	No
		3	-0.158	7.50	No
		3	-0.058	8.50	No
	3	3	-0.14	1.50	No
		3	-0.14	7.50	No
		3	-0.078	8.50	No
			0.00	0.00	Yes
	4	3	-0.149	1.50	No
		3	-0.149	6.50	No
		3	-0.062	7.50	No
	6	3	-0.045	2.00	No
		3	-0.063	3.50	No
	5	3	-0.052	1.00	No
		3	-0.052	3.00	No
		3	-0.062	5.00	No
		3	-0.062	7.00	No
W90	2	x	-0.118	1.50	No
		x	-0.118	7.50	No
		x	-0.05	8.50	No
		x	-0.029	8.50	No
	3	x	-0.115	1.50	No
		x	-0.115	7.50	No
		x	-0.036	8.50	No
		x	-0.067	8.50	No
	4	x	-0.113	1.50	No
		x	-0.113	6.50	No
		x	-0.057	7.50	No
	6	x	-0.035	2.00	No
		x	-0.063	3.50	No
	5	x	-0.041	1.00	No
		x	-0.041	3.00	No
		x	-0.056	5.00	No

		x	-0.056	7.00	No
W120	2	2	-0.158	1.50	No
		2	-0.158	7.50	No
		2	-0.058	8.50	No
	3	2	-0.14	1.50	No
		2	-0.14	7.50	No
		2	-0.078	8.50	No
			0.00	0.00	Yes
	4	2	-0.149	1.50	No
		2	-0.149	6.50	No
		2	-0.062	7.50	No
	6	2	-0.045	2.00	No
		2	-0.063	3.50	No
	5	2	-0.052	1.00	No
		2	-0.052	3.00	No
		2	-0.062	5.00	No
		2	-0.062	7.00	No
W150	2	2	-0.238	1.50	No
		2	-0.238	7.50	No
		2	-0.074	8.50	No
	3	2	-0.19	1.50	No
		2	-0.19	7.50	No
		2	-0.10	8.50	No
	4	2	-0.221	1.50	No
		2	-0.221	6.50	No
		2	-0.074	7.50	No
	6	2	-0.065	2.00	No
		2	-0.063	3.50	No
	5	2	-0.073	1.00	No
		2	-0.073	3.00	No
		2	-0.075	5.00	No
		2	-0.075	7.00	No
Di	2	y	-0.163	1.50	No
		y	-0.163	7.50	No
		y	-0.057	8.50	No
		y	-0.043	8.50	No
	3	y	-0.128	1.50	No
		y	-0.128	7.50	No
		y	-0.049	8.50	No
		y	-0.077	8.50	No
	4	y	-0.153	1.50	No
		y	-0.153	6.50	No
		y	-0.058	7.50	No
	6	y	-0.05	2.00	No
		y	-0.068	3.50	No
	5	y	-0.055	1.00	No
		y	-0.055	3.00	No
		y	-0.058	5.00	No
		y	-0.058	7.00	No
WI0	2	z	-0.06	1.50	No
		z	-0.06	7.50	No
		z	-0.021	8.50	No
	3	z	-0.049	1.50	No
		z	-0.049	7.50	No
		z	-0.028	8.50	No
	4	z	-0.055	1.50	No
		z	-0.055	6.50	No
		z	-0.021	7.50	No
	6	z	-0.02	2.00	No
		z	-0.016	3.50	No

	5	z	-0.02	1.00	No
		z	-0.02	3.00	No
		z	-0.02	5.00	No
		z	-0.02	7.00	No
WI30	2	3	-0.052	1.50	No
		3	-0.052	7.50	No
		3	-0.02	8.50	No
	3	3	-0.043	1.50	No
		3	-0.043	7.50	No
		3	-0.026	8.50	No
	4	3	-0.048	1.50	No
		3	-0.048	6.50	No
		3	-0.02	7.50	No
	6	3	-0.018	2.00	No
		3	-0.016	3.50	No
	5	3	-0.018	1.00	No
		3	-0.018	3.00	No
		3	-0.018	5.00	No
		3	-0.018	7.00	No
WI60	2	3	-0.037	1.50	No
		3	-0.037	7.50	No
		3	-0.017	8.50	No
	3	3	-0.034	1.50	No
		3	-0.034	7.50	No
		3	-0.021	8.50	No
			0.00	0.00	Yes
	4	3	-0.035	1.50	No
		3	-0.035	6.50	No
		3	-0.017	7.50	No
	6	3	-0.014	2.00	No
		3	-0.016	3.50	No
	5	3	-0.014	1.00	No
		3	-0.014	3.00	No
		3	-0.016	5.00	No
		3	-0.016	7.00	No
WI90	2	x	-0.03	1.50	No
		x	-0.03	7.50	No
		x	-0.015	8.50	No
		x	-0.01	8.50	No
	3	x	-0.03	1.50	No
		x	-0.03	7.50	No
		x	-0.012	8.50	No
		x	-0.019	8.50	No
	4	x	-0.029	1.50	No
		x	-0.029	6.50	No
		x	-0.016	7.50	No
	6	x	-0.012	2.00	No
		x	-0.016	3.50	No
	5	x	-0.011	1.00	No
		x	-0.011	3.00	No
		x	-0.014	5.00	No
		x	-0.014	7.00	No
WI120	2	2	-0.037	1.50	No
		2	-0.037	7.50	No
		2	-0.017	8.50	No
	3	2	-0.034	1.50	No
		2	-0.034	7.50	No
		2	-0.021	8.50	No
			0.00	0.00	Yes
	4	2	-0.035	1.50	No

		2	-0.035	6.50	No
		2	-0.017	7.50	No
	6	2	-0.014	2.00	No
		2	-0.016	3.50	No
	5	2	-0.014	1.00	No
		2	-0.014	3.00	No
		2	-0.016	5.00	No
		2	-0.016	7.00	No
WI150	2	2	-0.052	1.50	No
		2	-0.052	7.50	No
		2	-0.02	8.50	No
	3	2	-0.043	1.50	No
		2	-0.043	7.50	No
		2	-0.026	8.50	No
	4	2	-0.048	1.50	No
		2	-0.048	6.50	No
		2	-0.02	7.50	No
	6	2	-0.018	2.00	No
		2	-0.016	3.50	No
	5	2	-0.018	1.00	No
		2	-0.018	3.00	No
		2	-0.018	5.00	No
		2	-0.018	7.00	No
WL0	2	z	-0.018	1.50	No
		z	-0.018	7.50	No
		z	-0.005	8.50	No
	3	z	-0.014	1.50	No
		z	-0.014	7.50	No
		z	-0.007	8.50	No
	4	z	-0.016	1.50	No
		z	-0.016	6.50	No
		z	-0.005	7.50	No
	6	z	-0.005	2.00	No
		z	-0.004	3.50	No
	5	z	-0.006	1.00	No
		z	-0.006	3.00	No
		z	-0.005	5.00	No
		z	-0.005	7.00	No
WL30	2	3	-0.015	1.50	No
		3	-0.015	7.50	No
		3	-0.005	8.50	No
	3	3	-0.014	1.50	No
		3	-0.014	7.50	No
		3	-0.006	8.50	No
	4	3	-0.014	1.50	No
		3	-0.014	6.50	No
		3	-0.005	7.50	No
	6	3	-0.004	2.00	No
		3	-0.004	3.50	No
	5	3	-0.005	1.00	No
		3	-0.005	3.00	No
		3	-0.005	5.00	No
		3	-0.005	7.00	No
WL60	2	3	-0.01	1.50	No
		3	-0.01	7.50	No
		3	-0.004	8.50	No
	3	3	-0.009	1.50	No
		3	-0.009	7.50	No
		3	-0.005	8.50	No
			0.00	0.00	Yes

	4	3	-0.01	1.50	No
		3	-0.01	6.50	No
		3	-0.004	7.50	No
	6	3	-0.003	2.00	No
		3	-0.004	3.50	No
	5	3	-0.003	1.00	No
		3	-0.003	3.00	No
		3	-0.004	5.00	No
		3	-0.004	7.00	No
WL90	2	x	-0.008	1.50	No
		x	-0.008	7.50	No
		x	-0.003	8.50	No
		x	-0.002	8.50	No
	3	x	-0.007	1.50	No
		x	-0.007	7.50	No
		x	-0.002	8.50	No
		x	-0.004	8.50	No
	4	x	-0.007	1.50	No
		x	-0.007	6.50	No
		x	-0.004	7.50	No
	6	x	-0.002	2.00	No
		x	-0.004	3.50	No
	5	x	-0.003	1.00	No
		x	-0.003	3.00	No
		x	-0.004	5.00	No
		x	-0.004	7.00	No
WL120	2	2	-0.01	1.50	No
		2	-0.01	7.50	No
		2	-0.004	8.50	No
	3	2	-0.009	1.50	No
		2	-0.009	7.50	No
		2	-0.005	8.50	No
			0.00	0.00	Yes
	4	2	-0.01	1.50	No
		2	-0.01	6.50	No
		2	-0.004	7.50	No
	6	2	-0.003	2.00	No
		2	-0.004	3.50	No
	5	2	-0.003	1.00	No
		2	-0.003	3.00	No
		2	-0.004	5.00	No
		2	-0.004	7.00	No
WL150	2	2	-0.015	1.50	No
		2	-0.015	7.50	No
		2	-0.005	8.50	No
	3	2	-0.014	1.50	No
		2	-0.014	7.50	No
		2	-0.006	8.50	No
	4	2	-0.014	1.50	No
		2	-0.014	6.50	No
		2	-0.005	7.50	No
	6	2	-0.004	2.00	No
		2	-0.004	3.50	No
	5	2	-0.005	1.00	No
		2	-0.005	3.00	No
		2	-0.005	5.00	No
		2	-0.005	7.00	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	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
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00

RAM® Elements
CONNECT Edition

Current Date: 12/6/2022 9:15 AM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=1.2D
LC40=1.2D+WL0
LC41=1.2D+WL30
LC42=1.2D+WL60
LC43=1.2D+WL90
LC44=1.2D+WL120
LC45=1.2D+WL150
LC46=1.2D-WL0
LC47=1.2D-WL30
LC48=1.2D-WL60
LC49=1.2D-WL90
LC50=1.2D-WL120
LC51=1.2D-WL150

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	PIPE 2x0.154	**1**	LC10 at 79.17%	0.01	OK	
		2	LC1 at 66.67%	0.47	OK	
		3	LC1 at 56.25%	**0.55**	**OK**	
		4	LC1 at 68.75%	0.31	OK	
		6	LC1 at 79.17%	0.03	OK	
		5	LC1 at 68.75%	0.09	OK	

RAM® Elements
CONNECT Edition

Current Date: 12/6/2022 9:16 AM
Units system: English

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
2	0.00	2.50	0.00	0
3	0.00	-2.50	0.00	0
4	2.50	4.50	0.00	0
5	2.50	-4.50	0.00	0
6	5.00	4.00	0.00	0
7	5.00	-6.00	0.00	0
8	0.00	1.50	0.00	0
9	0.00	-1.50	0.00	0
10	2.50	1.50	0.00	0
11	2.50	-1.50	0.00	0
12	5.00	1.50	0.00	0
13	5.00	-1.50	0.00	0
15	2.50	13.00	0.00	0
16	2.50	5.00	0.00	0
17	2.50	10.50	0.00	0
18	2.50	7.50	0.00	0
19	5.00	13.00	0.00	0
20	5.00	5.00	0.00	0
21	5.00	10.50	0.00	0
22	5.00	7.50	0.00	0
23	0.00	11.50	0.00	0
24	0.00	6.50	0.00	0
25	0.00	10.50	0.00	0

26	0.00	7.50	0.00	0

Restraints

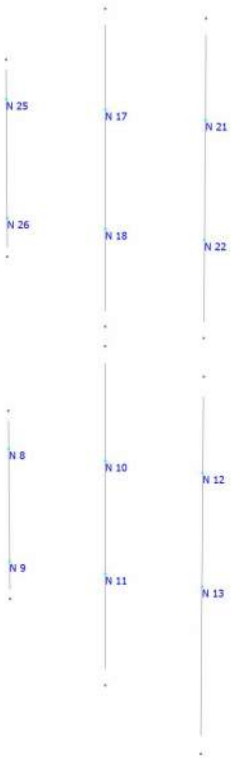
Node	TX	TY	TZ	RX	RY	RZ
8	1	1	1	1	1	1
9	1	1	1	1	1	1
10	1	1	1	1	1	1
11	1	1	1	1	1	1
12	1	1	1	1	1	1
13	1	1	1	1	1	1
17	1	1	1	1	1	1
18	1	1	1	1	1	1
21	1	1	1	1	1	1
22	1	1	1	1	1	1
25	1	1	1	1	1	1
26	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	2	3		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
2	4	5		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
3	6	7		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
4	15	16		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	23	24		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
5	19	20		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	315.00	0	0.00	0.00	0.00
2	315.00	0	0.00	0.00	0.00
3	315.00	0	0.00	0.00	0.00
4	315.00	0	0.00	0.00	0.00
6	315.00	0	0.00	0.00	0.00
5	315.00	0	0.00	0.00	0.00


N 25
N 17
N 21
N 26
N 18
N 22
N 8
N 10
N 12
N 9
N 11
N 13

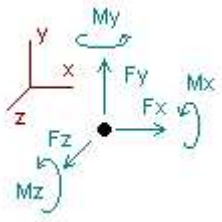

Y
X
Z

RAM® Elements
CONNECT Edition

Current Date: 12/6/2022 9:16 AM
Units system: English

Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **LC1=1.2D+Wo**						
8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.08426	0.27900	0.41875	0.00000	0.00000
11	0.00000	0.21506	0.36000	-0.61943	0.00000	0.00000
12	0.00000	0.06903	0.21600	0.21605	0.00000	0.00000
13	0.00000	0.20075	0.32700	-0.76191	0.00000	0.00000
17	0.00000	0.06423	0.25600	0.25605	0.00000	0.00000
18	0.00000	0.15183	0.33500	-0.41357	0.00000	0.00000
21	0.00000	0.09703	0.16785	0.09118	0.00000	0.00000
22	0.00000	0.11303	0.16415	-0.08864	0.00000	0.00000
25	0.00000	0.05274	0.06022	-0.03771	0.00000	0.00000
26	0.00000	0.05754	0.07778	0.03854	0.00000	0.00000
SUM	0.00000	1.12580	2.24300	-0.90068	0.00000	0.00000
Condition **LC2=1.2D+W30**						
8	0.00000	0.01014	0.02500	-0.00250	0.00000	0.00000
9	0.00000	0.01014	0.02500	0.00250	0.00000	0.00000
10	0.16829	0.08426	0.21329	0.29012	0.00000	-0.25259
11	0.22062	0.21506	0.26562	-0.41966	0.00000	0.38227
12	0.13435	0.06903	0.17435	0.15814	0.00000	-0.13438
13	0.20506	0.20075	0.26506	-0.57217	0.00000	0.47888
17	0.15627	0.06423	0.19627	0.18006	0.00000	-0.15630
18	0.20860	0.15183	0.24860	-0.28436	0.00000	0.26065
21	0.10334	0.09703	0.14334	0.07961	0.00000	-0.05585
22	0.10596	0.11303	0.14596	-0.08125	0.00000	0.05752
25	0.03735	0.05274	0.06235	-0.02602	0.00000	0.02352
26	0.05316	0.05754	0.07816	0.02818	0.00000	-0.02568
SUM	1.39300	1.12580	1.84300	-0.64735	0.00000	0.57805
Condition **LC3=1.2D+W60**						
8	0.02500	0.01014	0.00000	0.00000	0.00000	0.00250
9	0.02500	0.01014	0.00000	0.00000	0.00000	-0.00250
10	0.15672	0.08426	0.11172	0.16768	0.00000	-0.20521
11	0.19774	0.21506	0.15274	-0.26942	0.00000	0.30680
12	0.13899	0.06903	0.09899	0.09902	0.00000	-0.12278
13	0.21415	0.20075	0.15415	-0.36197	0.00000	0.45526
17	0.14536	0.06423	0.10536	0.10538	0.00000	-0.12914

18	0.18920	0.15183	0.14920	-0.19283	0.00000	0.21654
21	0.11406	0.09703	0.07406	0.03936	0.00000	-0.06312
22	0.12716	0.11303	0.08716	-0.04796	0.00000	0.07169
25	0.05187	0.05274	0.02687	-0.01724	0.00000	0.01974
26	0.07450	0.05754	0.04950	0.02254	0.00000	-0.02504
SUM	1.45975	1.12580	1.00975	-0.45543	0.00000	0.52473

Condition **LC4=1.2D+W90**

8	0.02500	0.01014	0.00000	0.00000	0.00000	0.00250
9	0.02500	0.01014	0.00000	0.00000	0.00000	-0.00250
10	0.16300	0.08426	0.00000	0.00000	0.00000	-0.21464
11	0.24200	0.21506	0.00000	0.00000	0.00000	0.41086
12	0.15500	0.06903	0.00000	0.00000	0.00000	-0.13879
13	0.27800	0.20075	0.00000	0.00000	0.00000	0.63001
17	0.15300	0.06423	0.00000	0.00000	0.00000	-0.13678
18	0.21000	0.15183	0.00000	0.00000	0.00000	0.25046
21	0.12311	0.09703	0.00000	0.00000	0.00000	-0.06716
22	0.15089	0.11303	0.00000	0.00000	0.00000	0.08541
25	0.05559	0.05274	0.00000	0.00000	0.00000	0.02243
26	0.09241	0.05754	0.00000	0.00000	0.00000	-0.03215
SUM	1.67300	1.12580	0.00000	0.00000	0.00000	0.80965

Condition **LC5=1.2D+W120**

8	0.02500	0.01014	0.00000	0.00000	0.00000	0.00250
9	0.02500	0.01014	0.00000	0.00000	0.00000	-0.00250
10	0.15672	0.08426	-0.11172	-0.16768	0.00000	-0.20521
11	0.19774	0.21506	-0.15274	0.26942	0.00000	0.30680
12	0.13899	0.06903	-0.09899	-0.09902	0.00000	-0.12278
13	0.21415	0.20075	-0.15415	0.36197	0.00000	0.45526
17	0.14536	0.06423	-0.10536	-0.10538	0.00000	-0.12914
18	0.18920	0.15183	-0.14920	0.19283	0.00000	0.21654
21	0.11406	0.09703	-0.07406	-0.03936	0.00000	-0.06312
22	0.12716	0.11303	-0.08716	0.04796	0.00000	0.07169
25	0.05187	0.05274	-0.02687	0.01724	0.00000	0.01974
26	0.07450	0.05754	-0.04950	-0.02254	0.00000	-0.02504
SUM	1.45975	1.12580	-1.00975	0.45543	0.00000	0.52473

Condition **LC6=1.2D+W150**

8	0.00000	0.01014	-0.02500	0.00250	0.00000	0.00000
9	0.00000	0.01014	-0.02500	-0.00250	0.00000	0.00000
10	0.16829	0.08426	-0.21329	-0.29012	0.00000	-0.25259
11	0.22062	0.21506	-0.26562	0.41966	0.00000	0.38227
12	0.13435	0.06903	-0.17435	-0.15814	0.00000	-0.13438
13	0.20506	0.20075	-0.26506	0.57217	0.00000	0.47888
17	0.15627	0.06423	-0.19627	-0.18006	0.00000	-0.15630
18	0.20860	0.15183	-0.24860	0.28436	0.00000	0.26065
21	0.10334	0.09703	-0.14334	-0.07961	0.00000	-0.05585
22	0.10596	0.11303	-0.14596	0.08125	0.00000	0.05752
25	0.03735	0.05274	-0.06235	0.02602	0.00000	0.02352
26	0.05316	0.05754	-0.07816	-0.02818	0.00000	-0.02568
SUM	1.39300	1.12580	-1.84300	0.64735	0.00000	0.57805

Condition **LC7=1.2D-Wo**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.08426	-0.27900	-0.41875	0.00000	0.00000
11	0.00000	0.21506	-0.36000	0.61943	0.00000	0.00000
12	0.00000	0.06903	-0.21600	-0.21605	0.00000	0.00000
13	0.00000	0.20075	-0.32700	0.76191	0.00000	0.00000
17	0.00000	0.06423	-0.25600	-0.25605	0.00000	0.00000
18	0.00000	0.15183	-0.33500	0.41357	0.00000	0.00000
21	0.00000	0.09703	-0.16785	-0.09118	0.00000	0.00000
22	0.00000	0.11303	-0.16415	0.08864	0.00000	0.00000
25	0.00000	0.05274	-0.06022	0.03771	0.00000	0.00000
26	0.00000	0.05754	-0.07778	-0.03854	0.00000	0.00000
SUM	0.00000	1.12580	-2.24300	0.90068	0.00000	0.00000

Condition **LC8=1.2D-W30**

8	0.00000	0.01014	-0.02500	0.00250	0.00000	0.00000
9	0.00000	0.01014	-0.02500	-0.00250	0.00000	0.00000
10	-0.16829	0.08426	-0.21329	-0.29012	0.00000	0.25259
11	-0.22062	0.21506	-0.26562	0.41966	0.00000	-0.38227
12	-0.13435	0.06903	-0.17435	-0.15814	0.00000	0.13438
13	-0.20506	0.20075	-0.26506	0.57217	0.00000	-0.47888
17	-0.15627	0.06423	-0.19627	-0.18006	0.00000	0.15630
18	-0.20860	0.15183	-0.24860	0.28436	0.00000	-0.26065
21	-0.10334	0.09703	-0.14334	-0.07961	0.00000	0.05585
22	-0.10596	0.11303	-0.14596	0.08125	0.00000	-0.05752
25	-0.03735	0.05274	-0.06235	0.02602	0.00000	-0.02352
26	-0.05316	0.05754	-0.07816	-0.02818	0.00000	0.02568
SUM	-1.39300	1.12580	-1.84300	0.64735	0.00000	-0.57805

Condition **LC9=1.2D-W60**

8	-0.02500	0.01014	0.00000	0.00000	0.00000	-0.00250
9	-0.02500	0.01014	0.00000	0.00000	0.00000	0.00250
10	-0.15672	0.08426	-0.11172	-0.16768	0.00000	0.20521
11	-0.19774	0.21506	-0.15274	0.26942	0.00000	-0.30680
12	-0.13899	0.06903	-0.09899	-0.09902	0.00000	0.12278
13	-0.21415	0.20075	-0.15415	0.36197	0.00000	-0.45526
17	-0.14536	0.06423	-0.10536	-0.10538	0.00000	0.12914
18	-0.18920	0.15183	-0.14920	0.19283	0.00000	-0.21654
21	-0.11406	0.09703	-0.07406	-0.03936	0.00000	0.06312
22	-0.12716	0.11303	-0.08716	0.04796	0.00000	-0.07169
25	-0.05187	0.05274	-0.02687	0.01724	0.00000	-0.01974
26	-0.07450	0.05754	-0.04950	-0.02254	0.00000	0.02504
SUM	-1.45975	1.12580	-1.00975	0.45543	0.00000	-0.52473

Condition **LC10=1.2D-W90**

8	-0.02500	0.01014	0.00000	0.00000	0.00000	-0.00250
9	-0.02500	0.01014	0.00000	0.00000	0.00000	0.00250
10	-0.16300	0.08426	0.00000	0.00000	0.00000	0.21464
11	-0.24200	0.21506	0.00000	0.00000	0.00000	-0.41086
12	-0.15500	0.06903	0.00000	0.00000	0.00000	0.13879
13	-0.27800	0.20075	0.00000	0.00000	0.00000	-0.63001
17	-0.15300	0.06423	0.00000	0.00000	0.00000	0.13678
18	-0.21000	0.15183	0.00000	0.00000	0.00000	-0.25046
21	-0.12311	0.09703	0.00000	0.00000	0.00000	0.06716
22	-0.15089	0.11303	0.00000	0.00000	0.00000	-0.08541
25	-0.05559	0.05274	0.00000	0.00000	0.00000	-0.02243

26	-0.09241	0.05754	0.00000	0.00000	0.00000	0.03215
SUM	-1.67300	1.12580	0.00000	0.00000	0.00000	-0.80965

Condition **LC11=1.2D-W120**

8	-0.02500	0.01014	0.00000	0.00000	0.00000	-0.00250
9	-0.02500	0.01014	0.00000	0.00000	0.00000	0.00250
10	-0.15672	0.08426	0.11172	0.16768	0.00000	0.20521
11	-0.19774	0.21506	0.15274	-0.26942	0.00000	-0.30680
12	-0.13899	0.06903	0.09899	0.09902	0.00000	0.12278
13	-0.21415	0.20075	0.15415	-0.36197	0.00000	-0.45526
17	-0.14536	0.06423	0.10536	0.10538	0.00000	0.12914
18	-0.18920	0.15183	0.14920	-0.19283	0.00000	-0.21654
21	-0.11406	0.09703	0.07406	0.03936	0.00000	0.06312
22	-0.12716	0.11303	0.08716	-0.04796	0.00000	-0.07169
25	-0.05187	0.05274	0.02687	-0.01724	0.00000	-0.01974
26	-0.07450	0.05754	0.04950	0.02254	0.00000	0.02504
SUM	-1.45975	1.12580	1.00975	-0.45543	0.00000	-0.52473

Condition **LC12=1.2D-W150**

8	0.00000	0.01014	0.02500	-0.00250	0.00000	0.00000
9	0.00000	0.01014	0.02500	0.00250	0.00000	0.00000
10	-0.16829	0.08426	0.21329	0.29012	0.00000	0.25259
11	-0.22062	0.21506	0.26562	-0.41966	0.00000	-0.38227
12	-0.13435	0.06903	0.17435	0.15814	0.00000	0.13438
13	-0.20506	0.20075	0.26506	-0.57217	0.00000	-0.47888
17	-0.15627	0.06423	0.19627	0.18006	0.00000	0.15630
18	-0.20860	0.15183	0.24860	-0.28436	0.00000	-0.26065
21	-0.10334	0.09703	0.14334	0.07961	0.00000	0.05585
22	-0.10596	0.11303	0.14596	-0.08125	0.00000	-0.05752
25	-0.03735	0.05274	0.06235	-0.02602	0.00000	-0.02352
26	-0.05316	0.05754	0.07816	0.02818	0.00000	0.02568
SUM	-1.39300	1.12580	1.84300	-0.64735	0.00000	-0.57805

Condition **LC13=0.9D+Wo**

8	0.00000	0.00761	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.00761	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.06320	0.27900	0.41868	0.00000	0.00000
11	0.00000	0.16130	0.36000	-0.61982	0.00000	0.00000
12	0.00000	0.05177	0.21600	0.21604	0.00000	0.00000
13	0.00000	0.15056	0.32700	-0.76268	0.00000	0.00000
17	0.00000	0.04817	0.25600	0.25604	0.00000	0.00000
18	0.00000	0.11387	0.33500	-0.41368	0.00000	0.00000
21	0.00000	0.07277	0.16785	0.09117	0.00000	0.00000
22	0.00000	0.08477	0.16415	-0.08866	0.00000	0.00000
25	0.00000	0.03956	0.06022	-0.03771	0.00000	0.00000
26	0.00000	0.04316	0.07778	0.03854	0.00000	0.00000
SUM	0.00000	0.84435	2.24300	-0.90206	0.00000	0.00000

Condition **LC14=0.9D+W30**

8	0.00000	0.00761	0.02500	-0.00250	0.00000	0.00000
9	0.00000	0.00761	0.02500	0.00250	0.00000	0.00000
10	0.16829	0.06320	0.21329	0.29007	0.00000	-0.25255
11	0.22062	0.16130	0.26562	-0.41993	0.00000	0.38252
12	0.13435	0.05177	0.17435	0.15813	0.00000	-0.13437
13	0.20506	0.15056	0.26506	-0.57277	0.00000	0.47937
17	0.15627	0.04817	0.19627	0.18005	0.00000	-0.15630
18	0.20860	0.11387	0.24860	-0.28444	0.00000	0.26072
21	0.10334	0.07277	0.14334	0.07960	0.00000	-0.05584
22	0.10596	0.08477	0.14596	-0.08127	0.00000	0.05753
25	0.03735	0.03956	0.06235	-0.02602	0.00000	0.02352
26	0.05316	0.04316	0.07816	0.02818	0.00000	-0.02568
SUM	1.39300	0.84435	1.84300	-0.64839	0.00000	0.57891

Condition **LC15=0.9D+W60**

8	0.02500	0.00761	0.00000	0.00000	0.00000	0.00250
9	0.02500	0.00761	0.00000	0.00000	0.00000	-0.00250
10	0.15672	0.06320	0.11172	0.16766	0.00000	-0.20518
11	0.19774	0.16130	0.15274	-0.26959	0.00000	0.30700
12	0.13899	0.05177	0.09899	0.09901	0.00000	-0.12277
13	0.21415	0.15056	0.15415	-0.36234	0.00000	0.45574
17	0.14536	0.04817	0.10536	0.10538	0.00000	-0.12913
18	0.18920	0.11387	0.14920	-0.19288	0.00000	0.21661
21	0.11406	0.07277	0.07406	0.03936	0.00000	-0.06312
22	0.12716	0.08477	0.08716	-0.04796	0.00000	0.07170
25	0.05187	0.03956	0.02687	-0.01724	0.00000	0.01974
26	0.07450	0.04316	0.04950	0.02254	0.00000	-0.02504
SUM	1.45975	0.84435	1.00975	-0.45607	0.00000	0.52555

Condition **LC16=0.9D+W90**

8	0.02500	0.00761	0.00000	0.00000	0.00000	0.00250
9	0.02500	0.00761	0.00000	0.00000	0.00000	-0.00250
10	0.16300	0.06320	0.00000	0.00000	0.00000	-0.21460
11	0.24200	0.16130	0.00000	0.00000	0.00000	0.41114
12	0.15500	0.05177	0.00000	0.00000	0.00000	-0.13878
13	0.27800	0.15056	0.00000	0.00000	0.00000	0.63069
17	0.15300	0.04817	0.00000	0.00000	0.00000	-0.13678
18	0.21000	0.11387	0.00000	0.00000	0.00000	0.25053
21	0.12311	0.07277	0.00000	0.00000	0.00000	-0.06715
22	0.15089	0.08477	0.00000	0.00000	0.00000	0.08542
25	0.05559	0.03956	0.00000	0.00000	0.00000	0.02243
26	0.09241	0.04316	0.00000	0.00000	0.00000	-0.03215
SUM	1.67300	0.84435	0.00000	0.00000	0.00000	0.81076

Condition **LC17=0.9D+W120**

8	0.02500	0.00761	0.00000	0.00000	0.00000	0.00250
9	0.02500	0.00761	0.00000	0.00000	0.00000	-0.00250
10	0.15672	0.06320	-0.11172	-0.16766	0.00000	-0.20518
11	0.19774	0.16130	-0.15274	0.26959	0.00000	0.30700
12	0.13899	0.05177	-0.09899	-0.09901	0.00000	-0.12277
13	0.21415	0.15056	-0.15415	0.36234	0.00000	0.45574
17	0.14536	0.04817	-0.10536	-0.10538	0.00000	-0.12913
18	0.18920	0.11387	-0.14920	0.19288	0.00000	0.21661
21	0.11406	0.07277	-0.07406	-0.03936	0.00000	-0.06312
22	0.12716	0.08477	-0.08716	0.04796	0.00000	0.07170
25	0.05187	0.03956	-0.02687	0.01724	0.00000	0.01974

26	0.07450	0.04316	-0.04950	-0.02254	0.00000	-0.02504
SUM	1.45975	0.84435	-1.00975	0.45607	0.00000	0.52555

Condition **LC18=0.9D+W150**

8	0.00000	0.00761	-0.02500	0.00250	0.00000	0.00000
9	0.00000	0.00761	-0.02500	-0.00250	0.00000	0.00000
10	0.16829	0.06320	-0.21329	-0.29007	0.00000	-0.25255
11	0.22062	0.16130	-0.26562	0.41993	0.00000	0.38252
12	0.13435	0.05177	-0.17435	-0.15813	0.00000	-0.13437
13	0.20506	0.15056	-0.26506	0.57277	0.00000	0.47937
17	0.15627	0.04817	-0.19627	-0.18005	0.00000	-0.15630
18	0.20860	0.11387	-0.24860	0.28444	0.00000	0.26072
21	0.10334	0.07277	-0.14334	-0.07960	0.00000	-0.05584
22	0.10596	0.08477	-0.14596	0.08127	0.00000	0.05753
25	0.03735	0.03956	-0.06235	0.02602	0.00000	0.02352
26	0.05316	0.04316	-0.07816	-0.02818	0.00000	-0.02568
SUM	1.39300	0.84435	-1.84300	0.64839	0.00000	0.57891

Condition **LC19=0.9D-Wo**

8	0.00000	0.00761	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.00761	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.06320	-0.27900	-0.41868	0.00000	0.00000
11	0.00000	0.16130	-0.36000	0.61982	0.00000	0.00000
12	0.00000	0.05177	-0.21600	-0.21604	0.00000	0.00000
13	0.00000	0.15056	-0.32700	0.76268	0.00000	0.00000
17	0.00000	0.04817	-0.25600	-0.25604	0.00000	0.00000
18	0.00000	0.11387	-0.33500	0.41368	0.00000	0.00000
21	0.00000	0.07277	-0.16785	-0.09117	0.00000	0.00000
22	0.00000	0.08477	-0.16415	0.08866	0.00000	0.00000
25	0.00000	0.03956	-0.06022	0.03771	0.00000	0.00000
26	0.00000	0.04316	-0.07778	-0.03854	0.00000	0.00000
SUM	0.00000	0.84435	-2.24300	0.90206	0.00000	0.00000

Condition **LC20=0.9D-W30**

8	0.00000	0.00761	-0.02500	0.00250	0.00000	0.00000
9	0.00000	0.00761	-0.02500	-0.00250	0.00000	0.00000
10	-0.16829	0.06320	-0.21329	-0.29007	0.00000	0.25255
11	-0.22062	0.16130	-0.26562	0.41993	0.00000	-0.38252
12	-0.13435	0.05177	-0.17435	-0.15813	0.00000	0.13437
13	-0.20506	0.15056	-0.26506	0.57277	0.00000	-0.47937
17	-0.15627	0.04817	-0.19627	-0.18005	0.00000	0.15630
18	-0.20860	0.11387	-0.24860	0.28444	0.00000	-0.26072
21	-0.10334	0.07277	-0.14334	-0.07960	0.00000	0.05584
22	-0.10596	0.08477	-0.14596	0.08127	0.00000	-0.05753
25	-0.03735	0.03956	-0.06235	0.02602	0.00000	-0.02352
26	-0.05316	0.04316	-0.07816	-0.02818	0.00000	0.02568
SUM	-1.39300	0.84435	-1.84300	0.64839	0.00000	-0.57891

Condition **LC21=0.9D-W60**

8	-0.02500	0.00761	0.00000	0.00000	0.00000	-0.00250
9	-0.02500	0.00761	0.00000	0.00000	0.00000	0.00250
10	-0.15672	0.06320	-0.11172	-0.16766	0.00000	0.20518
11	-0.19774	0.16130	-0.15274	0.26959	0.00000	-0.30700
12	-0.13899	0.05177	-0.09899	-0.09901	0.00000	0.12277
13	-0.21415	0.15056	-0.15415	0.36234	0.00000	-0.45574
17	-0.14536	0.04817	-0.10536	-0.10538	0.00000	0.12913
18	-0.18920	0.11387	-0.14920	0.19288	0.00000	-0.21661
21	-0.11406	0.07277	-0.07406	-0.03936	0.00000	0.06312
22	-0.12716	0.08477	-0.08716	0.04796	0.00000	-0.07170
25	-0.05187	0.03956	-0.02687	0.01724	0.00000	-0.01974
26	-0.07450	0.04316	-0.04950	-0.02254	0.00000	0.02504
SUM	-1.45975	0.84435	-1.00975	0.45607	0.00000	-0.52555

Condition **LC22=0.9D-W90**

8	-0.02500	0.00761	0.00000	0.00000	0.00000	-0.00250
9	-0.02500	0.00761	0.00000	0.00000	0.00000	0.00250
10	-0.16300	0.06320	0.00000	0.00000	0.00000	0.21460
11	-0.24200	0.16130	0.00000	0.00000	0.00000	-0.41114
12	-0.15500	0.05177	0.00000	0.00000	0.00000	0.13878
13	-0.27800	0.15056	0.00000	0.00000	0.00000	-0.63069
17	-0.15300	0.04817	0.00000	0.00000	0.00000	0.13678
18	-0.21000	0.11387	0.00000	0.00000	0.00000	-0.25053
21	-0.12311	0.07277	0.00000	0.00000	0.00000	0.06715
22	-0.15089	0.08477	0.00000	0.00000	0.00000	-0.08542
25	-0.05559	0.03956	0.00000	0.00000	0.00000	-0.02243
26	-0.09241	0.04316	0.00000	0.00000	0.00000	0.03215
SUM	-1.67300	0.84435	0.00000	0.00000	0.00000	-0.81076

Condition **LC23=0.9D-W120**

8	-0.02500	0.00761	0.00000	0.00000	0.00000	-0.00250
9	-0.02500	0.00761	0.00000	0.00000	0.00000	0.00250
10	-0.15672	0.06320	0.11172	0.16766	0.00000	0.20518
11	-0.19774	0.16130	0.15274	-0.26959	0.00000	-0.30700
12	-0.13899	0.05177	0.09899	0.09901	0.00000	0.12277
13	-0.21415	0.15056	0.15415	-0.36234	0.00000	-0.45574
17	-0.14536	0.04817	0.10536	0.10538	0.00000	0.12913
18	-0.18920	0.11387	0.14920	-0.19288	0.00000	-0.21661
21	-0.11406	0.07277	0.07406	0.03936	0.00000	0.06312
22	-0.12716	0.08477	0.08716	-0.04796	0.00000	-0.07170
25	-0.05187	0.03956	0.02687	-0.01724	0.00000	-0.01974
26	-0.07450	0.04316	0.04950	0.02254	0.00000	0.02504
SUM	-1.45975	0.84435	1.00975	-0.45607	0.00000	-0.52555

Condition **LC24=0.9D-W150**

8	0.00000	0.00761	0.02500	-0.00250	0.00000	0.00000
9	0.00000	0.00761	0.02500	0.00250	0.00000	0.00000
10	-0.16829	0.06320	0.21329	0.29007	0.00000	0.25255
11	-0.22062	0.16130	0.26562	-0.41993	0.00000	-0.38252
12	-0.13435	0.05177	0.17435	0.15813	0.00000	0.13437
13	-0.20506	0.15056	0.26506	-0.57277	0.00000	-0.47937
17	-0.15627	0.04817	0.19627	0.18005	0.00000	0.15630
18	-0.20860	0.11387	0.24860	-0.28444	0.00000	-0.26072
21	-0.10334	0.07277	0.14334	0.07960	0.00000	0.05584
22	-0.10596	0.08477	0.14596	-0.08127	0.00000	-0.05753
25	-0.03735	0.03956	0.06235	-0.02602	0.00000	-0.02352

26	-0.05316	0.04316	0.07816	0.02818	0.00000	0.02568
SUM	-1.39300	0.84435	1.84300	-0.64839	0.00000	-0.57891

Condition **LC25=1.2D+Di+WI0**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.24726	0.06000	0.09016	0.00000	0.00000
11	0.00000	0.47806	0.08100	-0.14173	0.00000	0.00000
12	0.00000	0.19703	0.04900	0.04903	0.00000	0.00000
13	0.00000	0.45475	0.07700	-0.18036	0.00000	0.00000
17	0.00000	0.21723	0.05500	0.05504	0.00000	0.00000
18	0.00000	0.36283	0.07600	-0.09678	0.00000	0.00000
21	0.00000	0.20753	0.04000	0.02169	0.00000	0.00000
22	0.00000	0.22853	0.04000	-0.02164	0.00000	0.00000
25	0.00000	0.09741	0.01600	-0.01000	0.00000	0.00000
26	0.00000	0.13088	0.02000	0.01000	0.00000	0.00000
SUM	0.00000	2.64180	0.51400	-0.22458	0.00000	0.00000

Condition **LC26=1.2D+Di+WI30**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.03677	0.24726	0.03677	0.05525	0.00000	-0.05525
11	0.05091	0.47806	0.05091	-0.09002	0.00000	0.09002
12	0.03041	0.19703	0.03041	0.03043	0.00000	-0.03043
13	0.04879	0.45475	0.04879	-0.11492	0.00000	0.11492
17	0.03394	0.21723	0.03394	0.03397	0.00000	-0.03397
18	0.04808	0.36283	0.04808	-0.06208	0.00000	0.06208
21	0.02546	0.20753	0.02546	0.01380	0.00000	-0.01380
22	0.02546	0.22853	0.02546	-0.01377	0.00000	0.01377
25	0.01027	0.09741	0.01027	-0.00644	0.00000	0.00644
26	0.01378	0.13088	0.01378	0.00676	0.00000	-0.00676
SUM	0.32385	2.64180	0.32385	-0.14702	0.00000	0.14702

Condition **LC27=1.2D+Di+WI60**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.02616	0.24726	0.02616	0.03932	0.00000	-0.03932
11	0.03818	0.47806	0.03818	-0.06891	0.00000	0.06891
12	0.02404	0.19703	0.02404	0.02406	0.00000	-0.02406
13	0.03889	0.45475	0.03889	-0.09179	0.00000	0.09179
17	0.02475	0.21723	0.02475	0.02477	0.00000	-0.02477
18	0.03677	0.36283	0.03677	-0.04868	0.00000	0.04868
21	0.01990	0.20753	0.01990	0.01064	0.00000	-0.01064
22	0.02252	0.22853	0.02252	-0.01234	0.00000	0.01234
25	0.00817	0.09741	0.00817	-0.00519	0.00000	0.00519
26	0.01304	0.13088	0.01304	0.00613	0.00000	-0.00613
SUM	0.25244	2.64180	0.25244	-0.12200	0.00000	0.12200

Condition **LC28=1.2D+Di+WI90**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.03000	0.24726	0.00000	0.00000	0.00000	-0.04508
11	0.05500	0.47806	0.00000	0.00000	0.00000	0.10687
12	0.03000	0.19703	0.00000	0.00000	0.00000	-0.03002
13	0.06100	0.45475	0.00000	0.00000	0.00000	0.15156
17	0.02900	0.21723	0.00000	0.00000	0.00000	-0.02902
18	0.04500	0.36283	0.00000	0.00000	0.00000	0.06085
21	0.02222	0.20753	0.00000	0.00000	0.00000	-0.01172
22	0.02778	0.22853	0.00000	0.00000	0.00000	0.01536
25	0.01007	0.09741	0.00000	0.00000	0.00000	0.00644
26	0.01793	0.13088	0.00000	0.00000	0.00000	-0.00822
SUM	0.32800	2.64180	0.00000	0.00000	0.00000	0.21702

Condition **LC29=1.2D+Di+WI120**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.02616	0.24726	-0.02616	-0.03932	0.00000	-0.03932
11	0.03818	0.47806	-0.03818	0.06891	0.00000	0.06891
12	0.02404	0.19703	-0.02404	-0.02406	0.00000	-0.02406
13	0.03889	0.45475	-0.03889	0.09179	0.00000	0.09179
17	0.02475	0.21723	-0.02475	-0.02477	0.00000	-0.02477
18	0.03677	0.36283	-0.03677	0.04868	0.00000	0.04868
21	0.01990	0.20753	-0.01990	-0.01064	0.00000	-0.01064
22	0.02252	0.22853	-0.02252	0.01234	0.00000	0.01234
25	0.00817	0.09741	-0.00817	0.00519	0.00000	0.00519
26	0.01304	0.13088	-0.01304	-0.00613	0.00000	-0.00613
SUM	0.25244	2.64180	-0.25244	0.12200	0.00000	0.12200

Condition **LC30=1.2D+Di+WI150**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.03677	0.24726	-0.03677	-0.05525	0.00000	-0.05525
11	0.05091	0.47806	-0.05091	0.09002	0.00000	0.09002
12	0.03041	0.19703	-0.03041	-0.03043	0.00000	-0.03043
13	0.04879	0.45475	-0.04879	0.11492	0.00000	0.11492
17	0.03394	0.21723	-0.03394	-0.03397	0.00000	-0.03397
18	0.04808	0.36283	-0.04808	0.06208	0.00000	0.06208
21	0.02546	0.20753	-0.02546	-0.01380	0.00000	-0.01380
22	0.02546	0.22853	-0.02546	0.01377	0.00000	0.01377
25	0.01027	0.09741	-0.01027	0.00644	0.00000	0.00644
26	0.01378	0.13088	-0.01378	-0.00676	0.00000	-0.00676
SUM	0.32385	2.64180	-0.32385	0.14702	0.00000	0.14702

Condition **LC31=1.2D+Di-WI0**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.24726	-0.06000	-0.09016	0.00000	0.00000
11	0.00000	0.47806	-0.08100	0.14173	0.00000	0.00000
12	0.00000	0.19703	-0.04900	-0.04903	0.00000	0.00000
13	0.00000	0.45475	-0.07700	0.18036	0.00000	0.00000
17	0.00000	0.21723	-0.05500	-0.05504	0.00000	0.00000
18	0.00000	0.36283	-0.07600	0.09678	0.00000	0.00000
21	0.00000	0.20753	-0.04000	-0.02169	0.00000	0.00000
22	0.00000	0.22853	-0.04000	0.02164	0.00000	0.00000
25	0.00000	0.09741	-0.01600	0.01000	0.00000	0.00000

26	0.00000	0.13088	-0.02000	-0.01000	0.00000	0.00000
SUM	0.00000	2.64180	-0.51400	0.22458	0.00000	0.00000

Condition **LC32=1.2D+Di-WI30**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.03677	0.24726	-0.03677	-0.05525	0.00000	0.05525
11	-0.05091	0.47806	-0.05091	0.09002	0.00000	-0.09002
12	-0.03041	0.19703	-0.03041	-0.03043	0.00000	0.03043
13	-0.04879	0.45475	-0.04879	0.11492	0.00000	-0.11492
17	-0.03394	0.21723	-0.03394	-0.03397	0.00000	0.03397
18	-0.04808	0.36283	-0.04808	0.06208	0.00000	-0.06208
21	-0.02546	0.20753	-0.02546	-0.01380	0.00000	0.01380
22	-0.02546	0.22853	-0.02546	0.01377	0.00000	-0.01377
25	-0.01027	0.09741	-0.01027	0.00644	0.00000	-0.00644
26	-0.01378	0.13088	-0.01378	-0.00676	0.00000	0.00676
SUM	-0.32385	2.64180	-0.32385	0.14702	0.00000	-0.14702

Condition **LC33=1.2D+Di-WI60**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.02616	0.24726	-0.02616	-0.03932	0.00000	0.03932
11	-0.03818	0.47806	-0.03818	0.06891	0.00000	-0.06891
12	-0.02404	0.19703	-0.02404	-0.02406	0.00000	0.02406
13	-0.03889	0.45475	-0.03889	0.09179	0.00000	-0.09179
17	-0.02475	0.21723	-0.02475	-0.02477	0.00000	0.02477
18	-0.03677	0.36283	-0.03677	0.04868	0.00000	-0.04868
21	-0.01990	0.20753	-0.01990	-0.01064	0.00000	0.01064
22	-0.02252	0.22853	-0.02252	0.01234	0.00000	-0.01234
25	-0.00817	0.09741	-0.00817	0.00519	0.00000	-0.00519
26	-0.01304	0.13088	-0.01304	-0.00613	0.00000	0.00613
SUM	-0.25244	2.64180	-0.25244	0.12200	0.00000	-0.12200

Condition **LC34=1.2D+Di-WI90**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.03000	0.24726	0.00000	0.00000	0.00000	0.04508
11	-0.05500	0.47806	0.00000	0.00000	0.00000	-0.10687
12	-0.03000	0.19703	0.00000	0.00000	0.00000	0.03002
13	-0.06100	0.45475	0.00000	0.00000	0.00000	-0.15156
17	-0.02900	0.21723	0.00000	0.00000	0.00000	0.02902
18	-0.04500	0.36283	0.00000	0.00000	0.00000	-0.06085
21	-0.02222	0.20753	0.00000	0.00000	0.00000	0.01172
22	-0.02778	0.22853	0.00000	0.00000	0.00000	-0.01536
25	-0.01007	0.09741	0.00000	0.00000	0.00000	-0.00644
26	-0.01793	0.13088	0.00000	0.00000	0.00000	0.00822
SUM	-0.32800	2.64180	0.00000	0.00000	0.00000	-0.21702

Condition **LC35=1.2D+Di-WI120**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.02616	0.24726	0.02616	0.03932	0.00000	0.03932
11	-0.03818	0.47806	0.03818	-0.06891	0.00000	-0.06891
12	-0.02404	0.19703	0.02404	0.02406	0.00000	0.02406
13	-0.03889	0.45475	0.03889	-0.09179	0.00000	-0.09179
17	-0.02475	0.21723	0.02475	0.02477	0.00000	0.02477
18	-0.03677	0.36283	0.03677	-0.04868	0.00000	-0.04868
21	-0.01990	0.20753	0.01990	0.01064	0.00000	0.01064
22	-0.02252	0.22853	0.02252	-0.01234	0.00000	-0.01234
25	-0.00817	0.09741	0.00817	-0.00519	0.00000	-0.00519
26	-0.01304	0.13088	0.01304	0.00613	0.00000	0.00613
SUM	-0.25244	2.64180	0.25244	-0.12200	0.00000	-0.12200

Condition **LC36=1.2D+Di-WI150**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.03677	0.24726	0.03677	0.05525	0.00000	0.05525
11	-0.05091	0.47806	0.05091	-0.09002	0.00000	-0.09002
12	-0.03041	0.19703	0.03041	0.03043	0.00000	0.03043
13	-0.04879	0.45475	0.04879	-0.11492	0.00000	-0.11492
17	-0.03394	0.21723	0.03394	0.03397	0.00000	0.03397
18	-0.04808	0.36283	0.04808	-0.06208	0.00000	-0.06208
21	-0.02546	0.20753	0.02546	0.01380	0.00000	0.01380
22	-0.02546	0.22853	0.02546	-0.01377	0.00000	-0.01377
25	-0.01027	0.09741	0.01027	-0.00644	0.00000	-0.00644
26	-0.01378	0.13088	0.01378	0.00676	0.00000	0.00676
SUM	-0.32385	2.64180	0.32385	-0.14702	0.00000	-0.14702

Condition **LC37=1.2D**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.08426	0.00000	0.00000	0.00000	0.00000
11	0.00000	0.21506	0.00000	0.00000	0.00000	0.00000
12	0.00000	0.06903	0.00000	0.00000	0.00000	0.00000
13	0.00000	0.20075	0.00000	0.00000	0.00000	0.00000
17	0.00000	0.06423	0.00000	0.00000	0.00000	0.00000
18	0.00000	0.15183	0.00000	0.00000	0.00000	0.00000
21	0.00000	0.09703	0.00000	0.00000	0.00000	0.00000
22	0.00000	0.11303	0.00000	0.00000	0.00000	0.00000
25	0.00000	0.05274	0.00000	0.00000	0.00000	0.00000
26	0.00000	0.05754	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	1.12580	0.00000	0.00000	0.00000	0.00000

Condition **LC40=1.2D+WL0**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.08426	0.01800	0.02702	0.00000	0.00000
11	0.00000	0.21506	0.02300	-0.03940	0.00000	0.00000
12	0.00000	0.06903	0.01400	0.01400	0.00000	0.00000
13	0.00000	0.20075	0.02100	-0.04880	0.00000	0.00000
17	0.00000	0.06423	0.01600	0.01600	0.00000	0.00000
18	0.00000	0.15183	0.02100	-0.02597	0.00000	0.00000
21	0.00000	0.09703	0.01193	0.00657	0.00000	0.00000
22	0.00000	0.11303	0.01007	-0.00534	0.00000	0.00000
25	0.00000	0.05274	0.00400	-0.00250	0.00000	0.00000

26	0.00000	0.05754	0.00500	0.00250	0.00000	0.00000
SUM	0.00000	1.12580	0.14400	-0.05592	0.00000	0.00000

Condition **LC41=1.2D+WL30**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.01061	0.08426	0.01061	0.01592	0.00000	-0.01592
11	0.01414	0.21506	0.01414	-0.02469	0.00000	0.02469
12	0.00990	0.06903	0.00990	0.00990	0.00000	-0.00990
13	0.01414	0.20075	0.01414	-0.03240	0.00000	0.03240
17	0.00990	0.06423	0.00990	0.00990	0.00000	-0.00990
18	0.01344	0.15183	0.01344	-0.01695	0.00000	0.01695
21	0.00707	0.09703	0.00707	0.00383	0.00000	-0.00383
22	0.00707	0.11303	0.00707	-0.00383	0.00000	0.00383
25	0.00230	0.05274	0.00230	-0.00145	0.00000	0.00145
26	0.00335	0.05754	0.00335	0.00161	0.00000	-0.00161
SUM	0.09192	1.12580	0.09192	-0.03815	0.00000	0.03815

Condition **LC42=1.2D+WL60**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00707	0.08426	0.00707	0.01061	0.00000	-0.01061
11	0.00990	0.21506	0.00990	-0.01763	0.00000	0.01763
12	0.00636	0.06903	0.00636	0.00637	0.00000	-0.00637
13	0.00990	0.20075	0.00990	-0.02324	0.00000	0.02324
17	0.00707	0.06423	0.00707	0.00707	0.00000	-0.00707
18	0.00990	0.15183	0.00990	-0.01271	0.00000	0.01271
21	0.00430	0.09703	0.00430	0.00225	0.00000	-0.00225
22	0.00560	0.11303	0.00560	-0.00311	0.00000	0.00311
25	0.00178	0.05274	0.00178	-0.00114	0.00000	0.00114
26	0.00317	0.05754	0.00317	0.00145	0.00000	-0.00145
SUM	0.06505	1.12580	0.06505	-0.03008	0.00000	0.03008

Condition **LC43=1.2D+WL90**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00800	0.08426	0.00000	0.00000	0.00000	-0.01201
11	0.01300	0.21506	0.00000	0.00000	0.00000	0.02443
12	0.00700	0.06903	0.00000	0.00000	0.00000	-0.00700
13	0.01300	0.20075	0.00000	0.00000	0.00000	0.03187
17	0.00700	0.06423	0.00000	0.00000	0.00000	-0.00700
18	0.01100	0.15183	0.00000	0.00000	0.00000	0.01498
21	0.00607	0.09703	0.00000	0.00000	0.00000	-0.00318
22	0.00793	0.11303	0.00000	0.00000	0.00000	0.00440
25	0.00178	0.05274	0.00000	0.00000	0.00000	0.00117
26	0.00422	0.05754	0.00000	0.00000	0.00000	-0.00183
SUM	0.07900	1.12580	0.00000	0.00000	0.00000	0.04582

Condition **LC44=1.2D+WL120**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00707	0.08426	-0.00707	-0.01061	0.00000	-0.01061
11	0.00990	0.21506	-0.00990	0.01763	0.00000	0.01763
12	0.00636	0.06903	-0.00636	-0.00637	0.00000	-0.00637
13	0.00990	0.20075	-0.00990	0.02324	0.00000	0.02324
17	0.00707	0.06423	-0.00707	-0.00707	0.00000	-0.00707
18	0.00990	0.15183	-0.00990	0.01271	0.00000	0.01271
21	0.00430	0.09703	-0.00430	-0.00225	0.00000	-0.00225
22	0.00560	0.11303	-0.00560	0.00311	0.00000	0.00311
25	0.00178	0.05274	-0.00178	0.00114	0.00000	0.00114
26	0.00317	0.05754	-0.00317	-0.00145	0.00000	-0.00145
SUM	0.06505	1.12580	-0.06505	0.03008	0.00000	0.03008

Condition **LC45=1.2D+WL150**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.01061	0.08426	-0.01061	-0.01592	0.00000	-0.01592
11	0.01414	0.21506	-0.01414	0.02469	0.00000	0.02469
12	0.00990	0.06903	-0.00990	-0.00990	0.00000	-0.00990
13	0.01414	0.20075	-0.01414	0.03240	0.00000	0.03240
17	0.00990	0.06423	-0.00990	-0.00990	0.00000	-0.00990
18	0.01344	0.15183	-0.01344	0.01695	0.00000	0.01695
21	0.00707	0.09703	-0.00707	-0.00383	0.00000	-0.00383
22	0.00707	0.11303	-0.00707	0.00383	0.00000	0.00383
25	0.00230	0.05274	-0.00230	0.00145	0.00000	0.00145
26	0.00335	0.05754	-0.00335	-0.00161	0.00000	-0.00161
SUM	0.09192	1.12580	-0.09192	0.03815	0.00000	0.03815

Condition **LC46=1.2D-WL0**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	0.00000	0.08426	-0.01800	-0.02702	0.00000	0.00000
11	0.00000	0.21506	-0.02300	0.03940	0.00000	0.00000
12	0.00000	0.06903	-0.01400	-0.01400	0.00000	0.00000
13	0.00000	0.20075	-0.02100	0.04880	0.00000	0.00000
17	0.00000	0.06423	-0.01600	-0.01600	0.00000	0.00000
18	0.00000	0.15183	-0.02100	0.02597	0.00000	0.00000
21	0.00000	0.09703	-0.01193	-0.00657	0.00000	0.00000
22	0.00000	0.11303	-0.01007	0.00534	0.00000	0.00000
25	0.00000	0.05274	-0.00400	0.00250	0.00000	0.00000
26	0.00000	0.05754	-0.00500	-0.00250	0.00000	0.00000
SUM	0.00000	1.12580	-0.14400	0.05592	0.00000	0.00000

Condition **LC47=1.2D-WL30**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.01061	0.08426	-0.01061	-0.01592	0.00000	0.01592
11	-0.01414	0.21506	-0.01414	0.02469	0.00000	-0.02469
12	-0.00990	0.06903	-0.00990	-0.00990	0.00000	0.00990
13	-0.01414	0.20075	-0.01414	0.03240	0.00000	-0.03240
17	-0.00990	0.06423	-0.00990	-0.00990	0.00000	0.00990
18	-0.01344	0.15183	-0.01344	0.01695	0.00000	-0.01695
21	-0.00707	0.09703	-0.00707	-0.00383	0.00000	0.00383
22	-0.00707	0.11303	-0.00707	0.00383	0.00000	-0.00383
25	-0.00230	0.05274	-0.00230	0.00145	0.00000	-0.00145

26	-0.00335	0.05754	-0.00335	-0.00161	0.00000	0.00161
SUM	-0.09192	1.12580	-0.09192	0.03815	0.00000	-0.03815

Condition **LC48=1.2D-WL60**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.00707	0.08426	-0.00707	-0.01061	0.00000	0.01061
11	-0.00990	0.21506	-0.00990	0.01763	0.00000	-0.01763
12	-0.00636	0.06903	-0.00636	-0.00637	0.00000	0.00637
13	-0.00990	0.20075	-0.00990	0.02324	0.00000	-0.02324
17	-0.00707	0.06423	-0.00707	-0.00707	0.00000	0.00707
18	-0.00990	0.15183	-0.00990	0.01271	0.00000	-0.01271
21	-0.00430	0.09703	-0.00430	-0.00225	0.00000	0.00225
22	-0.00560	0.11303	-0.00560	0.00311	0.00000	-0.00311
25	-0.00178	0.05274	-0.00178	0.00114	0.00000	-0.00114
26	-0.00317	0.05754	-0.00317	-0.00145	0.00000	0.00145
SUM	-0.06505	1.12580	-0.06505	0.03008	0.00000	-0.03008

Condition **LC49=1.2D-WL90**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.00800	0.08426	0.00000	0.00000	0.00000	0.01201
11	-0.01300	0.21506	0.00000	0.00000	0.00000	-0.02443
12	-0.00700	0.06903	0.00000	0.00000	0.00000	0.00700
13	-0.01300	0.20075	0.00000	0.00000	0.00000	-0.03187
17	-0.00700	0.06423	0.00000	0.00000	0.00000	0.00700
18	-0.01100	0.15183	0.00000	0.00000	0.00000	-0.01498
21	-0.00607	0.09703	0.00000	0.00000	0.00000	0.00318
22	-0.00793	0.11303	0.00000	0.00000	0.00000	-0.00440
25	-0.00178	0.05274	0.00000	0.00000	0.00000	-0.00117
26	-0.00422	0.05754	0.00000	0.00000	0.00000	0.00183
SUM	-0.07900	1.12580	0.00000	0.00000	0.00000	-0.04582

Condition **LC50=1.2D-WL120**

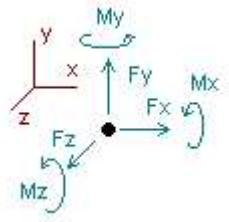
8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.00707	0.08426	0.00707	0.01061	0.00000	0.01061
11	-0.00990	0.21506	0.00990	-0.01763	0.00000	-0.01763
12	-0.00636	0.06903	0.00636	0.00637	0.00000	0.00637
13	-0.00990	0.20075	0.00990	-0.02324	0.00000	-0.02324
17	-0.00707	0.06423	0.00707	0.00707	0.00000	0.00707
18	-0.00990	0.15183	0.00990	-0.01271	0.00000	-0.01271
21	-0.00430	0.09703	0.00430	0.00225	0.00000	0.00225
22	-0.00560	0.11303	0.00560	-0.00311	0.00000	-0.00311
25	-0.00178	0.05274	0.00178	-0.00114	0.00000	-0.00114
26	-0.00317	0.05754	0.00317	0.00145	0.00000	0.00145
SUM	-0.06505	1.12580	0.06505	-0.03008	0.00000	-0.03008

Condition **LC51=1.2D-WL150**

8	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
9	0.00000	0.01014	0.00000	0.00000	0.00000	0.00000
10	-0.01061	0.08426	0.01061	0.01592	0.00000	0.01592
11	-0.01414	0.21506	0.01414	-0.02469	0.00000	-0.02469
12	-0.00990	0.06903	0.00990	0.00990	0.00000	0.00990
13	-0.01414	0.20075	0.01414	-0.03240	0.00000	-0.03240
17	-0.00990	0.06423	0.00990	0.00990	0.00000	0.00990
18	-0.01344	0.15183	0.01344	-0.01695	0.00000	-0.01695
21	-0.00707	0.09703	0.00707	0.00383	0.00000	0.00383
22	-0.00707	0.11303	0.00707	-0.00383	0.00000	-0.00383
25	-0.00230	0.05274	0.00230	-0.00145	0.00000	-0.00145
26	-0.00335	0.05754	0.00335	0.00161	0.00000	0.00161
SUM	-0.09192	1.12580	0.09192	-0.03815	0.00000	-0.03815

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60

LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=1.2D
LC40=1.2D+WL0
LC41=1.2D+WL30
LC42=1.2D+WL60
LC43=1.2D+WL90
LC44=1.2D+WL120
LC45=1.2D+WL150
LC46=1.2D-WL0
LC47=1.2D-WL30
LC48=1.2D-WL60
LC49=1.2D-WL90
LC50=1.2D-WL120
LC51=1.2D-WL150

		Forces						Moments					
Node		**Fx** [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
8	Max	0.025	LC3	0.010	LC1	0.025	LC2	0.00250	LC18	0.00000	LC1	0.00250	LC15
	Min	-0.025	LC9	0.008	LC13	-0.025	LC6	-0.00250	LC14	0.00000	LC1	-0.00250	LC21
9	Max	0.025	LC3	0.010	LC1	0.025	LC2	0.00250	LC2	0.00000	LC1	0.00250	LC9
	Min	-0.025	LC9	0.008	LC13	-0.025	LC6	-0.00250	LC6	0.00000	LC1	-0.00250	LC3
10	Max	0.168	LC2	0.247	LC25	0.279	LC1	0.41875	LC1	0.00000	LC1	0.25259	LC8
	Min	-0.168	LC8	0.063	LC13	-0.279	LC7	-0.41875	LC7	0.00000	LC1	-0.25259	LC2
11	Max	0.242	LC16	0.478	LC25	0.360	LC1	0.61982	LC19	0.00000	LC1	0.41114	LC16
	Min	-0.242	LC22	0.161	LC13	-0.360	LC7	-0.61982	LC13	0.00000	LC1	-0.41114	LC22
12	Max	0.155	LC4	0.197	LC25	0.216	LC1	0.21605	LC1	0.00000	LC1	0.13879	LC10
	Min	-0.155	LC10	0.052	LC13	-0.216	LC7	-0.21605	LC7	0.00000	LC1	-0.13879	LC4
13	Max	0.278	LC16	0.455	LC25	0.327	LC1	0.76268	LC19	0.00000	LC1	0.63069	LC16
	Min	-0.278	LC22	0.151	LC13	-0.327	LC7	-0.76268	LC13	0.00000	LC1	-0.63069	LC22
17	Max	0.156	LC2	0.217	LC25	0.256	LC1	0.25605	LC1	0.00000	LC1	0.15630	LC8
	Min	-0.156	LC8	0.048	LC13	-0.256	LC7	-0.25605	LC7	0.00000	LC1	-0.15630	LC2
18	Max	0.210	LC4	0.363	LC25	0.335	LC1	0.41368	LC19	0.00000	LC1	0.26072	LC14
	Min	-0.210	LC10	0.114	LC13	-0.335	LC7	-0.41368	LC13	0.00000	LC1	-0.26072	LC20
21	Max	0.123	LC4	0.208	LC25	0.168	LC1	0.09118	LC1	0.00000	LC1	0.06716	LC10
	Min	-0.123	LC10	0.073	LC13	-0.168	LC7	-0.09118	LC7	0.00000	LC1	-0.06716	LC4
22	Max	0.151	LC4	0.229	LC25	0.164	LC1	0.08866	LC19	0.00000	LC1	0.08542	LC16
	Min	-0.151	LC10	0.085	LC13	-0.164	LC7	-0.08866	LC13	0.00000	LC1	-0.08542	LC22
25	Max	0.056	LC4	0.097	LC25	0.062	LC12	0.03771	LC7	0.00000	LC1	0.02352	LC2
	Min	-0.056	LC10	0.040	LC13	-0.062	LC6	-0.03771	LC1	0.00000	LC1	-0.02352	LC8
26	Max	0.092	LC16	0.131	LC25	0.078	LC12	0.03854	LC1	0.00000	LC1	0.03215	LC10
	Min	-0.092	LC22	0.043	LC13	-0.078	LC6	-0.03854	LC7	0.00000	LC1	-0.03215	LC4

Date: 12-6-2022
Project Name: MANCHESTER SOUTH CENTRAL
Project No.: CT5322
Designed By: KM **Checked By:** MSC

Forces on Steel Tension Bands:

Lateral Forces:

The lateral support of the antennas and RRH's are assumed to be taken by the steel banding system clamped to the smokestack with steel plates and threaded rods.

***(2 steel bands are installed; therefore, the weight and ice load of equipment is assumed to be divided by 2.**

Item	Weight (lbs.)	Qty.	Total (lbs.)
AIR6449 Antenna	197	3	591
AIR6419 Antenna	175	3	525
DMP65R-BU6DA Antenna	402	3	1206
4415 B25 RRH	100	3	300
4449 B5/B12 RRH	131	3	393
Surge Arrestor	97	3	291
Mount Pipe	101	9	911.52
Miscellaneous	100	-	100
		Total =	4317.52 lbs.

Amount of Bands = 2

Tension per Band = 2158.76 lbs.

Linear Load per Band= 65.42 plf

Calculate Approximate Weight of 1/4" Thick Band:

Weight of Steel	490	lb/ft^3
Width	0.29	ft.
Thickness	0.02083	ft.

Total Weight per Band= 3.0 plf

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Total Gravity Force per Band=

65.42 lbs.
3.0 plf

Total = **68.4 plf**

CHECK FRICTION FORCES

Friction Equation = Fs = μs N

Force of static friction	**Fs =**	68.4	plf
Coefficient of static friction	**μs =**	0.7	(steel on brick)
Force required on band	**N =**	97.7	
	Factor of Safety =	1.5	
Force required on band	**N_T =**	146.6	plf

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CHECK CONNECTION CAPACITY (Worst Case)

Reference: AISC Steel Construction Manual 9th Edition (ASD)

Bolt Type =	Threaded Rod	
Bolt Diameter =	1/2	in.
Steel Grade =	A36	

Allowable Tensile Load =

F_{Tall} = 4271 lbs.

Allowable Shear Load =

F_{vall} = 2562 lbs.

Tension Forces

Gravity load of Equipment =	146.6	plf
Circumference of Smokestack =	33.0	ft
Total Tension =	4838	lbs.
No. of Knuckle Supports =	3	
No. of Bolts / Support =	2	

Tension Design Load /Bolts =

f_t= 806.30 lbs. < 4271 lbs. **Therefore, OK !**