



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: portal.ct.gov/csc

VIA ELECTRONIC MAIL

October 11, 2022

Denise Sabo
Northeast Site Solutions
4 Angela's Way
Burlington, CT 06013
denise@northeastsitesolutions.com

RE: **EM-T-MOBILE-057-220830** – T-Mobile notice of intent to modify an existing telecommunications facility located at 411 West Putnam Avenue, Greenwich, Connecticut.

Dear Denise Sabo:

The Connecticut Siting Council (Council) is in receipt of your correspondence of October 7, 2022 submitted in response to the Council's September 28, 2022 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,

A handwritten signature in cursive script, appearing to read "Melanie Bachman".

Melanie Bachman
Executive Director

MAB/IN/laf

From: Denise Sabo <denise@northeastsitesolutions.com>

Sent: Friday, October 7, 2022 10:53 AM

To: Robidoux, Evan <Evan.Robidoux@ct.gov>

Cc: CSC-DL Siting Council <Siting.Council@ct.gov>; Deborah Chase <deborah@northeastsitesolutions.com>

Subject: RE: Council Incomplete Letter for EM-T-MOBILE-057-220830 (West Putnam Avenue, Greenwich)
CT11090A-SBA-TMO

Hi Evan,

Please see attached SA for EM-T-MOBILE-057-220830 incomplete letter.

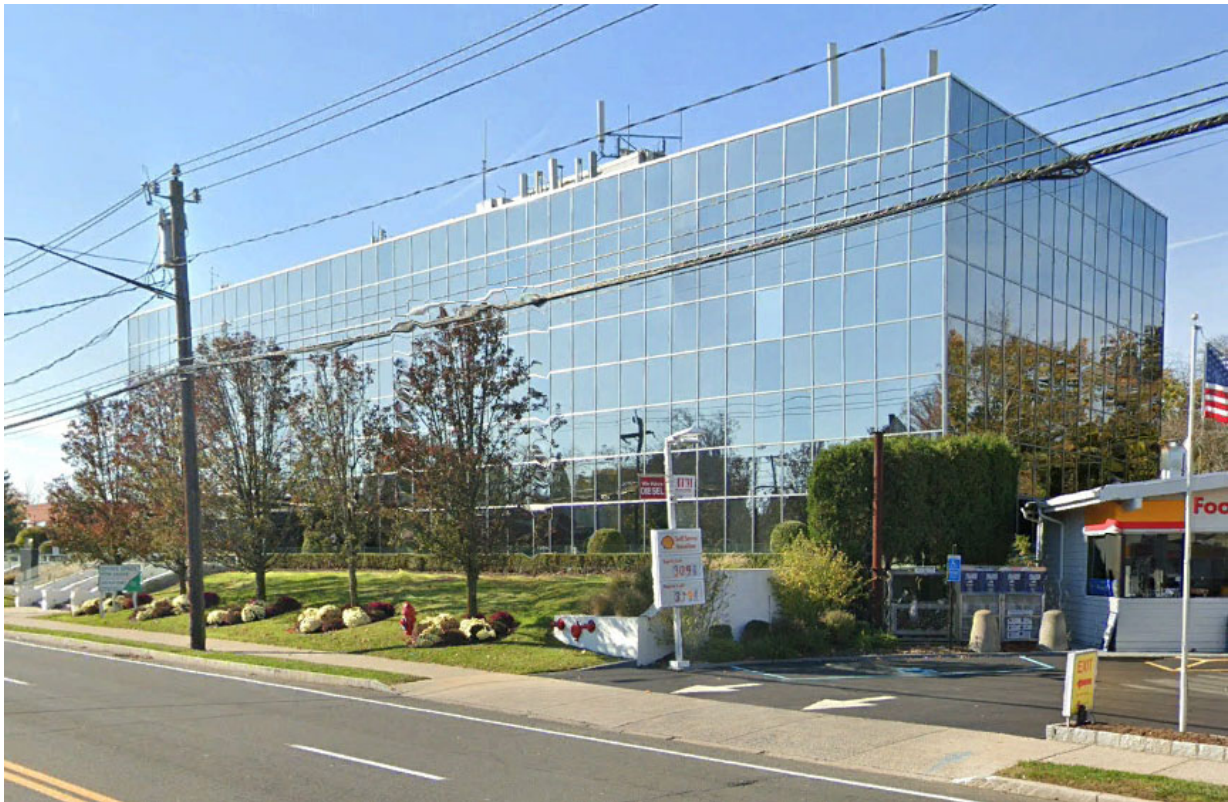
Thank you

Denise

· · **T** · · Mobile ·

15 Commerce Way
Suite B
Norton, MA 02766

STRUCTURAL ANALYSIS **CT11090A – GREENWICH / PUTNAM AVE 2**



Address:

411 WEST PUTNAM AVENUE
GREENWICH, CT 06830

Date:

OCTOBER 04, 2022



October 04, 2022

•T-Mobile•

15 Commerce Way
Suite B
Norton, MA 02766

Structural Analysis of Antenna and Equipment Loads

RE:

Site Number	CT11090A
Site Name	Greenwich / Putnam Ave 2
Site Address	411 West Putnam Avenue, Greenwich, CT 06830

To whom it may concern:

Chappell Engineering Associates, LLC has performed a structural analysis of the existing roof mounted ballast antenna frames at the above-referenced location. Based upon the site walk completed on 06-12-2020, the existing 3-sector site consists of a single elevated steel frame with equipment cabinets and three (3) roof mounted ballast antenna frames.

T-Mobile currently proposes to install one (1) Ericsson B160 Battery Cabinet and one (1) Ericsson 6160 Equipment Cabinet on the existing elevated steel equipment frame. The proposed cabinets will be located in the space reserved for future equipment as indicated in the table below. The total weight of the equipment cabinets being installed is 2,451lbs. The net change (-549lbs.) is a net decrease in the overall load to the frame as compared to the original (existing) design condition. A sketch of the proposed changes is included in on our construction drawings, and the table below summarizes the existing and proposed configurations:

Existing Equipment Configuration		Proposed Equipment Configuration	
Cabinet Type	Weight	Cabinet Type	Weight
PPC	150 lbs	PPC	150 lbs
Transformer	410 lbs.	Transformer	410 lbs.
Ericsson RBS 6102	1219 lbs.	Ericsson RBS 6102	1219 lbs.
Ericsson RS8000 (future)	1500 lbs.	Ericsson 6160	680 lbs.
Ericsson RS8000 (future)	1500 lbs.	Ericsson B160	1771 lbs.
Total	4779 lbs.		4230 lbs.

Additionally, T-Mobile proposes to install three (3) total 2500 MHz antennas, three (3) total 600/700MHz antennas, three (3) total 1900MHz antennas. Ancillary equipment serving to supplement the proposed antennas will include three (3) total Ericsson 4460 B25+B66 remote radios and three (3) total Ericsson 4480 B71+ B85 remote radios at the *alpha*, *beta* and *gamma* sectors to replace the existing three (3) in-service antennas and related transmitting equipment at these locations. Additionally, three (3) total DC/Hybrid cables will be run to service the proposed antenna (1 per sector, total of 3 sectors receiving the new antenna).

The existing *alpha*, *beta* and *gamma* sector antenna frames do not have the required capacity to support the proposed antennas, and will be reinforced to provide sufficient capacity to support the proposed antenna loads. The existing rear ballast will be re-located to the new larger footprint frames. Our calculations are enclosed and are summarized below for the respective member capacities of the reinforced ballast frames.

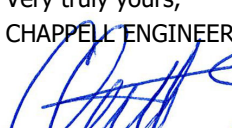
T-Mobile

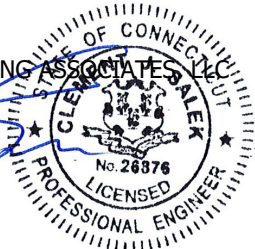
15 Commerce Way
Suite B
Norton, MA 02766
October 04, 2020

Beam	Section	Com	Defl L/	Slen	CAPACITY					Combined Axial+Mom
					Axial	Dir	Shea	Mom	LTB	
3	L 2.5x2.5x3/16	1	7285	176	0.00	MJ	0.00	0.02	0.03	0.03
4	L 2.5x2.5x3/16	1	7285	176	0.00	MJ	0.00	0.02	0.03	0.03
5	L 2.5x2.5x3/16	1	4482	207	0.00	MJ	0.00	0.03	0.04	0.04
6	L 2.5x2.5x3/16	1	1941	201	-0.08	MJ	0.01	0.08	0.10	0.11
13	L 2.5x2.5x3/16	1	1810	190	-0.09	MJ	0.04	0.34	0.37	0.44
						MI	0.00	0.01	0.00	
19	L 2.5x2.5x3/16	1	1479	190	-0.10	MJ	0.04	0.38	0.42	0.49
21	L 4x4x1/4	1	3797	189	0.00	MJ	0.02	0.21	0.23	0.36
						MI	0.01	0.08	0.00	
22	L 4x4x1/4	2	476	110	0.00	MJ	0.01	0.13	0.85	0.97
						MI	0.03	0.51	0.00	
23	L 2.5x2.5x3/16	1	1305	115	-0.09	MJ	0.02	0.20	0.31	0.58
						MI	0.05	0.19	0.00	
24	L 2.5x2.5x3/16	1	1941	201	-0.07	MJ	0.01	0.08	0.10	0.11
25	L 2.5x2.5x3/16	1	1336	114	-0.08	MJ	0.02	0.20	0.32	0.56
						MI	0.05	0.19	0.00	
26	PIPE 2-1/2	2	9999	4	-0.01	MJ	0.06	0.09	0.09	0.09
27	PIPE 2-1/2	1	9999	4	0.00	MJ	0.06	0.09	0.09	0.09
28	PIPE 2-1/2	2	9999	4	-0.01	MJ	0.06	0.09	0.09	0.09
29	PIPE 2-1/2	1	9999	4	0.00	MJ	0.06	0.09	0.09	0.09
31	PIPE 2-1/2	2	9999	4	-0.02	MJ	0.03	0.04	0.04	0.05
37	PIPE 2-1/2	1	539	83	-0.03	MI	0.02	0.18	0.00	0.19
43	PIPE 2-1/2	2	82	90	-0.01	MI	0.04	0.47	0.00	0.48
63	L 2.5x2.5x3/16	1	1641	202	0.00	MJ	0.00	0.00	0.16	0.16
						MI	0.01	0.10	0.00	
65	L 2.5x2.5x3/16	1	9999	8	-0.01	MJ	0.05	0.12	0.12	0.13
67	PIPE 2-1/2	1	1112	100	-0.03	MI	0.01	0.20	0.00	0.22
69	L 4x4x1/4	2	6021	82	-0.02	MJ	0.00	0.00	0.23	0.24
						MI	0.01	0.14	0.00	
71	L 4x4x1/4	2	9999	82	-0.01	MJ	0.00	0.00	0.14	0.14
						MI	0.01	0.08	0.00	
73	L 4x4x1/4	2	5260	118	0.00	MJ	0.01	0.13	0.13	0.13
74	L 4x4x1/4	2	5192	84	-0.01	MJ	0.04	0.23	0.23	0.23
75	L 4x4x1/4	2	3570	118	0.00	MJ	0.01	0.21	0.21	0.22
76	L 4x4x1/4	2	2316	84	-0.01	MJ	0.03	0.22	0.22	0.22
77	L 4x4x1/4	1	3646	189	0.00	MJ	0.00	0.05	0.06	0.06
78	L 4x4x1/4	1	3646	189	0.00	MJ	0.00	0.05	0.06	0.06
79	L 4x4x1/4	2	3501	199	-0.07	MJ	0.00	0.05	0.06	0.10
80	L 4x4x1/4	2	3501	199	-0.07	MJ	0.00	0.05	0.06	0.09
81	L 4x4x1/4	2	943	189	0.00	MJ	0.01	0.17	0.19	0.19
84	L 4x4x1/4	1	3176	189	0.00	MJ	0.01	0.12	0.13	0.13

Photos of the existing ballast frames and the existing antenna mounting locations are included in this report. The appropriate antenna mounting plans and details have been included in our drawings which are also enclosed for your convenience.

If you have any questions regarding this matter, please do not hesitate to call.

Very truly yours,
CHAPPELL ENGINEERING ASSOCIATES

Clement J Salek, P.E.
CJS/cjs





Existing T-Mobile Equipment Frame



Existing T-Mobile Equipment Frame



Existing T-Mobile Alpha Sector Antennas



Existing T-Mobile Alpha Sector Ballast



Existing T-Mobile Beta Sector Antennas



Existing T-Mobile Beta Sector Ballast



Existing T-Mobile Gamma Sector Antennas



Existing T-Mobile Gamma Sector Ballast

Site Name/Number:	CT11090A Greenwich / Putnam Ave 2	 CHAPPELL ENGINEERING ASSOCIATES, LLC <i>Civil • Structural • Land Surveying</i>
Site Address:	411 West Putnam Avenue, Greenwich, CT 06830	
CEA Job Number:	1815.141	
Date:	June 2, 2022	

Appurtenances Attached to Ballast Frame:

	Commscope W/ 65A-R1 Antenna		RFS APXVAALL24_43-U-NA20	Ericsson 4460 B25+B66	Ericsson 4480 B71+B85	Ericsson M-MIMO AIR6419				
Depth, d =	4.6 in	in	8.5 in	11.9 in	7.5 in	9.0 in	in			
Width, w =	12.1 in	in	24.0 in	15.1 in	15.1 in	20.9 in	in			
Height, h =	54.7 in	in	96.0 in	17.0 in	19.2 in	36.3 in	in			
Height ARL =	10.6 ft	ft	8.6 ft	5 ft	5 ft	10.6 ft	ft			
Weight =	24 lbs	lbs	128 lbs	104 lbs	93 lbs	84 lbs	lbs			

Design Code: ASCE 7

Z (Above Ground Level) =	60 ft	60 ft	60 ft	60 ft	60 ft	60 ft	60 ft	60 ft	60 ft	60 ft	
Height of Projection Area =	4.6 ft	0.0 ft	8.0 ft	1.4 ft	1.6 ft	3.0 ft	0.0 ft	0.0 ft	0.0 ft	0.0 ft	
Width of Projection Area =	1.0 ft	0.0 ft	2.0 ft	1.3 ft	1.3 ft	1.7 ft	0.0 ft	0.0 ft	0.0 ft	0.0 ft	
Af (Projected Area of Gross) =	4.6 s.f.	0.0 s.f.	16.0 s.f.	1.8 s.f.	2.0 s.f.	5.3 s.f.	0.0 s.f.	0.0 s.f.	0.0 s.f.	0.0 s.f.	
Reference Wind Velocity, V =	106 mph	106 mph	106 mph	106 mph	106 mph	106 mph	106 mph	106 mph	106 mph	106 mph	
Exposure =	B	B	B	B	B	B	B	B	B	B	Section 6.5.6.3
G (Gust effect factor) =	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	Section 6.5.8
Cf (Force Coefficient) =	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	Fig 6-20 to 6-23
Kz (Exposure Coefficients) =	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	6.5.6.6, Table 6-3
K1 (Multiplier) =	0	0	0	0	0	0	0	0	0	0	Figure 6-2
K2 (Multiplier) =	0	0	0	0	0	0	0	0	0	0	Figure 6-2
K3 (Multiplier) =	0	0	0	0	0	0	0	0	0	0	Figure 6-2
Kzt (Topographic Factor) : (1+K1*K2*K3)^2 =	1	1	1	1	1	1	1	1	1	1	Section 6.5.7.2
Kd =	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	Table 6-4
I (Importance Factor) =	1	1	1	1	1	1	1	1	1	1	Table 6-2
Qz = .00256*Kz*Kzt*Kd*V^2*I (psf) =	20.8 psf	20.8 psf	20.8 psf	20.8 psf	20.8 psf	20.8 psf	20.8 psf	20.8 psf	20.8 psf	20.8 psf	psf, Section 6.5.10
Reference Wind Pressure, p =	24.7 psf	24.7 psf	24.7 psf	24.7 psf	24.7 psf	24.7 psf	24.7 psf	24.7 psf	24.7 psf	24.7 psf	
F, lbs =	114	0	396	44	50	130	0	0	0	0	

Required Minimum Ballast:

Ballast Frame Geometry

Frame width =	10 ft
Frame depth =	14.00 ft
Centroid of front ballast to toe, dr =	0.67 ft
Centroid of rear ballast to toe, dr =	13.33 ft
Frame Footprint Area =	140.00 ft ²
Weight of steel frame =	1550 lbs

Common 8x8x16 Block Wgt = 37 lbs
 Solid 8x8x16 Block Wgt = 68 lbs
 Solid 4x8x16 Block Wgt = 34 lbs
 Common 8x4x16 Block Wgt = 19 lbs

Safety Factor for Overturning = 2.2 Total Appurtenance Wgt = 433 lbs

Let Wt = total ballast required, lbs
 Let Wr = 0.5 Wt
 Let Wf = 0.5 Wt

For Stability:

Mcausing <= Mresisting	
Mcausing <= Mframe wgt + Mrear ballast + Mfront ballast	
Mcausing <= Mframe wgt + 0.5 (Wt)(dr) + 0.5 (Wt)(df)	

Solving for Wt:

$\frac{Mcausing - Mframe wgt}{0.50 dr + 0.50 df} <= Wt$	(min total ballast req'd)
$\frac{13175.06}{7.00} <= Wt$	
Min. Total Ballast Req'd (Wt) = 1882 lbs <= Wt	

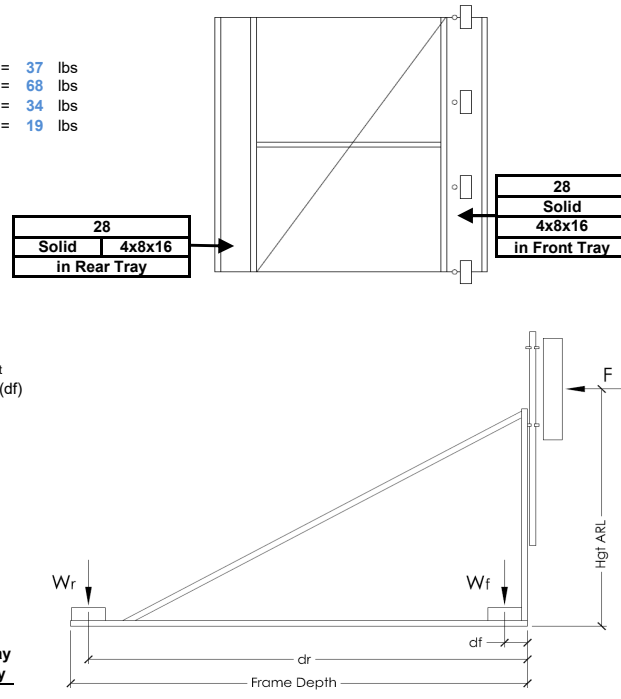
Mcausing = 14208.4 ft-lbs
 Mframe wgt = 1033.3 ft-lbs
 0.5 dr = 6.67 ft
 0.5 df = 0.33 ft

Min. Front Ballast Req'd (Wf) = 941 lbs = 28 Solid 4x8x16 Blocks in Front Tray

Min. Rear Ballast Req'd (Wr) = 941 lbs = 28 Solid 4x8x16 Blocks in Rear Tray

Total Loaded Frame Weight = 3865 lbs = 56 Total per Ballast Mount

Frame Surcharge = 27.6 psf



Frame Geometry

CT11090A Greenwich Putnam Ave 1815.141

Page: 1
Date: 10/ 4/22**Prepared by:****Load no. 1: X2 Antenna Loads (units - kips ft.)**/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADSFX2 0.065 FX3 -0.1 N 54
FX3 -0.1 N 51
/ JOINT LOADS
FX2 0.06 FX3 -0.012 N 39 53
FX2 0.065 FX3 -0.042 N 56 46/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS
FX2 0.19 FX3 -0.062 N 55 67
/ END**FORCE SUMMATION**FX1=0. kip
FX2=0.695 kip
FX3=-0.432 kip**Load no. 2: X2 Wind on Frame (units - kips ft.)**/ BEAM LOADS
/ BEAM LOADS
DIST GL FX2 0.009 B 63
/ BEAM LOADS
/ BEAM LOADS/ BEAM LOADS
/ BEAM LOADS
DIST GL FX2 0.008 B 6 21 22 TO 25 49 TO 62 66
/ BEAM LOADS
/ BEAM LOADSDIST GL FX2 0.005 B 67
DIST GL FX2 0.005 B 46 45
DIST GL FX2 0.005 B 34 42 44
/ END**FORCE SUMMATION**FX1=0. kip
FX2=0.5599 kip
FX3=0. kip**Load no. 3: Selfweight (units - kips ft.)**/ BEAM LOADS
SELF X3 -1. B 1 TO 19 21 TO 29 31 34 TO 39 42 TO 62 64 66 TO 68 89
/ BEAM LOADS
SELF X3 -1. B 70 72 TO 88
/ END

CT11090A Greenwich Putnam Ave 1815.141

Page: 2
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FX3=-1.2802 kip**Load no. 4: -X2 Antenna Loads (units - kips ft.)**/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS/ JOINT LOADS
FX2 -0.065 FX3 -0.1 N 54
FX3 -0.1 N 51/ JOINT LOADS
FX2 -0.06 FX3 -0.012 N 39 53

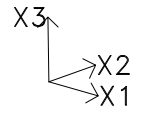
FX2 -0.065 FX3 -0.042 N 56 46

/ JOINT LOADS
/ JOINT LOADS
/ JOINT LOADS
FX2 -0.19 FX3 -0.062 N 55 67

/ END

FORCE SUMMATIONFX1=0. kip
FX2=-0.695 kip
FX3=-0.432 kip**Load no. 5: -X2 Wind on Frame (units - kips ft.)**/ BEAM LOADS
/ BEAM LOADS
DIST GL FX2 0.009 B 63
/ BEAM LOADS
/ BEAM LOADS/ BEAM LOADS
/ BEAM LOADS
/ BEAM LOADS
DIST GL FX2 -0.008 B 6 21 22 TO 25 49 TO 62 66
/ BEAM LOADSDIST GL FX2 -0.005 B 67
DIST GL FX2 -0.005 B 46 45
DIST GL FX2 -0.005 B 34 42 44
/ END STATIC**FORCE SUMMATION**FX1=0. kip
FX2=-0.4101 kip
FX3=0. kip

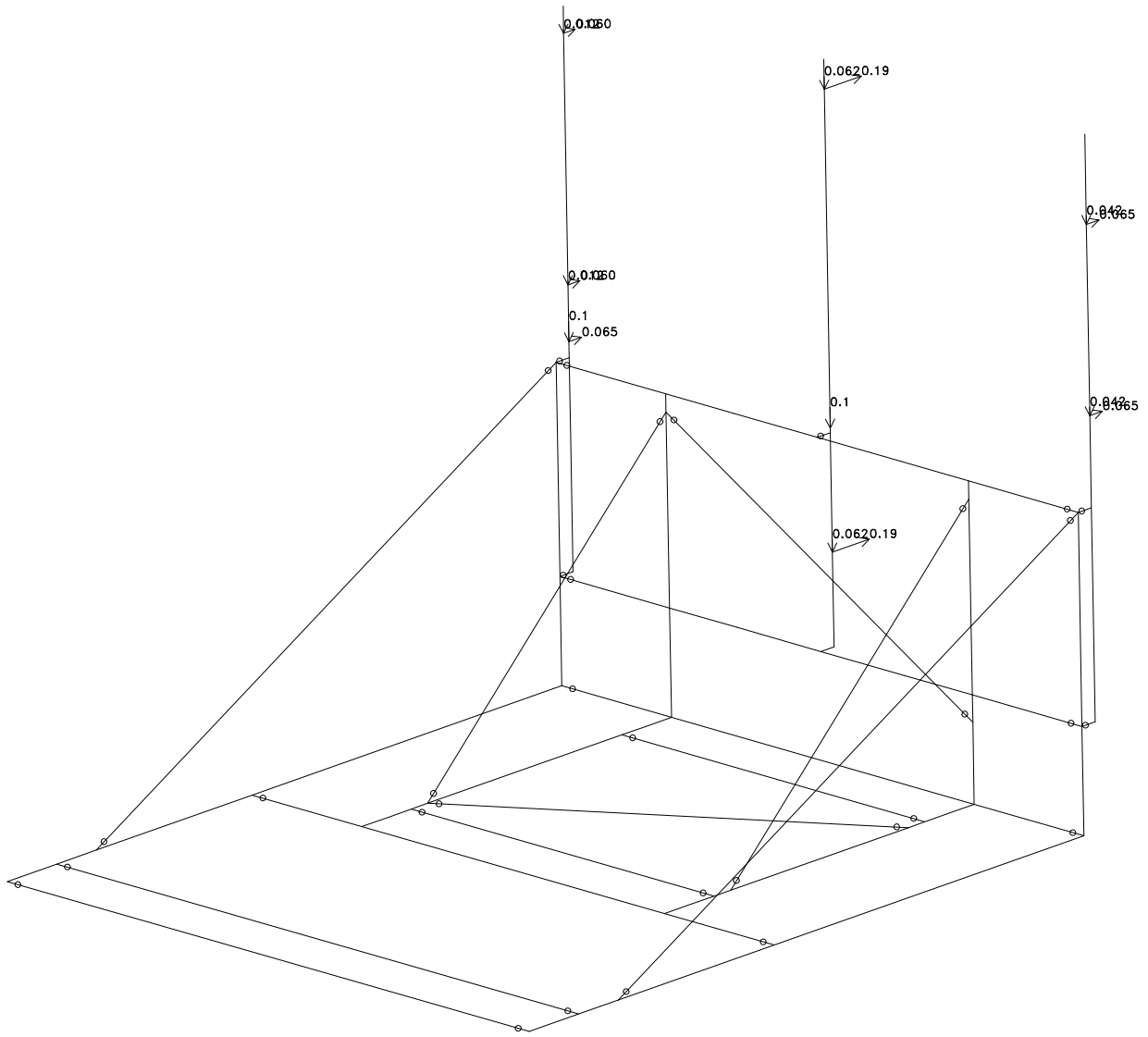
Load 1: X2 Antenna Loads



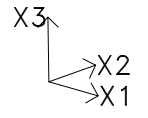
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UNITS: kip ft

DATE: 10/ 4/22



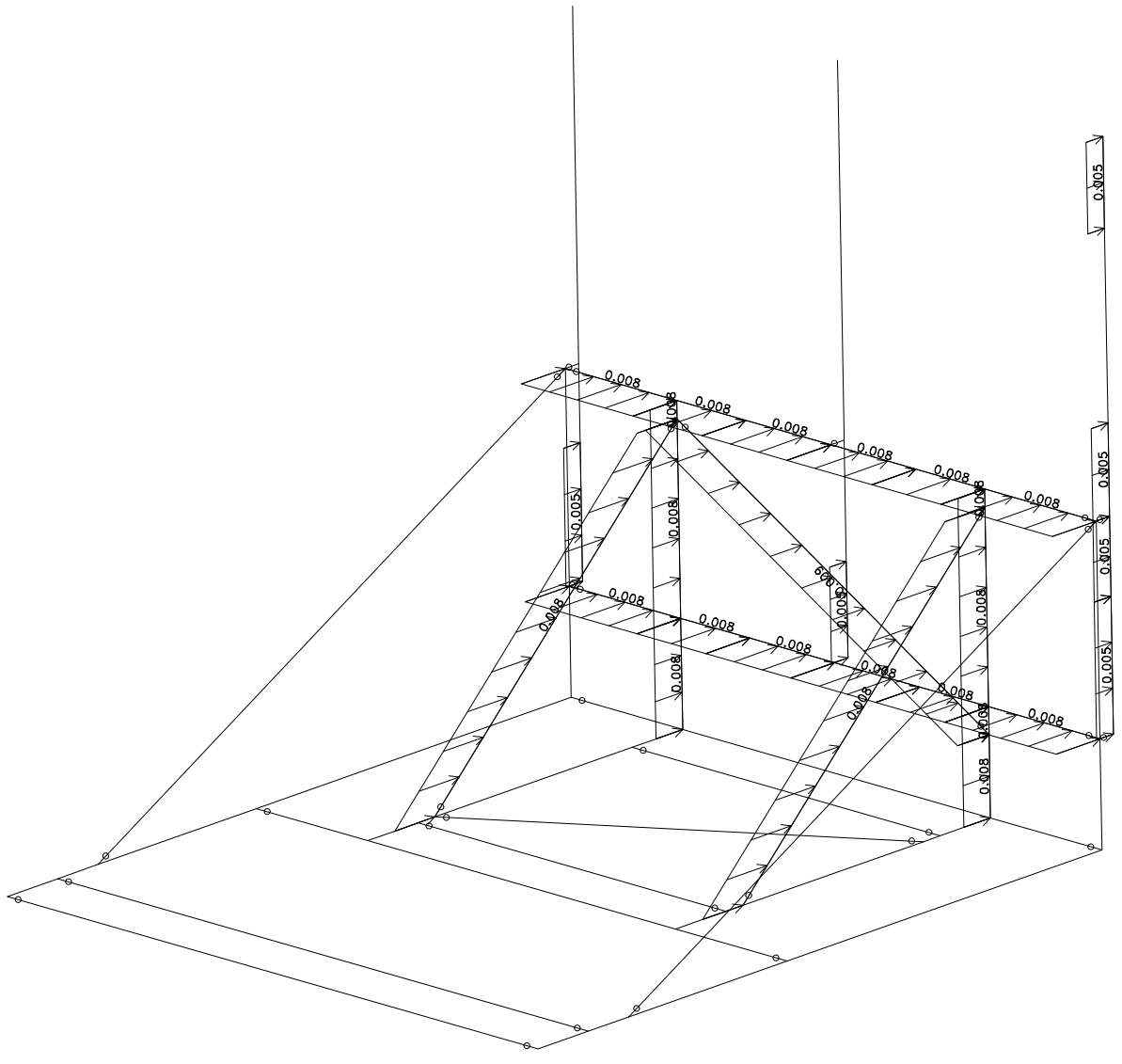
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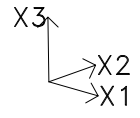
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DATE:10/ 4/22



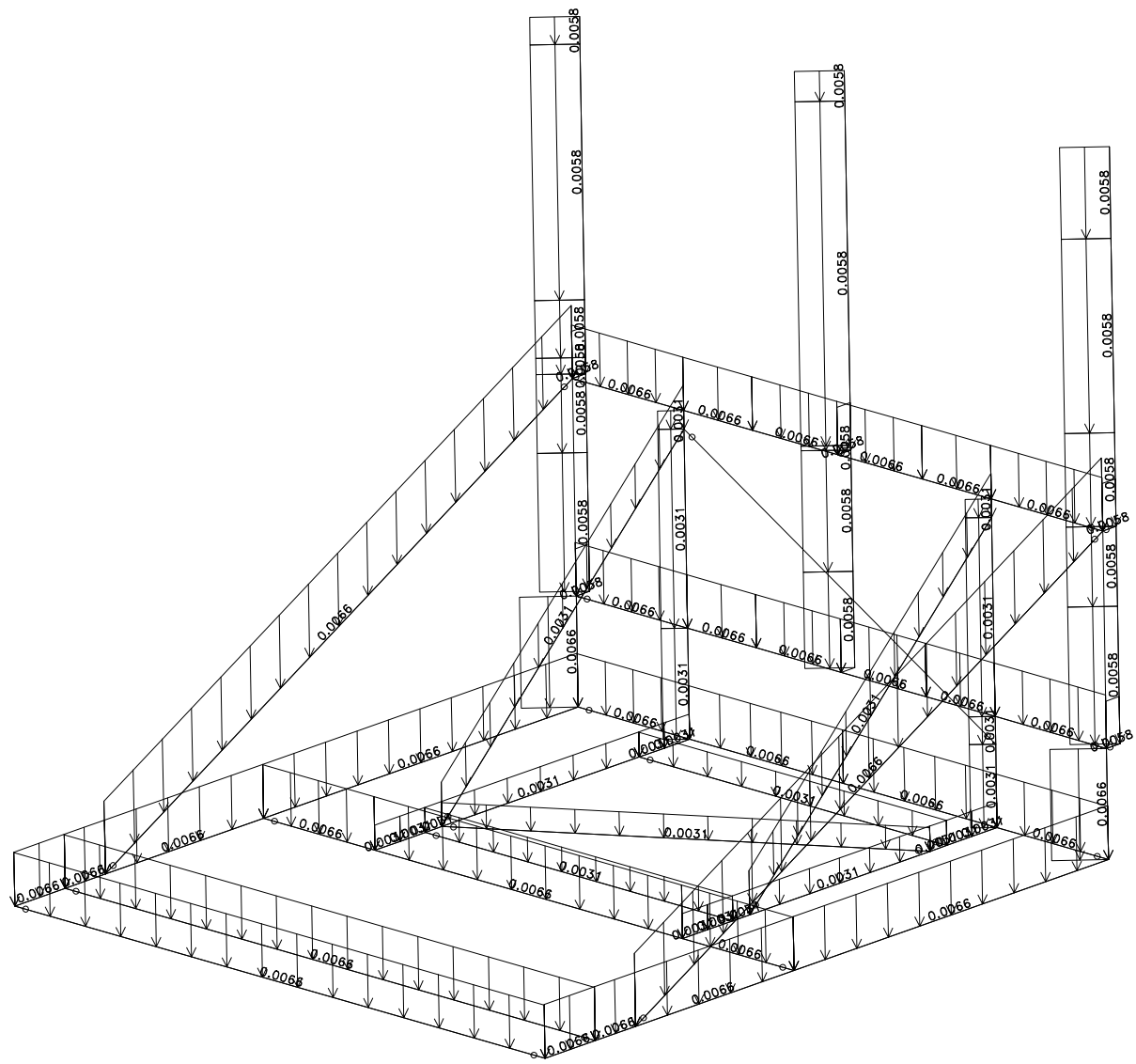
Load 3: Selfweight



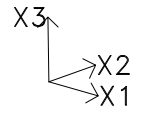
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UNITS: kip ft

DATE:10/ 4/22



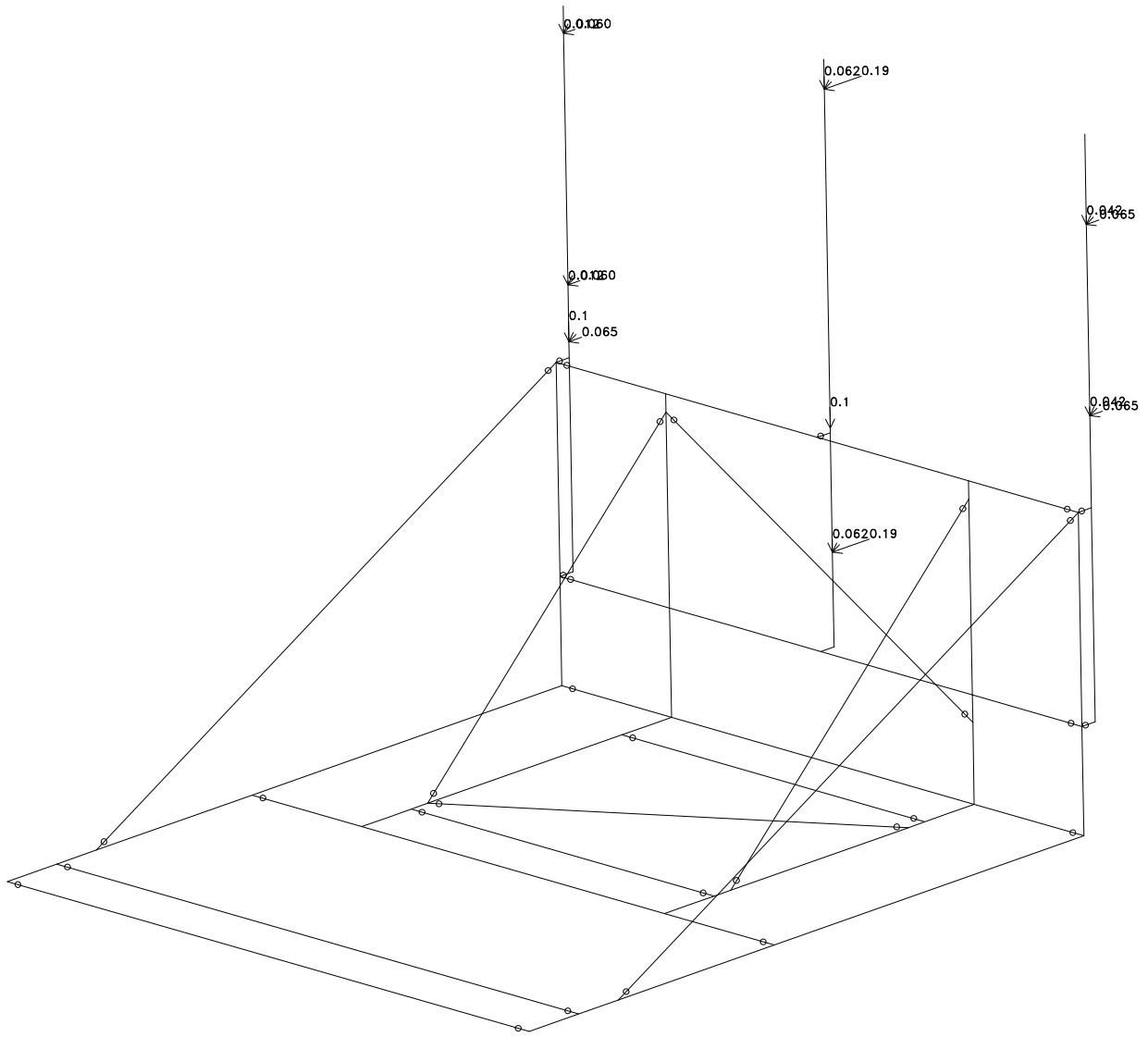
Load 4: -X2 Antenna Loads



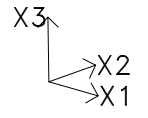
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UNITS: kip ft

DATE: 10/ 4/22



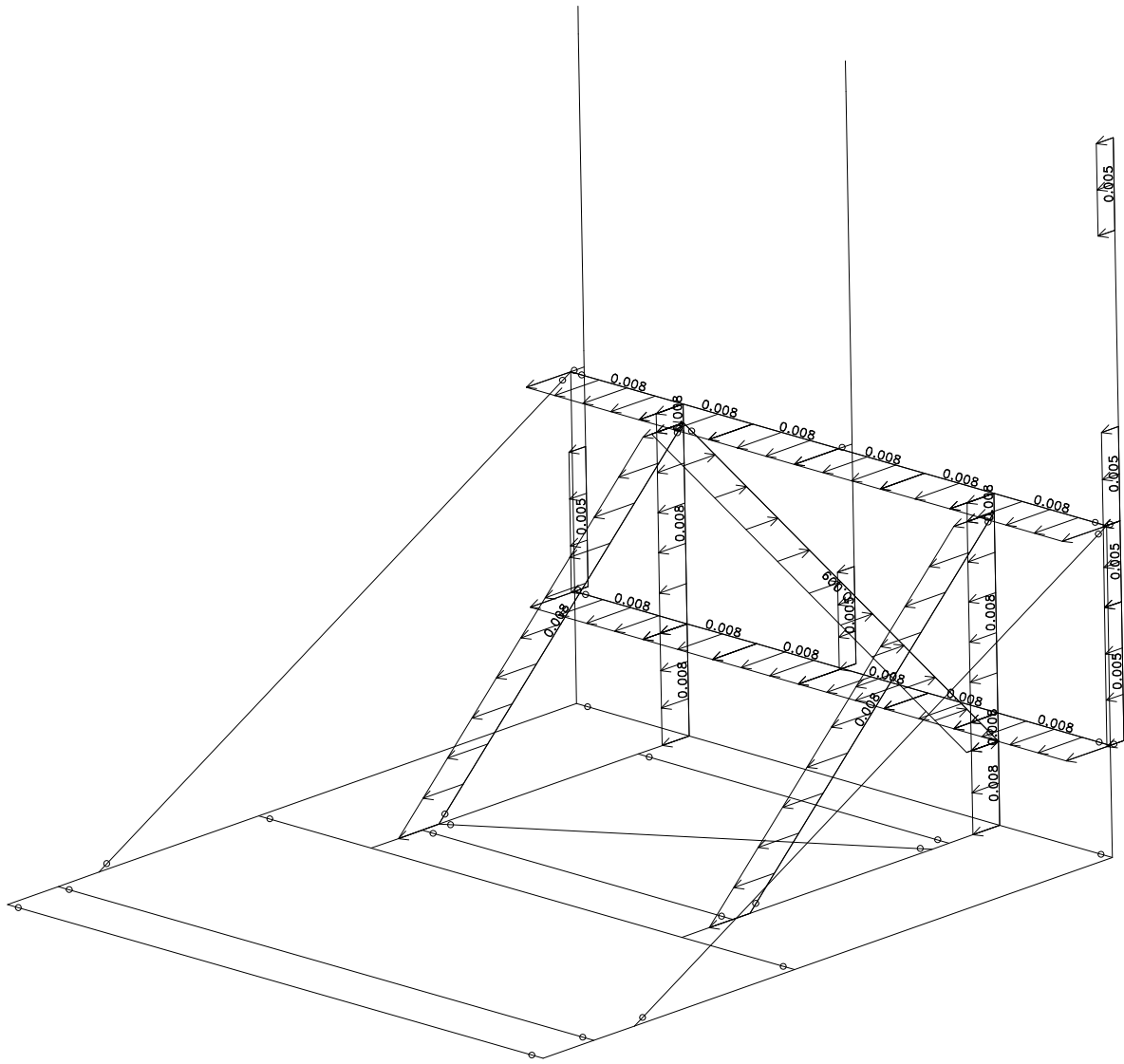
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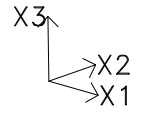


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UNITS: kip ft

DATE:10/ 4/22

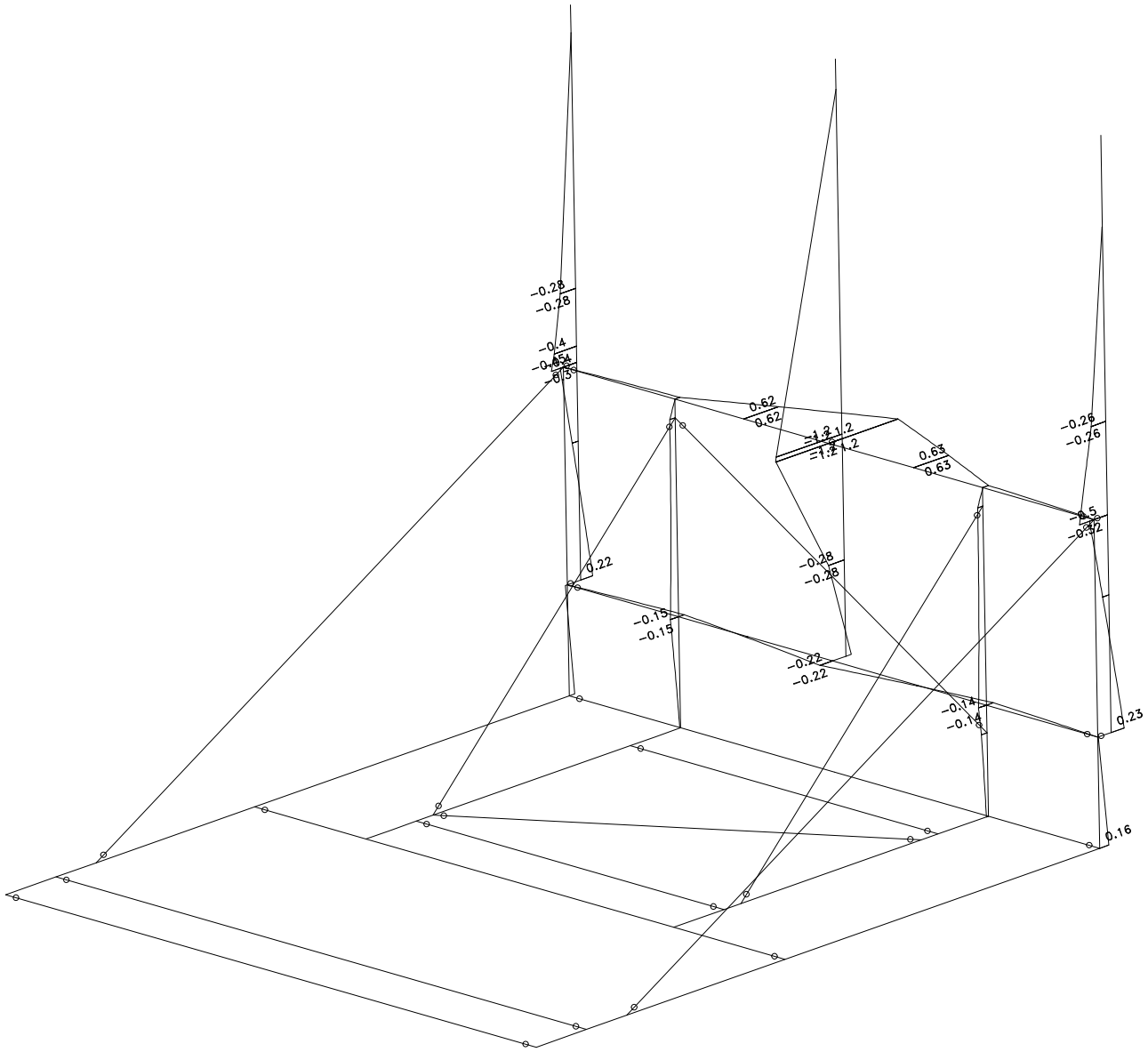


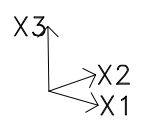


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UNITS: kip*ft

DATE:10/ 4/22

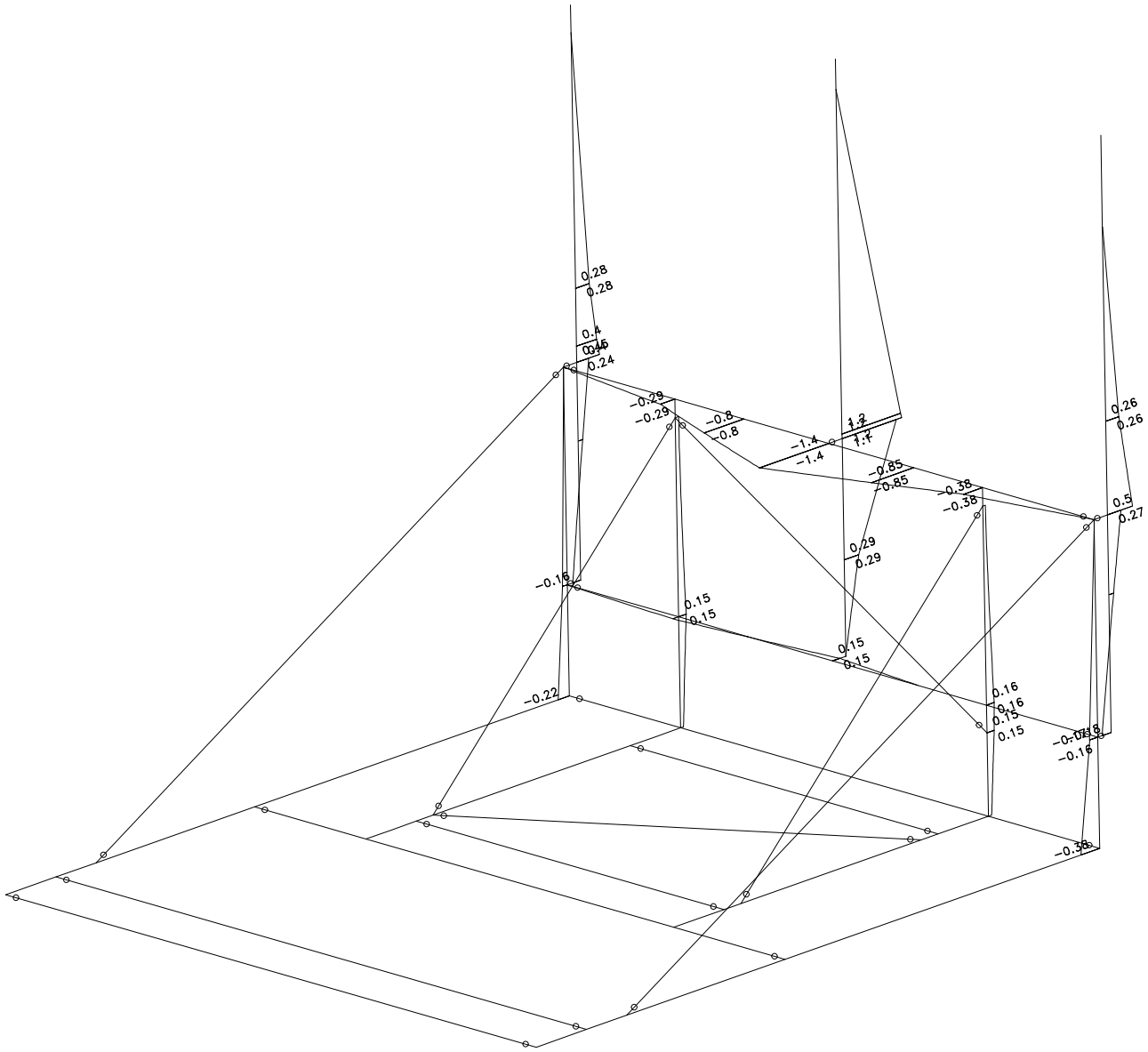




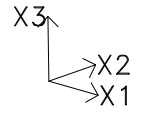
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UNITS: kip*ft

DATE:10/ 4/22



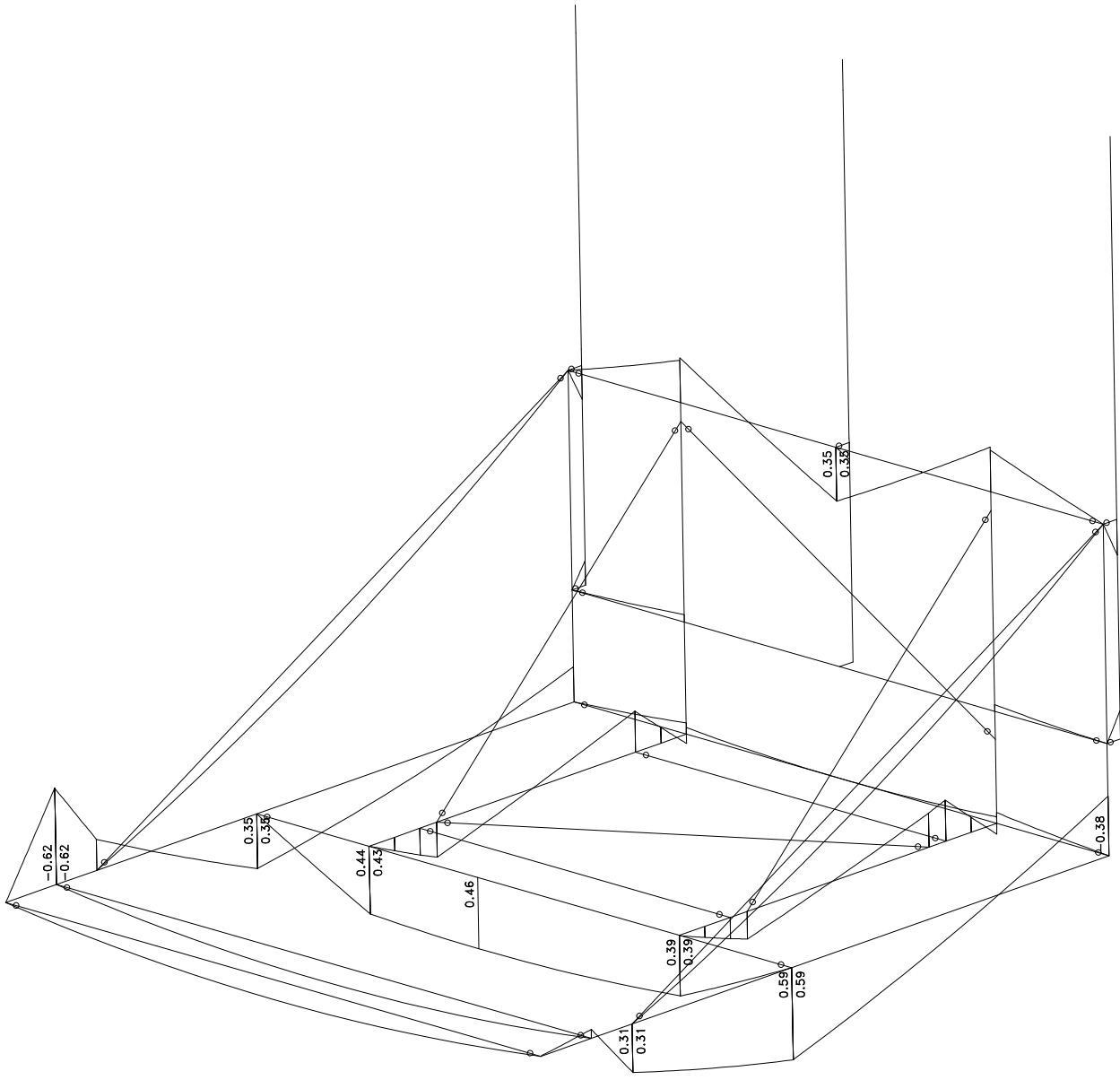
M3 MOMENT COMB. NO. 2 -X2 Wind



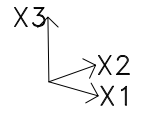
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UNITS: kip*ft

DATE:10/ 4/22

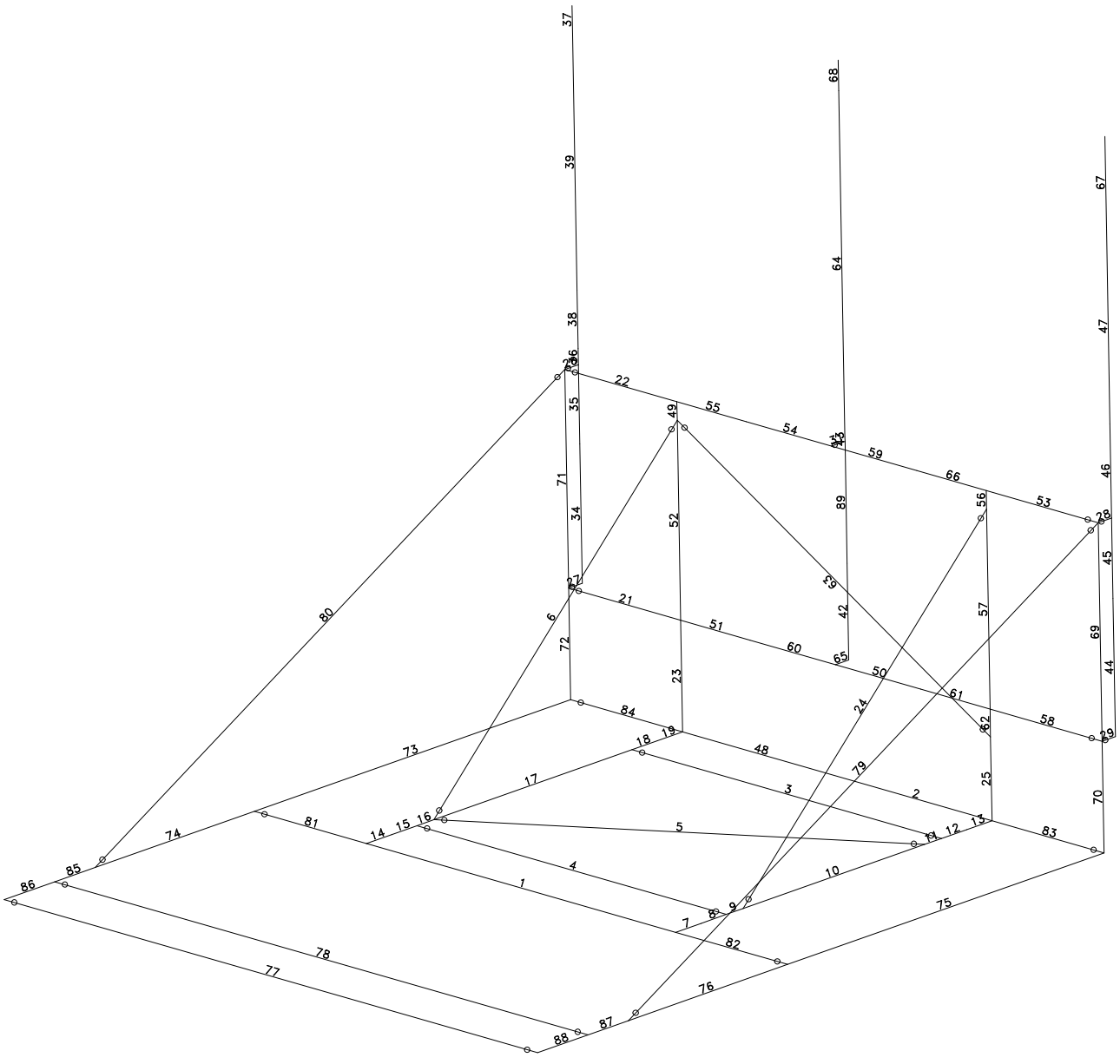


M2 MOMENT COMB. NO. 2 -X2 Wind



SCALE = 1:34

DATE:10/ 4/22



Prepared by:

Results Summary Table

Beam	Section	Com	Defl L/	Slen	CAPACITY					Combined Axial+Mom	
					Axial	Dir Shear	Mom	LTB			
3	L 2.5x2.5x3/16	1	7285	176	0.00	MJ	0.00	0.02	0.03	0.03	
4	L 2.5x2.5x3/16	1	7285	176	0.00	MJ	0.00	0.02	0.03	0.03	
5	L 2.5x2.5x3/16	1	4482	207	0.00	MJ	0.00	0.03	0.04	0.04	
6	L 2.5x2.5x3/16	1	1941	201	-0.08	MJ	0.01	0.08	0.10	0.11	***
13	L 2.5x2.5x3/16	1	1810	190	-0.09	MJ	0.04	0.34	0.37	0.44	
						MI	0.00	0.01	0.00		
19	L 2.5x2.5x3/16	1	1479	190	-0.10	MJ	0.04	0.38	0.42	0.49	
21	L 4x4x1/4	1	3797	189	0.00	MJ	0.02	0.21	0.23	0.36	
						MI	0.01	0.08	0.00		
22	L 4x4x1/4	2	476	110	0.00	MJ	0.01	0.13	0.85	0.97	
						MI	0.03	0.51	0.00		
23	L 2.5x2.5x3/16	1	1305	115	-0.09	MJ	0.02	0.20	0.31	0.58	
						MI	0.05	0.19	0.00		
24	L 2.5x2.5x3/16	1	1941	201	-0.07	MJ	0.01	0.08	0.10	0.11	***
25	L 2.5x2.5x3/16	1	1336	114	-0.08	MJ	0.02	0.20	0.32	0.56	
						MI	0.05	0.19	0.00		
26	PIPE 2-1/2	2	9999	4	-0.01	MJ	0.06	0.09	0.09	0.09	
27	PIPE 2-1/2	1	9999	4	0.00	MJ	0.06	0.09	0.09	0.09	
28	PIPE 2-1/2	2	9999	4	-0.01	MJ	0.06	0.09	0.09	0.09	
29	PIPE 2-1/2	1	9999	4	0.00	MJ	0.06	0.09	0.09	0.09	
31	PIPE 2-1/2	2	9999	4	-0.02	MJ	0.03	0.04	0.04	0.05	
37	PIPE 2-1/2	1	539	83	-0.03	MI	0.02	0.18	0.00	0.19	
43	PIPE 2-1/2	2	82	90	-0.01	MI	0.04	0.47	0.00	0.48	***
63	L 2.5x2.5x3/16	1	1641	202	0.00	MJ	0.00	0.00	0.16	0.16	
						MI	0.01	0.10	0.00		
65	L 2.5x2.5x3/16	1	9999	8	-0.01	MJ	0.05	0.12	0.12	0.13	
67	PIPE 2-1/2	1	1112	100	-0.03	MI	0.01	0.20	0.00	0.22	
69	L 4x4x1/4	2	6021	82	-0.02	MJ	0.00	0.00	0.23	0.24	
						MI	0.01	0.14	0.00		
71	L 4x4x1/4	2	9999	82	-0.01	MJ	0.00	0.00	0.14	0.14	
						MI	0.01	0.08	0.00		
73	L 4x4x1/4	2	5260	118	0.00	MJ	0.01	0.13	0.13	0.13	
74	L 4x4x1/4	2	5192	84	-0.01	MJ	0.04	0.23	0.23	0.23	
75	L 4x4x1/4	2	3570	118	0.00	MJ	0.01	0.21	0.21	0.22	
76	L 4x4x1/4	2	2316	84	-0.01	MJ	0.03	0.22	0.22	0.22	
77	L 4x4x1/4	1	3646	189	0.00	MJ	0.00	0.05	0.06	0.06	
78	L 4x4x1/4	1	3646	189	0.00	MJ	0.00	0.05	0.06	0.06	
79	L 4x4x1/4	2	3501	199	-0.07	MJ	0.00	0.05	0.06	0.10	
80	L 4x4x1/4	2	3501	199	-0.07	MJ	0.00	0.05	0.06	0.09	
81	L 4x4x1/4	2	943	189	0.00	MJ	0.01	0.17	0.19	0.19	
84	L 4x4x1/4	1	3176	189	0.00	MJ	0.01	0.12	0.13	0.13	

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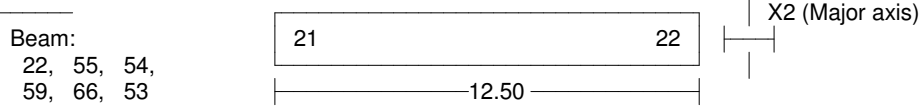
Prepared by:

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Detailed Results Table for Beam 22 - 53

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
 - Steel Grade: A36

DESIGN DATA

- Kx = 1.00 - Ky = 1.00
 - Allow. Slend. : 200 (compr.) 300 (tens.)
 - Allowable Deflection : 1/240
 - Tension Area Reduction Factor : 1.00
 - Building type : Unbraced

INTERMEDIATE SUPPORTS

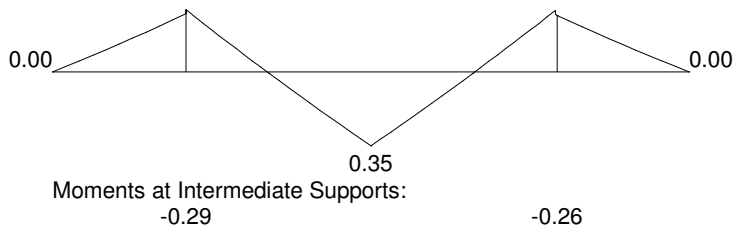
L =	2.62	9.92
Lat.-Tors.	+ -	+ -
Compress.	X Y	X Y

Section: L 4x4x1/4

ix = 3.04 ly = 3.04in4 Sx = 1.05 Sy = 1.05in3 Area = 1.94
 h = 4.00 b = 4.00in t = 0.25 ey = 2.90in ex = 2.90in
 J = 0.04 Cw = 0.00in6 Iv = 1.23 in4

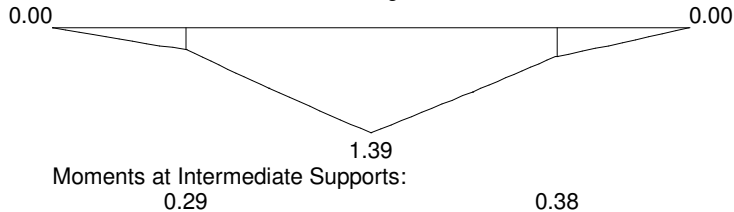
DESIGN COMBINATION = 2

M2 Moment Diagram



Max. AXIAL Force = -0.01 (compr.) Max. SHEAR Force = 0.19

M3 Moment Diagram



Max. AXIAL Force = -0.01 (compr.) Max. SHEAR Force = 0.32

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Detailed Results Table for Beam 22 - 53

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

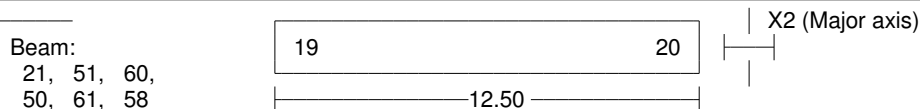
SECTION CLASSIFICATION: *** NON-COMPACT / SLENDER ***

Limiting Ratios: Compact Non-Compact Slender -axial
d/t= 16.13 < 15.3 25.8 12.8 (Fy= 36.0)
b/t= 16.13 < 15.3 25.8 12.8

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear G2.1.b-i	$V_u/0.6V_n < 1.00$ $V_n = 0.6 * F_y * A_w$	$A_w = 0.99$	$V_u = 0.32$ $V_n = 21.50$	0.02
M3 Moment (F10-6) FLB	$\frac{M}{0.6M_n} < 1.00$	$\lambda = 16.13$ $\lambda_p = 18.55$ $\lambda_r = 25.83$	$M = 1.39$ $M_n = 4.58$ $M_p = 4.73$ $M_r = 2.73$	0.51
V3 Shear G2.1.b-i	$V_u/0.6V_n < 1.00$ $V_n = 0.6 * F_y * A_w$	$A_w = 0.99$	$V_u = 0.19$ $V_n = 21.50$	0.01
M2 Moment (F10-6) FLB	$\frac{M}{0.6M_n} < 1.00$	$\lambda = 16.13$ $\lambda_p = 18.55$ $\lambda_r = 25.83$	$M = 0.35$ $M_n = 4.58$ $M_p = 4.73$ $M_r = 2.73$	0.13
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		$\text{defl} = 0.31514$	0.50
Axial Force (E7-1)	$\frac{P_u}{0.6A_e F_{cr}} < 1.00$	$(kL/r)_x = 70$ $(kL/r)_y = 110$ $A_e = 1.94$	$P_u = 0.01$ $A_g = 1.94$ $F_{cr} = 19.08$	0.00
Lateral Torsional Buckling (F10-2,3)	$\frac{M}{0.6M_n} < 1.00$ Critical Segment from 2.62 to 9.92 on +z flange Segment End Moments: -0.29 and -0.38	$L_b = 7.29$ $C_b = 1.22$	$M = 1.39$ $M_n = 2.74$ $M_e = -1.00$	0.85
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_n x} + \frac{M_{ry}}{\phi M_n y} < 1.00$	$C_{m_x} = 1.00$ $C_{m_y} = 1.00$ $P_{e_x} = 103.41$ $P_{e_y} = 41.88$	$M_{rx} = 0.35$ $M_{ry} = 1.39$ $B_{1x} = 1.00$ $B_{1y} = 1.00$	0.97

Detailed Results Table for Beam 21 - 58

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
- Steel Grade: A36

DESIGN DATA

- $K_x = 1.00$ - $K_y = 1.00$
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Prepared by:

Detailed Results Table for Beam 21 - 58

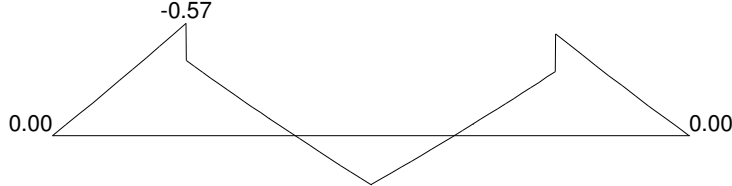
Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

Section: L 4x4x1/4

$I_x = 3.04$ $I_y = 3.04$ $I_x^4 = 1.05$ $I_y^3 = 1.05$ $I_n^3 = 1.94$
 $h = 4.00$ $b = 4.00$ $t = 0.25$ $e_y = 2.90$ $e_x = 2.90$
 $J = 0.04$ $C_w = 0.00$ $I_v = 1.23$ I_n^4

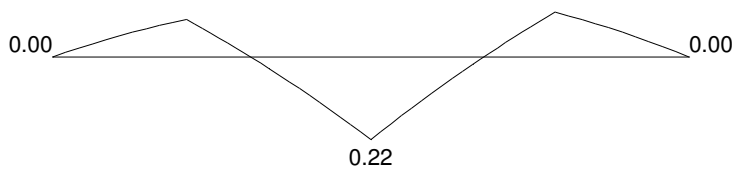
DESIGN COMBINATION = 1

M2 Moment Diagram



Max. AXIAL Force = 0.10 (tens.), 0.00 (compr.) Max. SHEAR Force = 0.23

M3 Moment Diagram



Max. AXIAL Force = 0.10 (tens.), 0.00 (compr.) Max. SHEAR Force = 0.11

SECTION CLASSIFICATION: *** NON-COMPACT / SLENDER ***

Limiting Ratios:	Compact	Non-Compact	Slender -axial	
$d/t = 16.13$	< 15.3	25.8	12.8	($F_y = 36.0$)
$b/t = 16.13$	< 15.3	25.8	12.8	

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear G2.1.b-i	$V_u / 0.6V_n < 1.00$ $V_n = 0.6 * F_y * A_w$	$A_w = 0.99$	$V_u = 0.11$ $V_n = 21.50$	0.01
M3 Moment (F10-6) FLB	$M / 0.6M_n < 1.00$	$\lambda = 16.13$ $\lambda_p = 18.55$ $\lambda_r = 25.83$	$M = 0.22$ $M_n = 4.58$ $M_p = 4.73$ $M_r = 2.73$	0.08
V3 Shear G2.1.b-i	$V_u / 0.6V_n < 1.00$ $V_n = 0.6 * F_y * A_w$	$A_w = 0.99$	$V_u = 0.23$ $V_n = 21.50$	0.02
M2 Moment (F10-6) FLB	$M / 0.6M_n < 1.00$	$\lambda = 16.13$ $\lambda_p = 18.55$ $\lambda_r = 25.83$	$M = 0.57$ $M_n = 4.58$ $M_p = 4.73$ $M_r = 2.73$	0.21
Deflection	$defl. / L < 1.00$ / 240		$defl = 0.03951$	0.06

Prepared by:

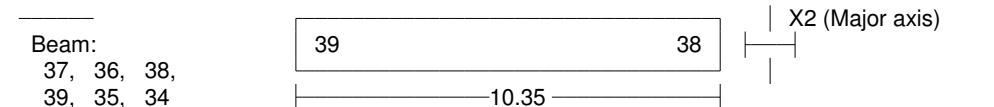
Detailed Results Table for Beam 21 - 58

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

DESIGN	EQUATION	FACTORS	VALUES	RESULT
Axial Force (D2-1)	$\frac{P_u}{0.6A_gF_y} < 1.00$	(kL/r) _x =120 (kL/r) _y =189	P _u = 0.10 A _g = 1.94 F _y = 36.00	0.00
Lateral Torsional Buckling (F10-2,3)	$\frac{M}{0.6M_n} < 1.00$ Critical Segment from 0.00 to 12.50 on +z flange Segment End Moments: 0.00 and 0.00	L _b = 12.50 C _b = 1.78	M = 0.57 M _n = 4.17 M _e = 12.25	0.23
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_{nx}} + \frac{M_{ry}}{\phi M_{ny}} < 1.00$	C _{mx} = 1.00 C _{my} = 1.00 P _{ex} = 35.19 P _{ey} = 14.19	M _{rx} = 0.57 M _{ry} = 0.22 B _{1x} = 1.00 B _{1y} = 1.00	0.36

Detailed Results Table for Beam 37 - 34

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
- Steel Grade: A53

DESIGN DATA

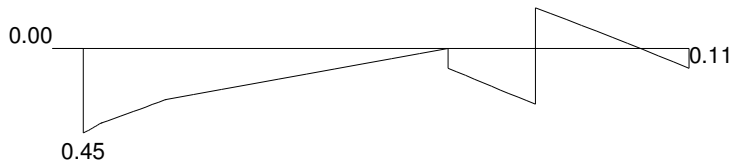
- K_x = 1.00 - K_y = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: PIPE 2-1/2

I_x = 1.53 I_y = 1.53in⁴ Z_x = 1.45 Z_y = 1.45in³ Area = 1.70
D = 2.87 t = 0.20in
J = 3.06 C_w = 0.00in⁶

DESIGN COMBINATION = 1

M3 Moment Diagram



Max. AXIAL Force = -0.65 (compr.) Max. SHEAR Force = 0.19

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Detailed Results Table for Beam 37 - 34

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

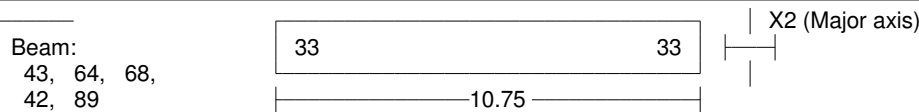
SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios: Compact Non-Compact Slender -axial
 d/t= 14.04 < 58.0 256.9 91.1 (Fy= 35.0 R = 0.011)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear G2.1.b-i	$V_u/0.6V_n < 1.00$ $V_n = 0.6 \cdot F_y \cdot A_w$	$A_w = 0.85$	$V_u = 0.19$ $V_n = 17.94$	0.02
M3 Moment (F8-1) without LTB	$\frac{M}{0.6M_n} < 1.00$	$Z = 1.45$	$M = 0.45$ $M_n = 4.24$	0.18
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		$\text{defl} = 0.23056$	0.45
Axial Force (E3-1)	$\frac{P_u}{0.6A_g F_{cr}} < 1.00$ Slender. reduct.	$(kL/r)_x = 83$ $(kL/r)_y = 83$ $x = 0.63$	$P_u = 0.65$ $A_g = 1.70$ $F_{cr} = 24.63$ $y = 0.63$	0.03
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_n x} + \frac{M_{ry}}{\phi M_n y} < 1.00$	$C_{mx} = 1.00$ $C_{my} = 1.00$ $P_{ex} = 71.09$ $P_{ey} = 71.09$	$M_{rx} = 0.00$ $M_{ry} = 0.46$ $B_{1x} = 1.01$ $B_{1y} = 1.01$	0.19

Detailed Results Table for Beam 68 - 89

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
 - Steel Grade: A53

DESIGN DATA

- $K_x = 1.00$ - $K_y = 1.00$
 - Allow. Slend. : 200 (compr.) 300 (tens.)
 - Allowable Deflection : 1/240
 - Tension Area Reduction Factor : 1.00
 - Building type : Unbraced

Section: PIPE 2-1/2

$I_x = 1.53$ $I_y = 1.53 \text{in}^4$ $Z_x = 1.45$ $Z_y = 1.45 \text{in}^3$ Area = 1.70
 D = 2.87 t = 0.20in
 J = 3.06 Cw = 0.00in⁶

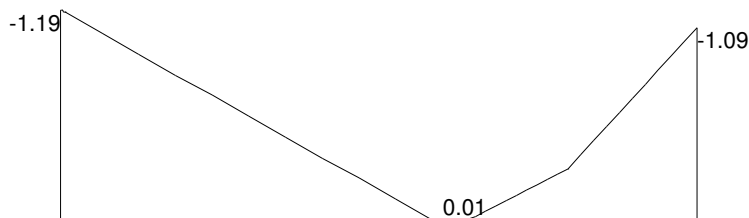
DESIGN COMBINATION = 2

Prepared by:

Detailed Results Table for Beam 68 - 89

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

M3 Moment Diagram



Max. AXIAL Force = 0.12 (tens.), -0.20 (compr.) Max. SHEAR Force = 0.36

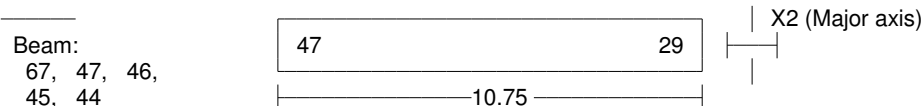
SECTION CLASSIFICATION: *** COMPACT ***

Limiting Ratios: Compact Non-Compact Slender -axial
 d/t= 14.04 < 58.0 256.9 91.1 (Fy= 35.0 R = 0.003)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear G2.1.b-i	$V_u/0.6V_n < 1.00$ $V_n = 0.6 \cdot F_y \cdot A_w$	$A_w = 0.85$	$V_u = 0.36$ $V_n = 17.94$	0.03
M3 Moment (F8-1) without LTB	$\frac{M}{0.6M_n} < 1.00$	$Z = 1.45$	$M = 1.19$ $M_n = 4.24$	0.47
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		$\text{defl} = 1.58216$	2.94
Axial Force (E3-1)	$\frac{P_u}{0.6A_g F_{cr}}$ Slender. reduct. < 1.00	$(kL/r)_x = 73$ $(kL/r)_y = 73$ $x = 0.53$	$P_u = 0.20$ $A_g = 1.70$ $F_{cr} = 26.67$ $y = 0.53$	0.01
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_n x} + \frac{M_{ry}}{\phi M_n y} < 1.00$	$C_{mx} = 1.00$ $C_{my} = 1.00$ $P_{ex} = 91.91$ $P_{ey} = 91.91$	$M_{rx} = 0.00$ $M_{ry} = 1.20$ $B_{1x} = 1.00$ $B_{1y} = 1.00$	0.47

Detailed Results Table for Beam 67 - 44

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
 - Steel Grade: A53

DESIGN DATA

- $K_x = 1.00$ - $K_y = 1.00$
 - Allow. Slend. : 200 (compr.) 300 (tens.)
 - Allowable Deflection : 1/240
 - Tension Area Reduction Factor : 1.00
 - Building type : Unbraced

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Detailed Results Table for Beam 67 - 44

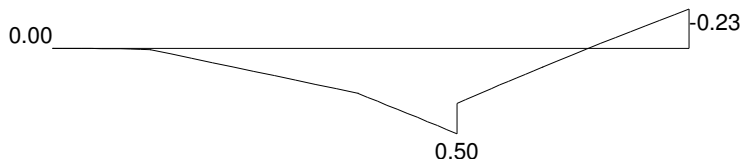
Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

Section: PIPE 2-1/2

$I_x = 1.53$ $I_y = 1.53in^4$ $Z_x = 1.45$ $Z_y = 1.45in^3$ Area = 1.70
 $D = 2.87$ $t = 0.20in$
 $J = 3.06$ $C_w = 0.00in^6$

DESIGN COMBINATION = 1

M3 Moment Diagram



Max. AXIAL Force = -0.69 (compr.) Max. SHEAR Force = 0.15

SECTION CLASSIFICATION: *** COMPACT ***

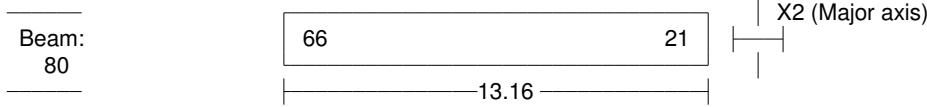
Limiting Ratios: Compact Non-Compact Slender -axial
 $d/t = 14.04 < 58.0$ 256.9 91.1 (Fy= 35.0 R = 0.012)

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V2 Shear G2.1.b-i	$\frac{V_u}{0.6V_n} < 1.00$ $V_n = 0.6 \cdot F_y \cdot A_w$	$A_w = 0.85$	$V_u = 0.15$ $V_n = 17.94$	0.01
M3 Moment (F8-1) without LTB	$\frac{M}{0.6M_n} < 1.00$	$Z = 1.45$	$M = 0.50$ $M_n = 4.24$	0.20
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		$\text{defl} = 0.11606$	0.22
Axial Force (E3-1)	$\frac{P_u}{0.6A_g F_{cr}}$ Slender. reduct. < 1.00	$(kL/r)_x = 88$ $(kL/r)_y = 88$ $x = 0.65$	$P_u = 0.69$ $A_g = 1.70$ $F_{cr} = 23.58$ $y = 0.65$	0.03
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_n x} + \frac{M_{ry}}{\phi M_n y} < 1.00$	$C_{mx} = 1.00$ $C_{my} = 1.00$ $P_{ex} = 63.24$ $P_{ey} = 63.24$	$M_{rx} = 0.00$ $M_{ry} = 0.51$ $B_{1x} = 1.02$ $B_{1y} = 1.02$	0.22

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Detailed Results Table for Beam 80

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
 - Steel Grade: A36

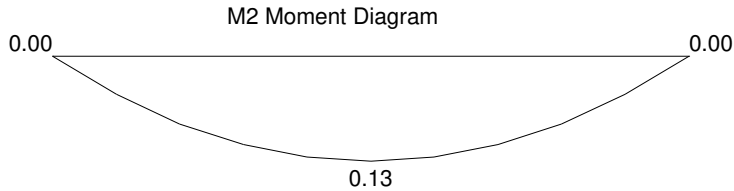
DESIGN DATA

- Kx = 1.00 - Ky = 1.00
 - Allow. Slend. : 200 (compr.) 300 (tens.)
 - Allowable Deflection : 1/240
 - Tension Area Reduction Factor : 1.00
 - Building type : Unbraced

Section: L 4x4x1/4

Ix = 3.04 Iy = 3.04in4 Sx = 1.05 Sy = 1.05in3 Area = 1.94
 h = 4.00 b = 4.00in t = 0.25 ey = 2.90in ex = 2.90in
 J = 0.04 Cw = 0.00in6 Iy = 1.23 in4

DESIGN COMBINATION = 2



Max. AXIAL Force = -0.51 (compr.) Max. SHEAR Force = 0.04

SECTION CLASSIFICATION: *** NON-COMPACT / SLENDER ***

Limiting Ratios: Compact Non-Compact Slender -axial
 d/t= 16.13 < 15.3 25.8 12.8 (Fy= 36.0)
 b/t= 16.13 < 15.3 25.8 12.8

DESIGN	EQUATION	FACTORS	VALUES	RESULT
M2 Moment (F10-6) FLB	$\frac{M}{0.6Mn} < 1.00$	$\lambda = 16.13$ $\lambda_p = 18.55$ $\lambda_r = 25.83$	M = 0.13 Mn = 4.58 Mp = 4.73 Mr = 2.73	0.05
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		defl = 0.04509	0.07
Axial Force (E7-1)	$\frac{Pu}{0.6AeFcr} < 1.00$	(kL/r)x = 186 (kL/r)y = 194 Ae = 1.94	Pu = 0.51 Ag = 1.94 Fcr = 6.69	0.07
Lateral Torsional Buckling (F10-2,3)	$\frac{M}{0.6Mn} < 1.00$ Critical Segment from 0.00 to 13.16 on +z flange Segment End Moments: 0.00 and 0.00	Lb = 13.16 Cb = 1.14	M = 0.13 Mn = 3.65 Me = 7.49	0.06

Prepared by:

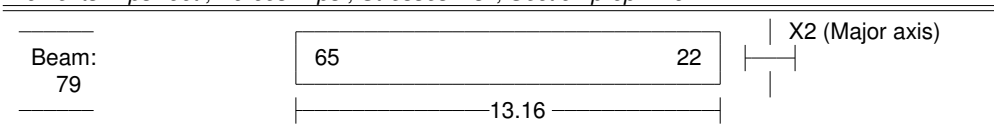
Detailed Results Table for Beam 80

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

DESIGN	EQUATION	FACTORS	VALUES	RESULT
Combined Forces (compress.) (H1-1b)	$\frac{Pr}{2\phi P_n} + \frac{M_{rx}}{\phi M_{nx}} + \frac{M_{ry}}{\phi M_{ny}} < 1.00$	C _{mx} = 1.00 C _{my} = 1.00 P _{ex} = 14.65 P _{ey} = 13.46	M _{rx} = 0.14 M _{ry} = 0.00 B _{1x} = 1.06 B _{1y} = 1.06	0.09

Detailed Results Table for Beam 79

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
- Steel Grade: A36

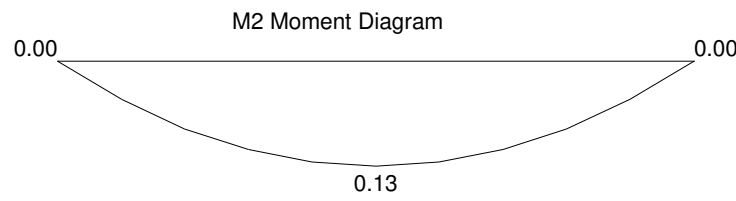
DESIGN DATA

- K_x = 1.00 - K_y = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: L 4x4x1/4

I_x = 3.04 I_y = 3.04in⁴ S_x = 1.05 S_y = 1.05in³ Area = 1.94
 h = 4.00 b = 4.00in t = 0.25 e_y = 2.90in e_x = 2.90in
 J = 0.04 C_w = 0.00in⁶ I_v = 1.23 in⁴

DESIGN COMBINATION = 2



Max. AXIAL Force = -0.55 (compr.) Max. SHEAR Force = 0.04

SECTION CLASSIFICATION: *** NON-COMPACT / SLENDER ***

Limiting Ratios:	Compact	Non-Compact	Slender -axial	
d/t = 16.13	< 15.3	25.8	12.8	(F _y = 36.0)
b/t = 16.13	< 15.3	25.8	12.8	

DESIGN	EQUATION	FACTORS	VALUES	RESULT
M2 Moment (F10-6)	$\frac{M}{0.6M_n} < 1.00$	λ = 16.13 λ _p = 18.55 λ _r = 25.83	M = 0.13 M _n = 4.58 M _p = 4.73 M _r = 2.73	0.05
FLB				

CT11090A Greenwich Putnam Ave 1815.141

Code: AISC-ASD

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Date: 10/ 4/22

Prepared by:

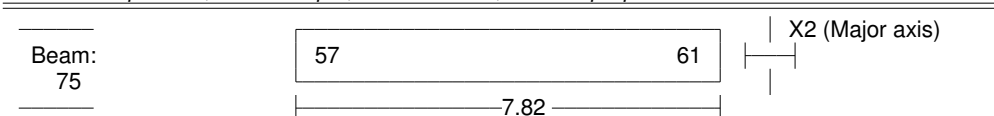
Detailed Results Table for Beam 79

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

DESIGN	EQUATION	FACTORS	VALUES	RESULT
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		defl = 0.04509	0.07
Axial Force (E7-1)	$\frac{P_u}{0.6A_eF_{cr}} < 1.00$	(kL/r) _x = 186 (kL/r) _y = 195 A _e = 1.94	P _u = 0.55 A _g = 1.94 F _{cr} = 6.62	0.07
Lateral Torsional Buckling (F10-2,3)	$\frac{M}{0.6M_n} < 1.00$ Critical Segment from Segment End Moments: 0.00 to 13.16 on +z flange Segment End Moments: 0.00 and 0.00	L _b = 13.16 C _b = 1.14	M = 0.13 M _n = 3.65 M _e = 7.49	0.06
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_{nx}} + \frac{M_{ry}}{\phi M_{ny}} < 1.00$	C _{mx} = 1.00 C _{my} = 1.00 P _{ex} = 14.65 P _{ey} = 13.33	M _{rx} = 0.14 M _{ry} = 0.00 B _{1x} = 1.06 B _{1y} = 1.07	0.10

Detailed Results Table for Beam 75

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
- Steel Grade: A36

DESIGN DATA

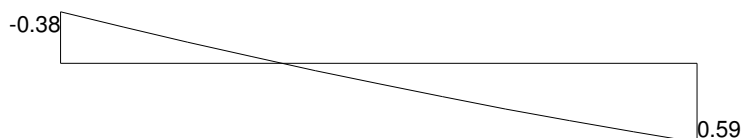
- K_x = 1.00 - K_y = 1.00
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: L 4x4x1/4

I_x = 3.04 I_y = 3.04in⁴ S_x = 1.05 S_y = 1.05in³ Area = 1.94
 h = 4.00 b = 4.00in t = 0.25 e_y = 2.90in e_x = 2.90in
 J = 0.04 C_w = 0.00in⁶ I_v = 1.23 in⁴

DESIGN COMBINATION = 2

M2 Moment Diagram



Max. AXIAL Force = 0.11 (tens.) Max. SHEAR Force = 0.15

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Code: AISC-ASD

Page: 11

Date: 10/ 4/22

Prepared by:

Detailed Results Table for Beam 75

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

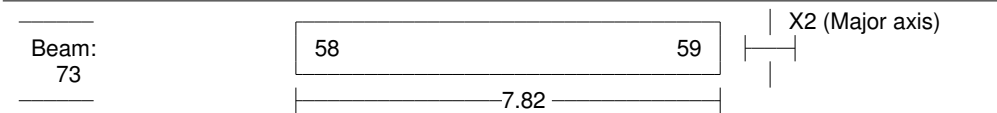
SECTION CLASSIFICATION: *** NON-COMPACT / SLENDER ***

Limiting Ratios: Compact Non-Compact Slender -axial
d/t= 16.13 < 15.3 25.8 12.8 (Fy= 36.0)
b/t= 16.13 < 15.3 25.8 12.8

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V3 Shear G2.1.b-i	$V_u/0.6V_n < 1.00$ $V_n = 0.6 * F_y * A_w$	$A_w = 0.99$	$V_u = 0.15$ $V_n = 21.50$	0.01
M2 Moment (F10-6) FLB	$\frac{M}{0.6M_n} < 1.00$	$\lambda = 16.13$ $\lambda_p = 18.55$ $\lambda_r = 25.83$	$M = 0.59$ $M_n = 4.58$ $M_p = 4.73$ $M_r = 2.73$	0.21
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		defl = 0.02628	0.07
Axial Force (D2-1)	$\frac{P_u}{0.6A_g F_y} < 1.00$	$(kL/r)_x = 75$ $(kL/r)_y = 118$	$P_u = 0.11$ $A_g = 1.94$ $F_y = 36.00$	0.00
Lateral Torsional Buckling (F10-2,3)	$\frac{M}{0.6M_n} < 1.00$ Critical Segment from 0.00 to 7.82 on +z flange Segment End Moments: -0.38 and 0.59	$L_b = 7.82$ $C_b = 2.08$	$M = 0.59$ $M_n = 4.58$ $M_e = 22.90$	0.21
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_n x} + \frac{M_{ry}}{\phi M_n y} < 1.00$	$C_{mx} = 1.00$ $C_{my} = 1.00$ $P_{ex} = 90.08$ $P_{ey} = 36.39$	$M_{rx} = 0.59$ $M_{ry} = 0.00$ $B1_x = 1.00$ $B1_y = 1.00$	0.22

Detailed Results Table for Beam 73

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch



CONSTRAINTS

- Sections : Check
- Steel Grade: A36

DESIGN DATA

- $K_x = 1.00$ - $K_y = 1.00$
- Allow. Slend. : 200 (compr.) 300 (tens.)
- Allowable Deflection : 1/240
- Tension Area Reduction Factor : 1.00
- Building type : Unbraced

Section: L 4x4x1/4

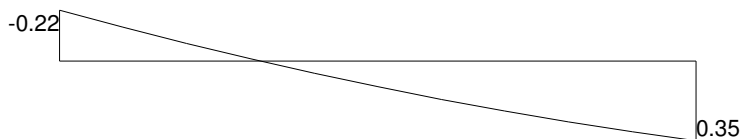
$I_x = 3.04$ $I_y = 3.04 \text{ in}^4$ $S_x = 1.05$ $S_y = 1.05 \text{ in}^3$ Area = 1.94
h = 4.00 b = 4.00 in t = 0.25 $e_y = 2.90 \text{ in}$ $e_x = 2.90 \text{ in}$
J = 0.04 $C_w = 0.00 \text{ in}^6$ $I_v = 1.23 \text{ in}^4$

DESIGN COMBINATION = 2

Detailed Results Table for Beam 73

Moments: kips*foot , Forces: kips , Stresses: ksi , Section prop.: inch

M2 Moment Diagram



Max. AXIAL Force = 0.06 (tens.) Max. SHEAR Force = 0.10

SECTION CLASSIFICATION: *** NON-COMPACT / SLENDER ***

Limiting Ratios:	Compact	Non-Compact	Slender -axial	
d/t= 16.13	< 15.3	25.8	12.8	(Fy= 36.0)
b/t= 16.13	< 15.3	25.8	12.8	

DESIGN	EQUATION	FACTORS	VALUES	RESULT
V3 Shear G2.1.b-i	$\frac{V_u}{0.6V_n} < 1.00$ $V_n = 0.6 \cdot F_y \cdot A_w$	$A_w = 0.99$	$V_u = 0.10$ $V_n = 21.50$	0.01
M2 Moment (F10-6) FLB	$\frac{M}{0.6M_n} < 1.00$	$\lambda = 16.13$ $\lambda_p = 18.55$ $\lambda_r = 25.83$	$M = 0.35$ $M_n = 4.58$ $M_p = 4.73$ $M_r = 2.73$	0.13
Deflection	$\frac{\text{defl.}}{L / 240} < 1.00$		$\text{defl} = 0.01783$	0.05
Axial Force (D2-1)	$\frac{P_u}{0.6A_g F_y} < 1.00$	$(kL/r)_x = 75$ $(kL/r)_y = 118$	$P_u = 0.06$ $A_g = 1.94$ $F_y = 36.00$	0.00
Lateral Torsional Buckling (F10-2,3)	$\frac{M}{0.6M_n} < 1.00$ Critical Segment from 0.00 to 7.82 on +z flange Segment End Moments: -0.22 and 0.35	$L_b = 7.82$ $C_b = 2.00$	$M = 0.35$ $M_n = 4.58$ $M_e = 22.03$	0.13
Combined Forces (compress.) (H1-1b)	$\frac{P_r}{2\phi P_n} + \frac{M_{rx}}{\phi M_{nx}} + \frac{M_{ry}}{\phi M_{ny}} < 1.00$	$C_{mx} = 1.00$ $C_{my} = 1.00$ $P_{ex} = 90.08$ $P_{ey} = 36.39$	$M_{rx} = 0.35$ $M_{ry} = 0.00$ $B_{1x} = 1.00$ $B_{1y} = 1.00$	0.13

GREENWICH/PUTNAM AVE 2

411 WEST PUTNAM AVENUE
GREENWICH, CT 06830
FAIRFIELD COUNTY

SITE NO.: CT11090A

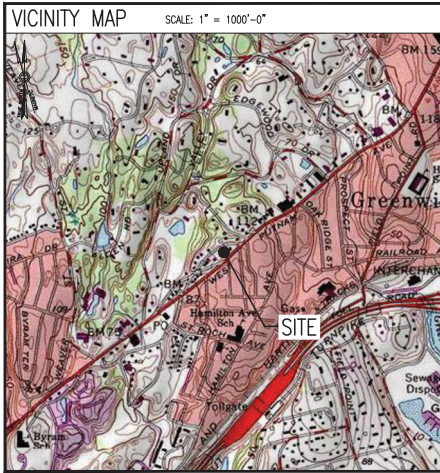
SITE TYPE: ROOFTOP

RF DESIGN GUIDELINE: 67E5A998E HYBRID

APPROVALS			
PROJECT MANAGER:	DATE:	ZONING/SITE ACQ.:	DATE:
CONSTRUCTION:	DATE:	OPERATIONS:	DATE:
RF ENGINEERING:	DATE:	TOWER OWNER:	DATE:

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS BY CERTIFIED CLIMBER
SECTOR B:	ACCESS BY CERTIFIED CLIMBER
SECTOR C:	ACCESS BY CERTIFIED CLIMBER
SECTOR D:	ACCESS BY CERTIFIED CLIMBER
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

GENERAL NOTES	
1. THE CONTRACTOR SHALL OBEY ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES REGARDING THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.	SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BEING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND/OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.	13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSAL OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PROMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SLAGGAGES OF ANY NATURE.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING IN WRITING THE OWNER'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PROCEED AT HIS/HER OWN RISK UNLESS DIRECTED IN WRITING OTHERWISE.	14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.	15. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.	16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DENIED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.	17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.	AT LEAST 72 HOURS PRIOR TO DIGGING, THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT 811
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE OPERATED WITH THE BEST RESOURCES AND APPROPRIATE CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.	
9. THE CONTRACTOR SHALL SUPERSEDE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.	
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADERS REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.	
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE CONTRACTOR/OWNER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.	
12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PLUMBING, CURBS, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR	



DIRECTIONS

MERGE ONTO I-495 NORTH TOWER MANSFIELD/MARLBORO. TAKE EXIT 33B TO MERGE ONTO I-95 SOUTH TOWARD PROVIDENCE RI. ENTER RHODE ISLAND. KEEP LEFT TO CONTINUE TOWARD I-95 SOUTH. CONTINUE ONTO I-95 SOUTH. KEEP RIGHT AT FORK TO STAY ON I-95 SOUTH. ENTER CONNECTICUT. KEEP LEFT TO STAY ON I-95 SOUTH. KEEP RIGHT TO STAY ON I-95 SOUTH. KEEP LEFT TO STAY ON I-95 SOUTH (7A). TAKE EXIT 3 FOR ARCH STREET TOWARD GREENWICH. USE MIDDLE LANE TO TURN RIGHT ONTO ARCH STREET. TURN LEFT ONTO RAILROAD AVENUE. CONTINUE ONTO OLD FIELD POINT ROAD. TURN RIGHT ONTO LIVINGSTON PLACE. LIVINGSTON PLACE TURNS LEFT & BECOMES US-1 SOUTH. SITE IS LOCATED ON THE RIGHT HAND SIDE.

SHEET INDEX		
SHEET NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	3
GN-1	GENERAL NOTES	3
A-1	ROOF PLAN	3
A-2	EQUIPMENT PLANS	3
A-3	BUILDING ELEVATION	3
A-4	ANTENNA PLANS	3
A-5	SITE DETAILS	3
A-6	ANTENNA & FEEDLINE CHARTS	3
S-1	BALLAST MOUNT REINFORCING DETAILS	3
E-1	ELECTRIC & GROUNDING DETAILS	3

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT SUMMARY	
SITE NUMBER:	CT11090A
SITE NAME:	GREENWICH/PUTNAM AVE 2
SBA SITE NUMBER:	CT95623-M
SBA SITE NAME:	GREENWICH (PUTNAM)
SITE ADDRESS:	411 WEST PUTNAM AVENUE GREENWICH, CT 06830
PROPERTY OWNER:	411 PUTNAM AVE, LLC 411 WEST PUTNAM AVENUE GREENWICH, CT 06830
TOWER OWNER:	MCM ACQUISITION 2017, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	FAIRFIELD
ZONING DISTRICT:	GB (GENERAL BUSINESS)
STRUCTURE TYPE:	ROOFTOP
STRUCTURE HEIGHT:	56±
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
ARCHITECT:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
STRUCTURAL ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
SITE CONTROL POINT:	LATITUDE: 41.021397° N41°01'17.03" LONGITUDE: -73.641289° W73°38'28.64"
SPECIAL ZONING NOTE:	BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(a), SECTION 6409(a), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW, AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, OR ADMINISTRATIVE REVIEW).

T-MOBILE NORTHEAST LLC

15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil Structural & Land Surveying

R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com



SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
3	05/27/22	CONSTRUCTION REVISED	CAC
2	05/19/22	CONSTRUCTION REVISED	CAC
1	07/28/20	ISSUED FOR CONSTRUCTION	CAC
0	06/17/20	ISSUED FOR REVIEW	CAC

SITE NUMBER:
CT11090A

SITE ADDRESS:
411 WEST PUTNAM AVENUE
GREENWICH, CT 06830

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – T-MOBILE
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – T-MOBILE
ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL, STATE AND FEDERAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER, T1 CABLES AND GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TOLCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR AND/OR LANDLORD PRIOR TO CONSTRUCTION.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, FIDEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION AND RETURN DISTURBED AREAS TO ORIGINAL CONDITIONS.
13. THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. SUBCONTRACTOR SHALL NOTIFY CHAPPELL ENGINEERING ASSOCIATES, LLC 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS AND POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEERING REVIEW.
15. CONSTRUCTION SHALL COMPLY WITH ALL T-MOBILE STANDARDS AND SPECIFICATIONS.
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITES ARE IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. IF THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
6. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND, FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
7. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
8. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING, OWNER AND/OR LOCAL UTILITIES.
9. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
10. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
11. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T-MOBILE SPECIFICATION FOR SITE SIGNAGE.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000PSI) MAY BE USED. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST EARTH.....3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 AND LARGER2 IN.
#5 AND SMALLER & WAF1 1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
SLAB AND WALL3/4 IN.
BEAMS AND COLUMNS1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY SIMPSON OR APPROVED EQUAL.
7. CONCRETE CYLINDER TIES ARE NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (BC1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER:
(A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIER'S PLANT.
(B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED, FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY ENGINEER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND T-MOBILE SPECIFICATIONS UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1, WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (5/8") AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE GALVANIZED OR STAINLESS STEEL.
4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 3/8" DIA. ASTM A 307 BOLTS (GALV) UNLESS NOTED OTHERWISE.
5. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
6. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
3. AS AN ALTERNATE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
4. COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING #1 SIEVE.
5. AS AN ALTERNATE TO ITEMS 2 AND 3, THE SUBGRADE SOILS WITH 5 PASSES OR A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E), AND SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T-MOBILE ANTENNA PLATFORM LOCATION AND UTILITY TRENCHWORK.
2. COORDINATION OF WORK:
SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.
3. CABLE LADDER RACK:
SUBCONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY AND/OR ICE BRIDGE, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELLORDA.
2. SUBCONTRACTOR SHALL MODIFY OR INSTALL CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLES TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.
3. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELLORDA.
4. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
5. EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND), 1/2" INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA, AND MATCH INSTALLATION REQUIREMENTS.
6. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND), 1/2" INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOD PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOD PLASTIC LABELS.
9. ALL THE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THIN OR THIN-W, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#8 AWG OR LARGER), 600 V, OIL RESISTANT THIN OR THIN-W GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID THINED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
13. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE T-CABLE (#14 AWG OR LARGER), 600 V, OIL RESISTANT THIN OR THIN-W, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
14. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WRENUTS BY HARGER (OR EQUAL). LUGS AND WRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
15. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANS/IEEE AND NEC.
16. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
17. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
18. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
19. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
20. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND, DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
21. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
22. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
23. CABINETS, BOXES AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANS/IEEE AND NEC.
24. CABINETS, BOXES AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
25. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
26. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 514 AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
27. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
28. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
29. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
30. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.
31. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
32. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

**T-MOBILE
NORTHEAST LLC**

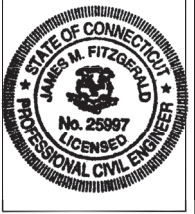
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SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
3	05/27/22	CONSTRUCTION REVISED	CMC
2	05/19/22	CONSTRUCTION REVISED	CMC
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0	06/17/20	ISSUED FOR REVIEW	CMC

SITE NUMBER:
CT11090A

SITE ADDRESS:
411 WEST PUTNAM AVENUE
GREENWICH, CT 06830

SHEET TITLE

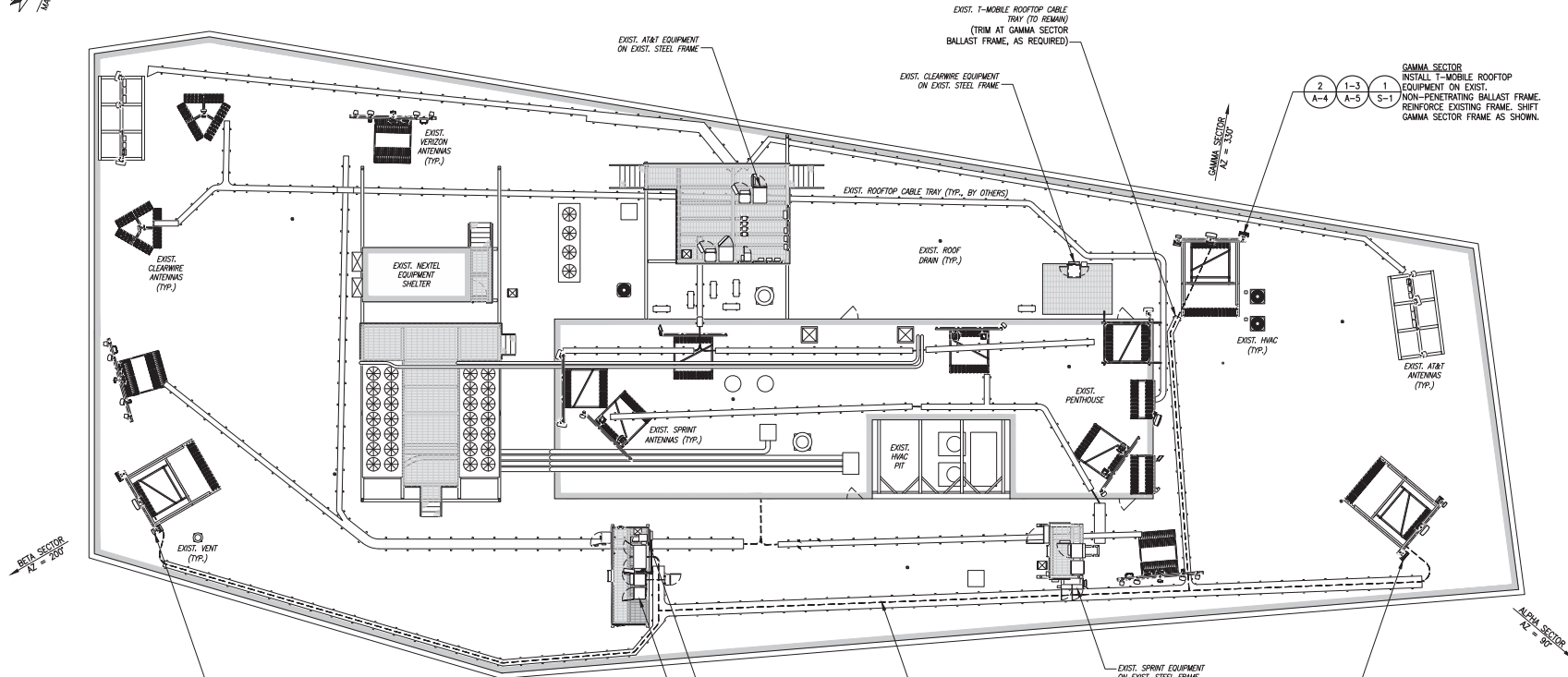
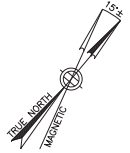
GENERAL NOTES

SHEET NUMBER

GN-1

SUPPLEMENTAL GENERAL CONDITIONS WORK NOTE (BUILDING PROTECTION AND RF EME SAFETY SIGNAGE):

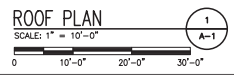
- GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ROOF SURFACE AND PARAPET WALL DURING CONSTRUCTION. PROPER ROOF PROTECTING MATERIALS SHALL BE PLACED AROUND ALL WORKING AREAS AND NO TOOLS, LADDERS, MATERIALS, OR EQUIPMENT SHALL BE PLACED DIRECTLY ON THE ROOF SURFACE. ANY DAMAGES TO ROOF SURFACE AND/OR PARAPET WALL DURING CONSTRUCTION SHALL BE REPAIRED TO AS NEW CONDITION.
- GENERAL CONTRACTOR SHALL USE BUILDING OWNER'S ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS.
- GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE THE INSTALLATION OF T-MOBILE RF SAFETY SIGNAGE AND OTHER RF SAFETY IMPROVEMENTS AS SHOWN ON SUPPLEMENTAL PLANS (BY OTHERS) WHICH SHALL BE SLIP-SHEETED BY SBA COMMUNICATIONS INTO THE FINAL CONSTRUCTION DRAWINGS. CHAPPELL ENGINEERING ASSOCIATES, LLC, IS NOT RESPONSIBLE FOR THE DESIGN OF ANY RF SAFETY IMPROVEMENTS.



BETA SECTOR
 2 1-3 1
 A-4 A-5 S-1
 INSTALL T-MOBILE ROOFTOP EQUIPMENT ON EXIST. NON-PENETRATING BALLAST FRAME. REINFORCE EXISTING FRAME.

2 4,5 1
 A-2 A-5
 INSTALL T-MOBILE ROOFTOP EQUIPMENT ON EXIST. STEEL FRAME

ALPHA SECTOR
 2 1-3 1
 A-4 A-5 S-1
 INSTALL T-MOBILE ROOFTOP EQUIPMENT ON EXIST. NON-PENETRATING BALLAST FRAME. REINFORCE EXISTING FRAME.



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ROOF PLAN

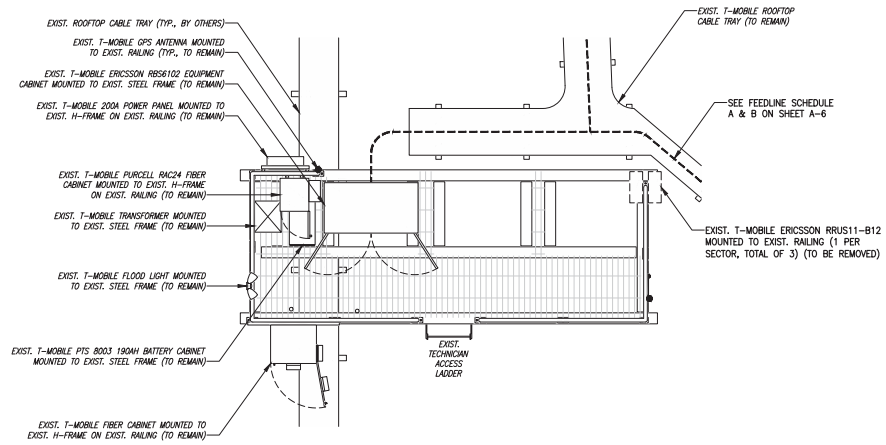
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A-1

SUPPLEMENTAL GENERAL CONDITIONS WORK NOTE (BUILDING PROTECTION AND RF EME SAFETY SIGNAGE):

- GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ROOF SURFACE AND PARAPET WALL DURING CONSTRUCTION. PROPER ROOF PROTECTING MATERIALS SHALL BE PLACED AROUND ALL WORKING AREAS AND NO TOOLS, LADDERS, MATERIALS, OR EQUIPMENT SHALL BE PLACED DIRECTLY ON THE ROOF SURFACE. ANY DAMAGES TO ROOF SURFACE AND/OR PARAPET WALL DURING CONSTRUCTION SHALL BE REPAIRED TO AS NEW CONDITION.
- GENERAL CONTRACTOR SHALL USE BUILDING OWNER'S ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS.
- GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE THE INSTALLATION OF T-MOBILE RF SAFETY SIGNAGE AND OTHER RF SAFETY IMPROVEMENTS AS SHOWN ON SUPPLEMENTAL PLANS (BY OTHERS) WHICH SHALL BE SLIP-SHEETED BY SBA COMMUNICATIONS INTO THE FINAL CONSTRUCTION DRAWINGS. CHAPPELL ENGINEERING ASSOCIATES, LLC, IS NOT RESPONSIBLE FOR THE DESIGN OF ANY RF SAFETY IMPROVEMENTS.

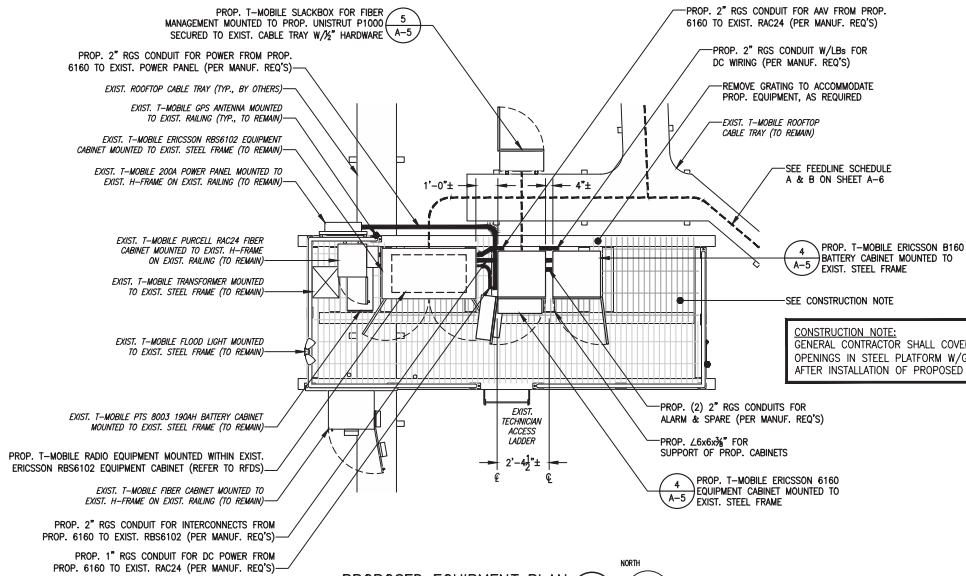
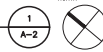


EXISTING EQUIPMENT PHOTO



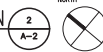
EXISTING EQUIPMENT PLAN

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



PROPOSED EQUIPMENT PLAN

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



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EQUIPMENT PLANS

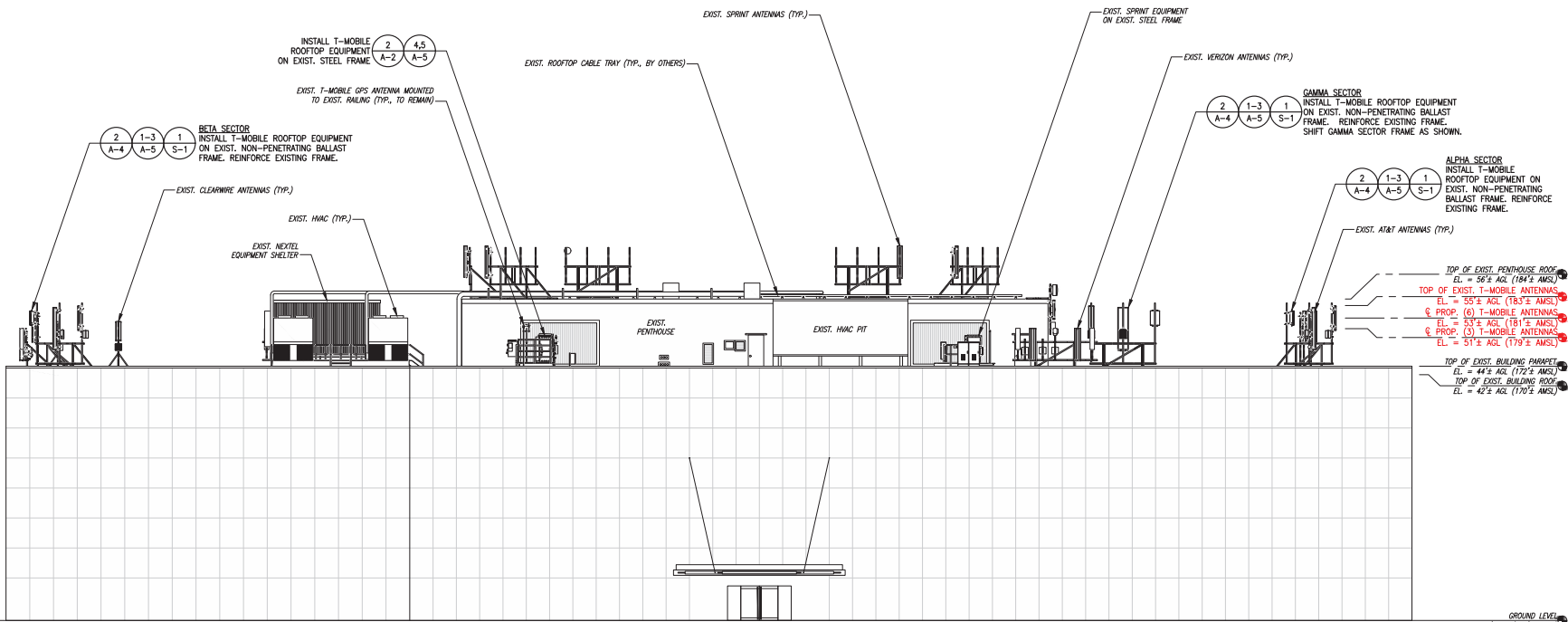
SHEET NUMBER
A-2

SUPPLEMENTAL GENERAL CONDITIONS WORK NOTE (BUILDING PROTECTION AND RF EME SAFETY SIGNAGE):

- GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ROOF SURFACE AND PARAPET WALL DURING CONSTRUCTION. PROPER ROOF PROTECTING MATERIALS SHALL BE PLACED AROUND ALL WORKING AREAS AND NO TOOLS, LADDERS, MATERIALS, OR EQUIPMENT SHALL BE PLACED DIRECTLY ON THE ROOF SURFACE. ANY DAMAGES TO ROOF SURFACE AND/OR PARAPET WALL DURING CONSTRUCTION SHALL BE REPAIRED TO AS NEW CONDITION.
- GENERAL CONTRACTOR SHALL USE BUILDING OWNER'S ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS.
- GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE THE INSTALLATION OF T-MOBILE RF SAFETY SIGNAGE AND OTHER RF SAFETY IMPROVEMENTS AS SHOWN ON SUPPLEMENTAL PLANS (BY OTHERS) WHICH SHALL BE SLIP-SHEETED BY SBA COMMUNICATIONS INTO THE FINAL CONSTRUCTION DRAWINGS. CHAPPELL ENGINEERING ASSOCIATES, LLC, IS NOT RESPONSIBLE FOR THE DESIGN OF ANY RF SAFETY IMPROVEMENTS.

RAD CENTER NOTE:
T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.

GENERAL CONTRACTOR NOTE:
GENERAL CONTRACTOR SHALL REFER TO MOUNT STRUCTURAL ANALYSIS AND ANY MOUNT MODIFICATION DESIGN PROVIDED BY SBA



- TOP OF EXIST. PENTHOUSE ROOF
EL. = 56'± AGL (184'± AMSL)
- TOP OF EXIST. T-MOBILE ANTENNAS
EL. = 55'± AGL (183'± AMSL)
- PROP. (6) T-MOBILE ANTENNAS
EL. = 53'± AGL (181'± AMSL)
- PROP. (3) T-MOBILE ANTENNAS
EL. = 51'± AGL (179'± AMSL)
- TOP OF EXIST. BUILDING PARAPET
EL. = 44'± AGL (172'± AMSL)
- TOP OF EXIST. BUILDING ROOF
EL. = 42'± AGL (170'± AMSL)



**T-MOBILE
NORTHEAST LLC**

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(508) 286-2700

SBA

SBA COMMUNICATIONS CORP.
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**CHAPPELL
ENGINEERING
ASSOCIATES, LLC**
Civil Structural & Land Surveying

R.K. EXECUTIVE CENTRE
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(508) 481-7400
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SITE ADDRESS:
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GREENWICH, CT 06830

SHEET TITLE
BUILDING ELEVATION

SHEET NUMBER
A-3



EXISTING ALPHA SECTOR ANTENNA PHOTO



EXISTING BETA SECTOR ANTENNA PHOTO



EXISTING GAMMA SECTOR ANTENNA PHOTO

ANTENNA STATUS LEGEND:
 EMPTY - EMPTY PIPE
 (E) - EXISTING
 (P) - INSTALL
 (F) - FUTURE

**T-MOBILE
 NORTHEAST LLC**

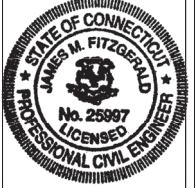
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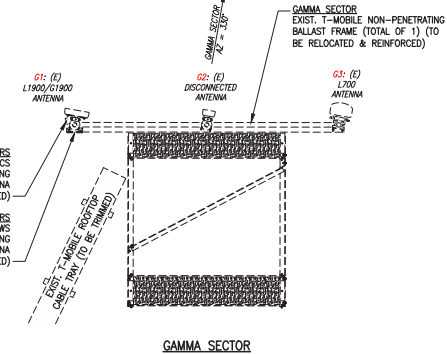
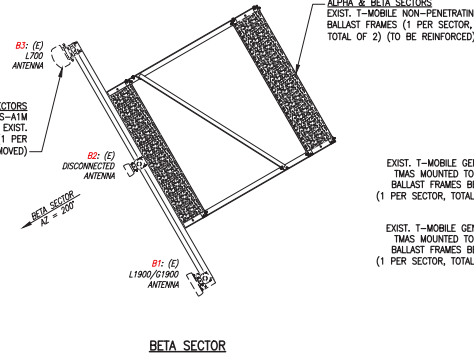
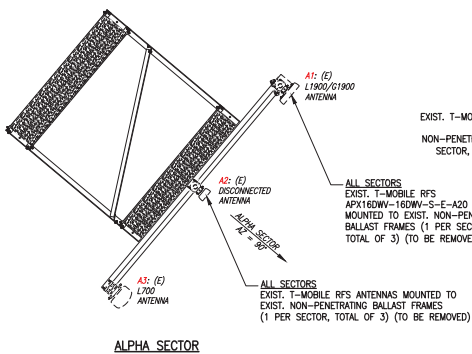
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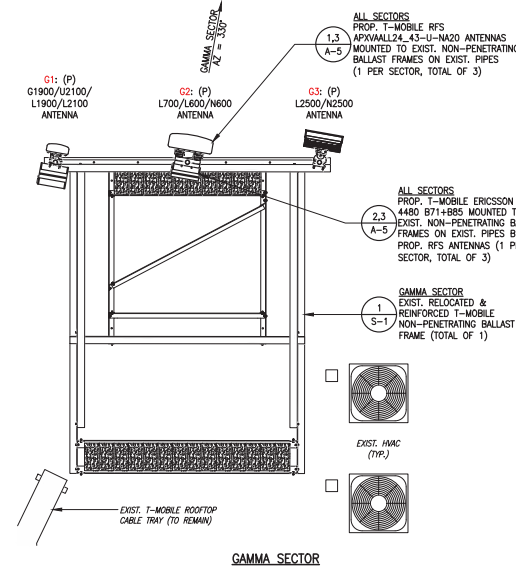
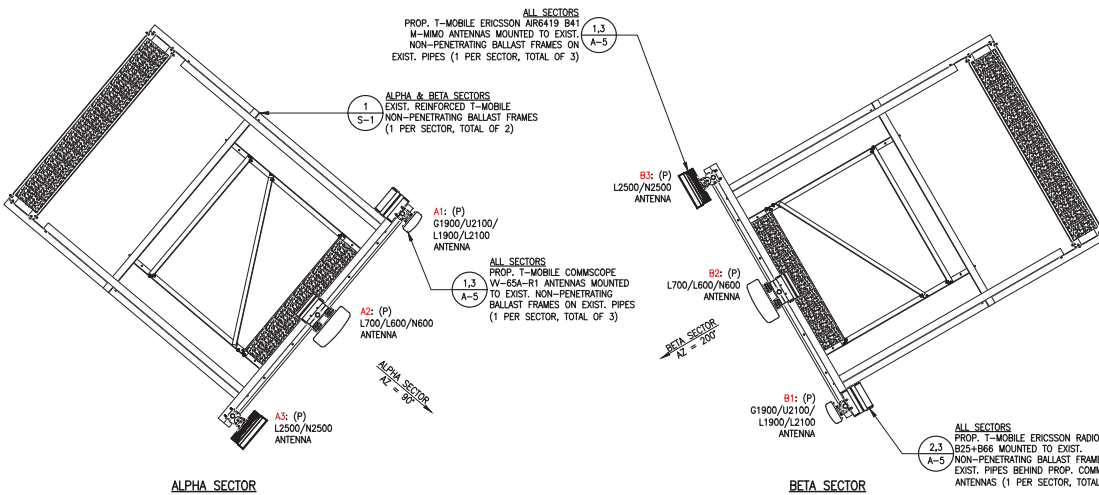
ANTENNA PLANS

SHEET NUMBER

A-4



EXIST. ANTENNA PLAN
 SCALE: 3/8" = 1'-0"



STRUCTURAL ANALYSIS NOTE:
 REFER TO STRUCTURAL ANALYSIS FOR REQUIRED RECONFIGURATION OF THE EXISTING CONCRETE BALLAST.

NOTE:
 VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.

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SHEET TITLE

SITE DETAILS

SHEET NUMBER

A-5



ERICSSON M-MIMO AIR6419_B41 ANTENNA

DIMENSIONS: 36.3"H x 20.9"W x 9.0"D
WEIGHT: 83.3 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 3



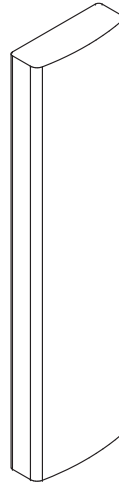
ERICSSON RADIO 4460_B25+B66

DIMENSIONS: 17.0"H x 15.1"W x 11.9"D
WEIGHT: 104.0 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 3



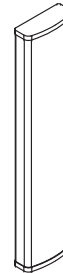
ERICSSON RADIO 4480_B71+B85

DIMENSIONS: 19.2"H x 15.1"W x 7.5"D
WEIGHT: 92.6 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 3



RFS APXVAAL124_43-U-NA20 ANTENNA

DIMENSIONS: 95.9"H x 24.0"W x 8.5"D
WEIGHT: 122.8 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 3

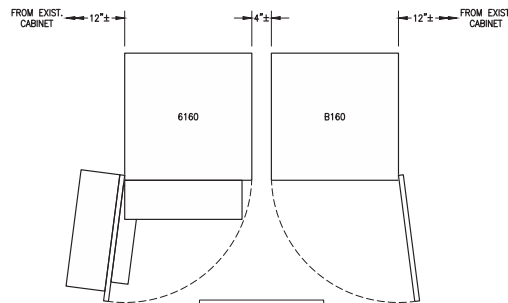


COMMSCOPE VV-65A-R1 ANTENNA

DIMENSIONS: 54.7"H x 12.1"W x 4.6"D
WEIGHT: 23.8 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 3

ANTENNA DETAILS

SCALE: N.T.S.



ERICSSON 6160 SITE SUPPORT CABINET

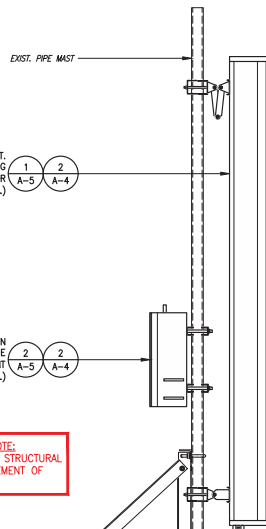
DIMENSIONS: 63.25"H x 26.0"W x 34.0"D
QUANTITY: TOTAL OF 1

ERICSSON B160 BATTERY CABINET

DIMENSIONS: 63.25"H x 26.0"W x 26.0"D
QUANTITY: TOTAL OF 1

EQUIPMENT DETAIL

SCALE: N.T.S.



INSTALL PROP. ANTENNA TO EXIST. PIPE ON EXIST. NON-PENETRATING BALLAST FRAME (TYP.) (MOUNT PER MANUFACTURER'S SPECIFICATIONS.)

INSTALL PROP. RADIO TO EXIST. PIPE ON EXIST. NON-PENETRATING BALLAST FRAME BEHIND PROP. ANTENNA (TYP.) (MOUNT PER MANUFACTURER'S SPECIFICATIONS.)

STRUCTURAL ANALYSIS NOTE:
REFER TO SHEET S-1 & STRUCTURAL ANALYSIS FOR REINFORCEMENT OF EXISTING BALLAST FRAME.

EXIST. T-MOBILE NON-PENETRATING BALLAST FRAME

EXIST./PROP. CONCRETE BALLAST

ANTENNA MOUNTING DETAIL

SCALE: N.T.S.



SLACKBOX -- HOFFMAN 32FH91 NEMA 3R ENCLOSURE

DIMENSIONS: 24.0"H x 24.0"W x 12.0"D
QUANTITY: TOTAL OF 1

SSC DETAILS

SCALE: N.T.S.



FINAL ANTENNA CONFIGURATION								
SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	CABLES
ALPHA	A1 COMMSCOPE W-65A-R1	53'± AGL	90°	0'	4'	G1900/U2100/L1900/L2100	ERICSSON RADIO 4460 B25+B66	(3) 1-3/8" (6x12) HCS FIBER CABLES PROP. (3) 2" (6x24) HCS FIBER CABLES
	A2 RFS APXVAALL24_43-U-NA20	51'± AGL	90°	0'	2'	L700/L600/N600	ERICSSON RADIO 4480 B71+B85	
	A3 ERICSSON M-MIMO AIR6419 B41	53'± AGL	90°	0'	2'	L2500/N2500	-	
BETA	B1 COMMSCOPE W-65A-R1	53'± AGL	200°	0'	4'	G1900/U2100/L1900/L2100	ERICSSON RADIO 4460 B25+B66	
	B2 RFS APXVAALL24_43-U-NA20	51'± AGL	200°	0'	2'	L700/L600/N600	ERICSSON RADIO 4480 B71+B85	
	B3 ERICSSON M-MIMO AIR6419 B41	53'± AGL	200°	0'	2'	L2500/N2500	-	
GAMMA	G1 COMMSCOPE W-65A-R1	53'± AGL	330°	0'	4'	G1900/U2100/L1900/L2100	ERICSSON RADIO 4460 B25+B66	
	G2 RFS APXVAALL24_43-U-NA20	51'± AGL	330°	0'	2'	L700/L600/N600	ERICSSON RADIO 4480 B71+B85	
	G3 ERICSSON M-MIMO AIR6419 B41	53'± AGL	330°	0'	2'	L2500/N2500	-	

CABLE NOTE: EXISTING (18) 1-3/8" COAX CABLES TO BE REMOVED. SEE FEEDLINE SCHEDULE A & B BELOW.

NOTE: RFDS REV6 - 01/28/22

FEEDLINE SCHEDULE		
SCHEDULE	FEEDLINES	LOCATION
A	<p>EXISTING TO REMAIN: (1) 1/2" COAX FOR GPS ANTENNA (3) 1-3/8" (6x12) HCS FIBER CABLES</p> <p>EXISTING TO BE REMOVED: (18) 1-3/8" COAX CABLES</p>	ROUTED PER STRUCTURAL ANALYSIS
B	PROPOSED: (3) 2" (6x24) HCS FIBER CABLES	

NOTE: EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

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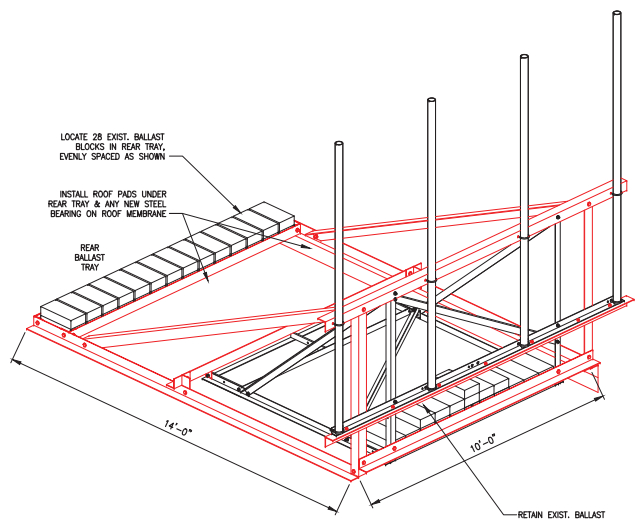
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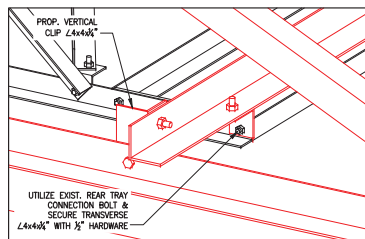
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SHEET TITLE
ANTENNA &
FEEDLINE CHARTS

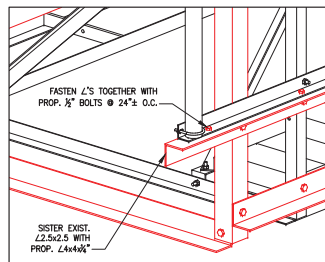
SHEET NUMBER
A-6



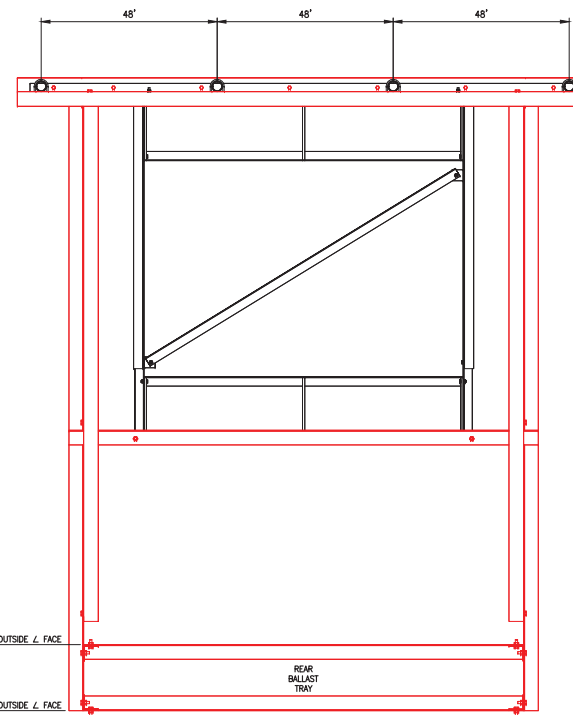
REINFORCED BALLAST FRAME -- ISOMETRIC VIEW



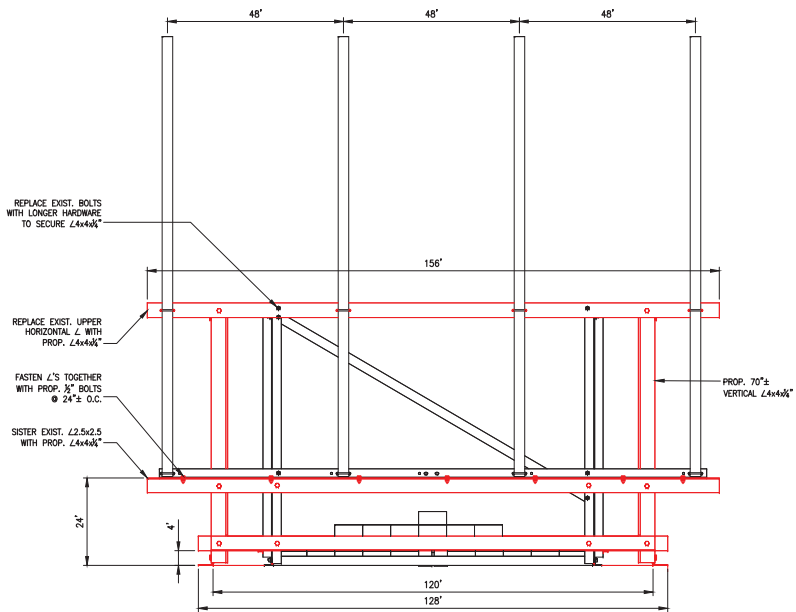
EXISTING REAR TRAY CONNECTION



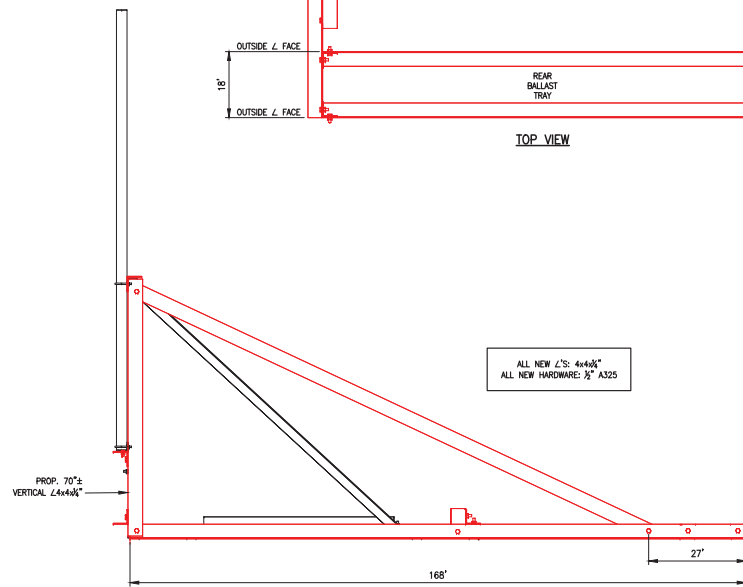
FRONT CORNER DETAIL



TOP VIEW



FRONT VIEW



SIDE VIEW

PROP. BALLAST ANTENNA FRAMES

1
S-1

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

T-MOBILE
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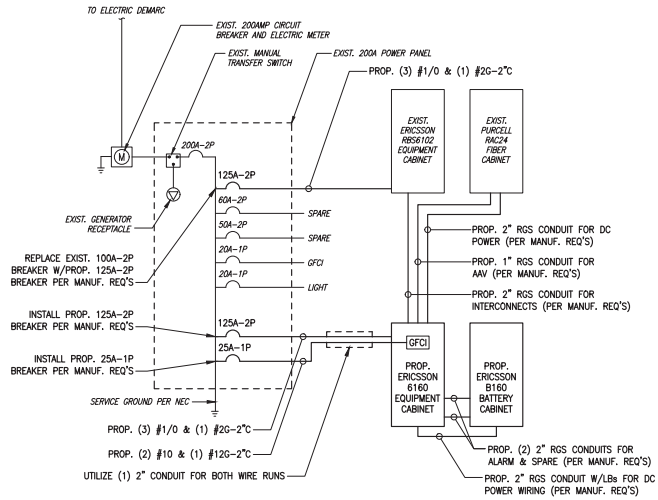
BALLAST MOUNT
REINFORCING DETAILS
(TYP 3 SECTORS)

SHEET NUMBER

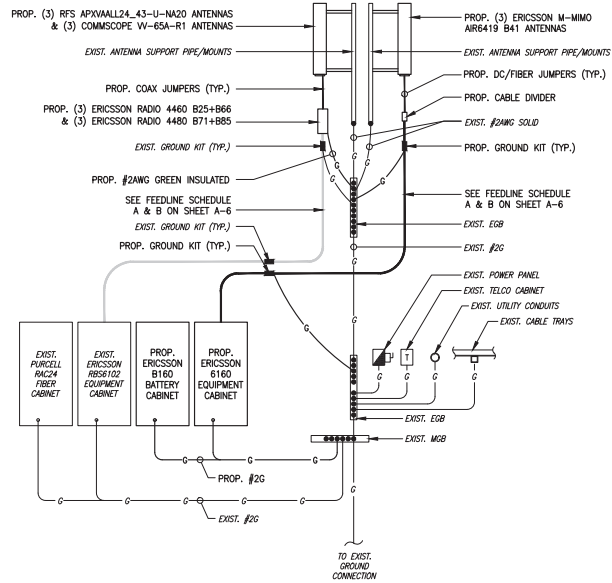
S-1



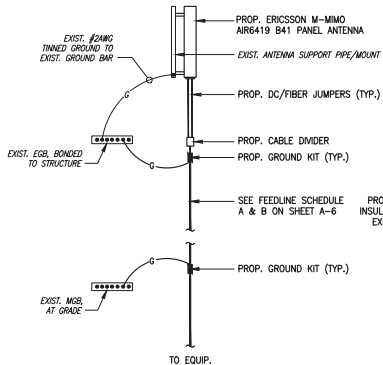
EXISTING POWER PANEL PHOTOS
SCALE: NOT TO SCALE



ONE LINE DIAGRAM
SCALE: NOT TO SCALE

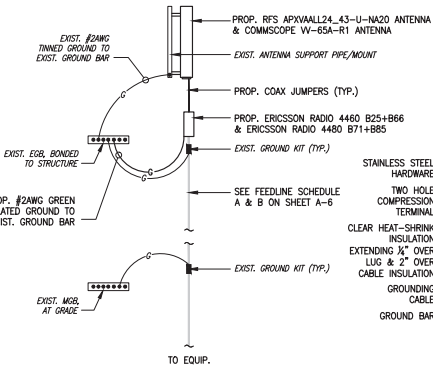


GROUNDING RISER DIAGRAM
SCALE: NOT TO SCALE

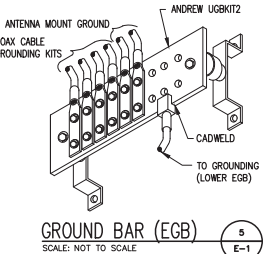


12500/N2500 ANTENNA

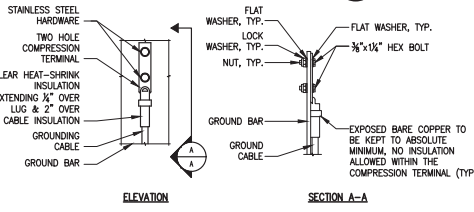
COAX CABLE CONNECTION AND GROUNDING DETAIL
SCALE: NOT TO SCALE



1700/1600/N600 ANTENNA & G1900/U2100/L1900/L2100 ANTENNA



GROUND BAR (EGB)
SCALE: NOT TO SCALE



TYPICAL GROUND BAR CONNECTIONS DETAIL
SCALE: NOT TO SCALE

- NOTES:
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 - CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

ELECTRICAL AND GROUNDING NOTES

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTORS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE 30XHX, THIN, OR THININSULATION.
- RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BITS CABINET AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLENE CONDUIT MEASURING TAPE AT EACH END.
- WHERE CONDUIT BETWEEN BITS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BITS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT, ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- PPC SUPPLIED BY PROJECT OWNER.
- GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BITS SITE GROUNDING STANDARDS".
- GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURIED HYDRONLID COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- CONTRACTOR SHALL PROVIDE AND INSTALL OMM DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXIST. TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
- CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
- CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE--TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE-OUT.

T-MOBILE
NORTHEAST LLC

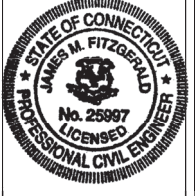
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**ELECTRIC & GROUNDING
DETAILS**

SHEET NUMBER

E-1