NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Victoria Masse
420 Main Street, Sturbridge MA 01566
860-306-2326
victoria@northeastsitesolutions.com

April 13, 2020

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Share Application
435 Mills Street, Southington CT 06489
Latitude: 41.604929620
Longitude: -72.89411820
T-Mobile Site#: CT11239A-PI

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile plans to install antennas and related equipment at the tower site located at 435 Mills Street, Southington, Connecticut.

T-Mobile will install three (3) 600/700MHz antenna, three (3) 1900/2100 MHz antennas and three (6) RRUs at the 110-foot level of the existing 120 foot tower. Three (3) hybrid lines will also be installed. T-Mobile's equipment cabinets will be placed within T-Mobile's 336 sq ft lease area. Included are plans by Tectonic Engineering dated April 8, 2020. **Exhibit C**. Also included is a structural analysis prepared by Tectonic Engineering, dated March 27, 2020, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as **Exhibit D.**

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of T-Mobile's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Mark Sciota, Town Manager and Rob Phillips, Planning Director of the Town of Southington, as well as the tower owner (Town of Southington) and property owner (Town of Southington).

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the support tower is 120-feet; T-Mobile's proposed antennas will be located at a center line height of 110-feet.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 7.46% as evidenced by **Exhibit E.**

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Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, T-Mobile respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting T-Mobile's proposed loading. The structural analysis is included as **Exhibit D**.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Southington. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation. Further, a lease agreement is included as **Exhibit F**, authorizing T-Mobile to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of T-Mobile equipment at the 110-foot level of the existing 120-foot tower would have an insignificant visual impact on the area around the tower. T-Mobile's ground equipment would be installed within the existing facility compound. T-Mobile's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by **Exhibit E**, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. T-Mobile will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the lease has been provided by the owner to assist T-Mobile with this tower sharing application.

E. Public Safety Concerns. As discussed above, the guyed tower is structurally capable of supporting T-Mobile's proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing guyed tower. T-Mobile's intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Southington.

Sincerely,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 2, Sturbridge MA 01566
Email: Victoria@northeastsitesolutions.com

Attachments

cc: Mark Sciota, Town Manager, as elected official
Rob Phillips, Planning Director
Town of Southington - as tower owner and property owner

Exhibit A

Exhibit B

435 MILL ST

Location	435 MILL ST	**Mblu**	109/ / 120/ /
Acct#	14081	**Owner**	SOUTHINGTON TOWN OF
Assessment	$229,140	**Appraisal**	$327,340
PID	10843	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$217,730	$109,610	$327,340

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$152,410	$76,730	$229,140

Owner of Record

Owner	SOUTHINGTON TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	75 MAIN ST SOUTHINGTON, CT 06489-2504	**Book & Page**	0087/0075
		Sale Date	09/30/1938
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
SOUTHINGTON TOWN OF	$0		0087/0075	25	09/30/1938

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Building Percent Good:

Building Attributes	
Field	**Description**
Style	Vacant w/OB

Model	
Grade:	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Total Kitchens	
Fireplaces	
Whirlpool Tubs	
Usrfld 104	
Fin Bsmt Area	
Fin Bsmt Quality	
Usrfld 107	
Bsmt Garages	
.	
Usrfld 108	
Bsmt Type	
Attic Type	
Cath Ceiling	
Usrfld 300	
Usrfld 301	

Building Photo

109 120 05/21/2015

(http://images.vgsi.com/photos2/SouthingtonCTPhotos//\00\04\35\89.JPG)

Building Layout

(http://images.vgsi.com/photos2/SouthingtonCTPhotos//Sketches/10843_1

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend

No Data for Extra Features

Land

Land Use

Use Code	903V
Description	Municipality Lnd
Zone	R-20/25
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	2.80
Depth	

Outbuildings

Outbuildings					Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Bldg #**
FN1	Fence - Chain			4848.00 L.F.	1
PCS	PreCast Shed/Bldg			80.00 S.F.	1
PCS	PreCast Shed/Bldg			80.00 S.F.	1
TNK5	Elevated Tank			650000.00 Gals	1
CTR	Cell Recievers			4.00 Units	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$217,730	$87,980	$305,710
2017	$217,730	$87,980	$305,710
2016	$217,730	$87,980	$305,710
2015	$217,730	$87,980	$305,710
2014	$210,120	$85,500	$295,620

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$152,410	$61,590	$214,000
2017	$152,410	$61,590	$214,000
2016	$152,410	$61,590	$214,000
2015	$152,410	$61,590	$214,000
2014	$147,080	$59,850	$206,930

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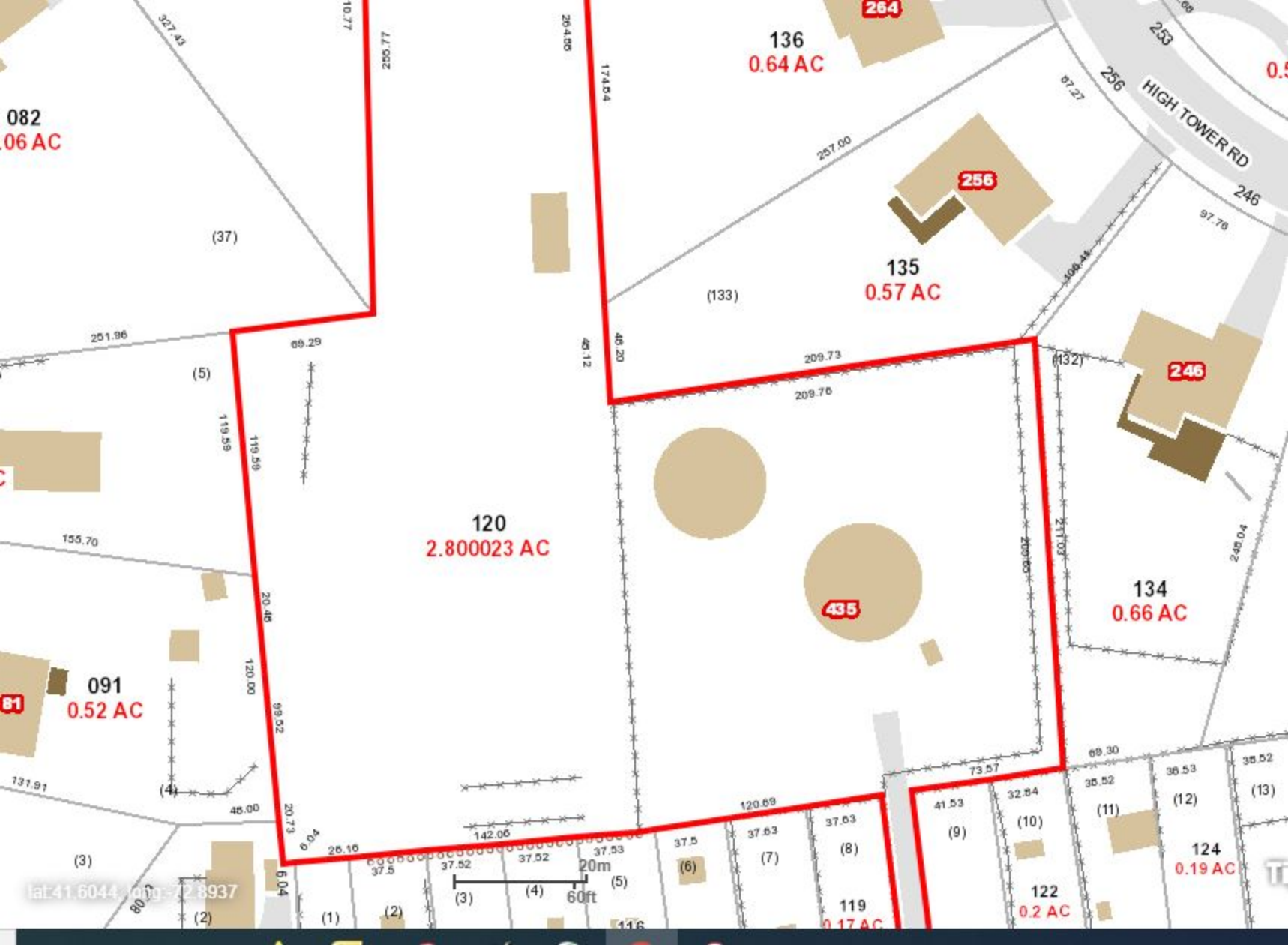

120
2.800023 AC
136
0.64 AC
135
0.57 AC
134
0.66 AC
124
0.19 AC
122
0.2 AC
119
091
0.52 AC
082
HIGH TOWER RD
264
256
246
435
(37)
(133)
(132)
(5)
(4)
(3)
(2)
(1)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
251.96
155.70
131.91
45.00
142.06
120.69
209.73
209.76
119.59
119.59
120.00
99.52
20.45
20.73
6.04
26.16
73.57
69.30
41.53
32.84
35.52
35.53
35.52
37.63
37.63
37.5
37.52
37.52
37.53
20m
60ft
lat:41.6044 lon:-72.8937

Exhibit C

T-Mobile

NORTHEAST, LLC.

PROJECT: L600

SITE I.D. NUMBER:

CT11239A

SITE NAME:

SOUTHINGTON / I-84

SITE ADDRESS:

435 MILL STREET
SOUTHINGTON, CT 06489

DESIGN NOTE

DESIGN BASED ON RFDS DATED
09/09/2019, VERSION 5.3.

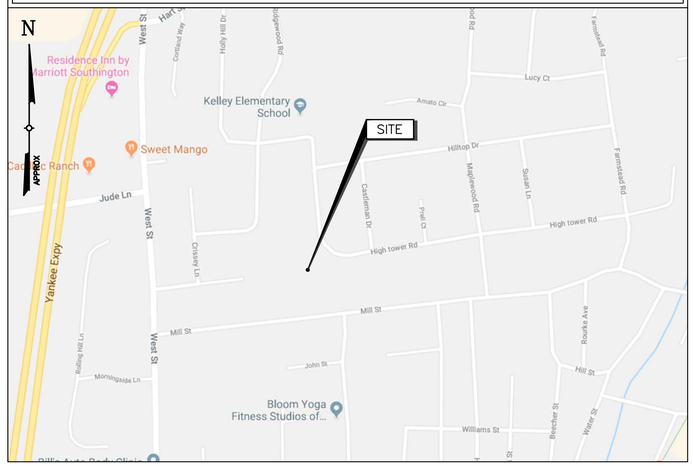
RAN TEMPLATE: 67D97DB2
A&L TEMPLATE: 67D92DB_1xAIR+1QP+1OP

PROJECT INDEX

SITE NUMBER:	CT11239A
SITE NAME:	SOUTHINGTON/I-84
SITE ADDRESS:	435 MILL STREET SOUTHINGTON, CT 06489
PROPERTY OWNER:	TOWN OF SOUTHINGTON 75 MAIN STREET SOUTHINGTON, CT 06489
APPLICANT:	T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
STRUCTURE TYPE:	SELF-SUPPORT
LATTITUDE (NAD83):	41° 36' 16.94" N
LONGITUDE (NAD83):	72° 53' 38.03" W
GRADE ELEVATION:	389' (AMSL, PER GOOGLE MAPS)
ZONING:	R-20/25
PARCEL ID:	109120

PROJECT CLIENT:	NORTHEAST SITE SOLUTIONS, LLC
CONTACT:	SHELDON FREINCLE
PHONE:	(201) 776-8521
ENGINEER/ STRUCTURAL ENG:	TECTONIC ENGINEERING CONSULTANTS, PC.
CONTACT:	EDWARD IAMICELI
PHONE:	(845) 567-6656x2811

VICINITY MAP (NTS)



SHEET INDEX

SHEET NO	DESCRIPTION	REVISION	DATE
T-1	TITLE SHEET	C	04/08/20
A-1	OVERALL SITE PLAN	C	04/08/20
A-2	TOWER ELEVATION	C	04/08/20
A-3	NEW T-MOBILE EQUIPMENT AREA PLAN	C	04/08/20
A-4	EXISTING T-MOBILE ANTENNA PLANS	C	04/08/20
A-5	NEW T-MOBILE ANTENNA PLAN & ANTENNA SCHEDULE	C	04/08/20
A-6	ANTENNA EQUIPMENT DETAILS	C	04/08/20
A-7	EQUIPMENT DETAILS	C	04/08/20
A-8	SITE DETAILS	C	04/08/20
A-9	NOTES	C	04/08/20
E-1	UTILITY PLAN, NOTES & ONE-LINE DIAGRAM	C	04/08/20
G-1	GROUNDING DETAILS & NOTES	C	04/08/20
G-2	GROUNDING DETAILS	C	04/08/20
G-3	GROUNDING DETAILS & NOTES	C	04/08/20

SPECIAL INSPECTIONS

SPECIAL INSPECTIONS ARE REQUIRED IN ACCORDANCE WITH THE FOLLOWING APPLICABLE SECTIONS OF THE BUILDING CODE. THE CONTRACTOR MUST NOTIFY THE ENGINEER AND THE SPECIAL INSPECTOR AT LEAST 72 HOURS BEFORE THE SPECIFIC WORK COMMENCES.

SPECIAL INSPECTIONS	CODE SECTION	FREQUENCY
FINAL INSPECTION	28-116.2.4.2 BC 110.5, DIRECTIVE 14	ONCE AT FINAL
POST INSTALLED ANCHORS	BC 1704.32	ONCE AT ANCHOR INSTALL
STRUCTURAL STEEL - HIGH STRENGTH BOLTING	BC 1704.3.3	ONCE AT INSTALL
STRUCTURAL STEEL DETAILS	BC 1704.3.2	ONCE AT INSTALL

STRUCTURAL NOTE

A STRUCTURAL ANALYSIS OF THE TOWER STRUCTURE WAS PREPARED BY TECTONIC ENGINEERING AND SURVEYING CONSULTANTS, P.C. DATED 3/27/20.

A MOUNT EVALUATION LETTER WAS PREPARED BY TECTONIC ENGINEERING AND SURVEYING CONSULTANTS, P.C. DATED 3/30/20.

CODE COMPLIANCE

CODE INFORMATION

- STATE OF CONNECTICUT BUILDING CODE, LATEST EDITION
- ANSI/TIA-222-G
- NATIONAL ELECTRIC CODE, LATEST EDITION

811 Know what's below. Call before you dig.

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STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED PROFESSIONAL ENGINEER

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Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	7/12/19	FOR COMMENT	RT
B	04/01/20	ISSUED PER COMMENT	BWY
C	04/08/20	ISSUED PER COMMENT	BWY

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

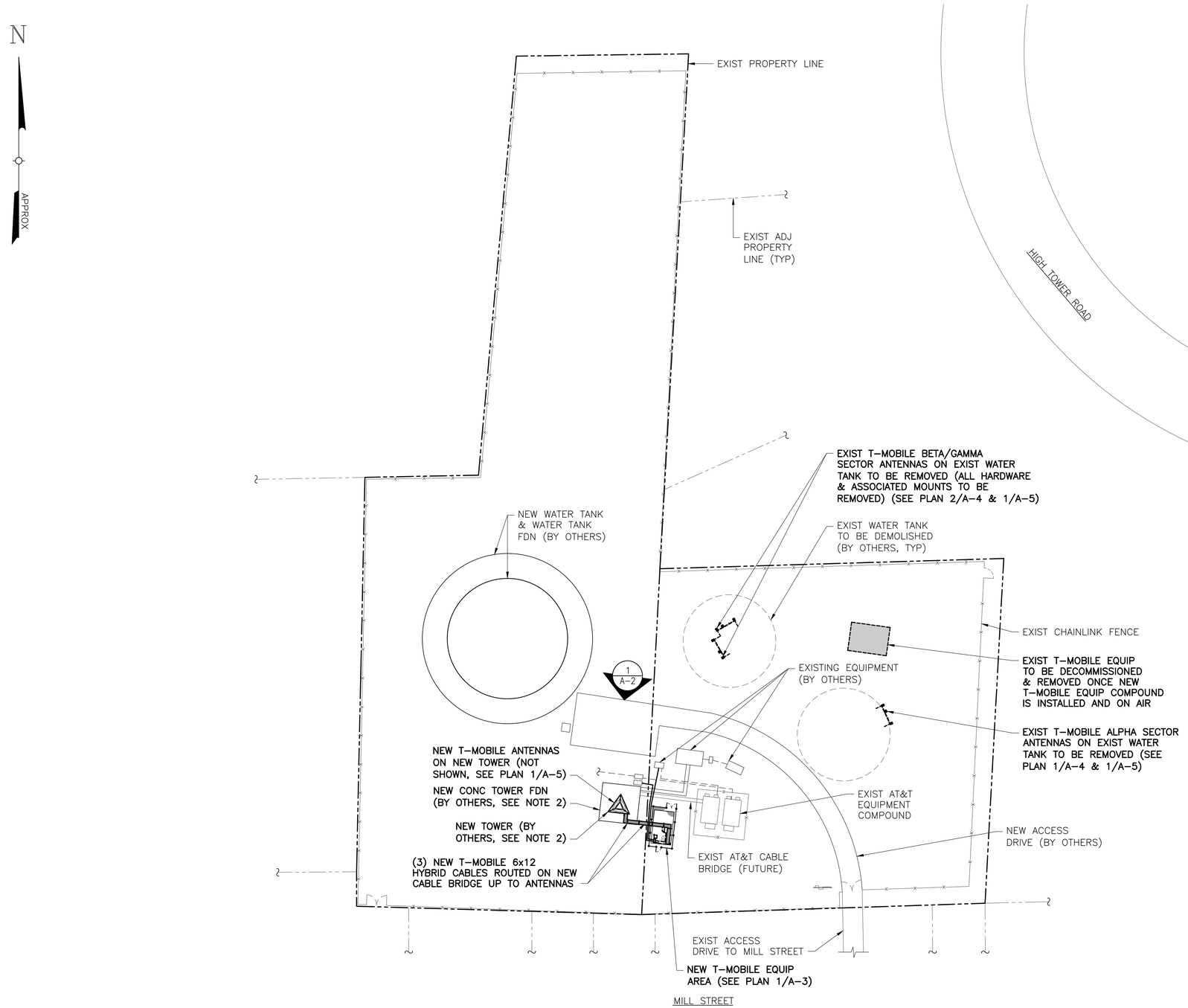
SOUTHINGTON/I-84
CT11239A
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



NOTES:
1. NOT ALL EXISTING SITE FEATURES AND ANTENNAS ARE SHOWN FOR CLARITY.
2. FINAL LOCATION, ORIENTATION OF NEW TOWER, AS WELL AS THE SITE PLAN AS PER DRAWINGS BY TIGHE & BOND DATED 1/20 REV 3.
3. CONTRACTOR SHALL REMOVE ALL EXISTING UNDERGROUND T-MOBILE COAX AS REQUIRED. CONTRACTOR SHALL FILL IN EXISTING UNDERGROUND COAX TRENCHES AS PER PROPERTY OWNER.

1/A-1 OVERALL SITE PLAN

SCALE: 1/32" = 1'-0"

STRUCTURAL NOTE

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SHEET TITLE

OVERALL
SITE PLAN

SHEET NUMBER

A-1

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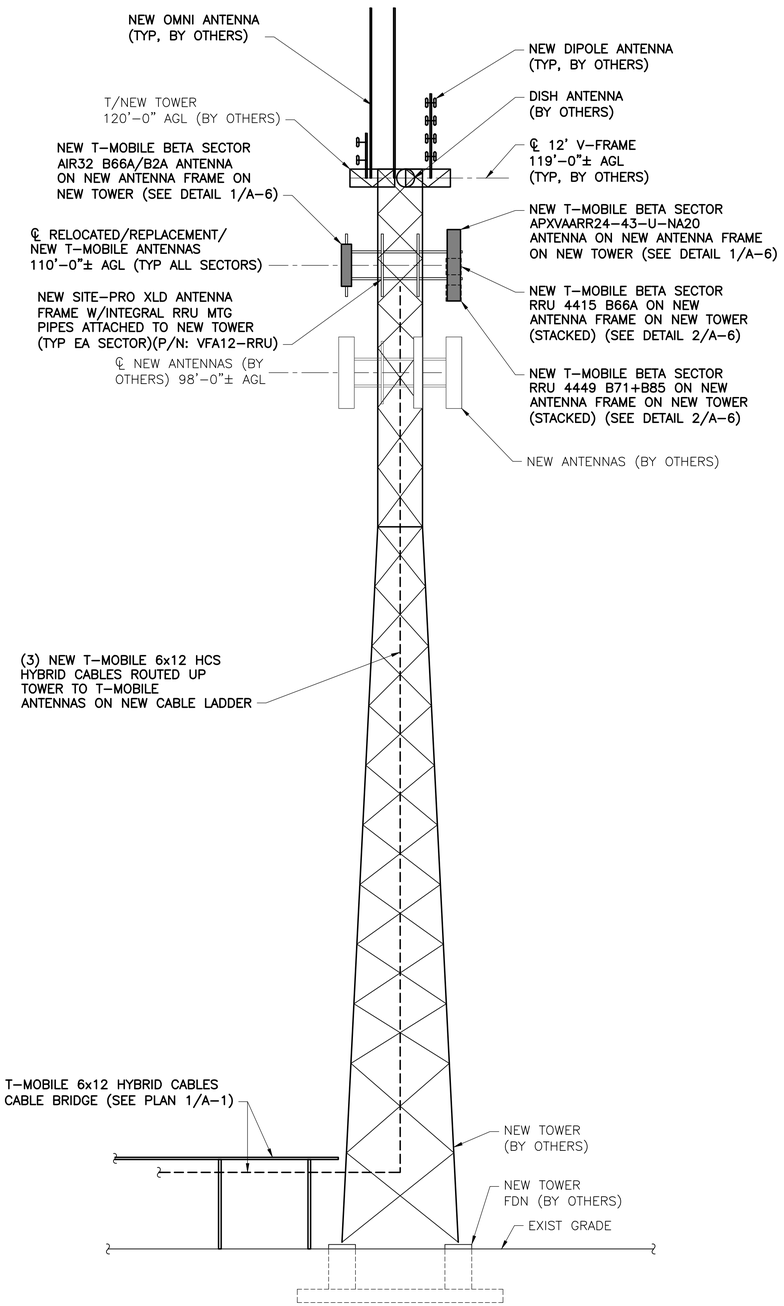

NOTES: NOT ALL SITE FEATURES SHOWN FOR CLARITY.

1/A-2 TOWER ELEVATION

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

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SHEET TITLE

TOWER ELEVATION

SHEET NUMBER

A-2

APPROX. N

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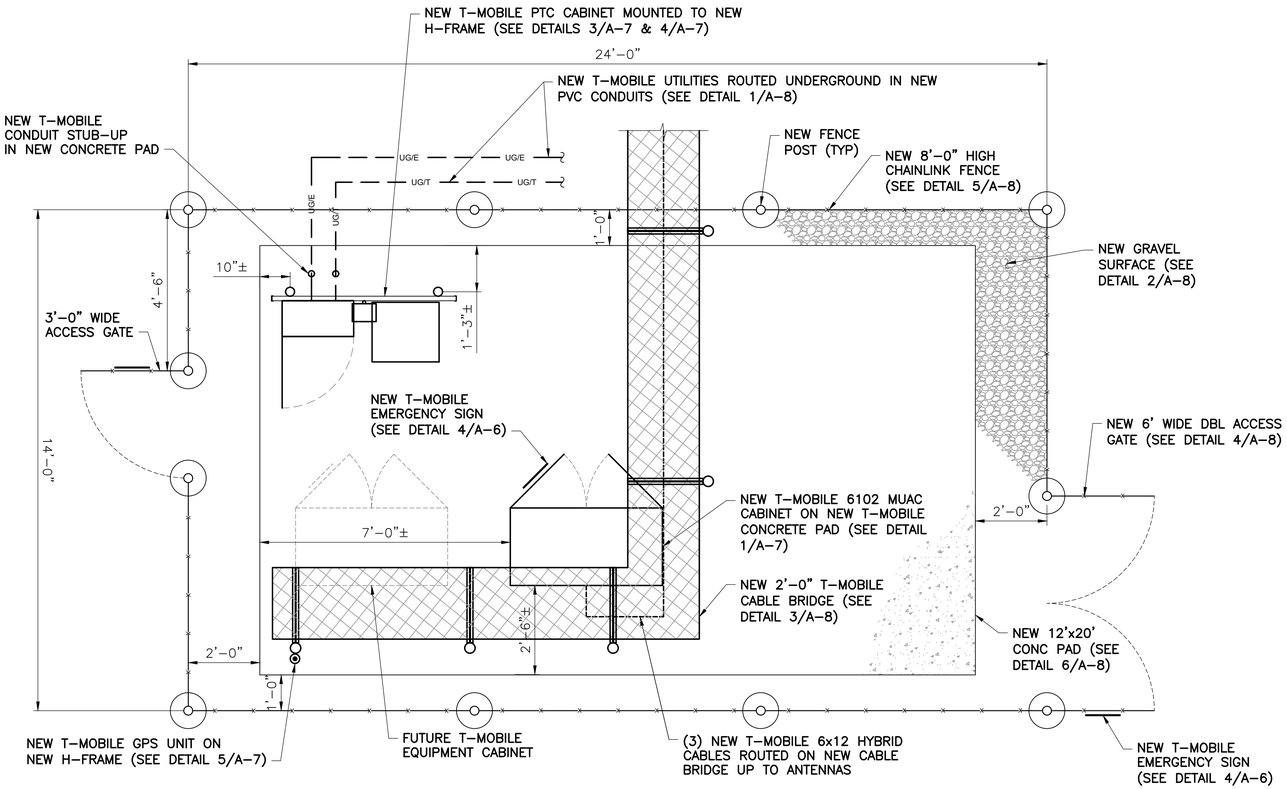

1 / A–3 NEW T–MOBILE EQUIPMENT AREA

SCALE: 1/2" = 1'–0"

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435 MILL STREET
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SOUTHINGTON, CT
06489

SHEET TITLE

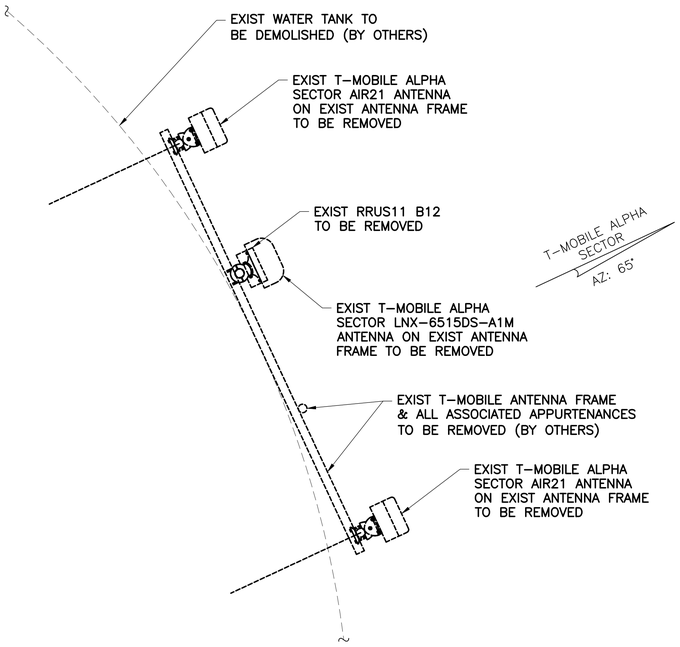
NEW T–MOBILE EQUIPMENT AREA PLAN

SHEET NUMBER

A–3

N

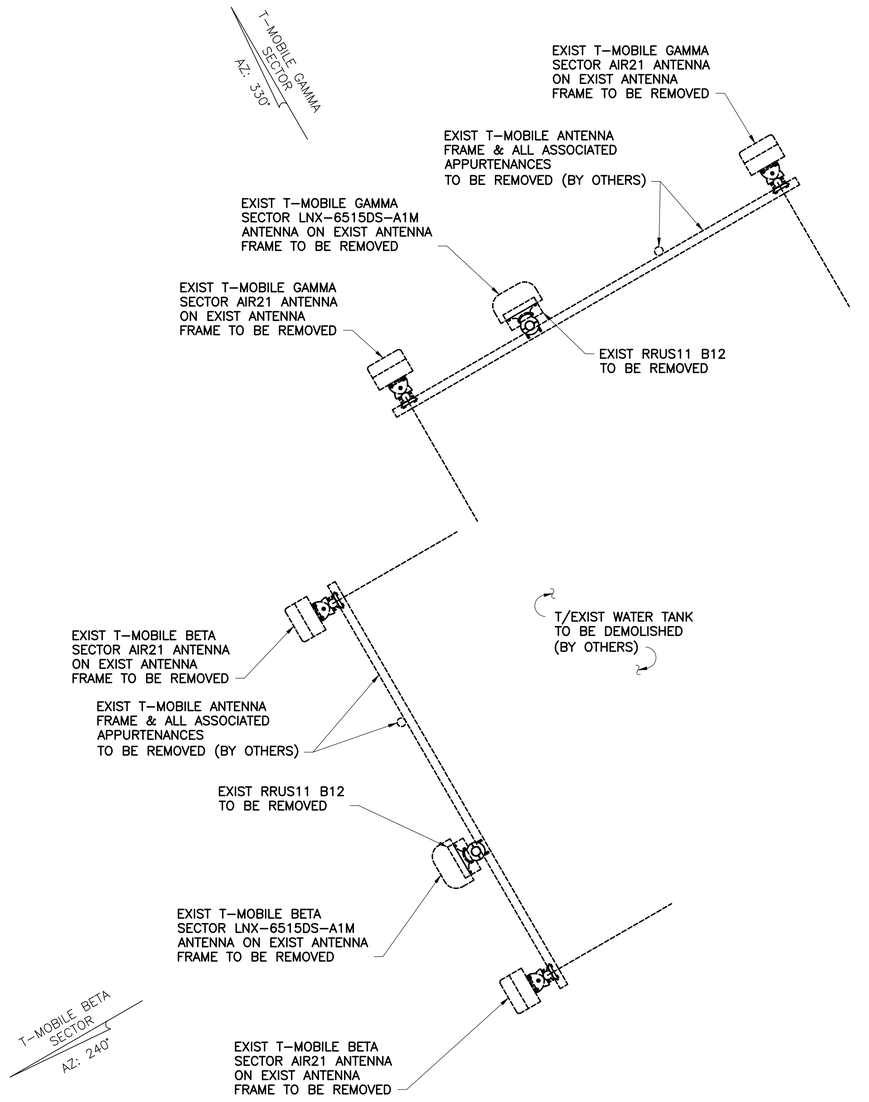
APPROX



ALPHA SECTOR

1 / A–4 EXISTING T–MOBILE ANTENNA PLAN

SCALE: 1/2" = 1'–0"



BETA & GAMMA SECTORS

2 / A–4 EXISTING T–MOBILE ANTENNA PLAN

SCALE: 1/2" = 1'–0"

GENERAL NOTE
ALL EQUIPMENT SHALL BE REMOVED INCLUDING HARDWARE AND CABLES ONCE THE NEW SITE IS ON AIR.

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LICENSED
PROFESSIONAL ENGINEER

Tectonic
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Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
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Phone: (845) 534-5959
(800) 829-6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____

RF _____

CONSTRUCTION _____

OPERATIONS _____

SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	7/12/19	FOR COMMENT	RT
B	04/01/20	ISSUED PER COMMENT	BWY
C	04/08/20	ISSUED PER COMMENT	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

SHEET TITLE

EXISTING T–MOBILE
ANTENNA PLANS

SHEET NUMBER

A–4

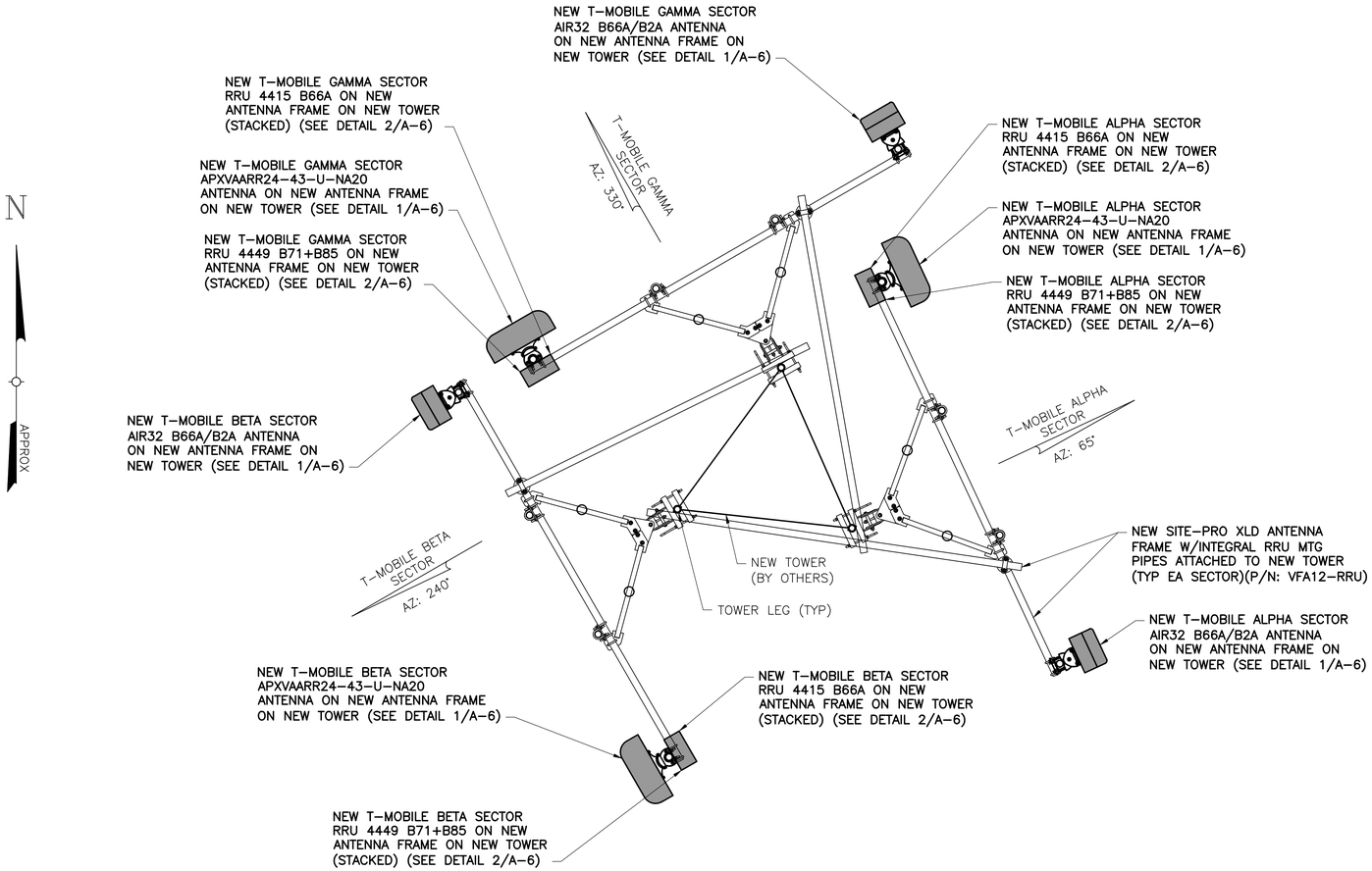
STRUCTURAL NOTE

A STRUCTURAL ANALYSIS OF THE TOWER STRUCTURE WAS PREPARED BY TECTONIC ENGINEERING AND SURVEYING CONSULTANTS, P.C. DATED 3/27/20.

A MOUNT EVALUATION LETTER WAS PREPARED BY TECTONIC ENGINEERING AND SURVEYING CONSULTANTS, P.C. DATED 3/30/20.

ANTENNA SCHEDULE

SECTOR MARK	ANTENNA MODEL	AZIMUTH	ELEC DOWNTILT	MECH DOWNTILT	ANTENNA CENTERLINE	SECTOR	STATUS	TMA/RRU	CABLE	JUMPER TYPE	CABLE LENGTH
A-1 LTE/UMTS	RFS APXVAARR24-43-U-NA20	65°	2°	0°	110'-0"±	LEFT ALPHA	NEW	0/2	NEW 6x12 HCS FIBER	COAX	XX'
A-2 LTE/GSM	ERICSSON AIR32 B66A/B2A	65°	2°	0°	110'-0"±	RIGHT ALPHA	NEW	0/0	SHARED 6x12 HCS FIBER	COAX	XX'
B-1 LTE/UMTS	RFS APXVAARR24-43-U-NA20	240°	2°	0°	110'-0"±	LEFT BETA	NEW	0/2	NEW 6x12 HCS FIBER	FIBER	XX'
B-2 LTE/GSM	ERICSSON AIR32 B66A/B2A	240°	2°	0°	110'-0"±	RIGHT BETA	NEW	0/0	SHARED 6x12 HCS FIBER	COAX	XX'
C-1 LTE/UMTS	RFS APXVAARR24-43-U-NA20	330°	2°	0°	110'-0"±	LEFT GAMMA	NEW	0/2	NEW 6x12 HCS FIBER	COAX	XX'
C-2 LTE/GSM	ERICSSON AIR32 B66A/B2A	330°	2°	0°	110'-0"±	RIGHT GAMMA	NEW	0/0	SHARED 6x12 HCS FIBER	FIBER	XX'
										FIBER	XX'
										COAX	XX'
										COAX	XX'
										FIBER	XX'
										FIBER	XX'
										COAX	XX'
										COAX	XX'
										FIBER	XX'
										FIBER	XX'



NOTE: ADJUST ORIENTATION OF MOUNTS AS REQUIRED BASED ON FINAL LOCATION AND PLACEMENT OF NEW TOWER.

1 / A-5 NEW T-MOBILE ANTENNA PLAN

SCALE: 1/2" = 1'-0"

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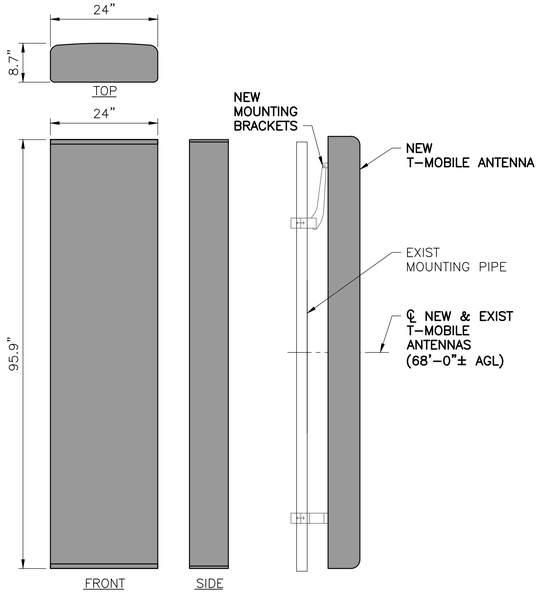
HARTFORD COUNTY
SOUTHINGTON, CT
06489

SHEET TITLE

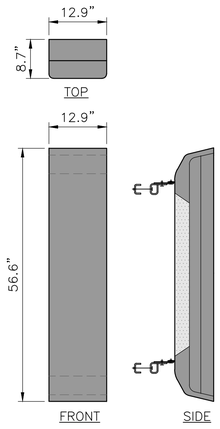
NEW T-MOBILE
ANTENNA PLAN
& ANTENNA SCHEDULE

SHEET NUMBER

A-5

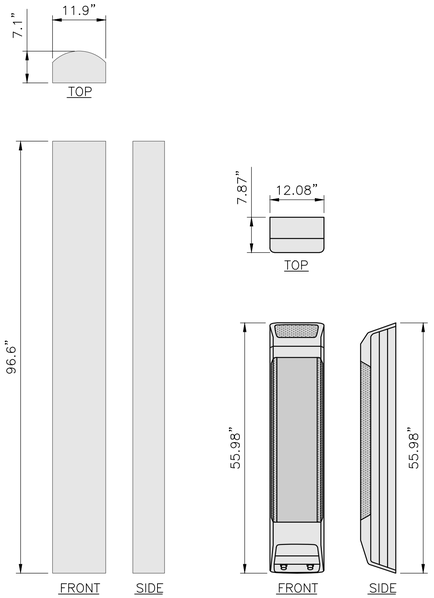


RFS: APXVAARR24_43_U_NA20
WEIGHT: 128 LBS



AIR32 DUAL BAND (DB) B66Aa/B2a
WEIGHT: 132.2 LBS

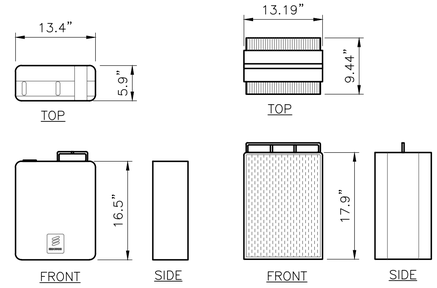
NEW ANTENNAS



ANDREW: LNX-6515DS-A1M
(TO BE REPLACED)
WEIGHT: 43.7 LBS

AIR21 B2A/B4P ANTENNA
(TO REMAIN)
WEIGHT: 83 LBS

EXISTING ANTENNAS TO BE REMOVED

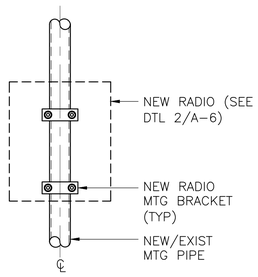


WEIGHT 46 LB
RRUS-4415 B66A

WEIGHT 71.0 LB
RRUS-4449
B71+B85

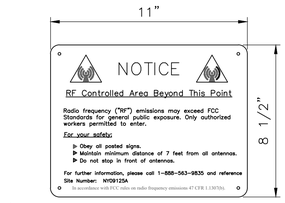
2 / A-6 RADIO DETAILS
SCALE: 1" = 1'-0"

1 / A-6 ANTENNA DETAILS
SCALE: 3/4" = 1'-0"



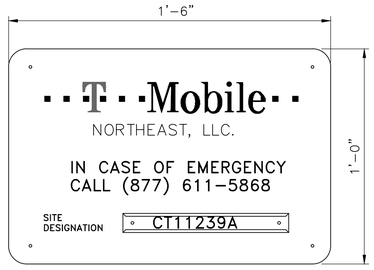
NOTE: MOUNTING OF RADIO TO MOUNTING PIPE, INCLUDING MOUNTING BRACKET ASSEMBLY SHALL BE PER MANUFACTURER DIRECTION.

3 / A-6 RADIO MOUNTING DETAIL
SCALE: 1" = 1'-0"



(WHITE METAL SIGN WITH BLACK LETTERING)

RF NOTICE SIGN



(RED METAL SIGN W/WHITE LETTERING)

EMERGENCY SIGN

2 / A-6 SIGN DETAILS
SCALE: 3" = 1'-0"

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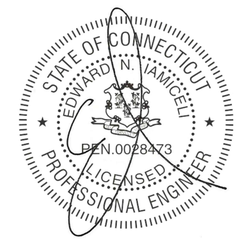

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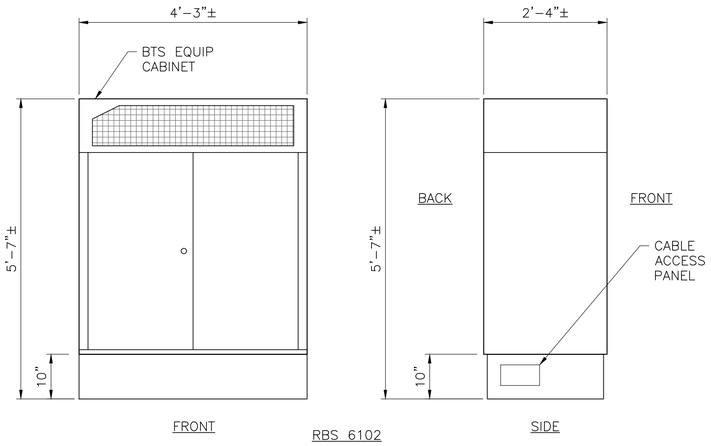
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

SHEET TITLE

ANTENNA EQUIPMENT DETAILS

SHEET NUMBER

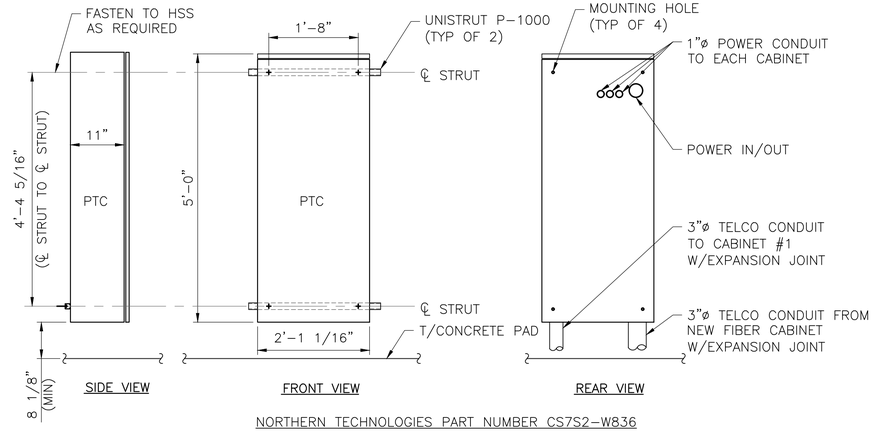
A-6



EQUIPMENT TO BE INSTALLED

1/A-7 6102 CABINET DETAIL

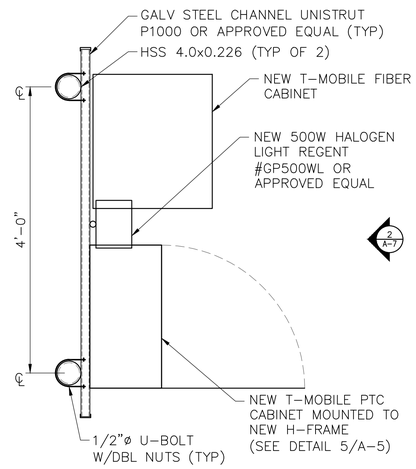
SCALE: NTS



NORTHERN TECHNOLOGIES PART NUMBER CS7S2-W836

2/A-7 PTC CABINET DETAIL

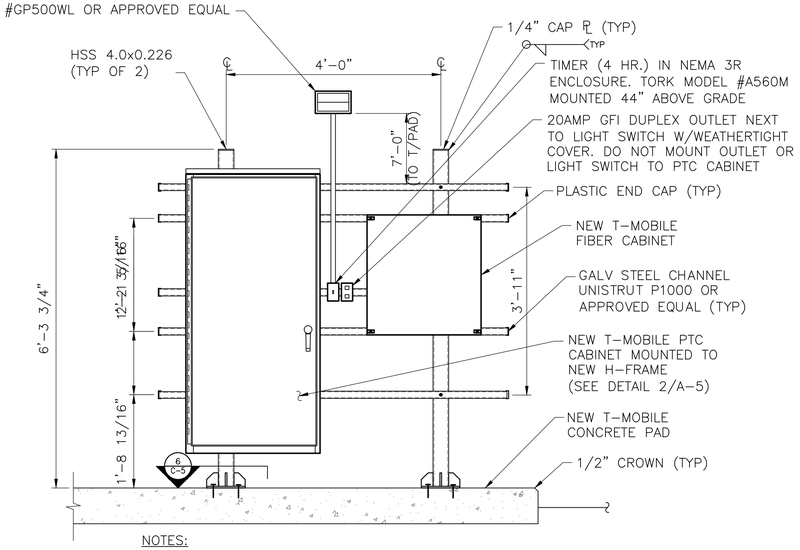
SCALE: 3/4" = 1'-0"



NOTE: INSTALL CAPS ON ALL OPEN POSTS.

3/A-7 H-FRAME PLAN

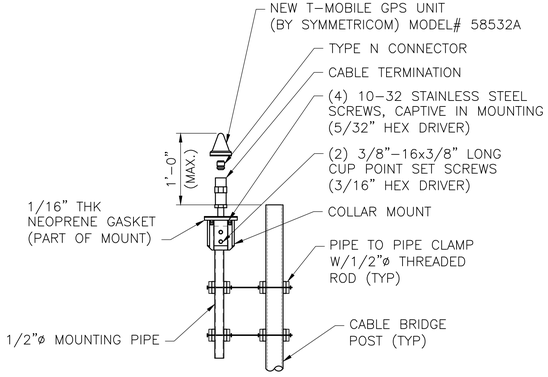
SCALE: 1" = 1'-0"



NOTES:
1. ALL EQUIPMENT SHALL BE GROUNDED.
2. ALL ELECTRICAL ENCLOSURES TO BE NEMA 3R RATED.
3. SEE SITE PLAN FOR GENERAL ROUTING OF ALL CONDUITS. DETERMINE EXACT ROUTINGS IN FIELD.
4. ELECTRICAL EQUIPMENT SHALL BE MIN. 3'-0" FROM ANY STRUCTURE.
5. ALL COVERPLATES TO BE WEATHERPROOF.
6. NEW CONDUITS NOT SHOWN FOR CLARITY.
7. INSTALL CAPS ON ALL OPEN POSTS.

4/A-7 H-FRAME ELEVATION

SCALE: 3/4" = 1'-0"



5/A-7 GPS ANTENNA MOUNT

SCALE: 1" = 1'-0"

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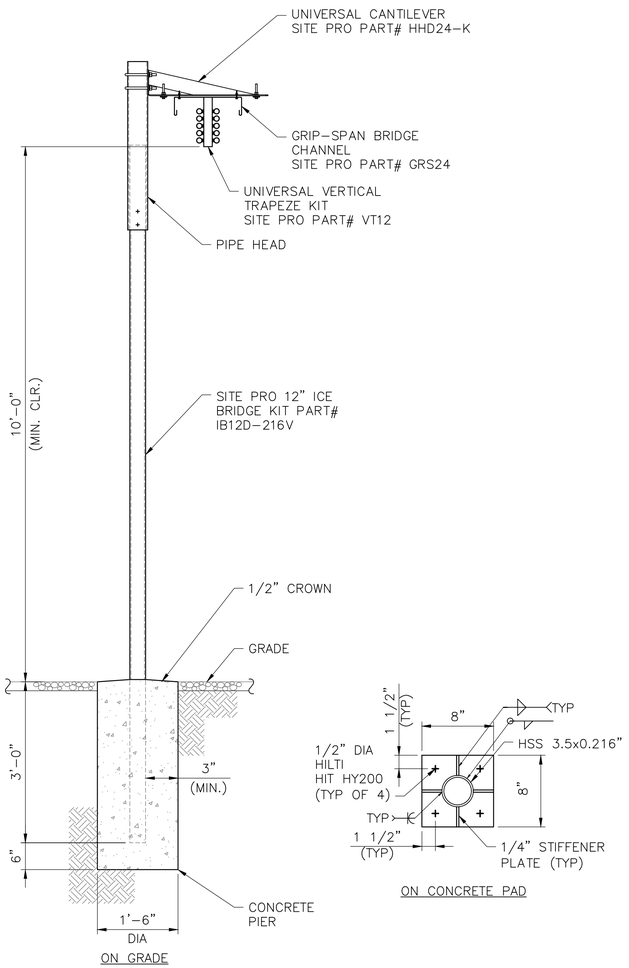
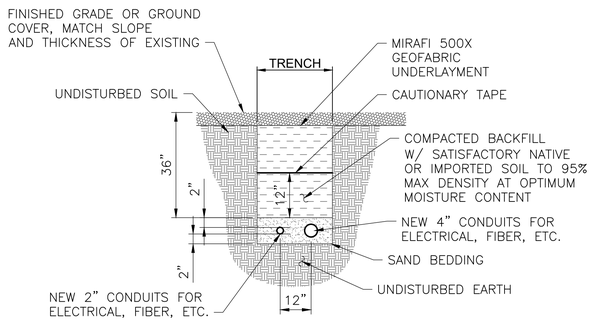
SHEET NUMBER

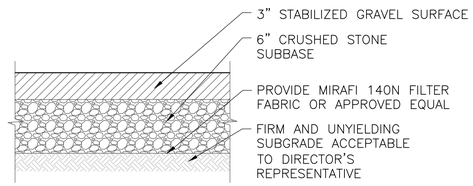
A-7



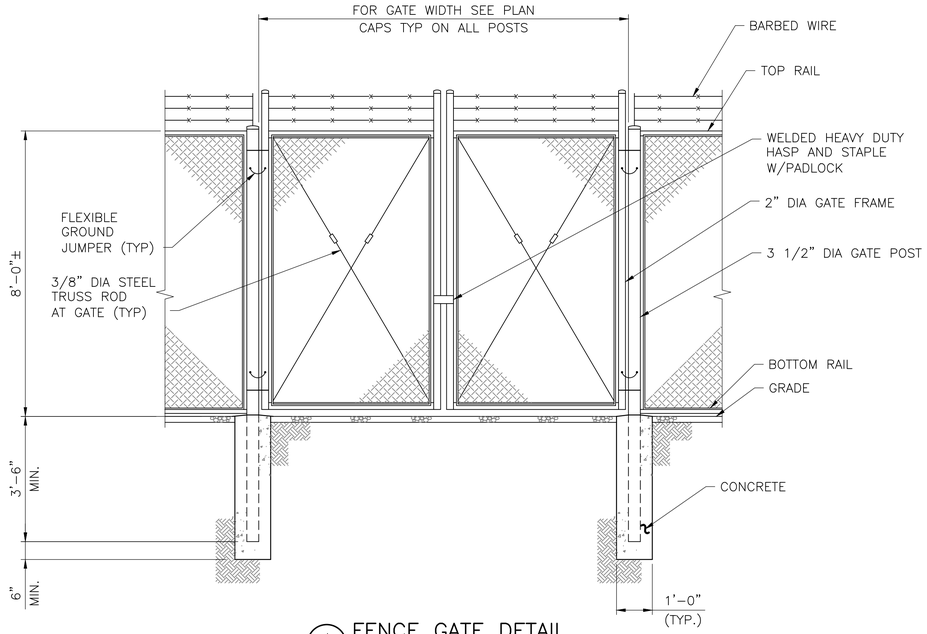
3 A-8 ICE BRIDGE DETAIL
SCALE: NTS



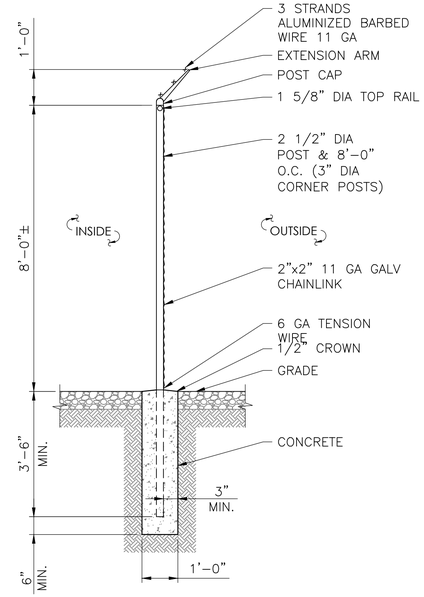
1 A-8 TRENCH DETAIL
SCALE: NTS



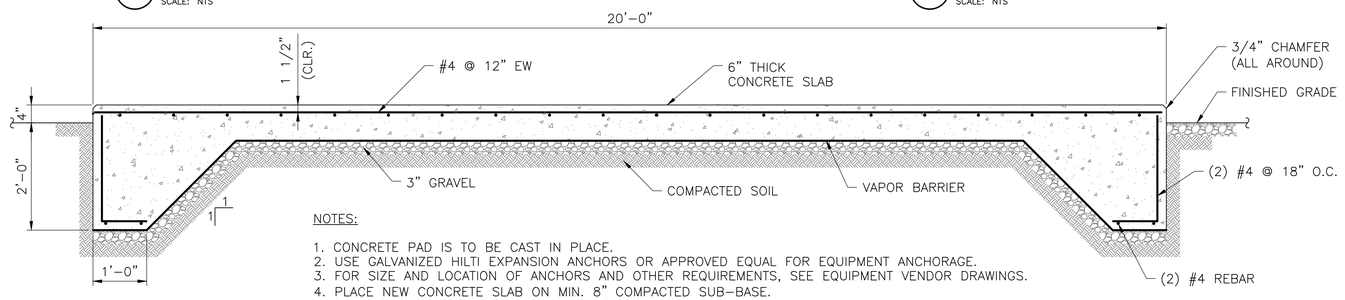
2 A-8 GRAVEL SURFACE DETAIL
SCALE: NTS



4 A-8 FENCE GATE DETAIL
SCALE: NTS



5 A-8 CHAIN LINK FENCE DETAIL
SCALE: NTS



NOTES:

1. CONCRETE PAD IS TO BE CAST IN PLACE.
2. USE GALVANIZED HILTI EXPANSION ANCHORS OR APPROVED EQUAL FOR EQUIPMENT ANCHORAGE.
3. FOR SIZE AND LOCATION OF ANCHORS AND OTHER REQUIREMENTS, SEE EQUIPMENT VENDOR DRAWINGS.
4. PLACE NEW CONCRETE SLAB ON MIN. 8" COMPACTED SUB-BASE.
5. EQUIPMENT CABINETS NOT SHOWN FOR CLARITY.

6 A-8 GRAVEL SURFACE DETAIL
SCALE: NTS

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SOUTHINGTON, CT
06489

SHEET TITLE

SITE DETAILS

SHEET NUMBER

A-8

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STATE OF CONNECTICUT BUILDING CODE, LATEST VERSION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
3. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
4. DIMENSIONS SHOWN ARE TO FINISH SURFACES, UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE AUTHORIZED REPRESENTATIVE OR THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
5. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
6. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
7. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE "NOTICE TO PROCEED," CONTRACTOR WILL CONTACT THE CONSTRUCTION MANAGER OF RECORD A MINIMUM OF 48 HOURS PRIOR TO WORK START.
8. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
9. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
10. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS, AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
12. CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
14. CONTRACTOR SHALL MAINTAIN LIABILITY INSURANCE TO PROTECT THE OWNER.
15. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
16. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, AND PIPING. REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
17. REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
18. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
19. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
20. PROVIDE 48 HOURS WRITTEN NOTICE TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
21. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS AND OTHER DOCUMENTATION SHALL BE TURNED OVER TO AT COMPLETION OF CONSTRUCTION.
22. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF ACCEPTANCE BY. ANY WORK, MATERIALS OR EQUIPMENT FOUND TO BE DEFECTIVE DURING THAT PERIOD SHALL BE CORRECTED IMMEDIATELY UPON WRITTEN NOTIFICATION AT NO ADDITIONAL COST TO T–MOBILE.

STRUCTURAL NOTES

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
2. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", LATEST EDITION.
3. STRUCTURAL STEEL BEAMS SHALL CONFORM TO ASTM A992 (Fy=50ksi). STRUCTURAL STEEL PLATES AND ANGLES SHALL CONFORM TO ASTM A36.
4. ROUND AND SQUARE HOLLOW STRUCTURAL SECTIONS (HSS) CONFORM TO ASTM A500 "COLD–FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE C.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD–FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 "PIPE, STEEL, BLACK AND HOT–DIPPED, ZINC–COATED WELDED AND SEAMLESS", TYPE E OR S, GRADE B.
6. CONNECTIONS: WELD OR BOLT CONNECTIONS, AS INDICATED:

   A) CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF THE CITED AISC SPECIFICATION.

   B) STRUCTURAL BOLTS SHALL CONFORM TO THE LATEST ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS".

   C) WHERE THE REACTION VALUES OF BEAMS, BRACING, STRUTS, ETC., ARE NOT SHOWN ON THE DRAWINGS THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE END REACTION DERIVED FROM THE TABLES AND FORMULA OF UNIFORM LOAD CONSTANTS IN PART 2, NINTH EDITION, OF THE AISC MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN MEMBER SIZE, SPAN AND YIELD STRENGTH.

   D) MINIMUM 3/16" FILLET E70–XX WELD SHALL APPLY UNLESS NOTED.

   E) MINIMUM 1/2" DIA. A325 BOLTS SHALL APPLY UNLESS NOTED.

   F) MINIMUM SIZE OF CLIP ANGLES SHALL BE L3x3x3/8" UNLESS NOTED.

   G) ALL GUSSET PLATES SHALL BE 3/8" THICK UNLESS NOTED.

   H) ALL HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
7. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS", LATEST EDITION. BOLTS SHALL BE 3/4 INCH DIA. UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
9. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
12. ALL STEEL SUPPORTS SHALL BE INSTALLED WITH DOUBLE NUTS AND SHALL BE INSTALLED SNUG TIGHT.
13. SLEEVE ANCHORS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 3, CLASS 3, AS MANUFACTURED BY HILTI FASTENING SYSTEMS OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE (3) INCHES.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 4, CLASS 1, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE FOUR (4) INCHES.
15. EPOXY ANCHORING SYSTEM SHALL BE THE HILTI HY–270 FOR MASONRY CONSTRUCTION WITH HOLLOW BRICK OR BLOCK & THE HILTI HIT HY200 INJECTION ADHESIVE ANCHOR FOR GROUT FILLED CONCRETE MASONRY UNITS AND CONCRETE. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2"ø STAINLESS STEEL ANCHOR ROD W/NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE FOR THE HY–270 ONLY & AN EPOXY ADHESIVE (6" MIN EMBEDMENT). THE INSTALLATION PROCEDURE SHALL BE AS FOLLOWS

   A. DRILL THE HOLE USING MANUFACTURER RECOMMENDED DRILL BIT UP TO SPECIFIED DEPTH. HAMMERING IS NOT PERMITTED.

   B. CLEAN THE HOLE USING NYLON BRUSH AND/OR COMPRESSED AIR. THE HOLE SHOULD BE CLEAR OF ANY LOOSE MATERIAL. IF WET, THE MASONRY SHOULD BE ALLOWED TO DRY FULLY BEFORE ANCHOR INSTALLATION.

   C. INSERT SPECIFIED SCREEN TUBE INTO THE HOLE.

   D. FILL THE SCREEN TUBE COMPLETELY WITH ADHESIVE, BEGINNING AT THE BOTTOM END.

   E. INSERT ANCHOR ROD OR INTERNALLY THREADED INSERT INTO THE ADHESIVE–FILLED SCREEN TUBE, TWISTING SLIGHTLY.

   F. LOAD FASTENER ONLY AFTER MANUFACTURER SPECIFIED CURE TIME HAS ELAPSED.
16. GRATING SHALL BE GALVANIZED WELDED STEEL BAR GRATING TYPE W/BA WITH 1–1/4" BEARING BARS AT 1–3/16" OC. FASTEN TO SUPPORTING MEMBERS WITH SADDLE–TYPE CLIPS AT 2'–0" O.C. AND BAND ALL EXPOSED EDGES.
17. SUBMIT DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
18. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
19. ALL WORK SHALL BE INSPECTED BY THE ENGINEER DURING AND AT THE COMPLETION OF CONSTRUCTION.
20. CONTRACTOR TO REMOVE MASTIC ON THE EXISTING WALL/PARAPET AT EVERY STEEL SUPPORT ATTACHMENT AND REPOINT MASONRY AS REQUIRED. A BED OF SILICONE SHALL BE APPLIED BEHIND AND ALL AROUND THE STEEL SUPPORT ATTACHMENT TO MAKE IT WEATHERPROOF.
21. HAMMER DRILLS ARE NOT TO BE USED WHEN DRILLING HOLES FOR SLEEVE OR EXPANSION BOLTS INSTALLED IN MASONRY BLOCKS/BRICKS.
22. ALL HOLES TO BE ADDED IN THE FIELD SHALL BE PUNCHED OR DRILLED. NO HOLE BURNING SHALL BE ALLOWED.
23. NOTES ARE NOT PROJECT SPECIFIC.

SITE NOTES

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING.
2. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
3. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
4. 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.
5. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
6. 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 CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES.
7. 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 DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEER.
8. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH.
9. CONTRACTOR 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.
10. CARE SHALL BE TAKEN TO RETAIN NATURAL GROWTH AND PREVENT DAMAGE TO TREES WITHIN AND OUTSIDE THE LIMITS OF CONSTRUCTION AND SPECIFIED WORK AREAS CAUSED BY EQUIPMENT AND MATERIALS. ANY DAMAGE TO THIS NATURAL GROWTH SHALL BE RESTORED AT THE EXPENSE OF THE CONTRACTOR.
11. ALL AREAS DISTURBED BY THE CONTRACTOR WITHOUT AUTHORIZATION SHALL BE RESTORED BY THE CONTRACTOR.
12. IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, HE SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE HIS WORK OPERATION UNTIL SERVICE IS RESTORED.

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35 GRIFFIN ROAD SOUTH
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NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	7/12/19	FOR COMMENT	RT
B	04/01/20	ISSUED PER COMMENT	BWY
C	04/08/20	ISSUED PER COMMENT	BWY

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

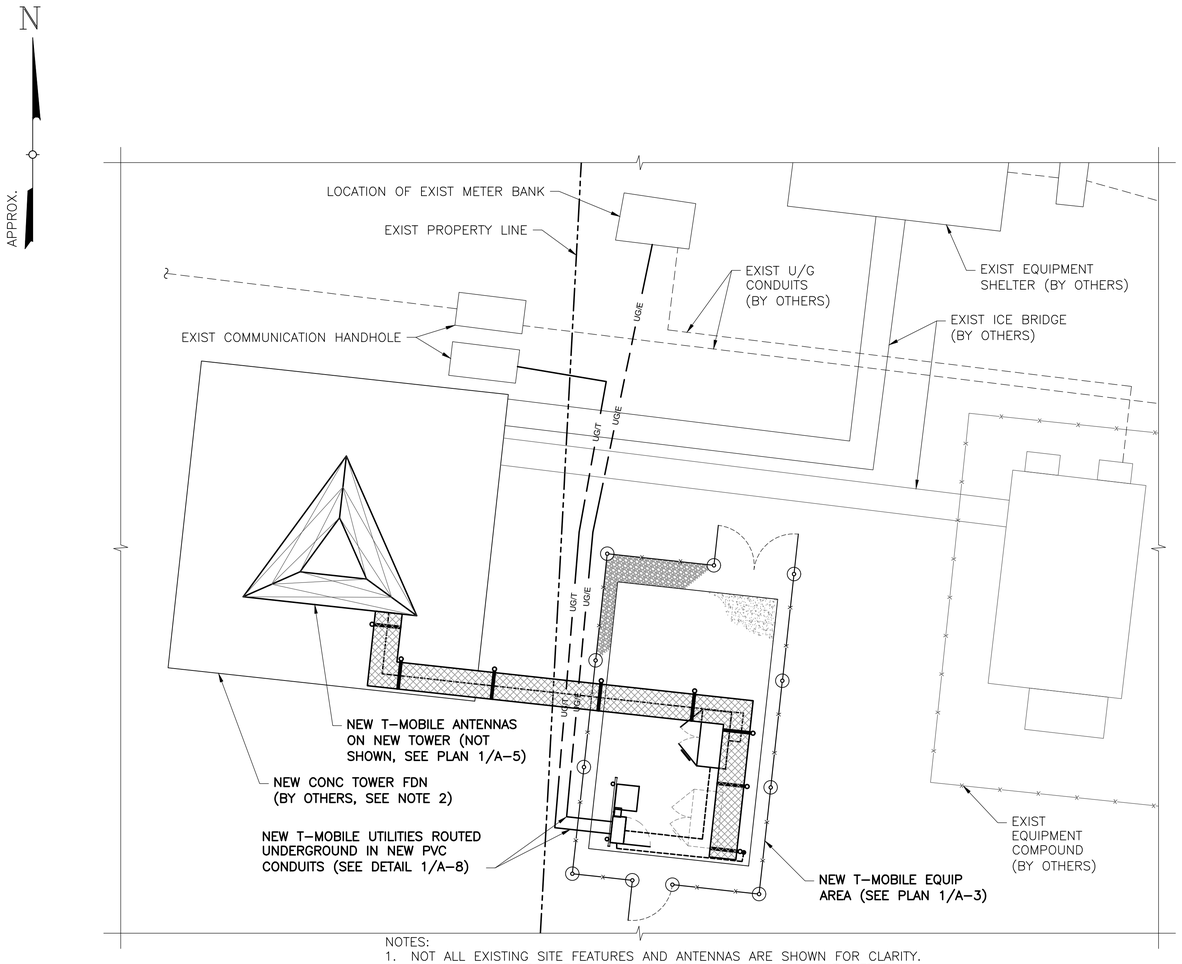
SOUTHINGTON/I–84
CT11239A
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

SHEET TITLE

NOTES

SHEET NUMBER

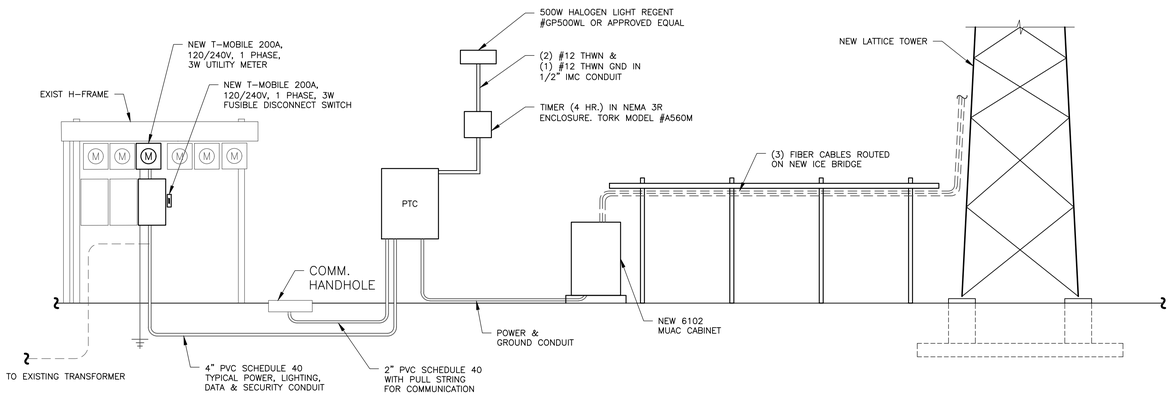
A–9



NOTES:
1. NOT ALL EXISTING SITE FEATURES AND ANTENNAS ARE SHOWN FOR CLARITY.
2. FINAL LOCATION, ORIENTATION OF NEW TOWER, AS WELL AS THE SITE PLAN AS PER DRAWINGS BY TIGHE & BOND DATED 1/20 REV 3.

1 E-1 UTILITY PLAN

SCALE: 3/16" = 1'-0"



2 E-1 SERVICE ELEVATION

SCALE: N.T.S.

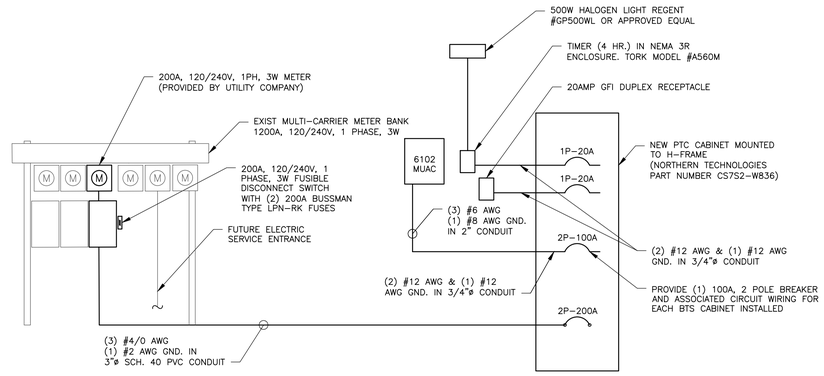
TELCO WIRE NOTES

CONTRACTOR WILL PULL THREE (3) RUNS OF BELDEN-M DATATWIST CAT 6 SHIELDED 24 AWG, 4 PAIR, 5 TWIST PER INCH, PART NUMBER 1624R TELCO WIRE WITH PULL LINE CONTINUOUS FROM WESTELL BOX TO PTC TO RBS.
CAT 6 CABLE 1 GREY
CAT 6 CABLE 2 RED
CAT 6 CABLE 3 BLUE

CBYD.COM 811 Call Before You Dig, Inc.

GENERAL ELECTRICAL NOTES

1. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ENGINEER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
2. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORIES (U.L.) AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. AND SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
4. CONTRACTOR TO COORDINATE WITH SITE OWNER FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
5. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
6. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
7. METER SOCKETS AMPERES, VOLTAGE AND NUMBER OF PHASES SHALL BE NOTED AND SHALL BE MANUFACTURED BY SQUARE "D" COMPANY, SANGAMO OR APPROVED EQUAL. METER SOCKET SHALL BE APPROVED BY UTILITY COMPANY PRIOR TO INSTALLATION.
8. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM WITH TYPE THHN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL CONDUCTORS SHALL BE COPPER.
10. USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.
11. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
12. CONDUIT:
    - A.) RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR.
    - B.) INTERMEDIATE METAL CONDUIT SHALL BE U.L. LABEL, FITTINGS SHALL BE THREADED ALUMINUM OR STEEL AND SHALL BE USED FOR ALL EXTERIOR RUNS. THREADLESS COUPLINGS AND CONNECTORS SHALL NOT BE USED.
    - C.) ELECTRICAL METALLIC TUBING (EMT) SHALL HAVE U.L. LABEL, FITTINGS SHALL BE NO SET SCREW OR CRIMP TYPE FITTINGS SHALL BE USED. GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
    - D.) FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
    - E.) CONDUIT SHALL BE SIZED PER THE NEC AND AS SHOWN.
    - F.) CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH OWNER PRIOR TO INSTALLING.
    - G.) ALL CONDUIT ONLY (C.O.) RUNS SHALL HAVE A PULL WIRE OR ROPE.
13. COVERPLATES SHALL BE BRUSHED STAINLESS STEEL FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, AND SHALL HAVE ENGRAVED LETTERING WHERE INDICATED WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD-8 LIFT COVERPLATES.
14. REFER TO MANUFACTURERS MANUAL FOR RECOMMENDED FUSE AND WIRE SIZES.
15. ALL FINAL CONNECTIONS TO THE EQUIPMENT ARE TO BE OF FLEXIBLE WEATHERPROOF CONDUIT TO MEET APPLICABLE CODES.
16. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
17. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2, UNLESS OTHERWISE NOTED.
18. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE CONSTRUCTION MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
19. PROVIDE CONSTRUCTION MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH GAINING APPROVALS AND PAYING ALL FEES ASSESSED BY UTILITY COMPANY FOR ELECTRICAL SERVICE.



NOTE:
1. RUN 3" PVC WITH 3 RUNS OF BELDEN-M DATATWIST CAT 6, SHIELDED, 24 AWG, 4 PAIR, 5 TWISTS PER INCH, PART NUMBER 1624R, TELCO WIRE AND PULL LINE FROM DEMARC PTC AND PTC TO BTS BASE, 4 INCH CONDUIT FROM DEMARC TO FUTURE FIBER CABINET, TO PTC.
2. FINAL ELECTRICAL CONSULTATION IS REQUIRED PRIOR TO CONSTRUCTION. COORDINATE WITH OWNER ON REQUIREMENTS AND FINAL DEMARK LOCATIONS.

3 E-1 ONE-LINE DIAGRAM

SCALE: N.T.S.

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NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	7/12/19	FOR COMMENT	RT
B	04/01/20	ISSUED PER COMMENT	BWY
C	04/08/20	ISSUED PER COMMENT	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

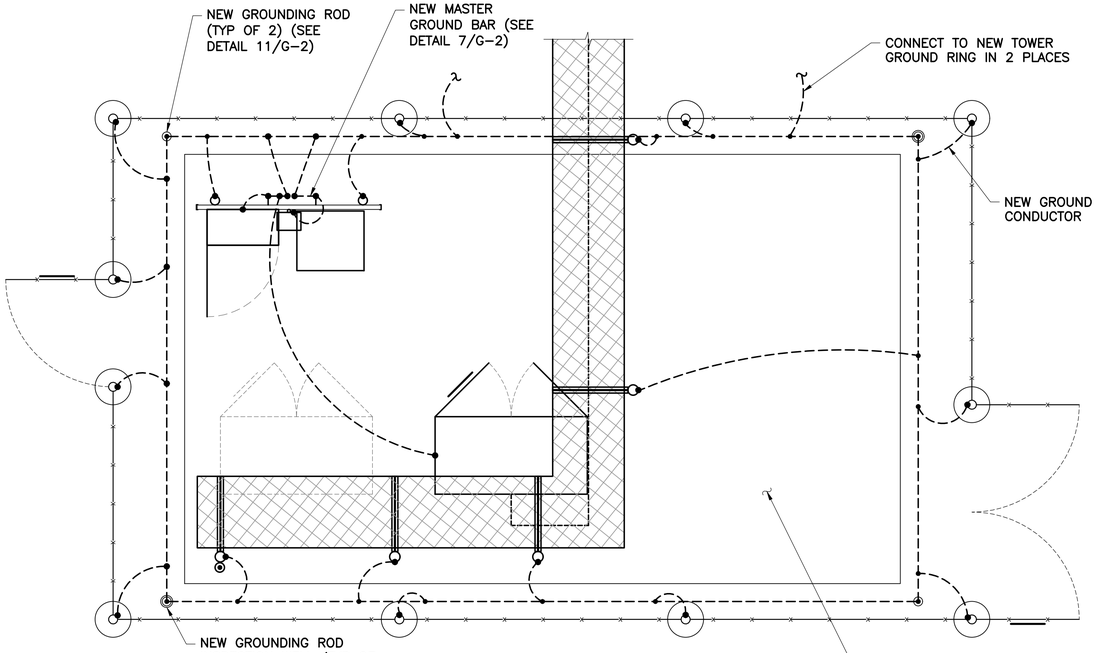
SHEET TITLE

UTILITY PLAN, NOTES & ONE-LINE DIAGRAM

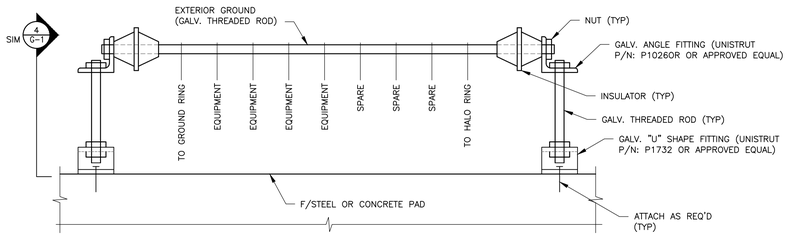
SHEET NUMBER

E-1

APPROX. N

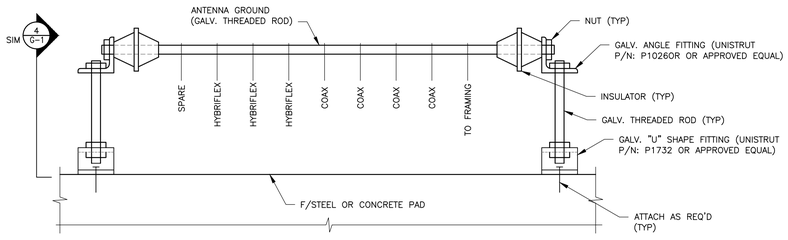


1 G-1 GROUNDING PLAN
SCALE: 1/2" = 1'-0"



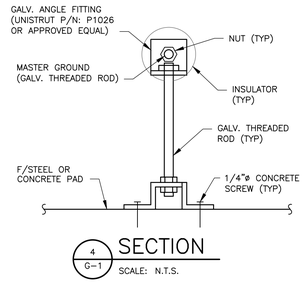
NOTE: INSTALL NO-OX PRIOR TO BOLTING CONNECTIONS.

2 G-1 EXTERIOR GROUND ROD
SCALE: 3" = 1'-0"



NOTE: INSTALL NO-OX PRIOR TO BOLTING CONNECTIONS.

3 G-1 ANTENNA GROUND ROD
SCALE: 3" = 1'-0"



4 G-1 SECTION
SCALE: N.T.S.

LEGEND

- GROUND CONDUCTOR
- CADWELD
- GROUND ROD
- GROUND ROD INSPECTION WELL
- GROUND LUG

GROUNDING NOTE

1. ALL ABOVE GROUND CONNECTIONS SHALL BE CADWELD, BOLT CLAMP, OR SPLIT BOLT CONNECTORS. CRIMP CONNECTORS SHALL NOT BE USED ON SOLID CONDUCTORS. CLAMPS MUST BE USED FOR FENCE AND HANDRAIL CONNECTION.
2. ALL GROUNDING CONNECTIONS TO THE GROUND BAR/ROD OR GROUND PLATE, INTAKE AND EXHAUST LOUVERS AND A/C UNIT SHALL BE MADE WITH TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS, (BURNDY OR EQUAL). ALL LUGS ATTACHED TO BUSSES USING BOLTS, NUTS, AND LOCK WASHERS.
3. ALL WIRE CONNECTORS SHALL BE THREE-CRIMP C TAP COMPRESSION, THOMAS & BETTS #54740, ORANGE.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE AN ANTI-OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. WHERE ANY GROUNDING CONDUCTOR PASSES THROUGH METAL CONDUIT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURNS SHORTER THAN AN 8-INCH NOMINAL RADIUS.
8. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 5 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY CROWN AND VERIZON FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
9. GROUND CONNECTORS TO ANTENNA MAST SHALL BE MADE WITH HEAVY DUTY GROUND CLAMPS SIMILAR TO THOMAS & BETTS OR APPROVED EQUAL.
10. ANTENNA CABLE INSTALLER TO PROVIDE GROUND ROD AT TOP & BOTTOM OF TOWER FOR ANTENNA CABLE GROUNDING. DOWNWARD LEADS FROM GROUNDING KITS MUST BE USED. GROUND KIT SHALL BE SIMILAR TO DETAIL 4/E-2.
11. CABLE TRAYS ARE TO BE GROUNDED TO THE GROUND ROD WITH #6 SOLID WIRE. CONNECTIONS ARE DOUBLE LUG-BOLTED, SCREWED MECHANICAL CONNECTIONS WITH STAR WASHERS AND NO-OX GREASE.
12. GROUNDING CLAMPS SHALL BE BURNDY GAR-TC OR EQUAL. PREPARE SURFACE PER BURNDY SPECIFICATIONS.
13. AVOID DISRUPTION OF EXISTING GROUNDING SYSTEM, REPAIR ANY DAMAGE TO THE SATISFACTION OF CROWN.
14. CONTRACTOR SHALL INSTALL ALL GROUNDING IN ACCORDANCE WITH VERIZON'S SITE GROUNDING SPECIFICATIONS, LATEST EDITION.
15. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
16. GPS ANTENNA MOUNTS GROUNDED TO ANTENNA 'BAR NONE SOLUTION' WITH ONE #6 WIRE EACH. GPS CABLE SHALL HAVE ONE GROUND KIT INSTALLED AT THE EQUIPMENT FRAME AND ATTACH CONDUCTORS TO THE 'BAR NONE SOLUTION'.
17. ALL ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TOGETHER AND SUBSEQUENTLY CONNECTED TO THE 'BAR NONE SOLUTION' AT THE EQUIPMENT FRAME. ALL CONNECTIONS ARE TO BE CAD-WELDED IF POSSIBLE.
18. PLUG ALL LB'S WITH ELECTRICAL CEMENT. PACK EPOXY AROUND ALL BOLTED LUGS. INSTALL ANTI-CORROSIVE GREASE ON ALL GROUNDING ATTACHMENTS.
19. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO CROWN AND VERIZON.

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NSS NORTHEAST SITE SOLUTIONS
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ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

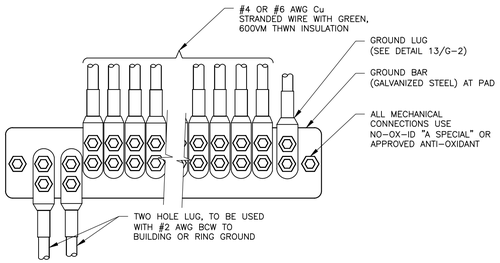
SHEET TITLE

GROUNDING PLAN
DETAILS & NOTES

SHEET NUMBER

G-1

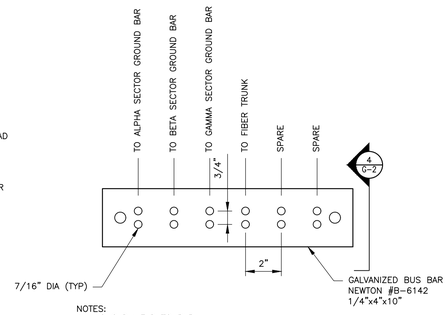
NOTE: ALL GROUND WIRES TO BE GALVANIZED STEEL. ERICO ERITECH THEFT DETERRENT CABLES TO BE USED.



NOTE: INSTALL ANTICORROSION GREASE ON ENTIRE GROUND BAR

1 / G-2 GROUNDING DETAIL

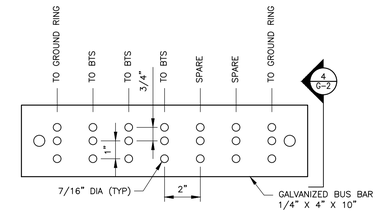
SCALE: N.T.S.



NOTES:
1. NO CAD WELD TO BAR.
2. INSTALL NO-OX PRIOR TO BOLTING CONNECTIONS.
3. GROUND BAR TO BE DIRECTLY ATTACHED TO TOWER WITHOUT INSULATORS.

2 / G-2 SECTOR GROUND BAR DETAIL

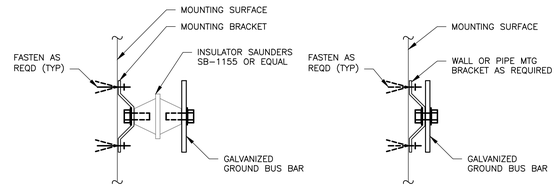
SCALE: 3" = 1'-0"



NOTES:
1. ALL CONDUCTORS 2 AWG (UON) WITH 2 HOLE LUGS.
2. ALL FIELD SIZED LUGS SHALL CONFIRM WITH NEMA STANDARDS.
3. INSTALL NO-OX PRIOR TO BOLTING CONNECTIONS.

3 / G-2 FIBER/COAX GROUND BAR

SCALE: 3" = 1'-0"

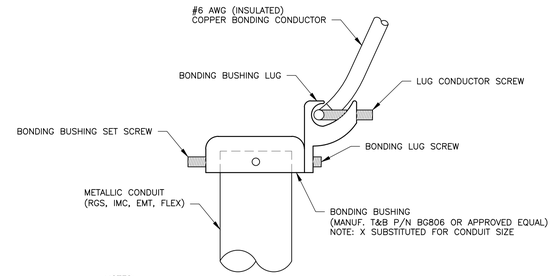


INSULATED GROUND BAR

NON-INSULATED GROUND BAR

4 / G-2 SECTION

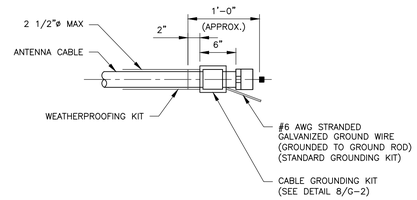
SCALE: 3" = 1'-0"



NOTES:
1. IF WITHIN 18" OF A GROUND BAR, CONNECT CONDUIT BOND CONDUCTOR TO GROUND BAR. OTHERWISE, CONNECT TO MAIN GROUND CONDUCTOR EXITING CONDUIT VIA C-TYPE COMPRESSION CONNECTION. WRAP CONNECTION POINT WITH UL LISTED GREEN ELECTRICAL TAPE.
2. BOTH ENDS OF CONDUIT TO BE GROUNDED.
3. ALLOW A MINIMUM OF 1/4" OF #6 AWG COPPER BONDING CONDUCTOR TO GO PAST END OF BONDING BUSHING LUG.
4. BONDING BUSHING, SET SCREW, LUG, LUG SCREW, CONDUCTOR LUG SCREW, SHOWN AS COMPLETE UNIT.

5 / G-2 CONDUIT BOND/GROUND BUSHING DETAIL

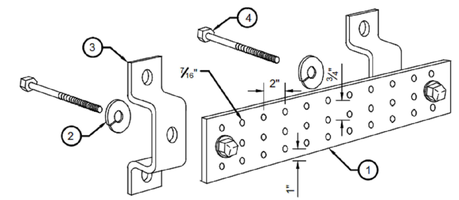
SCALE: N.T.S.



NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND ROD.

6 / G-2 CABLE GROUND KIT DETAIL

SCALE: 1" = 1'-0"



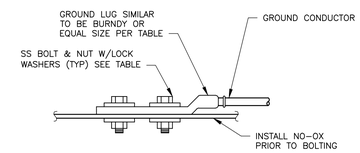
LEGEND:

1. GALVANIZED STEEL GROUND BAR, 1/4"x4"x10" (MIN.), NEWTON INSTRUMENT CO., CAT NO. 215505. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2. 5/8" STAINLESS STEEL LOCKWASHERS
3. STAINLESS STEEL MOUNTING BRACKET.
4. STAINLESS STEEL BOLTS.

7 / G-2 TOWER GROUND BAR DETAIL

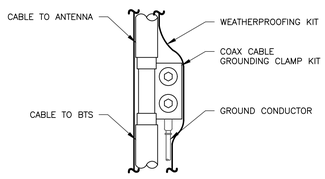
SCALE: N.T.S.

TABLE		
WIRE SIZE	LUG #	BOLT DIA
#2	YA2CL-2TC14	1/4"
#2/0	YA25-2LN	1/2"



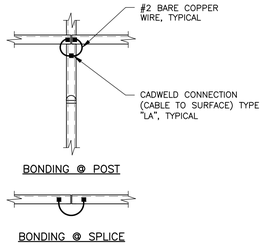
12 / G-2 LUG GROUND CONNECTION

SCALE: N.T.S.



8 / G-2 CABLE GROUNDING DETAIL

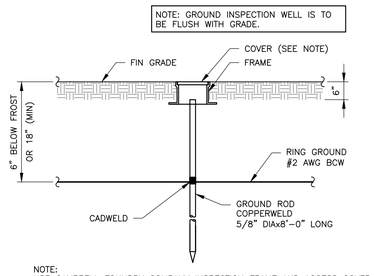
SCALE: N.T.S.



NOTE: WHERE TRAY IS USED BOND ADJACENT TRAY WITH A #6 STRANDED JUMPER VIA TWO HOLE LUGS. BOND BOTH ENDS TO THE #2 SOLID TINNED WIRE.

9 / G-2 COAX BRIDGE BONDING DETAIL

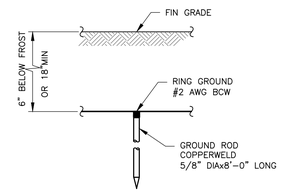
SCALE: N.T.S.



NOTE:
USE CAMPBELL FOUNDRY COMPANY INSPECTION FRAME AND ACCESS COVER MODEL #4153, OR EQUAL

10 / G-2 GROUND ROD INSPECTION

SCALE: 1/2" = 1'-0"



11 / G-2 GROUND ROD DETAIL

SCALE: 1/2" = 1'-0"

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RF _____

CONSTRUCTION _____

OPERATIONS _____

SITE ACQ. _____

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9927.CT11239A	EI

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B	04/01/20	ISSUED PER COMMENT	BWY
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0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

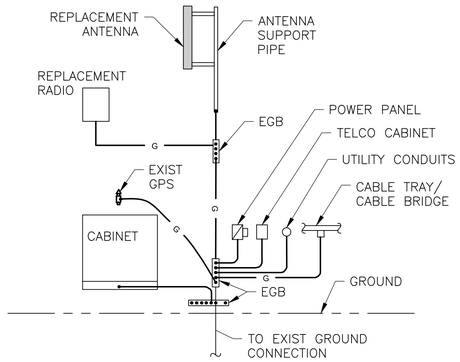
SOUTHINGTON/I-84
CT11239A
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

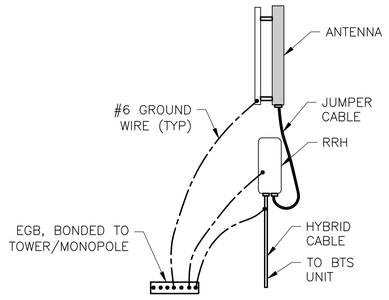
G-2



NOTE: CONTRACTOR SHALL CONFIRM ALL EQUIPMENT IS GROUNDED. IF NOT, CONTRACTOR SHALL GROUND EQUIPMENT AS SHOWN AND AS REQUIRED.

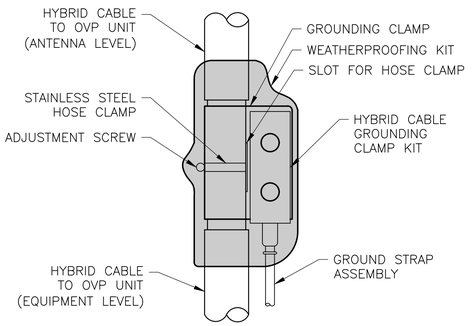
1 G-3 GROUNDING RISER DIAGRAM

SCALE: NTS



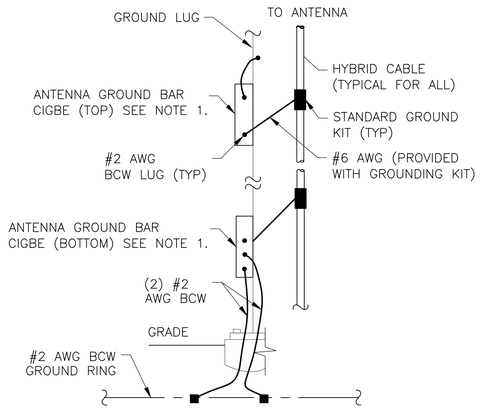
2 G-3 HYBRID CABLE CONNECTIOND DETAIL

SCALE: NTS



3 G-3 HYBRID CABLE GROUNDING DETAIL

SCALE: NTS

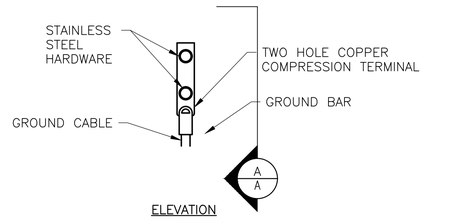


NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS UNIT IF REQUIRED.

4 G-3 ANTENNA CABLE GROUNDING

SCALE: NTS



NOTES:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

5 G-3 GROUND BAR CONNECTION DETAIL

SCALE: NTS

GROUNDING NOTES

1. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
2. ALL GROUNDING WORK SHALL BE IN ACCORDANCE WITH T-MOBILE STANDARD PRACTICE.
3. ALL BUS CONNECTORS SHALL BE TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS, T&B OR EQUAL, UNLESS OTHERWISE NOTED ON DRAWINGS. ALL LUGS SHALL BE ATTACHED TO BUSSES USING BOLTS, NUTS, AND LOCK WASHERS. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON-OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. ALL COPPER BUSSES SHALL BE CLEANED, POLISHED, AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURN SHORTER THAN AN 8-INCH NOMINAL RADIUS.
8. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2. ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS, OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
9. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
10. ALL ROOF TOP ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TO THE NEAREST GROUND BUS. ALL CONNECTIONS ARE TO BE CAD-WELDED IF POSSIBLE.
11. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE PROJECT MANAGER.
12. GROUNDING CONNECTION TO TRAVEL IN A DOWNWARD DIRECTION.
13. ALL EXPOSED #2 WIRE MUST BE TINN NOT BTW.
14. TECTONIC TAKES NO RESPONSIBILITY OR LIABILITY FOR THE GROUNDING SYSTEM AS SHOWN ON THIS SITE. THIS IS A STANDARD GROUNDING SYSTEM.

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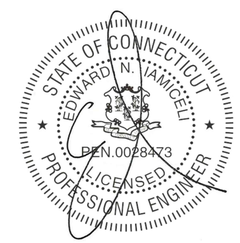

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0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
HARTFORD COUNTY
SOUTHINGTON, CT
06489

SHEET TITLE

GROUNDING DETAILS & NOTES

SHEET NUMBER

G-3

Exhibit D

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Date: **March 27, 2020**

Structural Analysis Report

Tower Owner: Town of Southington
Carrier: T-Mobile

Carrier Designation:
Project Number: CT11239A - L600
Site Name: Southington / I-84
Site Data: 435 Mill St., Southington, Hartford County, CT 06489
Latitude 41° 36' 16.53", Longitude -72° 53' 39.61"
120 Foot – Self Support Tower

Tectonic Project Number: 9927.CT11239A

Tectonic Engineering & Surveying Consultants P.C. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation to be:

Structure: **Sufficient – 56.2%**
Foundation: **Sufficient – 73.3%**

This analysis has been performed in accordance with the TIA-222-G Standard and the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 122 mph converted to a nominal 3-second gust wind speed of 95 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor, Kzt, of 1.0 and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the drawings for the determined available structural capacity to be effective.

We at Tectonic appreciate the opportunity of providing our continuing professional services to you and T-Mobile. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Connor Golden-Weathers / Graham Evans

Respectfully submitted by:
Tectonic Engineering & Surveying Consultants, P.C.

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
3/27/20
LICENSED
PROFESSIONAL ENGINEER

Edward N. Iamiceli, P.E.
Managing Director - Structural

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

TABLE OF CONTENTS

1) INTRODUCTION

The tower is a 120 ft Self Support tower designed by Valmont Structures.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	95 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	T-Mobile	3	ericsson	4415 B66A	3	6x12 Fiber	-
		3	ericsson	4449 B71/B85			
		3	ericsson	AIR -32 B2A/B66AA			
		3	rfs celwave	APXVAARR24_43-U-NA20			
		3	sitepro1	VFA12-RRU (Sector Mount)			

Table 2 – Existing/Reserved Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	Town of Southington	2	andrew	VHLP800-11	18	7/8	1
		1	commscope	DB404-B			
		1	-	10' Dipole			
		3	motorola	PTP 49400			
		2	rfi antennas	BA4040-67-DIN			
98.0	AT&T	3	ericsson	4449 B5/B12	6 6 2	1-5/8 7/16 3/8	1
		3	sitepro1	VFA12 (Sector Mount)			
		3	cci antennas	OPA65R-BU8D			
		6	cci antennas	TPA65R-BU8D			
		3	ericsson	8843 B2/B66A			
		1	raycap	DC6-48-60-0-8C-EV			
		2	raycap	DC6-48-60-18-8C-EV			

Notes:
1) Reserved Equipment

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
CONSTRUCTION DRAWINGS	Tectonic Rev. C	4/8/20
RFDS	T-Mobile	9/09/19
TOWER AND FOUNDATION DRAWINGS	Valmont Structures	12/12/19
CONSTRUCTION DRAWINGS	Hudson Design Group LLC	3/10/20
STRUCTURAL ANALYSIS REPORT	Hudson Design Group LLC	3/12/20

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2.

This analysis may be affected if any assumptions are not valid or have been made in error. Tectonic should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	120 - 100	Leg	1 3/4" solid	3	-21.65	83.36	26.0	Pass
T2	100 - 80	Leg	2 1/4" solid	81	-89.21	158.64	56.2	Pass
T3	80 - 60	Leg	Pirod 194651 (Gr. 58)	159	-113.63	236.90	48.0	Pass
T4	60 - 40	Leg	Priod 195213 (Gr. 58)	177	-139.86	331.32	42.2	Pass
T5	40 - 20	Leg	Pirod 195217 (Gr. 58)	192	-166.80	331.32	50.3	Pass
T6	20 - 0	Leg	Pirod 196915 (Gr. 58)	207	-169.19	385.15	43.9	Pass
T1	120 - 100	Diagonal	3/4" solid	16	-2.83	5.92	47.7	Pass
T2	100 - 80	Diagonal	7/8" solid	93	-5.39	11.16	48.3	Pass
T3	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	174	-5.85	18.78	31.1 39.1 (b)	Pass
T4	60 - 40	Diagonal	L2 1/2x2 1/2x3/16	180	-3.82	10.79	35.4 36.5 (b)	Pass
T5	40 - 20	Diagonal	L2 1/2x2 1/2x5/16	193	-5.60	13.50	41.5	Pass
T6	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4	212	-13.61	51.14	26.6	Pass
T1	120 - 100	Horizontal	3/4" solid	28	-0.21	3.35	6.1	Pass
T2	100 - 80	Horizontal	3/4" solid	97	-1.09	3.42	31.9	Pass
T1	120 - 100	Top Girt	7/8" solid	4	-0.28	6.20	4.5	Pass
T2	100 - 80	Top Girt	1" solid	82	-0.74	10.81	6.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T3	80 - 60	Top Girt	L3x3x3/16	160	-1.27	23.65	5.4 12.8 (b)	Pass
T1	120 - 100	Bottom Girt	7/8" solid	7	-1.00	6.20	16.0	Pass
T2	100 - 80	Bottom Girt	1" solid	85	-0.54	10.81	5.0	Pass
T1	120 - 100	Mid Girt	7/8" solid	11	-0.34	6.20	5.5	Pass
T2	100 - 80	Mid Girt	1" solid	88	-0.75	10.81	7.0	Pass
							Summary	
						Leg (T2)	56.2	Pass
						Diagonal (T2)	48.3	Pass
						Horizontal (T2)	31.9	Pass
						Top Girt (T3)	12.8	Pass
						Bottom Girt (T1)	16.0	Pass
						Mid Girt (T2)	7.0	Pass
						Bolt Checks	41.2	Pass
						Rating =	56.2	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	31.8	Pass
1	Base Foundation (Compared w/ Design Loads	0	73.3	Pass

Structure Rating (max from all components) =	73.3%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

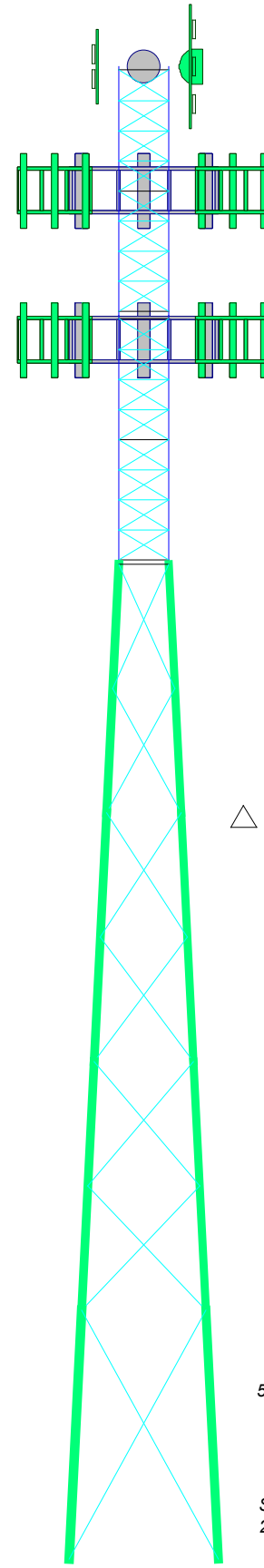
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6
Legs	SR 1 3/4" solid	SR 2 1/4" solid	Pirod 194651 (Gr. 58)	Pirod 195213 (Gr. 58)	Pirod 195217 (Gr. 58)	Pirod 196915 (Gr. 58)
Leg Grade	A572-55					
Diagonals	SR 3/4" solid	SR 7/8" solid	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x5/16	2L3 1/2x3 1/2x1/4
Diagonal Grade	A572-50					
Top Girts	SR 7/8" solid	SR 1" solid	L3x3x3/16	N.A.	N.A.	
Mid Girts	SR 7/8" solid	SR 1" solid		N.A.		
Bottom Girts	SR 7/8" solid	SR 1" solid		N.A.		
Horizontals	SR 3/4" solid			N.A.		
Face Width (ft)	4	16 @ 2.42708		6	8	10
# Panels @ (ft)	1.1	1.5	2.4	2.6	3.0	4.3
Weight (K)						14.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PTP 49400	120	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	110
PTP 49400	120	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	110
PTP 49400	120	DC6-48-60-0-8C-EV	98
10' Dipole	120	8843 B2/B66A	98
DB404-B	120	8843 B2/B66A	98
BA4040-67-DIN	120	8843 B2/B66A	98
BA4040-67-DIN	120	4449 B5/B12	98
VHLP800-11	120	4449 B5/B12	98
VHLP800-11	120	4449 B5/B12	98
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	110	OPA65R-BU8D w/ Mount Pipe	98
AIR -32 B2A/B66AA w/ Mount Pipe	110	OPA65R-BU8D w/ Mount Pipe	98
AIR -32 B2A/B66AA w/ Mount Pipe	110	OPA65R-BU8D w/ Mount Pipe	98
AIR -32 B2A/B66AA w/ Mount Pipe	110	(2) TPA65R-BU8D_TIA w/ Mount Pipe	98
4449 B71/B85	110	(2) TPA65R-BU8D_TIA w/ Mount Pipe	98
4449 B71/B85	110	(2) TPA65R-BU8D_TIA w/ Mount Pipe	98
4449 B71/B85	110	SitePro VFA12	98
4415 B66A	110	SitePro VFA12	98
4415 B66A	110	SitePro VFA12	98
4415 B66A	110	DC6-48-60-18-8C-EV	98
SitePro VFA12-RRU	110	DC6-48-60-18-8C-EV	98
SitePro VFA12-RRU	110		
SitePro VFA12-RRU	110		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-55	55 ksi	70 ksi	A572-50	50 ksi	65 ksi

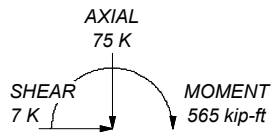
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 95 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 56.2%

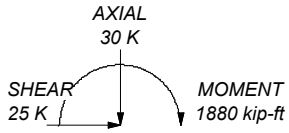
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 191 K
SHEAR: 20 K

UPLIFT: -171 K
SHEAR: 18 K



TORQUE 2 kip-ft
50 mph WIND - 0.75 in ICE



TORQUE 5 kip-ft
REACTIONS - 95 mph WIND

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: 9927.CT11239A			
Project: Southington / I-84			
Client: U.S. Cellular	Drawn by: Graham Evans	App'd:	
Code: TIA-222-G	Date: 03/27/20	Scale: NTS	
Path: C:\Users\graham.evans\Desktop\9927.CT11239A\Structural\Tower SA\TNX\9927.CT11239A - Tower SA.eri		Dwg No. E-1	

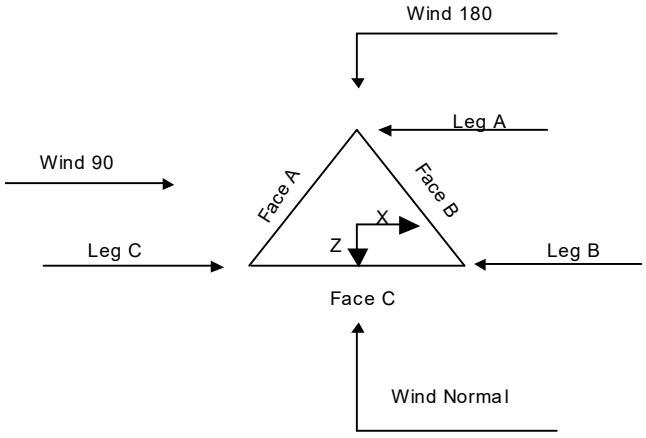
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 12.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 95 mph.
3) Structure Class II.
4) Exposure Category C.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.75 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in tower member design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	120.00-100.00			4.00	1	20.00
T2	100.00-80.00			4.00	1	20.00
T3	80.00-60.00			4.00	1	20.00
T4	60.00-40.00			6.00	1	20.00
T5	40.00-20.00			8.00	1	20.00
T6	20.00-0.00			10.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	120.00-100.00	2.43	X Brace	No	Yes	3.50	3.50
T2	100.00-80.00	2.43	X Brace	No	Yes	3.50	3.50
T3	80.00-60.00	10.00	X Brace	No	No	0.00	0.00
T4	60.00-40.00	10.00	X Brace	No	No	0.00	0.00
T5	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T6	20.00-0.00	20.00	X Brace	No	No	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 120.00-100.00	Solid Round	1 3/4" solid	A572-55 (55 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T2 100.00-80.00	Solid Round	2 1/4" solid	A572-55 (55 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T3 80.00-60.00	Truss Leg	Pirod 194651 (Gr. 58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A572-50 (50 ksi)
T4 60.00-40.00	Truss Leg	Priod 195213 (Gr. 58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T5 40.00-20.00	Truss Leg	Pirod 195217 (Gr. 58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A572-50 (50 ksi)
T6 20.00-0.00	Truss Leg	Pirod 196915 (Gr. 58)	A572-55 (55 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Top Girt Type*	*Top Girt Size*	*Top Girt Grade*	*Bottom Girt Type*	*Bottom Girt Size*	*Bottom Girt Grade*
T1 120.00-100.00	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T2 100.00-80.00	Solid Round	1" solid	A572-50 (50 ksi)	Solid Round	1" solid	A572-50 (50 ksi)
T3 80.00-60.00	Equal Angle	L3x3x3/16	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*No. of Mid Girts*	*Mid Girt Type*	*Mid Girt Size*	*Mid Girt Grade*	*Horizontal Type*	*Horizontal Size*	*Horizontal Grade*
T1 120.00-100.00	1	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)
T2 100.00-80.00	1	Solid Round	1" solid	A572-50 (50 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Gusset Area (per face) ft^2*	*Gusset Thickness in*	*Gusset Grade*	*Adjust. Factor A_f*	*Adjust. Factor A_r*	*Weight Mult.*	*Double Angle Stitch Bolt Spacing Diagonals in*	*Double Angle Stitch Bolt Spacing Horizontals in*	*Double Angle Stitch Bolt Spacing Redundants in*
T1 120.00-100.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T2 100.00-80.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T3 80.00-60.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T4 60.00-40.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T5 40.00-20.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T6 20.00-0.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals
T3 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T4 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T5 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T6 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T2 100.00-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T3 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T4 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T5 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T6 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 120.00-100.00	Flange	1.25 A325N	2	0.00 A325N	0	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T2 100.00-80.00	Flange	1.00 A325N	4	0.00 A325N	0	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T3 80.00-60.00	Flange	1.00 A325N	6	1.00 A325N	1	1.00 A325N	1	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T4 60.00-40.00	Flange	1.25 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T5 40.00-20.00	Flange	1.25 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T6 20.00-0.00	Flange	0.00 A325N	0	0.88 A325N	2	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
***													
7/8 coax	C	No	No	Ar (CaAa)	120.00 - 3.00	0.00	0	18	9	1.11	1.11		0.00
***													
HCS 6X12 4AWG(1-5/8)	B	No	No	Ar (CaAa)	110.00 - 8.00	0.00	-0.4	3	3	1.66	1.66		0.00
***													
1-5/8 coax	A	No	No	Ar (CaAa)	98.00 - 6.00	0.00	0	6	6	1.98	1.98		0.00
WR-VG122ST-BRDA(7/16")	A	No	No	Ar (CaAa)	98.00 - 6.00	0.00	0.12	6	6	0.00	0.40		0.00
FB-L98B-002-100000(3/8")	A	No	No	Ar (CaAa)	98.00 - 6.00	0.00	0.15	2	2	0.00	0.40		0.00
***													

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
***								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.980	0.000	0.07
		C	0.000	0.000	39.960	0.000	0.19
T2	100.00-80.00	A	0.000	0.000	27.144	0.000	0.19
		B	0.000	0.000	9.960	0.000	0.14
		C	0.000	0.000	39.960	0.000	0.19
T3	80.00-60.00	A	0.000	0.000	30.160	0.000	0.21
		B	0.000	0.000	9.960	0.000	0.14
		C	0.000	0.000	39.960	0.000	0.19
T4	60.00-40.00	A	0.000	0.000	30.160	0.000	0.21
		B	0.000	0.000	9.960	0.000	0.14
		C	0.000	0.000	39.960	0.000	0.19
T5	40.00-20.00	A	0.000	0.000	30.160	0.000	0.21
		B	0.000	0.000	9.960	0.000	0.14
		C	0.000	0.000	39.960	0.000	0.19
T6	20.00-0.00	A	0.000	0.000	21.112	0.000	0.15
		B	0.000	0.000	5.976	0.000	0.09
		C	0.000	0.000	33.966	0.000	0.17

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-100.00	A	1.692	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	15.908	0.000	0.25
		C		0.000	0.000	58.111	0.000	1.19
T2	100.00-80.00	A	1.658	0.000	0.000	85.532	0.000	1.15
		B		0.000	0.000	31.594	0.000	0.50
		C		0.000	0.000	57.902	0.000	1.17
T3	80.00-60.00	A	1.617	0.000	0.000	94.216	0.000	1.25
		B		0.000	0.000	31.324	0.000	0.49
		C		0.000	0.000	57.646	0.000	1.16
T4	60.00-40.00	A	1.564	0.000	0.000	93.153	0.000	1.22
		B		0.000	0.000	30.974	0.000	0.48
		C		0.000	0.000	57.314	0.000	1.13
T5	40.00-20.00	A	1.486	0.000	0.000	91.607	0.000	1.17
		B		0.000	0.000	30.465	0.000	0.46
		C		0.000	0.000	56.831	0.000	1.10
T6	20.00-0.00	A	1.331	0.000	0.000	61.982	0.000	0.75
		B		0.000	0.000	17.676	0.000	0.26
		C		0.000	0.000	47.495	0.000	0.88

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	120.00-100.00	0.17	0.21	0.10	-0.18
T2	100.00-80.00	-1.93	-4.05	-1.31	-3.07
T3	80.00-60.00	-1.71	-3.25	-0.95	-2.13
T4	60.00-40.00	-2.25	-4.28	-1.98	-4.50
T5	40.00-20.00	-2.71	-5.18	-2.78	-6.43
T6	20.00-0.00	-2.28	-3.55	-2.53	-5.17

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	7/8 coax	100.00 - 120.00	0.6000	0.3899
T1	4	HCS 6X12 4AWG(1-5/8)	100.00 - 110.00	0.6000	0.3899
T2	2	7/8 coax	80.00 - 100.00	0.6000	0.3801
T2	4	HCS 6X12 4AWG(1-5/8)	80.00 - 100.00	0.6000	0.3801
T2	6	1-5/8 coax	80.00 - 98.00	0.6000	0.3801
T2	7	WR-VG122ST-BRDA(7/16")	80.00 - 98.00	0.6000	0.3801
T2	8	FB-L98B-002-100000(3/8")	80.00 - 98.00	0.6000	0.3801
T3	2	7/8 coax	60.00 - 80.00	0.6000	0.2858
T3	4	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.2858
T3	6	1-5/8 coax	60.00 - 80.00	0.6000	0.2858
T3	7	WR-VG122ST-BRDA(7/16")	60.00 - 80.00	0.6000	0.2858
T3	8	FB-L98B-002-100000(3/8")	60.00 - 80.00	0.6000	0.2858
T4	2	7/8 coax	40.00 - 60.00	0.6000	0.4566
T4	4	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.4566
T4	6	1-5/8 coax	40.00 - 60.00	0.6000	0.4566
T4	7	WR-VG122ST-BRDA(7/16")	40.00 - 60.00	0.6000	0.4566
T4	8	FB-L98B-002-100000(3/8")	40.00 - 60.00	0.6000	0.4566
T5	2	7/8 coax	20.00 - 40.00	0.6000	0.5529
T5	4	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.5529
T5	6	1-5/8 coax	20.00 - 40.00	0.6000	0.5529
T5	7	WR-VG122ST-BRDA(7/16")	20.00 - 40.00	0.6000	0.5529
T5	8	FB-L98B-002-100000(3/8")	20.00 - 40.00	0.6000	0.5529
T6	2	7/8 coax	3.00 - 20.00	0.6000	0.6000
T6	4	HCS 6X12 4AWG(1-5/8)	8.00 - 20.00	0.6000	0.6000
T6	6	1-5/8 coax	6.00 - 20.00	0.6000	0.6000
T6	7	WR-VG122ST-BRDA(7/16")	6.00 - 20.00	0.6000	0.6000
T6	8	FB-L98B-002-100000(3/8")	6.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PTP 49400	A	From Leg	1.00 0.00 0.00	0.00	120.00	No Ice 1/2" Ice 1" Ice	1.75 1.92 2.09	0.48 0.58 0.69	0.01 0.02 0.04
PTP 49400	B	From Leg	1.00 0.00 0.00	0.00	120.00	No Ice 1/2" Ice 1" Ice	1.75 1.92 2.09	0.48 0.58 0.69	0.01 0.02 0.04
PTP 49400	C	From Leg	1.00 0.00 0.00	0.00	120.00	No Ice 1/2" Ice 1" Ice	1.75 1.92 2.09	0.48 0.58 0.69	0.01 0.02 0.04
10' Dipole	A	From Leg	2.00 0.00 0.00	0.00	120.00	No Ice 1/2" Ice 1" Ice	3.69 4.73 5.40	3.69 4.73 5.40	0.03 0.05 0.08
DB404-B	C	From Leg	2.00 0.00 0.00	0.00	120.00	No Ice 1/2" Ice 1" Ice	1.14 2.29 3.38	1.14 2.29 3.38	0.01 0.03 0.06
BA4040-67-DIN	A	From Leg	2.00 0.00 0.00	0.00	120.00	No Ice 1/2" Ice 1" Ice	12.76 13.51 14.25	4.92 6.06 7.22	0.18 0.23 0.30
BA4040-67-DIN	B	From Leg	2.00 0.00 0.00	0.00	120.00	No Ice 1/2" Ice 1" Ice	12.76 13.51 14.25	4.92 6.06 7.22	0.18 0.23 0.30
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APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
4449 B71/B85	A	From Leg	3.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.41 1.57 1.73	0.08 0.09 0.11
4449 B71/B85	B	From Leg	3.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.41 1.57 1.73	0.08 0.09 0.11
4449 B71/B85	C	From Leg	3.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.41 1.57 1.73	0.08 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
4415 B66A	A	From Leg	3.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.82 0.94 1.07	0.04 0.06 0.07
4415 B66A	B	From Leg	3.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.82 0.94 1.07	0.04 0.06 0.07
4415 B66A	C	From Leg	3.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	0.82 0.94 1.07	0.04 0.06 0.07
SitePro VFA12-RRU	A	From Leg	0.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	15.40 21.30 27.20	14.00 20.81 27.62	0.56 0.74 0.92
SitePro VFA12-RRU	B	From Leg	0.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	15.40 21.30 27.20	14.00 20.81 27.62	0.56 0.74 0.92
SitePro VFA12-RRU	C	From Leg	0.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	15.40 21.30 27.20	14.00 20.81 27.62	0.56 0.74 0.92
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DC6-48-60-18-8C-EV	A	From Leg	1.00 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.09 1.70 1.91	1.09 1.70 1.91	0.03 0.05 0.07
DC6-48-60-18-8C-EV	B	From Leg	1.00 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.09 1.70 1.91	1.09 1.70 1.91	0.03 0.05 0.07
DC6-48-60-0-8C-EV	C	From Leg	1.00 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.09 1.70 1.91	1.09 1.70 1.91	0.03 0.05 0.07
8843 B2/B66A	A	From Leg	2.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.98 2.16 2.34	1.70 1.86 2.04	0.08 0.10 0.12
8843 B2/B66A	B	From Leg	2.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.98 2.16 2.34	1.70 1.86 2.04	0.08 0.10 0.12
8843 B2/B66A	C	From Leg	2.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.98 2.16 2.34	1.70 1.86 2.04	0.08 0.10 0.12
4449 B5/B12	A	From Leg	2.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.41 1.57 1.73	0.08 0.09 0.11
4449 B5/B12	B	From Leg	2.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.41 1.57 1.73	0.08 0.09 0.11
4449 B5/B12	C	From Leg	2.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	1.97 2.15 2.33	1.41 1.57 1.73	0.08 0.09 0.11
OPA65R-BU8D w/ Mount Pipe	A	From Leg	3.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	18.09 18.72 19.36	10.10 11.52 12.80	0.11 0.23 0.36

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
OPA65R-BU8D w/ Mount Pipe	B	From Leg	3.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	18.09 18.72 19.36	10.10 11.52 12.80	0.11 0.23 0.36
OPA65R-BU8D w/ Mount Pipe	C	From Leg	3.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	18.09 18.72 19.36	10.10 11.52 12.80	0.11 0.23 0.36
(2) TPA65R-BU8D_TIA w/ Mount Pipe	A	From Leg	3.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	18.33 19.06 19.81	10.34 11.86 13.41	0.12 0.24 0.38
(2) TPA65R-BU8D_TIA w/ Mount Pipe	B	From Leg	3.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	18.33 19.06 19.81	10.34 11.86 13.41	0.12 0.24 0.38
(2) TPA65R-BU8D_TIA w/ Mount Pipe	C	From Leg	3.50 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	18.33 19.06 19.81	10.34 11.86 13.41	0.12 0.24 0.38
SitePro VFA12	A	From Leg	0.00 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	15.40 21.30 27.20	14.00 20.81 27.62	0.56 0.74 0.92
SitePro VFA12	B	From Leg	0.00 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	15.40 21.30 27.20	14.00 20.81 27.62	0.56 0.74 0.92
SitePro VFA12	C	From Leg	0.00 0.00 0.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	15.40 21.30 27.20	14.00 20.81 27.62	0.56 0.74 0.92
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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP800-11	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.00		120.00	2.80	No Ice 1/2" Ice 1" Ice	6.16 6.53 6.90	0.05 0.08 0.12
VHLP800-11	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.00		120.00	2.80	No Ice 1/2" Ice 1" Ice	6.16 6.53 6.90	0.05 0.08 0.12
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Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	K	K	in	in	in^2
Pirod 194651 (Gr. 58)	2306.37	6131.57	0.58	1.03	8.01	21.29	5.30
Priod 195213 (Gr. 58)	2435.39	6165.51	0.72	0.99	8.46	21.41	7.22
Pirod 195217 (Gr. 58)	2435.39	6110.12	0.72	0.92	8.46	21.22	7.22
Pirod 196915 (Gr. 58)	2572.73	6072.15	0.88	0.80	8.93	21.08	9.42

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	120 - 100	Leg	Max Tension	15	20.66	0.03	0.33
			Max. Compression	2	-24.14	0.02	0.38
			Max. Mx	8	-19.09	-0.32	-0.05
			Max. My	2	-24.14	0.02	0.38
			Max. Vy	8	1.91	-0.32	-0.05
			Max. Vx	2	-2.45	0.02	0.38
		Diagonal	Max Tension	25	2.73	0.00	0.00
			Max. Compression	24	-2.83	0.00	0.00
			Max. Mx	32	0.72	-0.00	-0.00
			Max. My	22	-2.37	-0.00	0.00
			Max. Vy	32	0.01	-0.00	-0.00
			Max. Vx	22	0.00	0.00	0.00
		Horizontal	Max Tension	14	0.32	0.00	0.00
			Max. Compression	3	-0.21	0.00	0.00
			Max. Mx	26	0.20	0.01	0.00
			Max. My	20	-0.01	0.00	-0.00
			Max. Vy	26	0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Top Girt	Max Tension	2	0.27	0.00	0.00
			Max. Compression	14	-0.28	0.00	0.00
			Max. Mx	26	0.01	0.02	0.00
			Max. My	20	0.04	0.00	-0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Bottom Girt	Max Tension	14	1.08	0.00	0.00
			Max. Compression	3	-1.00	0.00	0.00
			Max. Mx	26	0.13	0.02	0.00
			Max. My	20	0.02	0.00	-0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Mid Girt	Max Tension	18	0.43	0.00	0.00
			Max. Compression	7	-0.34	0.00	0.00
			Max. Mx	26	0.12	0.02	0.00
			Max. My	20	0.03	0.00	-0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
T2	100 - 80	Leg	Max Tension	15	87.28	0.00	-0.13
			Max. Compression	2	-94.57	0.03	2.24
			Max. Mx	10	-89.74	-1.81	-1.11
			Max. My	2	-94.57	0.03	2.24
			Max. Vy	10	5.82	-1.81	-1.11
			Max. Vx	2	-7.19	0.03	2.24
		Diagonal	Max Tension	13	5.16	0.00	0.00
			Max. Compression	12	-5.39	0.00	0.00
			Max. Mx	27	0.97	-0.01	0.00
			Max. My	8	-4.56	0.00	-0.00
			Max. Vy	27	0.01	-0.01	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Horizontal	Max Tension	14	1.33	0.00	0.00
			Max. Compression	3	-1.09	0.00	0.00
			Max. Mx	26	0.33	0.01	0.00
			Max. My	20	0.05	0.00	-0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Top Girt	Max Tension	2	0.80	0.00	0.00
			Max. Compression	15	-0.74	0.00	0.00
			Max. Mx	26	0.10	0.02	0.00
			Max. My	20	0.04	0.00	-0.00
			Max. Vy	26	0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Bottom Girt	Max Tension	15	0.51	0.00	0.00
			Max. Compression	2	-0.54	0.00	0.00
			Max. Mx	26	-0.04	0.02	0.00
			Max. My	20	-0.04	0.00	-0.00
			Max. Vy	26	0.02	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	20	0.00	0.00	0.00
		Mid Girt	Max Tension	14	0.96	0.00	0.00
			Max. Compression	3	-0.75	0.00	0.00
			Max. Mx	26	0.30	0.02	0.00
			Max. My	20	0.07	0.00	-0.00
			Max. Vy	26	0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
T3	80 - 60	Leg	Max Tension	15	105.22	-5.72	0.25
			Max. Compression	2	-113.63	5.68	-0.10
			Max. Mx	14	104.28	-5.82	0.26
			Max. My	24	-4.10	-0.31	10.27
			Max. Vy	14	0.49	-5.82	0.26
			Max. Vx	24	-1.09	-0.31	10.27
		Diagonal	Max Tension	5	5.36	0.09	-0.01
			Max. Compression	20	-5.85	0.00	0.00
			Max. Mx	2	4.22	0.12	-0.01
			Max. My	24	-3.69	-0.08	-0.03
			Max. Vy	27	-0.03	0.07	-0.01
			Max. Vx	24	0.01	0.00	0.00
		Top Girt	Max Tension	14	1.47	0.00	0.00
			Max. Compression	3	-1.27	0.00	0.00
			Max. Mx	26	0.26	-0.03	0.00
			Max. My	36	0.24	0.00	0.00
			Max. Vy	26	0.03	0.00	0.00
			Max. Vx	36	0.00	0.00	0.00
T4	60 - 40	Leg	Max Tension	15	128.48	-5.73	0.09
			Max. Compression	2	-139.86	4.27	-0.14
			Max. Mx	2	-128.32	5.94	-0.10
			Max. My	24	-6.61	-0.45	8.28
			Max. Vy	2	0.27	5.94	-0.10
			Max. Vx	24	-0.49	-0.45	8.28
		Diagonal	Max Tension	12	3.76	0.00	0.00
			Max. Compression	12	-4.14	0.00	0.00
			Max. Mx	2	3.66	0.06	-0.00
			Max. My	36	1.02	0.05	-0.01
			Max. Vy	37	0.04	0.05	0.01
			Max. Vx	29	-0.00	0.00	0.00
T5	40 - 20	Leg	Max Tension	15	151.73	-6.70	-0.02
			Max. Compression	2	-166.80	3.77	-0.18
			Max. Mx	2	-150.38	7.90	0.04
			Max. My	24	-8.54	-0.68	13.11
			Max. Vy	2	0.51	7.90	0.04
			Max. Vx	24	-1.65	-0.68	13.11
		Diagonal	Max Tension	24	6.16	0.00	0.00
			Max. Compression	25	-5.60	0.00	0.00
			Max. Mx	24	-1.90	0.10	0.00
			Max. My	14	-4.93	0.01	-0.03
			Max. Vy	38	0.05	0.08	-0.01
			Max. Vx	14	0.01	0.00	0.00
T6	20 - 0	Leg	Max Tension	15	154.51	-4.78	0.12
			Max. Compression	2	-169.19	0.00	0.00
			Max. Mx	14	152.98	-4.95	0.12
			Max. My	24	-7.33	-0.68	13.11
			Max. Vy	14	-0.47	-4.95	0.12
			Max. Vx	24	0.88	-0.68	13.11
		Diagonal	Max Tension	25	12.21	0.00	0.00
			Max. Compression	24	-13.60	0.00	0.00
			Max. Mx	2	0.34	-0.35	0.09
			Max. My	24	5.73	-0.30	-0.11
			Max. Vy	38	-0.11	-0.29	-0.08
			Max. Vx	24	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	173.89	15.97	-9.38
	Max. H_x	18	173.89	15.97	-9.38
	Max. H_z	7	-154.14	-13.92	8.17
	Min. Vert	7	-154.14	-13.92	8.17
	Min. H_x	7	-154.14	-13.92	8.17
	Min. H_z	18	173.89	15.97	-9.38
Leg B	Max. Vert	10	179.77	-16.61	-9.55
	Max. H_x	23	-160.98	14.61	8.41
	Max. H_z	23	-160.98	14.61	8.41
	Min. Vert	23	-160.98	14.61	8.41
	Min. H_x	10	179.77	-16.61	-9.55
	Min. H_z	10	179.77	-16.61	-9.55
Leg A	Max. Vert	2	190.72	-0.16	20.32
	Max. H_x	8	8.11	2.04	1.01
	Max. H_z	2	190.72	-0.16	20.32
	Min. Vert	15	-171.26	0.13	-18.01
	Min. H_x	20	12.73	-2.06	1.39
	Min. H_z	15	-171.26	0.13	-18.01

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	24.60	0.00	0.00	-1.79	0.60	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	29.51	-0.26	-24.99	-1879.73	31.78	-1.71
0.9 Dead+1.6 Wind 0 deg - No Ice	22.14	-0.26	-24.99	-1876.35	31.54	-1.71
1.2 Dead+1.6 Wind 30 deg - No Ice	29.51	11.44	-20.14	-1544.37	-866.48	1.92
0.9 Dead+1.6 Wind 30 deg - No Ice	22.14	11.44	-20.14	-1541.46	-865.34	1.92
1.2 Dead+1.6 Wind 60 deg - No Ice	29.51	19.07	-11.01	-842.56	-1454.87	-2.60
0.9 Dead+1.6 Wind 60 deg - No Ice	22.14	19.07	-11.01	-840.73	-1452.83	-2.60
1.2 Dead+1.6 Wind 90 deg - No Ice	29.51	21.97	0.17	17.92	-1669.61	-5.11
0.9 Dead+1.6 Wind 90 deg - No Ice	22.14	21.97	0.17	18.42	-1667.25	-5.11
1.2 Dead+1.6 Wind 120 deg - No Ice	29.51	20.18	11.95	908.59	-1514.64	-0.71
0.9 Dead+1.6 Wind 120 deg - No Ice	22.14	20.18	11.95	907.74	-1512.53	-0.70
1.2 Dead+1.6 Wind 150 deg - No Ice	29.51	12.39	21.49	1624.22	-935.94	3.94
0.9 Dead+1.6 Wind 150 deg - No Ice	22.14	12.39	21.49	1622.29	-934.70	3.94
1.2 Dead+1.6 Wind 180 deg - No Ice	29.51	0.21	24.47	1858.77	-24.12	1.59
0.9 Dead+1.6 Wind 180 deg - No Ice	22.14	0.21	24.47	1856.48	-24.24	1.59
1.2 Dead+1.6 Wind 210 deg - No Ice	29.51	-11.41	20.22	1549.58	864.43	-1.95
0.9 Dead+1.6 Wind 210 deg - No Ice	22.14	-11.41	20.22	1547.74	862.95	-1.95
1.2 Dead+1.6 Wind 240 deg - No Ice	29.51	-19.57	11.30	850.49	1477.57	2.60
0.9 Dead+1.6 Wind 240 deg - No Ice	22.14	-19.57	11.30	849.75	1475.16	2.60
1.2 Dead+1.6 Wind 270 deg - No Ice	29.51	-22.02	-0.23	-30.04	1677.56	5.14
0.9 Dead+1.6 Wind 270 deg - No Ice	22.14	-22.02	-0.23	-29.44	1674.83	5.13

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 300 deg - No Ice	29.51	-19.76	-11.64	-899.21	1504.76	0.83
0.9 Dead+1.6 Wind 300 deg - No Ice	22.14	-19.76	-11.64	-897.28	1502.29	0.82
1.2 Dead+1.6 Wind 330 deg - No Ice	29.51	-12.42	-21.47	-1626.52	940.87	-3.94
0.9 Dead+1.6 Wind 330 deg - No Ice	22.14	-12.42	-21.47	-1623.52	939.26	-3.94
1.2 Dead+1.0 Ice+1.0 Temp	75.27	0.00	0.00	-3.03	6.96	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	75.27	-0.05	-7.31	-558.03	12.71	-0.50
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	75.27	3.50	-6.12	-472.15	-259.89	-0.35
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	75.27	6.02	-3.48	-268.93	-453.44	-1.30
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	75.27	7.09	0.03	0.30	-530.58	-1.71
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	75.27	6.34	3.72	278.28	-468.92	-0.46
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	75.27	3.69	6.40	481.34	-272.19	0.67
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	75.27	0.04	7.24	550.05	2.61	0.48
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	75.27	-3.50	6.14	467.98	273.16	0.34
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	75.27	-6.09	3.52	264.48	470.45	1.30
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	75.27	-7.10	-0.04	-8.13	545.96	1.71
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	75.27	-6.29	-3.67	-282.43	482.04	0.49
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	75.27	-3.69	-6.39	-487.10	286.94	-0.67
Dead+Wind 0 deg - Service	24.60	-0.06	-6.23	-469.44	8.33	-0.43
Dead+Wind 30 deg - Service	24.60	2.85	-5.02	-385.90	-215.38	0.47
Dead+Wind 60 deg - Service	24.60	4.75	-2.74	-211.10	-361.93	-0.65
Dead+Wind 90 deg - Service	24.60	5.48	0.04	3.21	-415.42	-1.27
Dead+Wind 120 deg - Service	24.60	5.03	2.98	225.03	-376.83	-0.18
Dead+Wind 150 deg - Service	24.60	3.09	5.36	403.26	-232.70	0.98
Dead+Wind 180 deg - Service	24.60	0.05	6.10	461.68	-5.59	0.40
Dead+Wind 210 deg - Service	24.60	-2.84	5.04	384.67	215.72	-0.48
Dead+Wind 240 deg - Service	24.60	-4.88	2.82	210.57	368.42	0.65
Dead+Wind 270 deg - Service	24.60	-5.49	-0.06	-8.73	418.23	1.28
Dead+Wind 300 deg - Service	24.60	-4.93	-2.90	-225.21	375.19	0.21
Dead+Wind 330 deg - Service	24.60	-3.10	-5.35	-406.37	234.74	-0.98

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-24.60	0.00	0.00	24.60	0.00	0.000%
2	-0.26	-29.51	-24.99	0.26	29.51	24.99	0.000%
3	-0.26	-22.14	-24.99	0.26	22.14	24.99	0.000%
4	11.44	-29.51	-20.14	-11.44	29.51	20.14	0.000%
5	11.44	-22.14	-20.14	-11.44	22.14	20.14	0.000%
6	19.07	-29.51	-11.01	-19.07	29.51	11.01	0.000%
7	19.07	-22.14	-11.01	-19.07	22.14	11.01	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
8	21.97	-29.51	0.17	-21.97	29.51	-0.17	0.000%
9	21.97	-22.14	0.17	-21.97	22.14	-0.17	0.000%
10	20.18	-29.51	11.95	-20.18	29.51	-11.95	0.000%
11	20.18	-22.14	11.95	-20.18	22.14	-11.95	0.000%
12	12.39	-29.51	21.49	-12.39	29.51	-21.49	0.000%
13	12.39	-22.14	21.49	-12.39	22.14	-21.49	0.000%
14	0.21	-29.51	24.47	-0.21	29.51	-24.47	0.000%
15	0.21	-22.14	24.47	-0.21	22.14	-24.47	0.000%
16	-11.41	-29.51	20.22	11.41	29.51	-20.22	0.000%
17	-11.41	-22.14	20.22	11.41	22.14	-20.22	0.000%
18	-19.57	-29.51	11.30	19.57	29.51	-11.30	0.000%
19	-19.57	-22.14	11.30	19.57	22.14	-11.30	0.000%
20	-22.02	-29.51	-0.23	22.02	29.51	0.23	0.000%
21	-22.02	-22.14	-0.23	22.02	22.14	0.23	0.000%
22	-19.76	-29.51	-11.64	19.76	29.51	11.64	0.000%
23	-19.76	-22.14	-11.64	19.76	22.14	11.64	0.000%
24	-12.42	-29.51	-21.47	12.42	29.51	21.47	0.000%
25	-12.42	-22.14	-21.47	12.42	22.14	21.47	0.000%
26	0.00	-75.27	0.00	0.00	75.27	0.00	0.000%
27	-0.05	-75.27	-7.31	0.05	75.27	7.31	0.000%
28	3.50	-75.27	-6.12	-3.50	75.27	6.12	0.000%
29	6.02	-75.27	-3.48	-6.02	75.27	3.48	0.000%
30	7.09	-75.27	0.03	-7.09	75.27	-0.03	0.000%
31	6.34	-75.27	3.72	-6.34	75.27	-3.72	0.000%
32	3.69	-75.27	6.40	-3.69	75.27	-6.40	0.000%
33	0.04	-75.27	7.24	-0.04	75.27	-7.24	0.000%
34	-3.50	-75.27	6.14	3.50	75.27	-6.14	0.000%
35	-6.09	-75.27	3.52	6.09	75.27	-3.52	0.000%
36	-7.10	-75.27	-0.04	7.10	75.27	0.04	0.000%
37	-6.29	-75.27	-3.67	6.29	75.27	3.67	0.000%
38	-3.69	-75.27	-6.39	3.69	75.27	6.39	0.000%
39	-0.06	-24.60	-6.23	0.06	24.60	6.23	0.000%
40	2.85	-24.60	-5.02	-2.85	24.60	5.02	0.000%
41	4.75	-24.60	-2.74	-4.75	24.60	2.74	0.000%
42	5.48	-24.60	0.04	-5.48	24.60	-0.04	0.000%
43	5.03	-24.60	2.98	-5.03	24.60	-2.98	0.000%
44	3.09	-24.60	5.36	-3.09	24.60	-5.36	0.000%
45	0.05	-24.60	6.10	-0.05	24.60	-6.10	0.000%
46	-2.84	-24.60	5.04	2.84	24.60	-5.04	0.000%
47	-4.88	-24.60	2.82	4.88	24.60	-2.82	0.000%
48	-5.49	-24.60	-0.06	5.49	24.60	0.06	0.000%
49	-4.93	-24.60	-2.90	4.93	24.60	2.90	0.000%
50	-3.10	-24.60	-5.35	3.10	24.60	5.35	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000279
5	Yes	4	0.00000001	0.00000231
6	Yes	4	0.00000001	0.00000183
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000263
9	Yes	4	0.00000001	0.00000212
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000297
13	Yes	4	0.00000001	0.00000252
14	Yes	4	0.00000001	0.00000198
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000281
17	Yes	4	0.00000001	0.00000232

18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000265
21	Yes	4	0.00000001	0.00000213
22	Yes	4	0.00000001	0.00000188
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000297
25	Yes	4	0.00000001	0.00000252
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00001676
28	Yes	4	0.00000001	0.00001741
29	Yes	4	0.00000001	0.00001805
30	Yes	4	0.00000001	0.00001731
31	Yes	4	0.00000001	0.00001662
32	Yes	4	0.00000001	0.00001751
33	Yes	4	0.00000001	0.00001827
34	Yes	4	0.00000001	0.00001743
35	Yes	4	0.00000001	0.00001657
36	Yes	4	0.00000001	0.00001745
37	Yes	4	0.00000001	0.00001828
38	Yes	4	0.00000001	0.00001761
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 100	3.19	50	0.25	0.04
T2	100 - 80	2.16	50	0.23	0.02
T3	80 - 60	1.24	50	0.17	0.02
T4	60 - 40	0.64	50	0.11	0.01
T5	40 - 20	0.26	50	0.07	0.00
T6	20 - 0	0.05	39	0.03	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	VHLP800-11	50	3.19	0.25	0.04	219166
110.00	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	50	2.67	0.24	0.03	109583
98.00	DC6-48-60-18-8C-EV	50	2.06	0.23	0.02	40104

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 100	12.79	24	0.99	0.14
T2	100 - 80	8.64	24	0.93	0.10
T3	80 - 60	4.98	24	0.69	0.07
T4	60 - 40	2.56	24	0.43	0.03
T5	40 - 20	1.04	24	0.26	0.01
T6	20 - 0	0.21	2	0.10	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	VHLP800-11	24	12.79	0.99	0.14	55147
110.00	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	24	10.69	0.98	0.12	27573
98.00	DC6-48-60-18-8C-EV	24	8.24	0.91	0.10	10047

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	120	Leg	A325N	1.25	2	10.33	82.83	0.125	1	Bolt Tension
T2	100	Leg	A325N	1.00	4	21.82	53.01	0.412	1	Bolt Tension
T3	80	Leg	A325N	1.00	6	17.54	53.01	0.331	1	Bolt Tension
		Diagonal	A325N	1.00	1	5.36	13.71	0.391	1	Member Block Shear
		Top Girt	A325N	1.00	1	1.47	11.43	0.128	1	Member Block Shear
T4	60	Leg	A325N	1.25	6	21.41	82.83	0.259	1	Bolt Tension
		Diagonal	A325N	1.00	1	3.76	10.28	0.365	1	Member Block Shear
T5	40	Leg	A325N	1.25	6	25.29	82.83	0.305	1	Bolt Tension
		Diagonal	A325N	1.00	1	6.16	17.14	0.359	1	Member Block Shear
T6	20	Diagonal	A325N	0.88	2	6.11	30.01	0.203	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	1 3/4" solid	20.00	2.43	66.6 K=1.00	2.41	-21.65	83.36	0.260 [1]
T2	100 - 80	2 1/4" solid	20.00	2.43	51.8 K=1.00	3.98	-89.21	158.64	0.562 [1]
T3	80 - 60	Pirod 194651 (Gr. 58)	20.03	10.02	35.7 K=1.00	5.30	-113.63	236.90	0.480 [1]
T4	60 - 40	Priod 195213 (Gr. 58)	20.03	10.02	30.6	7.22	-139.86	331.32	0.422 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	40 - 20	Pirod 195217 (Gr. 58)	20.03	10.02	K=1.00 30.6	7.22	-166.80	331.32	0.503 [1]
T6	20 - 0	Pirod 196915 (Gr. 58)	20.03	20.03	K=1.00 48.8 K=1.00	9.42	-169.19	385.15	0.439 [1]

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	80 - 60	0.5	1.42	115.6	262.42	0.20	1.09	3.64	0.301
T4	60 - 40	0.5	1.40	114.6	357.18	0.20	0.50	3.69	0.136
T5	40 - 20	0.5	1.40	114.6	357.18	0.20	1.66	3.69	0.450
T6	20 - 0	0.5	1.39	113.2	466.53	0.20	0.88	3.76	0.235

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.68	2.25	129.8 K=0.90	0.44	-2.83	5.92	0.477 [1]
T2	100 - 80	7/8" solid	4.68	2.23	110.1 K=0.90	0.60	-5.39	11.16	0.483 [1]
T3	80 - 60	L2 1/2x2 1/2x1/4	10.97	4.89	119.7 K=1.00	1.19	-5.85	18.78	0.311 [1]
T4	60 - 40	L2 1/2x2 1/2x3/16	12.50	5.67	137.4 K=1.00	0.90	-3.82	10.79	0.354 [1]
T5	40 - 20	L2 1/2x2 1/2x5/16	13.80	6.37	156.3 K=1.00	1.46	-5.60	13.50	0.415 [1]
T6	20 - 0	2L3 1/2x3 1/2x1/4	22.83	11.16	122.2 K=0.99	3.38	-13.61	51.14	0.266 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.00	3.85	172.7 K=0.70	0.44	-0.21	3.35	0.061 [1]
T2	100 - 80	3/4" solid	4.00	3.81	170.8 K=0.70	0.44	-1.09	3.42	0.319 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	148.0 K=0.70	0.60	-0.28	6.20	0.045 [1]
T2	100 - 80	1" solid	4.00	3.81	128.1 K=0.70	0.79	-0.74	10.81	0.068 [1]
T3	80 - 60	L3x3x3/16	4.00	3.48	95.0 K=1.36	1.09	-1.27	23.65	0.054 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	148.0 K=0.70	0.60	-1.00	6.20	0.160 [1]
T2	100 - 80	1" solid	4.00	3.81	128.1 K=0.70	0.79	-0.54	10.81	0.050 [1]

[1] P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	148.0 K=0.70	0.60	-0.34	6.20	0.055 [1]
T2	100 - 80	1" solid	4.00	3.81	128.1 K=0.70	0.79	-0.75	10.81	0.070 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	1 3/4" solid	20.00	0.29	8.0	2.41	20.66	119.06	0.174 [1]
T2	100 - 80	2 1/4" solid	20.00	0.29	6.2	3.98	87.28	196.82	0.443 [1]
T3	80 - 60	Pirod 194651 (Gr. 58)	20.03	10.02	35.7	5.30	105.22	262.42	0.401 [1]
T4	60 - 40	Priod 195213 (Gr. 58)	20.03	10.02	30.6	7.22	128.48	357.18	0.360 [1]
T5	40 - 20	Pirod 195217 (Gr. 58)	20.03	10.02	30.6	7.22	151.73	357.18	0.425 [1]
T6	20 - 0	Pirod 196915 (Gr. 58)	20.03	20.03	48.8	9.42	154.51	466.53	0.331 [1]

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	80 - 60	0.5	1.42	115.6	262.42	0.20	1.09	3.64	0.301
T4	60 - 40	0.5	1.40	114.6	357.18	0.20	0.50	3.69	0.136
T5	40 - 20	0.5	1.40	114.6	357.18	0.20	1.66	3.69	0.450
T6	20 - 0	0.5	1.39	113.2	466.53	0.20	0.88	3.76	0.235

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.68	2.25	144.3	0.44	2.73	19.88	0.137 [1]
T2	100 - 80	7/8" solid	4.68	2.23	122.3	0.60	5.16	27.06	0.191 [1]
T3	80 - 60	L2 1/2x2 1/2x1/4	10.97	4.89	78.9	0.68	5.36	33.23	0.161 [1]
T4	60 - 40	L2 1/2x2 1/2x3/16	11.93	5.42	86.2	0.52	3.76	25.27	0.149 [1]
T5	40 - 20	L2 1/2x2 1/2x5/16	13.80	6.37	103.1	0.83	6.16	40.53	0.152 [1]
T6	20 - 0	2L3 1/2x3 1/2x1/4	22.83	11.16	125.7	2.16	12.21	105.30	0.116 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.00	3.85	246.7	0.44	0.32	19.88	0.016 [1]
T2	100 - 80	3/4" solid	4.00	3.81	244.0	0.44	1.33	19.88	0.067 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	211.4	0.60	0.27	27.06	0.010 [1]
T2	100 - 80	1" solid	4.00	3.81	183.0	0.79	0.80	35.34	0.023 [1]
T3	80 - 60	L3x3x3/16	4.00	3.48	48.7	0.66	1.47	32.14	0.046 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	211.4	0.60	1.08	27.06	0.040 [1]
T2	100 - 80	1" solid	4.00	3.81	183.0	0.79	0.51	35.34	0.014 [1]

[1] P_u / ϕP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	211.4	0.60	0.43	27.06	0.016 [1]
T2	100 - 80	1" solid	4.00	3.81	183.0	0.79	0.96	35.34	0.027 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

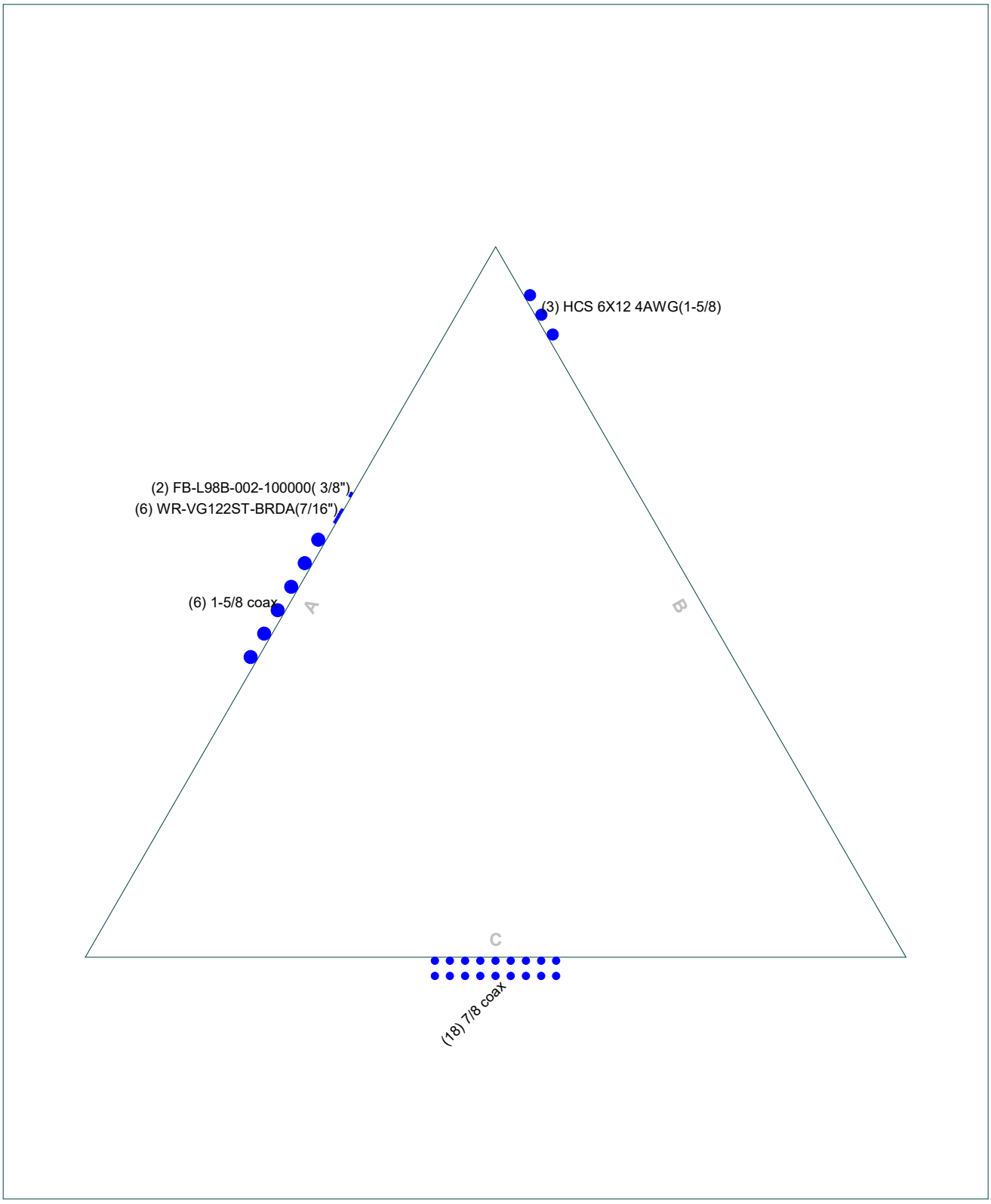
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	120 - 100	Leg	1 3/4" solid	3	-21.65	83.36	26.0	Pass
T2	100 - 80	Leg	2 1/4" solid	81	-89.21	158.64	56.2	Pass
T3	80 - 60	Leg	Pirod 194651 (Gr. 58)	159	-113.63	236.90	48.0	Pass
T4	60 - 40	Leg	Priod 195213 (Gr. 58)	177	-139.86	331.32	42.2	Pass
T5	40 - 20	Leg	Pirod 195217 (Gr. 58)	192	-166.80	331.32	50.3	Pass
T6	20 - 0	Leg	Pirod 196915 (Gr. 58)	207	-169.19	385.15	43.9	Pass
T1	120 - 100	Diagonal	3/4" solid	16	-2.83	5.92	47.7	Pass
T2	100 - 80	Diagonal	7/8" solid	93	-5.39	11.16	48.3	Pass
T3	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	174	-5.85	18.78	31.1 39.1 (b)	Pass
T4	60 - 40	Diagonal	L2 1/2x2 1/2x3/16	180	-3.82	10.79	35.4 36.5 (b)	Pass
T5	40 - 20	Diagonal	L2 1/2x2 1/2x5/16	193	-5.60	13.50	41.5	Pass
T6	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4	212	-13.61	51.14	26.6	Pass
T1	120 - 100	Horizontal	3/4" solid	28	-0.21	3.35	6.1	Pass
T2	100 - 80	Horizontal	3/4" solid	97	-1.09	3.42	31.9	Pass
T1	120 - 100	Top Girt	7/8" solid	4	-0.28	6.20	4.5	Pass
T2	100 - 80	Top Girt	1" solid	82	-0.74	10.81	6.8	Pass
T3	80 - 60	Top Girt	L3x3x3/16	160	-1.27	23.65	5.4 12.8 (b)	Pass
T1	120 - 100	Bottom Girt	7/8" solid	7	-1.00	6.20	16.0	Pass
T2	100 - 80	Bottom Girt	1" solid	85	-0.54	10.81	5.0	Pass
T1	120 - 100	Mid Girt	7/8" solid	11	-0.34	6.20	5.5	Pass
T2	100 - 80	Mid Girt	1" solid	88	-0.75	10.81	7.0	Pass
						Summary		
						Leg (T2)	56.2	Pass
						Diagonal (T2)	48.3	Pass
						Horizontal (T2)	31.9	Pass
						Top Girt (T3)	12.8	Pass
						Bottom Girt (T1)	16.0	Pass
						Mid Girt (T2)	7.0	Pass
						Bolt Checks	41.2	Pass
						RATING =	**56.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face Truss-Leg



Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: ***9927.CT11239A***			
Project: ***Southington / I-84***			
Client: U.S. Cellular	Drawn by: Graham Evans	App'd:	
Code: TIA-222-G	Date: 03/27/20	Scale: NTS	
Path: C:\Users\graham.evans\Desktop\9927.CT11239A\Structural\Tower SA\TNX\9927.CT11239A - Tower SA.eri		Dwg No. E-7	

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9 Rev. 6.1

Site Data	
Work Order #:	**9927.CT11239A**
Site Name:	**Southington / I-84**

Anchor Rod Data		
Qty:	**12**	
Diam:	**1**	in
Rod Material:	**Other**	F1554
Strength (Fu):	125	ksi
Yield (Fy):	105	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

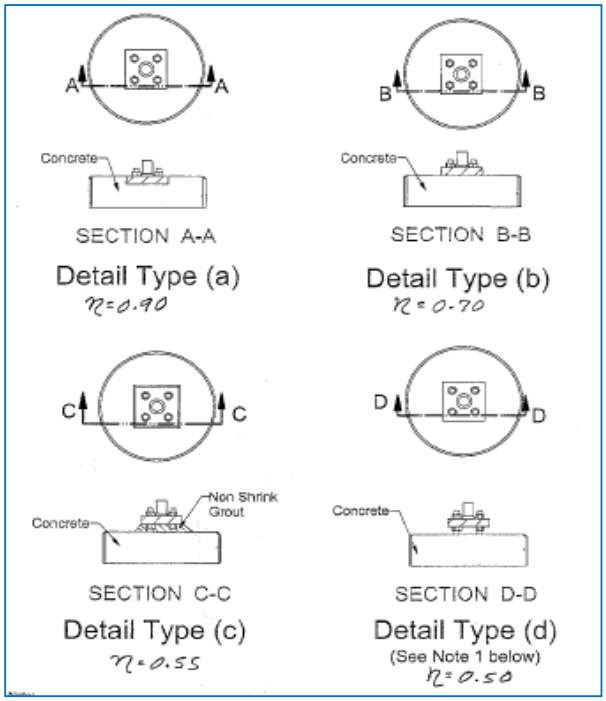


Figure 4-4 of TIA-222-G

Reactions		
Eta Factor, η	**0.5**	Detail Type
Down load, Pu:	**191**	kips
Shear, Vu:	**20**	kips

l_{ar}:		in
Mu = 0.65*l_{ar}*V_u		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ή):	19.3	Kips
Design Axial, Φ*Fu*Anet:	60.6	Kips
Anchor Rod Stress Ratio:	31.8%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

Maximum Acceptable Ratio:	**105**	%
Governing Stress Ratio:	**31.8%**	**Pass**

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W.O. 9927.CT11239A
Southington / I-84
BY : Connor Golden-Weathers
3/27/2020

FOUNDATION REACTION COMPARISON

TIA/EIA Design Revision:	G	
TIA/EIA Analysis Revision:	G	

Design Reactions

Leg Compression (Max)	270.7	kips
Leg Uplift (Max)	244.4	kips
Leg Shear (Max)	30	kips
Overall Shear	37.1	kips
Overall Compression	40.9	kips
Overturning Moment	2799.1	ft-kips

Current Analysis Reactions

Leg Compression (Max)	191	kips
Leg Uplift (Max)	171	kips
Leg Shear (Max)	20	kips
Overall Shear	25	kips
Overall Compression	30	kips
Overturning Moment	1880	ft-kips

Percentage of Original Reactions

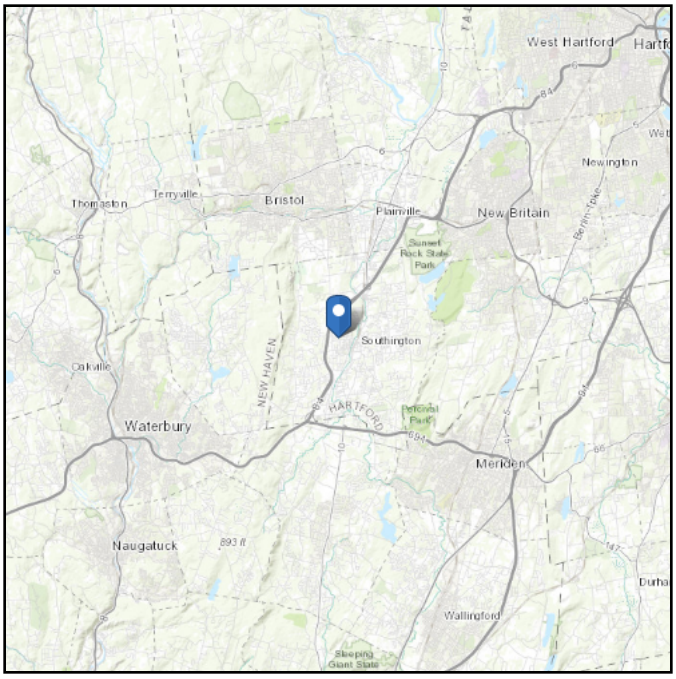
Leg Compression (Max)	70.6	%
Leg Uplift (Max)	70.0	%
Leg Shear (Max)	66.7	%
Overall Shear	67.4	%
Overall Compression	73.3	%
Overturning Moment	67.2	%

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 314.38 ft (NAVD 88)
Latitude: 41.604591
Longitude: -72.894336



Wind

Results:

Wind Speed:	122 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

*Ultimate 3 sec gust wind speed of 122 mph converted to Basic wind speed of 95 mph.

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Wed Mar 18 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

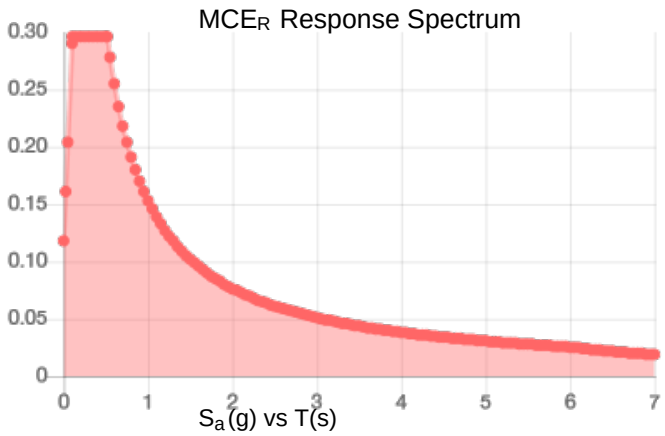
Seismic

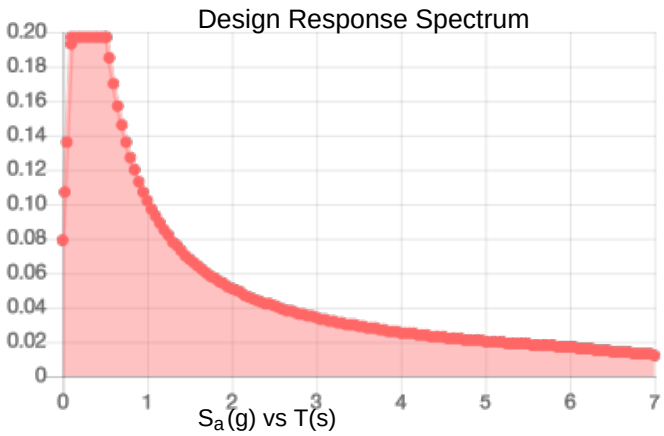
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.185	S_{DS} :	0.197
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.095
S_{MS} :	0.296	PGA_M :	0.152
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Mar 18 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Wed Mar 18 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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March 30, 2020

MOUNT EVALUATION LETTER

Sheldon Freincle
Northeast Site Solutions, LLC

Site ID: CT11239A
Site Name: Southington / I-84
Site Address: 435 Mill St., Southington, Hartford County, CT 06489

Tectonic W.O. #: 9927.CT11239A
Project Type: L600

Dear Mr. Freincle,

This letter is to confirm Tectonic Engineering & Surveying Consultants P.C.'s (Tectonic) structural evaluation of a proposed antenna mounting system for the new equipment installation on the site noted above. The intent of the review is to recommend a mount that is sufficient to support the loads from the proposed installation of antennas and appurtenances.

T-Mobile is proposing to install six (6) panel antennas and six (6) RRHs across three (3) sectors at a RAD elevation of approximately one hundred and ten feet (110'-0").

The following information was provided for this assessment:

- RFDS prepared by T-Mobile, last updated 9/9/19.
- SitePro1 P/N: *VFA12-RRU* Structural Specifications.

Based on the above, Tectonic is proposing to install three (3) Site Pro 1 VFA12-RRU XLD V-Frame Mounts with Integral RRU Mounting Pipes.

The specified mount will be adequate based on the following criteria:

Mount	Bare Conditions				Iced Conditions		
	Mast Pipes / sector	Basic Wind Speed (mph)	Wind Load (lb)	Dead Load (lb)	Design Ice Thickness (in)	Wind Load w/ Ice (lb)	Dead Load w/ Ice (lb)
VFA-12-RRU	4	139	550	275	2.75	250	1000
Proposed Loads	2	95	516	70	0.75	167	344

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
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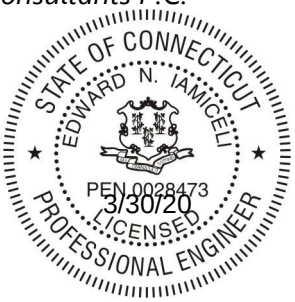
This structural assessment is solely based on the information provided in the documents referenced above. This assessment also assumes that the mounts are designed, fabricated, and constructed in accordance with the manufacturer's specifications.

The review and the analysis is based on TIA-222-G "Structural Standard for Antenna Supporting Structures and Antennas", and the 2018 Connecticut State Building Code, using an ultimate 3-second gust wind speed of one hundred twenty-two (122) mph converted to a nominal 3-second gust wind speed of ninety-five (95) mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1 with no ice, 50 mph with 0.75 inch escalated ice thickness, Exposure Category C and Topographic Category 1.

The contractor shall field verify existing conditions and notify the design engineer of any discrepancies prior to installation of the proposed upgrade. Any further changes to the antenna or other appurtenances configuration should be reviewed with respect to their effect on structural loads prior to implementation. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

Should you have any questions, please do not hesitate to contact us.

Respectfully submitted by:
Tectonic Engineering & Surveying Consultants P.C.



Edward Iamiceli, P.E.
Managing Director - Structural

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

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Exhibit E

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11239A

Southington / I-84
435 Mill Street
Southington, Connecticut 06489

April 10, 2020

EBI Project Number: 6220001518

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**7.46%**

April 10, 2020

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CT11239A - Southington / I-84

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **435 Mill Street** in **Southington, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 435 Mill Street in Southington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 80 Watts per Channel.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

8) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

9) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antennas used in this modeling are the RFS APXVAARR24_43-U-NA20 for the 2100 MHz / 600 MHz / 700 MHz / 600 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the RFS APXVAARR24_43-U-NA20 for the 2100 MHz / 600 MHz / 700 MHz / 600 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the RFS APXVAARR24_43-U-NA20 for the 2100 MHz / 600 MHz / 700 MHz / 600 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antenna mounting height centerline of the proposed antennas is 110 feet above ground level (AGL).

12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

13) Emissions from additional carriers were not included because emissions data for the site location are not available.

14) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	2100 MHz / 600 MHz / 700 MHz / 600 MHz	Frequency Bands:	2100 MHz / 600 MHz / 700 MHz / 600 MHz	Frequency Bands:	2100 MHz / 600 MHz / 700 MHz / 600 MHz
Gain:	16.35 dBd / 12.95 dBd / 13.35 dBd / 12.95 dBd	Gain:	16.35 dBd / 12.95 dBd / 13.35 dBd / 12.95 dBd	Gain:	16.35 dBd / 12.95 dBd / 13.35 dBd / 12.95 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	7	Channel Count:	7	Channel Count:	7
Total TX Power (W):	260 Watts	Total TX Power (W):	260 Watts	Total TX Power (W):	260 Watts
ERP (W):	6,648.14	ERP (W):	6,648.14	ERP (W):	6,648.14
Antenna A1 MPE %:	**3.65%**	Antenna B1 MPE %:	**3.65%**	Antenna C1 MPE %:	**3.65%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A2 MPE %:	**3.82%**	Antenna B2 MPE %:	**3.82%**	Antenna C2 MPE %:	**3.82%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	7.46%
no additional carriers	N/A
Site Total MPE % :	7.46%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.46%
T-Mobile Sector B Total:	7.46%
T-Mobile Sector C Total:	7.46%
Site Total MPE % :	7.46%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz UMTS	2	1294.56	110.0	7.69	2100 MHz UMTS	1000	0.77%
T-Mobile 600 MHz LTE	2	591.73	110.0	3.52	600 MHz LTE	400	0.88%
T-Mobile 700 MHz LTE	2	648.82	110.0	3.86	700 MHz LTE	467	0.83%
T-Mobile 600 MHz NR	1	1577.94	110.0	4.69	600 MHz NR	400	1.17%
T-Mobile 1900 MHz GSM	4	1028.30	110.0	12.22	1900 MHz GSM	1000	1.22%
T-Mobile 1900 MHz LTE	2	2056.61	110.0	12.22	1900 MHz LTE	1000	1.22%
T-Mobile 2100 MHz LTE	2	2307.55	110.0	13.71	2100 MHz LTE	1000	1.37%
						Total:	**7.46%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	7.46%
Sector B:	7.46%
Sector C:	7.46%
T-Mobile Maximum MPE % (Sector A):	7.46%
Site Total:	7.46%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.46%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit F

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FIRST AMENDMENT TO STANDARD LEASE AGREEMENT

This First Amendment to Standard Lease Agreement (the "**Amendment**") is effective as of the date of execution by the last party to sign (the "Effective Date") by and between the Town of Southington, a Connecticut Municipal corporation ("**Lessor**") and T-Mobile Northeast LLC, a Delaware limited liability company ("**Lessee**") (collectively, the "Parties").

Lessor and Lessee (or its predecessor-in-interest) entered into that certain Standard Lease Agreement dated August 31, 2000 (the "**Agreement**") regarding Lessor's leased area ("**Premises**") located at 435 Mill Street, Southington, CT 06489 (the "**Property**").

NOW, for good and valuable consideration, Lessor and Lessee agree as follows:

1. The Agreement is in full force and effect and neither Lessor nor Lessee is in breach under the terms of the Agreement.

2. Commencing on September 20, 2019, the Term of the Agreement will automatically be extended for four (4) additional and successive five (5) year terms (each a "**Renewal Term**", collectively the "**Term**"), provided, that Rent during these four (4) additional terms shall be paid in equal monthly installments to the Southington Water Department as follows:

Renewal Term	Start Date	End Date	Monthly Payment	Annual Agreement Fee
1	9/20/2019	9/19/2024	$3,318.82	$39,825.84
2	9/20/2024	9/19/2029	$3,484.76	$41,817.12
3	9/20/2029	9/19/2034	$3,659.00	$43,908.00
4	9/20/2034	9/19/2039	$3,841.95	$46,103.40

3. Lessor intends to demolish the existing water tank and build a new tower ("**Redevelopment**"). Once the new tower is built, Lessor will allow Lessee to move Lessee's Antenna Facilities to the new tower ("**Relocation**") upon the following conditions: (i) Lessor shall give Lessee not less than eight (8) months written notice prior to Relocation; (ii) all costs and expenses associated with or arising out of the Relocation (including approval and permitting costs) shall be paid by Lessee; (iii) the Relocation shall be performed exclusively by Lessee or its agents; (iv) the Relocation shall not limit or interfere with Lessee's Permitted Uses of the Premises; and (v) if the new tower is not comparable or does not meet Lessee's current requirements for permitted use, then Lessee may terminate the Agreement in its reasonable judgment upon written notice to Lessor, without penalty or further obligation. During the period of Redevelopment and the time Lessee is relocating its Antenna Facilities and equipment to the new tower, Tenant shall have the right to place a temporary cell site on wheels ("**COW**") on Lessor's Property at a mutually acceptable location so that Lessee can continue to provide communications service from such location.

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Upon completion of the Relocation, the new tower shall be considered the Premises for all purposes under the Lease.

4. Lessee and Lessor will reasonably cooperate with each other's requests to approve permit applications and other documents related to the Property.

5. All notices, requests, demands and other communications shall be in writing and shall be effective three (3) business days after deposit in the U.S. mail, certified, return receipt requested or upon receipt if personally delivered or sent via a nationally recognized courier to the addresses set forth below. Lessor or Lessee may from time to time designate any other address for this purpose by providing written notice to the other party.

If to Lessee:	If to Lessor:
T-Mobile USA, Inc. 12920 SE 38th Street Bellevue, WA 98006 Attn: Lease Compliance / CT11239A	Town of Southington 75 Main Street Southington, CT 06489

6. To the extent any provision contained in this Amendment conflicts with the terms of the Agreement, the terms and provisions of this Amendment shall control.

7. This Amendment may be executed in duplicate counterparts, each of which will be deemed an original. Signed electronic copies of this Amendment will legally bind the Parties to the same extent as originals.

8. Each of the Parties represents and warrants that it has the right, power, legal capacity and authority to enter into and perform its respective obligations under this Amendment.

IN WITNESS, the Parties execute this Amendment as of the Effective Date.

Lessor:

Town of Southington, a Connecticut Municipal corporation

By: Thomas J. Murphy

Print Name: Thomas J. Murphy

Title: President

Date: 1-23-19

Lessee:

T-Mobile Northeast LLC, a Delaware limited liability company

By: DocuSigned by: Cheryl Downs 27D7B387C46E457...

Print Name: Cheryl Downs

Title: Director, Tech Property Management

Date: 1/28/2019

Kelly Dunham 1/16/19
T-Mobile Contract Attorney, as to form

Exhibit G

From:	Deborah Chase
To:	"PhillipsR@southington.org"; "sciotam@southington.org"
Cc:	"ReimondoM@southington.org"; "nicholsl@southington.org"; "larkink@southington.org"
Subject:	435 Mill Street Tanks, Southington, CT 06489 T-Mobile TS Application (CT11239A-PI)
Date:	Monday, April 13, 2020 3:39:00 PM
Attachments:	image001.png

Good afternoon,

On behalf of our client, (T-Mobile), I am forwarding copies of T-Mobile's Tower Share Request to collocate a wireless telecommunications facility on the town owned facility located at 435 Mill Street.

Hard copies will be sent as well for your records.

Please do not hesitate to contact me with any questions regarding T-Mobile's Tower Share Request.

Thank you very much

Deborah Chase

Senior Project Coordinator & Analyst

Mobile: 860-490-8839

NSS NORTHEAST SITE SOLUTIONS

Save a tree. Refuse.Reduce. Reuse. Recycle.