Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

December 10, 2021

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

RE: Notice of Exempt Modification
50 Rust Road, Barkhamsted, CT 06063
AKA: 31 New Hartford Road, Barkhamsted, CT 06063
Latitude: 41.893808
Longitude: -72.996472
T-Mobile/Sprint Site#: CTNH617A-CT33XC113

Dear Ms. Bachman:

T-Mobile/Sprint currently maintains six (6) antennas at the 146-foot level of the existing 145-foot monopine at 50 Rust Road, Barkhamsted, CT. The 145-foot monopine tower is owned and operated by American Tower Corporation. The property is owned by Regional Refuse Disposal District 1. T-Mobile/Sprint now intends to remove the six (6) existing antennas and add nine (9) new 600/700/1900/2100/2500 MHz antennas. The new antennas will be installed at the 146-foot level of the tower and will support 5G services.

Planned Modifications:
Tower:
Remove:
(6) DB980F90E-M Antennas
(1) 1900 MHz RRH
(1) 800 MHZ w Notch Filter

Install New:
(3) Commscope VV-65A-R1 Antennas
(3) RFS APXVAALL24_43-U-NA20 Antennas
(3) Ericsson AIR6449 B41 Antennas
(3) 4460 B25+B66 RRU
(3) 4480 B71+B85A RRU
(3) 1.99” 6/24 4AWG Hybrid Cable

Ground:
Existing To Remain:
(1) RBS6601 Cabinet

Remove:
(2) Sprint Cabinets

Install New:
(1) Enclosure 6160
(1) B160 Battery Cabinet

This site was approved by the Connecticut Siting Counsel in Docket No. 182A dated May 7, 2002. T-Mobile/Sprint has been approved for subsequent modifications at their facility.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman Donald S. Stein, Elected Official, and Debra P. Brydon, Acting Zoning Enforcement Official, as well as the tower and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile/Sprint respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Dave DePinto
Transcend Wireless
Cell: 973-907-3243
Email: ddepinto@transcendwireless.com

Attachments

cc: Donald S. Stein – First Selectman of the Town of Barkhamsted
Debra P. Brydon– Acting Zoning Official
American Tower Corporation – Tower Owner
Regional Refuse Disposal District- Property Owner

Transcend Wireless

DePinto, Dave <ddepinto@transcendwireless.com>

UPS Delivery Notification, Tracking Number 1ZV257424294839713

UPS <pkginfo@ups.com>
To: DDEPINTO@transcendwireless.com

Tue, Dec 14, 2021 at 1:23 PM

Hello, your package has been delivered.

Delivery Date: Tuesday, 12/14/2021
Delivery Time: 1:15 PM
Left At: INSIDE DELIV
Signed by: CD SECRETARY

TRANSCEND WIRELESS

Tracking Number:	1ZV257424294839713
Ship To:	TOWN OF BARKHAMSTED 67 RIPLEY HILL ROAD BARKHAMSTED, CT 06063 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.8 LBS
Reference Number:	CTNH617A-CT33XC113

Download the UPS mobile app

For Questions, Visit Our Help and Support Center

Transcend Wireless

DePinto, Dave <ddepinto@transcendwireless.com>

UPS Delivery Notification, Tracking Number 1ZV257424290729723

UPS <pkginfo@ups.com>
To: DDEPINTO@transcendwireless.com

Tue, Dec 14, 2021 at 1:28 PM

Hello, your package has been delivered.

Delivery Date: Tuesday, 12/14/2021
Delivery Time: 1:15 PM
Left At: INSIDE DELIV
Signed by: CD SECRETARY

TRANSCEND WIRELESS

Tracking Number:	1ZV257424290729723
Ship To:	TOWN OF BARKHAMSTED- ZONING DEPT 67 RIPLEY HILL ROAD BARKHAMSTED, CT 06063 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.8 LBS
Reference Number:	CTNH617A-CT33XC113

Download the UPS mobile app

For Questions, Visit Our Help and Support Center

Signature Required

Your shipment
1ZV257424293353703

Estimated delivery
Wednesday, December 15 by 9:00 P.M.

Label Created

On the Way

Out for Delivery

Delivery

Ship To
CARY, NC US

Get Updates | Change My Delivery | View Details

Get updates for your package

Enroll in UPS My Choice and take the worry out of missed deliveries, or having packages sit outside while you're away.

Sign up

Already Enrolled? Log in

UPS Freight Less-than-Truckload (“LTL”) transportation services are offered by TFI International Inc., its affiliates or divisions (including without limitation TForce Freight), which are not affiliated with United Parcel Service, Inc. or any of its affiliates, subsidiaries or related entities (“UPS”). UPS assumes no liability in connection with UPS Freight LTL transportation services or any other services offered or provided by TFI International Inc. or its affiliates, divisions, subsidiaries or related entities.

This Site

Other UPS Sites

Connect With Us

Legal

Signature Required

Your shipment
1ZV257424296056896

Estimated delivery
Tuesday, December 14 by 9:00 P.M.

Label Created

On the Way

Out for Delivery

Delivery

Ship To
NEW HARTFORD, CT US

Get Updates | Change My Delivery | View Details

Get updates for your package

Enroll in UPS My Choice and take the worry out of missed deliveries, or having packages sit outside while you're away.

Sign up

Already Enrolled? Log in

(https://

(https://www.ups.com
loc=en_US&returnto=

Track Another Package

Track

UPS Freight Less-than-Truckload (“LTL”) transportation services are offered by TFI International Inc., its affiliates or divisions (including without limitation TForce Freight), which are not affiliated with United Parcel Service, Inc. or any of its affiliates, subsidiaries or related entities (“UPS”). UPS assumes no liability in connection with UPS Freight LTL transportation services or any other services offered or provided by TFI International Inc. or its affiliates, divisions, subsidiaries or related entities.

This Site

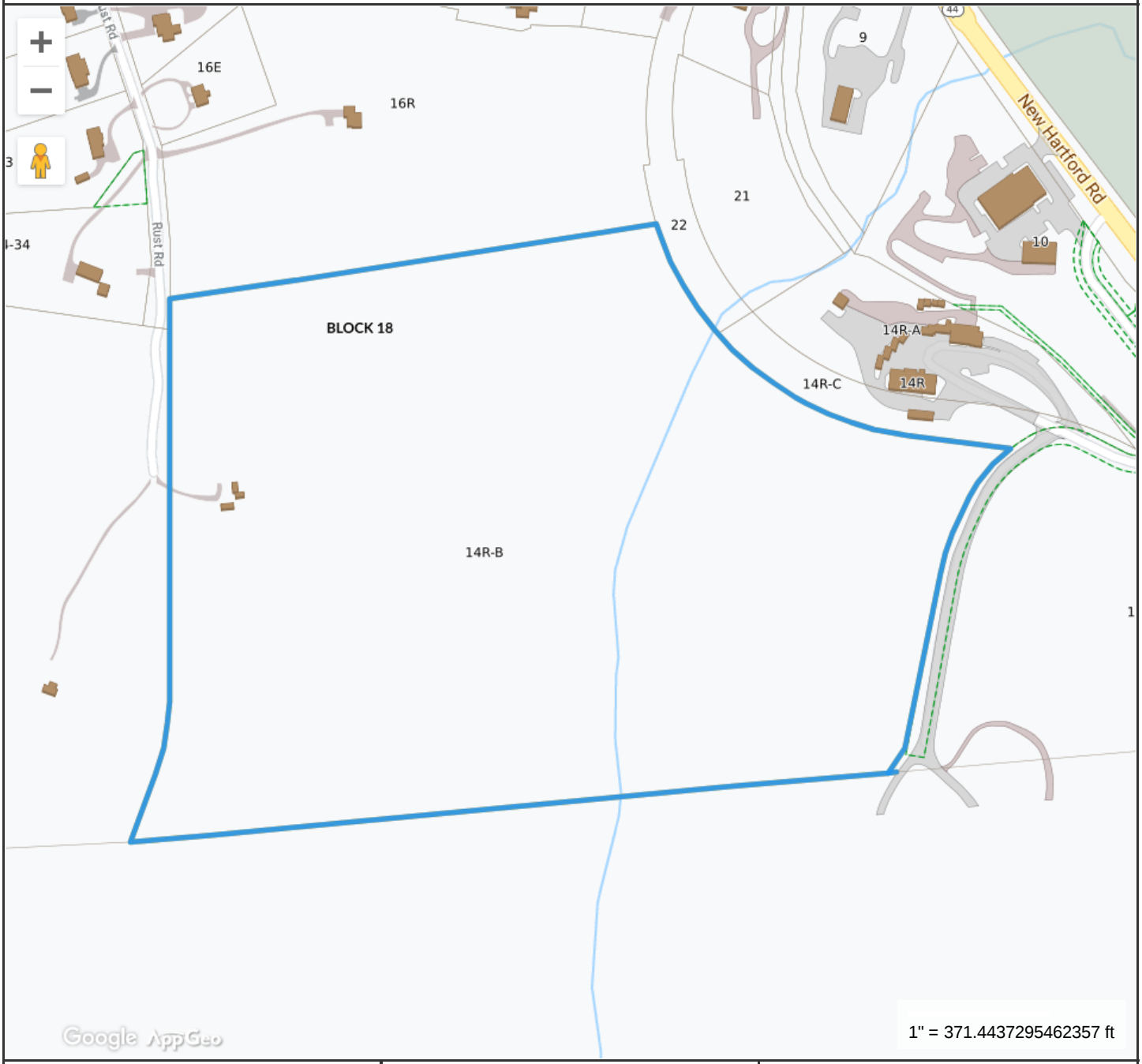
Other UPS Sites

Connect With Us

Legal

Ask UPS

31 New Hartford Road/50 Rust Road, Barkhamsted, CT



Property Information

Property ID	49-18-14R-B
Location	31 B NEW HARTFORD RD
Owner	REGIONAL REFUSE DISPOSAL DISTRICT 1

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Barkhamsted, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 6/2/2021
Data updated 11/15/2018

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

Property Location 31 B NEW HARTFORD RD | Map ID 49/ 18/ 14/R-B / | Bldg Name | State Use 300
Vision ID 1781 | Account # 00178500 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 2/4/2021 12:59:18 PM

CURRENT OWNER

REGIONAL REFUSE DISPOSAL DISTRICT 1

C/O DEBBIE ANGELL
31 NEW HARTFORD RD
BARKHAMSTED CT 06063

TOPO	UTILITIES	STRT / ROAD	LOCATION
4 Rolling			

SUPPLEMENTAL DATA

Alt Prcl ID 49-18-14R-B	DV Lot # B
B.P. Status	Solar Ener
Census Tr.	BAA
Interior	Callback
100 Yr Flo	PA490 Dat
DV Map # 942	
GIS ID	Assoc Pid#

CURRENT ASSESSMENT

Description	Code	Appraised	Assessed
IND LAND	3-1	375,000	262,500
VAC IN LN	5-3	1,156,550	809,580
	Total	1,531,550	1,072,080

6005

BARKHAMSTED, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
REGIONAL REFUSE DISPOSAL DISTRICT 1	0150	1047	08-15-2011	U	V	0	04
REGIONAL REFUSE DISP DISTR #1	0056	0050	04-02-1974		V	0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2020	3-1	262,500	2019	3-1	262,500	2018	3-1	262,500
	5-3	809,580		5-3	809,580		5-3	809,580
	Total	1072080		Total	1072080		Total	1072080

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	Street Index Name	Tracing	Batch
0001				

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised Xf (B) Value (Bldg)	0
Appraised Ob (B) Value (Bldg)	0
Appraised Land Value (Card)	1,531,550
Total Appraised Parcel Value	1,531,550
Valuation Method	C
Total Appraised Parcel Value	1,531,550

NOTES

PARCEL B 51.76AC ON ORIGINAL DEED/MAP#48
PARCEL FKA 59AC FOR TOTAL OF ALL PARCELS
8/15/2011 NOTICE OF BOUNDARY LINE ADJUST
MAP #942 PROPOSED ECONOMIC DEV ZONE
LEASE V112/1020; V162/906
2008 ASGN OF LEASE VOL 142/924
2010 - LAND VALUED FOR CELL SITE
***ACCESS VIA RUST RD**
8/27/03 MAP 669 EASEMENT AREA
STATE LND USE LIMITATION

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments
19-104-E	05-20-2019	EL	Electric	25,000		100	02-20-2020	remv/repl 6 antennas; remv 3
18-297-E	10-25-2018	GN	Generator	13,500		100	04-30-2019	inst backup generator on existi
17-102-E	06-05-2017	EL	Electric	25,000		100		install new equipment pad, sett
17-87-E	05-18-2017	EL	Electric	15,000		100		Verizon wireless is looking to r
14-10-64	10-01-2014	OT	Other	15,000		100		add one antenna & one pipe m
14-08-50	08-13-2014	OT	Other	15,000		100		add 3 antennas etc
14-04-13	04-23-2014	OT	Other	7,500		100		replace 6 existing antennas &

VISIT / CHANGE HISTORY

Date	Id	Type	Is	Cd	Purpost/Result
12-10-2008	DW			94	Vacant w/Outbldgs
04-07-2008	JQ			99	Vacant Land

LAND LINE VALUATION SECTION

B	Use Code	Description	Zone	Land Type	Land Units		Unit Price	Size Adj	Site Index	Cond.	Nbhd.	Nbhd. Adj.	Notes	Special Use		Location Adjustment	Adj Unit Pri	Land Value
1	300	Industrial Vacant	I-1		2.000	AC	61,372	0.57143	5	0.60	NH	1.500	TOPO/USE		0	1.00		63,130
1	300	Industrial Vacant	I-1		51.340	AC	35,496	1.00000	0	0.60		1.000	TOPO/USE		0	1.00		1,093,420
1	350	Cell Tower	I-1		0.130	AC	0	1.00000	0	1.00		1.000	CELL TOWER SITE		0	0.00		375,000
		Total Card Land Units			53.470	AC	Parcel Total Land Area			53.4700		AC				Total Land Value		1,531,550

Property Location 31 B NEW HARTFORD RD | Map ID 49/ 18/ 14/R-B / | Bldg Name | State Use 300
Vision ID 1781 | Account # 00178500 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 2/4/2021 12:59:19 PM

CONSTRUCTION DETAIL

Element	Cd	Description
Style:	99	Vacant Land
Model	00	Vacant
Grade:		
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		
Total Bthrms:		
Total Half Baths		
Total Rooms:		
Bath Style:		
Kitchen Style:		
Fireplace		
Whirlpool Tubs		
Fin Basement		
Fin Bsmt Qual		
Bsmt. Garages		

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd	Description

MIXED USE

Code	Description	Percentage
300	Industrial Vacant	100
		0
		0

COST / MARKET VALUATION

Adj. Base Rate	0
RCN	
Year Built	
Depreciation Code	
Remodel Rating	
Year Remodeled	
Depreciation %	
Functional Obsol	
External Obsol	
Cost Trend Factor	1
Condition	
Condition %	
Percent Good	
RCNLD	
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	

No Sketch

OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Cod	Description	Sub	Sub Desc	L/B	Units	Unit Price	Yr Blt	Cond.	% Gd	Grade	Grd A	Appr. Valu

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area
	Ttl Gross Liv / Lease Area	0	0

DOCKET NO. 182A - Sprint Spectrum, L.P. d/b/a Sprint PCS and Litchfield Acquisition Corporation d/b/a AT&T Wireless Services amendment to the Certificate of Environmental Compatibility and Public Need for the existing telecommunications facility located 31 New Hartford Road (access via Rust Road), Barkhamsted, Connecticut.	}	Connecticut Siting Council May 7, 2002

Findings of Fact

Introduction

1. Sprint Spectrum L. P. d/b/a Sprint PCS (Sprint) and Litchfield Acquisition Corporation d/b/a AT&T Wireless Services (AT&T) in accordance with provisions of General Statutes §§ 16-50g through 16-50aa applied to the Connecticut Siting Council (Council) on November 8, 2001, for an amendment to the Certificate of Environmental Compatibility and Public Need (Certificate) to an existing telecommunications facility on 31 New Hartford Road (access via Rust Road), Barkhamsted, Connecticut. On June 25, 1998, the Council issued a Certificate for construction of a 120-foot tower, that was extended to 124 feet above ground level (agl) for attachment of branching to be camouflaged as a tree and equipment compound that accommodates AT&T, Nextel, and SNET. Sprint proposes to increase the height of this existing monopole tower camouflaged as a tree to a tota1 height of 148 feet above ground level. The purpose of the proposed facility is to provide personal communications service (PCS) to sections of U.S. Route 44 and State Routes 181, 219, and 318 in the Town of Barkhamsted, Litchfield County, Connecticut. (Sprint 1, pp. 1,2 and 5, and Revision December 14, 2001; Transcript (Tr.) dated January 24, 2001, 7:00 p.m., pp. 7, 12, 13, 15)

2. The party in this proceeding is the applicant. The Federal Communications Commission (FCC) licenses Sprint as the "B block" "Wideband PCS" license holder for the two-gigahertz PCS frequencies for the greater New York City area, which includes the entire state of Connecticut. (Sprint 1, p. 1; Tr. pp. 5, 44, and 45)

3. Public notice of the application, as required by General Statutes § 16-50l (b), was published in The Hartford Courant and in the Register Citizen. (Sprint 1, p. 3)

4. As required by General Statute § 16-50l (e), Sprint provided the Town of Barkhamsted technical material on August 21, 2001 for the proposed increase in height of an existing tower to locate Sprint's antennas, and relocate existing antennas of AT&T, SNET and Nextel to accommodate future collocation. Since the existing site is within 2,500 feet of an adjoining municipality, Sprint provided the Town of New Hartford technical material on September 5, 2001. (Sprint 1, p. 21 and Exhibits Q and S)

5. Pursuant to General Statutes § 16-50m, the Council, after giving due notice thereof, held a public hearing on January 24, 2002, beginning at 7:00 p.m. in the cafeteria of the Barkhamsted Elementary School, 63 Ripley Hill Road, Barkhamsted, Connecticut. (Tr., p. 3)

6. The Council and its staff made inspections of the existing tower site on January 24, 2002. During this field inspection, the applicant flew a balloon at the site to simulate the height of the proposed extension. (Sprint 1 p. 19; Council Pre-hearing Conference Notice dated December 20, 2001)

PCS Service Design

7. Personal communications service (PCS) consists of low power transmitter/receiver stations known as cell sites. The system design allows for a configuration of cell sites so that the same frequencies can be used at the same time in different cells (frequency reuse) and to provide uninterrupted service throughout a service area (hand-off). (Docket No. 182, Finding of Fact No. 11)

8. The location of cell sites is based upon key factors such as traffic demand, topography, site height, site availability, building density, and foliage. (Sprint 1, p. 8, Tab H; Docket No. 182 Finding of Fact No. 18)

9. Sprint requires a minimum acceptable signal strength threshold of -94 decibels (dbm) to provide coverage in the Barkhamsted area. Signal strength thresholds lower than -94 dbm may create coverage gaps within a cell's coverage area that may prevent the establishment of a call or cause a call to be disconnected. Presently, a gap in coverage exists along Route 44 in Barkhamsted and surrounding areas. (Sprint 1, p. 7, Exhibits E and H)

10. Adjacent Sprint facilities that would hand off traffic with the proposed facility are as follows:

Location	**Distance and Direction from proposed facility**	**Status**
Greenwood Industrial Park, New Hartford	1.70 mi./east southeast	Operating
Old North Road, Barkhamsted	2.30 mi./northwest	Proposed
Oakdale Avenue, Winchester	3.42 mi./northwest	Operating
20 Antolini Road, New Hartford	4.63 mi./south	Proposed facility in Council Docket No. 184A
96 Powder Mill Road, Canton	5.22 mi./southeast	Operating
1925-1930 East Main Street, Torrington	6.40 mi./west	Operating
South of Route 202, New Hartford	4.0 mi./south southeast	Proposed
Torrington	9.0 mi./west	Proposed

(Sprint 1, Exhibit N and Revised Exhibits F and H; Sprint 3, Qs. 6 and 14, Tr. pp. 19-20)

Site Search

11. In its search for a cell site in the Barkhamsted area, Sprint identified and investigated 4 potential sites, including the proposed site in the application. The remaining sites were rejected because a property owner was not interested in leasing property, another site did not provide adequate coverage, and a raw land site was not pursued due to the existing facility's availability. The other alternative would be construction of a new tower. (Sprint 1, p. 16; Sprint 4, Timothy Keator Testimony)

Need and Coverage

12. In 1996, the United States Congress recognized a nationwide need for high quality wireless telecommunications services, including cellular telephone service. The Federal Telecommunications Act of 1996 seeks to promote competition, encourage technical innovations, and foster lower prices for telecommunications services. Furthermore, the Federal government has preempted the determination of public need for wireless service by the states, and has established design standards to ensure technical integrity and nationwide compatibility among all systems. (Sprint 1, pp. 6-7; Telecommunications Act of 1996, Definition of Act, Sections 256, and 704)

13. Coverage from existing and proposed facilities (see Finding of Fact # 8) within a two-mile radius of the Route 181 and Route 44 intersection indicates the following coverage gaps. Gaps are defined as areas

receiving less than -94 dbm coverage. The primary purpose of this application is to provide service to these gaps in coverage and provide hand-off capability to adjacent sites.

Existing Coverage
(See Appendix A)

Route	Gaps (miles) < -94 dbm	Total Road Miles
44	1.75	4.50
181	2.25	2.25
219	0.0	3.75
318	1.50	2.75

(Sprint 1, Revised Exhibit E coverage model)

14. Existing and proposed coverage combined with Sprint antennas on the proposed tower at a centerline height of 144 feet AGL within a two-mile radius of the Route 181 and Route 44 intersection as follows:

Proposed Tower at a centerline height of 144 feet AGL
(See Appendix B)

Route	Gaps (miles) < -94 dbm	Total Road Miles
44	0.13	4.50
181	0.0	2.50
219	0.0	3.75
318	0.13	2.75

(Sprint 1, Revised Exhibit F coverage model)

15. Existing and proposed coverage combined with Sprint antennas on the proposed tower at a centerline height of 130 feet AGL within a two-mile radius of the Route 181 and Route 44 intersection as follows:

Proposed Tower at a centerline height of 130 feet AGL
(See Appendix C)

Route	Gaps (miles) < -94 dbm	Total Road Miles
44	0.13	4.50
181	0.0	2.50
219	0.0	3.75
318	0.13	2.75

As capacity increases in the Route 44 area of Barkhamsted and New Hartford, the issue in providing coverage begins to change with increased use. While a 130-foot and 140-foot tower provides similar coverage, future demand may cause coverage from a 130-foot tower to be inadequate.
(Sprint 3, Q. 2 coverage model; Tr. 1, pp. 26-29)

16. Alternatives to monopole technology include microcell and repeater sites. A microcell is a small version of a cell site. A repeater is a low power system that borrows a channel from a nearby cell site and rebroadcasts it to a target area. These alternatives fulfill small coverage gaps or provide service to a building but would not be applicable in the Barkhamsted area due to the large coverage gaps and the necessary height to place antennas would not alleviate the need for a tower. (Sprint 1 pp. 15 and 16; Sprint 4, Anthony Wells Testimony)

Proposed site

17. The proposed site is an existing telecommunications facility owned and operated by AT&T Wireless Services and consists of a 120-foot monopole tower camouflaged as a pine tree and three equipment buildings at the base of the tower within a 50-foot by 50-foot fenced compound. An additional four-foot extension on this tower supports artificial tree branching for a total height of 124 feet. (Sprint 1, p. 5; Sprint 3, Q. 7; Sprint 4, Alitz Abadjian Testimony; Tr. p.13)

18. AT&T has a lease for a 75-foot by 75-foot area within an approximately 98-acre parcel of land owned by the Regional Refuse Disposal District (RRDD) No. 1. This site is located approximately 180 feet east from the end of Rust Road with an elevation of 780 feet above mean sea level. The RRDD property is zoned Restricted Industrial (I-1). The Barkhamsted Zoning Regulations, by special permit, allows use of communications towers in I-1 and I-2 zones. (Sprint 1, pp. 4, 5 and 13, Exhibit D; Sprint 1a Barkhamsted Zoning Regulations)

19. Land north and west of the RRDD property is zoned residential (RA-1). Land to the north contains residences. Land west and south is wooded, and contains no homes. The RRDD transfer station and buildings are located to the east. U.S. Route 44 borders the RRDD east property boundary. The RRDD western property boundary fronts an unimproved road (Rust Road) for approximately 1300 feet to the Barkhamsted and New Hartford town boundary. (Sprint 1, pp. 4, 5 and 13, Docket No 182 Finding of Fact No. 28)

20. Sprint would use an existing 12-foot wide by 170-foot long gravel covered access road. (Sprint 1, p. 8 and Revised Exhibit D; Sprint 4, Alitz Abadjian Testimony)

21. Electric and telephone utilities exist at the facility and are underground. No permanent backup electrical system is proposed; however, Sprint relies on batteries for backup power and for outages lasting longer than 4 hours Sprint may use a portable electric generator. Each carrier may have a generator for its own use. (Sprint 1, p. 8 and Revised Exhibit D; Tr. pp. 29-30)

22. No trees would be removed for the proposed extension of the tower or for the proposed placement of Sprint's equipment within the existing fenced compound. (Tr. p. 18)

23. There are no wetland areas within the existing leased parcel. (Sprint p. 9)

24. There are seven homes on Rust Road of which four would be within a 1000-foot radius of the existing tower. The nearest residential structure would be approximately 600 feet north of the existing tower. (Sprint 1, pp. 11 and 13 and Exhibit I)

25. The 148-foot tower radius would remain within the lessor's property. The facility site equipment buildings would be the only structures within the tower radius. (Sprint 1, Exhibit D)

26. The estimated cost of construction for the proposed modifications to the facility would be:

Monopine extension with branches	$55,630
New platforms for all carriers	$18,000
Installation of platforms, antennas, and branching	$44,000

Ground site work		$21,000
PCS radio equipment		$126,000
	Total	$264,630

(Sprint 1, p. 19; Tr. P. 52)

Facility Specifications

27. Sprint proposes to extend the existing 124-foot monopole to a total height of 148 feet above ground level (agl) and would maintain the tower as a camouflaged tree. Sprint proposes to install 12 panel type directional antennas, four per sector, at a centerline height of 144 feet agl. An additional four-foot extension for artificial tree branching would be installed above the antennas. A global positioning system antenna would be mounted at the 50-foot level of the tower. (Sprint 1, Revised Exhibit D; Sprint 5; Tr. p. 13-18)

28. Sprint would install an 8.5-foot by 20-foot concrete foundation within the fenced compound for equipment, a main power cabinet, secondary power cabinet, battery backup cabinet, and primary radio cabinet. The foundation would accommodate three additional cabinets in the future. (Sprint 1, pp. 5 and 6; Sprint 4, Alitz Abadjian Testimony)

29. AT&T proposes to relocate its 12 panel antennas on a 12-foot wide platform from its centerline height of 120 feet agl to an antenna centerline height of 134 feet agl. AT&T holds a PCS license for Litchfield County, Connecticut and proposes to provide data services. AT&T would operate six antennas at the 1900 MHz frequency and six antennas at the 850 MHz frequency. No modification to its equipment building is proposed. (Sprint 1, p. 6 and Revised Exhibit D; EM-AT&T-005-018-031-055-068-092-111-125-153-162-168-011121, Edwards and Kelsey d/b/o AT&T Wireless Services)

30. Nextel currently has three omni directional whip antennas (14 feet long by 3 inches in diameter) at the top of the proposed tower with a centerline of radiation of 127 feet agl. Nextel proposes to remove these whip antennas and replace them with panel antennas on a platform at a centerline of radiation 124 feet. No modification to its equipment building is proposed. (Sprint 1, p. 6 and Revised Exhibit D)

31. SNET proposes to relocate its 12 panel antennas on a 12-foot wide platform from its centerline height of 110 feet agl to an antenna centerline height of 114 feet agl. No modification to its equipment building is proposed. (Sprint 5; Tr. p.12)

32. The existing 124-foot tower and its foundation is capable of being extended to a total height of 158 feet, camouflaged as a tree, and accommodate up to six carriers. This 158-foot tower would be designed to withstand pressures equivalent to a 69-mph wind with one-half inch solid ice accumulation. Elevations for future carriers would be available at the 104-foot and 94-foot levels of the proposed 144-foot tower. (Sprint 1, p. 5 and Revised Exhibit D; Sprint 3, Q. 7; Sprint 4, Alitz Abadjian Testimony)

33. The existing tower did not have any air navigation marking and or lighting nor does Sprint propose any air navigation marking and or lighting consistent with Federal Aviation Administration (FAA) criteria. (Sprint 1, Exhibit K; Docket No. 182, Finding of Fact No. 43)

Environmental Considerations

34. There are no known or existing populations of federal or State endangered, threatened or special concern species occurring at the proposed site. (Sprint 1, p. 12 and Exhibit K; Docket No. 182 Findings of Fact No. 49)

35. The State Historic Preservation Officer determined that the proposed extension of the existing tower would have no effect with respect to historic, architectural, or archeological resources listed on or eligible for the national or State register of historic places. (Sprint 1, pp. 12-13 and Exhibit M)

36. Noise associated with construction would be temporary. After construction, noise would be from a portable emergency generator used during extended power outages. (Sprint 1, p. 11; Tr. 30-33)

37. A small amount of traffic would occur during construction. After construction, Sprint would make monthly visits for inspection and maintenance. (Sprint 1, p. 11)

38. State Route 181 is designated a State scenic road from the intersection with Route 44 to the intersection of Route 318 including portions of Route 318 across Saville Dam and Route 219 bordering the east shore of Lake McDonough in the Town of Barkhamsted. (Docket No. 182 Finding of Fact No. 55)

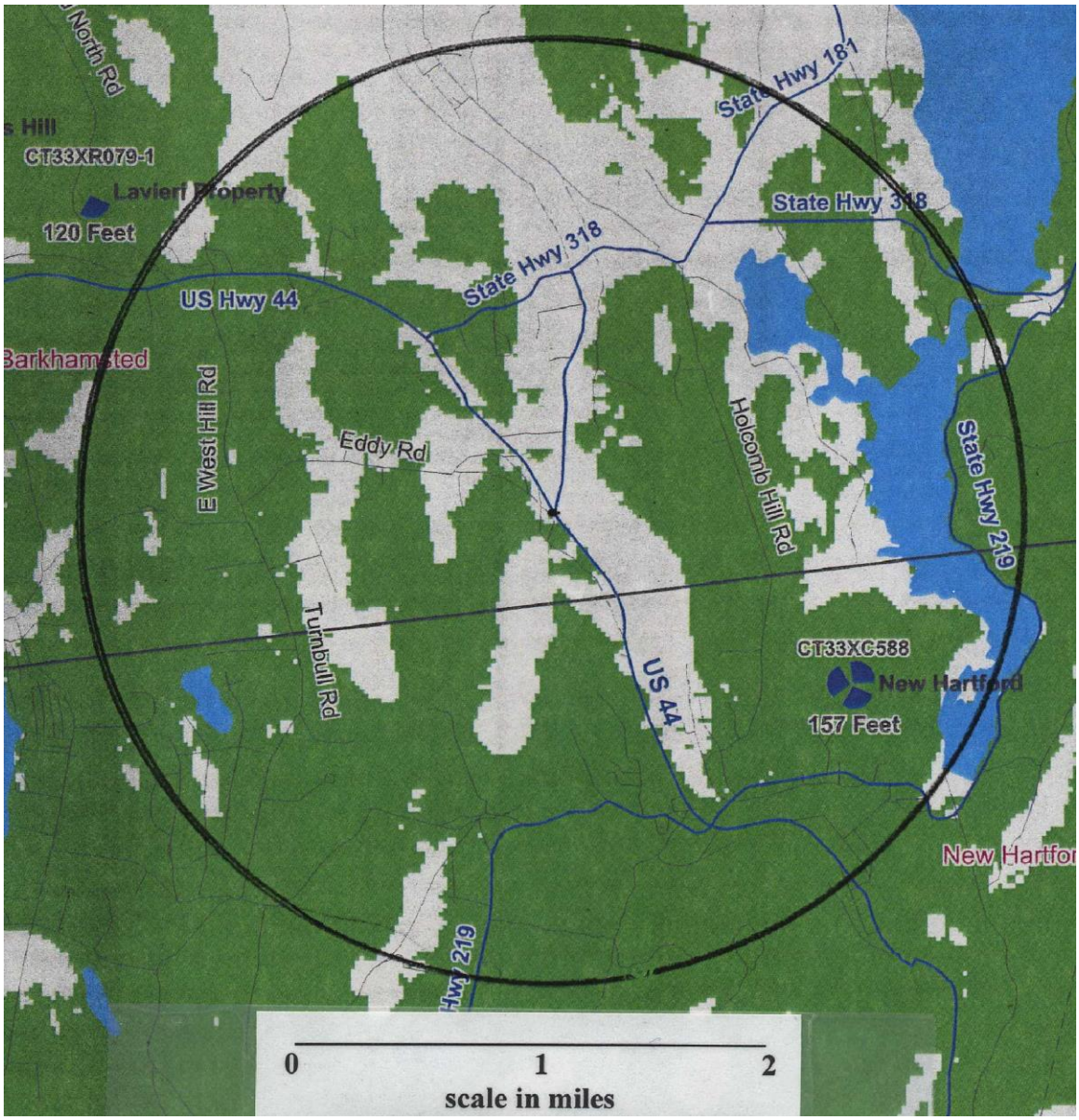
39. Visibility of proposed 148-foot tower camouflaged as a pine tree.

Location	Distance / Direction	Existing 124-foot Tower Visible?	Proposed tower with extension Visible?
Entrance to RRDD property off Route 44	0.58 mi./west	yes	yes
Hearthstone Drive	0.73 mi./southeast	yes	yes
Miner Lane and Holcomb Hill Road intersection	1.21 mi./west	yes	yes
Farmington River access off Route 318	1.26 mi./southwest	yes	yes
Barkhamsted Town Hall parking lot	1.32mi./southwest	yes	yes
State Route 181/318 intersection	1.38 mi./southwest	yes	yes
Vista from Tunis Trail on Ratlum Mountain	2.34 mi./west	no	no
Saville Dam on Route 318	2.50 mi./southwest	no	no

(Sprint 1, p. 11 and Exhibit L; Sprint 3, Qs. 10, 11, and 12; Docket No. 182 Finding of Fact 57 and 59)

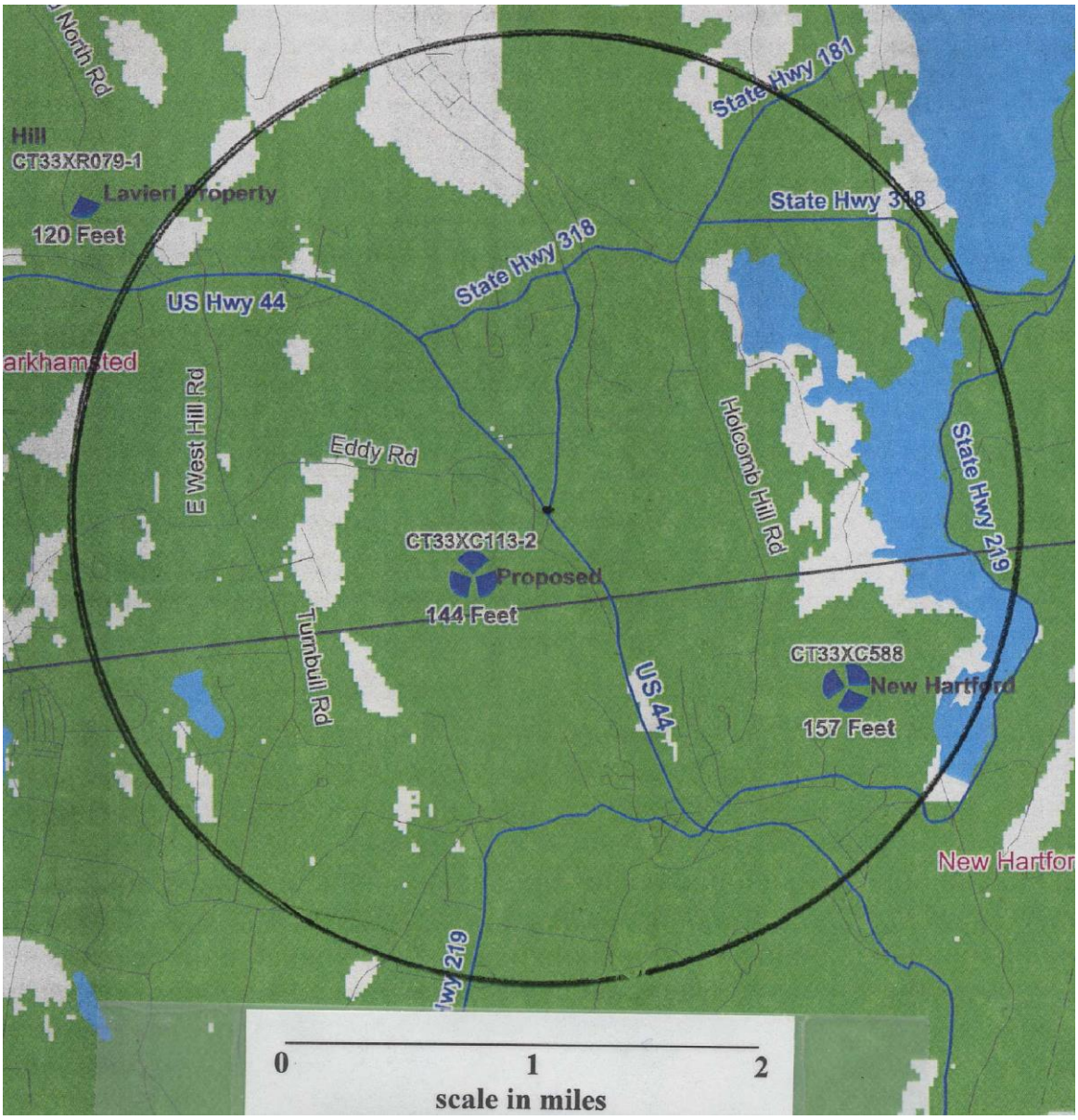
40. The cumulative worst-case electromagnetic radio frequency power densities for all carriers at the base of the proposed tower would be 22.45 percent of the 1992 American National Standards Institute (ANSI) standard as adopted by the FCC and the Connecticut Department of Environmental Protection General Statutes § 22a-162. (Sprint 1, Revised Exhibit P; OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, FCC, Office of Engineering and Technology, August 1997; IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 Ghz, approved by the American National Standards Institute, November 18, 1992; Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, Federal Communications Commission's Report and Order, adopted August 1, 1996)

Appendix A
Existing Coverage



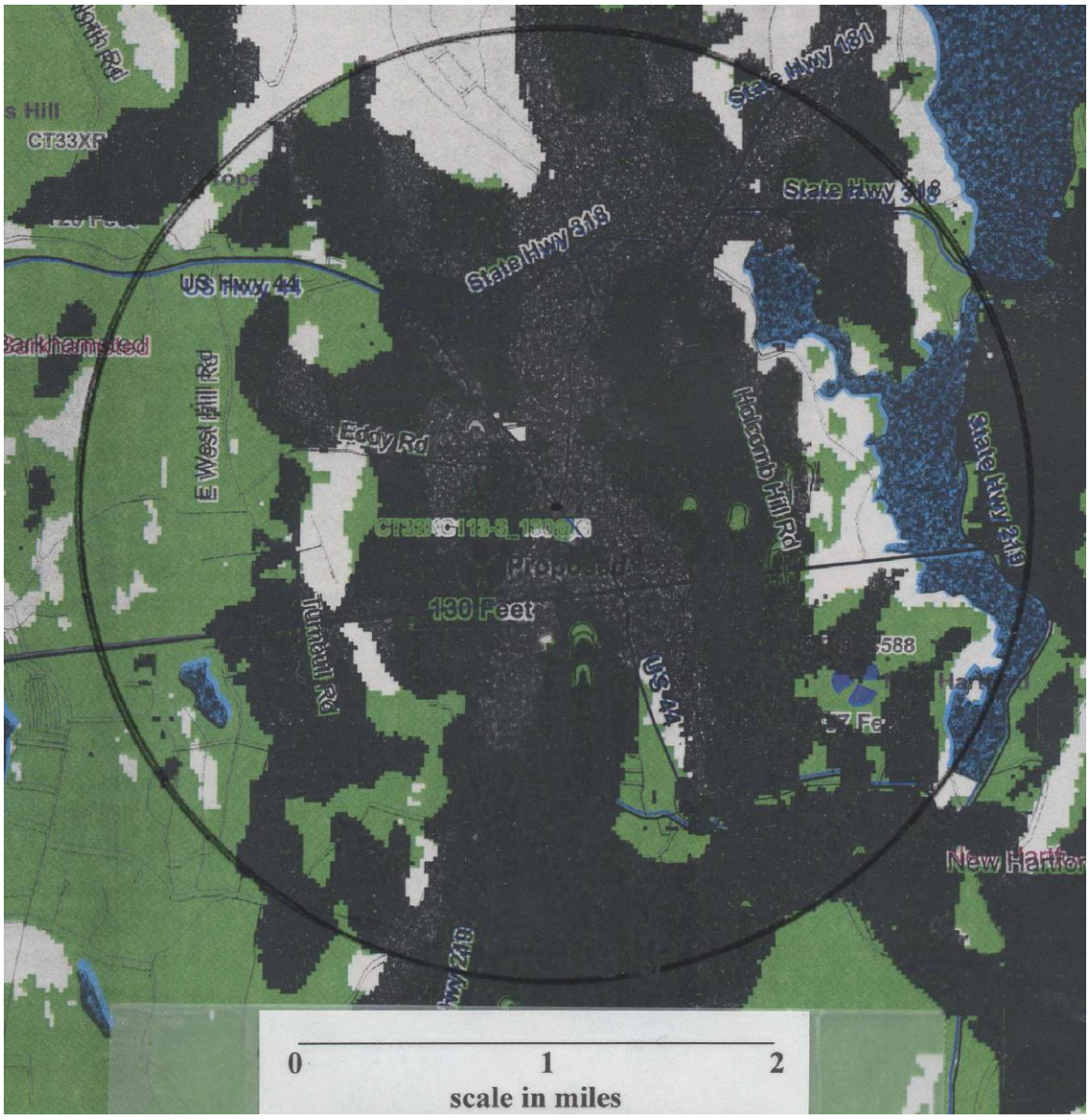
Green equates to coverage at -94 dbm or greater and white areas equate to no coverage.
(Sprint 1, Revised Exhibit E)

Appendix B
Proposed Tower at a centerline height of 144 feet AGL

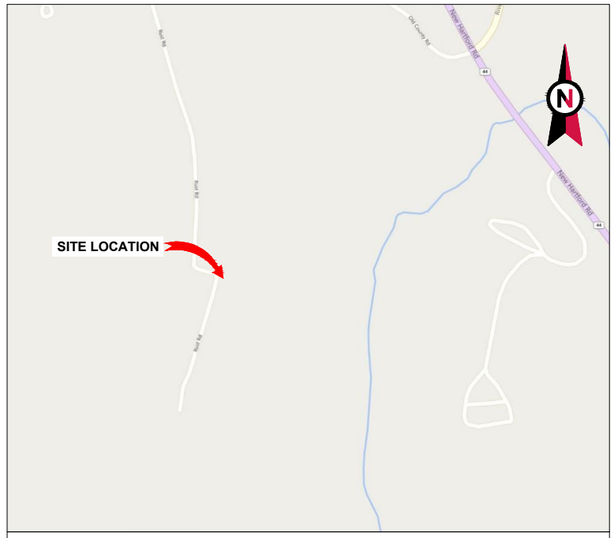


Green equates to coverage at -94 dbm or greater and white areas equate to no coverage.
(Sprint 1, Revised Exhibit F)

Appendix C
Proposed Tower at a centerline height of 130 feet AGL



Green and black equates to coverage at -94 dbm or greater and white areas equate to no coverage. (Sprint 3, Q. 2)



VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: BARKHAMSTEAD CT
ATC SITE NUMBER: 411181
T-MOBILE SITE NAME: CTNH617A
T-MOBILE SITE NUMBER: CTNH617A
SITE ADDRESS: 50 RUST ROAD
BARKHAMSTED, CT 06063

LOCATION MAP

T-MOBILE SPRINT RETAIN ANTENNA AMENDMENT PLAN
67E5A998E 6160 CONFIGURATION

COMPLIANCE CODE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2015 IBC
2. 2017 NATIONAL ELECTRICAL CODE - NFPA 70
3. LOCAL BUILDING CODE
4. CITY/COUNTY ORDINANCES

UTILITY COMPANIES

POWER COMPANY: NORTHEAST UTILITY SERVICE
PHONE: (800) 286-2000

TELEPHONE COMPANY: SNET
PHONE: (866) 404-7638

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

PROJECT SUMMARY

SITE ADDRESS:

50 RUST ROAD

BARKHAMSTED, CT 06063

COUNTY: LITCHFIELD

GEOGRAPHIC COORDINATES:

LATITUDE: 41.893808

LONGITUDE: -72.996472

GROUND ELEVATION: 793' AMSL

PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

APPLICANT:

T-MOBILE

ENGINEER:

COLLIERS ENGINEERING &
DESIGN CT, P.C.
135 NEW ROAD
MADISON, CT 06443

PROJECT #:
21904385A

PROPERTY OWNER:

REGIONAL REFUSE
DISPOSAL DIST OFFICE
50 RUST ROAD
BARKHAMSTED, CT 06063

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

TOWER WORK:

REMOVE (6) ANTENNA(s) AND (2) RRH(s)

INSTALL NEW SECTOR FRAME MOUNTS, (9) ANTENNA(s), (6) RRH(s) AND (3) HYBRID CABLE(s)

GROUND WORK:

REMOVE (2) EXISTING SPRINT CABINETS

INSTALL (1) ENCLOSURE 6160 AND (1) B160 BATTERY CABINET

EXISTING (1) RBS6601 CABINET TO REMAIN

PROJECT NOTES

1. THE FACILITY IS UNMANNED.
2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE.
3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE.
4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED.
5. HANDICAP ACCESS IS NOT REQUIRED.
6. THE PROJECT DEPICTED IN THESE PLANS QUALIFIES AS AN ELIGIBLE FACILITIES REQUEST ENTITLED TO EXPEDITED REVIEW UNDER 47 U.S.C. § 1455(A) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION, REMOVAL, AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER CFR § 1.61000 (B)(7).

PROJECT LOCATION DIRECTIONS

I-84 TO I-91 NORTH TO US-44 WEST....US 44 US 44-W BECOMES US-44/ MORGAN ST....TURN SLIGHT RIGHT ONTO US-44/MAIN ST...CONTINUE TO FOLLOW US-44W...US-44W BECOMES NEW HARTFORD RD...PROCEED ON NEW HARTFORD RD PAST THE TRANSFER STATION TO A LEFT ON THE NEXT DIRT RD (OLD COUNTRY RD).....FOLLOW OLD COUNTRY RD UPHILL TO A LEFT ON RUST RD & PROCEED TO SITE

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	2	11/08/21	AJC
G-002	GENERAL NOTES	2	11/08/21	AJC
C-101	DETAILED SITE PLAN	2	11/08/21	AJC
C-102	DETAILED GROUND PLAN	2	11/08/21	AJC
C-201	TOWER ELEVATION	2	11/08/21	AJC
C-401	ANTENNA INFORMATION & SCHEDULE	2	11/08/21	AJC
C-501	CONSTRUCTION DETAILS	2	11/08/21	AJC
E-501	GROUNDING DETAILS	2	11/08/21	AJC
E-502	ELECTRICAL UPGRADE DIAGRAM	2	11/08/21	AJC
R-601	SUPPLEMENTAL			
R-602	SUPPLEMENTAL			
R-603	SUPPLEMENTAL			
R-604	SUPPLEMENTAL			
R-605	SUPPLEMENTAL			

AMERICAN TOWER®

Colliers Engineering & Design
www.colliersengineering.com
Doing Business as MASER CONSULTING
MADISON
135 New Road
Madison, CT 06443
Phone: 860.395.0055
COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

TITLE SHEET

SHEET NUMBER:	REVISION:
G-001	2

GENERAL CONSTRUCTION NOTES:

1. OWNER FURNISHED MATERIALS, T-MOBILE "THE COMPANY" WILL PROVIDE AND THE CONTRACTOR WILL INSTALL
   - A. BTS EQUIPMENT FRAME (PLATFORM) AND ICEBRIDGE SHELTER (GROUND BUILD/CO-LOCATE ONLY)
   - B. AC/TELCO INTERFACE BOX (PPC)
   - C. ICE BRIDGE (CABLE TRAY WITH COVER) (GROUND BUILD/CO-LOCATE ONLY, GC TO FURNISH AND INSTALL FOR ROOFTOP INSTALLATION)
   - D. TOWERS, MONOPOLES
   - E. TOWER LIGHTING
   - F. GENERATORS & LIQUID PROPANE TANK
   - G. ANTENNA STANDARD BRACKETS, FRAMES AND PIPES FOR MOUNTING
   - H. ANTENNAS (INSTALLED BY OTHERS)
   - I. TRANSMISSION LINE
   - J. TRANSMISSION LINE JUMPERS
   - K. TRANSMISSION LINE CONNECTORS WITH WEATHERPROOFING KITS
   - L. TRANSMISSION LINE GROUND KITS
   - M. HANGERS
   - N. HOISTING GRIPS
   - O. BTS EQUIPMENT
2. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL OTHER MATERIALS FOR THE COMPLETE INSTALLATION OF THE SITE INCLUDING, BUT NOT LIMITED TO, SUCH MATERIALS AS FENCING, STRUCTURAL STEEL SUPPORTING SUB-FRAME FOR PLATFORM, ROOFING LABOR AND MATERIALS, GROUNDING RINGS, GROUNDING WIRES, COPPER-CLAD OR XIT CHEMICAL GROUND ROD(S), BUSS BARS, TRANSFORMERS AND DISCONNECT SWITCHES WHERE APPLICABLE, TEMPORARY ELECTRICAL POWER, CONDUIT, LANDSCAPING COMPOUND STONE, CRANES, CORE DRILLING, SLEEPERS AND RUBBER MATTING, REBAR, CONCRETE CAISSONS, PADS AND/OR AUGER MOUNTS, MISCELLANEOUS FASTENERS, CABLE TRAYS, NON-STANDARD ANTENNA FRAMES AND ALL OTHER MATERIAL AND LABOR REQUIRED TO COMPLETE THE JOB ACCORDING TO THE DRAWINGS AND SPECIFICATIONS. IT IS THE POSITION OF T-MOBILE TO APPLY FOR PERMITTING AND CONTRACTOR RESPONSIBLE FOR PICKUP AND PAYMENT OF REQUIRED PERMITS.
3. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS.
4. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
6. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
7. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
8. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
9. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
11. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
12. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE T-MOBILE REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE T-MOBILE REP PRIOR TO PROCEEDING.
13. EACH CONTRACTOR SHALL COOPERATE WITH THE T-MOBILE REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
14. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE T-MOBILE CONSTRUCTION MANAGER.
15. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
16. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE T-MOBILE REP AND ENGINEER OF RECORD IMMEDIATELY.
17. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
18. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
19. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH AMERICAN TOWER CORPORATION (ATC) AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
20. CONTRACTOR SHALL FURNISH T-MOBILE AND AMERICAN TOWER CORPORATION (ATC) WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
21. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
22. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY T-MOBILE MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH T-MOBILE SPECIFICATIONS AND REQUIREMENTS.
24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO T-MOBILE FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
25. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO T-MOBILE SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
26. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
27. CONTRACTOR SHALL NOTIFY T-MOBILE REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
28. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.
29. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
30. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE T-MOBILE REP. ANY WORK FOUND BY THE T-MOBILE REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
31. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.
32. T-MOBILE FURNISHED EQUIPMENT SHALL BE PICKED-UP AT THE T-MOBILE WAREHOUSE, NO LATER THAN 48HR AFTER BEING NOTIFIED INSURED, STORED, UNCRATE, PROTECTED AND INSTALLED BY THE CONTRACTOR WITH ALL APPURTENANCES REQUIRED TO PLACE THE EQUIPMENT IN OPERATION, READY FOR USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPMENT AFTER PICKING IT UP.
33. T-MOBILE OR HIS ARCHITECT/ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT OR MATERIALS WHICH, IN HIS OWN OPINION ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, EITHER BEFORE OR AFTER INSTALLATION AND THE EQUIPMENT SHALL BE REPLACED WITH EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY THE CONTRACTOR AT NO COST TO T-MOBILE OR THEIR ARCHITECT/ENGINEER.

SPECIAL CONSTRUCTION ANTENNA INSTALLATION NOTES:

1. WORK INCLUDED:
   - A. ANTENNA AND COAXIAL CABLES ARE FURNISHED BY T-MOBILE UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OD COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND
   - B. INSTALL ANTENNA AS INDICATE ON DRAWINGS AND T-MOBILE SPECIFICATIONS.
   - C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS
   - D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT TEST.
   - E. CONTRACTOR SHALL PROVIDE FOUR (4) SETS OF SWEEP TESTS USING ANRITZU-PACKARD 8713B RF SCALAR NETWORK ANALYZER. SUBMIT FREQUENCY DOMAIN REFLECTOMETER(FDR) TESTS RESULTS TO THE PROJECT MANAGER. SWEEP TESTS SHALL BE AS PER ATTACHED RFS "MINIMUM FIELD TESTING RECOMMENDED FOR ANTENNA AND HELIAX COAXIAL CABLE SYSTEMS" DATED 10/5/93. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING SERVICE AND BE BOUND AND SUBMITTED WITHIN ONE WEEK OF WORK COMPLETION.
   - F. INSTALL COAXIAL CABLES AND TERMINATING BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTIONS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.
   - G. ANTENNA AND COAXIAL CABLE GROUNDING:
2. ALL EXTERIOR #6 GREED GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH RFS CONNECTORS/SPLICE WEATHERPROOFING KIT #221213 OR EQUAL.
3. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS)

ELECTRICAL NOTES:

1. ELECTRICAL DESIGN SHALL BE PERFORMED BY ELECTRICAL CONTRACTOR. STRUCTURAL DESIGN SHALL BE PERFORMED BY GENERAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL WORK COMPLIES WITH ALL APPLICABLE LOCAL AND STATE CODES AND NATIONAL ELECTRICAL CODE.
2. ALL SUGGESTED ELECTRICAL ELEMENTS (SUCH AS BREAKER SIZES, WIRE SIZES, CONDUITS SIZES ARE FOR ZONING PURPOSES ONLY. IT IS THE RESPONSIBILITY TO OF THE ELECTRICAL CONTRACTOR TO CONFIRM COMPLIANCE WITH LOCAL ELECTRICAL CODES AND PASS ALL APPLICABLE AND NECESSARY INSPECTIONS. IN SOME EVENTS, IT MAY BE NECESSARY TO PERFORM AN ELECTRICAL LOAD STUDY TO VERIFY THE CAPACITY OF THE EXISTING SERVICE. THIS IS NOT THE RESPONSIBILITY OF CONCORDIA. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
3. CONTRACTOR SHALL FIELD LOCATE ALL BELOW GRADE GROUND LINES AND UTILITY LINES PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR RELOCATION OF ALL UTILITIES AND GROUND LINES THAT MAY BECOME DISTURBED OR CONFLICTING IN THE COURSE OF CONSTRUCTION.

ALL DISCREPANCIES FROM WHAT IS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE COMMUNICATED TO ATC ENGINEERING IMMEDIATELY FOR CORRECTION OR RE-DESIGN. FAILURE TO COMMUNICATE DIRECTLY WITH ATC ENGINEERING OR ANY CHANGES FROM THE DESIGN CONDUCTED WITHOUT PRIOR APPROVAL FROM ATC ENGINEERING SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

AMERICAN TOWER®

Colliers Engineering & Design

www.colliersengineering.com

Doing Business as MASER CONSULTING

MADISON
135 New Road

Madison, CT 06443
Phone: 860.395.0055

COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

GENERAL NOTES

SHEET NUMBER:	REVISION:
G-002	2

SITE PLAN NOTES:

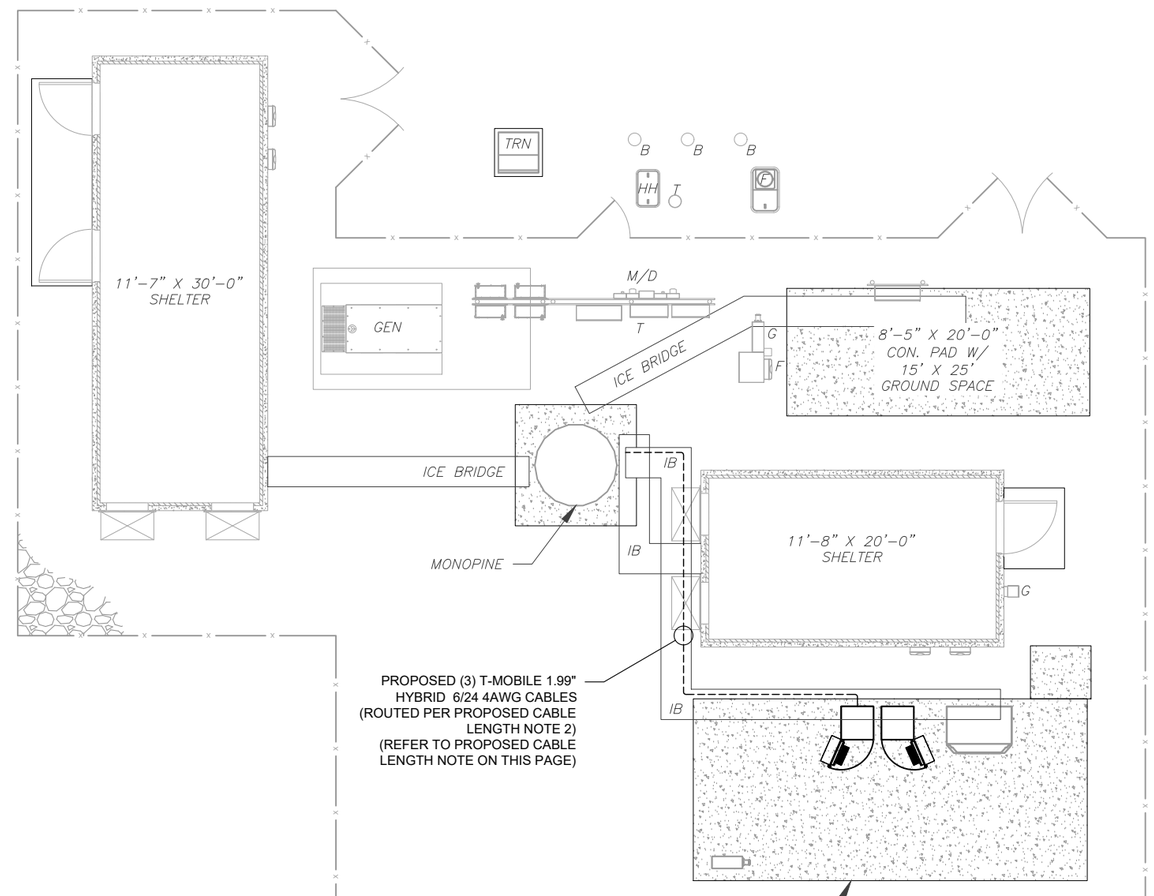
1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.

2. ICE BRIDGE, CABLE LADDER, COAX PORT, AND COAX CABLE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE UTILIZING EXISTING CABLE SUPPORTS, COAX PORTS, INSTALLING NEW PORTS OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.

3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.

LEGEND

⊗	GROUNDING TEST WELL
ATS	AUTOMATIC TRANSFER SWITCH
B	BOLLARD
CSC	CELL SITE CABINET
D	DISCONNECT
E	ELECTRICAL
F	FIBER
GEN	GENERATOR
G	GENERATOR RECEPTACAL
HH, V	HAND HOLE, VAULT
IB	ICE BRIDGE
K	KENTROX BOX
LC	LIGHTING CONTROL
M	METER
PB	PULL BOX
PP	POWER POLE
T	TELCO
TRN	TRANSFORMER
——x——	CHAINLINK FENCE



4 E-501 | 2 C-102 | 1 R-601

PROPOSED CABLE LENGTH:

1. ESTIMATED LENGTH OF PROPOSED CABLE IS **202'**. ESTIMATED LENGTH OF CABLE WAS PROVIDED BY CUSTOMER OR CALCULATED BY ADDING THE RAD CENTER AND THE DISTANCE FROM THE SHELTER ENTRY PLATE TO THE TOWER (ALONG THE ICE BRIDGE) AND A SAFETY FACTOR MEASUREMENT OF 15% (OF THE TWO PREVIOUS VALUES), CDS DEFER TO GREATEST CABLE LENGTH.
2. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.

1 DETAILED SITE PLAN

GRAPHIC SCALE

10 0 5 10

(IN FEET)
1 UNIT = 10 FEET

AMERICAN TOWER®

Colliers Engineering & Design

www.colliersengineering.com

Doing Business as MASER CONSULTING

MADISON
135 New Road

Madison, CT 06443
Phone: 860.395.0055

COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

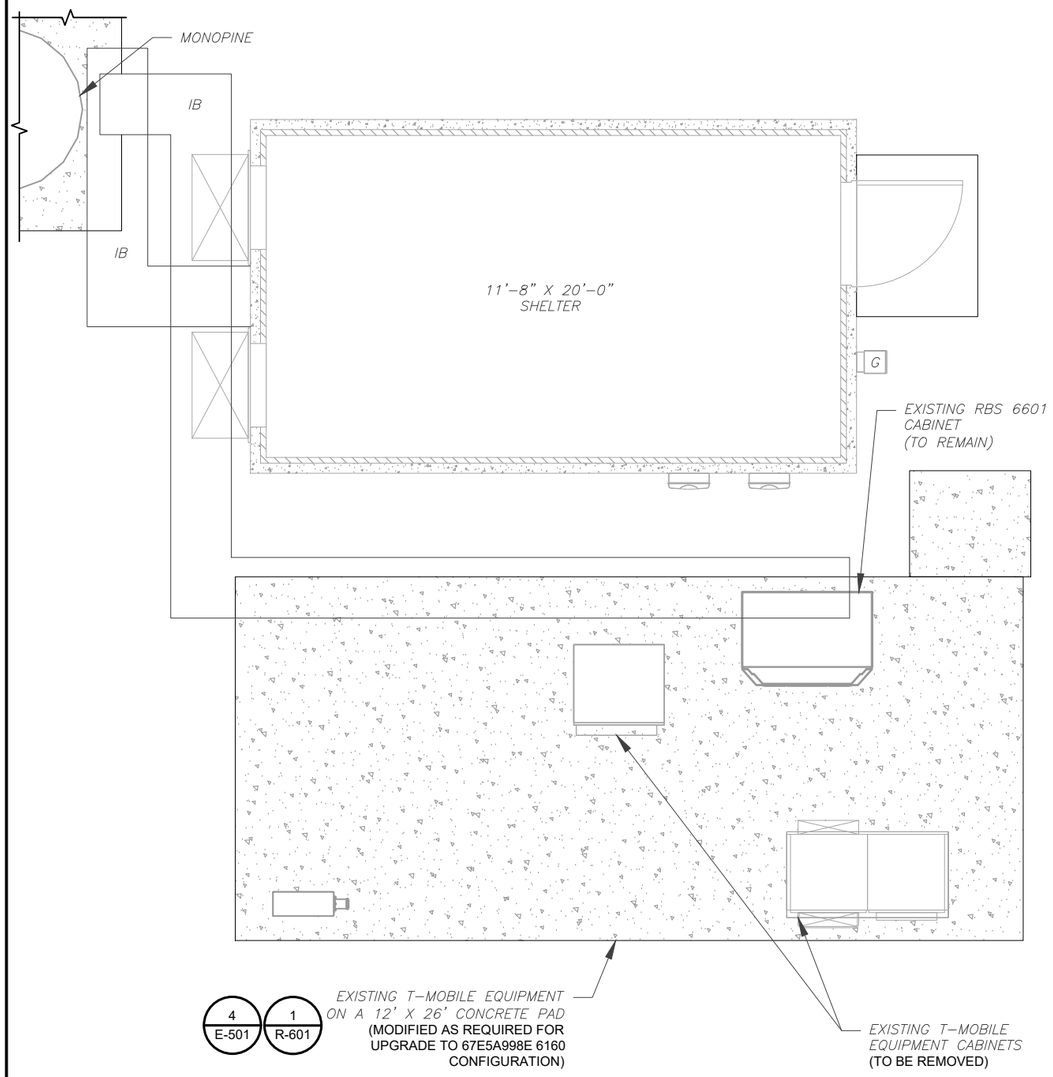
DETAILED SITE PLAN

SHEET NUMBER: C-101

REVISION: 2

SITE PLAN NOTES:

1. CONTRACTOR TO VERIFY THERE IS NO LIVE AAV FIBER RUNNING THROUGH EXISTING DEAD EQUIPMENT. IF SO, THIS WILL NEED TO BE RERUN THROUGH CONDUIT PRIOR TO REMOVING DEAD 2G (6201 CABS) EQUIPMENT.
2. REMOVE EXISTING 2G CABINETS, AND POWER / TELCO WHIPS ASSOCIATED WITH THE DEAD EQUIPMENT IF APPLICABLE.
3. ALL OPEN PORTS NEED TO BE SEALED / WEATHERPROOFED PROPERLY
4. ALL UNNEEDED / EXCESS EQUIPMENT AND GARBAGE TO BE REMOVED FROM EQUIPMENT AREA. DISPOSE OF MATERIALS PROPERLY OFF SITE.

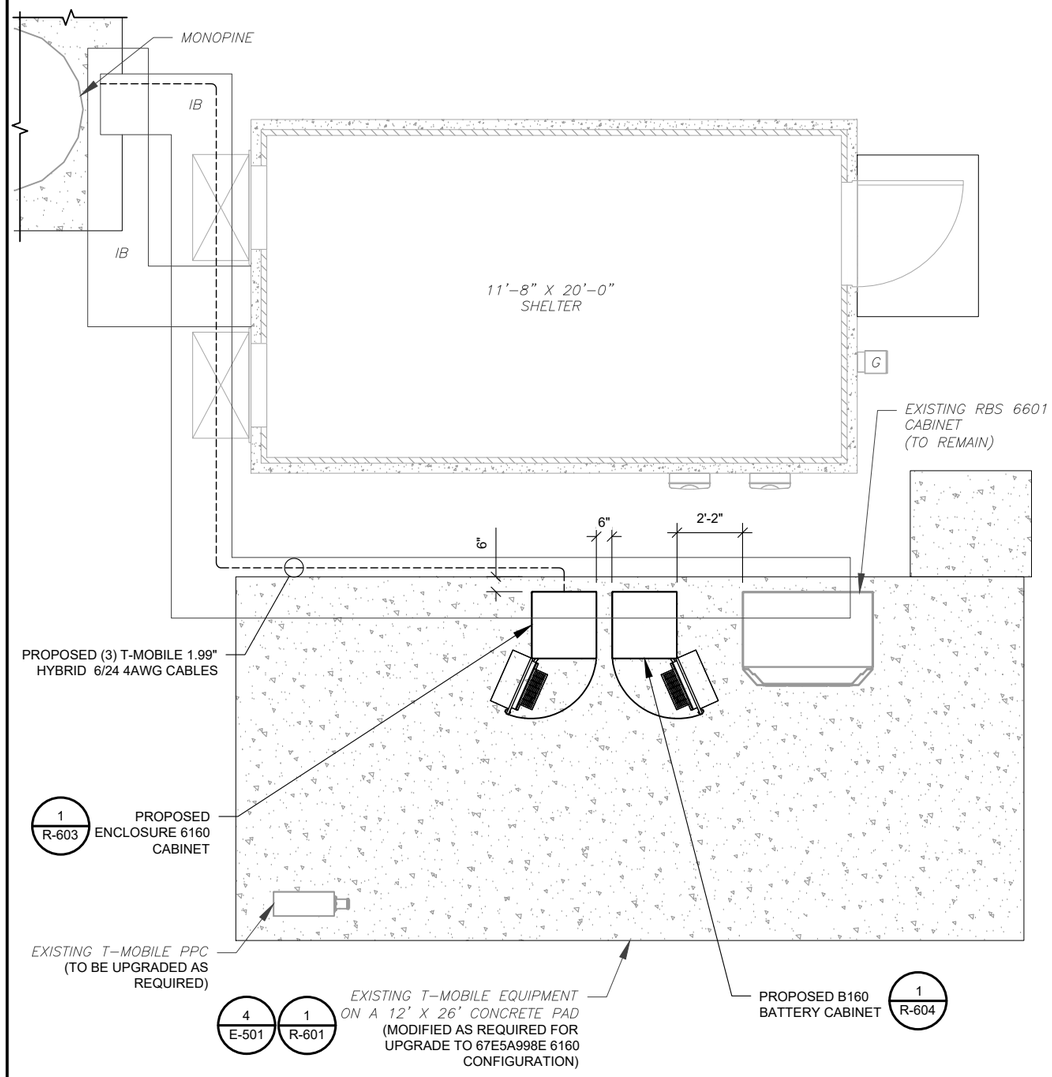


1 EXISTING GROUND EQUIPMENT LAYOUT

0 5' 10'

SCALE: 1"=5' (11X17)
1"=2.5' (22X34)

T-MOBILE CM APPROVAL REQUIRED
BEFORE INSTALLING CABINETS



2 PROPOSED GROUND EQUIPMENT LAYOUT

0 5' 10'

SCALE: 1"=5' (11X17)
1"=2.5' (22X34)

AMERICAN TOWER®

Colliers Engineering & Design

www.colliersengineering.com

Doing Business as MASER CONSULTING

MADISON
135 New Road

Madison, CT 06443
Phone: 860.395.0055

COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

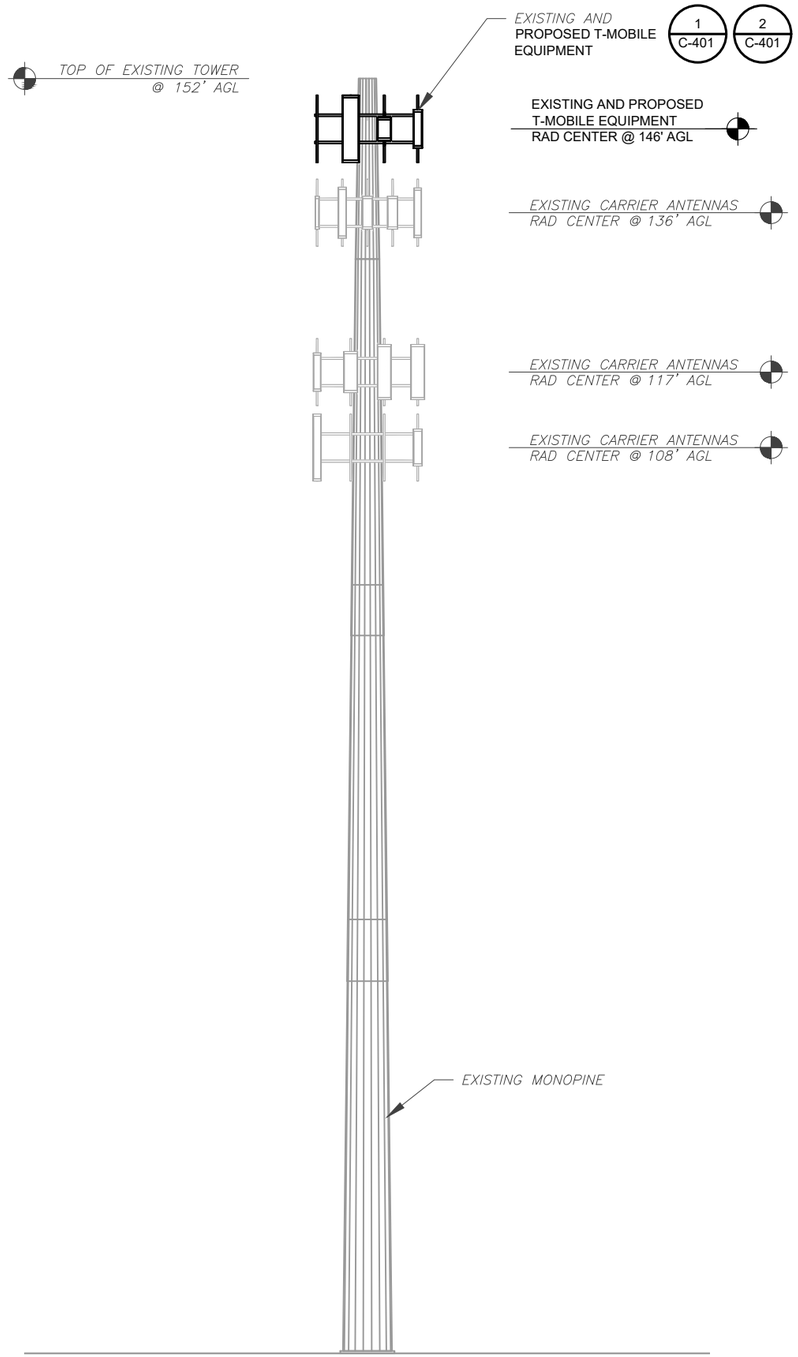
CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

DETAILED GROUND PLAN

SHEET NUMBER:	REVISION:
C-102	2



1 TOWER ELEVATION
SCALE: N.T.S.

PER MOUNT ANALYSIS COMPLETED BY AMERICAN TOWER CORPORATION, DATED 10/21/21, THE EXISTING MOUNT CAN NOT ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT REPLACEMENT PROPOSED IN THE MOUNT ANALYSIS, INCLUDED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT.

TOWER NOTE:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE PROJECT MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
2. WHERE APPLICABLE, ALL NEW ANTENNAS, EQUIPMENT, MOUNTS, CABLING, ETC. SHALL BE PAINTED/SOCKED TO MATCH EXISTING EQUIPMENT IN ACCORDANCE WITH FAA, JURISDICTION, AND/OR OTHER LOCAL REQUIREMENTS.
3. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.
4. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

AMERICAN TOWER®

Colliers Engineering & Design
www.colliersengineering.com
Doing Business as MASER CONSULTING
MADISON
135 New Road
Madison, CT 06443
Phone: 860.395.0055
COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

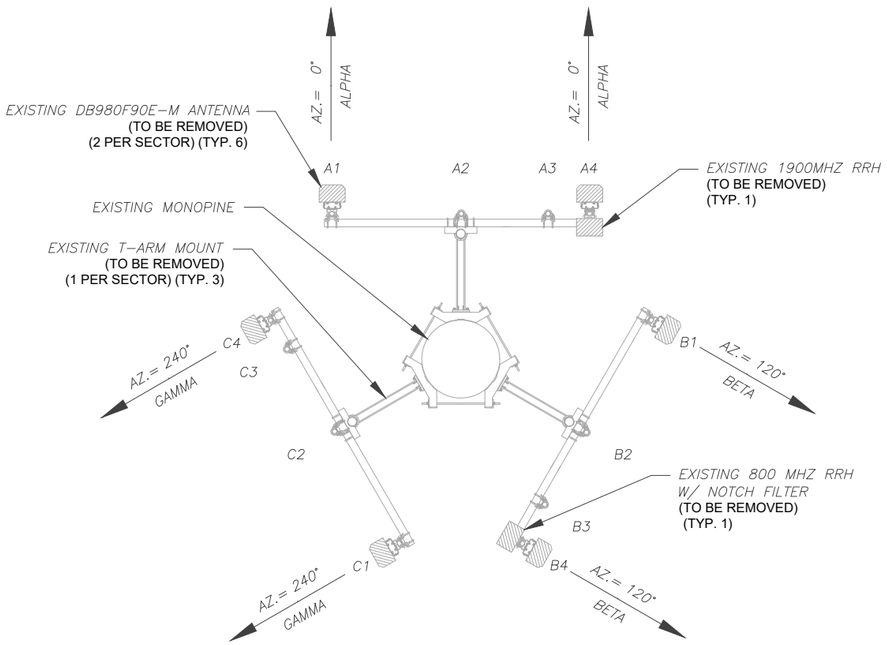
CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

TOWER ELEVATION

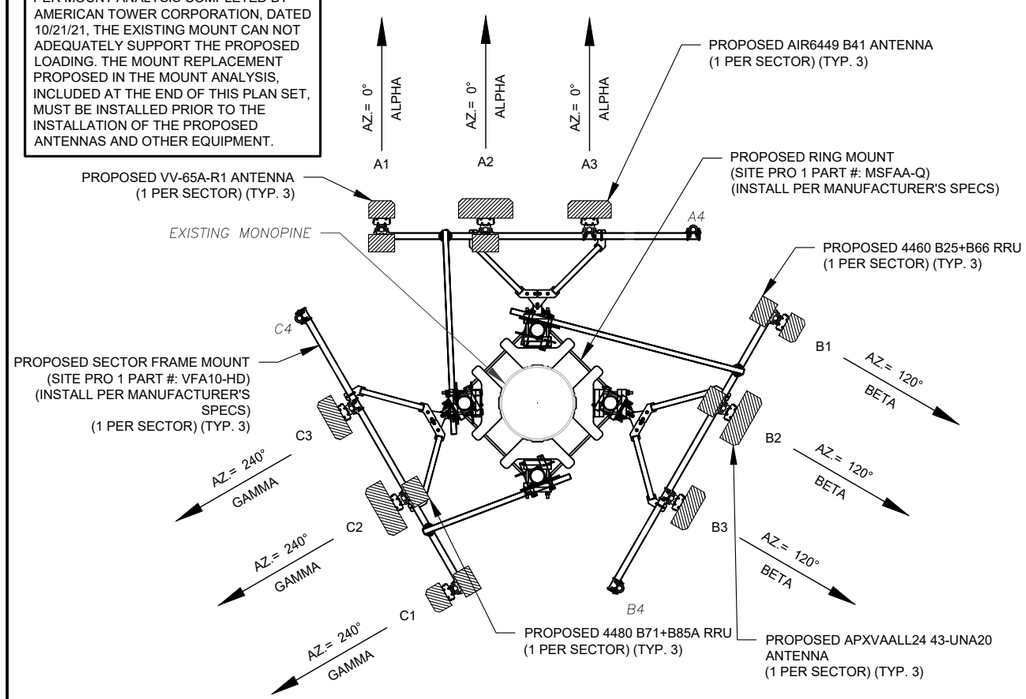
SHEET NUMBER:	REVISION:
C-201	2



1 EXISTING ANTENNA PLAN

SCALE: N.T.S.

PER MOUNT ANALYSIS COMPLETED BY AMERICAN TOWER CORPORATION, DATED 10/21/21, THE EXISTING MOUNT CAN NOT ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT REPLACEMENT PROPOSED IN THE MOUNT ANALYSIS, INCLUDED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT.



2 FINAL ANTENNA PLAN

SCALE: N.T.S.

3 EQUIPMENT SCHEDULES

EXISTING ANTENNA SCHEDULE

LOCATION			ANTENNA SUMMARY					NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	MECH/ELEC D-TILT	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	146'	0°	A1	DB980F90E-M	–	0/0	RMV	–	–
			A2	–	–	–	–	–	–
			A3	–	–	–	–	–	–
			A4	DB980F90E-M	–	0/0	RMV	1900MHz RRH	RMV
BETA	146'	120°	B1	DB980F90E-M	–	0/0	RMV	–	–
			B2	–	–	–	–	–	–
			B3	–	–	–	–	–	–
			B4	DB980F90E-M	–	0/0	RMV	800 MHZ RRH W/ NOTCH FILTER	RMV
GAMMA	146'	240°	C1	DB980F90E-M	–	0/0	RMV	–	–
			C2	–	–	–	–	–	–
			C3	–	–	–	–	–	–
			C4	DB980F90E-M	–	0/0	RMV	–	–

NOTES

1. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
2. CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.

STATUS ABBREVIATIONS

RMV: TO BE REMOVED
RMN: TO REMAIN
REL: TO BE RELOCATED
ADD: TO BE ADDED

CABLE LENGTHS FOR JUMPERS

JUNCTION BOX TO RRU: 15'
RRU TO ANTENNA: 10'

FINAL ANTENNA SCHEDULE

LOCATION			ANTENNA SUMMARY					NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	MECH/ELEC D-TILT	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	146'	0°	A1	VV-65A-R1	G1900/L1900/L2100	0/0	ADD	4460 B25+B66	ADD
			A2	APXVAALL24_43-U-NA20	L600/N600/L700	0/0	ADD	4480 B71+B85A	ADD
			A3	AIR6449 B41	L2500/N2500	0/0	ADD	-	-
			A4	-	-	-	-	-	-
BETA	146'	120°	B1	VV-65A-R1	G1900/L1900/L2100	0/0	ADD	4460 B25+B66	ADD
			B2	APXVAALL24_43-U-NA20	L600/N600/L700	0/0	ADD	4480 B71+B85A	ADD
			B3	AIR6449 B41	L2500/N2500	0/0	ADD	-	-
			B4	-	-	-	-	-	-
GAMMA	146'	240°	C1	VV-65A-R1	G1900/L1900/L2100	0/0	ADD	4460 B25+B66	ADD
			C2	APXVAALL24_43-U-NA20	L600/N600/L700	0/0	ADD	4480 B71+B85A	ADD
			C3	AIR6449 B41	L2500/N2500	0/0	ADD	-	-
			C4	-	-	-	-	-	-

FINAL FIBER DISTRIBUTION / OVP BOX		FINAL CABLING SUMMARY		
MODEL NUMBER	STATUS	COAX	HYBRID	STATUS
-	-	-	(3)1.99" 6/24 4AWG HYBRID CABLES	ADD

AMERICAN TOWER®

Colliers Engineering & Design

www.colliersengineering.com

Doing Business as MASER CONSULTING

MADISON
135 New Road

Madison, CT 06443
Phone: 860.395.0055

COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

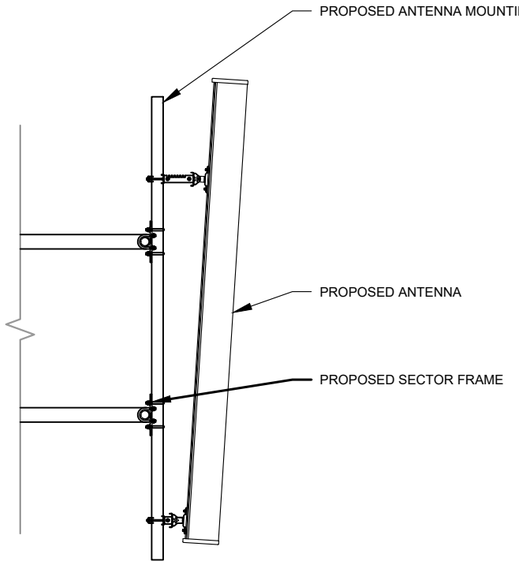
CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

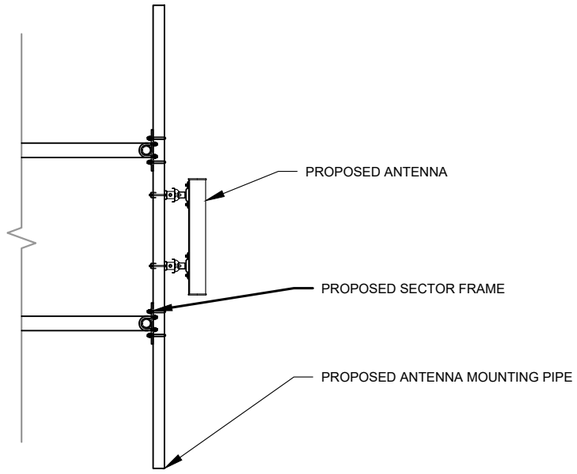
ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-401	2



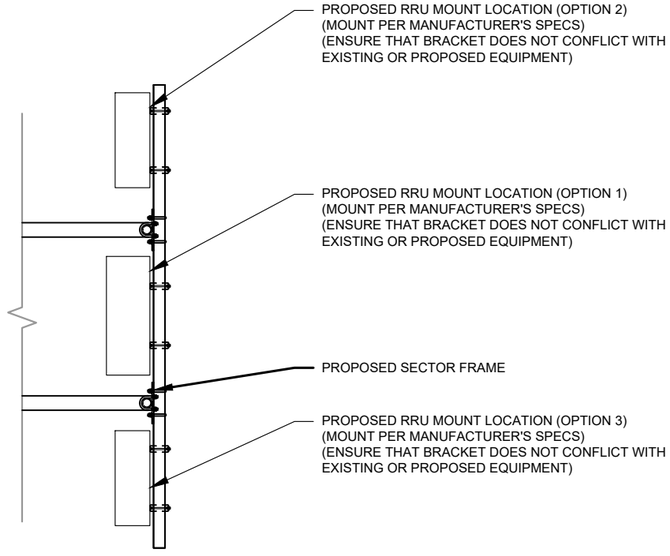
1 PROPOSED ANTENNA MOUNTING DETAIL - TYPICAL

SCALE: N.T.S.



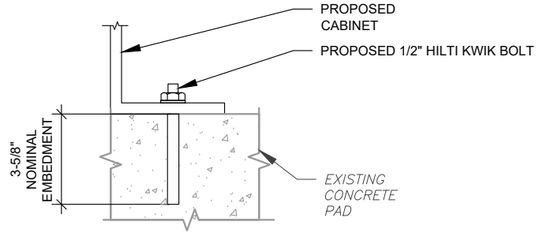
2 PROPOSED 5G ANTENNA MOUNTING DETAIL - TYPICAL

SCALE: N.T.S.



3 PROPOSED RRU MOUNTING DETAIL - TYPICAL

SCALE: N.T.S.



NOTE:

INSTALL HILTI KWIK BOLT ANCHORS STRICTLY PER INSTALLATION INSTRUCTIONS INCLUDED WITH PRODUCT OR FOUND ONLINE AT WWW.US.HILTI.COM. PROPER INSTALLATION IS CRITICAL FOR FULL PERFORMANCE.

4 CABINET ATTACHMENT DETAIL

SCALE: NOT TO SCALE

AMERICAN TOWER®

Colliers Engineering & Design

www.colliersengineering.com

Doing Business as MASER CONSULTING

MADISON
135 New Road

Madison, CT 06443
Phone: 860.395.0055

COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

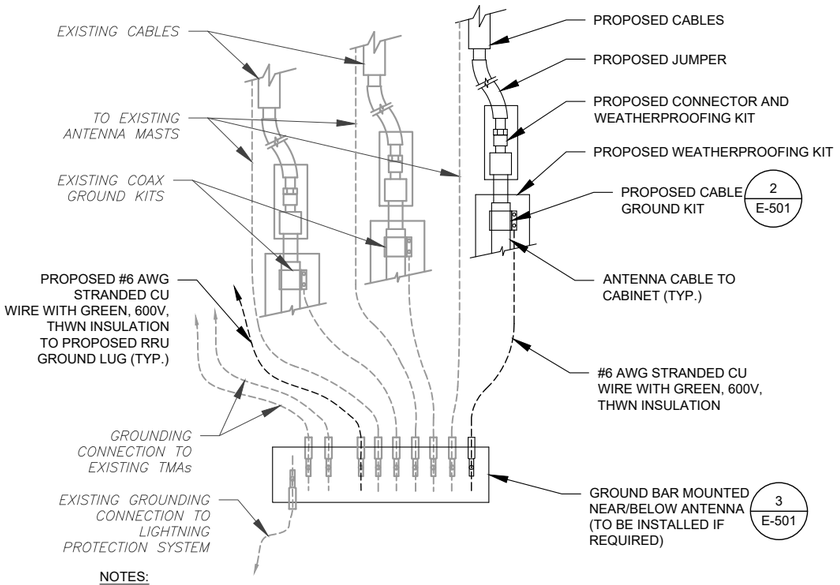
CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-501	2

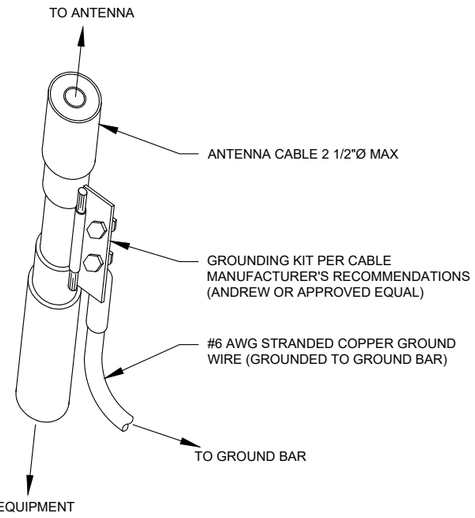


NOTES:

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH T-MOBILE GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH T-MOBILE GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

1 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: N.T.S.

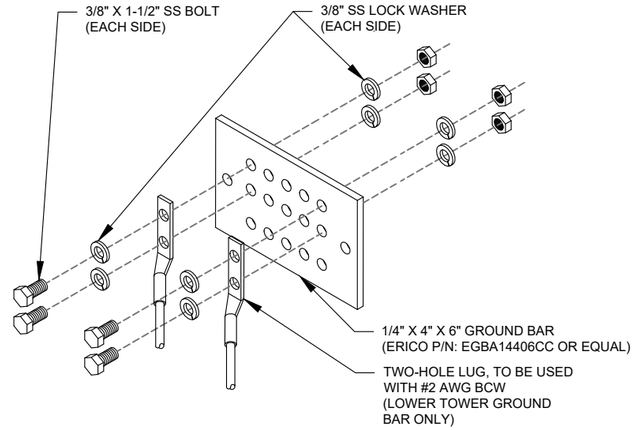


GROUND KIT NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. CONTRACTOR SHALL PROVIDE WEATHERPROOFING KIT (ANDREW PART NUMBER 221213) AND INSTALL/TAPE PER MANUFACTURER'S SPECIFICATIONS.

2 CABLE GROUND KIT CONNECTION DETAIL

SCALE: N.T.S.



GROUND BAR NOTES:

1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

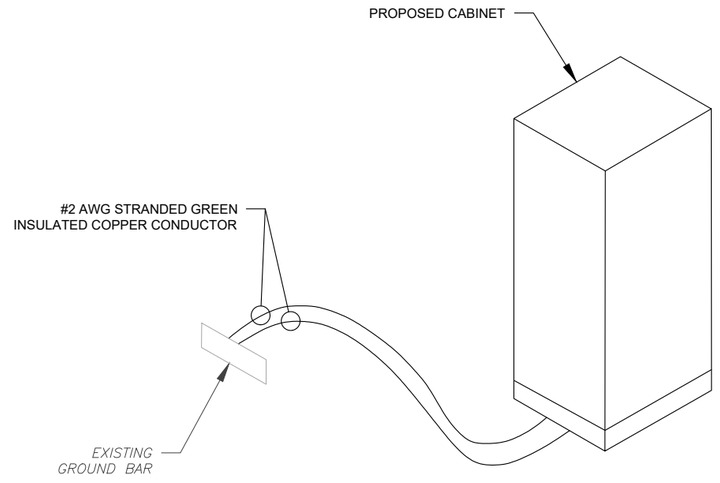
3 TOWER GROUND BAR DETAIL

SCALE: N.T.S.

ELECTRICAL NOTES:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.
2. ATC HAS NOT VERIFIED ANY EXISTING T-MOBILE GROUND EQUIPMENT OR ELECTRICAL LOADING. PROPOSED WORK BASED ON INSTALLATION CONFIGURATION PROVIDED BY T-MOBILE. CONTRACTOR TO VERIFY EXISTING T-MOBILE PANEL HAS SUFFICIENT SPACE FOR PROPOSED BREAKER. PROPOSED CABLE AND CONDUIT SHALL BE MINIMUM SIZE PER BELOW IN CHART.
3. FOR SPECIFIC CABINET / ANCILLARY EQUIPMENT WIRING REQUIREMENTS, THE T-MOBILE CONTRACTOR SHOULD REFERENCE DESIGN DOCUMENTS PROVIDED BY T-MOBILE FOR THIS CURRENT PROJECT CONFIGURATION, IN ACCORDANCE WITH LOCAL JURISDICTION REQUIREMENTS & NEC STANDARDS & PRACTICES.

OCPD SIZE	WIRE SIZE	GROUND SIZE	CONDUIT SIZE
80A/2P	2#3 AWG	#8 AWG	1-1/4"
100/2P	2#2 AWG	#8 AWG	1-1/4"
125A/2P	2#1 AWG	#8 AWG	1-1/2"
150A/2P	2#1/0 AWG	#8 AWG	1-1/2"



4 CABINET GROUNDING DETAIL

SCALE: N.T.S.

AMERICAN TOWER®

Colliers Engineering & Design

www.colliersengineering.com

Doing Business as MASER CONSULTING

MADISON
135 New Road

Madison, CT 06443
Phone: 860.395.0055

COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

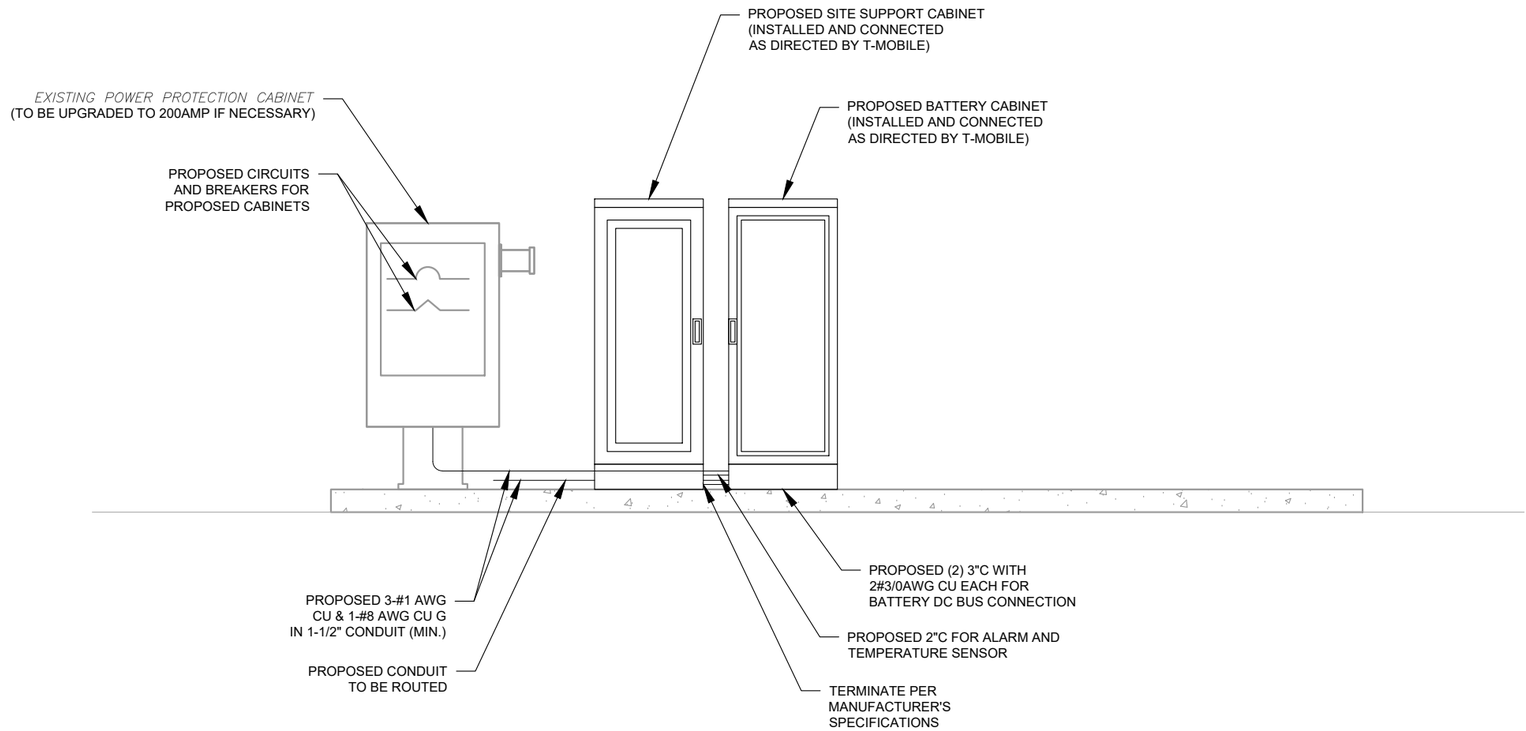
GROUNDING DETAILS

SHEET NUMBER:	REVISION:
E-501	2

NOTES:
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTSOF THE 2017 EDITION OF NATIONAL ELECTRICAL CODE (NEC), NATIONAL ELECTRICAL SAFETY CODE, NAPA, NETA, OSHA, AND ALL OTHER EXISTING CODES AND REGULATIONS OF AUTHORITIES WHICH WOULD HAVE JURISDICTION.

2. ALL NEW WIRING SHALL BE WITH THWN-2 OR XHHW-2 INSULATION AND RATED FOR 75 DEG CELSIUS.

3. ALL UNDERGROUND CONDUIT SHALL BE PVC SCH40. ALL ABOVE GROUND CONDUIT SHALL BE PVC SCH80 OR RMC.



1 ELECTRICAL UPGRADE DIAGRAM
SCALE: NOT TO SCALE

ELECTRICAL NOTES:

1. THIS DIAGRAM REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.
3. ATC HAS NOT YET VERIFIED ANY EXISTING T-MOBILE GROUND EQUIPMENT OR ELECTRICAL LOADING. PROPOSED WORK BASED ON INSTALLATION CONFIGURATION PROVIDED BY T-MOBILE. CONTRACTOR TO VERIFY EXISTING T-MOBILE PANEL HAS SUFFICIENT SPACE FOR PROPOSED BREAKER.

AMERICAN TOWER®

Colliers Engineering & Design
www.colliersengineering.com
Doing Business as MASER CONSULTING
MADISON
135 New Road
Madison, CT 06443
Phone: 860.395.0055
COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	AJC	08/26/21
B	REVISED PER COMMENTS	RMD	09/02/21
0	FOR CONSTRUCTION	AMN	09/21/21
1	FOR CONSTRUCTION	AMN	10/27/21
2	FOR CONSTRUCTION	RMD	11/08/21

ATC SITE NUMBER:
411181

ATC SITE NAME:
BARKHAMSTEAD CT

T-MOBILE SITE NAME:
CTNH617A

SITE ADDRESS:
50 RUST ROAD
BARKHAMSTED, CT 06063

SEAL:

CT. C.O.A. JPC.0000131

T-Mobile

DATE DRAWN:	08/26/21
ATC JOB NO:	13709505_G3
CUSTOMER ID:	CTNH617A
CUSTOMER #:	CTNH617A

ELECTRICAL UPGRADE DIAGRAM

SHEET NUMBER:	REVISION:
E-502	2

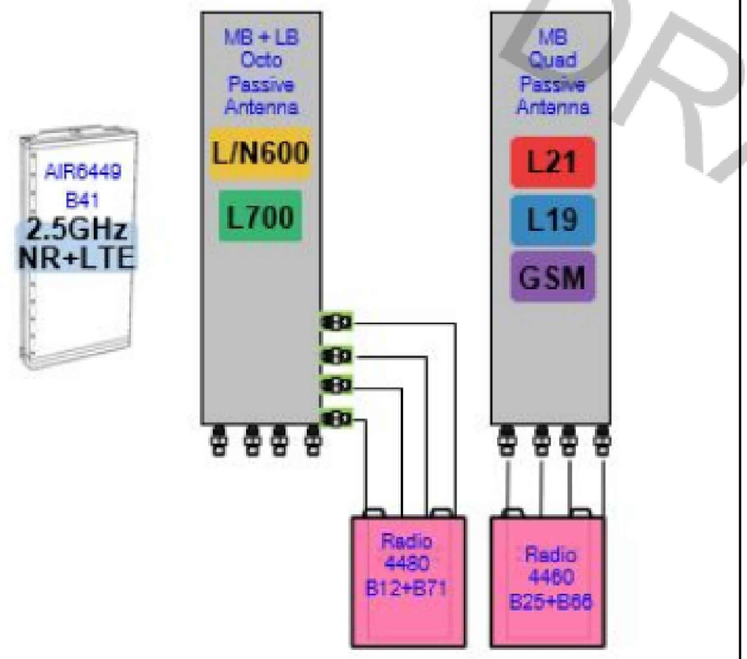
Proposed RAN Equipment			
Template: 67E5A998E 6160			
Enclosure	**1**	**2**	**3**
Enclosure Type	Enclosure 6160	RBS 6601	B160
Baseband	BB 6648 (L700, L600, N600) BB 6648 (L2500, N2500) BB 6648 (L2100, L1900)	DUG20 (G1900)	
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 100m (x 3)		
Transport System	CSR IXRe V2 (Gen2)		

RAN Scope of Work:

MonoPine with T-Arm Mounts, possible upgraded needed
200 amp existing
61% SA
Shared generator

1 CABINET CONFIGURATION
SCALE: NOT TO SCALE

67E5A998E.JPG



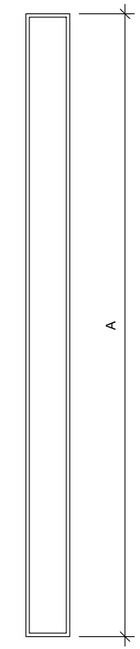
Notes:

2 ANTENNA CONFIGURATION
SCALE: NOT TO SCALE

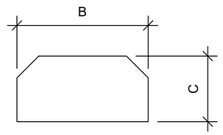
NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-601	-



FRONT VIEW

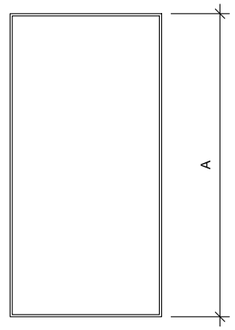


TOP VIEW

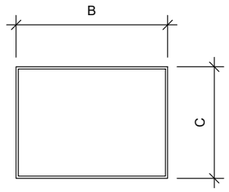
1 ANTENNA SPECIFICATIONS

FOR ILLUSTRATIVE PURPOSES ONLY - NOT TO SCALE

ANTENNA SPECIFICATIONS				
ANTENNA MODEL	A	B	C	WEIGHT (LBS)
VV-65A-R1	54.7"	12.0"	4.6"	24.7
AIR6449 B41	33.1"	20.6"	8.6"	104.0
APXVAALL24 43-U-NA20	95.9"	24.0"	8.5"	122.8



FRONT VIEW



TOP VIEW

2 RRU SPECIFICATIONS

FOR ILLUSTRATIVE PURPOSES ONLY - NOT TO SCALE

RRU SPECIFICATIONS				
RRU MODEL	A	B	C	WEIGHT (LBS)
4460	19.6"	15.7"	12.1"	109.0
4480	21.8"	15.7"	7.5"	84.0

SUPPLEMENTAL

SHEET NUMBER: R-602

REVISION: -

Enclosure 6160 AC

The Enclosure 6160 is a multi-purpose site cabinet designed to support a multitude of equipment such as ERS Baseband, Transport, Li-Ion battery and 3PP vendor equipment. It also provides a highly capable power system and battery back-up - all in a streamlined design and minimized footprint to support cost efficient expansion of mobile broadband.

Being an all-in-one enclosure, the Enclosure 6160 is a very fitting choice for all types of sites where the capacity need is large or room for future expansion is needed. It is ideally used for modernizing existing sites or in greenfield scenarios to match both current and future needs.

With a robust design, IP65 compliance and a sealed Heat Exchanger (HEX) climate system the Enclosure 6160 ensures optimal environmental protection of the active equipment - enabling them for a long-lasting service. The complete system is also integrated and verified for the entire Ericsson Radio System and ensures best-in-class service.

The power system offers 31,5kW of power in total and provides 24kW of -48V DC power for both internal and external consumers.

The equipment space allows 19U of rack space ensuring well enough capacity for existing need and future expansion.

One of the main advantages of the Enclosure 6160 is its default integration with ENM - allowing for advanced remote monitoring and control such a fault management (alarms), inventory management and performance measurements. The cabinet also provides an open O&M interface for integration to 3PP O&M systems.

Preliminary technical specification for Enclosure 6160 AC

CAPACITY	
Rack space user equipment	19U (19" rack)
Hardware capabilities	Power and CPRI support for multi-standard remote radios (RRU or AIR) ERS Baseband and Transport units Li-Ion batteries 3PP equipment Additional power feed available as option
MECHANICAL SPECIFICATION	
Weight	145 kg (excluding active equipment) 320 lbs (excluding active equipment)
Dimension (H x W x D)	1600 x 650 x 650 mm (incl. Base frame) 63 x 26 x 26 in. (incl. Base frame)
Base frame height	150 mm 6 in.
Mounting position	Ground
Enclosure material	Aluminum
Color	Power paint NCS 2002-B
Door	Front access
Rack type	19" (IEC 60297-3-100)
Locking type	Pad lock or Cylinder
POWER SYSTEM	
Input voltage	3P+N+PE: 346/200-415/240 VAC 2P+N+PE: 208/120-220/127 VAC 1P+N+PE: 200-250 VAC
Input power	<33kW
Output load (-48VDC)	24kW
Total capacity (-48VDC)	31.5kW
AC SPD	Class 2/Type 2
DC SPD	Class 2/Type 2
PSU Slots	9x
Service outlet	Optional
Priority load	8x Circuit Breaker
LLVD 1	6x Circuit Breaker
LLVD 2	6x Circuit Breaker
CB ratings	3A / 5A / 10A / 15A / 20A / 25A / 30A / 40A / 50A / 60A / 80A / 100A
Battery Interface	2x Circuit Breaker
Battery Circuit Breaker rating	125A 2pol (200A)
PSU capacity	3500W

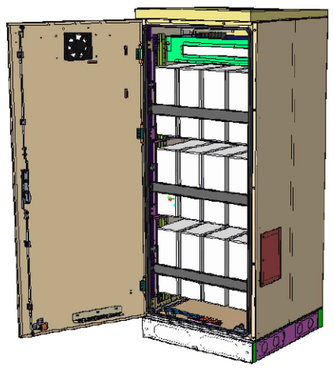
NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

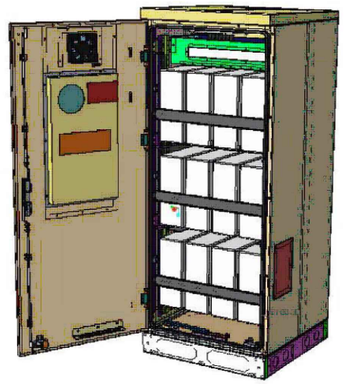
SHEET NUMBER: R-603

REVISION: -

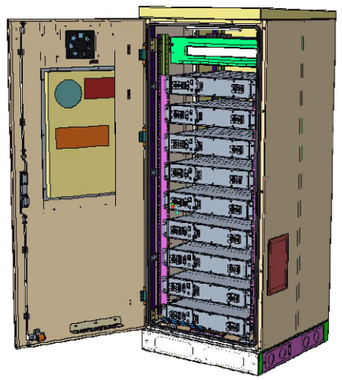
Enclosure B160



Enclosure B160
AirCon + VRLA



Enclosure B160
AirCon + Li-Ion



Enclosure B160
Convection Cooling
+ VRLA

Enclosure B160

Capacity
- VRLA 12V: 100Ah / 150Ah / 170Ah / 190Ah / 210Ah
- Li-Ion: 24U 19" / 23"
- Sodium-Nickel: 3x FIAMM

Electrical specification
- DC Output: -48VDC/200A
- Battery breakers: 2x 125/2p
- Alarms: Door open, Climate failure, MCB Connection

Mechanical specification
- Weight: 134kg
- Dimensions: 63 x 26 x 26 in. (incl. Base frame)
- Base frame height: 6 in.
- Material: Galvanized steel (180g/m^2)
- Color: Powder paint NCS 2002-B
- Door: Front access
- Locking type: Pad lock / cylinder

Environmental specification
- Ingress protection: VRLA/Sodium IP44
Li-Ion IP55
- Relative humidity: 15-100%

Climate system
- Air Conditioner
  - Fan type: DC
  - Cooling capacity: 500W @L35/L35
- Convection cooling
  - Emergency fan

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER: R-604

REVISION: -

AMERICAN TOWER®
CORPORATION

Mount Analysis Report

ATC Site Name	:	**Barkhamstead CT, CT**
ATC Site Number	:	**411181**
Engineering Number	:	**13709505_C8_07**
Mount Elevation	:	**146 ft**
Carrier	:	**Sprint Nextel**
Carrier Site Name	:	**CTNH617A**
Carrier Site Number	:	**CTNH617A**
Site Location	:	**50 Rust Road** **BARKHAMSTED, CT 06063-3314** **41.893808 , -72.996472**
County	:	**Litchfield**
Date	:	**October 21, 2021**
Max Usage	:	**53%**
Result	:	**Pass**

Prepared By:
Garrett Williams
Structural Engineer

Garrett Williams

Reviewed By:

STATE OF CONNECTICUT · ESHA KAUSHAL MODI · 32593 · LICENSED PROFESSIONAL ENGINEER

Authorized by "EOR"
21 Oct 2021 08:46:30 cosign

COA: PEC.0001553

Application Loading

Mount Centerline (ft)	Equipment Centerline (ft)	Qty	Equipment Manufacturer & Model
146.0	146.0	3	Commscope VV-65A-R1
		3	RFS APXVAALL24 43-U-NA20
		3	Ericsson Air6449 B41
		3	Ericsson Radio 4460 B25+B66
		3	Ericsson Radio 4480 B71+B85A
50.0	50.0	1	PCTEL GPS-TMG-HR-26N

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Horizontals	43%	Pass
Verticals	53%	Pass
Diagonals	20%	Pass
Tie-Backs	5%	Pass
Mount Pipes	35%	Pass

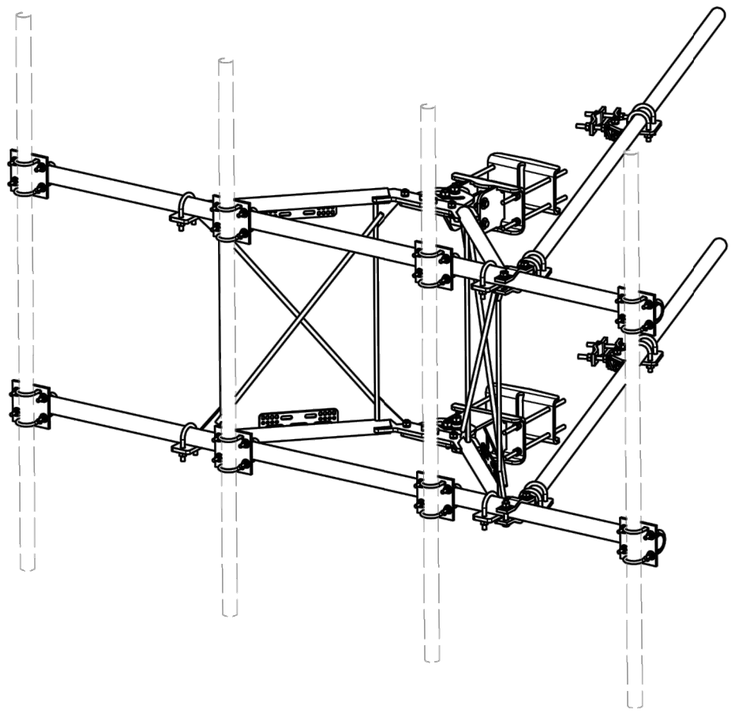
A.T. Engineering Service, PLLC - 3500 Regency Parkway, Suite 100 - Cary, NC 27518 - 919.468.0112 Office - 919.466.5414 Fax - www.americantower.com

1 MOUNT ANALYSIS

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONSTRUCTION.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-605	-



PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-VFAW	SUPPORT ARM		71.41	142.81
2	1	X-HDCAMTBW	CLAMP WELDMENT FOR BCAM-HD		33.86	33.86
3	1	X-MHTPHD	MULTI-HOLE TAPER PLATE WELDMENT		36.24	36.24
4	2	X-VFAPL4	VFA-HD PIVOT PLATE	12 in	15.88	31.77
5	2	X-LCBP4	BENT BACKING PLATE	13 in	19.00	38.01
6	1	X-HDCAMSS	ANGLE ADJUSTMENT WELDMENT FOR BCAM-HD		16.39	16.39
7	4	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	23.49
8	1	X-HDCAMSP	POSITIONING PLATE WELDMENT FOR BCAM-HD		2.58	2.58
9	4	X-TBCA	TIE BACK CLIP ANGLE		2.01	8.02
10	8	SCX2	CROSSOVER PLATE	7 in	4.80	38.37
11	4	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	14.37
12	8	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.36	18.90
13	2	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
14	2	P30126	2-7/8" O.D. X 126" SCH. 40 PIPE	126 in	64.63	129.25
15	4	A34212	3/4" x 2-1/2" UNC HEX BOLT (A325)	2 1/2 in	0.48	1.92
16	4	G34FW	3/4" HDG USS FLATWASHER		0.06	0.24
17	4	G34LW	3/4" HDG LOCKWASHER		0.04	0.17
18	4	G34NUT	3/4" HDG HEAVY 2H HEX NUT		0.21	0.85
19	8	G58R-18	5/8" x 18" THREADED ROD (HDG.)	18 in	0.40	3.19
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
22	4	X-UB5300	5/8" X 3" X 5-1/4" X 2-1/2" U-BOLT (HDG.)		1.15	4.60
23	8	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	8.00
24	2	G5807	5/8" x 7" HDG HEX BOLT GR5 FULL THREAD	7 in	0.70	1.41
25	1	G5806	5/8" x 6" HDG HEX BOLT GR5 FULL THREAD	6 in	0.62	0.62
26	8	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	3.55
27	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
28	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
29	25	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.76
30	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
31	71	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.22
32	32	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	23.64
33	16	X-UB1212	1/2" X 2" X 3" X 1-1/4" U-BOLT (HDG.)		0.60	9.56
34	64	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.18
35	64	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.89
36	64	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.58
					TOTAL WT. #	713.44

REVISION HISTORY

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION T0 BCAM CONNECTION		CEK	12/14/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/28/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

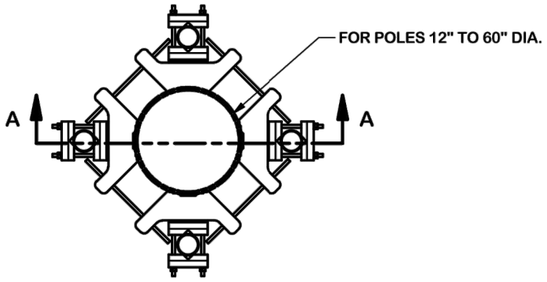
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 1/25/2017		VFA10-HD	1 OF 5
CLASS / SUB	DRAWING USAGE	CHECKED BY	DWG. NO.	
81 / 02	CUSTOMER	BMC 12/14/2017	VFA10-HD	

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

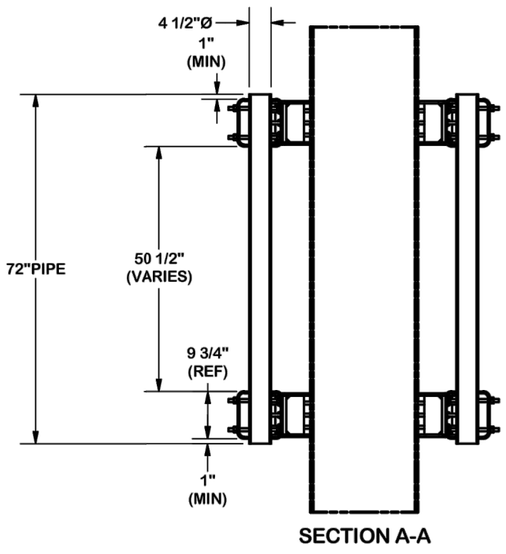
SUPPLEMENTAL

SHEET NUMBER: R-606

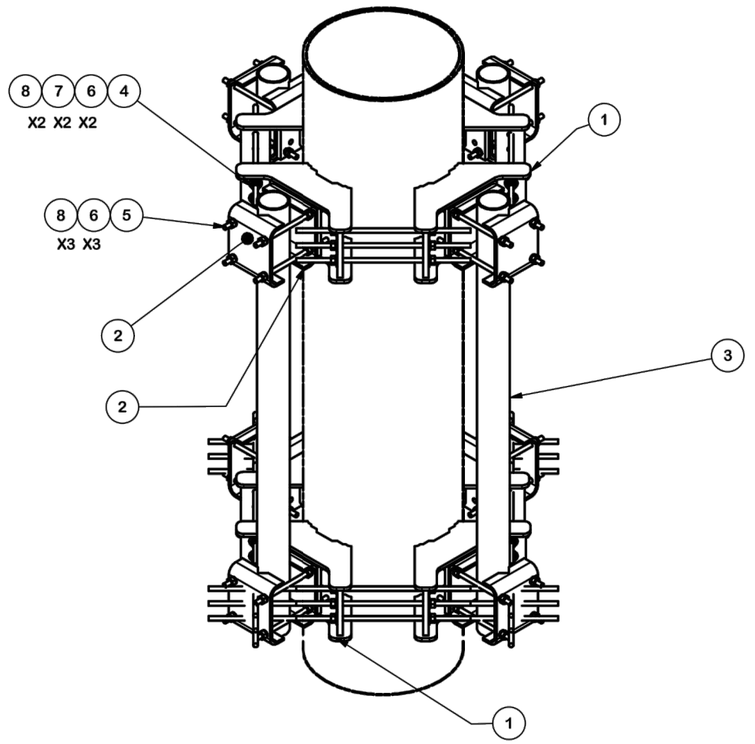
REVISION: -



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	8	X-UQB4	QUAD BRACKET WELDMENT		61.57	492.54
2	16	X-214130	BENT PLATE V-CLAMP	12 5/8 in	11.43	182.88
3	4	P472	4-1/2" X 72" SCH. 40 GALVANIZED PIPE	72 in	64.81	259.25
4	12	G58R-48	5/8" X 48" THREADED ROD (HDG.)		4.43	53.19
4	24	G58R-24	5/8" X 24" THREADED ROD (HDG.)		2.22	53.19
5	32	G58R-14	5/8" x 14" THREADED ROD (HDG.)		1.22	39.03
6	48	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	3.38
7	144	G58LW	5/8" HDG LOCKWASHER		0.03	3.76
8	144	A58NUT	5/8" HDG A325 HEX NUT		0.13	18.70
					TOTAL WT. #	1105.92



SECTION A-A



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS AND ANGLES ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

DESCRIPTION
MONOPOLE QUAD SECTOR FRAME ATTACHEMENT ASSEMBLY

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX
Tampa, FL

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	JET 8/7/2019	8/8/2019	MSFAA-Q	1 OF 1
CLASS 01 / SUB 01	DRAWING USAGE: CUSTOMER	CHECKED BY: BMC 8/8/2019	DWG. NO.: MSFAA-Q	

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-607	-

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

TOWER ENGINEERING PROFESSIONALS

Structural Analysis Report

Structure	:	**145 ft Monopine**
ATC Site Name	:	**Barkhamstead CT,CT**
ATC Site Number	:	**411181**
Engineering Number	:	**13741901_C3_01**
Proposed Carrier	:	**SPRINT NEXTEL**
Carrier Site Name	:	**CTNH617A**
Carrier Site Number	:	**CTNH617A**
Site Location	:	**50 Rust Road** **BARKHAMSTED, CT 06063-3314** **41.8938, -72.9965**
County	:	**Litchfield**
Date	:	**November 8, 2021**
Max Usage	:	**61%**
Result	:	**Pass**

Prepared By:

Austin Wilson
TEP

Reviewed By:

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

11/08/2021

COA : PEC.0001553

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 145 ft Monopine to reflect the change in loading by SPRINT NEXTEL.

Supporting Documents

Tower Drawings	Summit, PJF Job #29200-1316, dated September 5, 2000 Mapping by Geostructural Site #411181, dated February 22, 2016
Foundation Drawing	Summit, PJF Job #29200-1316, dated September 5, 2000
Geotechnical Report	Clarence Welti Project: AT&T Tower Site, dated March 27, 2000
Mount Analysis	ATC Engineering Job # 13709505_C8_07, dated October 21, 2021

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	115 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.00" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Topographic Category:	1
Spectral Response:	Ss = 0.17, S_1 = 0.05
Site Class:	D - Stiff Soil - Default

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
146.0	3	RFS APXVAALL24 43-U-NA20	Sitepro VFA10-HD Sector Frames	(3) 1.99" (50.7mm) Hybrid	SPRINT NEXTEL
	3	Ericsson Radio 4480 B71+B85A			
	3	Ericsson Air6449 B41			
	3	Ericsson Radio 4460 B25+B66			
136.0	3	Amphenol Antel BXA-70063-6CF-EDIN-X	T-Arms	(2) 1 1/4" Hybriflex Cable (12) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
134.0	6	Commscope SBNHH-1D65B (72.9")			
	3	Samsung B2/B66A RRH-BR049			
	4	Antel LPA-80063/4CF			
	2	Antel LPA-80080/4CF ___			
	3	Samsung B5/B13 RRH-BR04C			
	1	RFS DB-C1-12C-24AB-0Z			
	3	Samsung MT6407-77A			
131.0	1	VZW Unused Reserve (17134.86 sqin)			
117.0	2	Kathrein Scala 80010964	T-Arms	(2) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6 (12) 1 1/4" Coax (2) 2" conduit (3) 3" conduit	AT&T MOBILITY
	3	Powerwave Allgon 7770.00			
	1	Raycap DC6-48-60-18-8C-EV			
	1	Raycap DC6-48-60-18-8C			
	3	Ericsson RRUS 4478 B14			
	3	Ericsson RRUS 4449 B5, B12			
	3	Ericsson RRUS 8843 B2, B66A			
	6	Powerwave Allgon TT19-08BP111-001			
	6	Powerwave Allgon LGP21901			
	1	Andrew ABT-DMDF-ADBH			
	1	Raycap DC6-48-60-18-8F(32.8 lbs)			
	4	Kathrein Scala 80010965			
104.0	1	Generic E-911 GPS	T-Arms	(18) 1 5/8" Coax (1) 1/2" Coax	T-MOBILE
	3	Ericsson KRY 112 71			
	6	RFS APX16DWV-16DWV-S-E-ACU			
	3	Commscope LNX-6515DS-A1M (50.3 lb)			
	3	RFS ATMAP1412D-1A20			
50.0	1	PCTEL GPS-TMG-HR-26N	Flush	(1) 1/2" Coax	SPRINT NEXTEL

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
146.0	3	RFS APX16DWV-16DWVS-E-A20	-	-	SPRINT NEXTEL

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
146.0	3	Commscope VV-65A-R1	Sitepro VFA10-HD Sector Frames	-	SPRINT NEXTEL

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	61%	Pass
Shaft	57%	Pass
Base Plate	43%	Pass
Flange	28%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	5406.0	43%
Axial (Kips)	71.2	8%
Shear (Kips)	50.1	37%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
146.0	Commscope VV-65A-R1	SPRINT NEXTEL	1.240	0.850

***Deflection, Twist and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H**

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

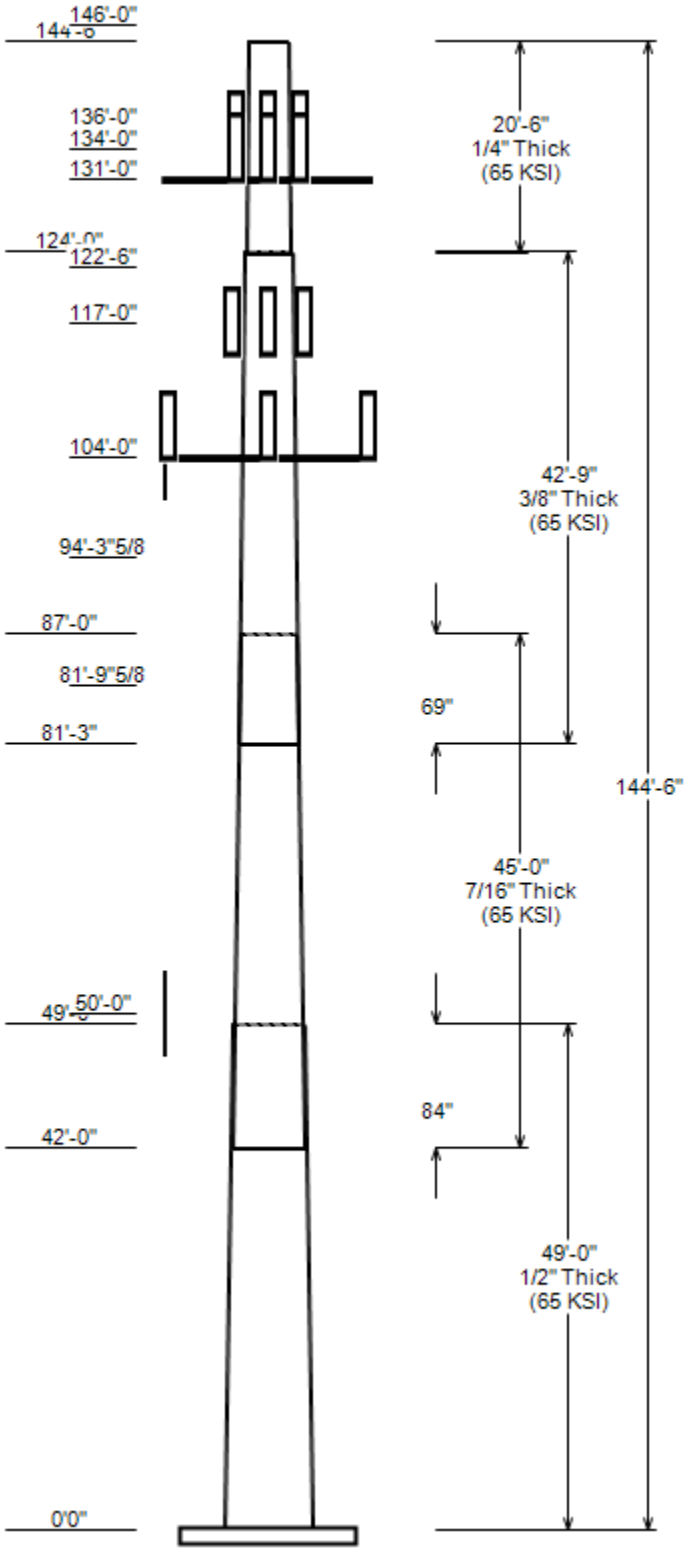
All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

JOB INFORMATION

Asset :	411181, Barkhamstead CT	Height :	144.5 ft
Client :	SPRINT NEXTEL	Base Width :	66.05
Code :	ANSI/TIA-222-H	Shape :	18 Sides



SITE PARAMETERS

Base Elev (ft):	0.00	Structure Class:	II
Taper :	0.28400 (In/ft)	Exposure :	B
Topographic Category :	1	Topographic Feature:	
Topo Method :	Method 1		

SECTION PROPERTIES

Shaft Section	Length (ft)	Diameter (in) Across Flats Top	Diameter (in) Across Flats Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	49.000	52.15	66.05	0.500		0.000	18 Sides	65
2	45.000	42.25	55.01	0.438	Slip Joint	84.000	18 Sides	65
3	42.750	32.50	44.63	0.375	Slip Joint	69.000	18 Sides	65
4	20.500	24.00	32.50	0.250	Butt Joint	0.000	18 Sides	65

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
146.0	146.0	3	Ericsson Radio 4460 B25+B66
146.0	146.0	3	Ericsson Radio 4480 B71+B85A
146.0	146.0	3	Ericsson Air6449 B41
146.0	146.0	3	Commscope VV-65A-R1
146.0	146.0	3	VFA10-HD
146.0	146.0	3	RFS APXVAALL24 43-U-NA20
144.5	144.5	1	Pine Tree Branches
136.0	136.0	3	Amphenol Antel BXA-70063-6CF-E
134.0	134.0	3	Samsung B5/B13 RRH-BR04C
134.0	134.0	3	Samsung B2/B66A RRH-BR049
134.0	134.0	1	RFS DB-C1-12C-24AB-0Z
134.0	134.0	3	Samsung MT6407-77A
134.0	134.0	2	Antel LPA-80080/4CF ___
134.0	134.0	4	Antel LPA-80063/4CF
134.0	134.0	6	Commscope SBNHH-1D65B (72.9")
131.0	131.0	3	Round T-Arm
131.0	131.0	1	VZW Unused Reserve (17134.86 s
122.5	122.5	1	Pine Tree Branches
117.0	117.0	1	Andrew ABT-DMDF-ADBH
117.0	117.0	6	Powerwave Allgon LGP21901
117.0	117.0	6	Powerwave Allgon TT19-08BP111-
117.0	117.0	1	Raycap DC6-48-60-18-8F(32.8 lb
117.0	117.0	3	Ericsson RRUS 8843 B2, B66A
117.0	117.0	3	Ericsson RRUS 4449 B5, B12
117.0	117.0	3	Ericsson RRUS 4478 B14
117.0	117.0	1	Raycap DC6-48-60-18-8C
117.0	117.0	1	Raycap DC6-48-60-18-8C-EV
117.0	117.0	3	Powerwave Allgon 7770.00
117.0	117.0	2	Kathrein Scala 80010964
117.0	117.0	4	Kathrein Scala 80010965
117.0	117.0	3	T-Arm with Site Pro 1 PRK-1245
104.0	104.0	1	Generic E-911 GPS
104.0	108.0	3	Ericsson KRY 112 71
104.0	108.0	3	RFS ATMAP1412D-1A20
104.0	108.0	6	RFS APX16DWV-16DWV-S-E-ACU
104.0	108.0	3	Commscope LNX-6515DS-A1M (50.3
104.0	104.0	3	Flat T-Arm
94.3	94.3	1	Pine Tree Branches
81.8	81.8	1	Pine Tree Branches
50.0	50.0	1	PCTEL GPS-TMG-HR-26N

JOB INFORMATION

Asset :	411181, Barkhamstead CT	Height :	144.5 ft
Client :	SPRINT NEXTEL	Base Width :	66.05
Code :	ANSI/TIA-222-H	Shape :	18 Sides

LINEAR APPURTENANCE

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	146.0	1.99" (50.7mm) Hybrid	No
0.0	136.0	1 1/4" Hybriflex Cable	No
0.0	134.0	1 5/8" Hybriflex	No
0.0	134.0	1 5/8" Coax	No
0.0	117.0	3" conduit	No
0.0	117.0	3" conduit	No
0.0	117.0	2" conduit	No
0.0	117.0	1 1/4" Coax	No
0.0	117.0	0.78" (19.7mm) 8 AWG 6	No
0.0	117.0	0.39" (10mm) Fiber Trunk	No
0.0	104.0	1/2" Coax	No
0.0	104.0	1 5/8" Coax	Yes
0.0	104.0	1 5/8" Coax	No
0.0	50.0	1/2" Coax	No

LOAD CASES

1.2D + 1.0W	115 mph wind with no ice
0.9D + 1.0W	115 mph wind with no ice
1.2D + 1.0Di + 1.0Wi	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice

REACTIONS

Load Case	Moment (kip-ft)	Shear (Kip)	Axial (Kip)
1.2D + 1.0W	5406.00	50.10	71.20
0.9D + 1.0W	5370.73	50.08	53.39
1.2D + 1.0Di + 1.0Wi	1489.58	13.94	91.11
1.2D + 1.0Ev + 1.0Eh	219.46	1.98	70.79
0.9D - 1.0Ev + 1.0Eh	217.75	1.98	49.44
1.0D + 1.0W	1311.51	12.20	59.38

DISH DEFLECTIONS

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)

ANALYSIS PARAMETERS

Location:	Litchfield County,CT	Height:	144.5 ft
Type and Shape:	Custom, 18 Sides	Base Diameter:	66.05 in
Manufacturer:	Undetermined	Top Diameter:	24.00 in
K_d (non-service):	0.95	Taper:	0.2840 in/ft
K_e:	0.97	Rotation:	0.000°

ICE & WIND PARAMETERS

Exposure Category:	B	Design Wind Speed w/o Ice:	115 mph
Risk Category:	II	Design Wind Speed w/Ice:	50 mph
Topo Factor Procedure:	Method 1	Operational Wind Speed:	60 mph
Topographic Category:	1	Design Ice Thickness:	1.00 in
Crest Height:	0 ft	HMSL:	793.00 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil			Period Based on Rayleigh Method (sec):	1.73
T_L (sec):	6	P:	1	$C_{s:}$	0.033
$S_{s:}$	0.171	$S_{1:}$	0.054	C_s Max:	0.033
$F_{a:}$	1.600	$F_{v:}$	2.400	C_s Min:	0.030
$S_{ds:}$	0.182	$S_{d1:}$	0.086		

LOAD CASES

1.2D + 1.0W	115 mph wind with no ice
0.9D + 1.0W	115 mph wind with no ice
1.2D + 1.0Di + 1.0Wi	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice

SHAFT SECTION PROPERTIES

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (in)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
									104.0							27,624.4			
1-18	49.00	0.5000	65		0.00	15,506	66.05	0.000	2	56,471.9	21.53	132.10	52.15	49.00	81.96		16.63	104.30	0.2837
2-18	45.00	0.4375	65	Slip	84.00	10,247	55.01	42.000	75.78	28,512.4	20.41	125.74	42.25	87.00	58.05	12,818.2	15.26	96.56	0.2837
3-18	42.75	0.3750	65	Slip	69.00	6,612	44.63	81.250	52.67	13,028.6	19.22	119.01	32.50	124.00	38.23	4,983.7	13.52	86.67	0.2837
4-18	20.50	0.2500	65	Butt	0.00	1,550	32.50	124.000	25.59	3,362.6	21.16	130.00	24.00	144.50	18.85	1,343.1	15.16	96.00	0.4146
				Shaft Weight		33,915													

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor
146.00	VFA10-HD	3	0.75	0.000	714.00	14.400	0.75	1044.53	21.066	0.75
146.00	Commscope VV-65A-R1	3	0.80	0.000	23.80	5.928	0.63	101.83	7.336	0.63
146.00	Ericsson Air6449 B41	3	0.80	0.000	104.00	5.682	0.67	194.56	6.737	0.67
146.00	Ericsson Radio 4480 B71+B85A	3	0.80	0.000	84.00	2.852	0.50	134.20	3.594	0.50
146.00	Ericsson Radio 4460 B25+B66	3	0.80	0.000	109.00	2.564	0.50	167.73	3.264	0.50
146.00	RFS APXVAALL24 43-U-NA20	3	0.80	0.000	122.80	20.243	0.67	381.63	22.708	0.67
144.50	Pine Tree Branches	1	1.00	0.000	337.50	11.700	1.00	493.74	17.116	1.00
136.00	Amphenol Antel BXA-70063-6CF-E	3	0.80	0.000	17.00	7.569	0.67	114.86	9.393	0.67
134.00	Samsung MT6407-77A	3	0.80	0.000	81.60	4.709	0.67	148.85	5.711	0.67
134.00	Samsung B2/B66A RRH-BR049	3	0.80	0.000	84.40	1.875	0.50	126.49	2.471	0.50
134.00	Samsung B5/B13 RRH-BR04C	3	0.80	0.000	70.30	1.875	0.50	108.04	2.471	0.50
134.00	Commscope SBNHH-1D65B (72.9")	6	0.80	0.000	40.60	8.200	0.67	156.98	10.066	0.67
134.00	Antel LPA-80063/4CF	4	0.80	0.000	20.00	6.142	0.67	148.58	6.813	0.67
134.00	Antel LPA-80080/4CF ___	2	0.80	0.000	12.00	5.399	0.67	94.82	3.161	0.67
134.00	RFS DB-C1-12C-24AB-0Z	1	0.80	0.000	32.00	4.056	0.50	115.86	4.956	0.50
131.00	Round T-Arm	3	0.75	0.000	250.00	9.700	0.67	387.69	15.131	0.67
131.00	VZW Unused Reserve (17134.86 s	1	0.80	0.000	1411.50	118.992	0.90	2059.31	173.604	0.90
122.50	Pine Tree Branches	1	1.00	0.000	3300.00	383.240	1.00	4803.46	557.841	1.00
117.00	T-Arm with Site Pro 1 PRK-1245	3	0.75	0.000	450.00	17.900	0.67	654.11	26.019	0.67
117.00	Andrew ABT-DMDF-ADBH	1	0.80	0.000	1.10	0.045	0.50	2.55	0.158	0.50
117.00	Kathrein Scala 80010965	4	0.80	0.000	97.60	13.814	0.67	271.18	15.800	0.67
117.00	Kathrein Scala 80010964	2	0.80	0.000	83.80	9.997	0.67	216.99	11.534	0.67
117.00	Powerwave Allgon 7770.00	3	0.80	0.000	35.00	5.508	0.67	109.01	6.892	0.67
117.00	Raycap DC6-48-60-18-8C-EV	1	0.80	0.000	16.00	4.788	0.50	100.08	5.746	0.50
117.00	Raycap DC6-48-60-18-8C	1	0.80	0.000	16.00	2.030	0.50	53.90	2.524	0.50
117.00	Ericsson RRUS 4478 B14	3	0.80	0.000	59.40	2.021	0.50	99.36	2.635	0.50
117.00	Ericsson RRUS 4449 B5, B12	3	0.80	0.000	71.00	1.969	0.50	112.96	2.576	0.50
117.00	Ericsson RRUS 8843 B2, B66A	3	0.80	0.000	72.00	1.639	0.50	111.91	2.189	0.50
117.00	Powerwave Allgon LGP21901	6	0.80	0.000	5.50	0.200	0.50	10.50	0.408	0.50
117.00	Powerwave Allgon TT19-08BP111-	6	0.80	0.000	16.00	0.553	0.50	29.15	0.886	0.50
117.00	Raycap DC6-48-60-18-8F(32.8 lb	1	0.80	0.000	32.80	1.470	0.50	72.97	1.925	0.50
104.00	Flat T-Arm	3	0.75	0.000	250.00	12.900	0.67	384.34	18.157	0.67
104.00	Commscope LNX-6515DS-A1M (50.3	3	0.80	4.000	50.30	11.440	0.67	199.02	13.530	0.67
104.00	RFS APX16DWV-16DWV-S-E-ACU	6	0.80	4.000	39.60	6.077	0.67	92.32	7.399	0.67
104.00	RFS ATMAP1412D-1A20	3	0.80	4.000	13.00	1.000	0.50	30.05	1.429	0.50
104.00	Generic E-911 GPS	1	0.80	0.000	5.00	0.580	0.50	21.47	0.864	0.50
104.00	Ericsson KRY 112 71	3	0.80	4.000	13.20	0.583	0.50	24.97	0.939	0.50
94.30	Pine Tree Branches	1	1.00	0.000	937.50	138.580	1.00	1353.06	200.007	1.00
81.80	Pine Tree Branches	1	1.00	0.000	937.50	146.250	1.00	1348.00	210.287	1.00
50.00	PCTEL GPS-TMG-HR-26N	1	1.00	0.000	0.60	0.090	1.00	3.50	0.198	1.00
Totals	Num Loadings: 40	108			16,324.10			28,372.68		

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg) : 0.00_

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	146.00	3	1.99" (50.7mm) Hybrid	1.99	1.9	N	0	0	0	0	0	N	SPRINT NEXTEL

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	136.00	2	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	0	0	N	VERIZON WIREL
0.00	134.00	12	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIREL
0.00	134.00	2	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIREL
0.00	117.00	12	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	117.00	6	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	117.00	2	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	117.00	2	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	117.00	2	3" conduit	3.5	7.58	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	117.00	1	3" conduit	3.5	7.58	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	104.00	12	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	T-MOBILE
0.00	104.00	6	1 5/8" Coax	1.98	0.82	N	6	1	1	90	1	Y	T-MOBILE
0.00	104.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	T-MOBILE
0.00	50.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	SPRINT NEXTEL

SEGMENT PROPERTIES

(Max Len: 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.5000	66.050	104.024	56,471.90	21.53	132.10	76.1	1684.0	0.0	0.0
5.00		0.5000	64.632	101.773	52,884.50	21.03	129.26	76.7	1611.6	0.0	1,750.7
10.00		0.5000	63.213	99.522	49,452.40	20.53	126.43	77.3	1540.9	0.0	1,712.4
15.00		0.5000	61.795	97.271	46,172.00	20.03	123.59	77.8	1471.7	0.0	1,674.1
20.00		0.5000	60.376	95.020	43,040.00	19.53	120.75	78.4	1404.1	0.0	1,635.8
25.00		0.5000	58.958	92.769	40,053.00	19.03	117.92	79	1338.1	0.0	1,597.5
30.00		0.5000	57.539	90.518	37,207.50	18.53	115.08	79.6	1273.6	0.0	1,559.2
35.00		0.5000	56.121	88.267	34,500.00	18.03	112.24	80.2	1210.8	0.0	1,520.9
40.00		0.5000	54.702	86.015	31,927.20	17.53	109.40	80.8	1149.6	0.0	1,482.6
42.00	Bot - Section 2	0.5000	54.135	85.115	30,935.00	17.33	108.27	81	1125.5	0.0	582.3
45.00		0.5000	53.284	83.764	29,485.50	17.03	106.57	81.4	1089.9	0.0	1,629.5
49.00	Top - Section 1	0.4375	53.024	73.020	25,511.60	19.61	121.20	78.3	947.7	0.0	2,132.5
50.00		0.4375	52.740	72.626	25,100.90	19.49	120.55	78.5	937.4	0.0	247.8
55.00		0.4375	51.322	70.656	23,113.50	18.92	117.31	79.1	887.1	0.0	1,218.9
60.00		0.4375	49.903	68.687	21,233.90	18.35	114.06	79.8	838.1	0.0	1,185.4
65.00		0.4375	48.485	66.717	19,459.00	17.78	110.82	80.5	790.5	0.0	1,151.9
70.00		0.4375	47.066	64.747	17,785.90	17.21	107.58	81.2	744.3	0.0	1,118.4
75.00		0.4375	45.648	62.777	16,211.60	16.63	104.34	81.8	699.5	0.0	1,084.8
80.00		0.4375	44.229	60.808	14,733.00	16.06	101.09	82.5	656.1	0.0	1,051.3
81.25	Bot - Section 3	0.4375	43.874	60.315	14,378.00	15.92	100.28	82.6	645.5	0.0	257.6
81.80		0.4375	43.718	60.099	14,223.60	15.86	99.93	82.6	640.8	0.0	211.1
85.00		0.4375	42.811	58.838	13,347.20	15.49	97.85	82.6	614.1	0.0	1,213.1
87.00	Top - Section 2	0.3750	42.993	50.724	11,640.10	18.45	114.65	79.7	533.3	0.0	745.3
90.00		0.3750	42.142	49.711	10,956.60	18.05	112.38	80.2	512.1	0.0	512.6
94.30		0.3750	40.922	48.259	10,024.30	17.48	109.13	80.8	482.5	0.0	716.8
95.00		0.3750	40.724	48.023	9,877.70	17.39	108.60	81	477.7	0.0	114.7
100.00		0.3750	39.305	46.335	8,872.10	16.72	104.81	81.7	444.6	0.0	802.7
104.00		0.3750	38.170	44.984	8,118.70	16.18	101.79	82.4	418.9	0.0	621.5
105.00		0.3750	37.887	44.646	7,937.20	16.05	101.03	82.5	412.6	0.0	152.5
110.00		0.3750	36.468	42.958	7,070.40	15.38	97.25	82.6	381.9	0.0	745.2
115.00		0.3750	35.050	41.270	6,269.10	14.72	93.47	82.6	352.3	0.0	716.5
117.00		0.3750	34.482	40.595	5,966.40	14.45	91.95	82.6	340.8	0.0	278.6
120.00		0.3750	33.631	39.582	5,530.80	14.05	89.68	82.6	323.9	0.0	409.2
122.50		0.3750	32.922	38.737	5,184.40	13.72	87.79	82.6	310.2	0.0	333.1
124.00	Top - Section 3	0.3750	32.496	38.231	4,983.70	13.52	86.66	82.6	302.1	0.0	196.4
124.00	Bot - Section 4	0.2500	32.500	25.589	3,362.60	21.16	130.00	76.5	203.8	0.0	
125.00		0.2500	32.085	25.260	3,234.60	20.87	128.34	76.9	198.6	0.0	86.5
130.00		0.2500	30.012	23.616	2,642.90	19.40	120.05	78.6	173.4	0.0	415.8
131.00		0.2500	29.598	23.287	2,534.00	19.11	118.39	78.9	168.6	0.0	79.8
134.00		0.2500	28.354	22.300	2,225.30	18.24	113.42	80	154.6	0.0	232.7
135.00		0.2500	27.939	21.971	2,128.30	17.94	111.76	80.3	150.0	0.0	75.3
136.00		0.2500	27.525	21.642	2,034.10	17.65	110.10	80.6	145.6	0.0	74.2
140.00		0.2500	25.866	20.326	1,685.20	16.48	103.47	82	128.3	0.0	285.6
144.50		0.2500	24.001	18.846	1,343.10	15.16	96.00	82.6	110.2	0.0	299.9
								Totals:			33,912.7

Load Case: 1.2D + 1.0W 115 mph wind with no ice 20 Iterations
Gust Response Factor: 1.10
Dead load Factor: 1.20
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-71.20	-50.10	0.00	-5,406.0	0.00	5,406.00	7,122.56	1,825.62	10,808.79	9,608.64	0	0	0.573
5.00	-68.53	-49.78	0.00	-5,155.5	0.00	5,155.48	7,022.32	1,786.12	10,346.10	9,266.86	0.07	-0.13	0.567
10.00	-65.90	-49.46	0.00	-4,906.6	0.00	4,906.58	6,919.69	1,746.61	9,893.54	8,927.89	0.28	-0.27	0.560
15.00	-63.31	-49.14	0.00	-4,659.3	0.00	4,659.28	6,814.69	1,707.10	9,451.09	8,591.96	0.64	-0.41	0.552
20.00	-60.78	-48.82	0.00	-4,413.6	0.00	4,413.58	6,707.29	1,667.60	9,018.76	8,259.27	1.14	-0.55	0.544
25.00	-58.28	-48.50	0.00	-4,169.5	0.00	4,169.49	6,597.52	1,628.09	8,596.56	7,930.04	1.79	-0.69	0.536
30.00	-55.84	-48.18	0.00	-3,927.0	0.00	3,926.98	6,485.35	1,588.58	8,184.47	7,604.46	2.59	-0.83	0.526
35.00	-53.44	-47.84	0.00	-3,686.1	0.00	3,686.09	6,370.81	1,549.08	7,782.51	7,282.76	3.54	-0.98	0.515
40.00	-51.12	-47.59	0.00	-3,446.9	0.00	3,446.87	6,253.88	1,509.57	7,390.66	6,965.15	4.64	-1.12	0.504
42.00	-50.18	-47.41	0.00	-3,351.7	0.00	3,351.70	6,206.44	1,493.77	7,236.76	6,839.29	5.13	-1.18	0.499
45.00	-47.87	-47.14	0.00	-3,209.5	0.00	3,209.46	6,134.57	1,470.07	7,008.94	6,651.83	5.9	-1.27	0.491
49.00	-44.89	-46.90	0.00	-3,020.9	0.00	3,020.92	5,148.29	1,281.50	6,086.85	5,567.88	7.02	-1.4	0.553
50.00	-44.43	-46.69	0.00	-2,974.0	0.00	2,974.03	5,129.30	1,274.59	6,021.36	5,517.17	7.32	-1.43	0.549
55.00	-42.39	-46.31	0.00	-2,740.6	0.00	2,740.58	5,032.95	1,240.02	5,699.22	5,265.49	8.9	-1.59	0.530
60.00	-40.39	-45.91	0.00	-2,509.0	0.00	2,509.05	4,934.21	1,205.45	5,385.93	5,017.06	10.65	-1.75	0.510
65.00	-38.44	-45.51	0.00	-2,279.5	0.00	2,279.48	4,833.09	1,170.88	5,081.50	4,772.08	12.57	-1.91	0.487
70.00	-36.54	-45.10	0.00	-2,051.9	0.00	2,051.93	4,729.59	1,136.31	4,785.93	4,530.77	14.66	-2.07	0.462
75.00	-34.68	-44.69	0.00	-1,826.4	0.00	1,826.41	4,623.70	1,101.74	4,499.21	4,293.33	16.91	-2.22	0.435
80.00	-32.90	-44.40	0.00	-1,603.0	0.00	1,602.96	4,515.42	1,067.18	4,221.34	4,059.98	19.32	-2.37	0.404
81.25	-32.46	-44.32	0.00	-1,547.5	0.00	1,547.46	4,481.13	1,058.53	4,153.26	3,996.20	19.94	-2.41	0.396
81.80	-31.19	-39.44	0.00	-1,523.1	0.00	1,523.09	4,465.03	1,054.73	4,123.48	3,967.40	20.22	-2.43	0.392
85.00	-29.41	-39.17	0.00	-1,396.9	0.00	1,396.89	4,371.38	1,032.61	3,952.34	3,801.89	21.88	-2.52	0.376
87.00	-28.29	-38.95	0.00	-1,318.5	0.00	1,318.54	3,638.34	890.21	3,426.86	3,187.47	22.95	-2.58	0.423
90.00	-27.35	-38.64	0.00	-1,201.7	0.00	1,201.70	3,586.74	872.43	3,291.38	3,078.96	24.6	-2.66	0.400
94.30	-25.16	-33.72	0.00	-1,035.5	0.00	1,035.54	3,511.28	846.95	3,101.94	2,925.37	27.06	-2.79	0.363
95.00	-24.92	-33.51	0.00	-1,011.9	0.00	1,011.93	3,498.83	842.80	3,071.64	2,900.59	27.47	-2.81	0.358
100.00	-23.45	-33.12	0.00	-844.4	0.00	844.38	3,408.54	813.18	2,859.49	2,725.48	30.49	-2.94	0.318
104.00	-20.96	-30.74	0.00	-706.4	0.00	706.38	3,334.59	789.47	2,695.23	2,587.88	33	-3.04	0.281
105.00	-20.69	-30.51	0.00	-675.6	0.00	675.64	3,315.86	783.55	2,654.93	2,553.84	33.64	-3.07	0.272
110.00	-19.39	-30.09	0.00	-523.1	0.00	523.07	3,191.58	753.92	2,457.96	2,364.24	36.91	-3.17	0.229
115.00	-18.15	-29.77	0.00	-372.6	0.00	372.64	3,066.14	724.29	2,268.59	2,181.14	40.28	-3.26	0.178
117.00	-14.47	-26.24	0.00	-313.1	0.00	313.11	3,015.97	712.43	2,194.96	2,109.97	41.66	-3.3	0.155
120.00	-13.91	-26.01	0.00	-234.4	0.00	234.38	2,940.71	694.66	2,086.80	2,005.42	43.74	-3.33	0.123
122.50	-10.31	-11.84	0.00	-169.4	0.00	169.35	2,877.99	679.84	1,998.76	1,920.33	45.49	-3.36	0.092
124.00	-10.04	-11.73	0.00	-151.6	0.00	151.60	2,840.36	670.95	1,946.84	1,870.16	46.55	-3.37	0.085
124.00	-10.04	-11.73	0.00	-151.6	0.00	151.60	1,762.15	449.09	1,308.17	1,169.42	46.55	-3.37	0.136
125.00	-9.92	-11.52	0.00	-139.9	0.00	139.86	1,747.31	443.32	1,274.75	1,144.56	47.26	-3.38	0.129
130.00	-9.30	-11.28	0.00	-82.3	0.00	82.26	1,670.08	414.45	1,114.16	1,022.18	50.83	-3.43	0.087
131.00	-6.82	-7.31	0.00	-71.0	0.00	70.98	1,654.03	408.68	1,083.34	998.13	51.55	-3.44	0.076
134.00	-5.31	-4.91	0.00	-49.0	0.00	49.04	1,604.63	391.36	993.47	926.94	53.72	-3.46	0.056
135.00	-5.21	-4.84	0.00	-44.1	0.00	44.14	1,587.76	385.59	964.38	903.54	54.44	-3.47	0.052
136.00	-5.09	-4.22	0.00	-39.3	0.00	39.30	1,570.69	379.81	935.72	880.32	55.17	-3.47	0.048
140.00	-4.73	-3.95	0.00	-22.4	0.00	22.40	1,500.35	356.72	825.40	789.31	58.08	-3.49	0.032
144.50	0.00	-3.65	0.00	-4.6	0.00	4.62	1,400.13	330.74	709.57	682.42	61.37	-3.5	0.007

Load Case: 0.9D + 1.0W 115 mph wind with no ice 20 Iterations
Gust Response Factor: 1.10
Dead load Factor: 0.90
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-53.39	-50.08	0.00	-5,370.7	0.00	5,370.73	7,122.56	1,825.62	10,808.79	9,608.64	0	0	0.567
5.00	-51.35	-49.72	0.00	-5,120.3	0.00	5,120.32	7,022.32	1,786.12	10,346.10	9,266.86	0.07	-0.13	0.561
10.00	-49.35	-49.36	0.00	-4,871.7	0.00	4,871.72	6,919.69	1,746.61	9,893.54	8,927.89	0.28	-0.27	0.554
15.00	-47.39	-49.00	0.00	-4,624.9	0.00	4,624.92	6,814.69	1,707.10	9,451.09	8,591.96	0.64	-0.4	0.546
20.00	-45.46	-48.65	0.00	-4,379.9	0.00	4,379.90	6,707.29	1,667.60	9,018.76	8,259.27	1.13	-0.54	0.538
25.00	-43.56	-48.30	0.00	-4,136.6	0.00	4,136.65	6,597.52	1,628.09	8,596.56	7,930.04	1.78	-0.68	0.529
30.00	-41.70	-47.95	0.00	-3,895.1	0.00	3,895.14	6,485.35	1,588.58	8,184.47	7,604.46	2.57	-0.83	0.520
35.00	-39.87	-47.59	0.00	-3,655.4	0.00	3,655.39	6,370.81	1,549.08	7,782.51	7,282.76	3.51	-0.97	0.509
40.00	-38.11	-47.32	0.00	-3,417.4	0.00	3,417.45	6,253.88	1,509.57	7,390.66	6,965.15	4.61	-1.12	0.498
42.00	-37.40	-47.13	0.00	-3,322.8	0.00	3,322.81	6,206.44	1,493.77	7,236.76	6,839.29	5.09	-1.18	0.493
45.00	-35.64	-46.84	0.00	-3,181.4	0.00	3,181.42	6,134.57	1,470.07	7,008.94	6,651.83	5.86	-1.27	0.485
49.00	-33.39	-46.61	0.00	-2,994.0	0.00	2,994.05	5,148.29	1,281.50	6,086.85	5,567.88	6.97	-1.38	0.546
50.00	-33.03	-46.38	0.00	-2,947.4	0.00	2,947.44	5,129.30	1,274.59	6,021.36	5,517.17	7.26	-1.41	0.542
55.00	-31.47	-45.98	0.00	-2,715.5	0.00	2,715.53	5,032.95	1,240.02	5,699.22	5,265.49	8.83	-1.58	0.523
60.00	-29.95	-45.57	0.00	-2,485.6	0.00	2,485.63	4,934.21	1,205.45	5,385.93	5,017.06	10.57	-1.74	0.503
65.00	-28.46	-45.16	0.00	-2,257.8	0.00	2,257.78	4,833.09	1,170.88	5,081.50	4,772.08	12.47	-1.89	0.480
70.00	-27.01	-44.74	0.00	-2,032.0	0.00	2,032.00	4,729.59	1,136.31	4,785.93	4,530.77	14.54	-2.05	0.456
75.00	-25.59	-44.32	0.00	-1,808.3	0.00	1,808.32	4,623.70	1,101.74	4,499.21	4,293.33	16.77	-2.2	0.428
80.00	-24.24	-44.03	0.00	-1,586.7	0.00	1,586.74	4,515.42	1,067.18	4,221.34	4,059.98	19.17	-2.35	0.398
81.25	-23.90	-43.95	0.00	-1,531.7	0.00	1,531.70	4,481.13	1,058.53	4,153.26	3,996.20	19.79	-2.39	0.390
81.80	-23.00	-39.07	0.00	-1,507.5	0.00	1,507.53	4,465.03	1,054.73	4,123.48	3,967.40	20.06	-2.41	0.387
85.00	-21.65	-38.82	0.00	-1,382.5	0.00	1,382.50	4,371.38	1,032.61	3,952.34	3,801.89	21.71	-2.5	0.370
87.00	-20.80	-38.59	0.00	-1,304.9	0.00	1,304.86	3,638.34	890.21	3,426.86	3,187.47	22.77	-2.56	0.417
90.00	-20.08	-38.29	0.00	-1,189.1	0.00	1,189.08	3,586.74	872.43	3,291.38	3,078.96	24.4	-2.64	0.394
94.30	-18.49	-33.39	0.00	-1,024.4	0.00	1,024.44	3,511.28	846.95	3,101.94	2,925.37	26.84	-2.76	0.357
95.00	-18.30	-33.17	0.00	-1,001.1	0.00	1,001.07	3,498.83	842.80	3,071.64	2,900.59	27.25	-2.78	0.352
100.00	-17.19	-32.78	0.00	-835.2	0.00	835.23	3,408.54	813.18	2,859.49	2,725.48	30.24	-2.92	0.313
104.00	-15.34	-30.43	0.00	-698.6	0.00	698.58	3,334.59	789.47	2,695.23	2,587.88	32.72	-3.02	0.276
105.00	-15.13	-30.20	0.00	-668.1	0.00	668.14	3,315.86	783.55	2,654.93	2,553.84	33.36	-3.04	0.268
110.00	-14.15	-29.78	0.00	-517.1	0.00	517.13	3,191.58	753.92	2,457.96	2,364.24	36.6	-3.15	0.225
115.00	-13.22	-29.48	0.00	-368.2	0.00	368.21	3,066.14	724.29	2,268.59	2,181.14	39.94	-3.23	0.175
117.00	-10.50	-26.01	0.00	-309.3	0.00	309.26	3,015.97	712.43	2,194.96	2,109.97	41.31	-3.27	0.151
120.00	-10.08	-25.78	0.00	-231.2	0.00	231.25	2,940.71	694.66	2,086.80	2,005.42	43.37	-3.3	0.120
122.50	-7.57	-11.67	0.00	-166.8	0.00	166.79	2,877.99	679.84	1,998.76	1,920.33	45.11	-3.33	0.090
124.00	-7.37	-11.57	0.00	-149.3	0.00	149.28	2,840.36	670.95	1,946.84	1,870.16	46.16	-3.34	0.083
124.00	-7.37	-11.57	0.00	-149.3	0.00	149.28	1,762.15	449.09	1,308.17	1,169.42	46.16	-3.34	0.133
125.00	-7.28	-11.36	0.00	-137.7	0.00	137.71	1,747.31	443.32	1,274.75	1,144.56	46.86	-3.35	0.125
130.00	-6.82	-11.13	0.00	-80.9	0.00	80.92	1,670.08	414.45	1,114.16	1,022.18	50.39	-3.4	0.084
131.00	-5.02	-7.20	0.00	-69.8	0.00	69.79	1,654.03	408.68	1,083.34	998.13	51.11	-3.41	0.073
134.00	-3.91	-4.82	0.00	-48.2	0.00	48.19	1,604.63	391.36	993.47	926.94	53.25	-3.43	0.055
135.00	-3.84	-4.75	0.00	-43.4	0.00	43.37	1,587.76	385.59	964.38	903.54	53.97	-3.43	0.051
136.00	-3.76	-4.14	0.00	-38.6	0.00	38.62	1,570.69	379.81	935.72	880.32	54.69	-3.44	0.046
140.00	-3.49	-3.87	0.00	-22.0	0.00	22.05	1,500.35	356.72	825.40	789.31	57.58	-3.46	0.030
144.50	0.00	-3.65	0.00	-4.6	0.00	4.62	1,400.13	330.74	709.57	682.42	60.84	-3.47	0.007

Load Case: 1.2D + 1.0Di + 1.0Wi		50 mph wind with 1" radial ice			20 Iterations
Gust Response Factor:	1.10	Ice Dead Load Factor	1.00		
Dead load Factor:	1.20			Ice Importance Factor	1.00
Wind Load Factor:	1.00				

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-91.11	-13.94	0.00	-1,489.6	0.00	1,489.58	7,122.56	1,825.62	10,808.79	9,608.64	0	0	0.168
5.00	-88.16	-13.84	0.00	-1,419.9	0.00	1,419.88	7,022.32	1,786.12	10,346.10	9,266.86	0.02	-0.04	0.166
10.00	-85.23	-13.75	0.00	-1,350.7	0.00	1,350.66	6,919.69	1,746.61	9,893.54	8,927.89	0.08	-0.07	0.164
15.00	-82.32	-13.65	0.00	-1,281.9	0.00	1,281.92	6,814.69	1,707.10	9,451.09	8,591.96	0.18	-0.11	0.161
20.00	-79.46	-13.55	0.00	-1,213.7	0.00	1,213.67	6,707.29	1,667.60	9,018.76	8,259.27	0.31	-0.15	0.159
25.00	-76.64	-13.46	0.00	-1,145.9	0.00	1,145.90	6,597.52	1,628.09	8,596.56	7,930.04	0.49	-0.19	0.156
30.00	-73.87	-13.36	0.00	-1,078.6	0.00	1,078.62	6,485.35	1,588.58	8,184.47	7,604.46	0.71	-0.23	0.153
35.00	-71.15	-13.26	0.00	-1,011.8	0.00	1,011.82	6,370.81	1,549.08	7,782.51	7,282.76	0.97	-0.27	0.150
40.00	-68.48	-13.18	0.00	-945.5	0.00	945.53	6,253.88	1,509.57	7,390.66	6,965.15	1.28	-0.31	0.147
42.00	-67.42	-13.13	0.00	-919.2	0.00	919.18	6,206.44	1,493.77	7,236.76	6,839.29	1.41	-0.33	0.145
45.00	-64.93	-13.04	0.00	-879.8	0.00	879.80	6,134.57	1,470.07	7,008.94	6,651.83	1.62	-0.35	0.143
49.00	-61.66	-12.97	0.00	-827.6	0.00	827.64	5,148.29	1,281.50	6,086.85	5,567.88	1.93	-0.38	0.161
50.00	-61.17	-12.91	0.00	-814.7	0.00	814.67	5,129.30	1,274.59	6,021.36	5,517.17	2.01	-0.39	0.160
55.00	-58.82	-12.79	0.00	-750.1	0.00	750.14	5,032.95	1,240.02	5,699.22	5,265.49	2.45	-0.44	0.154
60.00	-56.52	-12.67	0.00	-686.2	0.00	686.21	4,934.21	1,205.45	5,385.93	5,017.06	2.93	-0.48	0.148
65.00	-54.27	-12.54	0.00	-622.9	0.00	622.88	4,833.09	1,170.88	5,081.50	4,772.08	3.46	-0.52	0.142
70.00	-52.06	-12.41	0.00	-560.2	0.00	560.18	4,729.59	1,136.31	4,785.93	4,530.77	4.03	-0.57	0.135
75.00	-49.90	-12.29	0.00	-498.1	0.00	498.10	4,623.70	1,101.74	4,499.21	4,293.33	4.65	-0.61	0.127
80.00	-47.78	-12.19	0.00	-436.7	0.00	436.68	4,515.42	1,067.18	4,221.34	4,059.98	5.31	-0.65	0.118
81.25	-47.26	-12.17	0.00	-421.4	0.00	421.44	4,481.13	1,058.53	4,153.26	3,996.20	5.48	-0.66	0.116
81.80	-45.49	-10.83	0.00	-414.7	0.00	414.74	4,465.03	1,054.73	4,123.48	3,967.40	5.56	-0.67	0.115
85.00	-43.49	-10.75	0.00	-380.1	0.00	380.08	4,371.38	1,032.61	3,952.34	3,801.89	6.01	-0.69	0.110
87.00	-42.26	-10.68	0.00	-358.6	0.00	358.59	3,638.34	890.21	3,426.86	3,187.47	6.3	-0.71	0.124
90.00	-41.14	-10.58	0.00	-326.6	0.00	326.55	3,586.74	872.43	3,291.38	3,078.96	6.76	-0.73	0.118
94.30	-38.13	-9.22	0.00	-281.0	0.00	281.05	3,511.28	846.95	3,101.94	2,925.37	7.43	-0.76	0.107
95.00	-37.88	-9.16	0.00	-274.6	0.00	274.60	3,498.83	842.80	3,071.64	2,900.59	7.54	-0.77	0.106
100.00	-36.09	-9.03	0.00	-228.8	0.00	228.82	3,408.54	813.18	2,859.49	2,725.48	8.37	-0.81	0.095
104.00	-32.25	-8.42	0.00	-191.4	0.00	191.43	3,334.59	789.47	2,695.23	2,587.88	9.05	-0.83	0.084
105.00	-31.94	-8.35	0.00	-183.0	0.00	183.01	3,315.86	783.55	2,654.93	2,553.84	9.23	-0.84	0.081
110.00	-30.41	-8.21	0.00	-141.3	0.00	141.29	3,191.58	753.92	2,457.96	2,364.24	10.12	-0.87	0.069
115.00	-28.92	-8.10	0.00	-100.2	0.00	100.25	3,066.14	724.29	2,268.59	2,181.14	11.05	-0.89	0.056
117.00	-23.08	-7.20	0.00	-84.0	0.00	84.04	3,015.97	712.43	2,194.96	2,109.97	11.42	-0.9	0.048
120.00	-22.36	-7.12	0.00	-62.5	0.00	62.46	2,940.71	694.66	2,086.80	2,005.42	11.99	-0.91	0.039
122.50	-16.71	-3.19	0.00	-44.6	0.00	44.65	2,877.99	679.84	1,998.76	1,920.33	12.47	-0.92	0.029
124.00	-16.37	-3.15	0.00	-39.9	0.00	39.88	2,840.36	670.95	1,946.84	1,870.16	12.76	-0.92	0.027
124.00	-16.37	-3.15	0.00	-39.9	0.00	39.88	1,762.15	449.09	1,308.17	1,169.42	12.76	-0.92	0.043
125.00	-16.19	-3.08	0.00	-36.7	0.00	36.72	1,747.31	443.32	1,274.75	1,144.56	12.96	-0.92	0.041
130.00	-15.35	-3.00	0.00	-21.3	0.00	21.32	1,670.08	414.45	1,114.16	1,022.18	13.93	-0.94	0.030
131.00	-11.78	-1.87	0.00	-18.3	0.00	18.32	1,654.03	408.68	1,083.34	998.13	14.13	-0.94	0.026
134.00	-8.37	-1.30	0.00	-12.7	0.00	12.71	1,604.63	391.36	993.47	926.94	14.72	-0.94	0.019
135.00	-8.23	-1.28	0.00	-11.4	0.00	11.41	1,587.76	385.59	964.38	903.54	14.92	-0.95	0.018
136.00	-7.80	-1.11	0.00	-10.1	0.00	10.13	1,570.69	379.81	935.72	880.32	15.11	-0.95	0.016
140.00	-7.27	-1.02	0.00	-5.7	0.00	5.68	1,500.35	356.72	825.40	789.31	15.91	-0.95	0.012
144.50	0.00	-0.90	0.00	-1.1	0.00	1.10	1,400.13	330.74	709.57	682.42	16.81	-0.95	0.002

Load Case: 1.0D + 1.0W 60 mph Wind with No Ice 19 Iterations
Gust Response Factor: 1.10
Dead load Factor: 1.00
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-59.38	-12.20	0.00	-1,311.5	0.00	1,311.51	7,122.56	1,825.62	10,808.79	9,608.64	0	0	0.145
5.00	-57.24	-12.11	0.00	-1,250.5	0.00	1,250.52	7,022.32	1,786.12	10,346.10	9,266.86	0.02	-0.03	0.143
10.00	-55.14	-12.03	0.00	-1,190.0	0.00	1,189.95	6,919.69	1,746.61	9,893.54	8,927.89	0.07	-0.07	0.141
15.00	-53.08	-11.95	0.00	-1,129.8	0.00	1,129.81	6,814.69	1,707.10	9,451.09	8,591.96	0.16	-0.1	0.139
20.00	-51.05	-11.86	0.00	-1,070.1	0.00	1,070.08	6,707.29	1,667.60	9,018.76	8,259.27	0.28	-0.13	0.137
25.00	-49.07	-11.78	0.00	-1,010.8	0.00	1,010.77	6,597.52	1,628.09	8,596.56	7,930.04	0.43	-0.17	0.135
30.00	-47.12	-11.70	0.00	-951.9	0.00	951.87	6,485.35	1,588.58	8,184.47	7,604.46	0.63	-0.2	0.132
35.00	-45.21	-11.61	0.00	-893.4	0.00	893.38	6,370.81	1,549.08	7,782.51	7,282.76	0.86	-0.24	0.130
40.00	-43.34	-11.55	0.00	-835.3	0.00	835.32	6,253.88	1,509.57	7,390.66	6,965.15	1.13	-0.27	0.127
42.00	-42.60	-11.50	0.00	-812.2	0.00	812.23	6,206.44	1,493.77	7,236.76	6,839.29	1.24	-0.29	0.126
45.00	-40.74	-11.43	0.00	-777.7	0.00	777.72	6,134.57	1,470.07	7,008.94	6,651.83	1.43	-0.31	0.124
49.00	-38.29	-11.38	0.00	-732.0	0.00	731.98	5,148.29	1,281.50	6,086.85	5,567.88	1.7	-0.34	0.139
50.00	-37.96	-11.32	0.00	-720.6	0.00	720.60	5,129.30	1,274.59	6,021.36	5,517.17	1.77	-0.35	0.138
55.00	-36.36	-11.23	0.00	-664.0	0.00	663.98	5,032.95	1,240.02	5,699.22	5,265.49	2.16	-0.38	0.133
60.00	-34.78	-11.13	0.00	-607.8	0.00	607.84	4,934.21	1,205.45	5,385.93	5,017.06	2.58	-0.42	0.128
65.00	-33.24	-11.03	0.00	-552.2	0.00	552.19	4,833.09	1,170.88	5,081.50	4,772.08	3.05	-0.46	0.123
70.00	-31.74	-10.93	0.00	-497.0	0.00	497.03	4,729.59	1,136.31	4,785.93	4,530.77	3.55	-0.5	0.117
75.00	-30.26	-10.83	0.00	-442.4	0.00	442.37	4,623.70	1,101.74	4,499.21	4,293.33	4.1	-0.54	0.110
80.00	-28.83	-10.76	0.00	-388.2	0.00	388.21	4,515.42	1,067.18	4,221.34	4,059.98	4.68	-0.58	0.102
81.25	-28.47	-10.74	0.00	-374.8	0.00	374.76	4,481.13	1,058.53	4,153.26	3,996.20	4.84	-0.58	0.100
81.80	-27.29	-9.55	0.00	-368.8	0.00	368.85	4,465.03	1,054.73	4,123.48	3,967.40	4.9	-0.59	0.099
85.00	-25.83	-9.49	0.00	-338.3	0.00	338.28	4,371.38	1,032.61	3,952.34	3,801.89	5.31	-0.61	0.095
87.00	-24.93	-9.44	0.00	-319.3	0.00	319.30	3,638.34	890.21	3,426.86	3,187.47	5.57	-0.63	0.107
90.00	-24.19	-9.36	0.00	-291.0	0.00	290.99	3,586.74	872.43	3,291.38	3,078.96	5.96	-0.65	0.101
94.30	-22.22	-8.17	0.00	-250.7	0.00	250.73	3,511.28	846.95	3,101.94	2,925.37	6.56	-0.68	0.092
95.00	-22.05	-8.11	0.00	-245.0	0.00	245.01	3,498.83	842.80	3,071.64	2,900.59	6.66	-0.68	0.091
100.00	-20.86	-8.02	0.00	-204.4	0.00	204.44	3,408.54	813.18	2,859.49	2,725.48	7.39	-0.71	0.081
104.00	-18.72	-7.45	0.00	-171.0	0.00	171.01	3,334.59	789.47	2,695.23	2,587.88	8	-0.74	0.072
105.00	-18.50	-7.39	0.00	-163.6	0.00	163.57	3,315.86	783.55	2,654.93	2,553.84	8.15	-0.74	0.070
110.00	-17.45	-7.29	0.00	-126.6	0.00	126.61	3,191.58	753.92	2,457.96	2,364.24	8.95	-0.77	0.059
115.00	-16.42	-7.21	0.00	-90.2	0.00	90.17	3,066.14	724.29	2,268.59	2,181.14	9.77	-0.79	0.047
117.00	-13.22	-6.36	0.00	-75.7	0.00	75.74	3,015.97	712.43	2,194.96	2,109.97	10.1	-0.8	0.040
120.00	-12.75	-6.31	0.00	-56.7	0.00	56.66	2,940.71	694.66	2,086.80	2,005.42	10.6	-0.81	0.033
122.50	-9.11	-2.86	0.00	-40.9	0.00	40.89	2,877.99	679.84	1,998.76	1,920.33	11.03	-0.81	0.024
124.00	-8.89	-2.84	0.00	-36.6	0.00	36.60	2,840.36	670.95	1,946.84	1,870.16	11.29	-0.82	0.023
124.00	-8.89	-2.84	0.00	-36.6	0.00	36.60	1,762.15	449.09	1,308.17	1,169.42	11.29	-0.82	0.036
125.00	-8.78	-2.78	0.00	-33.8	0.00	33.76	1,747.31	443.32	1,274.75	1,144.56	11.46	-0.82	0.035
130.00	-8.26	-2.73	0.00	-19.8	0.00	19.85	1,670.08	414.45	1,114.16	1,022.18	12.32	-0.83	0.024
131.00	-6.02	-1.77	0.00	-17.1	0.00	17.12	1,654.03	408.68	1,083.34	998.13	12.5	-0.83	0.021
134.00	-4.64	-1.18	0.00	-11.8	0.00	11.82	1,604.63	391.36	993.47	926.94	13.02	-0.84	0.016
135.00	-4.56	-1.17	0.00	-10.6	0.00	10.64	1,587.76	385.59	964.38	903.54	13.2	-0.84	0.015
136.00	-4.43	-1.02	0.00	-9.5	0.00	9.47	1,570.69	379.81	935.72	880.32	13.37	-0.84	0.014
140.00	-4.12	-0.95	0.00	-5.4	0.00	5.41	1,500.35	356.72	825.40	789.31	14.08	-0.84	0.010
144.50	0.00	-0.89	0.00	-1.1	0.00	1.13	1,400.13	330.74	709.57	682.42	14.88	-0.85	0.002

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period (S_S):	0.171
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.054
Long-Period Transition Period (T_L – Seconds):	6
Importance Factor (I_e):	1.000
Site Coefficient F_a:	1.600
Site Coefficient F_v:	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.182
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.086
Seismic Response Coefficient (C_s):	0.033
Upper Limit C_S:	0.033
Lower Limit C_S:	0.030
Period based on Rayleigh Method (sec):	1.730
Redundancy Factor (p):	1.000
Seismic Force Distribution Exponent (k):	1.620
Total Unfactored Dead Load:	59.390 k
Seismic Base Shear (E):	1.980 k

1.2D + 1.0Ev + 1.0Eh **Seismic**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
42	142.25	326	980	0.013	26	403
41	138	308	884	0.012	23	381
40	135.5	82	228	0.003	6	101
39	134.5	83	228	0.003	6	103
38	132.5	293	786	0.010	21	362
37	130.5	100	262	0.004	7	124
36	127.5	516	1,302	0.017	34	639
35	124.5	107	259	0.004	7	132
34	123.25	227	541	0.007	14	280
33	121.25	383	891	0.012	24	474
32	118.5	470	1,052	0.014	28	581
31	116	401	869	0.012	23	496
30	112.5	1,024	2,108	0.028	56	1,266
29	107.5	1,052	2,014	0.027	53	1,301
28	104.5	214	391	0.005	10	264
27	102	927	1,629	0.022	43	1,146
26	97.5	1,184	1,936	0.026	51	1,464
25	94.65	168	262	0.004	7	208
24	92.15	1,045	1,559	0.021	41	1,292
23	88.5	742	1,037	0.014	27	917
22	86	898	1,198	0.016	32	1,110
21	83.4	1,457	1,851	0.025	49	1,802
20	81.525	253	310	0.004	8	313
19	80.625	353	424	0.006	11	436
18	77.5	1,433	1,616	0.022	43	1,772
17	72.5	1,466	1,485	0.020	39	1,813
16	67.5	1,500	1,353	0.018	36	1,855
15	62.5	1,533	1,222	0.016	32	1,896
14	57.5	1,567	1,091	0.015	29	1,937
13	52.5	1,600	962	0.013	25	1,979
12	49.5	324	177	0.002	5	401
11	47	2,438	1,226	0.016	32	3,015
10	43.5	1,859	825	0.011	22	2,298
9	41	735	296	0.004	8	909

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
8	37.5	1,865	651	0.009	17	2,306
7	32.5	1,903	527	0.007	14	2,353
6	27.5	1,942	411	0.006	11	2,401
5	22.5	1,980	303	0.004	8	2,448
4	17.5	2,018	206	0.003	5	2,495
3	12.5	2,056	122	0.002	3	2,543
2	7.5	2,095	54	0.001	1	2,590
1	2.5	2,133	9	0.000	0	2,637
Ericsson Radio 4460 B25+B66	144.5	327	1,009	0.014	27	404
Ericsson Radio 4480 B71+B85A	144.5	252	778	0.010	21	312
Ericsson Air6449 B41	144.5	312	963	0.013	25	386
Commscope VV-65A-R1	144.5	71	220	0.003	6	88
VFA10-HD	144.5	2,142	6,611	0.088	174	2,649
RFS APXVAALL24 43-U-NA20	144.5	368	1,137	0.015	30	456
Pine Tree Branches	144.5	338	1,042	0.014	27	417
Pine Tree Branches	122.5	3,300	7,800	0.104	206	4,080
Pine Tree Branches	94.3	938	1,452	0.019	38	1,159
Pine Tree Branches	81.8	938	1,154	0.015	30	1,159
Amphenol Antel BXA-70063-6CF-EDIN-X	136	51	143	0.002	4	63
Samsung B2/B66A RRH-BR049	134	253	692	0.009	18	313
Samsung B5/B13 RRH-BR04C	134	211	576	0.008	15	261
RFS DB-C1-12C-24AB-0Z	134	32	87	0.001	2	40
Samsung MT6407-77A	134	245	669	0.009	18	303
Antel LPA-80080/4CF ___	134	24	66	0.001	2	30
Antel LPA-80063/4CF	134	80	219	0.003	6	99
Commscope SBNHH-1D65B (72.9")	134	244	666	0.009	18	301
Round T-Arm	131	750	1,976	0.026	52	927
VZW Unused Reserve (17134.86 sqin)	131	1,412	3,718	0.050	98	1,745
Andrew ABT-DMDF-ADBH	117	1	2	0.000	0	1
Powerwave Allgon LGP21901	117	33	72	0.001	2	41
Powerwave Allgon TT19-08BP111-001	117	96	211	0.003	6	119
Raycap DC6-48-60-18-8F(32.8 lbs)	117	33	72	0.001	2	41
Ericsson RRUS 8843 B2, B66A	117	216	474	0.006	13	267
Ericsson RRUS 4449 B5, B12	117	213	467	0.006	12	263
Ericsson RRUS 4478 B14	117	178	391	0.005	10	220
Raycap DC6-48-60-18-8C	117	16	35	0.000	1	20
Raycap DC6-48-60-18-8C-EV	117	16	35	0.000	1	20
Powerwave Allgon 7770.00	117	105	230	0.003	6	130
Kathrein Scala 80010964	117	168	368	0.005	10	207
Kathrein Scala 80010965	117	390	857	0.011	23	483
T-Arm with Site Pro 1 PRK-1245	117	1,350	2,963	0.040	78	1,669
Generic E-911 GPS	104	5	9	0.000	0	6
Ericsson KRY 112 71	104	40	72	0.001	2	49
RFS ATMAP1412D-1A20	104	39	71	0.001	2	48
RFS APX16DWV-16DWV-S-E-ACU	104	238	431	0.006	11	294
Commscope LNX-6515DS-A1M (50.3 lb)	104	151	274	0.004	7	187
Flat T-Arm	104	750	1,361	0.018	36	927
PCTEL GPS-TMG-HR-26N	50	1	0	0.000	0	1
		59,385	74,909	1.000	1,976	73,428

0.9D - 1.0Ev + 1.0Eh **Seismic (Reduced DL)**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
42	142.25	326	980	0.013	26	281
41	138	308	884	0.012	23	266
40	135.5	82	228	0.003	6	71
39	134.5	83	228	0.003	6	72
38	132.5	293	786	0.010	21	253
37	130.5	100	262	0.004	7	86
36	127.5	516	1,302	0.017	34	446
35	124.5	107	259	0.004	7	92
34	123.25	227	541	0.007	14	196

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
33	121.25	383	891	0.012	24	331
32	118.5	470	1,052	0.014	28	406
31	116	401	869	0.012	23	347
30	112.5	1,024	2,108	0.028	56	884
29	107.5	1,052	2,014	0.027	53	909
28	104.5	214	391	0.005	10	185
27	102	927	1,629	0.022	43	800
26	97.5	1,184	1,936	0.026	51	1,023
25	94.65	168	262	0.004	7	145
24	92.15	1,045	1,559	0.021	41	902
23	88.5	742	1,037	0.014	27	640
22	86	898	1,198	0.016	32	775
21	83.4	1,457	1,851	0.025	49	1,258
20	81.525	253	310	0.004	8	219
19	80.625	353	424	0.006	11	305
18	77.5	1,433	1,616	0.022	43	1,237
17	72.5	1,466	1,485	0.020	39	1,266
16	67.5	1,500	1,353	0.018	36	1,295
15	62.5	1,533	1,222	0.016	32	1,324
14	57.5	1,567	1,091	0.015	29	1,353
13	52.5	1,600	962	0.013	25	1,382
12	49.5	324	177	0.002	5	280
11	47	2,438	1,226	0.016	32	2,106
10	43.5	1,859	825	0.011	22	1,605
9	41	735	296	0.004	8	635
8	37.5	1,865	651	0.009	17	1,610
7	32.5	1,903	527	0.007	14	1,643
6	27.5	1,942	411	0.006	11	1,677
5	22.5	1,980	303	0.004	8	1,710
4	17.5	2,018	206	0.003	5	1,743
3	12.5	2,056	122	0.002	3	1,776
2	7.5	2,095	54	0.001	1	1,809
1	2.5	2,133	9	0.000	0	1,842
Ericsson Radio 4460 B25+B66	144.5	327	1,009	0.014	27	282
Ericsson Radio 4480 B71+B85A	144.5	252	778	0.010	21	218
Ericsson Air6449 B41	144.5	312	963	0.013	25	269
Commscope VV-65A-R1	144.5	71	220	0.003	6	62
VFA10-HD	144.5	2,142	6,611	0.088	174	1,850
RFS APXVAALL24 43-U-NA20	144.5	368	1,137	0.015	30	318
Pine Tree Branches	144.5	338	1,042	0.014	27	291
Pine Tree Branches	122.5	3,300	7,800	0.104	206	2,850
Pine Tree Branches	94.3	938	1,452	0.019	38	810
Pine Tree Branches	81.8	938	1,154	0.015	30	810
Amphenol Antel BXA-70063-6CF-EDIN-X	136	51	143	0.002	4	44
Samsung B2/B66A RRH-BR049	134	253	692	0.009	18	219
Samsung B5/B13 RRH-BR04C	134	211	576	0.008	15	182
RFS DB-C1-12C-24AB-0Z	134	32	87	0.001	2	28
Samsung MT6407-77A	134	245	669	0.009	18	211
Antel LPA-80080/4CF ___	134	24	66	0.001	2	21
Antel LPA-80063/4CF	134	80	219	0.003	6	69
Commscope SBNHH-1D65B (72.9")	134	244	666	0.009	18	210
Round T-Arm	131	750	1,976	0.026	52	648
VZW Unused Reserve (17134.86 sqin)	131	1,412	3,718	0.050	98	1,219
Andrew ABT-DMDF-ADBH	117	1	2	0.000	0	1
Powerwave Allgon LGP21901	117	33	72	0.001	2	28
Powerwave Allgon TT19-08BP111-001	117	96	211	0.003	6	83
Raycap DC6-48-60-18-8F(32.8 lbs)	117	33	72	0.001	2	28
Ericsson RRUS 8843 B2, B66A	117	216	474	0.006	13	187
Ericsson RRUS 4449 B5, B12	117	213	467	0.006	12	184
Ericsson RRUS 4478 B14	117	178	391	0.005	10	154
Raycap DC6-48-60-18-8C	117	16	35	0.000	1	14
Raycap DC6-48-60-18-8C-EV	117	16	35	0.000	1	14
Powerwave Allgon 7770.00	117	105	230	0.003	6	91
Kathrein Scala 80010964	117	168	368	0.005	10	145
Kathrein Scala 80010965	117	390	857	0.011	23	337
T-Arm with Site Pro 1 PRK-1245	117	1,350	2,963	0.040	78	1,166
Generic E-911 GPS	104	5	9	0.000	0	4
Ericsson KRY 112 71	104	40	72	0.001	2	34
RFS ATMAP1412D-1A20	104	39	71	0.001	2	34
RFS APX16DWV-16DWV-S-E-ACU	104	238	431	0.006	11	205

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
Commscope LNX-6515DS-A1M (50.3 lb)	104	151	274	0.004	7	130
Flat T-Arm	104	750	1,361	0.018	36	648
PCTEL GPS-TMG-HR-26N	50	1	0	0.000	0	1
		59,385	74,909	1.000	1,976	51,280

1.2D + 1.0Ev + 1.0Eh **Seismic**

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-70.79	-1.98	0.00	-219.46	0.00	219.46	7,122.56	1,825.62	10,809	9,608.64	0.00	0.00	0.03
5.00	-68.20	-1.98	0.00	-209.57	0.00	209.57	7,022.32	1,786.12	10,346	9,266.86	0.00	-0.01	0.03
10.00	-65.66	-1.99	0.00	-199.66	0.00	199.66	6,919.69	1,746.61	9,894	8,927.89	0.01	-0.01	0.03
15.00	-63.16	-1.99	0.00	-189.73	0.00	189.73	6,814.69	1,707.10	9,451	8,591.96	0.03	-0.02	0.03
20.00	-60.71	-1.98	0.00	-179.80	0.00	179.80	6,707.29	1,667.60	9,019	8,259.27	0.05	-0.02	0.03
25.00	-58.31	-1.98	0.00	-169.89	0.00	169.89	6,597.52	1,628.09	8,597	7,930.04	0.07	-0.03	0.03
30.00	-55.96	-1.97	0.00	-160.00	0.00	160.00	6,485.35	1,588.58	8,184	7,604.46	0.11	-0.03	0.03
35.00	-53.65	-1.95	0.00	-150.16	0.00	150.16	6,370.81	1,549.08	7,783	7,282.76	0.14	-0.04	0.03
40.00	-52.74	-1.95	0.00	-140.39	0.00	140.39	6,253.88	1,509.57	7,391	6,965.15	0.19	-0.05	0.03
42.00	-50.45	-1.93	0.00	-136.49	0.00	136.49	6,206.44	1,493.77	7,237	6,839.29	0.21	-0.05	0.03
45.00	-47.43	-1.90	0.00	-130.70	0.00	130.70	6,134.57	1,470.07	7,009	6,651.83	0.24	-0.05	0.03
49.00	-47.03	-1.90	0.00	-123.11	0.00	123.11	5,148.29	1,281.50	6,087	5,567.88	0.29	-0.06	0.03
50.00	-45.05	-1.87	0.00	-121.21	0.00	121.21	5,129.30	1,274.59	6,021	5,517.17	0.30	-0.06	0.03
55.00	-43.11	-1.85	0.00	-111.86	0.00	111.86	5,032.95	1,240.02	5,699	5,265.49	0.36	-0.06	0.03
60.00	-41.22	-1.82	0.00	-102.63	0.00	102.63	4,934.21	1,205.45	5,386	5,017.06	0.43	-0.07	0.03
65.00	-39.36	-1.78	0.00	-93.55	0.00	93.55	4,833.09	1,170.88	5,082	4,772.08	0.51	-0.08	0.03
70.00	-37.55	-1.74	0.00	-84.65	0.00	84.65	4,729.59	1,136.31	4,786	4,530.77	0.60	-0.08	0.03
75.00	-35.78	-1.70	0.00	-75.92	0.00	75.92	4,623.70	1,101.74	4,499	4,293.33	0.69	-0.09	0.03
80.00	-35.34	-1.69	0.00	-67.41	0.00	67.41	4,515.42	1,067.18	4,221	4,059.98	0.79	-0.10	0.02
81.25	-35.03	-1.69	0.00	-65.29	0.00	65.29	4,481.13	1,058.53	4,153	3,996.20	0.81	-0.10	0.02
81.80	-32.07	-1.60	0.00	-64.37	0.00	64.37	4,465.03	1,054.73	4,123	3,967.40	0.82	-0.10	0.02
85.00	-30.96	-1.57	0.00	-59.24	0.00	59.24	4,371.38	1,032.61	3,952	3,801.89	0.89	-0.10	0.02
87.00	-30.04	-1.54	0.00	-56.10	0.00	56.10	3,638.34	890.21	3,427	3,187.47	0.94	-0.11	0.03
90.00	-28.75	-1.50	0.00	-51.47	0.00	51.47	3,586.74	872.43	3,291	3,078.96	1.00	-0.11	0.03
94.30	-27.38	-1.46	0.00	-45.01	0.00	45.01	3,511.28	846.95	3,102	2,925.37	1.10	-0.11	0.02
95.00	-25.92	-1.40	0.00	-43.99	0.00	43.99	3,498.83	842.80	3,072	2,900.59	1.12	-0.12	0.02
100.00	-24.77	-1.36	0.00	-36.97	0.00	36.97	3,408.54	813.18	2,859	2,725.48	1.25	-0.12	0.02
104.00	-22.99	-1.29	0.00	-31.53	0.00	31.53	3,334.59	789.47	2,695	2,587.88	1.35	-0.13	0.02
105.00	-21.69	-1.23	0.00	-30.25	0.00	30.25	3,315.86	783.55	2,655	2,553.84	1.38	-0.13	0.02
110.00	-20.43	-1.18	0.00	-24.08	0.00	24.08	3,191.58	753.92	2,458	2,364.24	1.51	-0.13	0.02
115.00	-19.93	-1.15	0.00	-18.19	0.00	18.19	3,066.14	724.29	2,269	2,181.14	1.65	-0.14	0.02
117.00	-15.87	-0.95	0.00	-15.89	0.00	15.89	3,015.97	712.43	2,195	2,109.97	1.71	-0.14	0.01
120.00	-15.40	-0.93	0.00	-13.02	0.00	13.02	2,940.71	694.66	2,087	2,005.42	1.80	-0.14	0.01
122.50	-11.04	-0.70	0.00	-10.70	0.00	10.70	2,877.99	679.84	1,999	1,920.33	1.87	-0.14	0.01
124.00	-10.90	-0.69	0.00	-9.65	0.00	9.65	2,840.36	670.95	1,947	1,870.16	1.92	-0.14	0.01
124.00	-10.90	-0.69	0.00	-9.65	0.00	9.65	1,762.15	449.09	1,308	1,169.42	1.92	-0.14	0.01
125.00	-10.27	-0.66	0.00	-8.96	0.00	8.96	1,747.31	443.32	1,275	1,144.56	1.95	-0.14	0.01
130.00	-10.14	-0.65	0.00	-5.67	0.00	5.67	1,670.08	414.45	1,114	1,022.18	2.10	-0.15	0.01
131.00	-7.11	-0.47	0.00	-5.02	0.00	5.02	1,654.03	408.68	1,083	998.13	2.13	-0.15	0.01
134.00	-5.66	-0.38	0.00	-3.61	0.00	3.61	1,604.63	391.36	993	926.94	2.22	-0.15	0.01
135.00	-5.56	-0.38	0.00	-3.23	0.00	3.23	1,587.76	385.59	964	903.54	2.25	-0.15	0.01
136.00	-5.11	-0.35	0.00	-2.85	0.00	2.85	1,570.69	379.81	936	880.32	2.28	-0.15	0.01
140.00	-4.71	-0.32	0.00	-1.45	0.00	1.45	1,500.35	356.72	825	789.31	2.41	-0.15	0.01
144.50	0.00	-0.31	0.00	0.00	0.00	0.00	1,400.13	330.74	710	682.42	2.55	-0.15	0.00

0.9D - 1.0Ev + 1.0Eh **Seismic (Reduced DL)**

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-49.44	-1.98	0.00	-217.75	0.00	217.75	7,122.56	1,825.62	10,809	9,608.64	0.00	0.00	0.03

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
5.00	-47.63	-1.98	0.00	-207.86	0.00	207.86	7,022.32	1,786.12	10,346	9,266.86	0.00	-0.01	0.03
10.00	-45.85	-1.98	0.00	-197.96	0.00	197.96	6,919.69	1,746.61	9,894	8,927.89	0.01	-0.01	0.03
15.00	-44.11	-1.98	0.00	-188.06	0.00	188.06	6,814.69	1,707.10	9,451	8,591.96	0.03	-0.02	0.03
20.00	-42.40	-1.98	0.00	-178.16	0.00	178.16	6,707.29	1,667.60	9,019	8,259.27	0.05	-0.02	0.03
25.00	-40.72	-1.97	0.00	-168.28	0.00	168.28	6,597.52	1,628.09	8,597	7,930.04	0.07	-0.03	0.03
30.00	-39.08	-1.96	0.00	-158.45	0.00	158.45	6,485.35	1,588.58	8,184	7,604.46	0.10	-0.03	0.03
35.00	-37.47	-1.94	0.00	-148.66	0.00	148.66	6,370.81	1,549.08	7,783	7,282.76	0.14	-0.04	0.03
40.00	-36.83	-1.94	0.00	-138.95	0.00	138.95	6,253.88	1,509.57	7,391	6,965.15	0.19	-0.05	0.03
42.00	-35.23	-1.92	0.00	-135.08	0.00	135.08	6,206.44	1,493.77	7,237	6,839.29	0.21	-0.05	0.03
45.00	-33.12	-1.88	0.00	-129.33	0.00	129.33	6,134.57	1,470.07	7,009	6,651.83	0.24	-0.05	0.03
49.00	-32.84	-1.88	0.00	-121.79	0.00	121.79	5,148.29	1,281.50	6,087	5,567.88	0.28	-0.06	0.03
50.00	-31.46	-1.86	0.00	-119.91	0.00	119.91	5,129.30	1,274.59	6,021	5,517.17	0.30	-0.06	0.03
55.00	-30.11	-1.83	0.00	-110.63	0.00	110.63	5,032.95	1,240.02	5,699	5,265.49	0.36	-0.06	0.03
60.00	-28.78	-1.80	0.00	-101.49	0.00	101.49	4,934.21	1,205.45	5,386	5,017.06	0.43	-0.07	0.03
65.00	-27.49	-1.76	0.00	-92.49	0.00	92.49	4,833.09	1,170.88	5,082	4,772.08	0.51	-0.08	0.03
70.00	-26.22	-1.73	0.00	-83.67	0.00	83.67	4,729.59	1,136.31	4,786	4,530.77	0.59	-0.08	0.02
75.00	-24.98	-1.68	0.00	-75.03	0.00	75.03	4,623.70	1,101.74	4,499	4,293.33	0.68	-0.09	0.02
80.00	-24.68	-1.67	0.00	-66.61	0.00	66.61	4,515.42	1,067.18	4,221	4,059.98	0.78	-0.10	0.02
81.25	-24.46	-1.67	0.00	-64.52	0.00	64.52	4,481.13	1,058.53	4,153	3,996.20	0.81	-0.10	0.02
81.80	-22.39	-1.58	0.00	-63.60	0.00	63.60	4,465.03	1,054.73	4,123	3,967.40	0.82	-0.10	0.02
85.00	-21.62	-1.55	0.00	-58.53	0.00	58.53	4,371.38	1,032.61	3,952	3,801.89	0.88	-0.10	0.02
87.00	-20.98	-1.53	0.00	-55.42	0.00	55.42	3,638.34	890.21	3,427	3,187.47	0.93	-0.10	0.02
90.00	-20.07	-1.48	0.00	-50.84	0.00	50.84	3,586.74	872.43	3,291	3,078.96	0.99	-0.11	0.02
94.30	-19.12	-1.44	0.00	-44.46	0.00	44.46	3,511.28	846.95	3,102	2,925.37	1.09	-0.11	0.02
95.00	-18.10	-1.39	0.00	-43.45	0.00	43.45	3,498.83	842.80	3,072	2,900.59	1.11	-0.11	0.02
100.00	-17.30	-1.34	0.00	-36.52	0.00	36.52	3,408.54	813.18	2,859	2,725.48	1.23	-0.12	0.02
104.00	-16.06	-1.27	0.00	-31.15	0.00	31.15	3,334.59	789.47	2,695	2,587.88	1.34	-0.12	0.02
105.00	-15.15	-1.22	0.00	-29.87	0.00	29.87	3,315.86	783.55	2,655	2,553.84	1.36	-0.13	0.02
110.00	-14.26	-1.16	0.00	-23.78	0.00	23.78	3,191.58	753.92	2,458	2,364.24	1.50	-0.13	0.02
115.00	-13.92	-1.14	0.00	-17.97	0.00	17.97	3,066.14	724.29	2,269	2,181.14	1.64	-0.13	0.01
117.00	-11.08	-0.94	0.00	-15.69	0.00	15.69	3,015.97	712.43	2,195	2,109.97	1.69	-0.14	0.01
120.00	-10.75	-0.92	0.00	-12.87	0.00	12.87	2,940.71	694.66	2,087	2,005.42	1.78	-0.14	0.01
122.50	-7.71	-0.69	0.00	-10.57	0.00	10.57	2,877.99	679.84	1,999	1,920.33	1.85	-0.14	0.01
124.00	-7.61	-0.68	0.00	-9.53	0.00	9.53	2,840.36	670.95	1,947	1,870.16	1.90	-0.14	0.01
124.00	-7.61	-0.68	0.00	-9.53	0.00	9.53	1,762.15	449.09	1,308	1,169.42	1.90	-0.14	0.01
125.00	-7.17	-0.65	0.00	-8.85	0.00	8.85	1,747.31	443.32	1,275	1,144.56	1.93	-0.14	0.01
130.00	-7.08	-0.64	0.00	-5.61	0.00	5.61	1,670.08	414.45	1,114	1,022.18	2.07	-0.14	0.01
131.00	-4.96	-0.47	0.00	-4.96	0.00	4.96	1,654.03	408.68	1,083	998.13	2.11	-0.14	0.01
134.00	-3.95	-0.38	0.00	-3.57	0.00	3.57	1,604.63	391.36	993	926.94	2.20	-0.15	0.01
135.00	-3.88	-0.37	0.00	-3.19	0.00	3.19	1,587.76	385.59	964	903.54	2.23	-0.15	0.01
136.00	-3.57	-0.35	0.00	-2.81	0.00	2.81	1,570.69	379.81	936	880.32	2.26	-0.15	0.01
140.00	-3.29	-0.32	0.00	-1.43	0.00	1.43	1,500.35	356.72	825	789.31	2.38	-0.15	0.00
144.50	0.00	-0.31	0.00	0.00	0.00	0.00	1,400.13	330.74	710	682.42	2.52	-0.15	0.00

ANALYSIS SUMMARY

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W	50.10	0.00	71.20	0.00	0.00	5406.00	0.00	0.57
0.9D + 1.0W	50.08	0.00	53.39	0.00	0.00	5370.73	0.00	0.57
1.2D + 1.0Di + 1.0Wi	13.94	0.00	91.11	0.00	0.00	1489.58	0.00	0.17
1.2D + 1.0Ev + 1.0Eh	1.99	0.00	70.79	0.00	0.00	219.46	0.00	0.03
0.9D - 1.0Ev + 1.0Eh	1.98	0.00	49.44	0.00	0.00	217.75	0.00	0.03
1.0D + 1.0W	12.20	0.00	59.38	0.00	0.00	1311.51	0.00	0.14

Flange Plate Analysis

Flange Plate

Plate Type	***Flange***	***@ 124 ft***
Pole Diameter	32.508	in
Pole Thickness	0.25	in
Plate Diameter	41	in
Plate Thickness	1 1/4	in
Plate Fy	50	ksi
Weld Length	3/16	in
f_s Resistance	125.35	k-in
Applied	23.21	k-in

Code Rev.	***H***
Moment	151.6 k-ft
Axial	10.4 k

Required Flange Thickness:
0.54 in OK

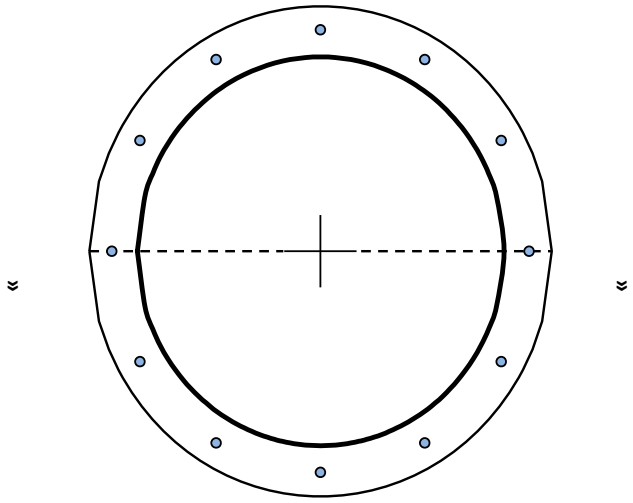
Date	11/8/2021
Engineer	AEW
Site #	411181
Carrier	SPRINT NEXTEL

Stiffeners

#	***0***

Bolts

#	***12***	
Bolt Circle	37	in
(R)adial / (S)quare	R	
Diameter	1	in
Hole Diameter	1 1/8	in
Type	A325	
Fy	92	ksi
Fu	120	ksi
f_s Resistance	54.52	k
Applied	15.52	k



Reinforcement

#	***0***

Plate Stress Ratio:
19% Pass

Bolt Stress Ratio:
28% Pass

Extra Bolts O

#	***0***

Base Plate & Anchor Rod Analysis

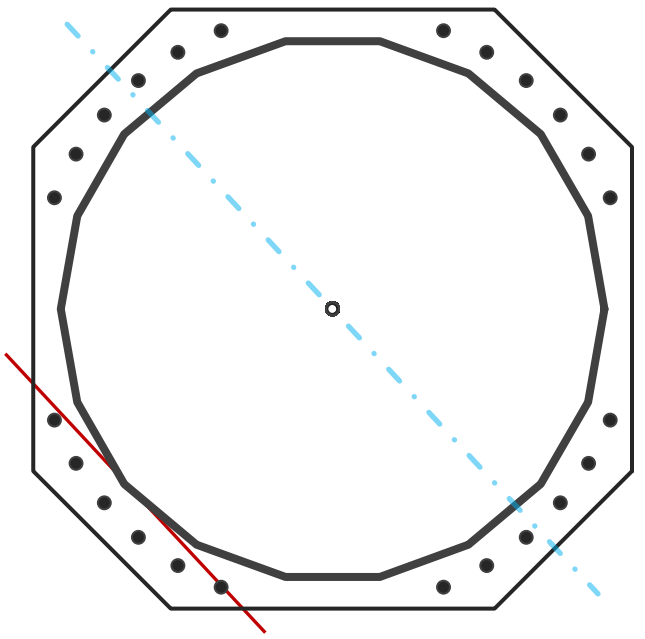
Pole Dimensions		
Number of Sides	18	-
Diameter	66.05	in
Thickness	1/2	in
Orientation Offset		°

Base Reactions		
Moment, Mu	5,406.0	k-ft
Axial, Pu	71.2	k
Shear, Vu	50.1	k
Neutral Axis	133	°

Report Capacities		
Component	Capacity	Result
Base Plate	43%	Pass
Anchor Rods	61%	Pass
Dwyidag	-	-

Base Plate		
Shape	Square	-
Width	74	in
Thickness	3 1/4	in
Grade	Other	
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	70	ksi
Clip	17	in
Orientation Offset		°
Anchor Rod Detail	d	η=0.5
Clear Distance	2 3/4	in
Applied Moment, Mu	2176.9	k
Bending Stress, ϕMn	5029.3	k

Original Anchor Rods		
Arrangement	Cluster	-
Quantity	24	-
Diameter, ø	2 1/4	in
Bolt Circle	74	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	6.0	in
Orientation Offset		°
Applied Force, Pu	148.9	k
Anchor Rods, ϕPn	243.6	k



Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	50.1	5406.0	1.00
Anchor Rod Forces	50.1	5406.0	1.00
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	0.0	0.0	0.00

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	102.4437	5.6913	0.4761		55031.14
Bolt	3.9761	3.2477	0.8393	4.5	53373.19
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate		
Shape	Square	-
Width, W	74	in
Thickness, t	3.25	in
Yield Strength, Fy	55	ksi
Tensile Strength, Fu	70	ksi
Base Plate Chord	33.368	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	2.75	-

Anchor Rods		
Anchor Rod Quantity, N	24	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	74	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	148.9	k
Applied Shear, Vu	0.2	k
Compressive Capacity, ϕPn	243.6	k
Tensile Capacity, ϕRnt	0.611	OK
Interaction Capacity	0.612	OK

External Base Plate		
Chord Length AA	38.477	in
Additional AA	0.000	in
Section Modulus, Z	101.603	in^3
Applied Moment, Mu	2176.9	k-ft
Bending Capacity, ϕMn	5029.3	k-ft
Capacity, Mu/ϕMn	0.433	OK
Chord Length AB	37.456	in
Additional AB	0.000	in
Section Modulus, Z	98.907	in^3
Applied Moment, Mu	1754.9	k-ft
Bending Capacity, ϕMn	4895.9	k-ft
Capacity, Mu/ϕMn	0.358	OK
Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in^3
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

Internal Base Plate		
Arc Length	0.000	in
Section Modulus, Z	0.000	in^3
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

Site Name: Barkhamstead CT, CT
Site Number: 411181
Tower Type: MP
Design Loads (Factored) - Analysis per TIA-222-H Standards

Monolithic Mat & Pier Foundation Analysis

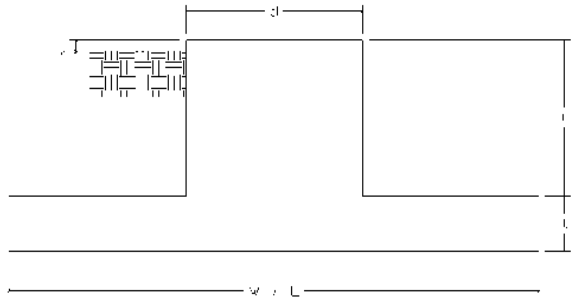
Foundation Analysis Parameters		
Design / Analysis / Mapping:	Analysis	-
Compression/Leg:	71.2	k
Uplift/Leg:	0.0	k
Total Shear:	50.1	k
Moment:	5,406.0	k-ft
Tower + Appurtenance Weight:	71.2	k
Depth to Base of Foundation (l + t - h):	9	ft
Diameter of Pier (d):	8	ft
Length of Pier (l):	5.5	ft
Height of Pier above Ground (h):	0.5	ft
Width of Pad (W):	31.5	ft
Length of Pad (L):	31.5	ft
Thickness of Pad (t):	4	ft
Tower Leg Center to Center:	0	ft
Number of Tower Legs:	1	-
Tower Center from Mat Center:	0	ft
Depth Below Ground Surface to Water Table:	3	ft
Unit Weight of Concrete:	150	pcf
Unit Weight of Soil Above Water Table:	125	pcf
Unit Weight of Water:	62.4	pcf
Unit Weight of Soil Below Water Table:	62.6	pcf
Friction Angle of Uplift:	15	°
Coefficient of Shear Friction:	0.20	-
Ultimate Compressive Bearing Pressure:	24,000	psf
Ultimate Passive Pressure on Pad Face:	0	psf
$f_{Soil\ and\ Concrete\ Weight}$:	0.9	-
f_{Soil}:	0.75	-

Overturning Moment Usage		
Design OTM:	5882.0	k-ft
OTM Resistance:	13668.8	k-ft
Design OTM / OTM Resistance:	43%	Pass

Soil Bearing Pressure Usage		
Net Bearing Pressure:	1447	psf
Factored Nominal Bearing Pressure:	18000	psf
Factored Nominal (Net) Bearing Pressure:	8%	Pass
Load Direction Controling Design Bearing Pressure:	*Diagonal to Pad Edge*	

Sliding Factor of Safety		
Ultimate Friction Resistance:	182.7	k
Ultimate Passive Pressure Resistance:	0.0	k
Total Factored Sliding Resistance:	137.0	k
Sliding Design / Sliding Resistance:	37%	Pass

Foundation Steel Parameters		
Shear/Leg (Compression):	50.1	k
Shear/Leg (Uplift):	50.1	k
Concrete Strength (f'_c):	3,000	psi
Pad Tension Steel Depth:	43.31	in
Dead Load Factor:	0.9	-
f_{Shear}:	0.75	-
$f_{Flexure\ /\ Tension}$:	0.9	-
$f_{Compression:}$	0.65	-
b:	0.85	-
Bottom Pad Rebar Size #:	11	-
# of Bottom Pad Rebar:	47	-
Pad Bottom Steel Area:	73.32	in^2
Pad Steel F_y:	60,000	psi
Top Pad Rebar Size #:	11	-
# of Top Pad Rebar:	47	-
Pad Top Steel Area:	73.32	in^2
Pier Rebar Size #:	11	-
Pier Steel Area (Single Bar):	1.56	in^2
# of Pier Rebar:	60	-
Pier Steel F_y:	60,000	psi
Pier Cage Diameter:	85.6	in
Rebar Strain Limit:	0.008	-
Steel Elastic Modulus:	29,000	ksi
Tie Rebar Size #:	4	-
Tie Steel Area (Single Bar):	0.20	in^2
Tie Spacing:	6.5	in
Tie Steel F_y:	40,000	psi
Clear Cover:	4	in



Pad Strength Capacity			
Factored One Way Shear (V_u):	368.0	k	
One Way Shear Capacity (fV_c):	1345.1	k	*ACI 318-14 25.5.5.1*
V_u / fV_c:	27%	Pass	
Load Direction Controling Shear Capacity:	*Parallel to Pad Edge*		
Lower Steel Pad Factored Moment (M_u):	3120.5	k-ft	
Lower Steel Pad Moment Capacity (fM_n):	13650.5	k-ft	*ACI 318-14 22.3.1.1*
M_u / fM_n:	23%	Pass	
Load Direction Controling Flexural Capacity:	*Parallel to Pad Edge*		
Upper Steel Pad Factored Moment (M_u):	1849.6	k-ft	
Upper Steel Pad Moment Capacity (fM_n):	13650.5	k-ft	
M_u / fM_n:	14%	Pass	
Lower Pad Flexural Reinforcement Ratio:	0.0045		*OK - ACI 318-14 7.6.1.1 & 8.6.1.1*
Upper Pad Flexural Reinforcement Ratio:	0.0045		*OK - ACI 318-14 7.6.1.1 & 8.6.1.1*
Lower Pad Reinforcement Spacing:	8.0	in	*OK - ACI 318-14 7.7.2.3, 8.7.2.2, & 24.4.3.3*
Upper Pad Reinforcement Spacing:	8.0	in	*OK - ACI 318-14 7.7.2.3, 8.7.2.2, & 24.4.3.3*
Ultimate Punching Shear Stress, v_u:	33.82	psi	*ACI 318-14 R8.4.4.2.3*
Nominal Punching Shear Capacity (f_cv_c):	164.3	psi	*ACI 318-14 22.6.5.2*
v_u / f_cv_c:	21%	Pass	
Pier Moment Pad Flexure Transfer Ratio, γ_f:	0.60		*TIA-222-H 9.4.2*
Moment Transfer Effective Flexural Width, B_{eff}:	20.00	ft	*TIA-222-H 9.4.2*
Moment Transfer Through Pad Flexure:	40907.16	k-in	*TIA-222-H 9.4.2*
Moment Transfer Flexural Capacity ($fM_{sc,f}$):	107493.07	k-in	
g_fM_{sc} / $fM_{sc,f}$:	0%	Pass	

Pier Strength Capacity			
Factored Moment in Pier (M_u):	5681.6	k-ft	
Pier Moment Capacity (fM_n):	17633.7	k-ft	
M_u / fM_n:	32%	Pass	
Factored Shear in Pier (V_u):	50.1	k	
Pier Shear Capacity (fV_n):	739.4	k	*ACI 318-14 22.5.1.1*
V_u / fV_c:	7%	Pass	
Pier Shear Reinforcement Ratio:	0.0003		*OK - No Ties Necessary for Shear - ACI11.5.6.1*
Factored Tension in Pier (T_u):	0.0	k	
Pier Tension Capacity (fT_n):	5054.4	k	
T_u / fT_n:	0%	Pass	
Factored Compression in Pier (P_u):	71.2	k	
Pier Compression Capacity (fP_n):	9522.5	k	*ACI 318-14 22.4.2.1*
P_u / fP_n:	1%	Pass	
Minimum Depth to Develop Vertical Rebar:	63	in	*ACI 318-14 25.4.2.3*
Minimum Hook Development Length:	31	in	*ACI 318-14 25.4.3.1*
Minimum Mat Thickness / Edge Distance from Pier:	34.0	in	
Minimum Foundation Depth:	8.35	ft	
$M_u/f_BM_n + T_u/f_TT_n$:	32%	Pass	

AMERICAN TOWER®
CORPORATION

Mount Analysis Report

ATC Site Name	:	**Barkhamstead CT, CT**
ATC Site Number	:	**411181**
Engineering Number	:	**13709505_C8_07**
Mount Elevation	:	**146 ft**
Carrier	:	**Sprint Nextel**
Carrier Site Name	:	**CTNH617A**
Carrier Site Number	:	**CTNH617A**
Site Location	:	**50 Rust Road** **BARKHAMSTED, CT 06063-3314** **41.893808 , -72.996472**
County	:	**Litchfield**
Date	:	**October 21, 2021**
Max Usage	:	**53%**
Result	:	**Pass**

Prepared By:
Garrett Williams
Structural Engineer

Garrett Williams

Reviewed By:

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of the mount analysis performed for Sprint Nextel at 146 ft.

Supporting Documents

Specifications Sheet	Site Pro 1 VFA10-HD, dated December 14, 2017
Radio Frequency Data Sheet	RFDS ID #CTNH617A, dated October 6, 2021

Analysis

This mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

Basic Wind Speed:	115 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1'' radial ice concurrent
Codes:	ANSI/TIA-222-H
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 2
Feature:	Flat
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	Ss = 0.171, S1 = 0.054
Site Class:	D - Stiff Soil
Live Loads:	Lm = 500 lbs, Lv = 250 lbs

Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above. The mount can support the equipment as described in this report.

- Analysis is based on new Site Pro 1 VFA10-HD sector frame.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

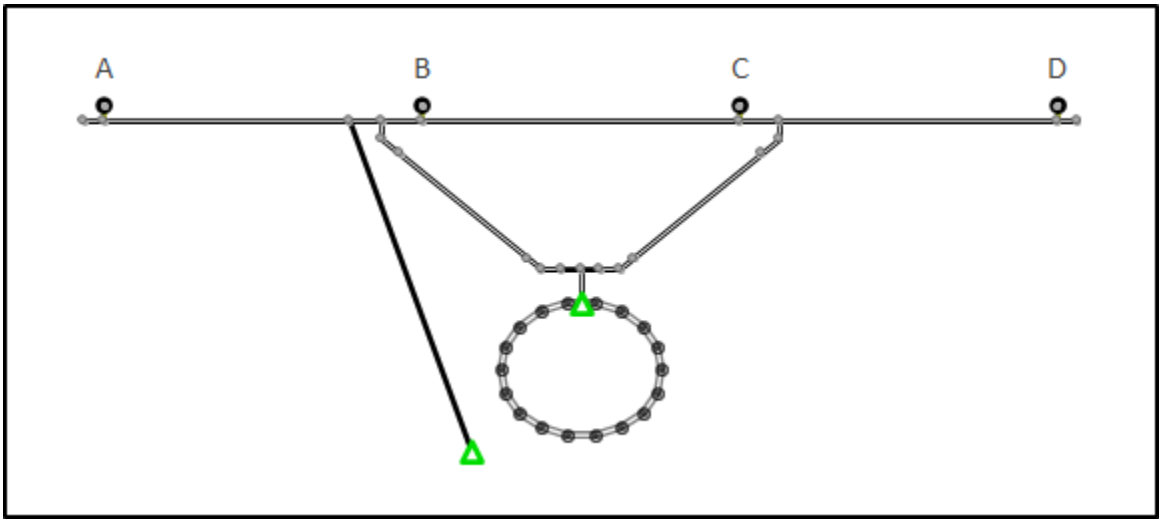
Application Loading

Mount Centerline (ft)	Equipment Centerline (ft)	Qty	Equipment Manufacturer & Model
146.0	146.0	3	Commscope VV-65A-R1
		3	RFS APXVAALL24 43-U-NA20
		3	Ericsson Air6449 B41
		3	Ericsson Radio 4460 B25+B66
		3	Ericsson Radio 4480 B71+B85A
50.0	50.0	1	PCTEL GPS-TMG-HR-26N

Structure Usages

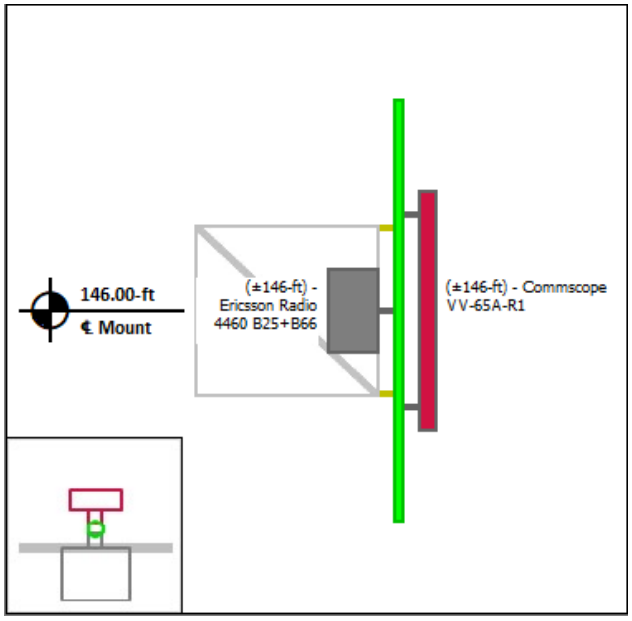
Structural Component	Controlling Usage	Pass/Fail
Horizontals	43%	Pass
Verticals	53%	Pass
Diagonals	20%	Pass
Tie-Backs	5%	Pass
Mount Pipes	35%	Pass

Mount Layout

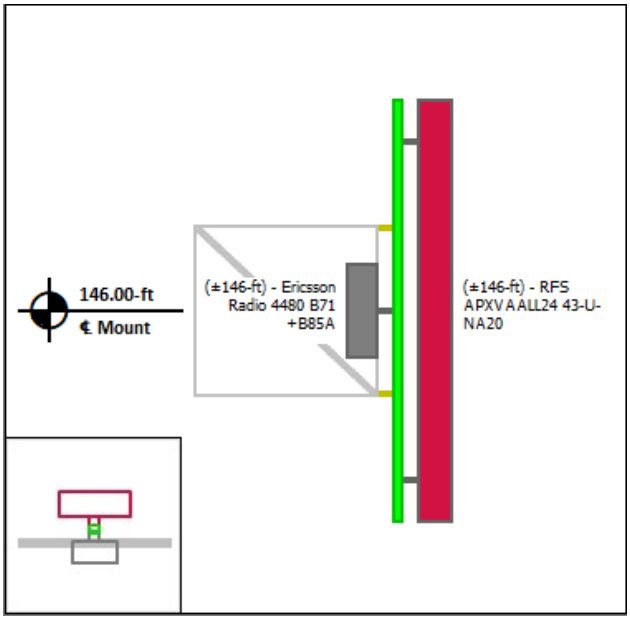


Equipment Layout

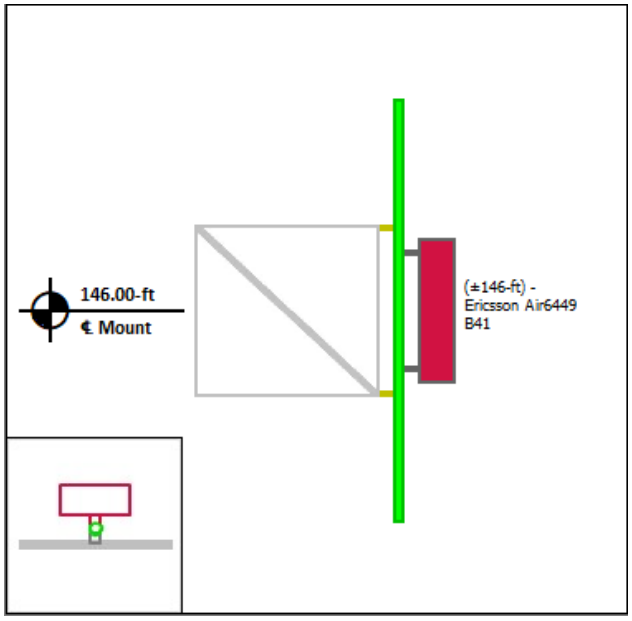
Mount Pipe A



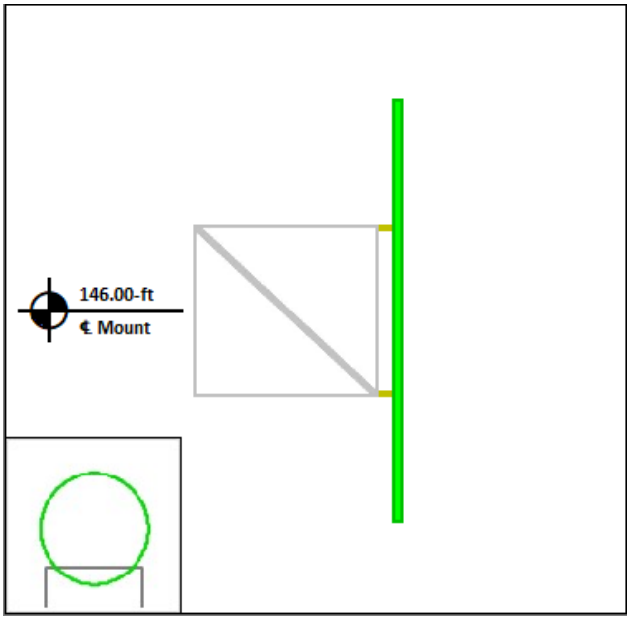
Mount Pipe B



Mount Pipe C



Mount Pipe D



Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding equipment, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

Installation of all equipment and steel should be confirmed not to cause tower conflicts nor impede the tower climbing pegs.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

AMERICAN TOWER®
CORPORATION

Site Number:	*411181*
Project Number:	*13709505_C8_07*
Carrier:	*Sprint Nextel*
Mount Elevation:	*146 ft*
Date:	10/21/2021

Mount Analysis Force Calculations

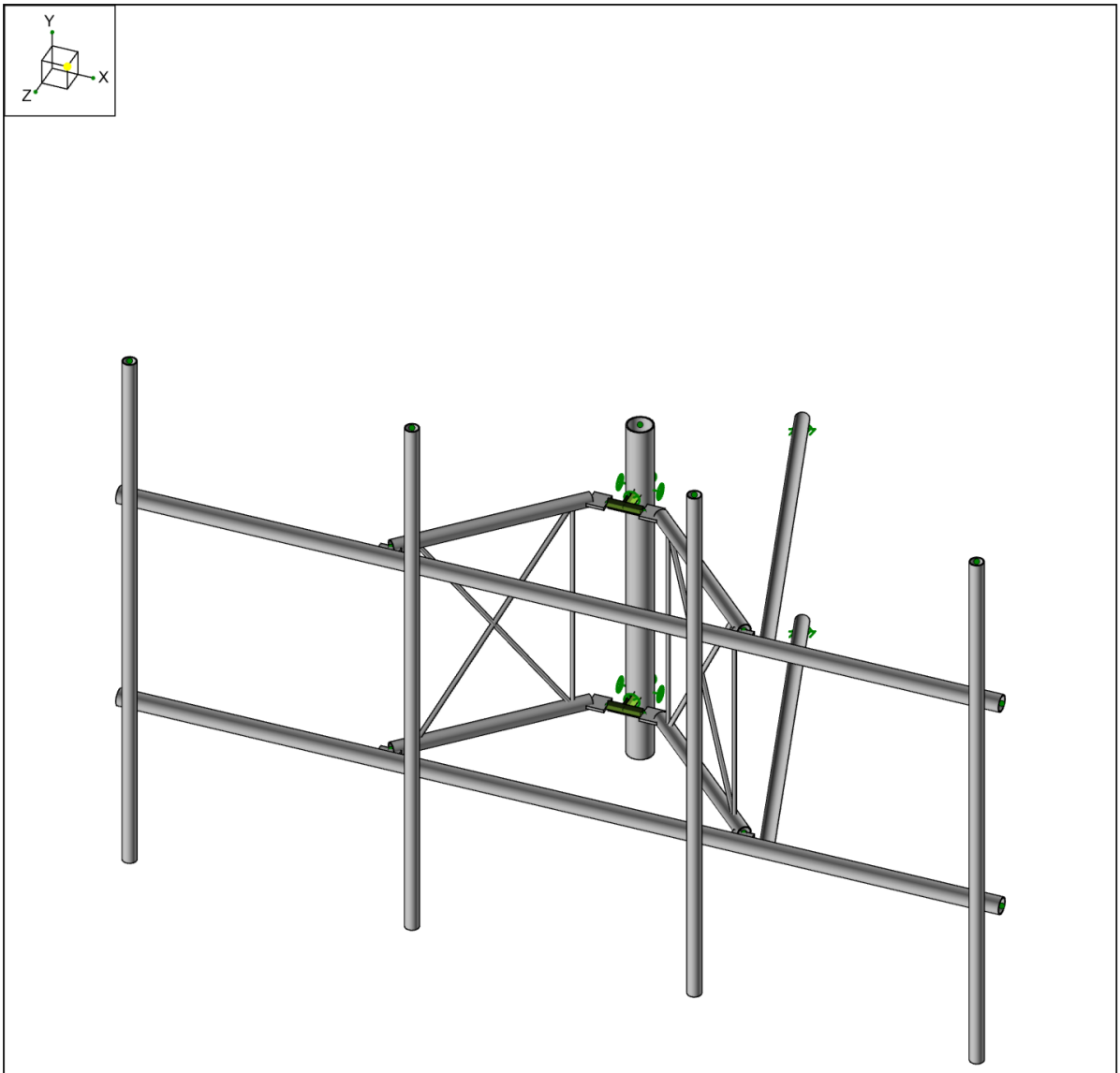
Wind & Ice Load Calculations			
Velocity Pressure Coefficient	K_z	1.10	
Topographic Factor	K_{zt}	1.00	
Rooftop Wind Speed-up Factor	K_s	1.00	
Shielding Factor	K_a	0.90	
Ground Elevation Factor	K_e	0.97	
Wind Direction Probability Factor	K_d	0.95	
Basic Wind Speed	V	115	mph
Velocity Pressure	q_z	34.4	psf
Height Escalation Factor	K_{iz}	1.16	
Thickness of Radial Glaze Ice	T_{iz}	1.16	in

Seismic Load Calculations			
Short Period DSRAP	S_{DS}	0.182	
1 Second DSRAP	S_{D1}	0.086	
Importance Factor	I	1.0	
Response Modification Coefficient	R	2.0	
Seismic Response Coefficient	C_S	0.091	
Amplification Factor	A	1.0	
Total Weight	W	1013.3	lbs
Total Shear Force	V_S	92.4	lbs
Horizontal Seismic Load	Eh	92.4	lbs
Vertical Seismic Load	Ev	37.0	lbs

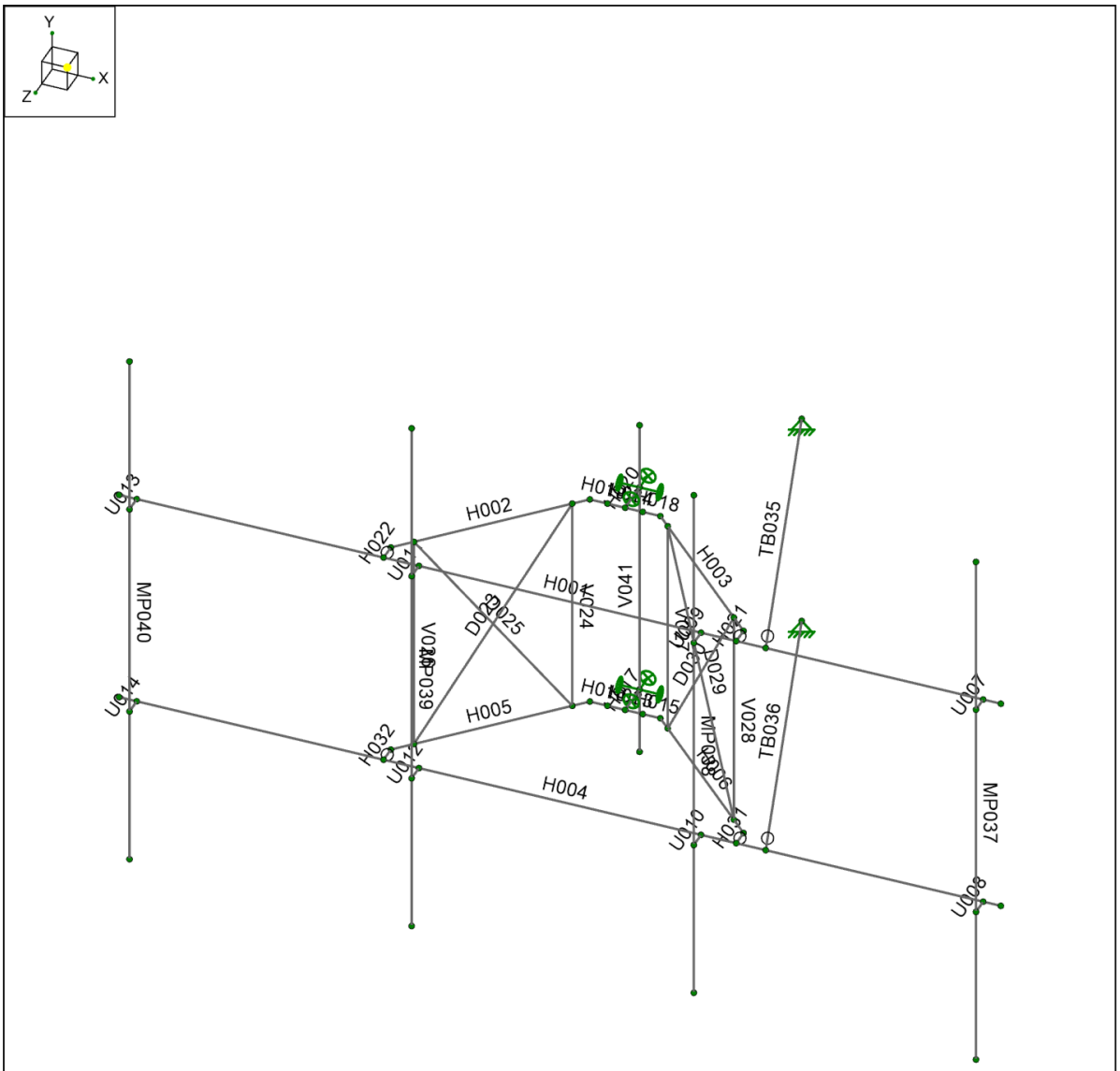
Antenna Calculations (Elevations per Application/RFDS)*

Equipment	Height	Width	Depth	Weight	EPA_N	EPA_T	EPA_{Ni}	EPA_{Ti}
Model #	in	in	in	lbs	sqft	sqft	sqft	sqft
Commscope VV-65A-R1	54.7	12.1	4.6	23.8	5.93	1.44	7.37	2.26
RFS APXVAALL24 43-U-NA20	95.9	24.0	8.5	122.8	20.24	3.40	22.74	4.43
Ericsson Air6449 B41	33.1	20.6	8.6	104.0	5.68	1.56	6.77	2.12
Ericsson Radio 4460 B25+B66	19.6	15.7	12.1	109.0	2.56	1.98	3.29	2.63
Ericsson Radio 4480 B71+B85A	21.8	15.7	7.5	84.0	2.85	1.38	3.62	2.00

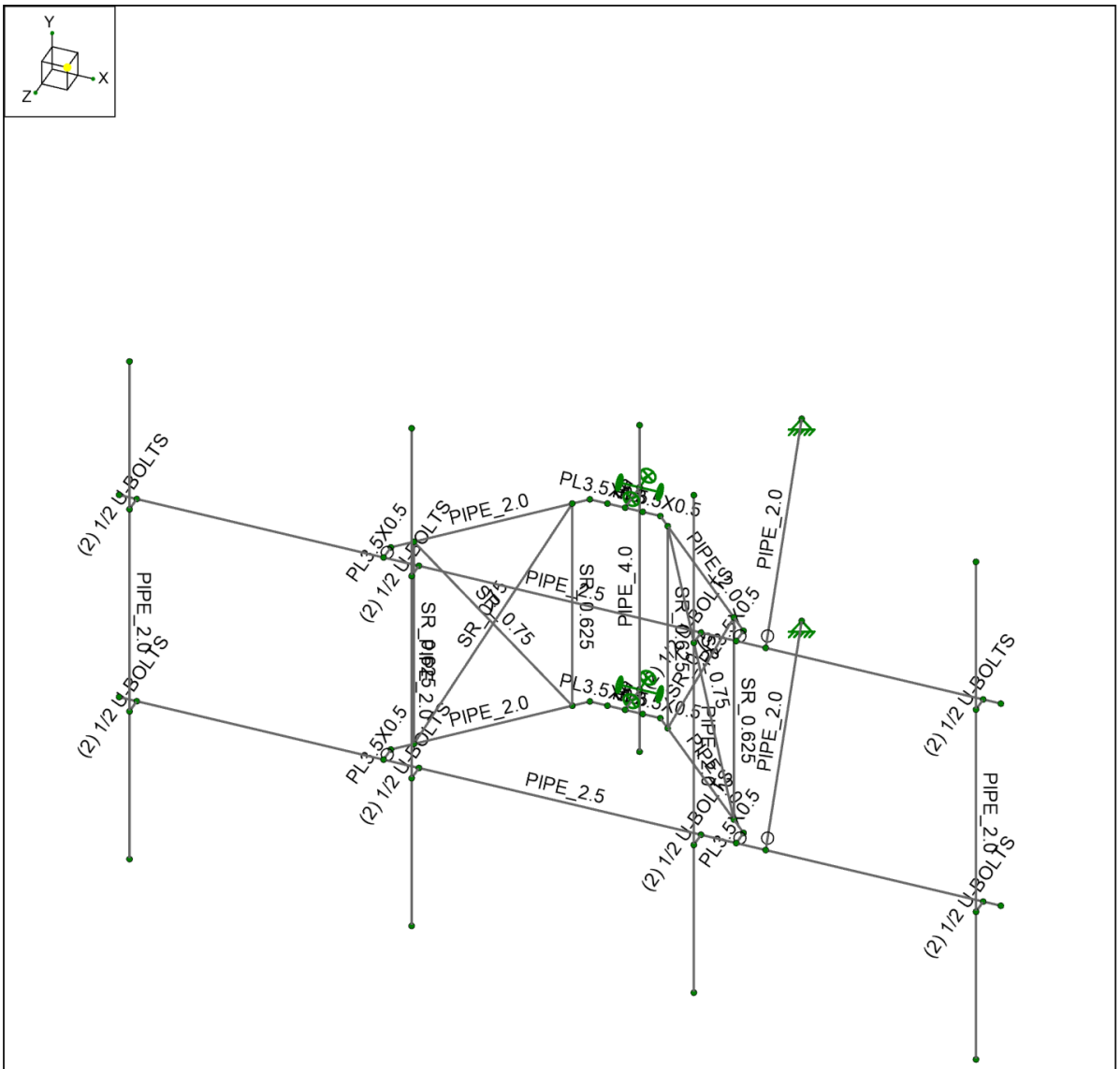
**** Equipment with EPA values N/A were not considered in the mount analysis***



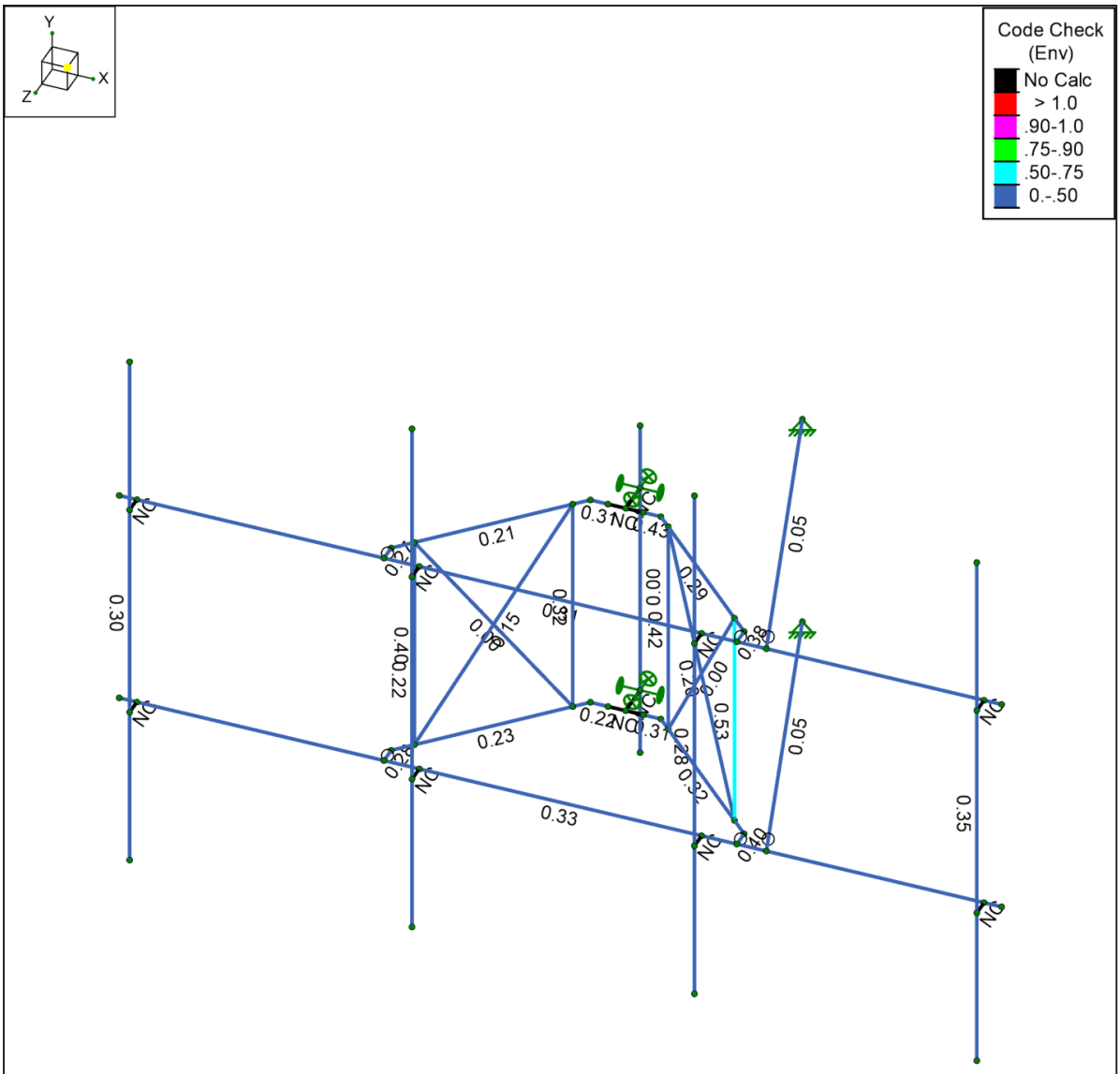
American Tower Corp.	411181, Barkhamstead CT	SK-1
Garrett.Williams		Oct 21, 2021
13709505_C8_07		R3D. SPRINT NEXTEL @ 411181, Bark…



American Tower Corp.	411181, Barkhamstead CT	SK-2
Garrett.Williams		Oct 21, 2021
13709505_C8_07		R3D. SPRINT NEXTEL @ 411181, Bark…

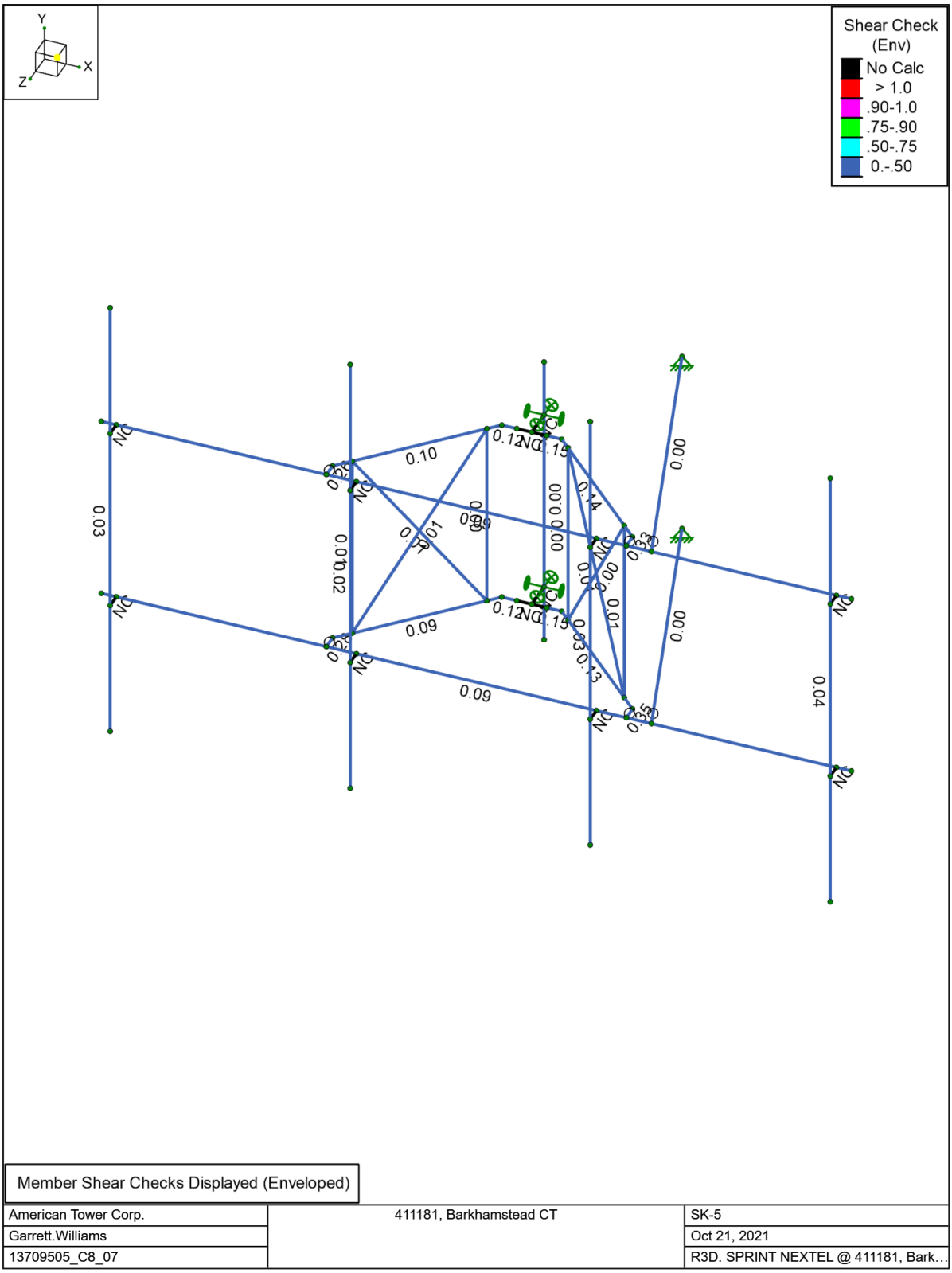


American Tower Corp.	411181, Barkhamstead CT	SK-3
Garrett.Williams		Oct 21, 2021
13709505_C8_07		R3D. SPRINT NEXTEL @ 411181, Bark…



Member Code Checks Displayed (Enveloped)

American Tower Corp.	411181, Barkhamstead CT	SK-4
Garrett.Williams		Oct 21, 2021
13709505_C8_07		R3D. SPRINT NEXTEL @ 411181, Bark…


Y
X
Z
Shear Check
(Env)
No Calc
> 1.0
.90-1.0
.75-.90
.50-.75
0.-.50
Member Shear Checks Displayed (Enveloped)
American Tower Corp.
411181, Barkhamstead CT
SK-5
Garrett.Williams
Oct 21, 2021
13709505_C8_07
R3D. SPRINT NEXTEL @ 411181, Bark…

Node Boundary Conditions

	Node Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot [k-in/rad]	Z Rot [k-in/rad]
1	N001	Reaction	Reaction	Reaction	Reaction	Reaction
2	N006	Reaction	Reaction	Reaction	Reaction	Reaction
3	N050	Reaction	Reaction	Reaction		
4	N051	Reaction	Reaction	Reaction		

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	H001	N003	N002		PIPE_2.5	Beam	None	A53 Gr. B	Typical
2	H002	N032	N004		PIPE_2.0	Beam	None	A53 Gr. B	Typical
3	H003	N031	N005		PIPE_2.0	Beam	None	A53 Gr. B	Typical
4	H004	N008	N007		PIPE_2.5	Beam	None	A53 Gr. B	Typical
5	H005	N029	N009		PIPE_2.0	Beam	None	A53 Gr. B	Typical
6	H006	N028	N010		PIPE_2.0	Beam	None	A53 Gr. B	Typical
7	U007	N011	N015		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
8	U008	N016	N017		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
9	U009	N012	N018		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
10	U010	N019	N020		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
11	U011	N013	N021		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
12	U012	N022	N023		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
13	U013	N014	N024		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
14	U014	N025	N026		(2) 1/2 U-BOLTS	Beam	None	SAE J429 Gr. 2	Typical
15	H015	N047	N028	90	PL3.5X0.5	Beam	None	A36	Typical
16	H016	N048	N029	90	PL3.5X0.5	Beam	None	A36	Typical
17	H017	N006	N027		RIGID	None	None	RIGID	Typical
18	H018	N045	N031	90	PL3.5X0.5	Beam	None	A36	Typical
19	H019	N046	N032	90	PL3.5X0.5	Beam	None	A36	Typical
20	H020	N001	N030		RIGID	None	None	RIGID	Typical
21	H021	N005	N034	90	PL3.5X0.5	Beam	None	A36	Typical
22	H022	N004	N033	90	PL3.5X0.5	Beam	None	A36	Typical
23	D023	N038	N035		SR_0.75	Column	None	A36	Typical
24	V024	N035	N036		SR_0.625	Column	None	A36	Typical
25	D025	N036	N037		SR_0.75	Column	None	A36	Typical
26	V026	N037	N038		SR_0.625	Column	None	A36	Typical
27	V027	N039	N040		SR_0.625	Column	None	A36	Typical
28	V028	N041	N042		SR_0.625	Column	None	A36	Typical
29	D029	N042	N039		SR_0.75	Column	None	A36	Typical
30	D030	N040	N041		SR_0.75	Column	None	A36	Typical
31	H031	N010	N044	90	PL3.5X0.5	Beam	None	A36	Typical
32	H032	N009	N043	90	PL3.5X0.5	Beam	None	A36	Typical
33	H033	N047	N048		RIGID	None	None	RIGID	Typical
34	H034	N045	N046		RIGID	None	None	RIGID	Typical
35	TB035	N050	N049		PIPE_2.0	Beam	None	A53 Gr. B	Typical
36	TB036	N051	N052		PIPE_2.0	Beam	None	A53 Gr. B	Typical
37	MP037	N053	N054		PIPE_2.0	Column	None	A53 Gr. B	Typical
38	MP038	N055	N056		PIPE_2.0	Column	None	A53 Gr. B	Typical
39	MP039	N057	N058		PIPE_2.0	Column	None	A53 Gr. B	Typical
40	MP040	N059	N060		PIPE_2.0	Column	None	A53 Gr. B	Typical
41	V041	N062	N061		PIPE_4.0	Column	None	A53 Gr. B	Typical

Member Advanced Data

	Label	J Release	T/C Only	Physical	Deflection Ratio Options	Activation	Seismic DR
1	H001			Yes	N/A		None
2	H002			Yes	Default		None
3	H003			Yes	Default		None
4	H004			Yes	N/A		None
5	H005			Yes	Default		None
6	H006			Yes	Default		None
7	U007			Yes	N/A	Exclude	None
8	U008			Yes	N/A	Exclude	None
9	U009			Yes	N/A	Exclude	None
10	U010			Yes	N/A	Exclude	None
11	U011			Yes	N/A	Exclude	None
12	U012			Yes	N/A	Exclude	None
13	U013			Yes	N/A	Exclude	None
14	U014			Yes	N/A	Exclude	None

Member Advanced Data (Continued)

	Label	J Release	T/C Only	Physical	Deflection Ratio Options	Activation	Seismic DR
15	H015			Yes	Default		None
16	H016			Yes	Default		None
17	H017			Yes	** NA **		None
18	H018			Yes	Default		None
19	H019			Yes	Default		None
20	H020			Yes	** NA **		None
21	H021	BenPIN		Yes	Default		None
22	H022	BenPIN		Yes	Default		None
23	D023		Tension Only	Yes	** NA **		None
24	V024			Yes	** NA **		None
25	D025		Tension Only	Yes	** NA **		None
26	V026			Yes	** NA **		None
27	V027			Yes	** NA **		None
28	V028			Yes	** NA **		None
29	D029		Tension Only	Yes	** NA **		None
30	D030		Tension Only	Yes	** NA **		None
31	H031	BenPIN		Yes	Default		None
32	H032	BenPIN		Yes	Default		None
33	H033			Yes	** NA **		None
34	H034			Yes	** NA **		None
35	TB035	BenPIN		Yes	N/A		None
36	TB036	BenPIN		Yes	N/A		None
37	MP037			Yes	** NA **		None
38	MP038			Yes	** NA **		None
39	MP039			Yes	** NA **		None
40	MP040			Yes	** NA **		None
41	V041			Yes	** NA **		None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lcomp top [in]	K y-y	K z-z	Function
1	H001	PIPE_2.5	150	Lbyy	1	1	Lateral
2	H002	PIPE_2.0	33.941	Lbyy	0.8	0.8	Lateral
3	H003	PIPE_2.0	33.941	Lbyy	0.8	0.8	Lateral
4	H004	PIPE_2.5	150	Lbyy	1	1	Lateral
5	H005	PIPE_2.0	33.941	Lbyy	0.8	0.8	Lateral
6	H006	PIPE_2.0	33.941	Lbyy	0.8	0.8	Lateral
7	U007	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
8	U008	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
9	U009	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
10	U010	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
11	U011	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
12	U012	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
13	U013	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
14	U014	(2) 1/2 U-BOLTS	3	Lbyy	0.5	0.5	Lateral
15	H015	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
16	H016	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
17	H018	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
18	H019	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
19	H021	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
20	H022	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
21	D023	SR_0.75	47.434	Lbyy	0.65	0.65	Lateral
22	V024	SR_0.625	39	Lbyy	0.65	0.65	Lateral
23	D025	SR_0.75	47.434	Lbyy	0.65	0.65	Lateral
24	V026	SR_0.625	39	Lbyy	0.65	0.65	Lateral
25	V027	SR_0.625	39	Lbyy	0.65	0.65	Lateral
26	V028	SR_0.625	39	Lbyy	0.65	0.65	Lateral
27	D029	SR_0.75	47.434	Lbyy	0.65	0.65	Lateral
28	D030	SR_0.75	47.434	Lbyy	0.65	0.65	Lateral
29	H031	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
30	H032	PL3.5X0.5	3	Lbyy	2.1	2.1	Lateral
31	TB035	PIPE_2.0	62.787	Lbyy	1	1	Lateral
32	TB036	PIPE_2.0	62.787	Lbyy	1	1	Lateral
33	MP037	PIPE_2.0	96	Lbyy	2.1	2.1	Lateral
34	MP038	PIPE_2.0	96	Lbyy	2.1	2.1	Lateral
35	MP039	PIPE_2.0	96	Lbyy	2.1	2.1	Lateral
36	MP040	PIPE_2.0	96	Lbyy	2.1	2.1	Lateral
37	V041	PIPE_4.0	63	Lbyy	0.65	0.65	Lateral

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [lb/ft³]	Yield [psi]	Ry	Fu [psi]	Rt
1	A53 Gr. B	2.9e+07	1.115e+07	0.3	0.65	490	35000	1.6	60000	1.2
2	SAE J429 Gr. 2	2.9e+07	1.115e+07	0.3	0.65	490	57000	1.1	74000	1.1
3	A36	2.9e+07	1.115e+07	0.3	0.65	490	36000	1.5	58000	1.2

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N001	max	1019.412	110	1264.737	26	398.178	16	-142.451	20	0	117	437.917	81
2		min	-1705.285	80	332.841	20	-1711.835	34	-660.883	26	0	1	-235.427	112
3	N006	max	1703.029	74	908.826	32	1706.853	28	-81.898	14	0	117	285.822	76
4		min	-1017.232	116	204.828	14	-369.152	22	-487.514	32	0	1	-151.986	106
5	N050	max	335.856	13	24.243	30	1123.064	13	0	117	0	117	0	117
6		min	-314.79	19	7.53	25	-1056.769	19	0	1	0	1	0	1
7	N051	max	301.692	25	24.409	30	1012.783	25	0	117	0	117	0	117
8		min	-321.897	7	7.844	24	-1080.205	7	0	1	0	1	0	1
9	Totals:	max	1236.713	6	2167.97	31	1624.005	2						
10		min	-1236.713	24	787.177	25	-1624.005	20						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	H001	PIPE_2.5	0.313	43.75	75	0.088	40.625		13	14558.792	50715	3596.25	3596.25	2.102	H1-1b
2	H002	PIPE_2.0	0.209	30.052	106	0.103	0		106	30216.926	32130	1871.625	1871.625	1.967	H1-1b
3	H003	PIPE_2.0	0.285	30.052	81	0.141	0		70	30216.926	32130	1871.625	1871.625	1.964	H1-1b
4	H004	PIPE_2.5	0.329	43.75	72	0.085	40.625		7	14558.792	50715	3596.25	3596.25	2.108	H1-1b
5	H005	PIPE_2.0	0.232	29.698	112	0.093	30.052		99	30216.926	32130	1871.625	1871.625	1.988	H1-1b
6	H006	PIPE_2.0	0.317	29.698	75	0.128	30.052		88	30216.926	32130	1871.625	1871.625	1.985	H1-1b
7	H015	PL3.5X0.5	0.306	0	72	0.154	3	y	87	51289.202	56700	590.625	4134.375	1.683	H1-1b
8	H016	PL3.5X0.5	0.216	0	107	0.122	3	y	102	51289.202	56700	590.625	4134.375	1.744	H1-1b
9	H018	PL3.5X0.5	0.426	0	78	0.147	3	y	93	51289.202	56700	590.625	4134.375	1.687	H1-1b
10	H019	PL3.5X0.5	0.308	0	113	0.117	3	y	96	51289.202	56700	590.625	4134.375	1.757	H1-1b
11	H021	PL3.5X0.5	0.379	0	81	0.328	0	y	80	51289.202	56700	590.625	4134.375	1.667	H1-1b
12	H022	PL3.5X0.5	0.267	0	107	0.259	0.031	y	111	51289.202	56700	590.625	4134.375	1.667	H1-1b
13	D023	SR_0.75	0.154	47.434	108	0.006	0		114	3691.013	14313.882	178.924	178.924	2.524	H1-1b*
14	V024	SR_0.625	0.318	0	110	0.002	0		32	2633.14	9940.196	103.544	103.544	2.284	H1-1a
15	D025	SR_0.75	0.004	47.434	78	0.005	0		78	3691.013	14313.882	178.924	178.924	2.193	H1-1b*
16	V026	SR_0.625	0.398	39	106	0.008	39		78	2633.14	9940.196	103.544	103.544	2.263	H1-1a
17	V027	SR_0.625	0.416	0	76	0.001	0		32	2633.14	9940.196	103.544	103.544	2.218	H1-1a
18	V028	SR_0.625	0.527	39	70	0.011	0		78	2633.14	9940.196	103.544	103.544	2.261	H1-1a
19	D029	SR_0.75	0.202	47.434	80	0.013	47.434		7	3691.013	14313.882	178.924	178.924	2.452	H1-1a*
20	D030	SR_0.75	0	47.434	117	0	47.434		117	3691.013	14313.882	178.924	178.924	1	H1-1a
21	H031	PL3.5X0.5	0.4	0	75	0.354	0	y	74	51289.202	56700	590.625	4134.375	1.667	H1-1b
22	H032	PL3.5X0.5	0.282	0	111	0.279	0.031	y	117	51289.202	56700	590.625	4134.375	1.667	H1-1b
23	TB035	PIPE_2.0	0.051	0	13	0.003	62.787		30	23139.652	32130	1871.625	1871.625	1.136	H1-1b*
24	TB036	PIPE_2.0	0.046	0	25	0.003	62.787		30	23139.652	32130	1871.625	1871.625	1.136	H1-1b*
25	MP037	PIPE_2.0	0.351	67	72	0.041	29		78	3485.189	32130	1871.625	1871.625	3	H1-1b
26	MP038	PIPE_2.0	0.279	28	8	0.033	28		8	3485.189	32130	1871.625	1871.625	3	H1-1b
27	MP039	PIPE_2.0	0.219	28	100	0.019	67		80	3485.189	32130	1871.625	1871.625	3	H1-1a
28	MP040	PIPE_2.0	0.299	67	116	0.03	29		109	3485.189	32130	1871.625	1871.625	3	H1-1b
29	V041	PIPE_4.0	0	12.469	26	0.004	50.531		70	89830.649	93240	10631.25	10631.25	1	H1-1b*

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: CTNH617A

50 Rust Road
Barkhamsted, Connecticut 06063

December 3, 2021

EBI Project Number: 6221007357

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**28.27%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

December 3, 2021

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

Emissions Analysis for Site: CTNH617A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **50 Rust Road** in **Barkhamsted, 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 50 Rust Road in Barkhamsted, 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 power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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. This Channel has a transmit power of 80 Watts.

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 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.

7) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

8) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

11) 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.

12) 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.

13) The antennas used in this modeling are the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 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.

14) The antenna mounting height centerline of the proposed antennas is 146 feet above ground level (AGL).

15) 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.

16) 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:	Commscope VV-65A-R1	Make / Model:	Commscope VV-65A-R1	Make / Model:	Commscope VV-65A-R1
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:	15.15 dBd / 15.15 dBd / 15.8 dBd	Gain:	15.15 dBd / 15.15 dBd / 15.8 dBd	Gain:	15.15 dBd / 15.15 dBd / 15.8 dBd
Height (AGL):	146 feet	Height (AGL):	146 feet	Height (AGL):	146 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):	12,418.45	ERP (W):	12,418.45	ERP (W):	12,418.45
Antenna A1 MPE %:	**2.28%**	Antenna B1 MPE %:	**2.28%**	Antenna C1 MPE %:	**2.28%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	146 feet	Height (AGL):	146 feet	Height (AGL):	146 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A2 MPE %:	**1.81%**	Antenna B2 MPE %:	**1.81%**	Antenna C2 MPE %:	**1.81%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	146 feet	Height (AGL):	146 feet	Height (AGL):	146 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A3 MPE %:	**6.67%**	Antenna B3 MPE %:	**6.67%**	Antenna C3 MPE %:	**6.67%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	10.76%
AT&T	9.04%
Metro PCS	0.9%
T-Mobile (Existing)	1.87%
Nextel	0.39%
Verizon	5.31%
Site Total MPE % :	28.27%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	10.76%
T-Mobile Sector B Total:	10.76%
T-Mobile Sector C Total:	10.76%
Site Total MPE % :	28.27%

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 1900 MHz GSM	4	982.02	146.0	7.21	1900 MHz GSM	1000	0.72%
T-Mobile 1900 MHz LTE	2	1964.04	146.0	7.21	1900 MHz LTE	1000	0.72%
T-Mobile 2100 MHz LTE	2	2281.14	146.0	8.37	2100 MHz LTE	1000	0.84%
T-Mobile 600 MHz LTE	2	591.73	146.0	2.17	600 MHz LTE	400	0.54%
T-Mobile 600 MHz NR	1	1577.94	146.0	2.89	600 MHz NR	400	0.72%
T-Mobile 700 MHz LTE	2	695.22	146.0	2.55	700 MHz LTE	467	0.55%
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	11044.63	146.0	20.26	2500 MHz LTE 1C & 2C Traffic	1000	2.03%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	146.0	1.97	2500 MHz LTE 1C & 2C Broadcast	1000	0.20%
T-Mobile 2500 MHz NR Traffic	1	22089.26	146.0	40.52	2500 MHz NR Traffic	1000	4.05%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	146.0	3.94	2500 MHz NR Broadcast	1000	0.39%
						Total:	**10.76%**

• 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:	10.76%
Sector B:	10.76%
Sector C:	10.76%
T-Mobile Maximum MPE % (Sector A):	10.76%
Site Total:	28.27%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **28.27%** 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.